

Power Xpert C445 Global Motor Management Relay

User Manual

Effective May 2023

Supersedes January 2019



EU: Eaton Industries GmbH
Hein-Moeller-Str. 7-11
53115 Bonn, Germany

US: Eaton Corporation
W126N7250 Flint Drive
Menomonee Falls, WI 53051

Disclaimer of Warranties and Limitation of Liability

The information, recommendations, descriptions and safety notations in this document are based on Eaton's experience and judgment and may not cover all contingencies. If further information is required, an Eaton sales office should be consulted. Sale of the product shown in this literature is subject to the terms and conditions outlined in appropriate Eaton selling policies or other contractual agreement between Eaton and the purchaser.

THERE ARE NO UNDERSTANDINGS, AGREEMENTS, WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, OTHER THAN THOSE SPECIFICALLY SET OUT IN ANY EXISTING CONTRACT BETWEEN THE PARTIES. ANY SUCH CONTRACT STATES THE ENTIRE OBLIGATION OF EATON. THE CONTENTS OF THIS DOCUMENT SHALL NOT BECOME PART OF OR MODIFY ANY CONTRACT BETWEEN THE PARTIES.

In no event will Eaton be responsible to the purchaser or user in contract, in tort (including negligence), strict liability or otherwise for any special, indirect, incidental or consequential damage or loss whatsoever, including but not limited to damage or loss of use of equipment, plant or power system, cost of capital, loss of power, additional expenses in the use of existing power facilities, or claims against the purchaser or user by its customers resulting from the use of the information, recommendations and descriptions contained herein. The information contained in this manual is subject to change without notice.

Cover Photo: Eaton Power Xpert™ C445 global motor management relay

Support Services

The goal of Eaton is to ensure your greatest possible satisfaction with the operation of our products. We are dedicated to providing fast, friendly, and accurate assistance. That is why we offer you so many ways to get the support you need. Whether it is by phone, fax, or email, you can access Eaton's support information 24 hours a day, seven days a week.

Our wide range of services is listed below.

You should contact your local distributor for product pricing, availability, ordering, expediting, and repairs.

Website

Use the Eaton website to find product information. You can also find information on local distributors or Eaton's sales offices.

Website Address

www.eaton.com/c445

EatonCare Customer Support Center

Call the EatonCare Support Center if you need assistance with placing an order, stock availability or proof of shipment, expediting an existing order, emergency shipments, product price information, returns other than warranty returns, and information on local distributors or sales offices.

Voice: 877-ETN-CARE (386-2273) (8:00 a.m. to 6:00 p.m. EST)

After-Hours Emergency: 800-543-7038 (6:00 p.m. to 8:00 a.m. EST)

Technical Resource Center

Overload, Starter and MCC Communications Products

Voice: 877-ETN-CARE (386-2273)

(8:00 a.m. to 5:00 p.m. CST [UTC -6])

email: trc@eaton.com

Online Chat: eaton.com/chat

For Customers in Europe, contact:

Phone: +49 (0) 228 6 02-3640

Hotline: +49 (0) 180 5 223822

email: techsupportemea@eaton.com

website: www.eaton.com/moeller/aftersales

Table of Contents

SAFETY

| | |
|-------------------------------|-----|
| Definitions and Symbols | xii |
| Hazardous High Voltage | xii |
| Warnings and Cautions | xii |

CHAPTER 1—POWER XPERT C445 OVERVIEW

| | |
|-------------------------|---|
| System Overview | 1 |
| Catalog Numbering | 2 |
| Accessories | 4 |
| Modules Overview | 6 |

CHAPTER 2—RECEIPT/UNPACKING

| | |
|-----------------|---|
| General | 9 |
| Unpacking | 9 |
| Storage | 9 |

CHAPTER 3—INSTALLATION AND WIRING

| | |
|--|----|
| Introduction | 10 |
| Mounting Positions | 10 |
| Clearance | 11 |
| C445 Module Assembly | 12 |
| C445 Mounting | 15 |
| C445 Surface Mounting on DIN rail | 15 |
| C445... Mounting Dimensions—DIN Rail and Panel Mount | 16 |
| Monitoring User Interface C445UM Mounting Dimensions | 20 |
| Motor Wiring Connections—Typical | 26 |
| Motor Connections for Standard Overload Control | 27 |
| Power and I/O Wiring | 34 |
| Digital Outputs | 38 |
| Base Control Module DIP Switches | 41 |

CHAPTER 4—SYSTEM CONFIGURATION AND COMMISSIONING

| | |
|---|----|
| Commissioning | 45 |
| The New C445 Web Pages | 49 |
| Power Xpert <i>in</i> Control Commissioning Software Tool | 55 |
| Real-Time Clock and Memory Backup Module (RTC Module) | 58 |
| SNTP (Simple Network Time Protocol) | 62 |
| Parameter Lock Features | 64 |
| Cyber Security | 71 |

Table of Contents, continued

| | |
|--|------------|
| CHAPTER 5—SYSTEM CONFIGURATION AND OPERATION | |
| Control Sources | 75 |
| Pre-Defined Operation Modes | 76 |
| Overload Only Operation Mode | 77 |
| Direct Operation Mode | 81 |
| Reverser Operation Mode | 85 |
| Star/Delta Operation Mode | 89 |
| Two Speed Two Winding Operation Mode (Two Speed Poll Changing) ... | 93 |
| Two Speed Dahlander Operation Mode | 97 |
| Auto Transformer Operation Mode | 101 |
| Solenoid Valve Operation Mode | 105 |
| MCCB Feeder Operation Mode | 110 |
| Contactor Feeder Operation Mode | 114 |
| General Purpose Input / Output Operation Mode | 118 |
| Stand Alone Ground Fault Module | 120 |
| CHAPTER 6—MOTOR PROTECTION | |
| Introduction | 122 |
| Configuration Parameter Locking | 122 |
| Fault Trip, Fault No Trip and Fault Warning | 123 |
| Motor Control Operation | 123 |
| Start Cycle and Transition Timing | 123 |
| Motor Thermal Overload | 124 |
| Application Configuration | 128 |
| Overview of Protection Features | 129 |
| Advanced Protection | 132 |
| Advanced Protection Parameters | 140 |
| Motor Protection | 141 |
| Supply Protection | 145 |
| Load Protection | 150 |
| CHAPTER 7—MONITORING AND DIAGNOSTICS | |
| Methods for Monitoring | 152 |
| Monitoring Parameters | 152 |
| CHAPTER 8—C445UM MONITORING USER INTERFACE | |
| C445UM Overview | 158 |
| C445UM Setup Wizard | 159 |
| C445UM LED and Button Overview | 160 |
| C445UM Monitoring | 161 |
| C445UM PRG Menu (Customizing Settings) | 162 |
| Customizing Settings in PRG Menu | 163 |
| C445UM Fault and Event Diagnostics | 164 |
| C445UM User Interface Settings | 166 |
| C445UM Security | 167 |
| C445UM Services | 167 |
| Floating User Interface option | 168 |

Table of Contents, continued

| | |
|--|-----|
| CHAPTER 9—C445 LOGIC ENGINE AND EXPANSION I/O | |
| Power Xpert <i>inControl</i> Logic Engine | 169 |
| The Function Blocks | 171 |
| Accessing C445 System Parameters with the Logic Engine | 206 |
| C445 Expansion Inputs and Outputs | 207 |
| Expansion I/O Pass-through to fieldbus networks | 213 |
| EtherNet/IP | 214 |
| PROFIBUS | 215 |
| Assigning I/O parameters to Cyclic Modules | 217 |
| Modbus TCP and RS-485 Modbus | 218 |
| CHAPTER 10—C445 GROUND FAULT MONITORING AND PROTECTION | |
| Ground Fault Monitoring Methods | 222 |
| APPENDIX A—TECHNICAL DATA AND SPECIFICATIONS | |
| Technical Data and Specifications | 226 |
| APPENDIX B—TROUBLESHOOTING AND DIAGNOSTICS | |
| Troubleshooting and Diagnostics | 232 |
| APPENDIX C—OPTIONAL COMMUNICATION CARDS | |
| Ethernet Card (C445XC-E) | 235 |
| Ethernet Communication Card and DIP Switches | 236 |
| LED Status Indicators | 238 |
| Ethernet LED Indications | 239 |
| Configuration Using a Web Browser | 239 |
| Configuration Using an EDS File | 240 |
| Configuring Using the <i>inControl</i> Software Tool | 240 |
| Ethernet/IP Protocol | 240 |
| Object Details | 241 |
| Modbus TCP Protocol | 306 |
| PROFIBUS Communication Card | 307 |
| C445 Cyclic (Polling) | 309 |
| PROFIBUS Diagnostics | 313 |
| C445 PROFIBUS Configuration File | 314 |
| C445 PROFIBUS Bit Mapping Parameters | 315 |
| APPENDIX D—MODBUS REGISTER MAP | |
| C445 Modbus Register Map | 317 |
| APPENDIX E—FIRMWARE UPDATES | |
| Upgrade process for Base Control Modules with Firmware version 2.1.3 or earlier (Style number 3-4104-xxxC) | 435 |
| Firmware Upgrade Process for a C445 with a Base Control Module Firmware 3.0 or later (Style Number 3-4104-xxxD) | 440 |
| Downloading Firmware to a C445 via the RS485 port or a Micro USB port | 441 |
| Downloading Firmware to a C445 via Ethernet and the Web Browser | 445 |
| APPENDIX F—LICENSES | |
| Licenses | 451 |

List of Figures

Figure 1. C445 System Catalog Numbering **2**

Figure 2. Base Control Module Catalog Numbering **2**

Figure 3. Measurement Module Catalog Numbering **2**

Figure 4. User Interface Catalog Numbering **3**

Figure 5. Optional High Resistance Ground Fault Module and CTs **3**

Figure 6. Optional Expansion I/O **3**

Figure 7. Control User Interface Overlay Examples: IEC **3**

Figure 8. Base Control Module Image **6**

Figure 9. Base Module Features and Connections—Front View **6**

Figure 10. Base Module Features and Connections—Bottom View **7**

Figure 11. Measurement Module Image **7**

Figure 12. Measurement Module Features and Connections **7**

Figure 13. C445UM Monitoring User Interface Image **8**

Figure 14. Vertical Position Limits **10**

Figure 15. Clearance Dimensions **11**

Figure 16. Component Exploded View (C445B...Base Module,
C445M...Measurement Module, Accessory Cover, C445XO-TRTC
Real Time Clock Module, C445C... Communications card(s)) **12**

Figure 17. Option Cover Removal **12**

Figure 18. Real-Time Clock and Memory Backup Module Installation **13**

Figure 19. Communication Card Installation **14**

Figure 20. Component Mating **14**

Figure 21. DIN Rail Mounting Instructions **15**

Figure 22. DIN Rail Dimensions **15**

Figure 23. Base Control Module—C445B... Mounting Dimensions **16**

Figure 24. Measurement Module—C445MA... Mounting Dimensions **17**

Figure 25. Stacked Base Control Module C445B... and Measurement
Module C445MA... Mounting Dimensions **18**

Figure 26. Measurement Module C445MB... Mounting Dimensions **19**

Figure 27. Measurement Module C445MC... Mounting Dimensions **19**

Figure 28. User Interface—Monitoring Option **20**

Figure 29. Panel Cutout Options **20**

Figure 30. C445XG-MOD—C445 External Ground Fault Module **21**

Figure 31. C445XG-CT2—28 mm Diameter Zero Sequencing Ground Fault CT **22**

Figure 32. C445XG-CT3—52 mm Diameter Zero Sequencing Ground Fault CT **23**

Figure 33. C445XG-CT4—63 mm Diameter Zero Sequencing Ground Fault CT **24**

Figure 34. C445XG-CT7—80 x 175 Rectangular Zero Sequencing Ground Fault CT **25**

Figure 35. Terminal Fastening **26**

Figure 36. Motor Connections for Standard Overload Control with C445BD... **27**

Figure 37. Motor Connections for Standard Overload Control with C445BA... **28**

Figure 38. XCT300-5, XCT600-5 (inches) XCT800-5 (inches) **29**

Figure 39. External CT Wiring Diagram **31**

Figure 40. Motor Connections for Standard Overload Control
Using Potential Transformers with C445BD... **32**

Figure 41. Motor Connections for Standard Overload Control
Using Potential Transformers with C445BA... **33**

Figure 42. Base Control Module Features and Connections **34**

Figure 43. Base Control Module LED Overview **35**

Figure 44. Input Power Options **35**

Figure 45. AC Field Input Terminal **36**

List of Figures, continued

| | |
|--|-----|
| Figure 46. 120 Vac Input Terminal Diagram | 36 |
| Figure 47. DC Field Input Terminal | 37 |
| Figure 48. DC Input Wiring Option 1 (Isolated) | 37 |
| Figure 49. DC Input Wiring Option 2 (Non-Isolated) | 37 |
| Figure 50. 4-Point Form A (NO) Output Connector | 40 |
| Figure 51. 3-Point Form C (NO/NC) Output Connector | 40 |
| Figure 52. Modbus Serial Connection | 40 |
| Figure 53. RS-485 Port | 40 |
| Figure 54. Base Control Module DIP Switches with Built-In Modbus | 41 |
| Figure 55. Base Control Module DIP Switches with PROFIBUS Card | 41 |
| Figure 56. Base Control Module DIP Switches with Ethernet Card | 41 |
| Figure 57. Measurement Module LED Overview | 43 |
| Figure 58. C445 System Connection | 44 |
| Figure 59. C445 System Connection with Ground Fault Included | 44 |
| Figure 60. C445UM: Monitoring User Interface | 77 |
| Figure 61. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power | 79 |
| Figure 62. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power | 79 |
| Figure 63. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power | 80 |
| Figure 64. Timing Diagram for the Direct Mode Operation | 81 |
| Figure 65. C445UM: Monitoring User Interface | 81 |
| Figure 66. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power | 83 |
| Figure 67. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power | 83 |
| Figure 68. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power | 84 |
| Figure 69. Timing Diagram for the Reverse Operation Mode | 85 |
| Figure 70. C445UM: Monitoring User Interface | 85 |
| Figure 71. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power | 87 |
| Figure 72. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power | 87 |
| Figure 73. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power | 88 |
| Figure 74. Timing Diagram for the Star/Delta Operation Mode | 89 |
| Figure 75. C445UM: Monitoring User Interface | 89 |
| Figure 76. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power | 91 |
| Figure 77. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power | 91 |
| Figure 78. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power | 92 |
| Figure 79. Timing Diagram for the Two Speed Operation Mode | 93 |
| Figure 80. C445UM: Monitoring User Interface | 93 |
| Figure 81. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power | 95 |
| Figure 82. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power | 95 |
| Figure 83. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power | 96 |
| Figure 84. Timing Diagram for the Two Speed Dahlander Operation Mode | 97 |
| Figure 85. C445UM: Monitoring User Interface | 97 |
| Figure 86. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power | 99 |
| Figure 87. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power | 99 |
| Figure 88. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power | 100 |
| Figure 89. Timing Diagram for the Auto Transformer Operation Mode | 101 |
| Figure 90. C445UM: Monitoring User Interface | 101 |
| Figure 91. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power | 103 |
| Figure 92. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power | 103 |
| Figure 93. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power | 104 |
| Figure 94. Timing Diagram for the Solenoid Valve Operation Mode | 105 |
| Figure 95. C445UM: Monitoring User Interface | 105 |

List of Figures, continued

| | |
|---|------------|
| Figure 96. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power | 108 |
| Figure 97. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power | 108 |
| Figure 98. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power | 109 |
| Figure 99. Timing Diagram for MCCB Feeder Operation Mode | 110 |
| Figure 100. C445UM: Monitoring User Interface | 110 |
| Figure 101. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power | 112 |
| Figure 102. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power | 112 |
| Figure 103. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power | 113 |
| Figure 104. Timing Diagram for the Contactor Feeder Operating Mode | 114 |
| Figure 105. C445UM: Monitoring User Interface | 114 |
| Figure 106. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power | 116 |
| Figure 107. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power | 116 |
| Figure 108. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power | 117 |
| Figure 109. C445UM: Monitoring User Interface | 120 |
| Figure 110. Start Cycle and Transition Timing | 124 |
| Figure 111. Overload Trip Curves—Cold Coil (–40 °C to +60 °C) | 125 |
| Figure 112. Overload Trip Curves—Hot Coil (–40 °C to +60 °C) | 126 |
| Figure 113. Example #1: Auto-Time—Mains Voltage Returns Before Auto Time Expires | 134 |
| Figure 114. Example #2: Auto-Time—Mains Voltage Does Not Return Before Auto Time Expires | 135 |
| Figure 115. Example #3: Short-Time—Mains Voltage Returns Before Short Time Expires | 136 |
| Figure 116. Example #4: Short-Time—Mains Voltage Does Not Return Before Short Time Expires | 137 |
| Figure 117. Example #5: Long-Time—Mains Voltage Returns Before Long Time Expires | 138 |
| Figure 118. Example #6: Long-Time—Mains Voltage Does Not Return Before Long Time Expires | 139 |
| Figure 119. C445UM | 158 |
| Figure 120. C445UM Setup Wizard | 159 |
| Figure 121. C445UM LED and Buttons | 160 |
| Figure 122. C445UM Monitoring Menus | 161 |
| Figure 123. Monitoring Menu Data | 161 |
| Figure 124. C445UM Program Menu | 162 |
| Figure 125. C445UM Diagnostics | 164 |
| Figure 126. C445UM Faults and Events | 164 |
| Figure 127. C445UM Inhibits | 165 |
| Figure 128. C445UM Control Button Disabled Notification Screen | 166 |
| Figure 129. C445 Ethernet Star Network Connection Example | 235 |
| Figure 130. C445 Ethernet Ring Network Connection Example | 235 |
| Figure 131. C445 Ethernet Linear Network Connection Example | 235 |
| Figure 132. Installing the Ethernet Communication Card | 235 |
| Figure 133. Base Control Module DIP Switches with Ethernet Card | 236 |
| Figure 134. Installing the PROFIBUS Communication Card | 307 |
| Figure 135. Base Control Module DIP Switches with PROFIBUS Card | 308 |

List of Tables

| | |
|---|------------|
| Table 1. Control User Interface Family—IEC Color Scheme (Symbols) | 3 |
| Table 2. Suggested Current Transformers | 4 |
| Table 3. Catalog Numbers: C445XC... Optional Communication Cards and C445XO... Modules | 4 |
| Table 4. Catalog Numbers: D77E... RJ-12 Cables | 4 |
| Table 5. Catalog Numbers: C445XU... Control User Interface Wiring Harnesses | 5 |
| Table 6. Catalog Numbers: C445XS... Spare Parts Kit and USB Cables | 5 |
| Table 7. Mounting Hardware | 15 |
| Table 8. C445 CT Offering Catalog Numbers (XCT_ CTs) | 29 |
| Table 9. External CT Settings | 30 |
| Table 10. Modbus Data Rate | 41 |
| Table 11. PTC Sensor Status | 43 |
| Table 12. Overload Only Configuration Parameters | 78 |
| Table 13. Direct Configuration Parameters | 82 |
| Table 14. Reverser Configuration Parameters | 86 |
| Table 15. Star/Delta Configuration Parameters | 90 |
| Table 16. Two Speed Two Winding Configuration Parameters | 94 |
| Table 17. Two Speed Dahlander Configuration Parameters | 98 |
| Table 18. Auto Transformer Configuration Parameters | 102 |
| Table 19. Solenoid Configuration Parameters | 106 |
| Table 20. MCCB Configuration Parameters | 111 |
| Table 21. Contactor Feeder Configuration Parameters | 115 |
| Table 22. Configuration Parameter | 118 |
| Table 23. Stand Alone Ground Fault Module Configuration Parameters | 121 |
| Table 24. Parameters That Control the Transition Profile | 124 |
| Table 25. Basic Parameters | 128 |
| Table 26. Advanced Parameters | 128 |
| Table 27. Current Based Protections | 130 |
| Table 28. Voltage Based Protections | 131 |
| Table 29. Power Based Protections | 131 |
| Table 30. Undervoltage | 132 |
| Table 31. Voltage Loss Restart | 132 |
| Table 32. Protections | 140 |
| Table 33. Fault Warnings | 141 |
| Table 34. Overload | 142 |
| Table 35. Instantaneous Overcurrent | 142 |
| Table 36. Jam | 143 |
| Table 37. Stall | 143 |
| Table 38. Current Unbalance | 143 |
| Table 39. Current Phase Loss | 144 |
| Table 40. Undercurrent | 144 |
| Table 41. Ground Fault | 145 |
| Table 42. Undervoltage | 146 |
| Table 43. Overvoltage | 146 |
| Table 44. Voltage Unbalance | 147 |
| Table 45. Voltage Phase Loss | 147 |
| Table 46. Voltage Phase Rotation | 148 |
| Table 47. PF Deviation | 148 |
| Table 48. Hz Dev – Slow | 149 |
| Table 49. Hz Dev – Fast | 149 |

List of Tables, continued

| | |
|--|-----|
| Table 50. Undercurrent | 150 |
| Table 51. Low Power | 150 |
| Table 52. High Power | 151 |
| Table 53. Peak Demand | 151 |
| Table 54. Current Based Monitoring | 152 |
| Table 55. Current Scale Factor | 153 |
| Table 56. Voltage Based Monitoring | 153 |
| Table 57. Power-Based Monitoring | 154 |
| Table 58. System Monitoring | 154 |
| Table 59. Faults and Events | 155 |
| Table 60. Trip Snapshot Parameters | 155 |
| Table 61. PTC Status Bits | 155 |
| Table 62. Motor Control Status Bits | 155 |
| Table 63. Active Fault, Warning and Inhibit Values | 156 |
| Table 64. C445UM Catalog Numbers | 158 |
| Table 65. C445UM Setup Wizard Parameters | 159 |
| Table 66. Program Menu Groups | 163 |
| Table 67. Running/Stopped/Auto LED Color Settings | 166 |
| Table 68. Residual Ground Fault Parameterization | 222 |
| Table 69. Zero-sequence Ground Fault Parameterization | 223 |
| Table 70. C445 Zero-sequence Current Transformers | 223 |
| Table 71. Pulse Detection Protection Parameterization | 225 |
| Table 72. Environmental Specifications | 226 |
| Table 73. Power Supply Specifications Summary | 226 |
| Table 74. Input/Output Specifications | 227 |
| Table 75. PTC Specifications | 227 |
| Table 76. Measurement Module Specifications | 228 |
| Table 77. Measurement Module Frame Breaks | 228 |
| Table 78. EMC Emissions | 228 |
| Table 79. EMC Immunity | 229 |
| Table 80. Agency Certifications and Regulatory | 229 |
| Table 81. Physical Size Specifications | 230 |
| Table 82. Short Circuit Ratings (North American CSA and UL) | 230 |
| Table 83. Short Circuit Ratings (IEC) | 230 |
| Table 84. Impulse Withstand Ratings | 231 |
| Table 85. Motor Protection Fault Definitions | 232 |
| Table 86. Load Protection Fault Definitions | 233 |
| Table 87. Line Protection Fault Definitions | 234 |
| Table 88. Module Status Indicator | 238 |
| Table 89. Network Status Indicator | 238 |
| Table 90. Ethernet LED Description | 239 |
| Table 91. Five Levels Of Authorization | 239 |
| Table 92. EtherNet/IP Object Model for the C445 Motor Management Relay | 240 |
| Table 93. Identity Object—Class 0x01 (1) | 241 |
| Table 94. Message Router Object—Class 0x2 (2) | 242 |
| Table 95. Assembly Object—Class 0x4 (4) | 243 |
| Table 96. C445 Assembly Object Instances | 243 |
| Table 97. Connection Manager Object—Class 0x6 (6) | 276 |
| Table 98. Discrete Input Object—Class 0x8 (8) | 277 |
| Table 99. Discrete Output Object—Class 0x9 (9) | 278 |

List of Tables, continued

| | |
|---|------------|
| Table 100. Control Supervisor Object—Class 0x29 (41) | 279 |
| Table 101. Overload Object—Class 0x2C (44) | 285 |
| Table 103. System Component Definition Object—Class 0x88 (136) | 286 |
| Table 103. Voltage Object—Class 0x93 (147) | 288 |
| Table 104. Dynamic Input Assembly Interface Object—Class 0x96 (150) | 289 |
| Table 105. Dynamic Input Assembly Instance Parameters | 290 |
| Table 106. Motor Info Object—Class 0x9B (155) | 290 |
| Table 107. Operation Mode Object—Class 0x9F (159) | 291 |
| Table 108. Modbus Object—Class 0xA0 (160) | 292 |
| Table 109. Motor Monitoring Object—Class 0xA1 (161) | 293 |
| Table 110. Motor Protection Object—Class 0xA2 (162) | 294 |
| Table 111. Snapshot Object—Class 0xA5 (165) | 298 |
| Table 112. Parameter Access Object—Class 0xAA (170) | 299 |
| Table 113. RTC Object—Class 0xB0 (176) | 299 |
| Table 114. BCM Object—Class 0xB1 (177) | 300 |
| Table 115. Option Card Object—Class 0xB3 (179) | 301 |
| Table 116. Port Object—Class 0xF4 (244) | 302 |
| Table 117. TCP/IP Object—Class 0xF5 (245) | 303 |
| Table 118. Ethernet Link Object—Class 0xF6 (246) | 304 |
| Table 119. Modbus TCP Function Codes | 306 |
| Table 120. Modbus Data Rate | 308 |
| Table 121. PROFIBUS D-Shell Connector Specifications | 308 |
| Table 122. DB-9 Connector | 308 |
| Table 123. PROFIBUS Card LED Definitions | 309 |
| Table 124. C445 Diagnostic Telegram Details | 313 |
| Table 125. PROFIBUS Configuration File | 314 |
| Table 126. Bit Mapping Parameters for Cyclic/Acyclic Writeable Parameters | 315 |
| Table 127. Fieldbus Motor Control Bits | 315 |
| Table 128. Bit Mapping Parameters for Cyclic/Acyclic Readable Parameters | 315 |
| Table 129. PROFIBUS Cyclic/Acyclic Readable Parameters | 316 |
| Table 130. C445 Modbus Register Map | 317 |

Safety

Definitions and Symbols

 **WARNING**

This symbol indicates high voltage. It calls your attention to items or operations that could be dangerous to you and other persons operating this equipment. Read the message and follow the instructions carefully.



This symbol is the “Safety Alert Symbol.” It occurs with either of two signal words: CAUTION or WARNING, as described below.

 **WARNING**

Indicates a potentially hazardous situation which, if not avoided, can result in serious injury or death.

 **CAUTION**

Indicates a potentially hazardous situation which, if not avoided, can result in minor to moderate injury, or serious damage to the product. The situation described in the CAUTION may, if not avoided, lead to serious results. Important safety measures are described in CAUTION (as well as WARNING).

Hazardous High Voltage

 **WARNING**

Motor control equipment and electronic controllers are connected to hazardous line voltages. When servicing drives and electronic controllers, there may be exposed components with housings or protrusions at or above line potential. Extreme care should be taken to protect against shock.

Stand on an insulating pad and make it a habit to use only one hand when checking components. Always work with another person in case an emergency occurs. Disconnect power before checking controllers or performing maintenance. Be sure equipment is properly grounded. Wear safety glasses whenever working on electronic controllers or rotating machinery.

Warnings and Cautions

This manual contains clearly marked cautions and warnings which are intended for your personal safety and to avoid any unintentional damage to the product or connected appliances.

Please read the information included in cautions and warnings carefully.

 **WARNING**

The C445 may reset at any time enabling a motor start. When faulted (FAULT LED is ON) the READY LED will flash when an auto reset is pending.

 **CAUTION**

Record all passwords in a safe location. Once a password has been set it cannot be displayed. If a password is forgotten the only method of resetting the password(s) is a factory reset.

 **CAUTION**

In the Auto Reset mode, caution must be exercised to assure that any restart occurs in a safe manner. Auto Reset mode should not be used in environments where excessive restart attempts may cause component damage and/or create unsafe conditions.

 **CAUTION**

The motor, the wiring diameter and the switching device(s) must be suitable for the selected Trip Class.

 **CAUTION**

The current-dependent protective device must be selected so that not only is the motor current monitored but the blocked motor is switched OFF within the temperature rise time.

Chapter 1—Power Xpert C445 Overview

System Overview

The Power Xpert™ C445 is an advanced, global motor management relay with full line, load and motor system monitoring and protection. It is designed to protect single or three phase AC electric induction motors ranging from 0.3 to 800 A. In the event of an overload trip, C445 disconnects power flow to the monitored motor. C445 additionally provides advanced monitoring and control algorithms for efficiency, torque, speed, energy deviation, and voltage loss restart.

C445 offers a modular pass-through design, separating monitoring, protection and control functionality into individual modules. This allows the user to select the appropriate options for each module and combine them to meet the exact needs of their application. The C445 also offers multiple pre-programmed operation modes to support fast, easy and error-free installation for the majority of applications.

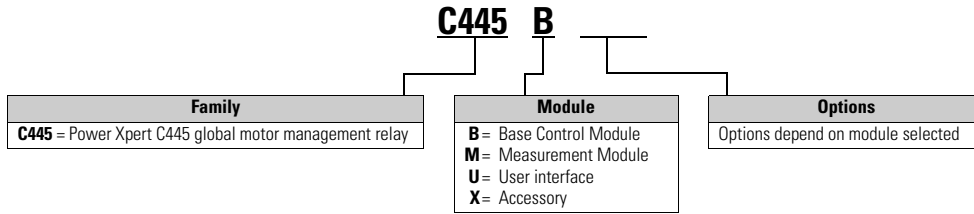
How to Use this Manual

The purpose of this manual is to provide you with information necessary to install, set and customize parameters, start-up, troubleshoot and maintain the Eaton Power Xpert C445 global motor management relay. To provide for safe installation and operation of the equipment, read the safety guidelines at the beginning of this manual and follow the procedures outlined in the following chapters before connecting power to the Eaton Power Xpert C445 global motor management relay. Keep this operating manual handy and distribute to all users, technicians and maintenance personnel for reference.

Catalog Numbering

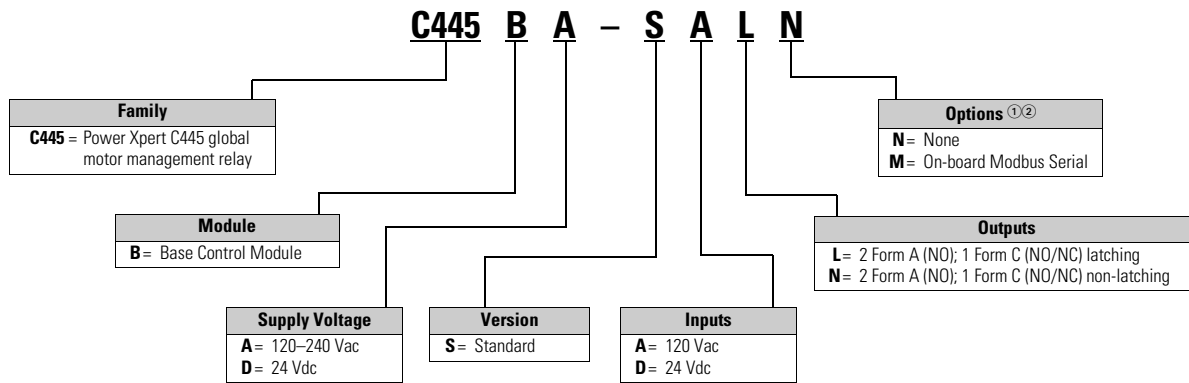
Relay

Figure 1. C445 System Catalog Numbering



Base Control Module

Figure 2. Base Control Module Catalog Numbering

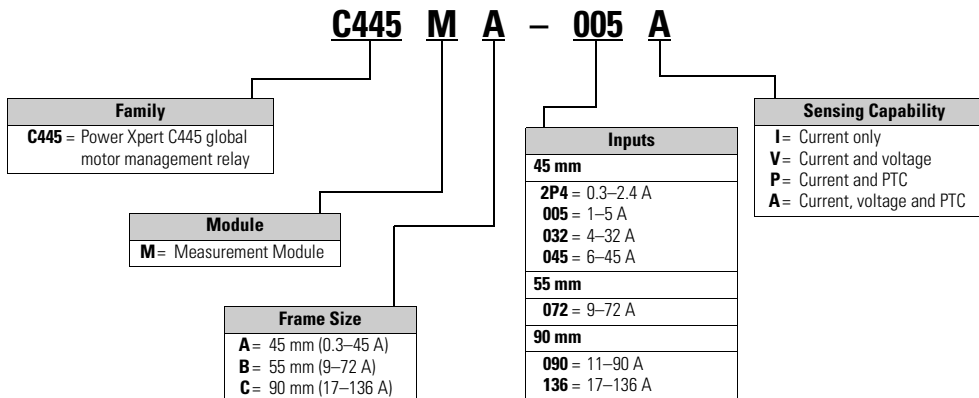


Notes

- ① For other communication protocol options, please see **Table 3**, Optional Communication Cards and Modules, on **Page 4**.
- ② If a Real-Time Clock and Memory Backup Module are required, please see **Table 3**, Optional Communication Cards and Modules, on **Page 4**.

Measurement Module

Figure 3. Measurement Module Catalog Numbering



User Interface

Figure 4. User Interface Catalog Numbering

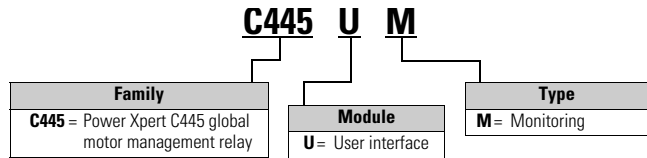


Figure 5. Optional High Resistance Ground Fault Module and CTs

| Ground Fault Module |
|--|
| C445XG-MOD = C445 External Ground Fault Module |
| Zero Sequencing Ground Fault CTs |
| C445XG-CT2 = 28 mm diameter |
| C445XG-CT3 = 52 mm diameter |
| C445XG-CT4 = 63 mm diameter |
| C445XG-CT7 = 80 x 175 rectangular |

Figure 6. Optional Expansion I/O

| Modbus Adapter |
|--|
| ELC-CARS485 |
| Digital |
| ELC-EX08NNDR = 4 24 Vdc inputs and 4 relay outputs |
| ELC-EX08NNDT = 4 24 Vdc inputs and 4 24 Vdc transistor outputs |
| ELC-EX16NNDR = 8 24 Vdc inputs and 8 relay outputs |
| ELC-EX16NNDT = 8 24 Vdc inputs and 8 24 Vdc transistor outputs |
| ELC-EX08NNDN = 8 24 Vdc inputs |
| ELC-EX08NNAN = 8 120 Vac inputs |
| ELC-EX08NNNR = 8 relay outputs |
| ELC-EX08NNNT = 8 24 Vdc transistor outputs |
| ELC-EX06NNNI = 6 high current relay outputs (6 amp/point) |
| ELC-EX08NNNSN = 8 toggle switch inputs |
| Analog |
| ELC-ANO4ANN = 4 analog inputs |
| ELC-ANO2NANN = 2 analog outputs |
| ELC-ANO4NANN = 4 analog outputs |
| ELC-ANO6ANN = 4 analog inputs and 2 analog outputs |
| ELC-TC04ANN = 4 thermocouple inputs |
| ELC-PT04ANN = 4 platinum thermocouple (PT-100-Ohm) inputs |

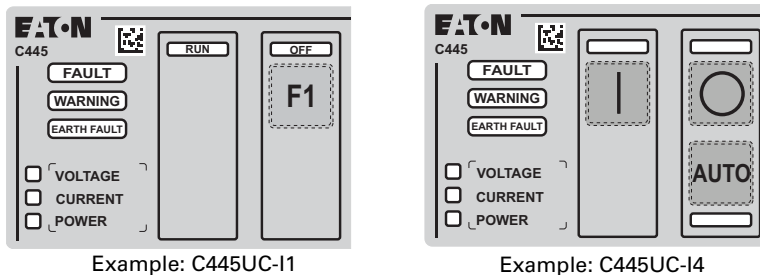
Table 1. Control User Interface Family—IEC Color Scheme (Symbols) ①

| Operation Mode | Control Type (Local = UI) | Control Button(s) Action | Control Button(s) LED Indicator Labels | Diagnostic LED Label(s) | Catalog Number | |
|-----------------|---------------------------|--------------------------|--|-----------------------------|-----------------------------|-----------|
| FVNR Starter | Local Only | ○ | — — | FAULT, WARNING, EARTH FAULT | C445UC-10 | |
| FVNR Starter | Remote Only | — — | F1 — | RUN OFF | FAULT, WARNING, EARTH FAULT | C445UC-11 |
| 2-Speed Starter | Local Only | ▶▶ ○ | — — | FAULT, WARNING, EARTH FAULT | C445UC-12 | |
| FVR Starter | Local Only | ▶ ○ | — — | FAULT, WARNING, EARTH FAULT | C445UC-13 | |
| FVNR Starter | Local/Remote | ○ | AUTO — | FAULT, WARNING, EARTH FAULT | C445UC-14 | |
| FVR Starter | Local/Remote | ▶ ○ | AUTO — | FAULT, WARNING, EARTH FAULT | C445UC-15 | |
| 2-Speed Starter | Local/Remote | ▶▶ ○ | AUTO — | FAULT, WARNING, EARTH FAULT | C445UC-16 | |
| MCCB Actuation | Local/Remote | ○ | AUTO — | FAULT, WARNING, TRIPPED | C445UC-17 | |
| MCCB Actuation | Local Only | ○ | — — | FAULT, WARNING, TRIPPED | C445UC-18 | |
| Overload | Local/Remote | — TEST | F1 AUTO | RUN OFF | FAULT, WARNING, EARTH FAULT | C445UC-19 |

Note

① All options include a reset button, Micro USB port and four 24 Vdc self-powered digital inputs. Please see Accessories on Page 4 for digital inputs wiring harness options.

Figure 7. Control User Interface Overlay Examples: IEC



Accessories

Current Transformer

C445 measurement modules are designed to be used in applications up to 136 A. For applications beyond 136 A, external CTs with a 5 A output may be used.

CT Kits do not include Measurement Modules.

Table 2. Suggested Current Transformers ^①

| CT Range (A) | Description | Terminal Size | Measurement Module | Catalog Number |
|--------------|--|---|--------------------|-----------------|
| 17–300 | 300:5 Single-Phase CT, 1.25 inch dia hole, UL & CSA ANSI/IEEE C57.13, 50–400 Hz, 600 Vac, 10 kV, relay class C50, accuracy 0.3% B0.1 | (2) 8–32 brass terminals, comes with mounting bracket kit | C445MA-005_ | XCT300-5 |
| 75–600 | 600:5 Single-Phase CT, 2.00 inch dia hole, UL & CSA ANSI/IEEE C57.13, 50–400 Hz, 600 Vac, 10 kV, relay class C50, accuracy 0.3% B0.1 | (2) 8–32 brass terminals, comes with mounting bracket kit | C445MA-005_ | XCT600-5 |
| 100–800 | 800:5 Single-Phase CT, 2.50 inch dia hole, UL & CSA ANSI/IEEE C57.13, 50–400 Hz, 600 Vac, 10 kV, relay class C50, accuracy 0.3% B0.1 | (2) 8–32 brass terminals, comes with mounting bracket kit | C445MA-005_ | XCT800-5 |

Note

^① Catalog numbers are for one CT. Order 3 for a three-phase system. Customer supplied CTs may be also be used. See section on using C445 with external CTs.

Communication and Option Modules

Table 3. Catalog Numbers: C445XC... Optional Communication Cards and C445XO... Modules

| Description | Catalog Number |
|--|-------------------|
| EtherNet/IP and Modbus TCP card with 2-port switch | C445XC-E |
| PROFIBUS DPV1 and DPV0 card | C445XC-P |
| Real-Time Clock and Memory Backup Module | C445XO-RTC |

Cables, Wiring Harnesses and Spare Parts

D77E connection cables are required to connect the Base Control Module to the Measurement Module and to the user interface. Use the appropriate lengths for each connection.

Table 4. Catalog Numbers: D77E... RJ-12 Cables

| Description | Catalog Number |
|---|---------------------|
| Connection cable (Base Control Module to Measurement Module or user interface), 13 cm length | D77E-QPIP13 |
| Connection cable (Base Control Module to Measurement Module or user interface), 25 cm length | D77E-QPIP25 |
| Connection cable (Base Control Module to Measurement Module or user interface), 100 cm length | D77E-QPIP100 |
| Connection cable (Base Control Module to Measurement Module or user interface), 200 cm length | D77E-QPIP200 |
| Connection cable (Base Control Module to Measurement Module or user interface), 300 cm length | D77E-QPIP300 |

Table 5. Catalog Numbers: C445XU... Control User Interface Wiring Harnesses

| Description | Catalog Number |
|---|-----------------------|
| Control user interface digital inputs wiring harness, 50 cm, 16 AWG wires | C445XU-050 |
| Control user interface digital inputs wiring harness, 100 cm, 16 AWG wires | C445XU-100 |
| Control user interface digital inputs wiring harness, 200 cm, 16 AWG wires | C445XU-200 |
| Control user interface digital inputs wiring harness, 300 cm, 16 AWG wires | C445XU-300 |
| Control user interface digital inputs wiring harness, 100 cm, 1 mm ² wires | C445XU-100CXH |

The cables above in **Table 5** are not used with the Monitoring User Interface, C445-UM. They are only for the older line of NEMA and IEC Control User Interface units.

Table 6. Catalog Numbers: C445XS... Spare Parts Kit and USB Cables

| Description | Catalog Number |
|---|------------------------|
| Spare parts kit – terminal connectors, mounting feet | C445XS-TERM |
| Standard USB A Male to Micro USB Male cable | C445XS-USBMICRO |
| Standard USB A Male to RJ12 cable | C445XS-USBRJ12 |
| Standard USB A Male to Loose Leads cable (for use with Modbus Serial terminals) | C445XS-USBLEADS |

Modules Overview

Base Control Module Basic Overview

The Base Control Module is the controller of the C445 system, providing the various monitoring, protection and control algorithms. Equipped with native I/O connections, communication card options and USB connectivity, the Base Control Module provides users with real-time data on the health and status of their applications. Various pre-configured operation modes are available that simplify the wiring and logic requirements for the user.

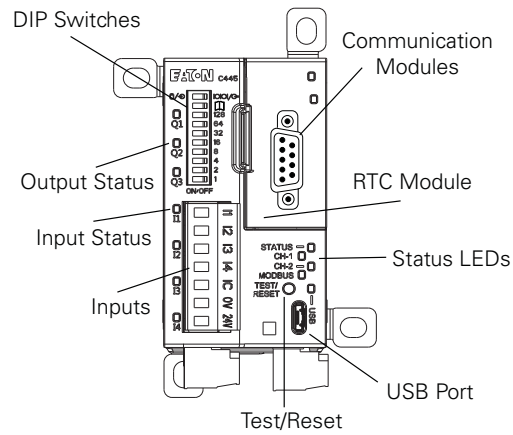
Figure 8. Base Control Module Image



Base Control Module Features

- Motor protection
- Current, voltage, power and system monitoring
- Pre-configured operating modes
- 120/240 Vac or 24 Vdc supply voltage options
- Four 120 Vac or 24 Vdc inputs, 2NO and 1NO/1NC relay outputs
- Integrated USB port
- Real-time clock and memory backup module option slot
- Multiple fieldbus communication options
- Status LEDs
- Provides power and communications to the Measurement Module and the user interface through the cable connection

Figure 9. Base Module Features and Connections—Front View



DIP Switches: Used for node addressing and configuration selections.

Output Status: LEDs indicate the ON/OFF status of each output.

Input Status: LEDs indicate the ON/OFF status of each input.

Inputs: Four digital inputs available. Must be purchased as 24 Vdc or 120 Vac.

Test/Reset: Used to manually trip the Base Control Module. Also used to reset the module after a trip has occurred.

USB Port: Micro AB connector. Enables configuration upload.

Status LEDs:

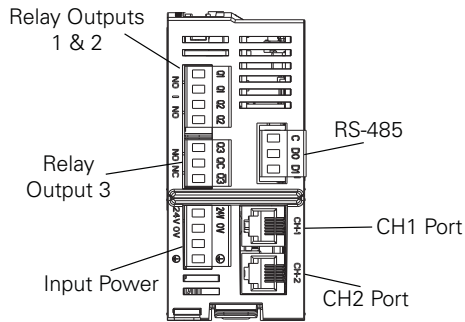
- **Status:** Indicates the fault and warning status of the Base Control Module
- **CH1:** Indicates status of modules attached to Channel 1 port on Base Control Module (Measurement Module or user interface)
- **CH2:** Indicates status of modules attached to Channel 2 port on Base Control Module (Measurement Module or user interface)
- **USB:** USB traffic indication

Real Time Clock and Memory Backup Module: Optional real time clock module. Plugs in behind the communication cards. Provides battery backed-up fault time stamping and non-volatile memory for configuration parameters.

Communication Cards: Optional modules to provide communications.

- PROFIBUS DVP0 and DVP1 (Shown)
- Ethernet for Modbus/TCP and EtherNet/IP

Figure 10. Base Module Features and Connections— Bottom View



Relay Outputs 1 & 2: Two normally open outputs.

Relay Output 3: Form C NC/NO. Factory orderable as latching or non-latching.

Two options available: 120–240 Vac or 24 Vdc

RS-485: Modbus Serial terminal (factory orderable option only)

CH1 Port: Provides communication and power from the Base Control Module to the connected module (Measurement Module or user interface)

CH2 Port: Provides connection and power from the Base Control Module to the connected module (Measurement Module or user interface)

Measurement Module Basic Overview

The Measurement Module is a pass-through device which samples current and voltage data consumed by the system. This data is continually transmitted back to the Base Control Module for analysis. Various frame sizes are available for applications up to 800 A, with factory orderable options for voltage measurement and positive temperature coefficient (PTC) protection.

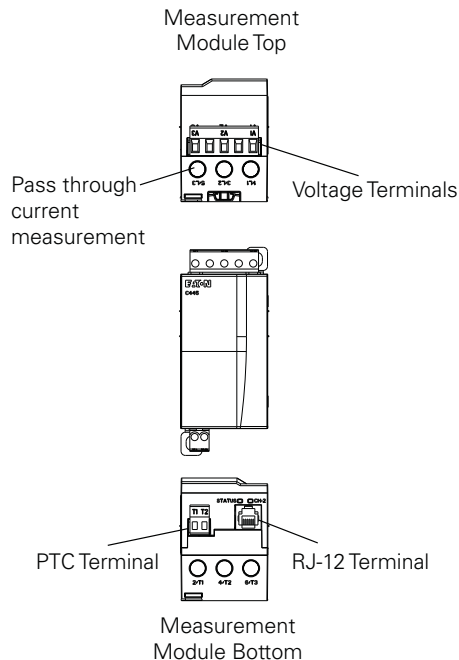
Figure 11. Measurement Module Image



Measurement Module Features

- 0.3–136 A pass-through current measurement
- External CTs for applications up to 800 A
- Optional line voltage measurement and protection
- Optional positive temperature coefficient (PTC) protection
- DIN rail or panel mounting
- The Measurement Module is powered through its cable connection to the Base Control Module

Figure 12. Measurement Module Features and Connections



Voltage Terminals: Optional factory installed terminals for measuring line voltage. Required for monitoring voltage, power and energy and related protection features. Cannot be installed in the field.

PTC Terminal: Optional factory installed terminal for Positive Temperature Coefficient (PTC) protection. PTC protection uses temperature measurement signals from the motors stator windings. Cannot be installed in the field.

RJ-12 Terminal: Connection port to the Base Control Module.

Pass through current measurement: for measuring motor lead current from 0.3 to 136 A.

User Interface Options Overview

C445 offers two User Interface types:

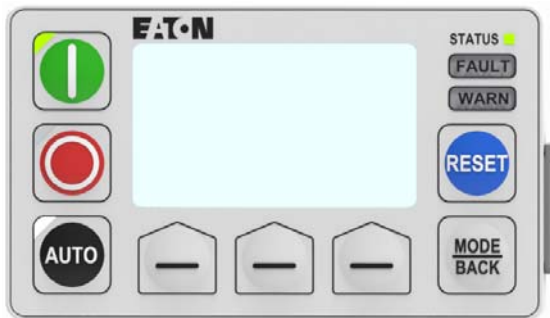
1—Monitoring User Interface (C445UM): Unlocks advanced functionality but in an intuitive format. Provides a quick start wizard, advanced monitoring, parameter editing, complete fault data and optional control. Ideal for users who want easy access to local diagnostics and setup with or without use of a network.

2—Control User Interfaces (C445UC...): A family of control and diagnostic user interface customized for common starter applications. Designed for users who prefer system monitoring to be done only by higher level fieldbus systems.

Both displays offer micro-USB ports for connection to Power Xpert *inControl* as well as bright fault, warning and control status LEDs.

User Interface Options Overview

Figure 13. C445UM Monitoring User Interface Image



Monitoring User Interface Features

- Monitoring menus with large font display
 - Current, voltage, power, thermal, and other system data
- Setup wizard
- Easy parameter setting
- Fault notification and diagnostics
- Optional control buttons
- Running, stopped and auto status LEDs
- Fault and warning LEDs
- Micro-USB for connection to PC
- Optional password protection
- Safe remote mounting

Power Xpert *inControl* Software Tool Basic Overview

Power Xpert *inControl* device configuration and control software is a FDT/DTM based Software Tool used for configuration of the C445. This tool has been developed to provide a simple interface for configuration, monitoring and troubleshooting. The software consists of two major parts—the Field Device Tool (FDT) software, which is also known as the “frame application,” and the Device-Type Managers (DTM). The DTM portion is further classified into two categories: Device DTMs which connect to the field devices configuration components, and Communication DTMs, which connect to the communications components of the device.

Pre-Defined Operating Modes Basic Overview

The C445 relay has several predefined configurations referred to as operation modes. Selecting one of these operation modes will determine the behavior of some or all of the inputs and outputs of the C445 relay.

- Overload Only
- Direct Online
- Reverser
- Star/Delta
- Two Speed Two Winding
- Two Speed Dahlander
- Auto Transformer
- Solenoid Valve
- MCCB Actuation
- Contactor Feeder
- General Purpose Input/Output
- Stand Alone Ground Fault Module

See **Chapter 5—System Configuration and Operation** on **Page 75** for detailed explanations of each operating mode.

Chapter 2—Receipt/Unpacking

Do not service with voltage applied; use Lock-out Tags.

General

Upon receipt of the unit, verify that the catalog number and unit options stated on the shipping container match those stated on the order/purchase form.

Inspect the equipment upon delivery. Report any crate or carton damage to the carrier prior to accepting the delivery. Have this information noted on the freight bill. Eaton is not responsible for damage incurred in shipping.

Unpacking

Remove all packing material from the unit. Check the unit for any signs of shipping damage. If damage is found after unpacking, report it to the freight company. Retain the packaging materials for carrier to review.

Verify that the unit's catalog number and options match those stated on the order/purchase form.

Storage

It is recommended that the unit be stored in its original shipping box/crate until it is to be installed.

The unit should be stored in a location where:

- The ambient temperature is $-40\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$
- The relative humidity is 0% to 95%, noncondensing
- The environment is dry, clean and non-corrosive
- The unit will not be subjected to high shock or vibration conditions

Chapter 3—Installation and Wiring

Introduction

This chapter provides a description of the mounting and electrical connection(s) to the Power Xpert C445 global motor management relay.

While installing and/or mounting the relay, cover all openings to ensure that no foreign materials can enter the device.

Perform all installation work with the specified tools and without the use of excessive force.

The C445 relay must only be mounted on a non-combustible base.

Relevant mounting and installation instructions are provided in the following instruction leaflets:

IL043001EN for C44B... Base Control Module

IL043003EN for C445M... Measurement Modules

IL043002EN for C445UC... Control User Interface

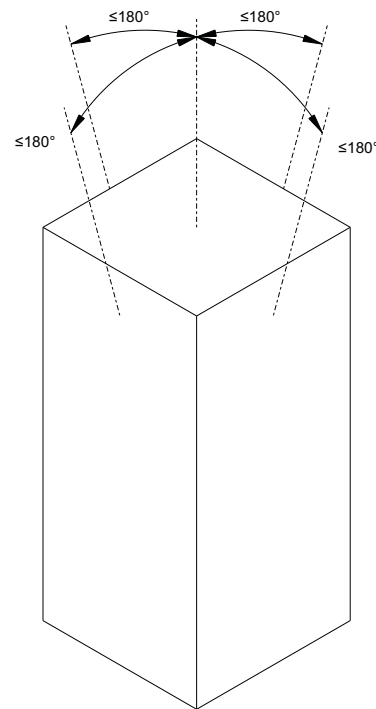
IL042004EN for C445UM Monitoring User Interface

IL042005EN for C445XG-MOD Ground Fault Module

Mounting Positions

The maximum permissible angle of inclination for all C445 devices is shown below:

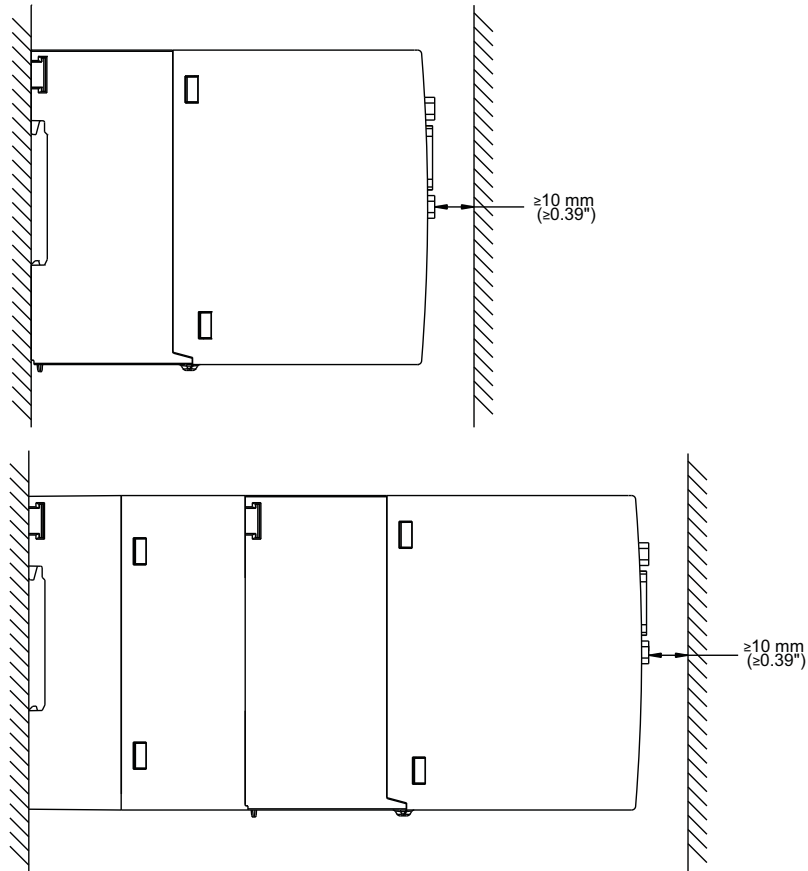
Figure 14. Vertical Position Limits



Clearance

Surrounding air temperature must be less than or equal to 60 °C. A 10 mm clearance between C445 and the enclosure door is recommended.

Figure 15. Clearance Dimensions



C445 Module Assembly

Note: Power down the C445 before adding or removing option cards or RTC module.

Figure 16. Component Exploded View (C445B...Base Module, C445M...Measurement Module, Accessory Cover, C445XO-TRTC Real Time Clock Module, C445C... Communications card(s))

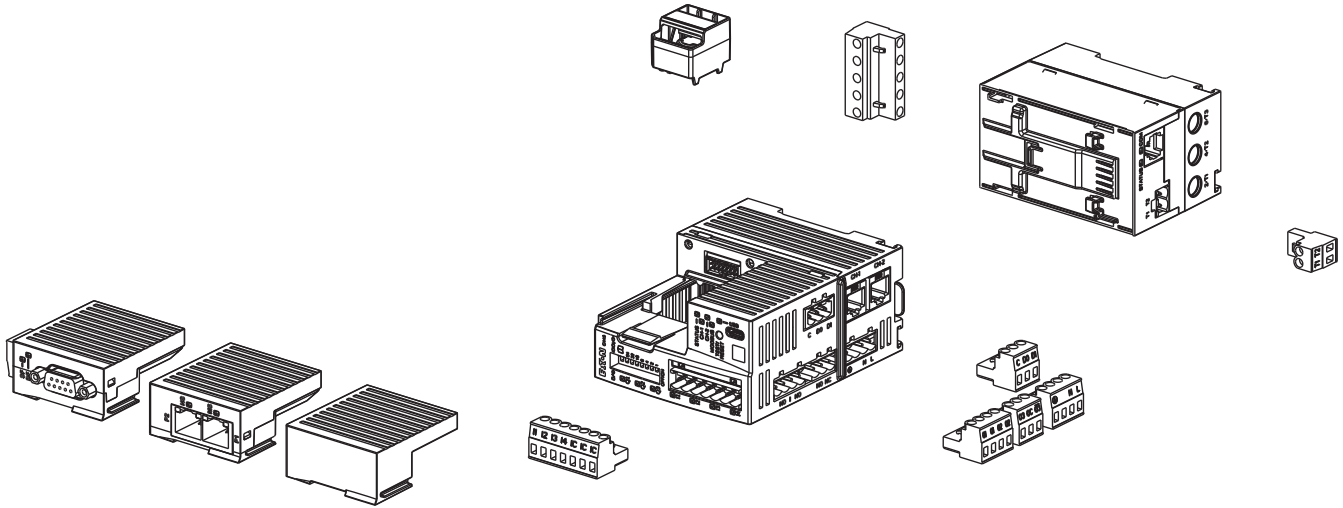


Figure 17. Option Cover Removal

Do not remove or install modules while the device is powered.

Remove the blank cover on the base control module to install the Memory/RTC (C445XO-RTC) Module and/or Communication Card (C445XC...).

If installing only the Memory/RTC module, put the blank cover back in place.

If installing a Communication Card, the blank cover can be discarded.

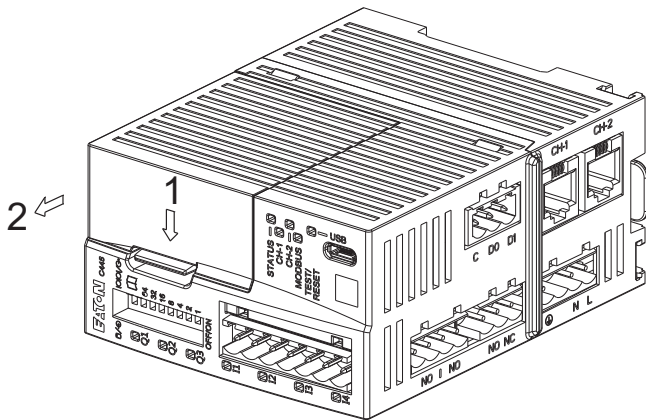


Figure 18. Real-Time Clock and Memory Backup Module Installation

Do not remove or install the module when the unit is powered.

Remove the C445B... Option Cover as shown in **Figure 17**.

The C445XO-RTC module installation is facilitated by a notch on the upper right corner of the module to provide proper orientation of the module.

Firmly push the module into the C445B... pocket until the module is completely seated.

Reinstall Option Cover.

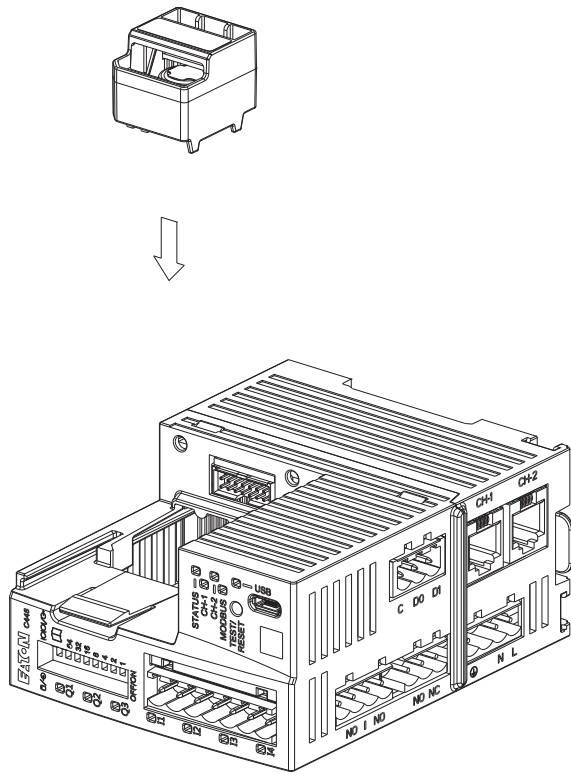


Figure 19. Communication Card Installation

Do not remove or install communication cards when the unit is powered.

Remove the C445B... Option Cover as shown in **Figure 17**.

The Option Cover may be discarded as it will not be reinstalled.

The communication card installation is accomplished by firmly pushing the card downward into the C445B... communications card pocket until the card is completely seated and the locking tab snaps into place.

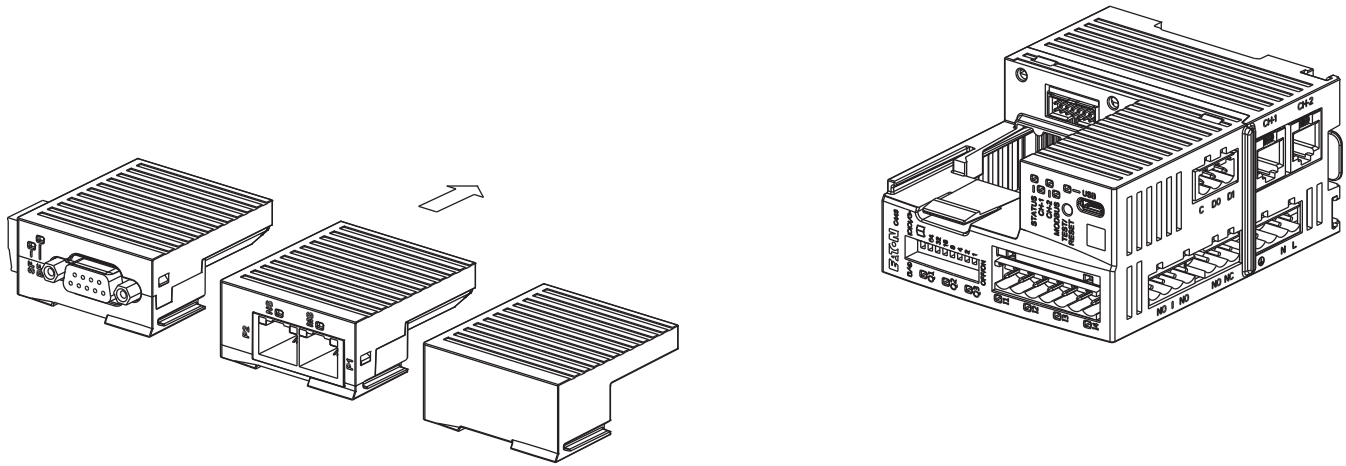


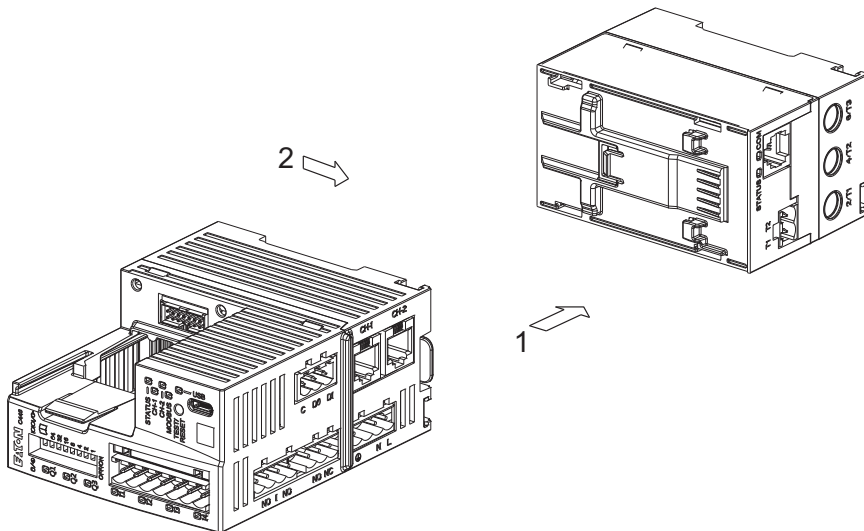
Figure 20. Component Mating

The C445B... Base Module can be attached to the top of the C445MA... Measurement module.

Orient both modules so the two (2) RJ12 jacks on the C445B... module are on the same side as the RJ12 jack on the C445MA... module.

Align the modules so there is an offset of 0.098–0.157 in (2.3–4.0 mm).

Slide the C445B... Base Module downward on the C445MA... Measurement Module until the locking tab moves into place.



C445 Mounting

To aid with the panel layout of the Power Xpert C445 modules, refer to the dimension drawings.

The C445MB... Base Control Module and the C445M... Measurement Modules are designed to be mounted utilizing a standard 35 mm DIN rail or utilizing a panel mount method.

When mounting the modules on 35 mm DIN rail, ensure that the rail is properly secured to support all devices installed on the rail.

All C445 devices may be panel mounted. The C445B... base module and C445MA... Measurement Module utilize optional mounting feet that are snapped into place. A minimum of two (2) mounting feet are required. Tabs are installed at locations so one tab is on the top and one on the bottom of the device when mounted vertically.

C445MB... and C445MC... Measurement Modules have mounting tabs molded into the housing assembly. Installation of panel mount screws on all mount tabs are required.

The C445B... base module may be installed directly on top of the C445MA... Measurement Module by aligning the mating slots of the two devices and snapping them together. If the two devices are to be panel mounted, all four (4) panel mount tabs are required.

Table 7. Mounting Hardware

| Mounting Fasteners | Quantity | mm, Grade 4.8 | | | SAE Grade 5 | | |
|----------------------|----------|---------------|--------|--------------|-------------|----------|---------------|
| | | Device | Size | Grip | Torque | Size | Grip |
| C445B... | 2 | M5 | 0.8 mm | 2.0 – 2.7 Nm | #10 | 0.032 in | 30 – 42 lb/in |
| C445B... & C445MA... | 4 | M5 | 0.8 mm | 2.0 – 2.7 Nm | #10 | 0.032 in | 30 – 42 lb/in |
| C445MB... | 2 | M5 | 8.0 mm | 2.0 – 2.7 Nm | #10 | 0.312 in | 30 – 42 lb/in |
| C445MC... | 4 | M5 | 8.0 mm | 2.0 – 2.7 Nm | #10 | 0.312 in | 30 – 42 lb/in |

The C445B.../C445MA... combined assembly may be mounted on a 35 mm DIN-Rail.

C445 Surface Mounting on DIN rail

Place the C445 device onto the mounting rail from above [1], push down [2], and allow the device to snap into position.

To remove any C445 device from a rail, gently press down on the unit and then pull the lower housing edge away from the rail. Lift the C445 device upward and off the mounting rail.

Figure 21. DIN Rail Mounting Instructions

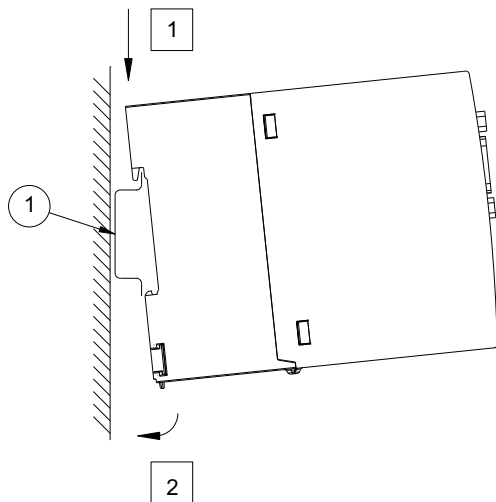
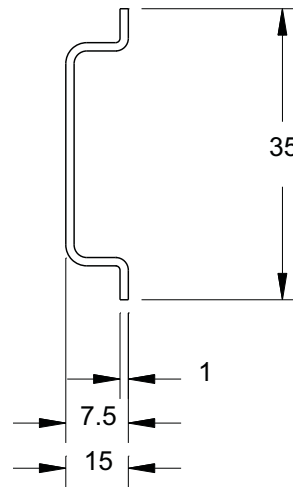


Figure 22. DIN Rail Dimensions



C445... Mounting Dimensions—DIN Rail and Panel Mount

A minimum of two (2) mounting clips are required to panel mount the C445MA...

Mounting clip orientation is one clip on top and one on bottom of the unit.

Figure 23. Base Control Module—C445B... Mounting Dimensions

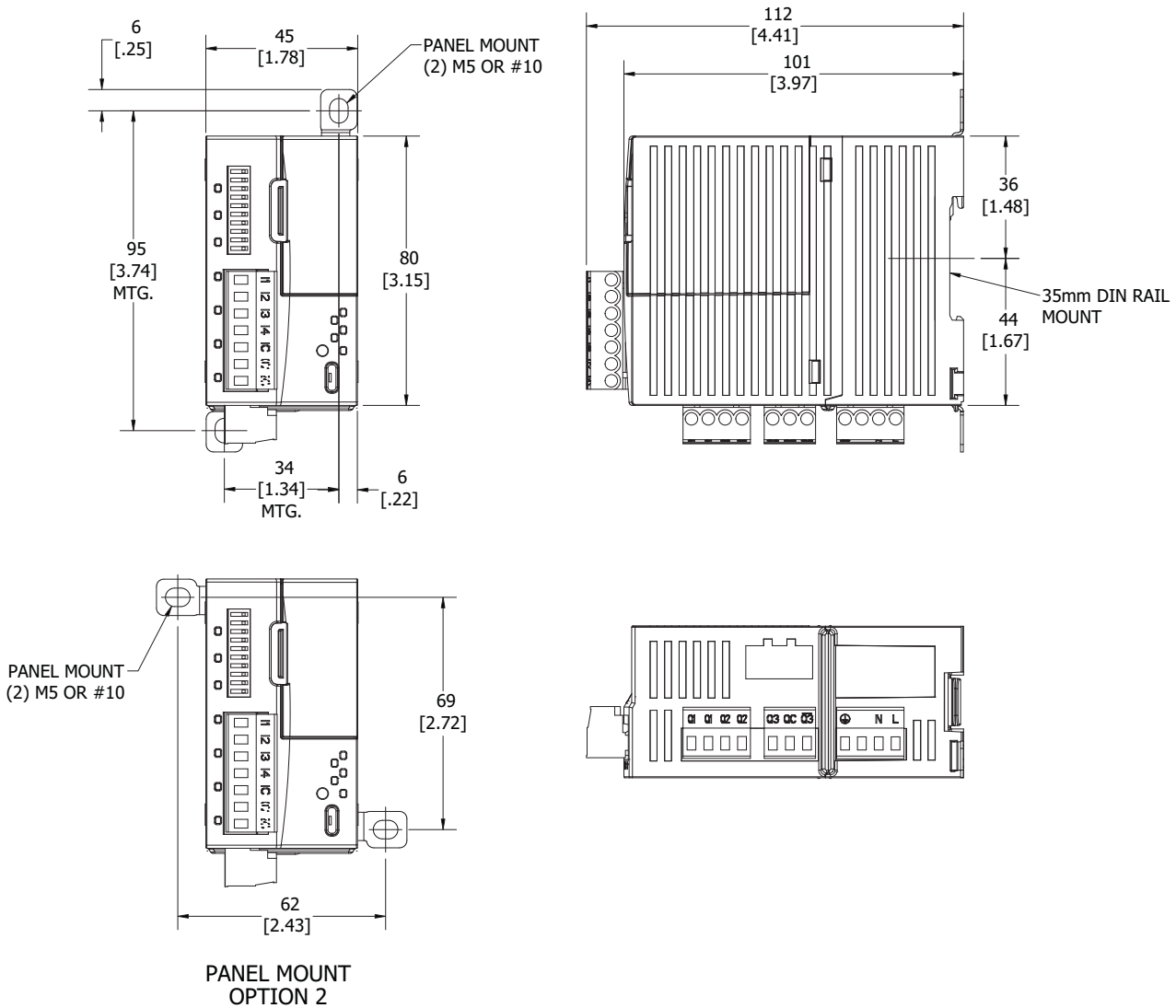


Figure 24. Measurement Module—C445MA... Mounting Dimensions

A minimum of two (2) mounting feet are required to panel mount the C445MA...
Foot orientation is one clip on top and one on bottom of the unit.

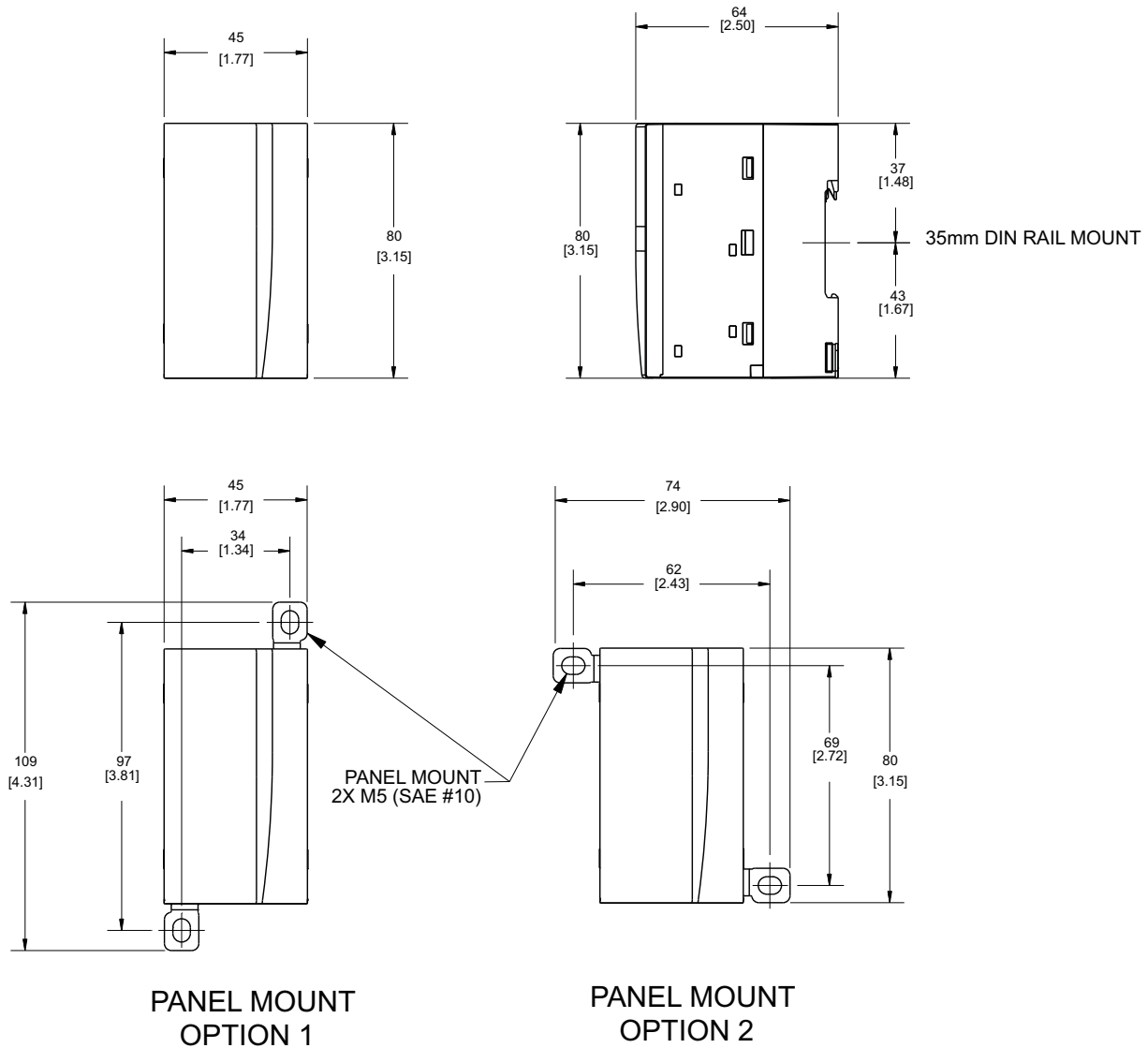


Figure 25. Stacked Base Control Module C445B... and Measurement Module C445MA... Mounting Dimensions

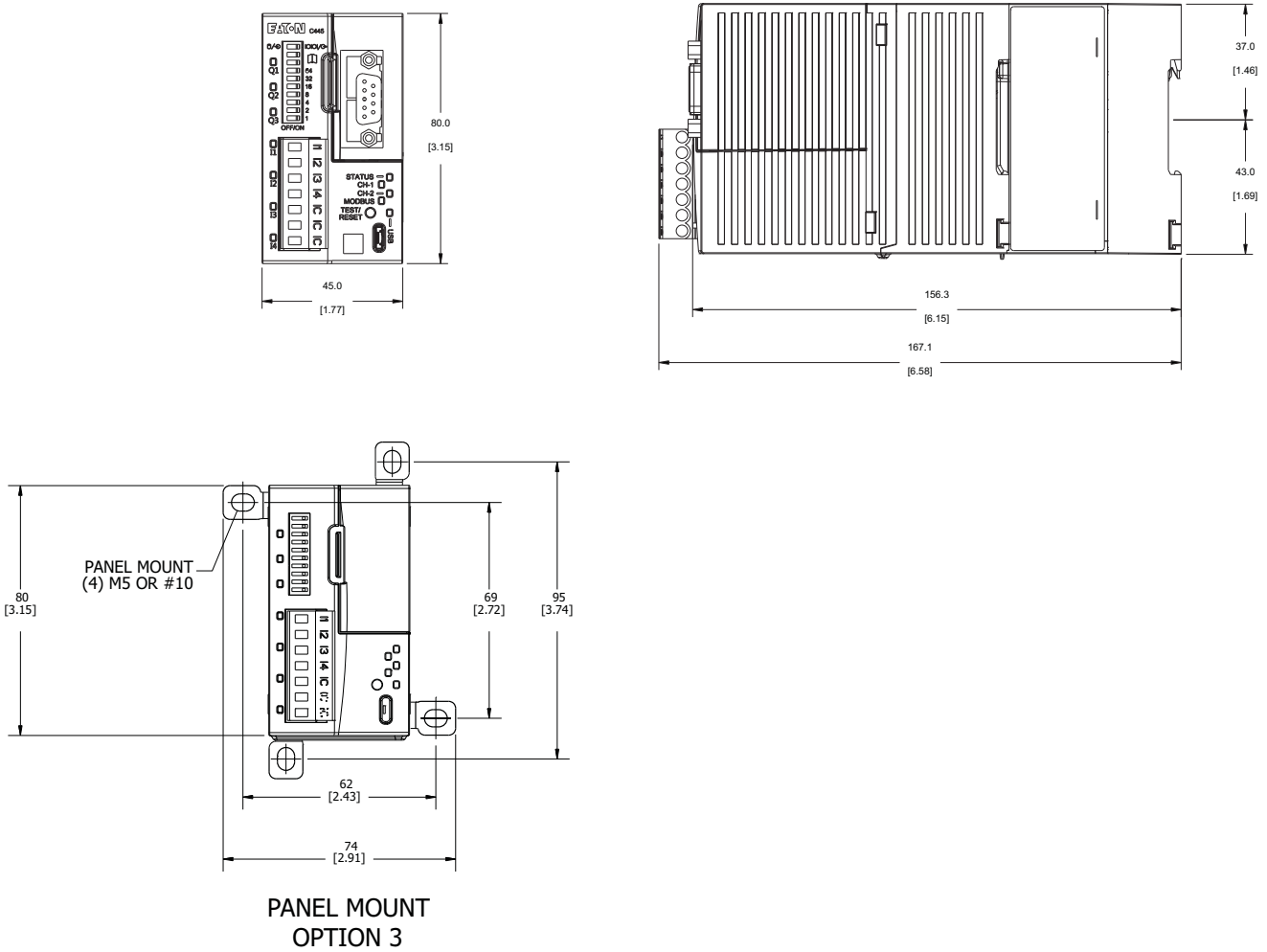


Figure 26. Measurement Module C445MB... Mounting Dimensions

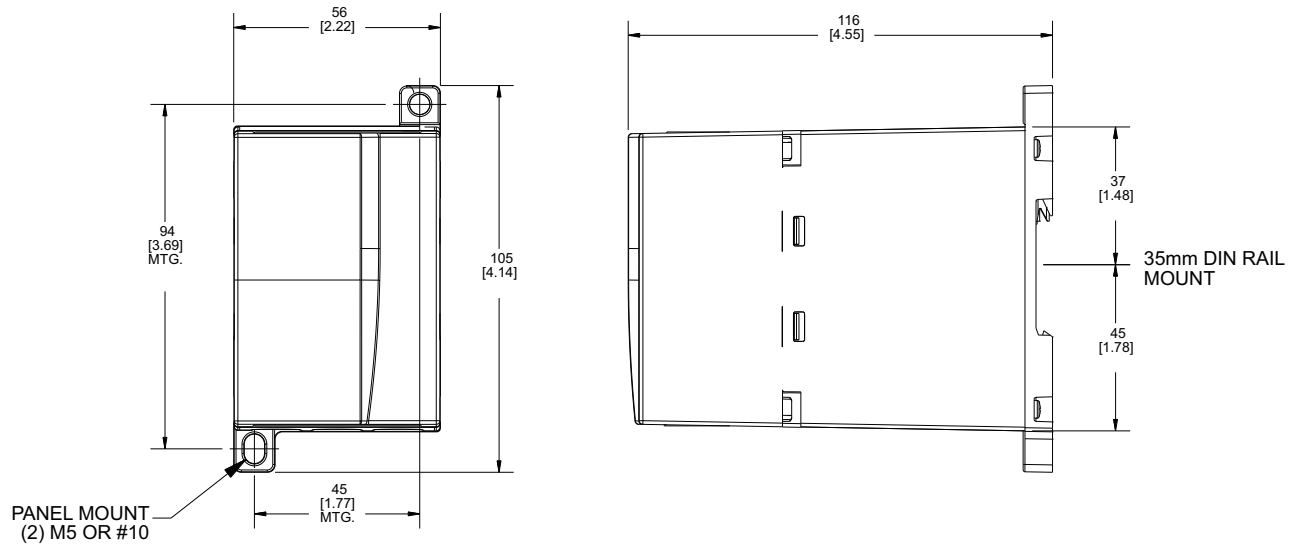
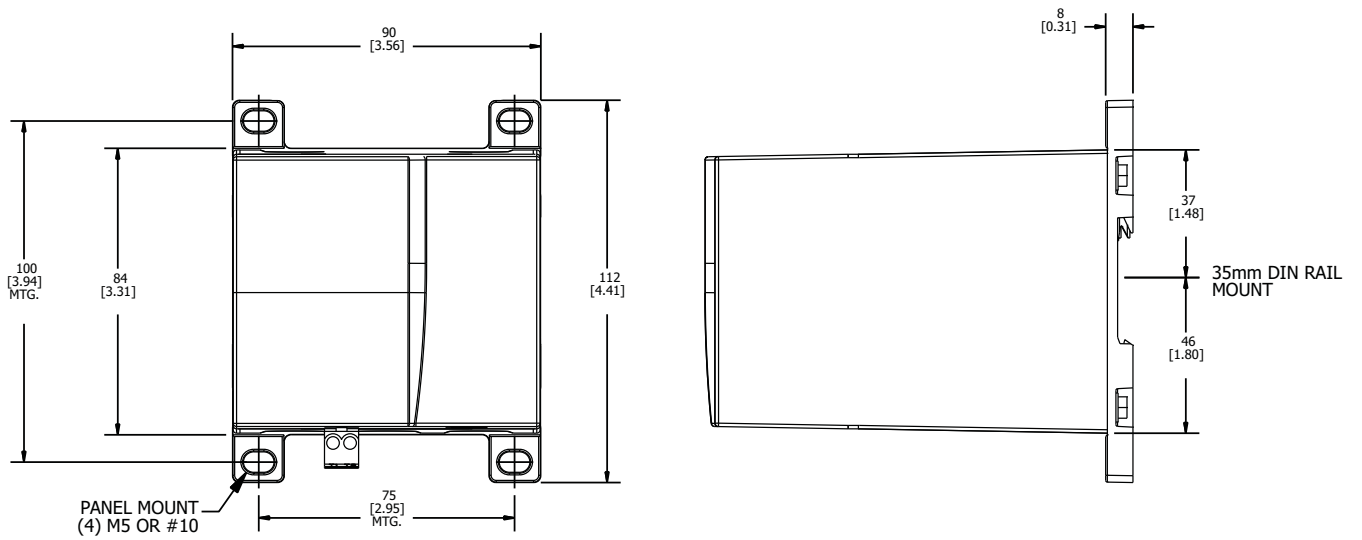


Figure 27. Measurement Module C445MC... Mounting Dimensions



Monitoring User Interface C445UM Mounting Dimensions

Figure 28. User Interface—Monitoring Option

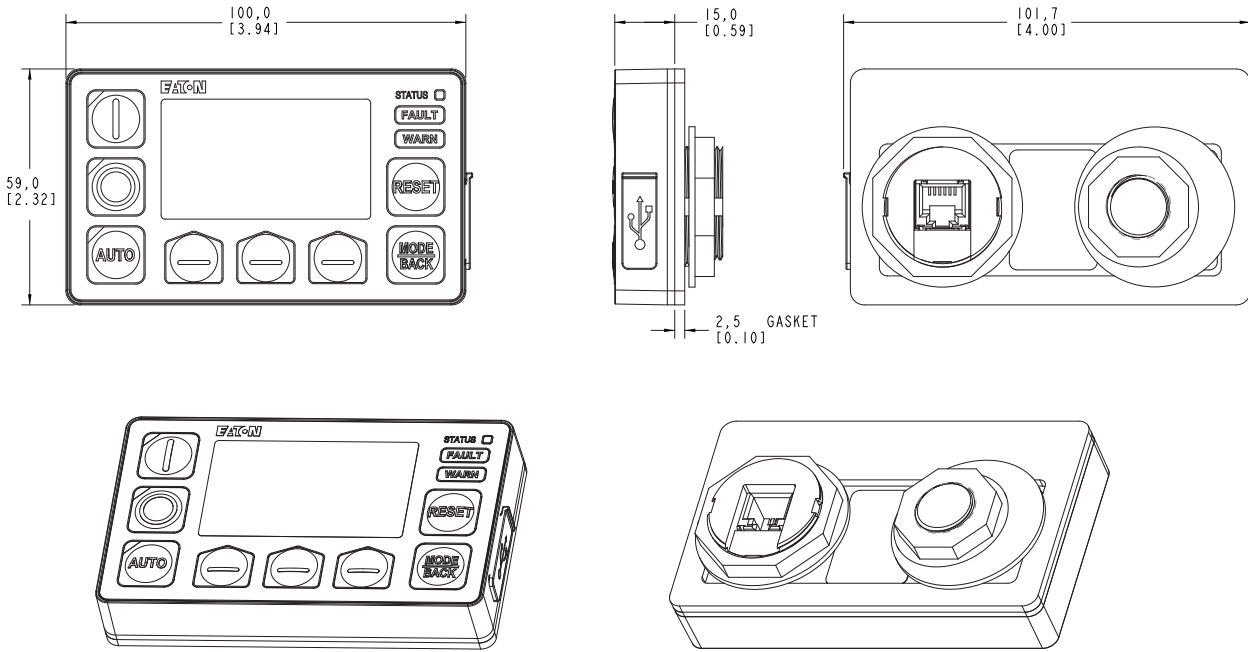


Figure 29. Panel Cutout Options

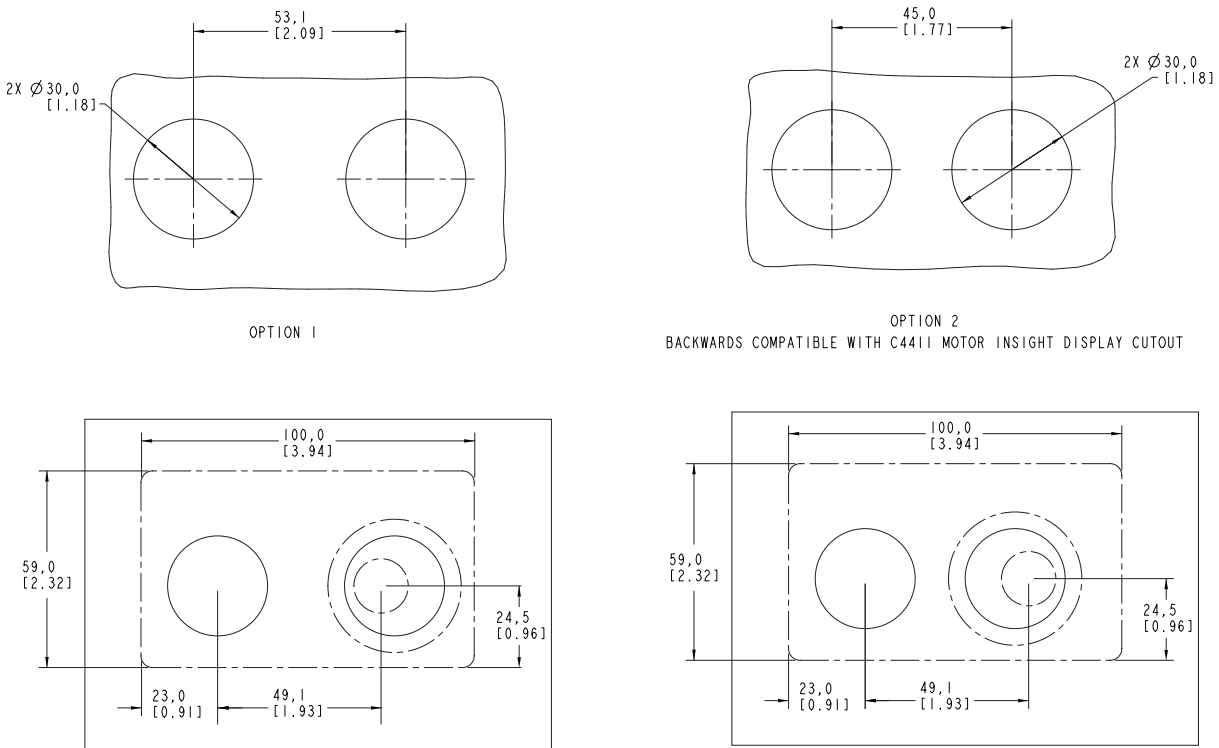
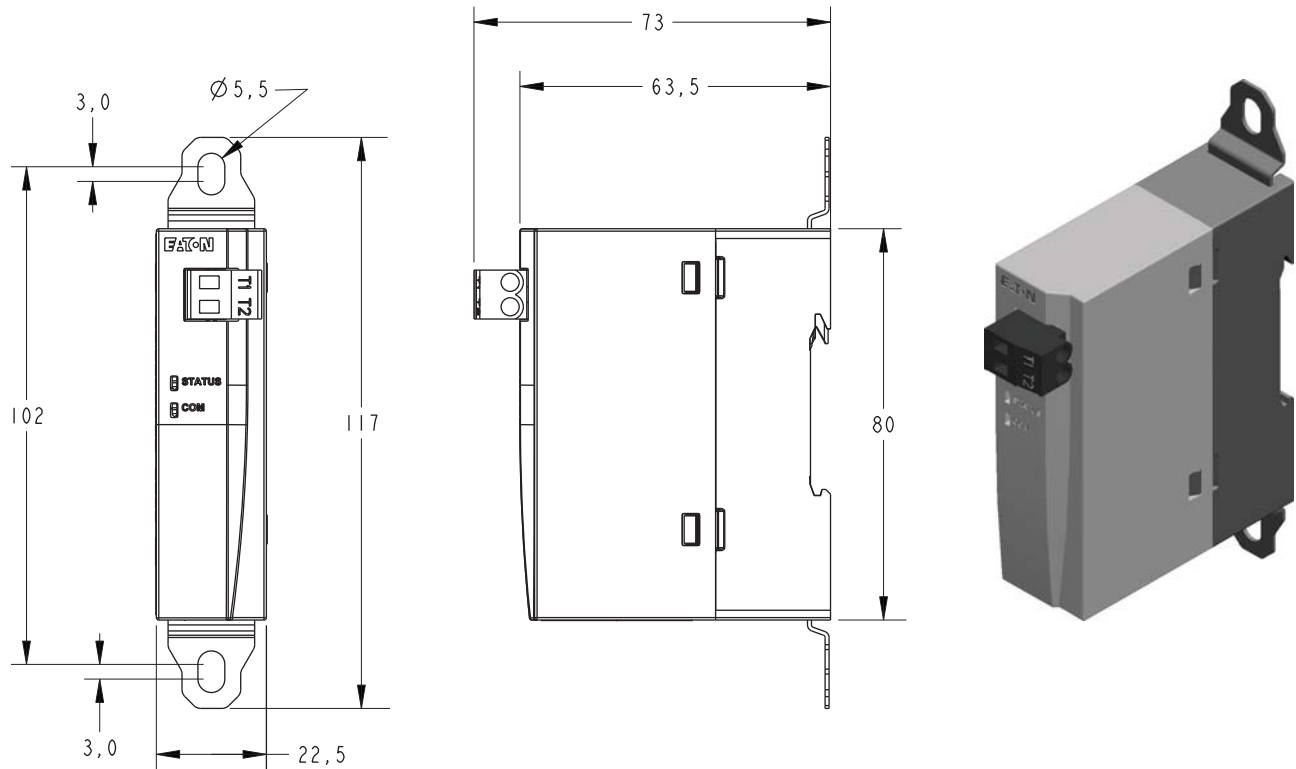


Figure 30. C445XG-MOD—C445 External Ground Fault Module



Note: Remove mounting tabs for DIN rail mount.

Figure 31. C445XG-CT2—28 mm Diameter Zero Sequencing Ground Fault CT

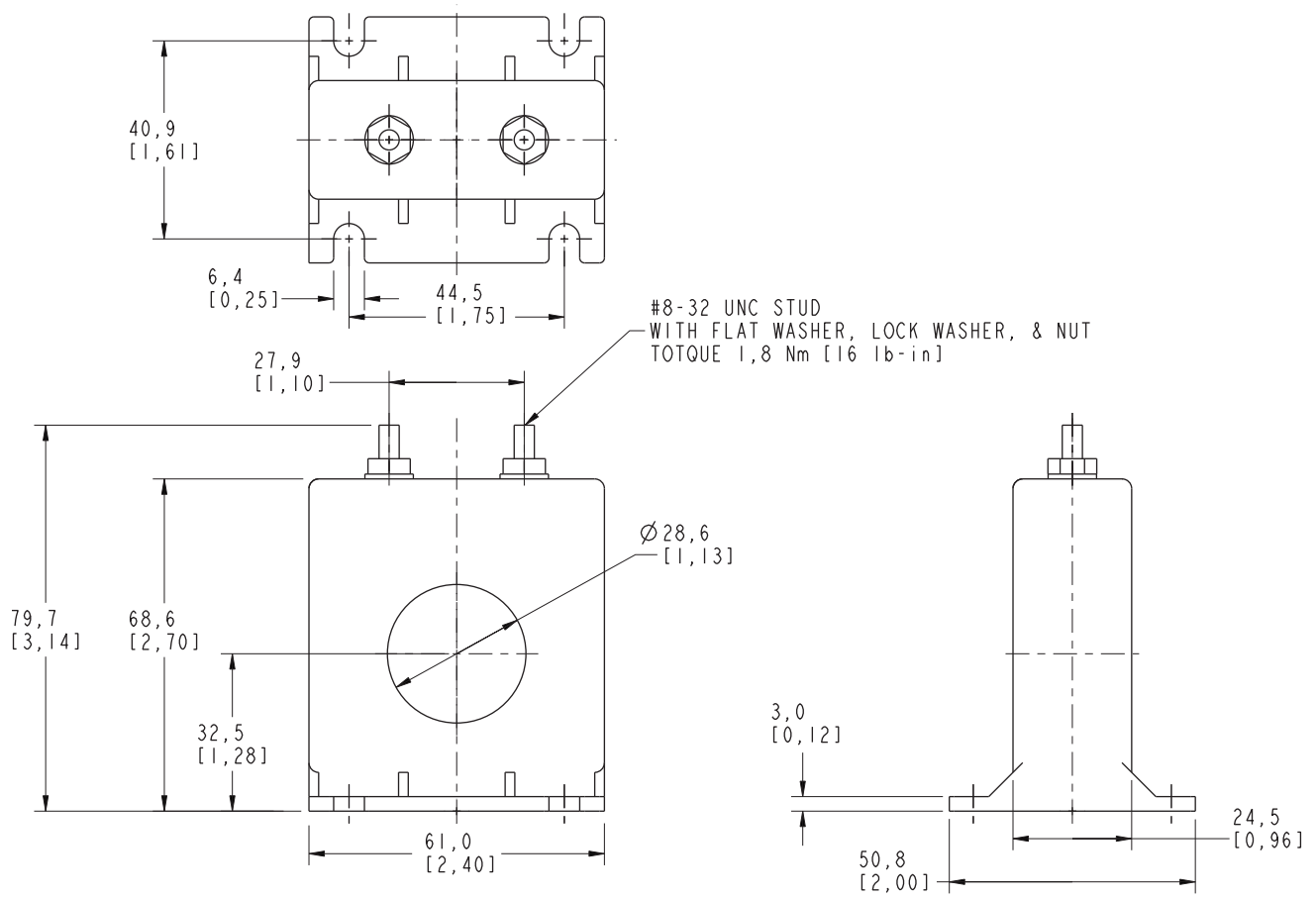


Figure 32. C445XG-CT3—52 mm Diameter Zero Sequencing Ground Fault CT

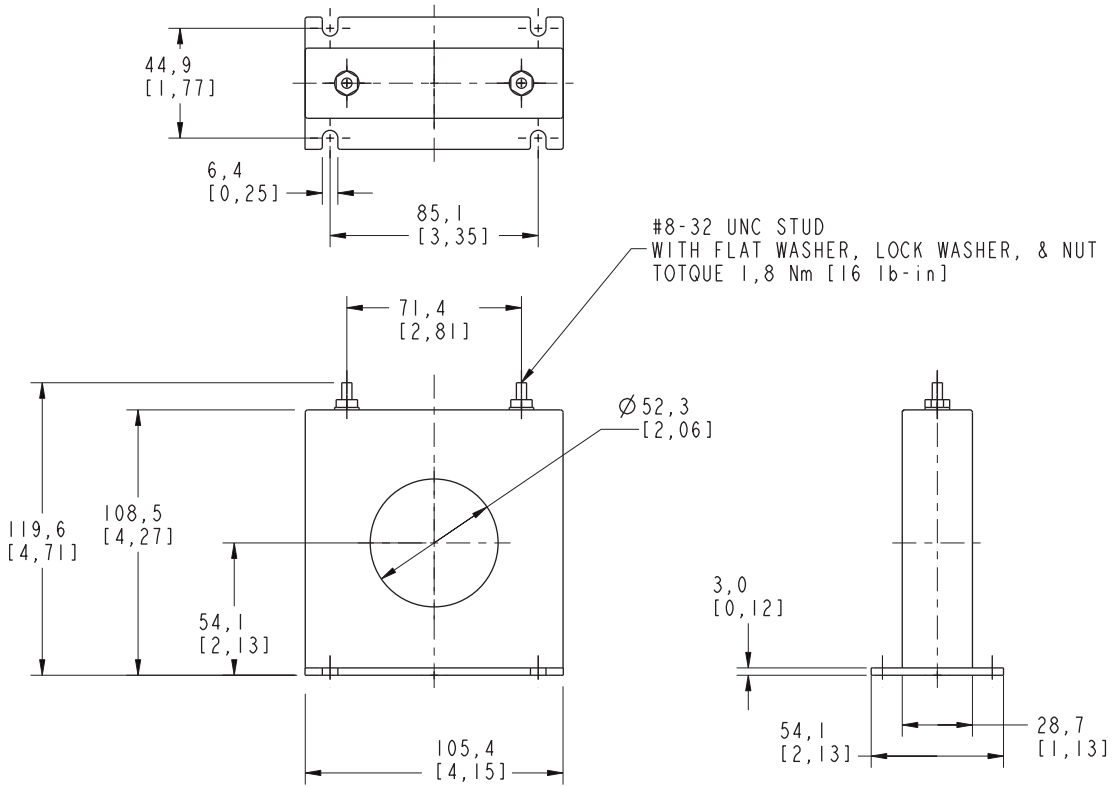


Figure 33. C445XG-CT4—63 mm Diameter Zero Sequencing Ground Fault CT

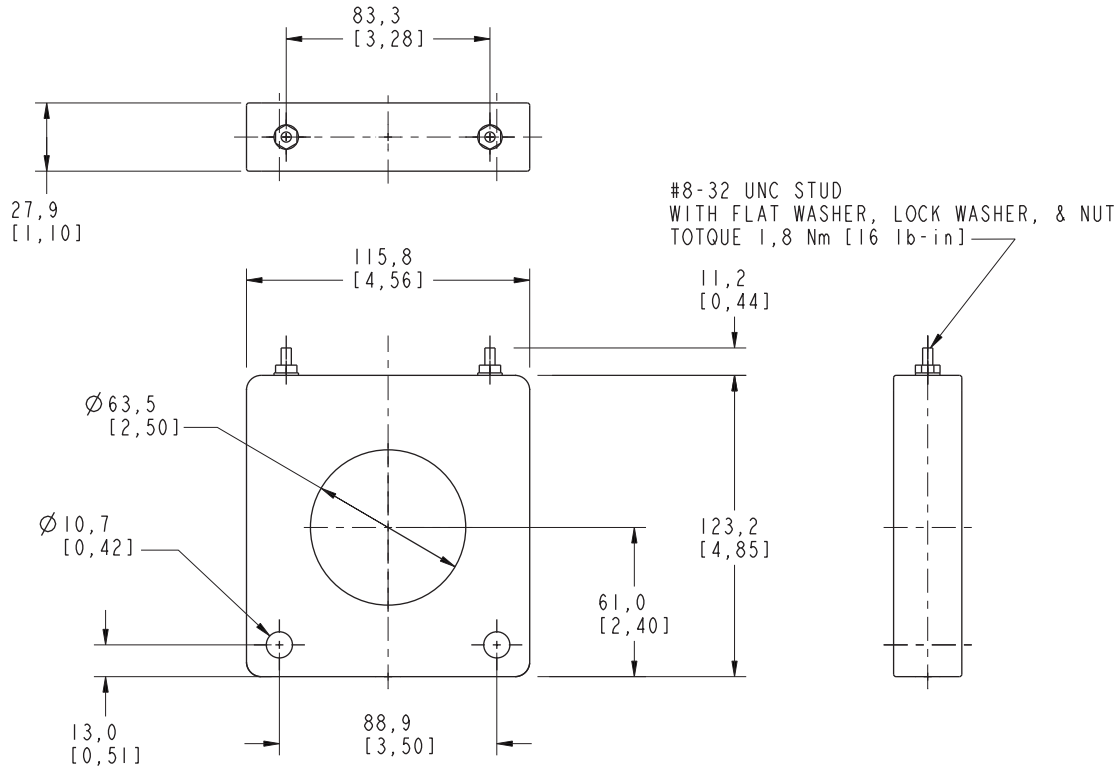
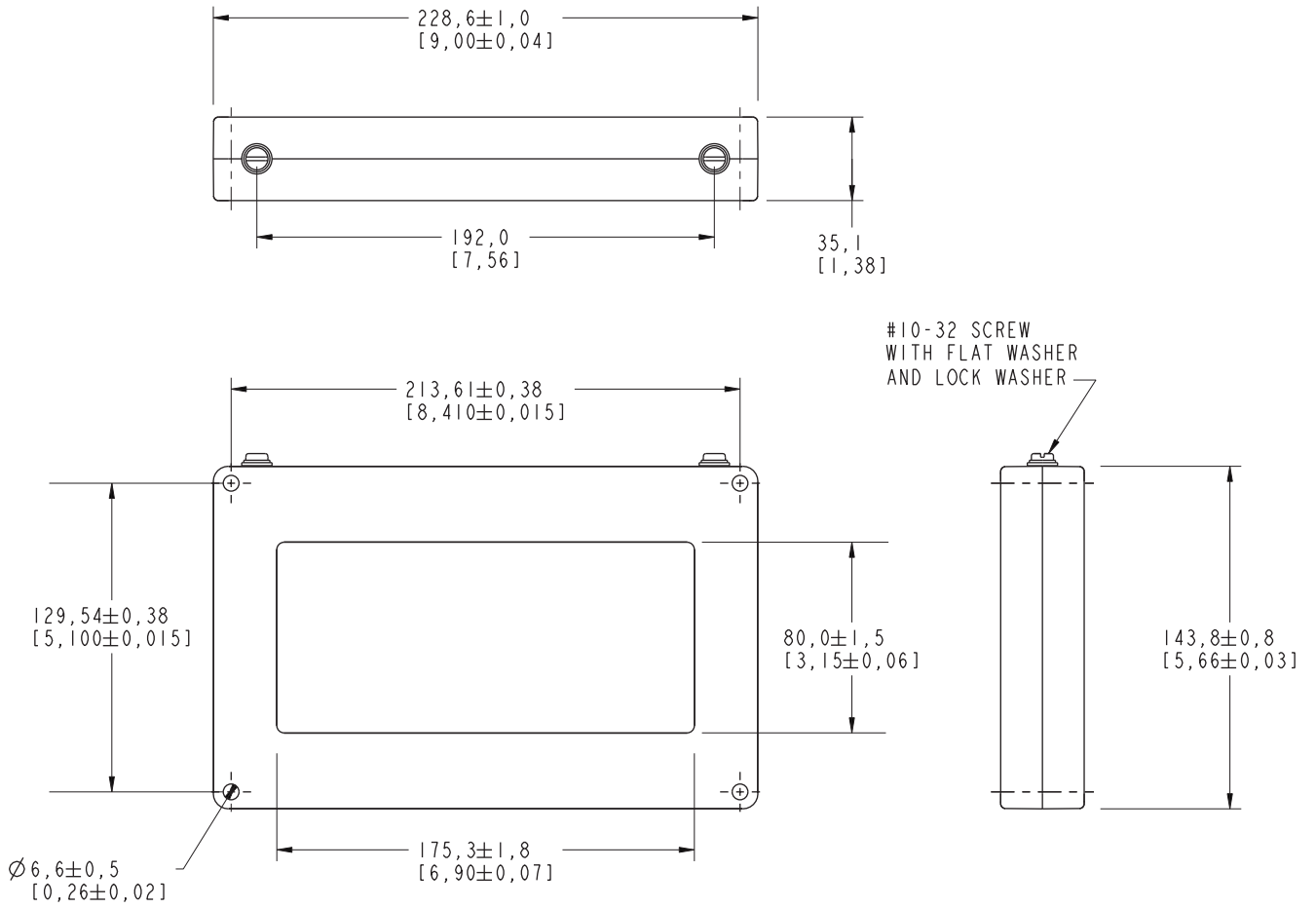


Figure 34. C445XG-CT7—80 x 175 Rectangular Zero Sequencing Ground Fault CT



Motor Wiring Connections—Typical

This section shows typical diagrams for basic overload applications. Each C445 system consists of a base Module C445B... and a Measurement Module C445MA..., C445MB..., or C445MC...

Options such as the user interface C445U..., current transformers, and potential transformers may be connected to meet the operating requirements of the customer application.

The C445 can be configured utilizing external current transformers (CTs) and potential transformers (PTs).

Current transformers and/or potential transformers may be connected to any C445 application. Please follow the device manufacturer’s instructions for connection information.

The C445 will support optional mains voltage monitoring with phase voltage connections to Terminals V1, V2, and V3 on any Measurement Module.

The C445 will support optional motor positive temperature coefficient (PTC) thermistors with device connections to Terminals T1 and T2 on any Measurement Module to provide additional levels of protection to any application.

Figure 35. Terminal Fastening

Control signal terminal connector specifications apply to all connectors:

C445BA...

N L PE Q1 Q2 Q3 C Q3 I1 I2 I3 I4 C D0 D1

C445BD...

24 0 PE Q1 Q2 Q3 C Q3 I1 I2 I3 I4 C QV 24V

C445M...

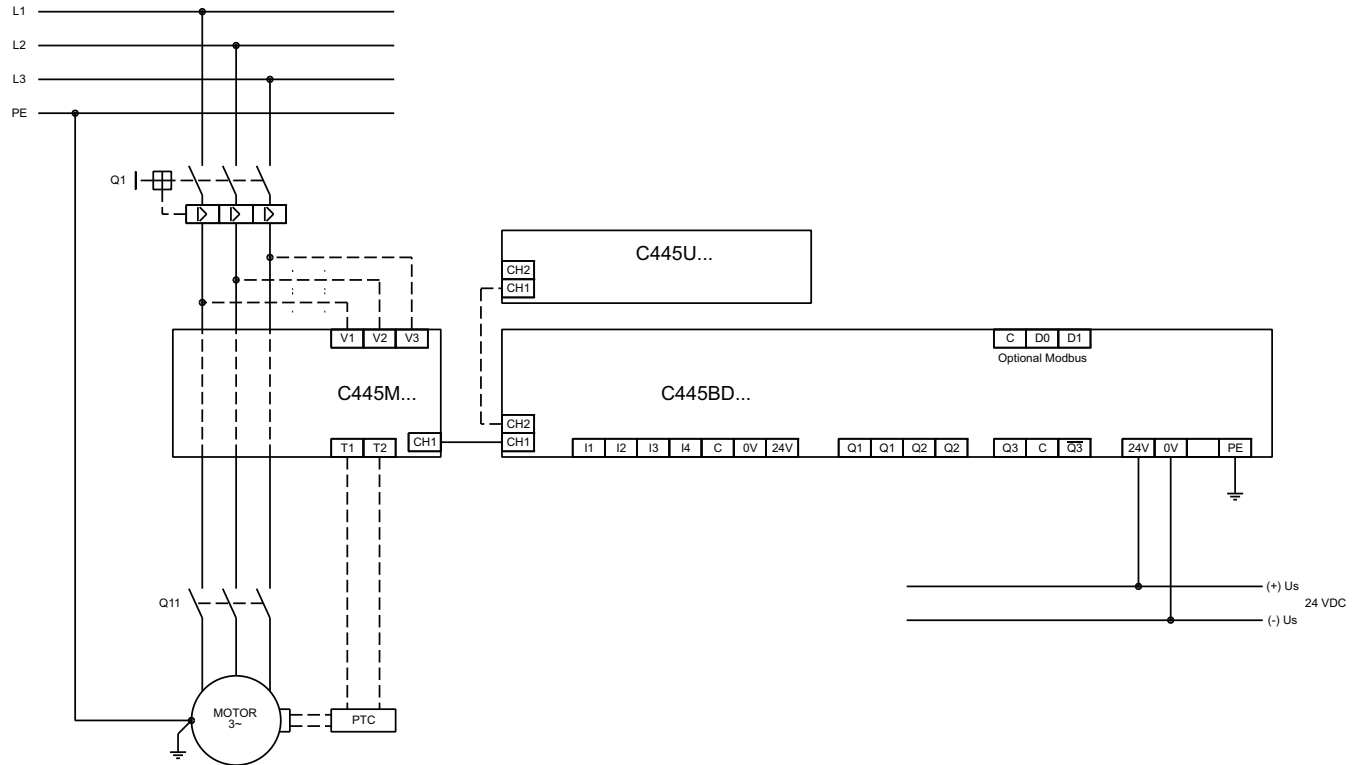
V1 V2 V3 T1 T2

| mm ² | mm ² | AWG | mm | inch | | | Nm | lb-in |
|-----------------|-----------------|-----------|-----|-------|--------------|----------|---------|---------|
| 1 x 0.2–2.5 | 1 x 0.2–2.5 | 1 x 24–12 | 7.0 | 0.275 | 0.6 x 3.5 mm | PH0, PZ0 | 0.4–0.5 | 3.5–4.4 |

Motor Connections for Standard Overload Control

Standard Overload Applications

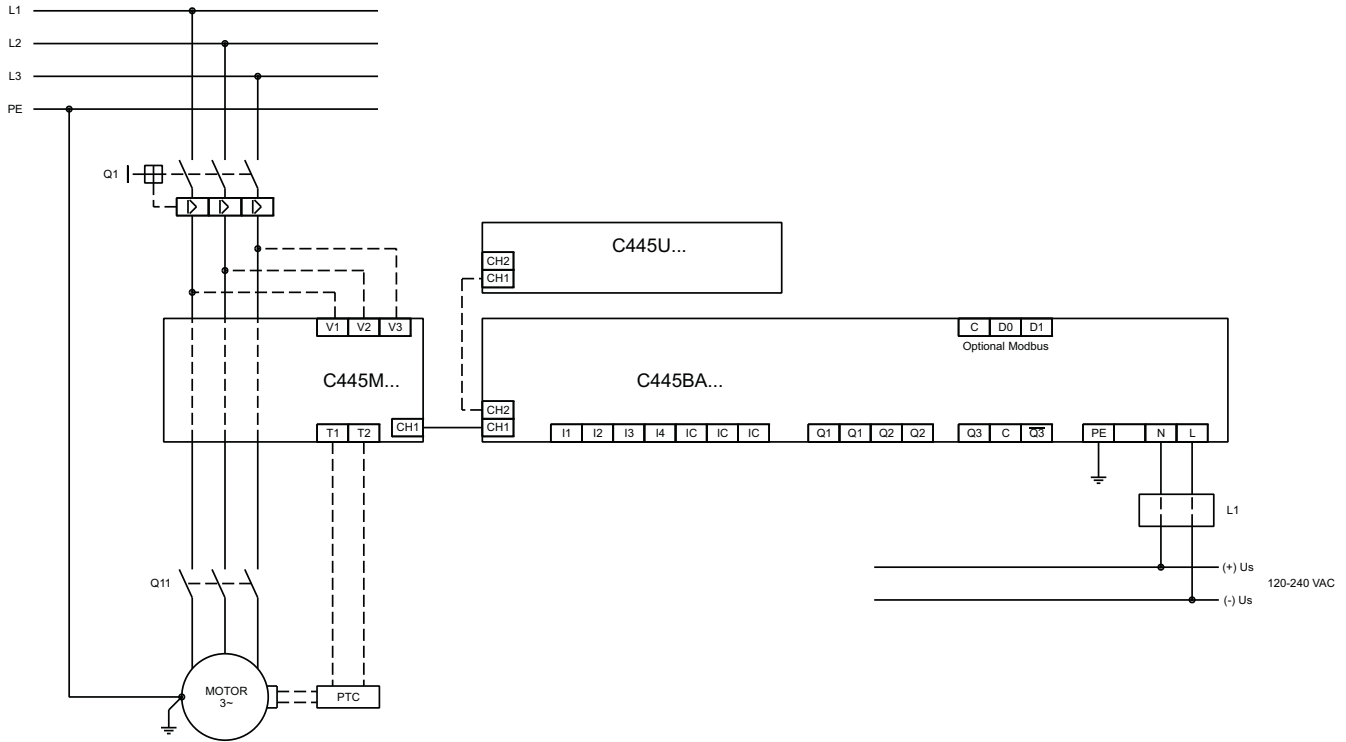
Figure 36. Motor Connections for Standard Overload Control with C445BD...



Legend

- Q1 = Cable and motor protection.
- Q11 = Run contactor.
- PTC = Positive Temperature Coefficient (PTC) sensor.

Figure 37. Motor Connections for Standard Overload Control with C445BA...



Legend

- Q1 = Cable and motor protection.
- Q11 = Run contactor.
- PTC = Positive Temperature Coefficient (PTC) sensor.

Using Power Xpert C445 with External CTs

C445 covers systems from 0.3 A to 800 A. Embedded CTs provide measurement up to 136 A. Motor applications from 136 A to 800 A require external CTs. Systems using external CTs always use the 1-5 Amp Measurement Module (C445MA-005...).

Eaton offers the following CTs for use with C445. Catalog numbers are for one CT. Users may purchase CTs from Eaton or use their own.

Table 8. C445 CT Offering Catalog Numbers (XCT_ CTs)

| CT Range | Description | Qty. ① | Use with ... | Catalog Number |
|-----------|---|--------|--------------|-----------------|
| 17–300 A | 300:5 single-phase CT, 1.25 inch diameter hole, Class C50 | 1 | C45MA-005_ | XCT300-5 |
| 75–600 A | 600:5 single-phase CT, 2.00 inch diameter hole, Class C50 | 1 | C45MA-005_ | XCT600-5 |
| 100–800 A | 800:5 single-phase CT, 2.50 inch diameter hole, Class C50 | 1 | C45MA-005_ | XCT800-5 |

Note

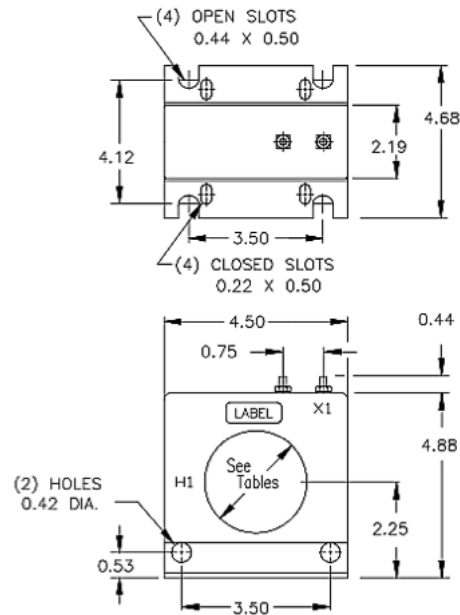
① Order 3 per system.

Mounting (XCT_ CTs)

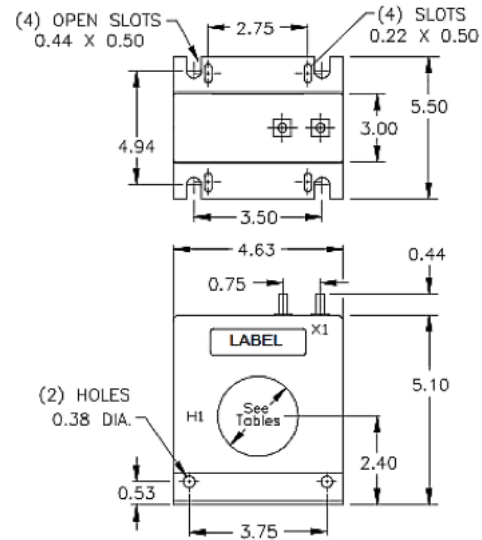
Each XCT_CT comes with a bracket mounting kit for panel mounting. Secondary terminals are 8-32 brass terminals with one flatwasher, lockwasher and regular nut.

Dimensions (XCT_ CTs)

Figure 38. XCT300-5, XCT600-5 (inches)



XCT800-5 (inches)



Using External Current Transformers

Customer Supplied CTs

Other external CTs may be used with C445. For best accuracy, provide CTs with at minimum the following ratings/features. Customers are responsible for ensuring that the environmental and regulatory ratings of their selected CTs meet the requirements of their application.

Recommended CT Specifications:

Insulation Voltage: Equal to or above Voltage of application

Insulation Rating: 10 kV BIL Full Wave <OR>

Test Voltage One Minute 3 kV

Rated secondary current: 5 A or 1 A

Frequency: 50/60 Hz

Accuracy: 0.3% or better

Note: Systems using external measurement CTs with a 5 A secondary current or XCT_ _ _-5 should use the C445MA-005_. Systems with CTs that have a 1 A secondary current should use the C445MA-2P4_ measurement module.

External CT Wiring Instructions

1. Pass primary motor lead through opening in CT in proper direction. Perform for each phase.
 - Eaton XCT_CTs: Pass through in direction **H1** → **H2**
 - Customer Supplied CTs: Follow manufacturer’s directions
2. Attach wire to secondary output terminal on external CT and pass through C445MA-005_ in proper direction (in through **1/L1, 3/L2, 5/L3** terminals). Perform for each phase.
 - Eaton XCT_CTs: Start from terminal X1
 - Customer Supplied CTs: Follow manufacturer’s directions
3. Secure wire after measurement module pass through into second terminal on external CT. Perform for each phase.
 - Eaton XCT_CTs: Secure in second, unmarked terminal
 - Customer Supplied CTs: Follow manufacturer’s directions

Table 9. External CT Settings

When using external CTs, CT ratio must be set in the C445 using the following parameters:

| Parameter | Units | Increment | Minimum | Maximum | Default | Modbus Register |
|--------------------|-------|-----------|---------|---------|---------|-----------------|
| CT Ratio—Primary | Amps | 1 | 1 | | 1 | 918 |
| CT Ratio—Secondary | Amps | 1 | 1 | | 1 | 919 |

External CT Wiring Diagram

Terminal designations shown are for Eaton XCT family. Customer supplied CTs may have different terminal designations or wiring. Follow manufacturer's instructions for customer supplied CTs.

Figure 39. External CT Wiring Diagram

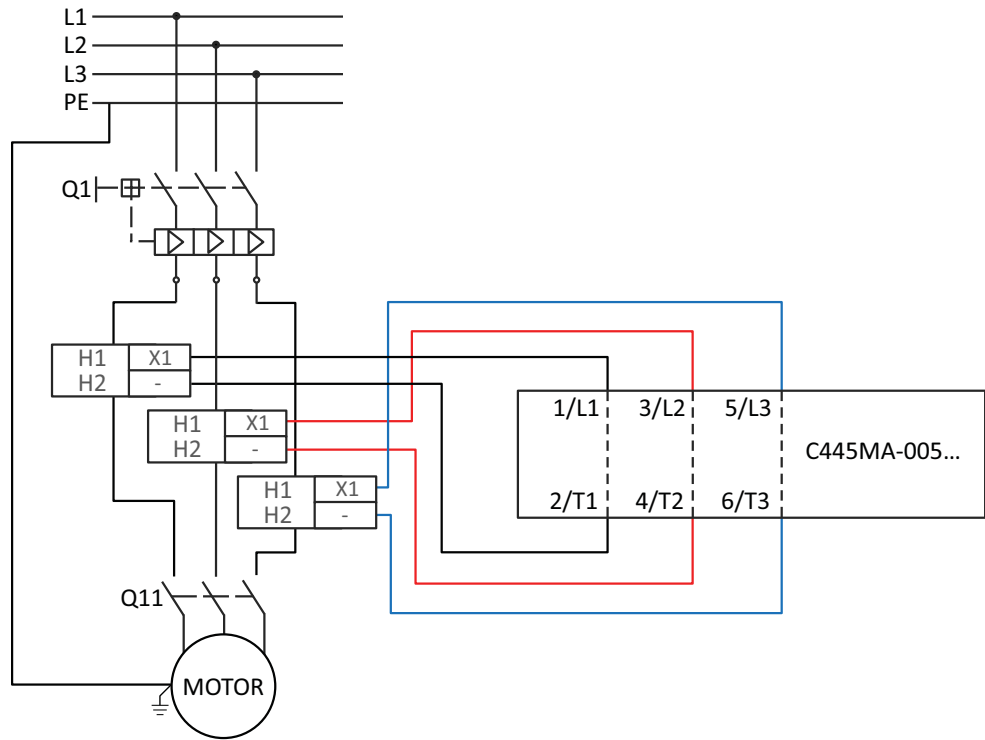
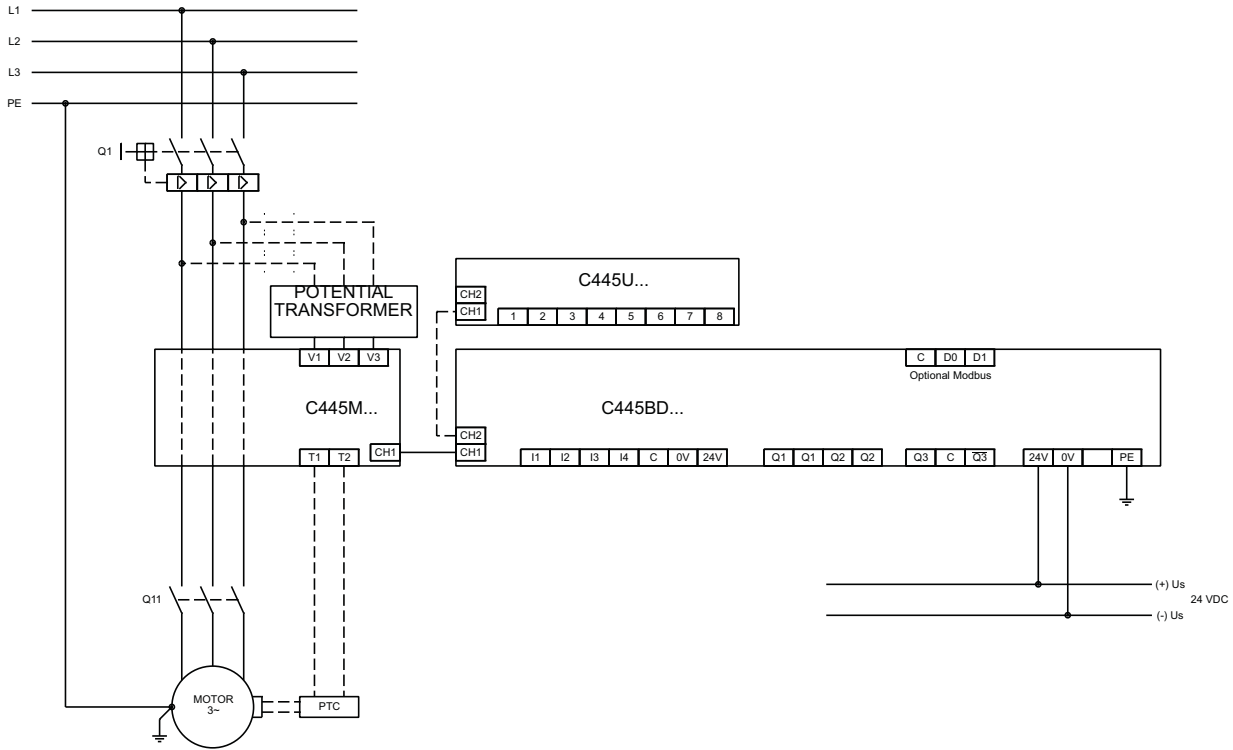


Figure 40. Motor Connections for Standard Overload Control Using Potential Transformers with C445BD...

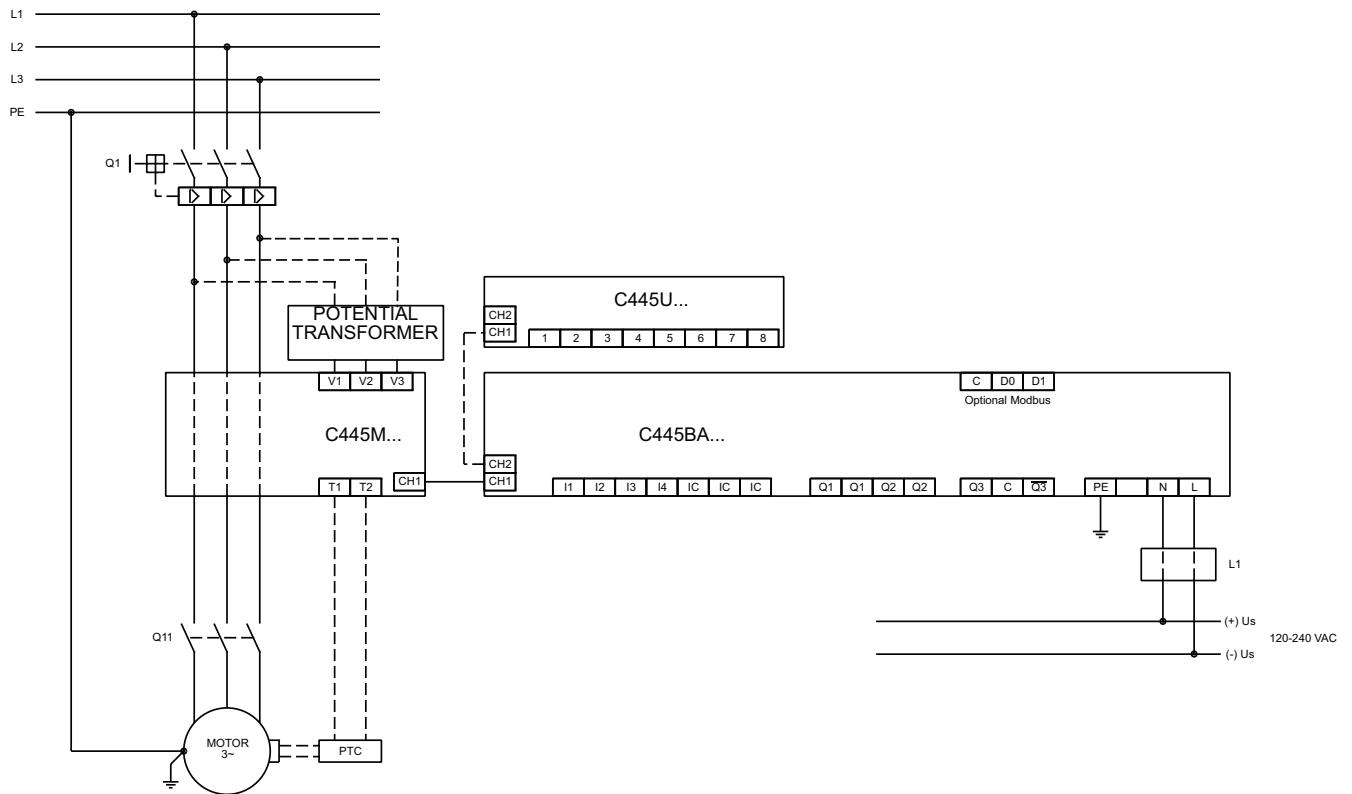


Legend

- Q1 = Cable and motor protection.
- Q11 = Run contactor.
- External CT = External Current Transformer, connect in accordance with manufacturer's instructions.
- PTC = Positive Temperature Coefficient (PTC) sensor.

Motor Connections with Potential Transformer(s)

Figure 41. Motor Connections for Standard Overload Control Using Potential Transformers with C445BA...



Legend

- Q1 = Cable and motor protection.
- Q11 = Run contactor.
- External CT = External Current Transformer, connect in accordance with manufacturer's instructions.
- PTC = Positive Temperature Coefficient (PTC) sensor.

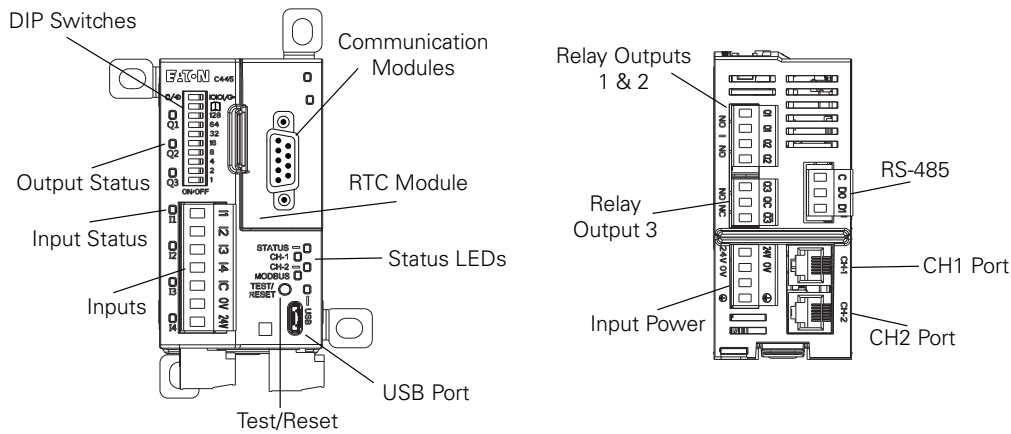
Power and I/O Wiring

Base Control Module

The Base Control Module is the controller of the C445 Motor Management Relay system. It provides motor protection and control algorithms and various motor data for monitoring. This module is equipped with native digital inputs for field wire control and outputs for motor control and protection. It also provides communication card options and USB connectivity for real-time data on the health and status of the motor.

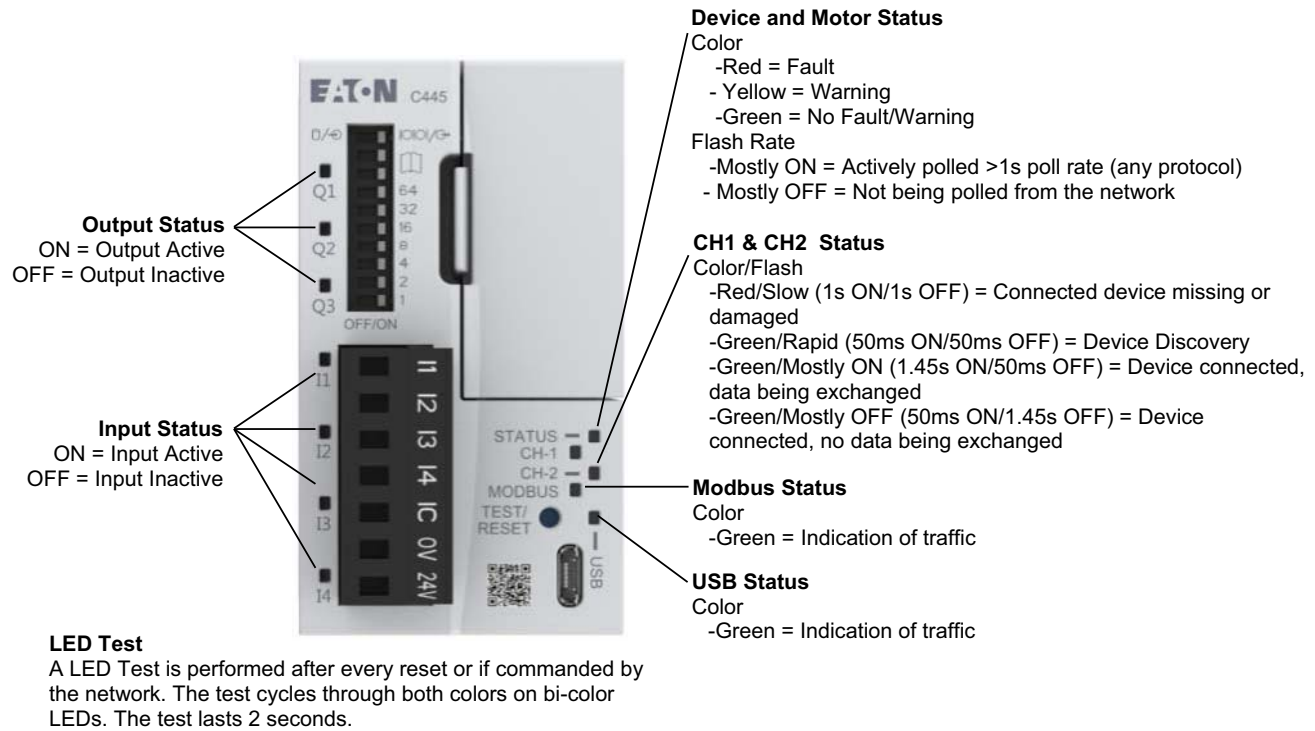
Base Control Module provides the slot for optional communication cards, the connectors for digital inputs and outputs, the optional RS-485 Modbus connector, the connector for powering the system, the USB port and the DIP switches (see **Figure 42**). The DIP Switch settings are dependent on the communication options installed.

Figure 42. Base Control Module Features and Connections



Base Control Module LED Behavior Overview

Figure 43. Base Control Module LED Overview



Base Control Module Features

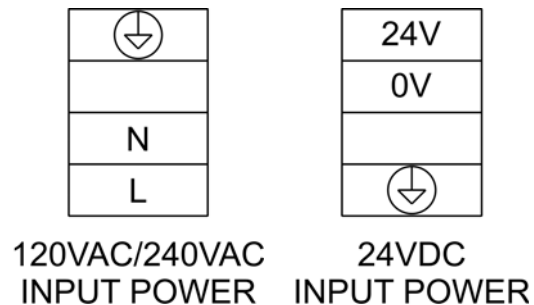
- Motor protection
- Power and efficiency monitoring
- Pre-configured operating modes
- AC (120/240) and DC (24) supply power options
- (4) Inputs / (3) Outputs
- Integrated USB port
- Real time clock memory module option
- Multiple fieldbus communication options
- Status LEDs
- Provides power and communications to the Measurement Module, the User Interface, and the Ground Fault Module (optional) through RJ-12 cables

24 Vdc and 120/240 Vac System Power

The C445 system consisting of the Base Control Module and a Measurement Module along with a number of optional modules, cards and ports are all powered from the four point connector on the Base Control Module. The Base Control Module can be powered by one of the following sources.

Input Power: Three options available, AC powered 110 Vac, 60 Hz, 220 Vac, 50 Hz, or 24 Vdc.

Figure 44. Input Power Options



Digital Inputs

There are 4 digital inputs on the Base Control Module. The module can be ordered with four 24 Vdc inputs or four 120 Vac inputs. Some or all of these inputs may be used if Field Wire is selected as one of the control sources. Or, if Field Wire is not selected as one of the control sources, all of these inputs are available as general purpose inputs. The state of these inputs is available to a system controller over a supported fieldbus network. The wiring for the inputs if they are available as general purpose inputs is shown below for both 24 Vdc and 120 Vac.

The Operation mode selected along with selecting Field Wire as one of the control sources determines which inputs are available as general purpose inputs. Refer to **Chapter 5—System Configuration and Operation** on **Page 75** for additional information on the Operation modes of the C445 and what functionality is assigned certain inputs based on the Operation mode.

For more information on the Operation modes and Input wiring if Fieldwire is selected as one of the control sources, refer to **Chapter 5—System Configuration and Operation** on **Page 75**.

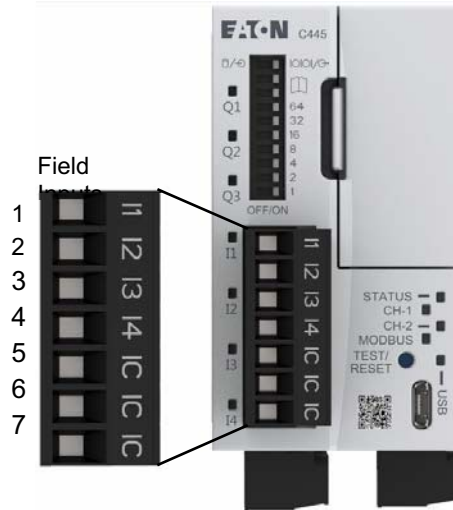
Below are wiring diagrams for the inputs on the Base Control Module assuming Field Wire is not one of the control sources, i.e. all inputs are available as general purpose inputs.

AC Input Option

The C445 Base Control Module with the AC Input option allows for up to four 120 Vac Inputs to be connected.

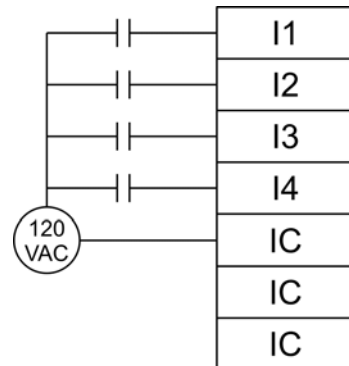
AC Input Field wiring is accomplished with a 7-pin, 5.00 mm pitch, removable screw terminal plug.

Figure 45. AC Field Input Terminal



| Pin# | Circuit | Description |
|------|---------|---------------------------|
| 1 | I1 | AC Field Input 1 |
| 2 | I2 | AC Field Input 2 |
| 3 | I3 | AC Field Input 3 |
| 4 | I4 | AC Field Input 4 |
| 5 | IC | Common for AC Field Input |
| 6 | IC | Common for AC Field Input |
| 7 | IC | Common for AC Field Input |

Figure 46. 120 Vac Input Terminal Diagram

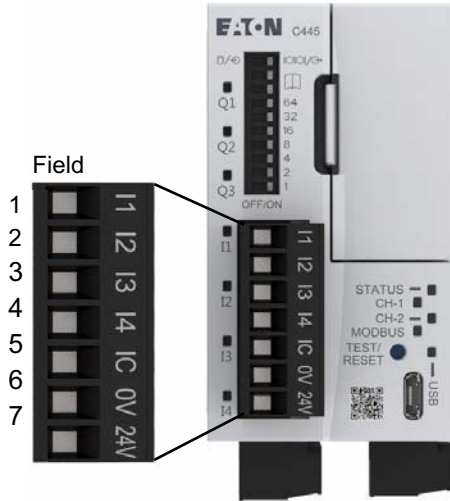


120VAC INPUT WIRING

DC Input Option

The C445 Base Control Module with the DC Input option allows for four isolated 24 Vdc Inputs (Option #1) or four dry contact (relay/switches) inputs (Option #2).

Figure 47. DC Field Input Terminal



| Pin# | Circuit | Description |
|------|---------|----------------------------|
| 1 | I1 | DC Field Input 1 |
| 2 | I2 | DC Field Input 2 |
| 3 | I3 | DC Field Input 3 |
| 4 | I4 | DC Field Input 4 |
| 5 | C | Common for DC Field Input |
| 6 | 0V | Digital Electronics Ground |
| 7 | 24V | Source for DC Field Inputs |

Wiring Option #1—Four Isolated 24 Vdc Inputs

When using option #1, no connections are made to pins 6 or 7.

Wiring Option #2—Four Dry Contact Inputs

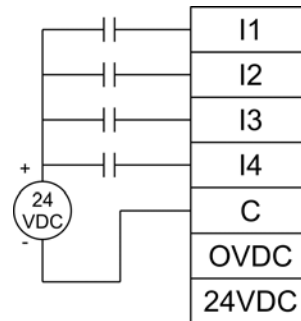
To use this option, pin 5 is shorted directly to pin 6. Pin 7 is connected through a switch or relay to the appropriate input.

The maximum wire length from pin 7 to the corresponding input is 10 m.

DC Field Input wiring is accomplished with a 7-pin, 5.00 mm pitch, removable screw terminal plug.

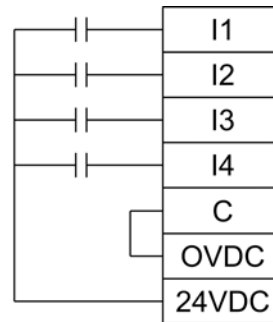
Note: When using Option #2, all wiring must meet PELV requirements.

Figure 48. DC Input Wiring Option 1 (Isolated)



ISOLATED 24VDC INPUT WIRING

Figure 49. DC Input Wiring Option 2 (Non-Isolated)



NON-ISOLATED 24VDC INPUT WIRING

Digital Outputs

The three digital outputs are dedicated to specific functionality based on the Operation mode selected. For example, Output 1 is used to control the contactor that energizes and de-energizes the motor for a Direct (FVNR) Motor application. In this example, Output 1 is used to control the contactor and to protect the motor. It is a normally open contact that closes when the active control source instructs it to do so, provided there are no faults or inhibits present. This same output contact opens when an active protection instructs it to do so, to protect the motor. In the case of the Direct Operation mode, only Output 1 is dedicated to this mode, leaving Outputs 2 and 3 available as general purpose relay outputs or another configurable function. This is the case for each Operation mode selected. Any of the three outputs not dedicated to an Operation mode may be used as general purpose outputs, controlled by a controller via a Fieldbus. Or, configured for another specific purpose with the Power Xpert *inControl* Software Tool.

Any available outputs configured as general purpose outputs are controlled by a controller via a fieldbus network such as EtherNet/IP, PROFIBUS, Modbus TCP or Modbus serial. The low 4 bits of the Field Output Control Word are used for this purpose. Any of the four low bits, 0-3 can be assigned to control any of the available outputs. In other words, bit 2 of the Field Output Control Word could be assigned to control output 2. But bit 0 could also be assigned as the control bit for that output. The Power Xpert *inControl* Software Tool is used to assign the bits in the Field Output Control word to the available outputs.

There are 2 bits that are needed to control output 3 if the C445 is ordered with the latching relay output option. Only output 3 can be ordered as a latching relay output. The 2 bits used for controlling output 3 when it is a latching relay are to set and reset the output. If output 3 is not ordered as a latching relay, then output 3 is controlled with one bit like outputs 1 and 2. This is the reason there are four bits in the Field Output Control word for controlling 3 outputs.

For more information on the Operation modes and associated output wiring refer to **Chapter 5—System Configuration and Operation** on **Page 75**.

All the available outputs not used for an Operation mode can be configured as general purpose outputs or can also be configured to indicate a specific Fault, Trip, Motor or Warning status. The available outputs can be configured for specific purposes using the Power Xpert *inControl* configuration Software Tool or via Modbus commands. Refer to **Appendix D**, for the Modbus Register map for C445 to perform this configuration using a Modbus master. The configuration Software Tool provides a user friendly way to configure the outputs for the various selections.

Outputs dedicated to the selected Operation mode will be shown as Reserved in the Software Tool and on the User Interface when online with the C445. Available outputs will be shown configured as follows by default. But any of the functions shown below can be selected for each of the available outputs with the Web Pages, Software Tool or the User Interface:

- Q1 Function Select: Output Control – bit 0
- Q2 Function Select: Output Control – bit 1
- Q3 Function Select: Output Control – bit 2
- Q3 Latch Reset: Output Control – bit 3
- 0: None
- 1: Fault Reason Type – Load Fault
- 2: Fault Reason Type – Supply Fault
- 3: Fault Reason Type – Motor fault
- 4: Tripped Status Bits – PTC Temperature
- 5: Tripped Status Bits – Phase Rotation
- 6: Tripped Status Bits – Stall
- 7: Tripped Status Bits – Overload
- 8: Reserved
- 9: Tripped Status Bits – Low Power
- 10: Tripped Status Bits – High Power
- 11: Tripped Status Bits – Under Current
- 12: Tripped Status Bits – Frequency Deviation Slow
- 13: Tripped Status Bits – Frequency Deviation Fast
- 14: Tripped Status Bits – Voltage Unbalance
- 15: Tripped Status Bits – Voltage Phase Loss
- 16: Tripped Status Bits – PF Deviation
- 17: Tripped Status Bits – Jam
- 18: Tripped Status Bits – Instantaneous Over Current
- 19: Tripped Status Bits – Current Unbalance
- 20: Tripped Status Bits – Current Phase Loss
- 21: Tripped Status Bits – Ground Current
- 22: Motor Control Status – Motor at Speed
- 23: Motor Control Status – Ready
- 24: Motor Control Status – Inhibited
- 25: Motor Control Status – Warning
- 26: Motor Control Status – Fault
- 27: Motor Control Status – Remote Enabled
- 28: Motor Control Status – Running 2
- 29: Motor Control Status – Running 1

| |
|--|
| 30: Warning Status Bits – PTC |
| 31: Warning Status Bits – Phase Rotation |
| 32: Warning Status Bits – Stall |
| 33: Warning Status Bits – Overload |
| 34: Warning Status Bits - exceeds starts limit |
| 35: Warning Status Bits – Low Power |
| 36: Warning Status Bits – High Power |
| 37: Warning Status Bits – Under Current |
| 38: Warning Status Bits – Frequency Deviation Slow |
| 39: Warning Status Bits – Frequency Deviation Fast |
| 40: Warning Status Bits – Voltage Unbalance |
| 41: Warning Status Bits – Voltage Phase Loss |
| 42: Warning Status Bits – PF Deviation |
| 43: Warning Status Bits – Jam |
| 44: Warning Status Bits – Instantaneous Over Current |
| 45: Warning Status Bits – Current Unbalance |
| 46: Warning Status Bits – Current Phase Loss |
| 47: Warning Status Bits – Residual GF |
| 48: Warning Status Bits – External GF |
| 49: Warning Status Bits – Overvoltage |
| 50: Warning Status Bits – Undervoltage |
| 51: Tripped Status Bits – Undervoltage |
| 52: Tripped Status Bits – Overvoltage |
| 53: Tripped Status Bits – External GF |
| 54: Field Output Control word – bit 0 |
| 55: Field Output Control word – bit 1 |
| 56: Field Output Control word – bit 2 |
| 57: Field Output Control word – bit 3 |
| 58: Shunt Trip Output |
| 59: Warning Status Bits – HRGF Pulse Detect |
| 60: Warning Status Bits – Peak Demand |
| 61: Base Control Module Field Input I1 |
| 62: Base Control Module Field Input I2 |
| 63: Base Control Module Field Input I3 |
| 64: Base Control Module Field Input I4 |
| 65: Tripped Status Bits (Fail Safe) – Not Ground Current |
| 66: Trip Reason – HRGF Pulse Detection |

Outputs 1 and 2 are normally open form A relay outputs. Output 3 is a form C relay output with one normally open and one normally closed contact. When the output is energized, both contacts change state. When ordering the C445 Motor Management Relay, one of the options is to obtain a Base Control Module where Output 3 is either a standard form C relay output or a latching form C relay output.

Output 3 operation as a standard form C relay output means the output will de-energize and return the contacts to their normal state when the Base Control Module is powered off.

Output 3 operation as a latching relay output offers capability beyond what's available from a non-latching, or a standard relay output. The energized state of the latching relay can be maintained after power has been removed from the Base Control Module. Energized means that the normally open contact will be closed and the normally closed contact will be open.

There are two additional configuration parameter for the latching relay and that involves the Power-down behavior. The following are the four choices for this behavior. These parameters can be configured using the Power Xpert *inControl* Software, the Monitoring User Interface, or via a Modbus message from a Modbus master. These parameters are called:

Base Control Module Relay 3 Behavior (Modbus register 719):

- Behave like a non-latching relay (default) (Modbus value = 0)
- Behave like a latching relay (Modbus value = 1)

If "Behave like a latching relay" is selected for the parameter above, then the following options are available in the Output 3 Latching Relay Behavior at Power Down parameter (Modbus register 729):

- Turn Off (default) (Modbus value = 0)
- Turn On (Modbus value = 1)
- Hold Last State (Modbus value = 2)
- Toggle (Modbus value = 3)

The four bits in the Base Control Module Field Output Control word (Modbus register 601) can be assigned in any order to control the various outputs as follows:

- Output 1 Function Select: Select Field Output Control Word bit 0, 1, 2 or 3
- Output 2 Function Select: Select Field Output Control Word bit 0, 1, 2 or 3
- Output 3 Function Select: Select Field Output Control Word bit 0, 1, 2 or 3
- Output 3 Reset Function Select: Select Field Output Control Word bit 0, 1, 2 or 3 (for Latching Relay Operation only)

Refer to **Appendix D** for a complete C445 Modbus register map.

The outputs are relay contacts and wired as follows.

Figure 50. 4-Point Form A (NO) Output Connector

| | | |
|----|----------|--------------------|
| Q1 | Output 1 | Normally Open (NO) |
| Q1 | Output 1 | Normally Open (NO) |
| Q2 | Output 2 | Normally Open (NO) |
| Q2 | Output 2 | Normally Open (NO) |

Figure 51. 3-Point Form C (NO/NC) Output Connector

| | | |
|----------|----------|----------------------|
| Q3 | Output 3 | Normally Open (NO) |
| C | Output 3 | Common |
| Q3 (Not) | Output 3 | Normally Closed (NC) |

Optional RS-485 Port

If the C445 includes an RS-485 port on the Base Control Module and there is not an optional Ethernet or PROFIBUS Communication Card installed, the Modbus address and Baud Rate for this port is assigned with the DIP Switches on the Base Control Module.

If an optional PROFIBUS Card is installed, the DIP Switches on the Base Control Module double as the node address for the RS-485 Modbus port and the PROFIBUS slave module.

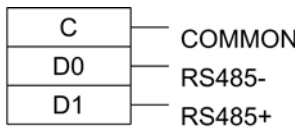
Figure 52. Modbus Serial Connection

| Setting | Default | Range |
|-----------|---------|---------------------|
| Address | 1 | 1 to 247 |
| Baud Rate | 19200 | 9600, 19200, 115200 |
| Stop Bits | 1 | 1 or 2 |
| Parity | Even | Even or Odd |
| Mode | RTU | RTU or ASCII |

If an optional Ethernet Card is installed, the DIP Switches on the Base Control Module are dedicated to the Ethernet Card's IP address. In this case, the RS-485 port must be configured via the Power Xpert *inControl* Software, the Monitoring User Interface, or via Modbus commands from a Modbus master. The Modbus Register map is in **Appendix D**.

Note that even if there is no optional Ethernet or PROFIBUS communication card installed, the DIP Switches can be set to allow the Modbus address to be set with the configuration software.

Figure 53. RS-485 Port



Notes

- Shield shall be Earthed externally
- Shield should NOT be connected to any of these three terminals
- Wiring must meet PELV requirements

Base Control Module DIP Switches

DIP Switch settings when no optional communication card is installed in the Base Control Module, but the optional RS-485 Modbus port is included.

Figure 54. Base Control Module DIP Switches with Built-In Modbus

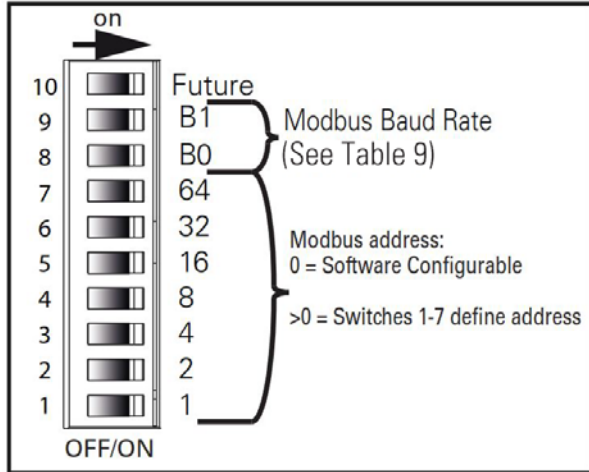


Figure 55. Base Control Module DIP Switches with PROFIBUS Card

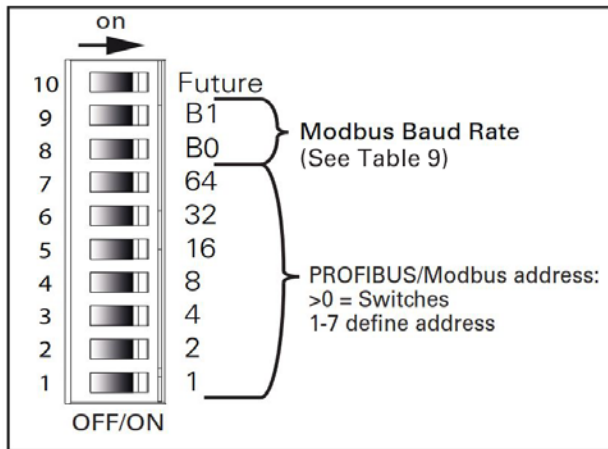
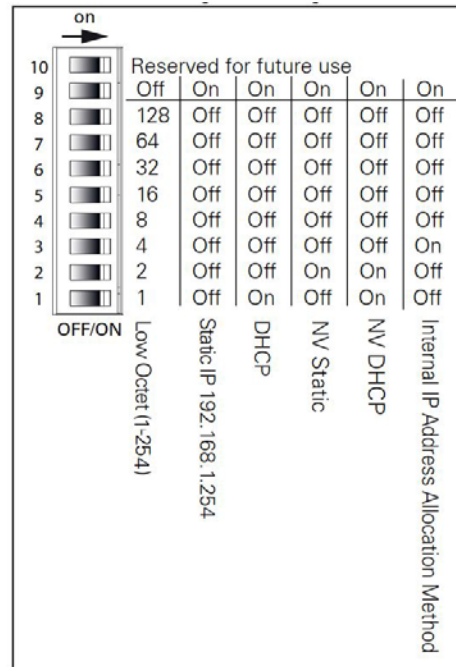


Table 10. Modbus Data Rate

| B1 | B0 | Rate |
|----|----|-----------------------|
| 0 | 0 | Software Configurable |
| 0 | 1 | 9600 |
| 1 | 0 | 115200 |
| 1 | 1 | 19200 |

Figure 56. Base Control Module DIP Switches with Ethernet Card



Note: See **Appendix C** Optional Communication Cards for detailed information on each Communication Option.

USB Port

The USB port on the Base Control Module is a standard Micro USB port. It supports the Modbus protocol and is typically used to interface the Power Xpert *inControl* Software Tool to the C445 Motor Management Relay for configuration and monitoring. Since this port supports the Modbus slave protocol, it will respond to Modbus commands from any Modbus master connected to this port. All parameters shown in the C445 Modbus Register Table in **Appendix E** can be accessed by the Software Tool or any Modbus master.

When a Micro B cable is connected, this port acts as a serial Modbus port with the following interface parameters:

19200 Baud, 8 bits/byte, Even Parity and 1 Stop Bit

The LED labeled “USB” above the USB port flashes green when the port is connected and data is being transferred.

Test/Reset Button

There is a small indented push button on the front of the Base Control Module that supports reset and Test Trip functions as follows:

Factory Reset – This is a power up service. With the C445 powered down, press the button and hold it while applying power. Continue to hold down the button for 5 seconds after applying power.

Test Trip – This is a runtime service. With the C445 already powered, press and hold the button for at least 5 seconds and a Test Trip Fault will occur.

Fault Reset – This is a runtime service. With the C445 already powered, press and hold the button for at least 0.5 seconds, but less than 5 seconds to perform a fault reset.

RJ12 Ports

The two RJ12 ports on the bottom of the Base Control Module are used to connect the Measurement Module and the optional User Interface and Ground Fault modules, to create a complete C445 Motor Management Relay system. RJ12 cables of varying lengths are available for this purpose. Refer to **Table 4** on **Page 4** for part numbers and cable lengths.

When a Measurement Module and an optional User Interface and/or Ground Fault Module are initially connected to the Base Control Module, they are automatically accepted. Either RJ12 port can be used for these modules. If a User Interface Module and a GF Module are used, the GF Module must be connected to the Base Control Module and either the User Interface or the Measurement Module can then be connected to the GF Module. The GF Module has two RJ12 ports. After the C445 system is initially connected, a fault will be generated by the Base Control Module if the Measurement Module is moved to the other RJ12 port on the Base Control Module while the system is powered. This applies to the User Interface and GF Modules as well. A fault reset must be sent to clear this fault. If the modules are connected to different RJ12 ports while the system is powered down, no faults will be generated upon power-up.

If the Measurement Module, User Interface, or GF Module are removed while the system is powered up or down and not plugged back into the Base Control Module, a communication loss fault will be generated. If the removed module is meant to be removed from the system permanently, a “repair” service should be sent from the Power Xpert *inControl* Software Tool. Following this, the device will soft reset itself and the fault will be cleared, resulting in a new system configuration without the removed module. This really only applies to removing a User Interface or a GF Module because a Measurement Module is required for all motor protection Operation modes. Only the General Purpose Input/Output and Stand-alone GF Module operation modes do not require a Measurement Module.

Connecting a Measurement Module or User Interface module with a different part number to the Base Control Module while the system is powered will also result in a fault. A fault reset will clear the fault. If the desire is to use the new module, a “repair” service should be sent with the Software Tool. If the new module was connected by mistake, connect the correct module with the old part number and send a fault reset. A soft reset always follows a “repair” service.

Connecting a Measurement Module or User Interface module with a different part number to the Base Control Module while the system is powered down will result in a fault when the system is re-powered. A “repair” service should be sent if the desire is to use the module with the new part number. If the new module was connected by mistake, connect the module with the old part number and issue a fault reset.

A fault reset can be issued from the following sources:

1. By holding the small button on the front of the Base Control Module down for at least 0.5 seconds while the device is powered.
2. From the Power Xpert *inControl* Software Tool.
3. From any Modbus master to the USB port or the RS-485 port.
4. From a Modbus TCP master to the optional Ethernet card.
5. From an EtherNet/IP master to the optional Ethernet card.
6. With the blue Reset button on the Monitoring User Interface if one is connected.

Measurement Module

1. PTC Input

To utilize this optional feature, a Measurement Module must first be purchased with this feature included from the factory. This is not a field upgradable option.

Wire a compatible thermal detector, up to a 6 MARK A type PTC thermal detector across the T1 and T2 terminals of the 2-point connector on the Measurement Module. There are no settings of any kind to make in the C445.

To make this PTC input a Trip or Warning, enable it as such using the Power Xpert *in*Control Software Tool under the Protections category.

To monitor the status of this input, monitor the “PTC Status” register for the following:

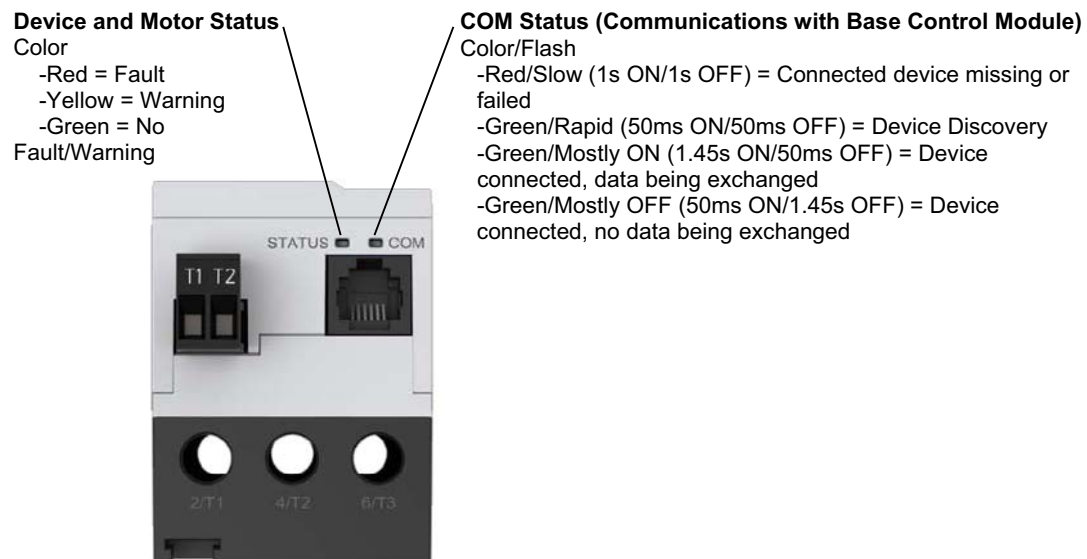
Table 11. PTC Sensor Status

| Value | Description |
|-------|---------------------------|
| 0 | PTC ok – no fault |
| 1 | PTC overtemperature fault |
| 2 | PTC shorted fault |
| 3 | PTC open fault |

PTC Connection: PTC wiring is connected to terminals T1 & T2 in any polarity. This connector is designed to accept 0.2 mm² (24 AWG) to 2.5 mm² (12 AWG) wire. The use of twisted pair wiring is strongly recommended. Shielded cable should be used when the cable lengths exceed 100ft (30m) or as needed. It's recommended that the cable shield be earth referenced near the motor frame. Cable resistance as measured at the T1 & T2 terminals must not exceed 10 ohms to retain short circuit monitoring along the entire length of the cable run

2. LEDs on the Measurement Module

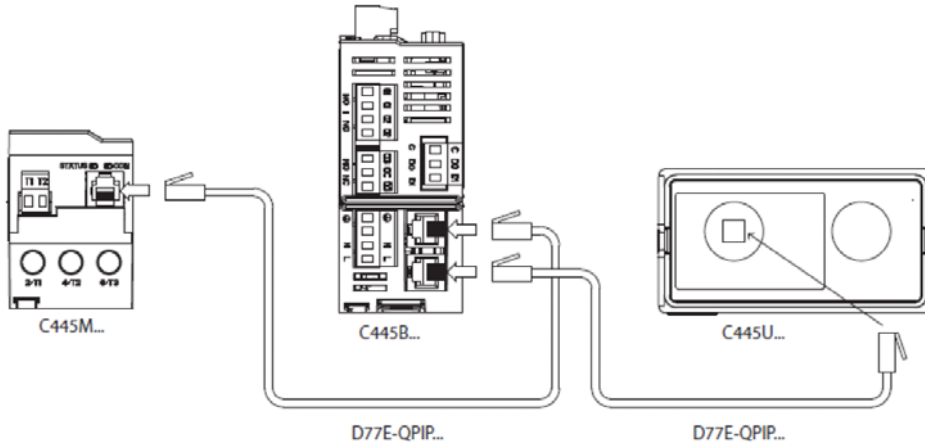
Figure 57. Measurement Module LED Overview



RJ12 Connections for C445 System

Below is a diagram showing how a C445 system is connected when a Base Control Module, a Measurement Module and a User Interface are used.

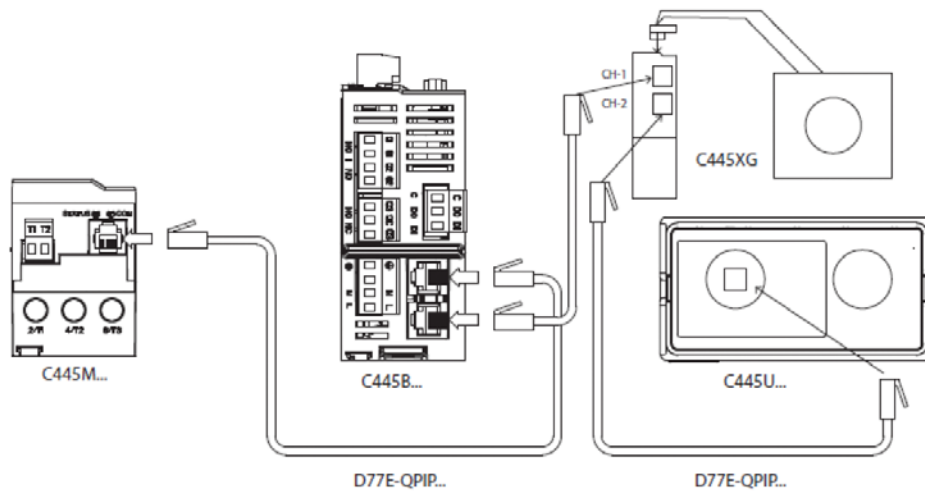
Figure 58. C445 System Connection



Ground Fault Module

When a Ground Fault Module is included in the C445 system, it is connected between the Base Control Module and the User Interface Module as shown below, or between the Base Control Module and the Measurement Module, not shown. The Ground Fault Module has 2 RJ12 ports on the bottom for connecting to the Base Control Module and the User Interface Module or the Measurement Module.

Figure 59. C445 System Connection with Ground Fault Included

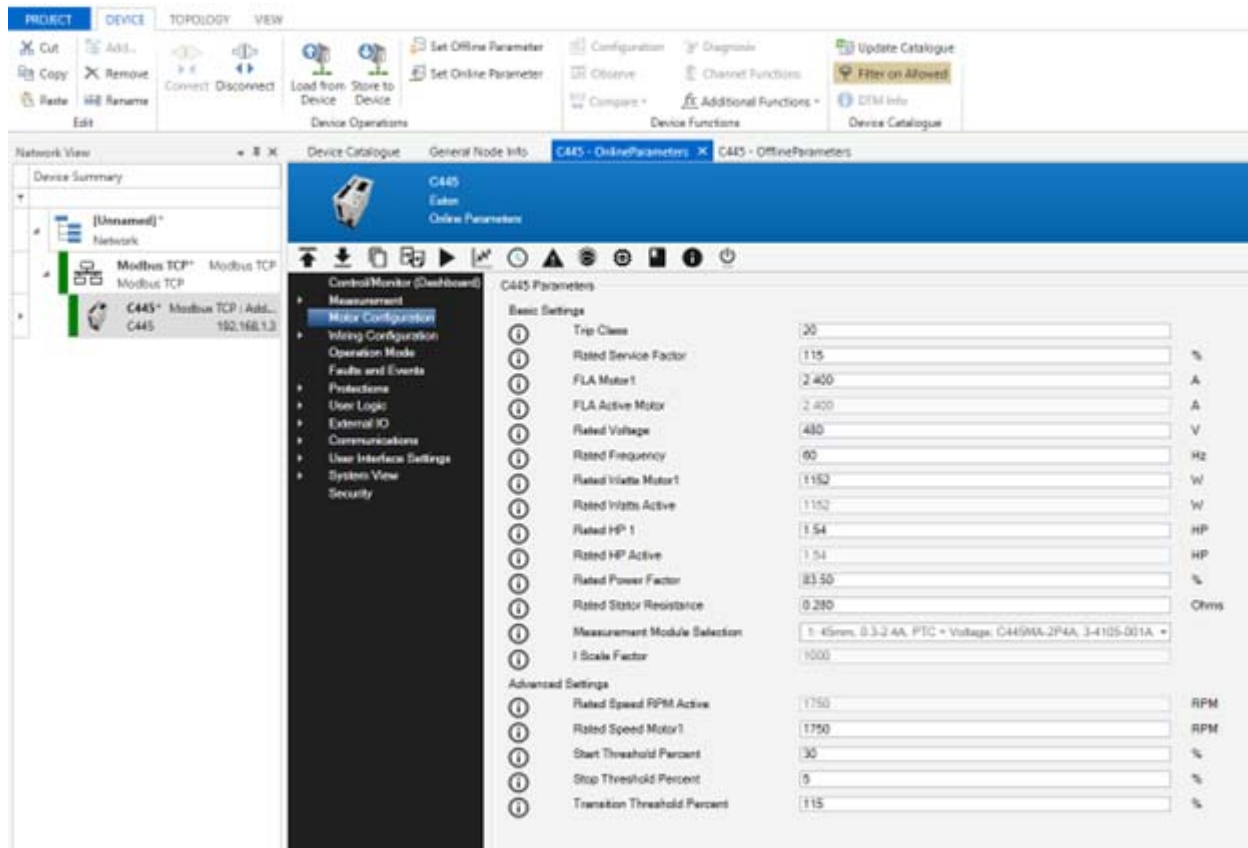


Chapter 4—System Configuration and Commissioning

Commissioning

There are many ways to configure a C445 Motor Management Relay. There are configuration tools that are best to use for initial commissioning and some that are faster when configuring a replacement C445 and others that are network dependent. Each will be described below.

1. C445UM Monitoring User Interface
 - (1) Easy start-up wizard for configuring critical parameters. The wizard will appear on first power-up attempt and can also be prompted in the PRG → Services menu.
 - (2) PRG menu allows you to easily view or change any system parameter. Parameters are broken into simple menu groups so that it is easy to find what you are looking for without requiring use of any documentation. See **Chapter 8** for more details on the Monitoring User Interface
2. The Power Xpert *inControl* Software configuration and monitoring tool. This Software Tool may be downloaded free of charge from the Eaton website. It is a powerful Software Tool with many features including:
 - (1) Start-up wizard for configuring the most critical motor nameplate parameters.
 - (2) Categorized parameters for ease of finding the parameters needed to enable and configure particular features in the C445
 - (3) Ability to save configuration files for easy access later or to open and download to a replacement C445
 - (4) Motor Control page to monitor run status, some motor parameters such as average current and voltage as well as fault and warning codes and descriptions.
 - (5) Parameter compare feature between two different configuration files.
 - (6) Online and offline configuration for a C445 along with the ability to upload from an online device to an offline file and from an offline file to a device.



There are many more features offered by this Software Tool that are described in more detail in the Power Xpert *inControl* User Manual, publication MN040013EN.

To access a C445 online with this Software Tool, two protocols are supported: Modbus TCP Ethernet and Modbus Serial. In order to use Ethernet, the optional Ethernet card must be installed in the C445 Base Control Module. Using Modbus serial can be accomplished via the optional RS-485 serial port on the Base Control Module or via a Micro USB port on either the Base Control Module or the optional User Interface Module.

The Micro USB ports use a standard USB/Micro USB cable. This cable may be ordered from Eaton as catalog number: C445XS-USBMICRO.

To access the C445 via the RS-485 serial port, a USB to RS-485 flying leads cable is also available from Eaton as catalog number: C445XS-USBLEADS.

- Web Pages can be easily accessed using any web browser and an Ethernet cable connected between the computer running the Power Xpert *inControl* Software and the optional Ethernet card connected to the C445 Base Control Module.

An IP address or IP addressing method must be selected using the DIP Switches on the Base Control Module. Refer to **Installation and Wiring on Page 41** for information on setting the DIP Switches when an Ethernet Card is installed in the C445 Base Control Module. The computer must then be configured with an IP address in the same range as the C445 Ethernet card.

Connect an Ethernet cable between the computer and the C445 Ethernet Card. Enter the IP address of the C445 Ethernet Card on the command line in the web browser and press the Enter key. In a few seconds, the Web Pages for the C445 will open as follows:

The screenshot displays the Eaton web interface for the C445 motor management relay. On the left is a navigation menu with the Eaton logo and the tagline "Powering Business Worldwide". The main content area is titled "DASHBOARD GROUP" and includes a checkbox to "Display all parameter details in group". Below this is a table listing various parameters.

| PID | Param Name | Parameter Value | Unit |
|-----|--------------------------------------|-----------------|---------|
| 300 | Motor Control Status | 0x44 | |
| 304 | I Average Scaled | 0 | |
| 306 | I Unbalance Percent | 0 | % |
| 308 | Thermal Memory Percent | 0 | % |
| 309 | Time to Trip Overload | 9999 | seconds |
| 311 | Time to Reset Overload | 0 | seconds |
| 324 | Average Line-to-Line Voltage | 82 | V |
| 325 | Voltage Unbalance Percent | 49 | % |
| 326 | Voltage Phase Order | 2 | |
| 327 | Total Watts | 0 | W |
| 333 | Power Factor Scaled | 0 | % |
| 350 | Number of Operating Seconds | 190577 | seconds |
| 356 | Operating Seconds (Resettable) | 190242 | seconds |
| 362 | I Average % of FLA (Nominal Current) | 0 | % |
| 372 | Motor State (Current Based) | 0 | |

All parameters can be accessed or parameters in specific categories. The Web Pages can be used to configure parameters, monitor and control.

Chapter 4—System Configuration and Commissioning

4. Any Modbus serial master can be connected to the optional RS-485 port or to either Micro USB port to modify any parameter that is a read/write parameter. A complete C445 Modbus Register Map is in **Appendix D** of this manual.
5. Any Modbus TCP Ethernet master can be used to commission a C445 provided an optional Ethernet card is installed in the C445 Base Control Module. Any read/write parameters may be modified using the Modbus Register Map in **Appendix D** of this manual.
6. The Ethernet card for the C445 also supports EtherNet/IP. An EtherNet/IP master can configure C445 parameters via explicit messages. Refer to **Appendix C** the EtherNet/IP section for additional information.
7. If a PROFIBUS option card is installed in the C445 Base Control Module, read/write parameters can be modified via the Configuration file sent from the master each time a connection is established to the C445 or from PROFIBUS DP V1 acyclic messages sent from the master. The C445 PROFIBUS Card supports both DP V0 and DP V1 PROFIBUS features. Refer to **Appendix C** the PROFIBUS section for additional information.
8. Optional Real-Time Clock and memory backup module (RTC module) continually reads the C445 configuration and downloads it to a replacement unit. This module is discussed in more detail later in this section.

The New C445 Web Pages

C445s with a Base Control Module (BCM) with firmware version of 3.0 or later (Style Number 3-4104-xxxD) and with an Ethernet module with firmware version 2.0 or later, support the new web pages.

Accessing the new C445 Web Pages

1. Connect an Ethernet cable to the computer and to the C445.
2. Open the web browser.
3. Enter the IP Address of the C445 on the command line and press Enter.
4. When the following screen opens, enter the username and password.

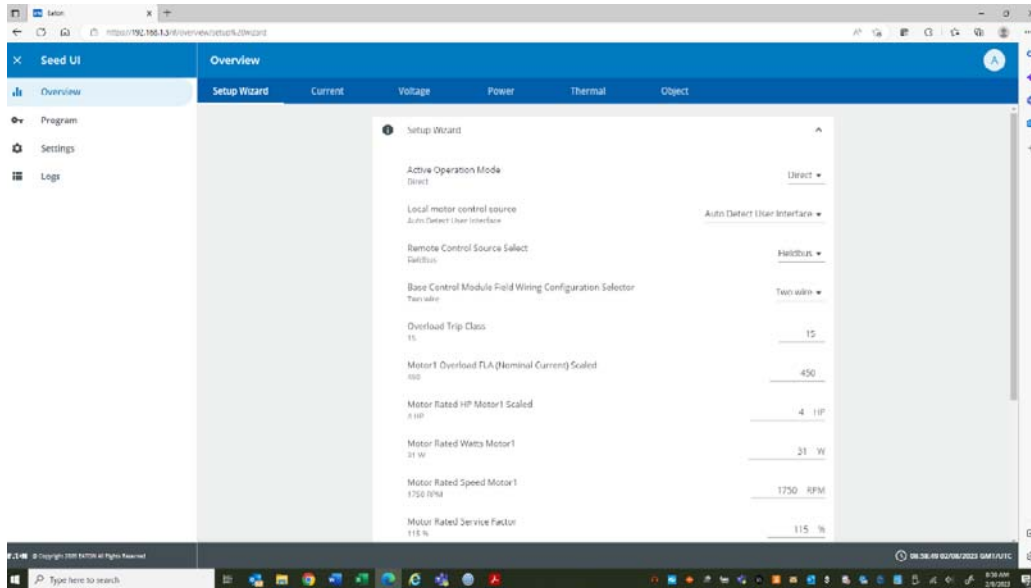
Note: When entering the web pages for the first time, enter the default username and password below:

Username: admin
Password: Admin*1.

You will then be prompted to change the default password. Once you have done this, you will need to log in again with the new password.

Chapter 4—System Configuration and Commissioning

The new web pages look like the following. Navigation is very straight-forward.



Select a category on the left of the screen:

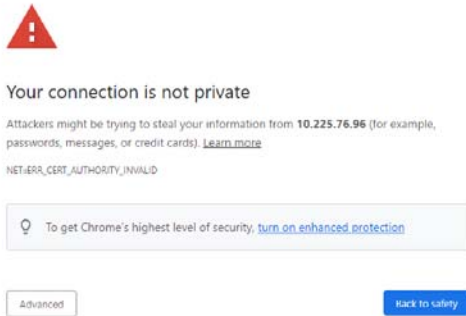
1. Overview
2. Program
3. Settings
4. Logs

Then select from the categories that appear for each selection along the top of the screen. Various parameters associated with each category will then be displayed, such as monitoring parameters and configuration parameters.

Downloading a certificate for a secure encrypted data connection

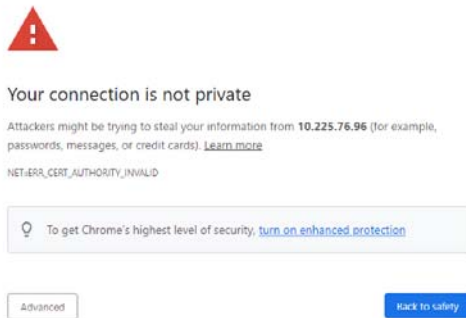
The introduction of a TLS (Secure) server in the C445 Ethernet module Web Pages has resulted in the need to download a certificate in order to provide a secure encrypted data connection between the PC and EDC and thereby avoid privacy warnings when logging in and "Not Secure" indications on the address bar when navigating to the Ethernet modules IP Address.

The following message will be displayed prior to logging in to the Web Pages prior to the certificate being downloaded and installed from a new PC/Browser connection. This will only need to be performed one time for each computer used to access the new C445 Web Pages.

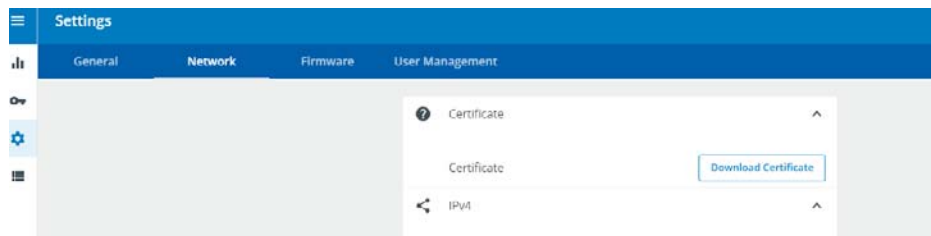


To download and install the certificate:

1. Log in to the Ethernet modules Web Pages via its IP Address.

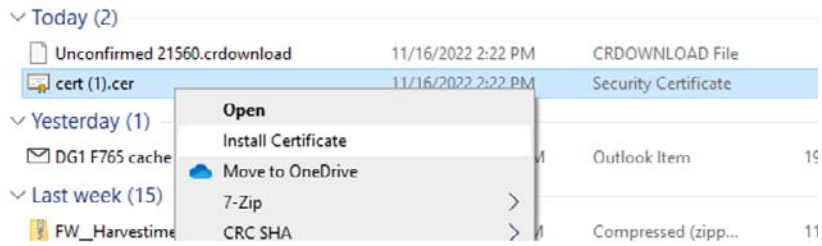


2. Press the 'Advanced' button at the 'Your connection is not private' screen and then 'Proceed to <IP Address>' to gain access to the login screen.
3. Log in with admin credentials.
4. Navigate to the Network tab under the Settings menu.
5. Press the 'Download Certificate' button from the Network menu.

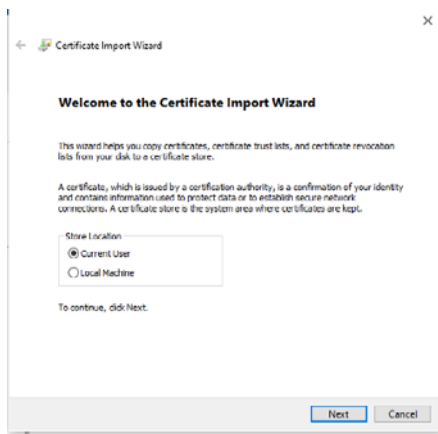


Chapter 4—System Configuration and Commissioning

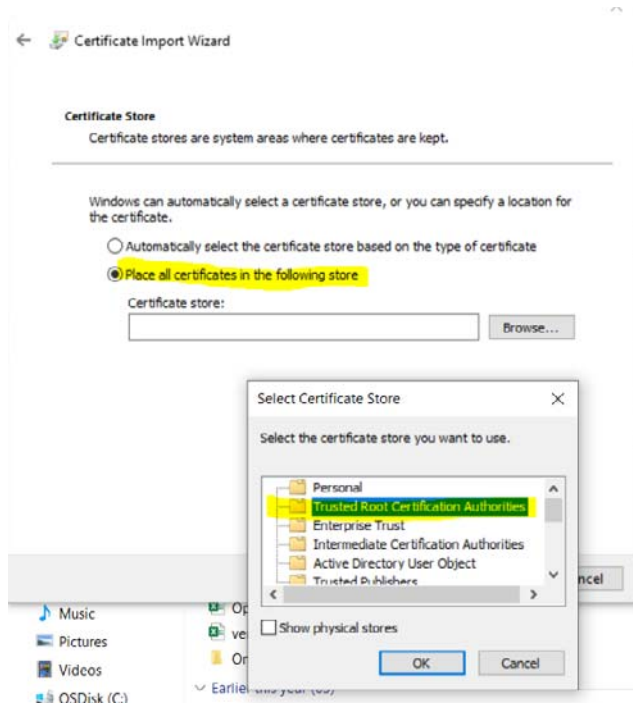
6. Navigate to the Downloads folder on your PC to find the downloaded certificate.
7. Right click on the cert.cer file and choose 'Install Certificate'.



8. Select "Current User":



9. Select 'Place all certificates in the following store' and then select 'Trusted Root Certification Authorities'.



10. Click Finish and then close and re-open your browser (all instances of it) before reconnecting to the Web Pages.
11. You should now be able to log in to the Ethernet Module without any security or privacy warnings.

Clearing the Audit Logs on the New C445 Web Pages

There are 4 Audit Logs on the C445 Web Pages:

Audit-Power Log

Audit-Fw-Update Log

Audit-Config Log

Audit-User Log

These Audit Logs can be accessed from the “Logs” category on the left of the Web Pages screen. They are records of these 4 types of events for cybersecurity reasons.

The Audit Logs do not roll over when each buffer is full. In most cases, it will take years to fill these buffers. When a Log buffer is full, a Warning will be issued by the C445. The Warning will not affect normal operation but will persist until the Logs are cleared.

To clear the Audit Logs, go to the Logs page and select the Clear Logs button. The Logs will not be cleared until the next power cycle or soft reset. This is to be sure that Ethernet connections that may be present to the C445 Ethernet module do not time out. Clearing these large Log buffers could take as long as 20 seconds, which could result in a communication timeout fault if connections are present. If the Clear Logs button is selected, the logs will be cleared at the next power cycle. This could take as long as 20 seconds, so be prepared to wait that long before a new connection to the C445 Ethernet module is accepted. After the Logs are cleared, Ethernet connections to the Ethernet module will be accepted to allow for normal operation.

Power Xpert *inControl* Commissioning Software Tool

There is a Power Xpert *inControl* User Manual that describes all the features of this powerful Software Tool (publication MN040013EN). Below is information on using the Start-Up Wizard in this Software Tool.

The Start-Up Wizard executes under the following conditions:

1. Each time a new C445 is added to a project and the parameters are accessed in the offline mode.
2. Each time the parameters for a C445 are accessed online for the first time or if they are accessed again without having been saved.

The wizard consists of two pages of parameters for single motor applications and three pages of parameters for two motor applications. The two pages of parameters for single motor applications are shown below:

The screenshot displays the 'Set-Up Wizard' interface for a C445 motor. The header includes the Eaton logo and the text 'C445 Eaton Corporation Offline Set-Up Wizard'. A 'Firmware' dropdown menu is set to '1.00.0012'. The main area contains five configuration steps, each with an information icon (i) and a dropdown menu:

- Active Operation Mode:** 1: Direct Online
- Measurement Module Selection:** 1- 45mm, 0.3-7 4A, PTC + Voltage: C445MA-2P4A; 3-4105-001A
- Local Motor Control Source:** 0: Auto Detect User Interface
- Remote Control Source Select:** 1: Fieldbus is Remote Control Source
- Base Control Module Field Wiring Configuration Selector:** 0: Two Wire Field Wiring Configuration

If changes are made to any parameters on this page and the user does not need to view the second page, select the check mark to save the changes made on this page and exit the wizard.

If changes are made to any parameters on this page, or not, selecting the right arrow button will save those changes and progress to the second page shown below.

At any time, there is a Close button located at the bottom right of each wizard screen (not shown above). If that is selected no changes are saved and you will Exit the wizard.

Note: When a wizard opens on an online C445 DTM, the parameters contained in the wizard are read from the C445.

C445
Eaton Corporation
Offline Set-Up Wizard

Firmware 1.00.0012

Set-Up Wizard

| | | | |
|--|---------------------------------------|------------------------------------|-----|
| | Overload Trip Class | <input type="text" value="5"/> | |
| | Motor1 Overload FLA (Nominal Current) | <input type="text" value="0.300"/> | A |
| | Motor Rated Watts Motor1 | <input type="text" value="14914"/> | W |
| | Motor Rated HP Motor 1 | <input type="text" value="20.00"/> | HP |
| | Motor Rated Speed Motor1 | <input type="text" value="1750"/> | RPM |
| | Motor Rated Service Factor | <input type="text" value="115"/> | % |
| | Motor Rated Voltage | <input type="text" value="480"/> | V |
| | Motor Rated Frequency | <input type="text" value="60"/> | Hz |
| | Motor Rated Efficiency | <input type="text" value="85"/> | % |
| | Motor Rated Power Factor | <input type="text" value="83.50"/> | % |
| | Motor Start Threshold | <input type="text" value="30"/> | % |
| | Motor Stop Threshold | <input type="text" value="5"/> | % |
| | Motor Transition Threshold Percent | <input type="text" value="115"/> | % |

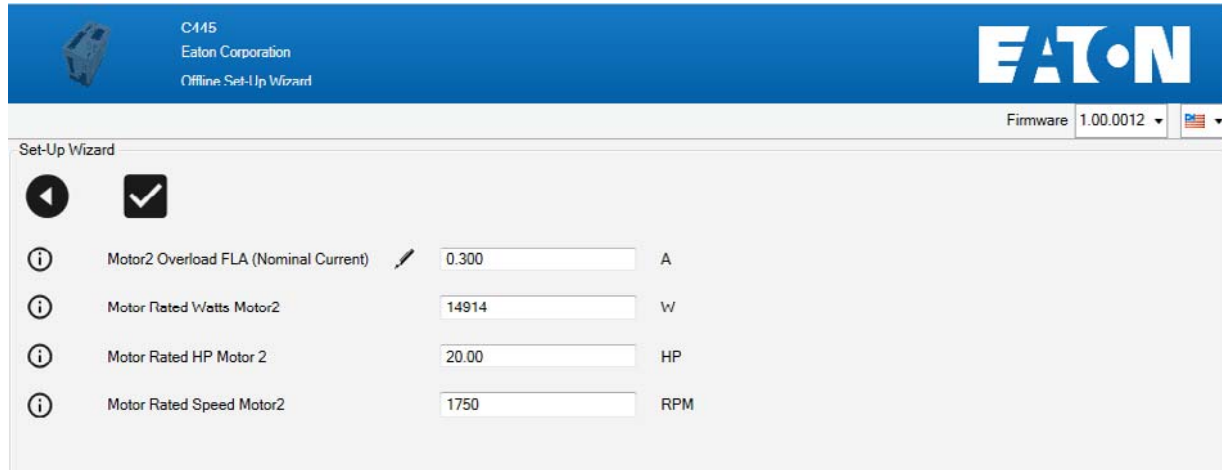
Close

After modifying parameters on page 2 above, select the check mark to save all changes and Exit the wizard.

To go back to page 1, select the left arrow key.

To Exit the Wizard and not save any changes, select the Close button at the bottom right of the screen.

The third page for two motor applications is shown below.



This screen consists of all the Motor 2 parameters.

For additional information on the Power Xpert *inControl* Software Tool including the C445 parameter categories and the many features included in this tool, refer to the User Manual, publication MN040013EN.

Real-Time Clock and Memory Backup Module (RTC Module)

The Real-Time Clock and Memory Backup module is an optional module that plugs into the Base Control Module. It is located under the communication card module.

This board provides non-volatile (NV) application configuration backup memory and clock time management.

Setting the Real Time Clock (RTC)

There are three ways to set the Real Time Clock parameters:

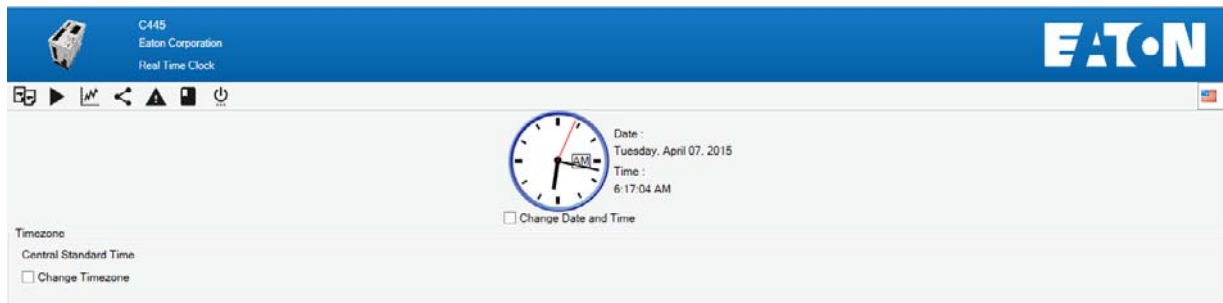
1. The Monitoring User Interface with the following path
PRG → Real Time Clock → Date & Time
2. Using a Modbus or Modbus TCP master and writing to the RTC parameters. Refer to the Modbus register map in **Appendix D**.

The RTC parameters begin with Modbus register 4000. Each individual time/clock parameter can be written to set the RTC, or a single parameter (register 4010) can be written with a value containing the “Real Time clock in Seconds from the UNIX Epoch”. This is a 32 bit value.

3. Using the Power Xpert *inControl* Software Tool and selecting a single button to set all RTC parameters from the RTC parameters on the computer running the software.

This is the most straight forward way to set the RTC. Connect with the C445 via one of the supported protocols and ports and perform the following steps:

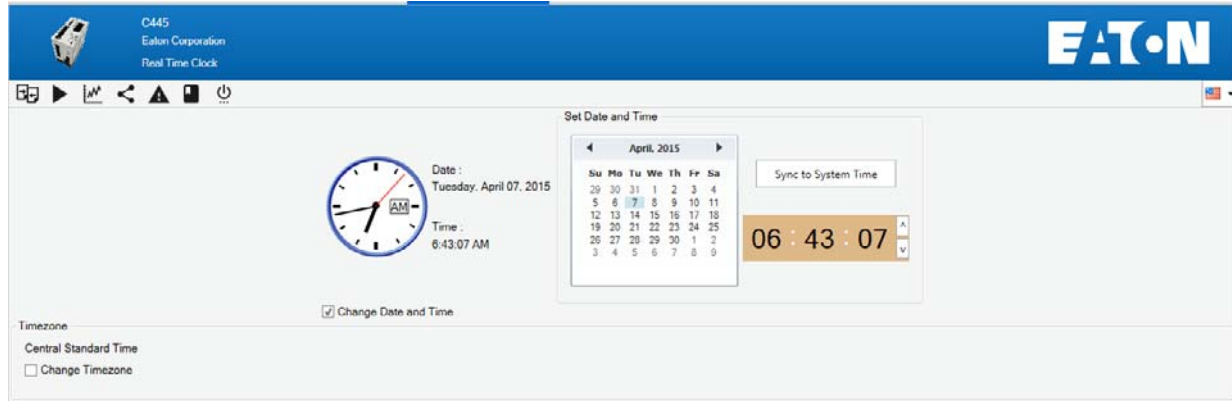
- (1) Once online with the C445, select the Real Time Clock icon as shown below.



The Real Time Clock window will open as below.

4. Select the proper time zone.

- Select the box to the left of “Change Date and Time” below the clock to display all the RTC parameters as shown below.



- Select the “Sync To System Time” button and the RTC values will sync with the RTC on the computer and continue running from that point, keeping the correct time and date. The RTC module chip contains a battery to retain the RTC parameters even when power is turned off to the C445. The memory on-board the RTC module is non-volatile memory and does not use the battery to retain its contents. This will be discussed further below.

Note: Time management in the real time clock module starts using the default values (01/01/2000 00:00:00). If a real time clock board is not present then the date and time will reset to this value every time the C445 powers up. If a RTC module is installed, the time and date will increment continually.

RTC Module—Fault Snapshot

The C445 module saves and time stamps critical application data for the most recent fault, per the figure below.

| Fault Snapshot (Trip Cause) | |
|-----------------------------|----------------------------------|
| Time Base | : Battery Backed Real Time Clock |
| Fault Code | : 28 |
| Fault Description | : Test trip was triggered |
| Fault Time | : 6:35:20 |
| Fault Date | : 2015-4-7 |
| Thermal Memory | : 19 % |
| Current Phase A (L1) | : 1168 A |
| Current Phase B (L2) | : 1143 A |
| Current Phase C (L3) | : 1187 A |
| Voltage AB (L1-L2) | : 234 V |
| Voltage BC (L2-L3) | : 234 V |
| Voltage CA (L3-L1) | : 229 V |
| Line Frequency | : 6003 Hz |
| Ground Current | : 53 A |
| Apparent Power | : 465 VA |
| Real Power | : -94 W |
| Power Factor | : -2036 |
| TroubleShooting | : A test trip has been executed. |

This information may be accessed from the Power Xpert *inControl* Software Tool.

If the Base Control Module includes a real time clock board then time stamping will be in UNIX format (day of week–month–day of month–time HH:MM:SS–time zone–year).

If a real time clock board is not present then time stamping will use the number of seconds that have elapsed since the Base Control Module started up.

RTC Module—Non-Volatile Memory Operation

There are two RTC/Memory Modules. Both have the same part number, but a different Style Number (see below). Prior to 2023, the module contained an 8K non-volatile memory chip. Beginning in 2023, a 64K non-volatile memory chip was added. This was to accommodate an optional logic program in the C445/Base Control Module as well as the configuration parameters. Only the 64K RTC/Memory module is capable of backing up a logic program along with the configuration parameters. These two modules can be identified by the Style Number printed on the label of each as follows:

8K Memory Module Style Number: 3-4108-001A

64K Memory Module Style Number: 3-4108-001B

Note: 64K RTC/Memory Module will only back up a logic program along with configuration parameters if the C445 Base Control Module (BCM) has the following firmware and Style Number:
BCM Firmware version: 3.0 or later and Style Number 3-4104-xxxD.

Below is a description of the operation of the 64K RTC/Memory Module. The 8K RTC/Memory Module operates the same as the 64K, but it cannot store a logic program from the C445/Base Control Module. It can store only the configuration parameters.

One of the main purposes of the RTC module is to simplify the replacement of a C445 Base Control Module if needed. The 64K RTC module stores a copy of the configuration parameters and a logic program if one exists, which can be transferred to a replacement unit with minimal downtime. But, for it to store and transfer the logic program, the Base Control Modules must be of the firmware version noted above.

The memory module functionality in the RTC chip operates as follows:

1. When plugged into a C445/Base Control Module for the first time, the C445 will write its configuration and the logic program if one exists to the non-volatile memory on the RTC module. If the configuration changes or the logic program changes, the changes will immediately be loaded to the memory module. This means that the memory module will always contain the latest configuration and logic program.
2. When plugged into a replacement C445/Base Control Module, the RTC module will download the configuration and a logic program if one exists to that new C445/Base Control Module. Once the download is complete, the new C445/Base Control Module can begin normal operation immediately.
3. Unplugging an RTC module and plugging it back into the same C445/Base Control Module will simply result in resuming normal operation. No download from the memory module to the C445 will take place.
4. The RTC module uses non-volatile memory to store the configuration parameters and a logic program from the host C445/Base Control Module.

Notes:

1. Due to memory space on the 64K RTC/Memory Module, only the executable segment of the logic program will be backed up. This will allow the logic to operate normally in a replacement Base Control Module. But no metadata (tags, text and so on) will be backed up. So, at the earliest convenience, it is recommended that the complete logic program be downloaded to the replaced Base Control Module using the Power Xpert *inControl* Logic Engine software.
2. If a 64K RTC/Memory module is inserted into a Base Control Module (BCM) and it contains a logic program that is different from the logic program already in the BCM, when the BCM is powered, the program in the RTC/Memory Module will be downloaded to the BCM.
3. An RTC/Memory module should only be inserted or removed from a BCM when the BCM is not powered.

Chapter 4—System Configuration and Commissioning

4. Whenever a logic program is downloaded to a BCM with the Power Xpert *inControl* Logic Engine software and a 64K RTC/Memory Module is connected to the BCM, the program downloaded to the BCM will immediately be uploaded to the RTC/Memory Module.
5. Whenever power is applied to a BCM and a 64K RTC/Memory Module is connected and contains a logic program, and the programs in the BCM and memory module are different, the program in the memory module will be downloaded to the BCM.
6. Whenever a logic program is downloaded to a BCM from a 64K RTC/Memory Module, if the program in the BCM was not in Run Mode, the newly downloaded program will also not be put into Run Mode. The C445 User Interface module can be used to put the logic program into Run Mode (PRG / 16. User Logic / 1. Logic Run Control).
7. Whenever a logic program is downloaded to a BCM from a 64K RTC/Memory Module, if the program in the BCM was in Run Mode, it will be stopped during the download process. Then, the newly downloaded program will be put back into Run Mode.
8. Whenever a 64K RTC/Memory Module containing a logic program is inserted into a BCM that does not contain a logic program, the program will be downloaded and put into Run Mode if the program was in the Run Mode when the last backup occurred to the memory module. The download will take place when the BCM is powered with the 'new' memory module having been inserted.
9. The RTC/Memory Module always contains the complete backup of the configuration of the C445. The logic program is also included if this optional logic program exists in the BCM.
10. To clear a program in an RTC/Memory Module, use the Power Xpert *inControl* Logic Engine software to download a blank program to the BCM, which will then be uploaded to the RTC/Memory Module.

SNTP (Simple Network Time Protocol)

This is a feature that was added to the C445s with Base Control Modules (BCM) with firmware version 3.0 or later and Style Number 3-4104-xxxD.

1. The C445 Ethernet module with firmware version 2.0 or later must be present.
2. An optional RTC/Memory Module is inserted into the BCM. Part number C445X0-RTC. Both the 8K and the 64K versions of this module will work with this feature. Style numbers 3-4108-001A and 3-4108-001B.
3. The SNTP feature, when enabled will keep the date/time in the C445 updated even if a C445X0-RTC module is not present.

This feature needs to be enabled to access an SNTP server in order to keep the date/time data in the C445 updated.

To enable this feature. Select "Enable" as shown below. The SNTP server address shown below should work for any application, provided the C445 is connected to the internet and has external access. These SNTP server addresses can be changed to any valid SNTP server IP Address.

The following is a screen shot from the Web Pages in the C445, under the Program / Real Time Clock category. To access the Web Pages, refer to the New Web Pages section in **Chapter 4**.

SNTP Time Sync

Local Time
Thu Apr 27 2023 13:15:33

SNTP Operation Enable
Enable Enable ▾

SNTP Update Time
86400000 mSec 86400000 mSec

SNTP Retry Time
3000 mSec 3000 mSec

SNTP server 1
151.110.232.100 IP 151.110.232.100 IP

SNTP server 2
151.110.232.100 IP 151.110.232.100 IP

SNTP server 3
151.110.232.100 IP 151.110.232.100 IP

RTC Power Interrupted
Power continuous

Notes:

1. Once enabled, by default it will sync with the SNTP server at power up and every 24 hours.
2. The sync time is configurable from 3 seconds to 24 hours (3000 ms to 86,400,000 ms).
3. There is a configurable Retry Time for cases when the SNTP server is not responding.
4. If SNTP is Enabled, it takes precedent over setting the RTC manually or syncing it with a computer. SNTP will overwrite the RTC settings when enabled, at the next update time or power up.
5. The Green Circle around the SNTP Server IP address above indicates an active SNTP connection with that SNTP Server.
6. If SNTP is Disabled, the RTC setting may be set manually (from the Monitoring User Interface or the Power Xpert inControl software) or synced to a connected computer. A C445X0-RTC module is required if SNTP is disabled, or the date/time data will reset each time the C445 is power cycled.
7. The SNTP feature will function with or without a C445X0-RTC module installed in the C445.

Parameter Lock Features

The C445 supports various protection feature options for writing to its parameters, including:

1. Administrator password Lock
2. USB lockout password
3. Running Lock option

Note: The Administrator password and Running Lock option also applies to the Web Pages if an Ethernet Card is installed. The Web Pages also allow for a separate password to be set to prevent access to the parameters from the Web Pages.

Administrator Password Lock

The Admin password protection prevents anyone who has not logged into the system with the proper password from modifying any configuration parameters. All parameters may be read, but not written.

Out-of-box, there is no active Administrator password protection.

The Administrator password is a 32-bit value that can be set as a Hex, ASCII or decimal value that fits in 32-bits. Whatever format is used to set the password will need to be used when entering the password as well, to be sure it is correct. For example, if the password is set by writing an ASCII value of 1234 and later someone tries to unlock it with a decimal or hexadecimal value of 1234, it will not work.

The Modbus register addresses that store the 32-bit Administrator password are 5000/5001. The Modbus register addresses that must be written to when logging in to a system with an Administrator password set are 5002/5003.

Reading the value at register 5010 will indicate if an Administrator password is set in the device or not. If a value of 1 is read, this indicates that an Administrator password is active. A value of 0 indicates that an Administrator password is not currently active.

When 5000 and 5001 each contain hexadecimal zeros (0x0000), this means no password is set. This is also what must be written to these registers to clear a password. The only way to write to these registers if there is a password set is to first log in. Then once logged in, hexadecimal 0s can be written to these register to clear the password. A “Reset to Factory Defaults” also clears/resets the password. Since this can be accomplished using the button on the Base Control Module, a C445 with an unknown password can be recovered in this manner, but will need to be reconfigured. All parameters will have been set to factory defaults, not just the Admin password.

The Admin password can also be set using the Power Xpert *inControl* Software Tool, under the Security category. Parameters that are locked in Admin mode are indicated in

Appendix D Modbus Register Map

USB Lockout Password

The USB lockout password protection prevents anyone who has not logged into the system using a USB port from modifying any configuration parameters. Parameters may be read, but not written.

Out-of-box, there is no active USB Lockout password protection.

The USB lockout password is a 32-bit value that can be set as a Hex, ASCII or decimal value that fits in 32-bits. Whatever format is used to set the password will need to be used when entering the password as well, to be sure it is correct. For example, if the password is set by writing an ASCII value of 1234 and later someone tries to unlock it with a decimal or hexadecimal value of 1234, it will not work.

The Modbus register addresses that store the 32-bit USB password are 5004/5005. The Modbus register addresses that must be written to when logging in to a system with a USB password set are 5006/5007.

Reading the value at Modbus register 5011 will indicate if a USB password is set in the device or not. If a value of 1 is read, this indicates that a USB password is active. A value of 0 indicates that a USB password is not currently active.

When 5004 and 5005 each contain hexadecimal zeros (0x0000), this means no password is set. This is also what must be written to these registers to clear a password. The only way to write to these registers if there is a password set is to first log in. Then once logged in, hexadecimal 0s can be written to these register to clear the password. A “Reset to Factory Defaults” also clears/resets the password. Since this can be accomplished using the button on the Base Control Module, a C445 with an unknown password can be recovered in this manner, but will need to be reconfigured. All parameters will have been set to factory defaults, not just the password. Parameters that are locked in USB Lockout are indicated in **Appendix D** Modbus Register Map.

Running Lock Option

The Running Lock Option is not a password but is an option that can be enabled or disabled. When enabled, configuration parameters are “Read_Only” when the motor is either running or being instructed to run.

Out-of-box, this option is enabled.

To disable this running lock feature and allow configuration parameters to be adjusted during motor run time, set Modbus register 5008 to a value of 1. To enable this protection feature and restrict access to modify or write to configuration parameters during motor run time, reset this value to 0.

Reading the value at Modbus register 5009 will indicate whether this feature is enabled (locked) or not. If the value read from Modbus register 5009 is 1, this protection feature is currently enabled (locked). When this feature is enabled, all configuration parameters are read-only when the motor is running or being instructed to run.

This protection applies to the Power Xpert *inControl* Software Tool as well. If this protection is enabled, configuration parameters cannot be modified using this software while the motor is running or being instructed to run. Parameters that are locked with the Running Lock option are indicated in **Appendix D** Modbus Register Map.

Web Pages Password Protection

Only Super-User has the ability to change the User Names and Passwords for the various levels. The web page provides five levels of authorization.

| Level | Default User Name | Default Password | Description |
|------------|-------------------|------------------|--|
| Open | <none> | <none> | Open access, has no password. Allows opening web page to be viewed, but no additional information is available |
| Read_Only | readonly | readonly | Read_Only access allows parameters to be viewed, but no control or configuration |
| Control | control | control | Control provides capabilities of Read_Only plus allows motor and discrete outputs to be turned on and off |
| Config | configuration | configuration | Config provides capabilities of Control plus the ability to set configuration values |
| Super_User | superuser | superuser | Super_User provides the capabilities of Config plus the ability to change user names and passwords |

The following is a step by step process demonstrating how to set passwords for the Web Pages.

1. After opening the Web Pages, select user name/password:

- Dashboard
- All Parameters
- Access Levels
- Username/Passwords
- User Group Setup
- Groups
 - Monitor
 - Voltage
 - Current
 - Power
 - System
 - Motor Configuration
 - Wiring Configuration
 - Operation Mode
 - Faults and Events
 - Protections General
 - Protections Current
 - Protections Voltage
 - Protections Power
 - Protections Frequency
 - Protections Ground Fault
 - Real Time Clock
 - Modbus
 - Ethernet
 - Base Control Module
 - User Interface
 - Measurement Module
 - Option Card
 - Input/Power Board
 - Security
 - USER ASM1
 - USER ASM2
 - USER ASM3
 - USER ASM4
 - USER ASM5
 - USER ASM6
 - USER ASM7
 - USER ASM8
 - USER ASM9
 - USER ASM10

SET USER NAME AND PASSWORD

Enter User Name

Enter Password

Repeat Password

| Description | Access Level | Action |
|---|---------------|--|
| Type the user name and password in the above input boxes, and click the proper button on the right. You have to be a SUPER USER , or the password waiver level has to be set at SUPER USER (99) . | READ ONLY | <input type="button" value="Set User/Passwd"/> |
| | CONTROL | <input type="button" value="Set User/Passwd"/> |
| | CONFIGURATION | <input type="button" value="Set User/Passwd"/> |
| | SUPER USER | <input type="button" value="Set User/Passwd"/> |
| User name should only contain 0-9, a-z, A-Z and underscore. | | |
| Password should only contain printable ASCII characters, excluding white spaces and tabs | | |

STATUS

Description for parameter 8636 loaded

2. Enter a user name and password for each level.

SET USER NAME AND PASSWORD

| | |
|-----------------|---|
| Enter User Name | <input type="text" value="readonly"/> |
| Enter Password | <input type="password" value="••••••••"/> |
| Repeat Password | <input type="password" value="••••••••"/> |

| Description | Access Level | Action |
|---|----------------------|--|
| Type the user name and password in the above input boxes, and click the proper button on the right. You have to be a SUPER USER , or the password waiver level has to be set at SUPER USER (99) . | READ ONLY | <input type="button" value="Set User/Passwd"/> |
| User name should only contain 0~9, a~z, A~Z and underscore. | CONTROL | <input type="button" value="Set User/Passwd"/> |
| Password should only contain printable ASCII characters, excluding white spaces and tabs | CONFIGURATION | <input type="button" value="Set User/Passwd"/> |
| | SUPER USER | <input type="button" value="Set User/Passwd"/> |

STATUS


- After entering the username & password, select the Set User/Password button for each level. A successful status message will be displayed per the following:

SET USER NAME AND PASSWORD

Enter User Name

Enter Password

Repeat Password

Click Here 

| Description | Access Level | Action |
|---|---------------|--|
| Type the user name and password in the above input boxes, and click the proper button on the right. You have to be a SUPER USER , or the password waiver level has to be set at SUPER USER (99) . | READ ONLY | <input type="button" value="Set User/Passwd"/> |
| User name should only contain 0~9, a~z, A~Z and underscore. | CONTROL | <input type="button" value="Set User/Passwd"/> |
| Password should only contain printable ASCII characters, excluding white spaces and tabs | CONFIGURATION | <input type="button" value="Set User/Passwd"/> |
| | SUPER USER | <input type="button" value="Set User/Passwd"/> |

STATUS

Successfully changed username/password to READ ONLY

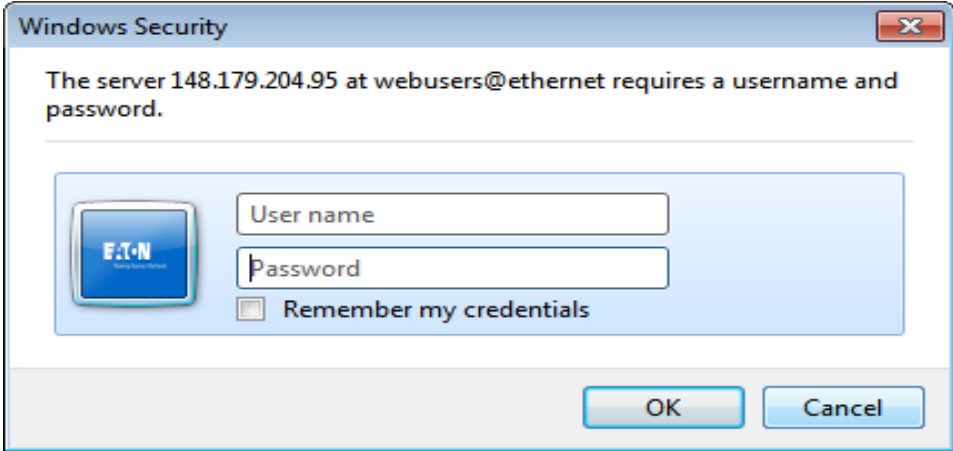
- 4. Select an access level to change the access level to something other than Super-User.

The screenshot shows the Eaton web interface. On the left is a navigation menu with categories like Dashboard, All Parameters, Access Levels, Username/Passwords, and User Group Setup. The main content area has two sections:

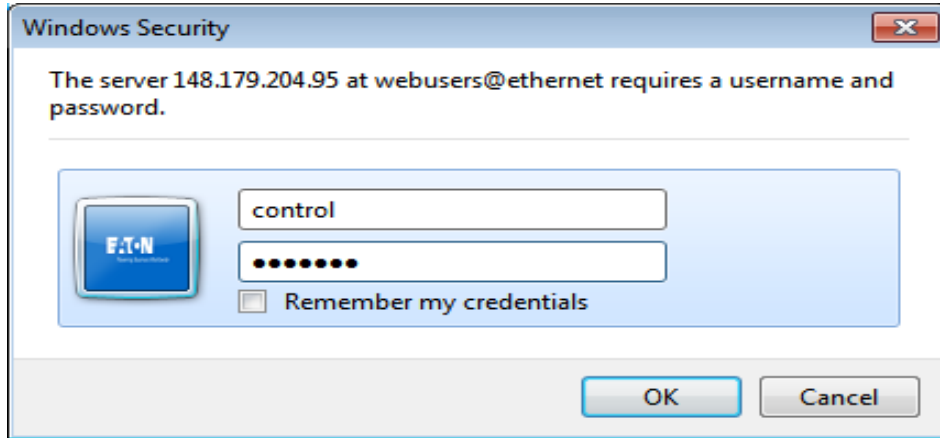
- CHANGE TO A DIFFERENT ACCESS LEVEL WITH USER NAME AND PASSWORD**: A table with two columns: Description and Action. It lists four options: READ ONLY, CONTROL, CONFIGURATION, and SUPER USER, each with a 'Change' button.
- CHANGE TO A DIFFERENT PASSWORD WAIVER LEVEL**: A section with a description and a 'Change' button next to an input box.

STATUS

- 5. Select the Control Level then the Change Button and enter a User Name and Password when prompted.



- Enter the username and password set for Control access level.



- The following message will be displayed if successful.

CHANGE TO A DIFFERENT ACCESS LEVEL WITH USER NAME AND PASSWORD

| Description | Action |
|--|---------------------------------------|
| Click button to change to READ ONLY level, type in user name and password when prompted | <input type="button" value="Change"/> |
| Click button to change to CONTROL level, type in user name and password when prompted | <input type="button" value="Change"/> |
| Click button to change to CONFIGURATION level, type in user name and password when prompted | <input type="button" value="Change"/> |
| Click button to change to SUPER USER level, type in user name and password when prompted | <input type="button" value="Change"/> |

CHANGE TO A DIFFERENT PASSWORD WAIVER LEVEL

Click button to set the Password Waiver Level to the value in the input box
 This level or below does not need password,
7 for **READ ONLY**,
15 for **CONTROL**,
31 for **CONFIGURATION**,
99 for **SUPER USER**,
Setting to 0 requires password for all levels

STATUS

Successfully changed access level to **CONTROL**

- Repeat this process to change the User Name and Password for other access levels.

Note: User Names and Passwords are case sensitive and must be 6-16 characters in length.

Cyber Security

C445s with a Base Control Module (BCM) with firmware version 3.0 or later (Style number 3-4104-xxxD) supports cyber security via disabled Ethernet protocols by default and optional password complexity levels for accessing the C445 via the Web Pages. These password complexity password levels are:

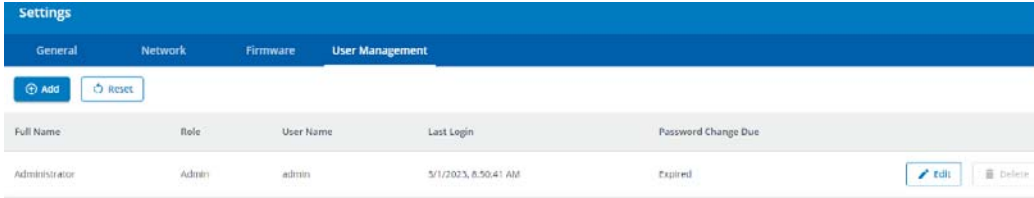
- Password complexity level – 0
 - It should be at least 6 characters long
 - It should not match with user name or full name
 - It should not match with existing password
- Password complexity level – 1
 - It should be at least 8 characters long
 - It should not match with user name or full name
 - It should not match with existing password
 - It should contain at least 1 alphabetic and 1 numeric character
- Password complexity level – 2
 - It should be at least 12 characters long
 - It should not match with user name or full name
 - It should not match with existing password
 - It should contain at least 1 alphabetic and 1 numeric character
 - It should contain at least 1 special character
 - It should contain at least 1 upper case alphabetic character
- Password complexity level – 3
 - It should be at least 16 characters long
 - It should not match with user name or full name
 - It should not match with existing password
 - It should contain at least 2 alphabetic characters and 1 numeric character
 - It should contain at least 2 special characters
 - It should contain at least 1 upper case alphabetic character
 - It should contain at least 1 lower case alphabetic character

–

Password complexity level 2 is the default. To change the password complexity level, the password and other related parameters, open the web pages (see below) and select Settings, then User Management. All options can be modified by selecting the Edit button.

Web Pages – User Management

The C445 Web Pages contain a User Management section where user accounts are managed. Per below, access the User Management section in the Settings category under User Management.



At least one user account must be available with an admin role. The platform has one admin account by default, with a default username and password of:

Username: admin

Password: Admin*1

Note: See the “New Web Pages” section in Chapter 4 for more information on logging into the web pages, changing passwords and more.

REST protocol has 4 role levels with privileges as Admin, Engineer, Operator and Viewer, per the table below.

| Role Level | Role | Description |
|------------|----------|---|
| 1 | Admin | Administrator having All Privileges |
| 2 | Engineer | Engineer Role having Product Configuration Privileges |
| 3 | Operator | Operator Role having Product Control Privileges |
| 4 | Viewer | Viewer Role having Read-Only Access |

A maximum of 6 Users can be added with any of the 4 roles assigned to each.

It is recommended that the default password complexity level of 2 be used, or a level of 3 for each User.

It is also recommended that a Password Timeout in days be assigned to each User. A value of 0 for the timeout represents never.

Use the Add button on the User Management page to add a user. Once added, any user profile can be edited by selecting the Edit button for it. A User is removed by selecting the Delete button for that User entry.

Below is an example of the screen that is displayed when the Add button or the Edit button is selected. This screen shows a John Smith as a User Role of Engineer with a password complexity level of 2 and a Password Timeout of 7 days.

John Smith ✕

Full Name *
John Smith

User Name *
jsmith

Device Secured

Password Complexity
2 ▼

Password Timeout Days *
7

Current Logged-In Password *

New Password *

Confirm Password *

User Role
Engineer ▼

Cancel Save

Ethernet Protocols

C445s with a Base Control Module (BCM) with firmware version 3.0 or later (Style number 3-4104-xxxD) include an added layer of protection.

If an Ethernet module is present (part number C445XC-E), the Modbus TCP and Ethernet/IP protocols are disabled by default. To enable either of these protocols or both of them, the Web Pages can be used as well as the User Interface, per below:

The Web Pages: Login to the C445 using the Web Pages (see the “New Web Pages” section in Chapter 4). Then access the “Program” category on the left, followed by “Communications” on the row above. Then scroll down to the “Protocol Enable/Disable” section.

The User Interface: PRG / 9. Communications / 2. Ethernet / 10. Protocol Enable/Disable.

This must be done before using either of these protocols in the application.

Note: When entering the web pages for the first time, enter the default username and password below:

Username: admin

Password: Admin*1

You will then be prompted to change the default password. Once you have done this, you will need to login again with the new password.

Note: Access to the C445 via its micro USB ports (on the user interface and the BCM) and the optional RS485 port are not affected. They are always enabled. But, the USB ports can be optionally password protected as can access to configuration parameters via the user interface. This is discussed earlier in this chapter.

Chapter 5—System Configuration and Operation

Control Sources

Types

The C445 can be operated from either a Local or a Remote control source. There are four options for the Local Control Source:

- Auto detect User Interface
- No Local Control
- User Interface Control
- Fieldwire Control

Auto detect User Interface—By default the local control source is set to the “Auto detect User Interface” selection. In this selection, if a User Interface with control buttons is connected, the User Interface will be the Local Control Source.

User Interface Control—User Interface will be the Local Control Source. If a Status only User Interface without control buttons is connected or if no User Interface is connected at all, the system will remain inhibited.

Fieldwire Control—The Fieldwire will act as the Local Control Source. **Page 79** displays the wiring options for all modes.

There are four options for the remote control source:

- No remote control source
- Fieldbus
- Fieldwire
- Logic Engine

No remote control source—Remote Control is not allowed under any condition.

Fieldbus—Fieldbus will be the Remote Control source if the Active Control Source is Remote.

Fieldwire—Fieldwire will be the remote control source if the Active Control Source is Remote. This selection cannot be used if the Fieldwire is already selected as a local control source. Three-wire control is an option in most cases. Wiring options for all modes are shown later in this chapter.

Active Control Source

The C445 system can have only one active control source at any given point of time. At power up, the control source is determined by the local/remote power up mode setting, which can be set to either remote control, local control or hold last control state. By default the setting is set to hold last control state and out of the box local control will be source of control. The current active control source can be determined by reading the active control source parameter.

Switching Between Local and Remote

Local to Remote

When the active control source is local, the following actions will change the active control source to Remote control:

1. Pressing the AUTO button on the User Interface if User Interface is the local control.
2. Setting the REMOTE input on the Fieldwire if the Fieldwire is used as the local control.
3. Setting the Local Control Source to No local Control and the Remote Control Source is not set to No remote control source.

After switching to Remote control, the Remote control source is determined by the Remote Control Source parameter.

Remote to Local

When the active control source is remote, the following actions will change the active control source to Local control:

1. Pressing any button on the User Interface except the AUTO and the Reset button.
2. Clearing the REMOTE input on the Fieldwire if the Fieldwire is used as the local control.

After switching to Local control, the Local control source is determined by the Local Control Source parameter.

Note: The Remote Control source can optionally be configured to control the mode. Refer to **Appendix C** for more information.

Pre-Defined Operation Modes

There are 12 selectable Operation modes for the C445. This section describes the modes in detail. Selecting one of these modes will determine the behavior of the relay's inputs and outputs.

Active Operation Mode

The Active Operation Mode parameter is used to select the active mode. Any change to this parameter will require a soft reset or power cycle before the new mode takes effect. The following modes are supported:

- Overload Only
- Direct (FVNR)
- Reverser (FVR)
- Star/Delta
- Two Speed Two Winding
- Two Speed Dahlander
- Auto Transformer
- Solenoid Valve
- MCCB Actuation
- Contactor Feeder
- General Purpose Input/Output
- Stand Alone Ground Fault Module

Note: All Operation Modes require, as a minimum, a Base Control Module and a Measurement Module except "General Purpose Input/Output" and "Stand Alone Ground Fault Module". In the General Purpose I/O mode, only a Base Control Module is required. In Stand Alone Ground Fault Module mode, a Base Control Module and a Ground Fault Module are required.

2-Wire and 3-Wire Control Fieldwiring

The diagrams shown below for each operation mode show the default 2-wire control. Users can also choose to select 3-wire control, which will change how the input behavior is defined if fieldwire is used as a local or remote control source.

2-Wire: In 2-wire control, Input 1 is dedicated to accept a run signal. The user is free to define their start stop logic as required to send a run command to Input 1. It is common to use a hand/off/auto switch to provide a maintained signal to Input 1.

3-Wire: In 3-wire control, there is a dedicated start input and a dedicated permissive (stop) input. If no signal is present at the permissive input, the system will not be allowed to run. If the permissive signal is removed while running, it will stop. If the permissive signal is present and a signal is sent to the start input, it will act as a run command. The start input can be a maintained or momentary.

The 3-wire inputs are:

For Run1 only modes (all except Reverser and 2-Speed modes): Input 1 is Start and Input 2 is permissive (stop).

For Run1/Run2 modes (Reverser and 2-Speed): 3-Wire control is only allowed if fieldwire is the remote control source. Inputs 1 and 2 are Start (Fwd/Rev and Fast/Slow) and Input 3 is Permissive.

Three-Phase Power Wiring

The three-phase wires to the C445 for voltage and current must be in phase for the power (watts) reading to be correct. Whatever phase is routed through the L1 CT, that same phase MUST be wired to the V1 input. Same for L2 CT and V2; L3 CT and V3.

Overload Only Operation Mode

Description

The Overload only mode uses the Motor 1 parameters for all control/protections.

C445 outputs:

- Output 1 is used as the fault contact. It is a normally open contact.
- Outputs 2 and 3 are general purpose outputs

At power up, the C445 Motor Management relay closes Output 1, provided the C445 is in the “Ready” state (no faults or inhibits active). This normally open fault contact provides fail-safe operation in case power is lost.

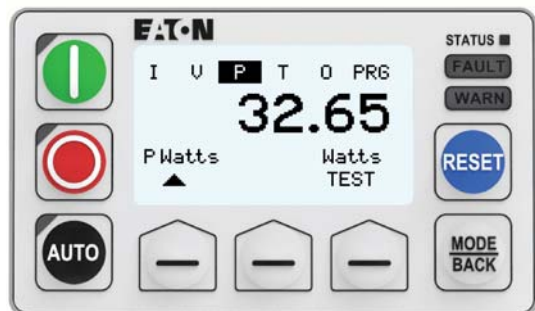
Outputs 2 and 3 are user configurable outputs that may be used to indicate a Fault, Trip, Motor or Warning status as well as general purpose outputs controlled by the fieldbus master.

The Overload Only Operation mode does not control the contactor/motor, but it does protect it. Per the output wiring diagrams shown later in this section, a control source must be used in series with the normally open fault contact for control.

The only control allowed for this Operation Mode from any of the three potential sources, User Interface, Fieldbus or Fieldwire is to Reset a Fault or Test Trip the unit.

Recommended User Interface Options for the Overload Only Operation Mode

Figure 60. C445UM: Monitoring User Interface



The Monitoring User Interface can be used with any operation mode. In Overload Only, the start and stop buttons will be disabled. If a user presses a control button, the screen will notify them that the functionality is not enabled. The reset button will still function but can be disabled if desired in User Interface Settings. Monitoring, Navigation, and Parameter settings are all available. Test Trip is also available in PRG → Service.

Control Settings

The following parameters are used to configure the Overload Only Operation Mode and the C445 sources of control.

Table 12. Overload Only Configuration Parameters

| Configuration Parameter | Modbus Register | Description | Read/Write |
|---|-----------------|---|------------|
| Active Operation Mode ^① | 700 | This parameter selects the Operation Mode | R/W |
| Motor#1 Overload FLA Scaled | 900 | This parameter is used to set the motor nameplate full load amps for the overload | R/W |
| Motor Overload Trip FLA | 500 | This parameter contains the active overload FLA | R |
| Trip Enable Bit Field | 1000–1001 | Trip (Fault) protection enable bits Set bits to enable desired motor protections | R/W |
| Warn Enable Bit Field | 1002–1003 | Warning protection enable bits Set bits to enable desired motor protections warnings | R/W |
| C445 Local Source Selector ^① | 711 | Select the Local Control source. | R/W |
| C445 Remote Source Selector | 712 | Select the Remote Control source. | R/W |
| C445 O2 Output function select ^① | 716 | Output 2 user function selection | R/W |
| C445 O3 Output function select ^① | 717 | Output 3 user function selection | R/W |

Note

^① Soft reset (power cycle) required for changes to these parameters to take effect.

Fieldbus Control Word

The Overload Only profile will accept the following control commands over a fieldbus network.

Control Bits

- Bit 3 0 = No action
1 = Reset fault (will clear fault provided condition has cleared)
- Bit 5 0 = No action
1 = The C445 will issue a “Test Trip” fault causing the Output 1 control relay to open

Control Status Word

The control status word of the Overload Only profile can be accessed over the fieldbus network.

Status Bits

- Bit 0 0 = Stopped (No current detected)
1 = Running1 (Current flow detected)
- Bit 2 0 = local control source active
1 = remote control source is active
- Bit 3 0 = no fault present
1 = C445 fault present
- Bit 4 0 = no warning present
1 = C445 warning present
- Bit 5 0 = no inhibit present
1 = C445 control inhibit present
- Bit 6 0 = C445 not ready (fault and/or inhibit present)
1 = C445 ready for control (No fault or inhibit present)
- Bit 7 0 = motor is not up to speed (AtRef)
1 = C445 has detected motor is up to speed (AtRef)

Motor status is determined by current readings obtained from the measurement module. The overload profile will signal the motor is running when the START threshold exceeds 30%. Then, when the current drops below 5%, which is the STOP threshold, the C445 will transition to stop.

Two conditions will then set the AtRef bit, signaling the motor is up to speed.

- If motor current first exceeds 115% of the active overload FLA rating and then decreases back below 115% of the active overload FLA rating, it is determined the motor has come up to speed and the AtRef bit will be set.
- If motor current exceeds 30% of the active overload FLA rating and remains until after the start delay time expires the motor is determined to be up to speed and the AtRef bit will be set.

Wiring Diagrams for the Overload Only Operation Mode

Figure 61. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power

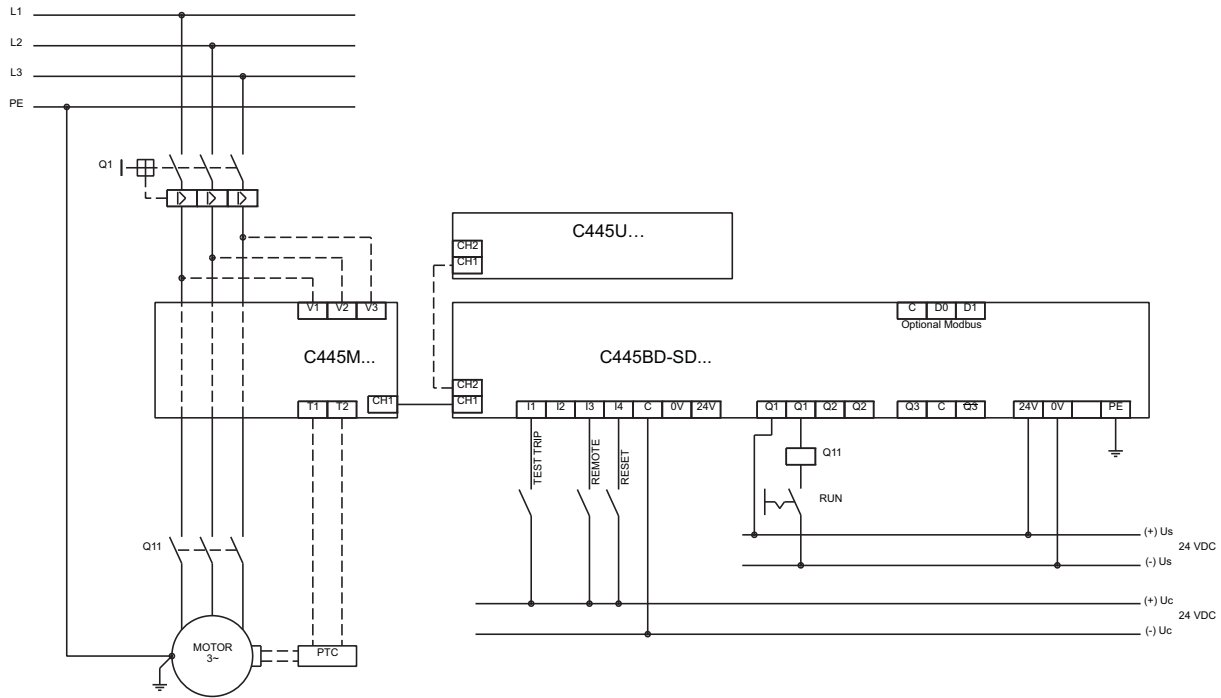


Figure 62. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power

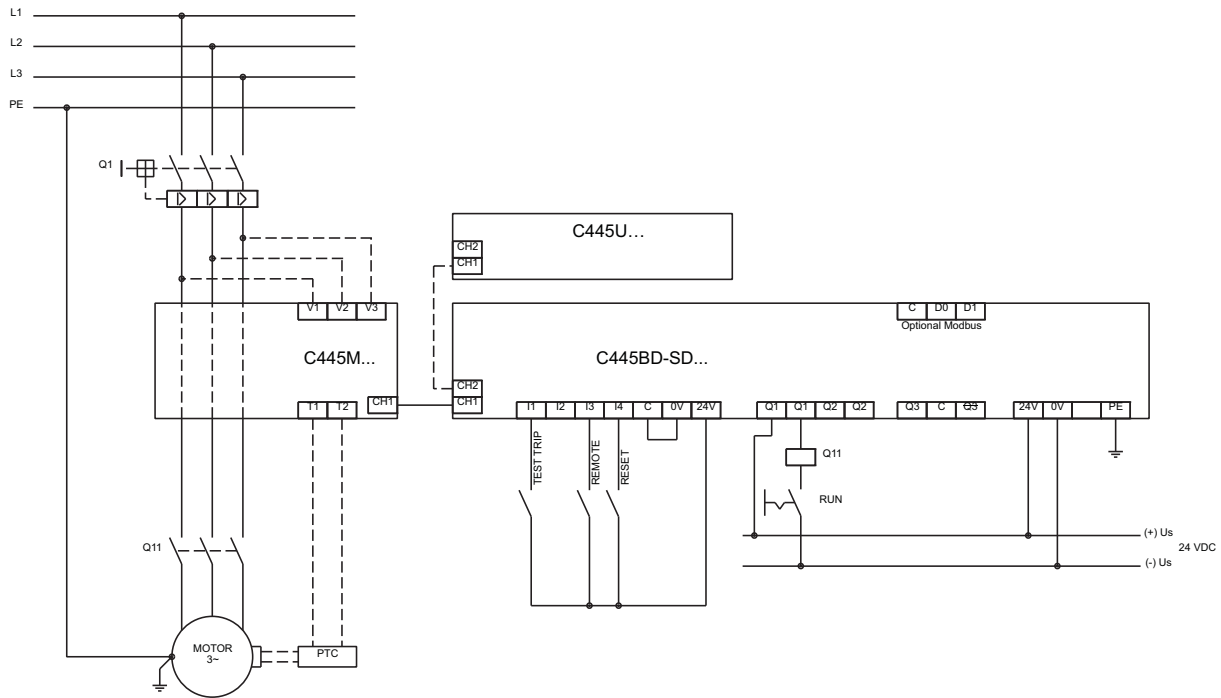
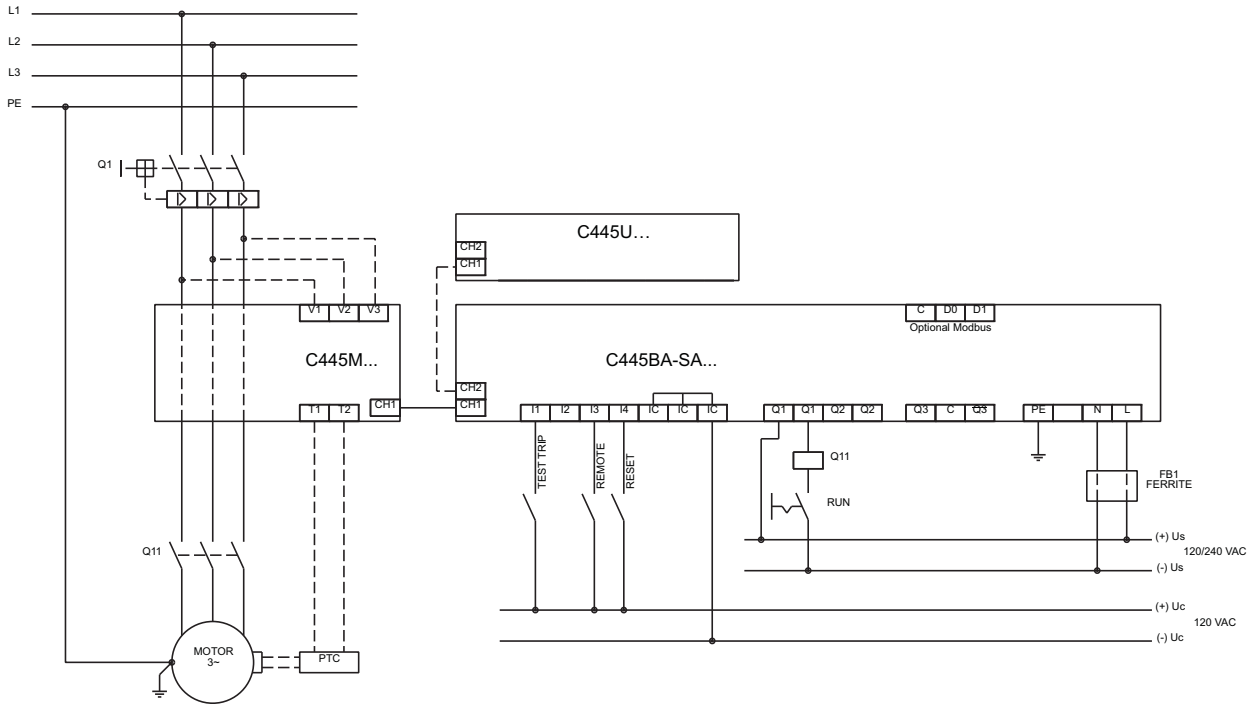


Figure 63. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power



Notes:

1. The inputs on the Base Control Module are only used by this Operation Mode if Fieldwire is selected for one of the control sources. If Fieldwire is not the Local or Remote control source, all 4 inputs may be used as general purpose inputs.
2. Input 2 and Outputs 2 and 3 may be used as general purpose I/O for this operation mode.
3. If Fieldwire is the Local control source, Input 3 is the Remote input. When power is applied to Input 3, the C445 will be in Remote mode.
4. If Fieldwire is the Remote control source and 2-wire control (default) is selected, Input 3 is unused by this operation mode.
5. Fusing: Although C445 product listings do not require fusing on the high impedance line voltage measurement inputs, it may be necessary to provide overcurrent protection of the supply leads in accordance with applicable final installation specific local, state and national electrical codes.

Direct Operation Mode

Description

Direct Motor starter is the default profile. The Direct Motor starter profile will use the motor1 parameters for all control/ protections.

C445 outputs:

- Output 1 is dedicated by this application mode for controlling and protecting the motor
- Outputs 2 and 3 are general purpose

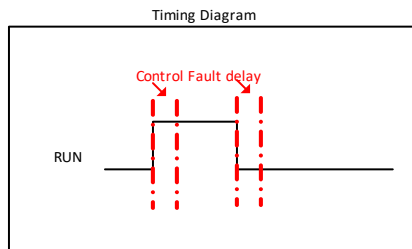
Output 1 controls and protects the contactor/motor. It will close when a valid RUN command is received by the C445, provided a fault or inhibit is not active and will open on a STOP command or if a trip occurs. A C445 Trip condition will cause the Output contact to open.

Outputs 2 and 3 are user configurable outputs and their function can be selected by the user.

The C445 will issue a control fault when:

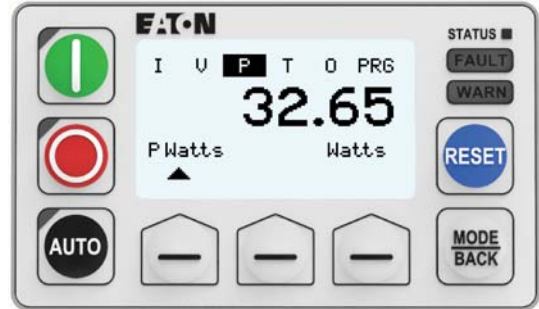
- Run command is active and phase voltage is present with no phase current detected after delay expires
- Stop command active and current detected after delay expires

Figure 64. Timing Diagram for the Direct Mode Operation



Recommended User Interface Options for the Direct Operation Mode

Figure 65. C445UM: Monitoring User Interface



The Monitoring User Interface can be used with any operation mode. If selected as a local control source, the User Interface Start and Stop buttons are enabled in Direct Mode. Users may optionally disable local start or reset functionality if desired.

C445UM may still be used in Direct Mode if the User Interface is not the local control source. Start, Stop and Auto buttons will be disabled. If pressed, the screen will notify the user that this functionality is not enabled. Control Status LEDs indicating running, stopped and Auto status will still function.

Control Settings

The following parameters are used to configure the Direct Operation Mode and the C445 sources of control.

Table 13. Direct Configuration Parameters

| Configuration Parameter | Modbus Register | Description | Read/Write |
|---|-----------------|---|------------|
| Active Operation Mode ^① | 700 | This parameter selects the Operation Mode | R/W |
| Control Fault Delay | 701 | Delay time before a control fault is issued. A setting of “0” disables this protection. | R/W |
| Motor#1 Overload FLA Scaled | 900 | This parameter is used to set the motor nameplate full load amps for the overload | R/W |
| Motor Overload Trip FLA | 500 | This parameter contains the active overload FLA | R |
| Trip Enable Bit Field | 1000-1001 | Trip (Fault) protection enable bits Set bits to enable desired motor protections | R/W |
| Warn Enable Bit Field | 1002-1003 | Warning protection enable bits Set bits to enable desired motor protections warnings | R/W |
| C445 Local Source Selector ^① | 711 | Select the Local Control source. | R/W |
| C445 Remote Source Selector | 712 | Select the Remote Control source. | R/W |
| C445 O2 Output function select ^① | 716 | Output 2 user function selection | R/W |
| C445 O3 Output function select ^① | 717 | Output 3 user function selection | R/W |

Note

^① Soft reset (power cycle) required for changes to these parameters to take effect.

Fieldbus Control Word

The direct motor starter profile will accept the following control commands over a fieldbus network.

Control Bits

- Bit 0 0 = Stop command, de-activate all control outputs
1 = Run1 command, activate Output 1
- Bit 2 This bit can be used to switch between Local and Remote from the network when the Allow Remote Control Switch parameter is enabled.
- Bit 3 0 = No action
1 = Reset fault (will clear fault provided condition has cleared)
- Bit 5 0 = No action
1 = The C445 will issue a “Test Trip” fault causing the Output 1 control relay to open

- Bit 4 0 = no warning present
1 = C445 warning present
- Bit 5 0 = no inhibit present
1 = C445 control inhibit present
- Bit 6 0 = C445 not ready (fault and/or inhibit present)
1 = C445 ready for control (No fault or inhibit present)
- Bit 7 0 = motor is not up to speed (AtRef)
1 = C445 has detected motor is up to speed (AtRef)

Motor status is determined by current readings obtained from the measurement module. The overload profile will signal the motor is running when the START threshold exceeds 30%. Then, when the current drops below 5%, which is the STOP threshold, the C445 will transition to stop.

Two conditions will then set the AtRef bit, signaling the motor is up to speed.

- If motor current first exceeds 115% of the active overload FLA rating and then decreases back below 115% of the active overload FLA rating, it is determined the motor has come up to speed and the AtRef bit will be set.
- If motor current exceeds 30% of the active overload FLA rating and remains until after the start delay time expires the motor is determined to be up to speed and the AtRef bit will be set.

Control Status Word

The control status word of the direct motor starter profile can be accessed over the fieldbus network.

Status Bits

- Bit 0 0 = Stopped (No active Run1 command)
1 = Running1 (Run1 command is present)
- Bit 2 0 = local control source active
1 = remote control source is active
- Bit 3 0 = no fault present
1 = C445 fault present

Wiring Diagrams for the Direct Operation Mode

Figure 66. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power

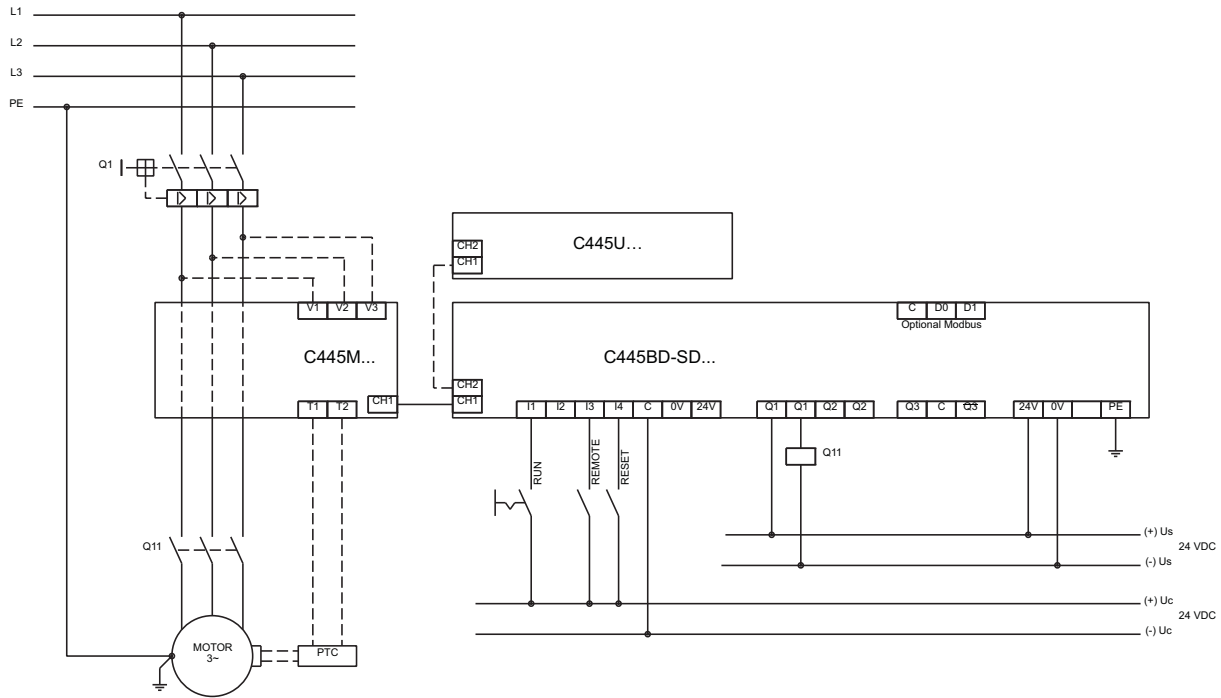


Figure 67. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power

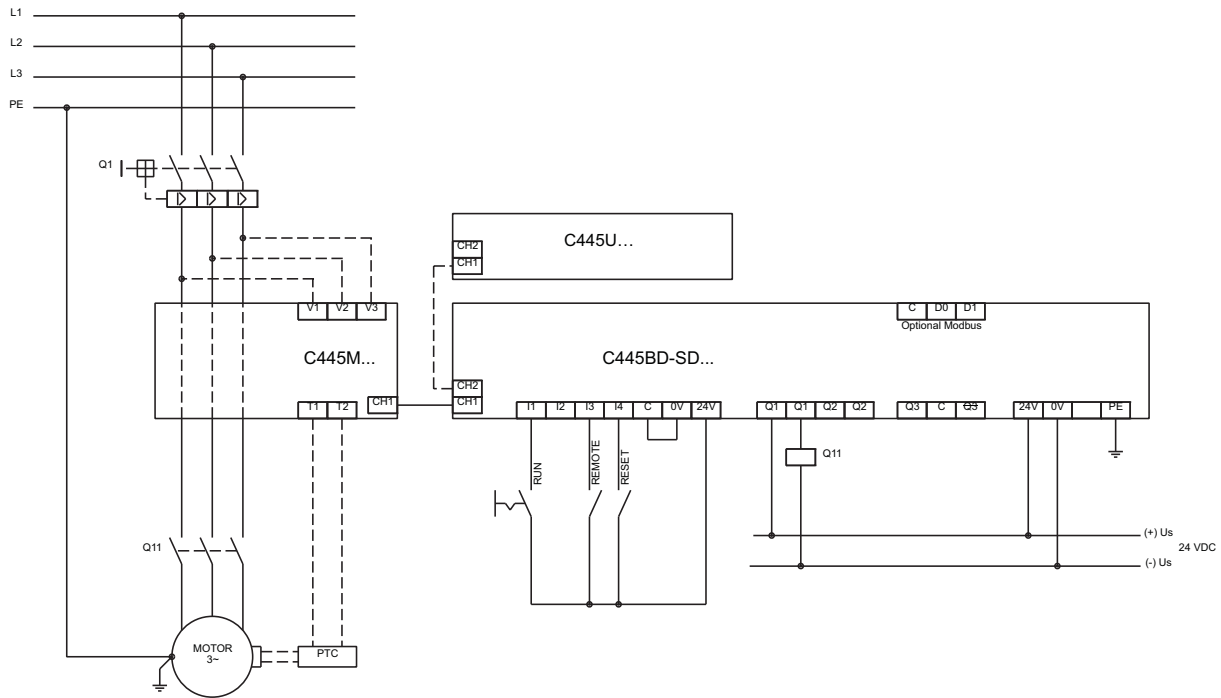
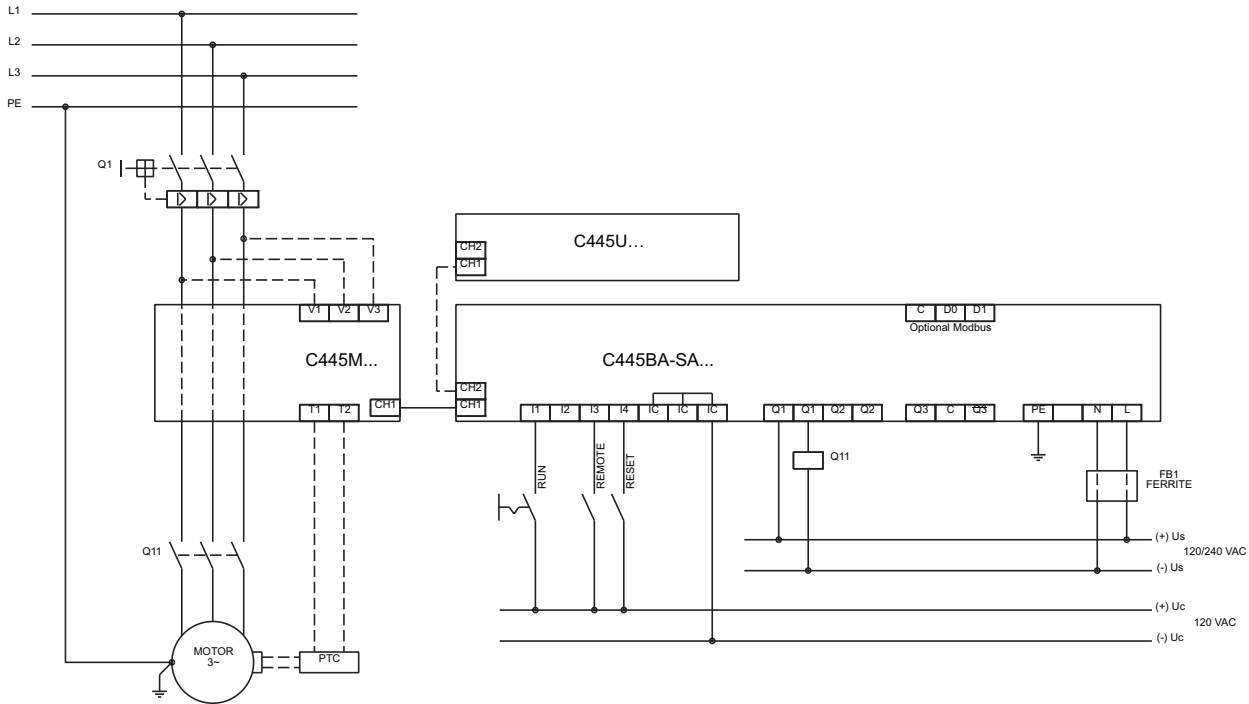


Figure 68. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power



Notes:

1. The inputs on the Base Control Module are only used by this Operation Mode if Fieldwire is selected for one of the control sources. If Fieldwire is not the Local or Remote control source, all 4 inputs may be used as general purpose inputs.
2. Outputs 2 and 3 may be used as general purpose outputs for this Operation Mode.
3. If Fieldwire is the Local control source, Input 3 is the Remote input. When power is applied to Input 3, the C445 will be in Remote mode.
4. If Fieldwire is the Remote control source and 2-wire control (default) is selected, Inputs 2 and 3 are unused by this operation mode.
5. If 3-wire control is selected along with Fieldwire for either control source, Input 2 is Permissive.
6. Fusing: Although C445 product listings do not require fusing on the high impedance line voltage measurement inputs, it may be necessary to provide overcurrent protection of the supply leads in accordance with applicable final installation specific local, state and national electrical codes.

Reverser Operation Mode

Description

The Reverser starter profile will use the motor1 parameters for all control/protections.

C445 outputs:

- Output 1 is configured as the FWD relay output
- Output 2 is configured as the REV relay output
- Output 3 is general purpose

Output 1 controls the FORWARD contactor. Output 1 will close when a valid FWD(RUN1) command is received and there is no active fault or inhibit.

It will open on a STOP command or if a trip occurs.

Output 2 controls the REVERSE contactor. Output 2 will close anytime a valid REV(RUN2) command is received and there is no active fault or inhibit. It will open on a STOP command or if a trip occurs.

A C445 trip will cause Outputs 1 and 2 to open effectively dropping out the reverser.

Output 3 is a user configurable output whose function can be changed by the user.

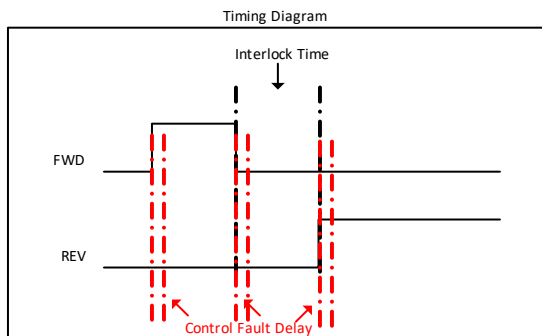
A transition from FWD to REV or REV to FWD must first go through STOP unless the Control Interlocking Time parameter is set to a value of 0. If the value of this parameter is greater than 0, the control will transition to Stop for that delay time before transitioning to the new direction. The Control Interlocking Time parameter can be found in the Operation mode category in the Power Xpert *inControl* Software Tool.

The C445 will issue a control fault when:

- RunFwd or RunRev command is active and phase voltage is present with no phase current detected after delay expires
- Stop command active and current detected after delay expires

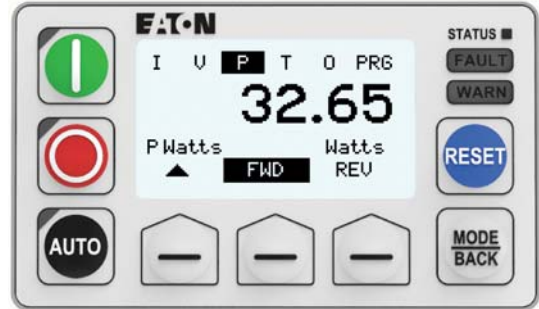
Note: Even with the control fault disabled, the C445 will NOT transition to a new direction until current readings decrease to zero.

Figure 69. Timing Diagram for the Reverse Operation Mode



Recommended User Interface Options for the Reverser Operation Mode

Figure 70. C445UM: Monitoring User Interface



The Monitoring User Interface can be used with any operation mode. If selected as a local control source, the User Interface Start and Stop buttons are enabled in Reverser Mode. The screen provides selection and indication of Fwd/Rev. Use the soft keys to select Fwd or Rev before pressing the Start button. When running, the highlighted selection indicates direction. Users may optionally disable local start or reset functionality if desired.

C445UM may still be used in Reverser if the User Interface is not the local control source. Start, Stop and Auto buttons will be disabled. If pressed, the screen will notify the user that this functionality is not enabled. Control Status LEDs indicating running, stopped and Auto status will still function.

Control Settings

The following parameters are used to configure the Reverser Operation Mode and the C445 sources of control.

Table 14. Reverser Configuration Parameters

| Configuration Parameter | Modbus Register | Description | Read/Write |
|---|-----------------|---|------------|
| Active Operation Mode ^① | 700 | This parameter selects the Operation Mode | R/W |
| Control Fault Delay | 701 | Delay time before a control fault is issued. A setting of "0" disables protection. | R/W |
| Control Interlock Time Delay | 702 | Time delay before change of direction allowed | R/W |
| Motor#1 Overload FLA Scaled | 900 | This parameter is used to set the motor nameplate full load amps for the overload | R/W |
| Motor Overload Trip FLA | 500 | This parameter contains the active overload FLA | R |
| Trip Enable Bit Field | 1000-1001 | Trip (Fault) protection enable bits Set bits to enable desired motor protections | R/W |
| Warn Enable Bit Field | 1002-1003 | Warning protection enable bits Set bits to enable desired motor protections warnings | R/W |
| C445 Local Source Selector ^① | 711 | Select the Local Control source. | R/W |
| C445 Remote Source Selector | 712 | Select the Remote Control source. | R/W |
| C445 Q3 Output function select ^① | 717 | Output 3 user function selection | R/W |

Note

^① Soft reset (power cycle) required for changes to these parameters to take effect.

Fieldbus Control Word

The reverser motor starter profile will accept the following control commands over a fieldbus network.

Control Bits

- Bit 0/1 00 = Stop command, de-activate all control outputs
01 = Run FWD command, activate Output 1
10 = Run REV command, activate Output 2
11 = Unknown command, No action
- Bit 2 This bit can be used to switch between Local and Remote from the network when the Allow Remote Control Switch parameter is enabled.
- Bit 3 0 = No action
1 = Reset fault (will clear fault provided condition has cleared)
- Bit 5 0 = No action
1 = The C445 will issue a "Test Trip" fault causing the Output 1 & Output 2 control relays to open.

Control Status Word

The control status word of the reverser motor starter profile can be accessed over the fieldbus network.

Status Bits

- Bit 0/1 00 = Stopped (No active Run commands)
01 = Running1 (Run FWD command is active)
10 = Running2 (Run REV command is active)
- Bit 2 0 = local control source active
1 = remote control source is active
- Bit 3 0 = no fault present
1 = C445 fault present
- Bit 4 0 = no warning present
1 = C445 warning present
- Bit 5 0 = no inhibit present
1 = C445 control inhibit present
- Bit 6 0 = C445 not ready (fault and/or inhibit present)
1 = C445 ready for control (No fault or inhibit present)
- Bit 7 0 = motor is not up to speed (AtRef)
1 = C445 has detected motor is up to speed (AtRef)

Two conditions will set the AtRef bit, signaling the motor is up to speed.

- If motor current first exceeds 115% of the active overload FLA rating and then decreases back below 115% of the active overload FLA rating, it is determined the motor has come up to speed and the AtRef bit will be set.
- If motor current exceeds 30% of the active overload FLA rating and remains until after the start delay time expires the motor is determined to be up to speed and the AtRef bit will be set.

Wiring Diagrams for the Reverse Operation Mode

Figure 71. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power

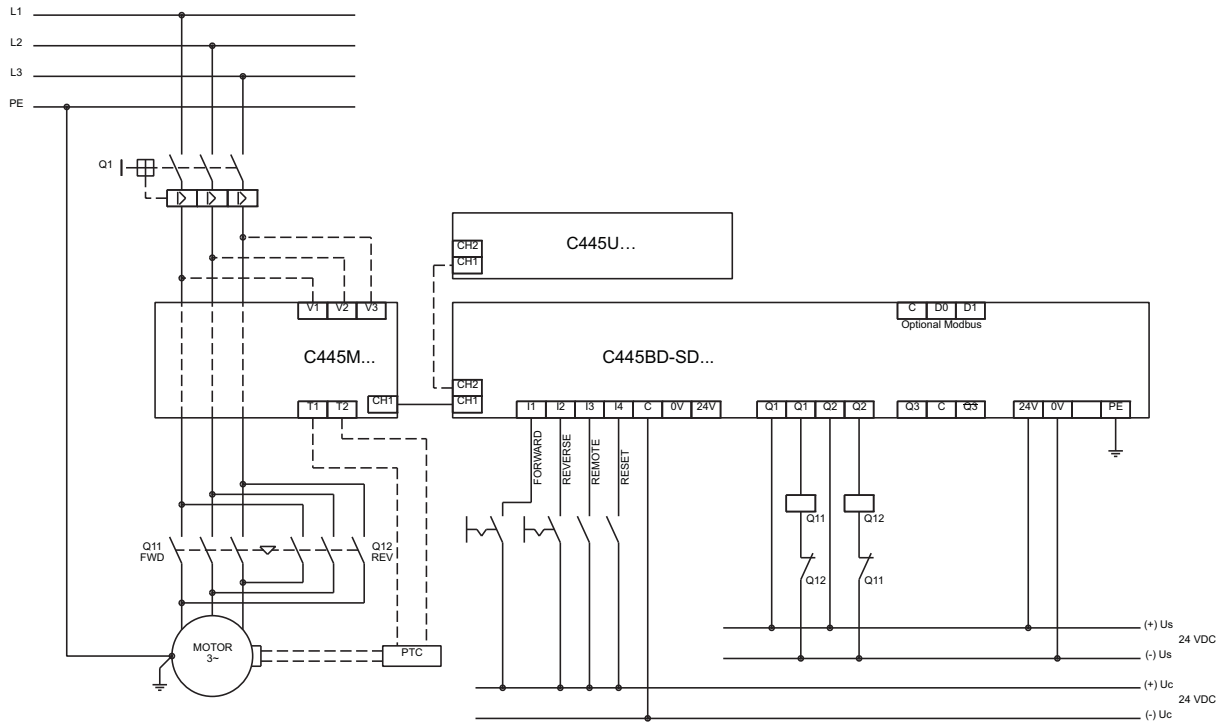


Figure 72. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power

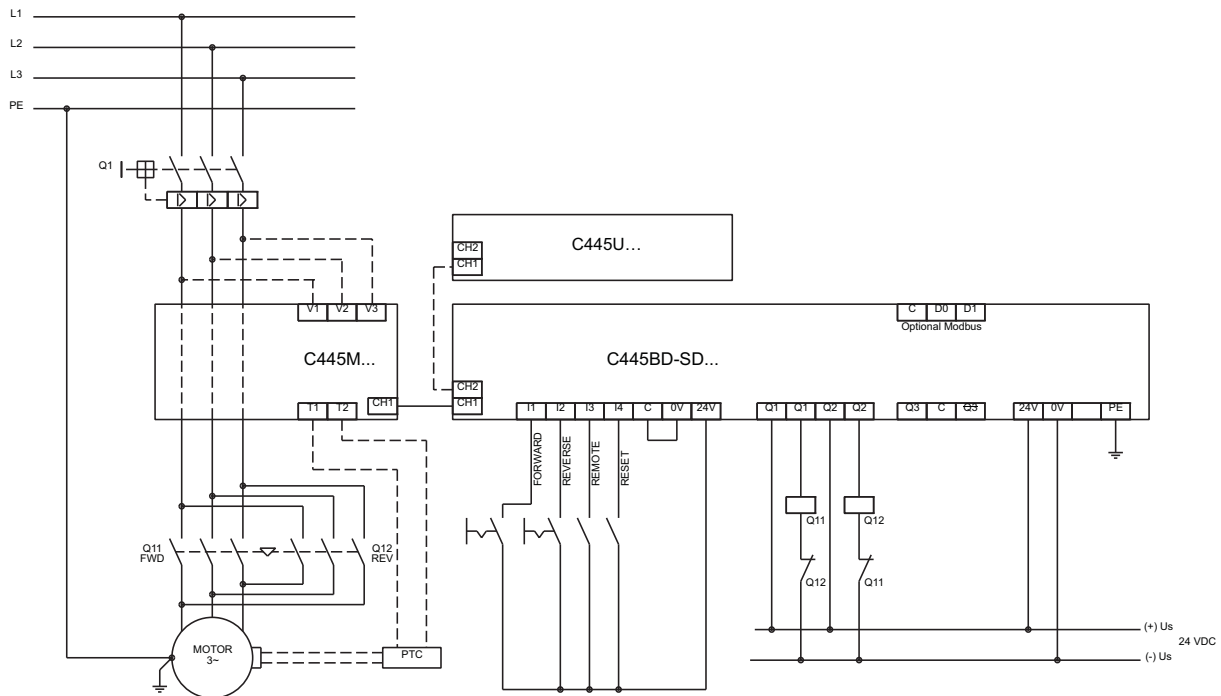
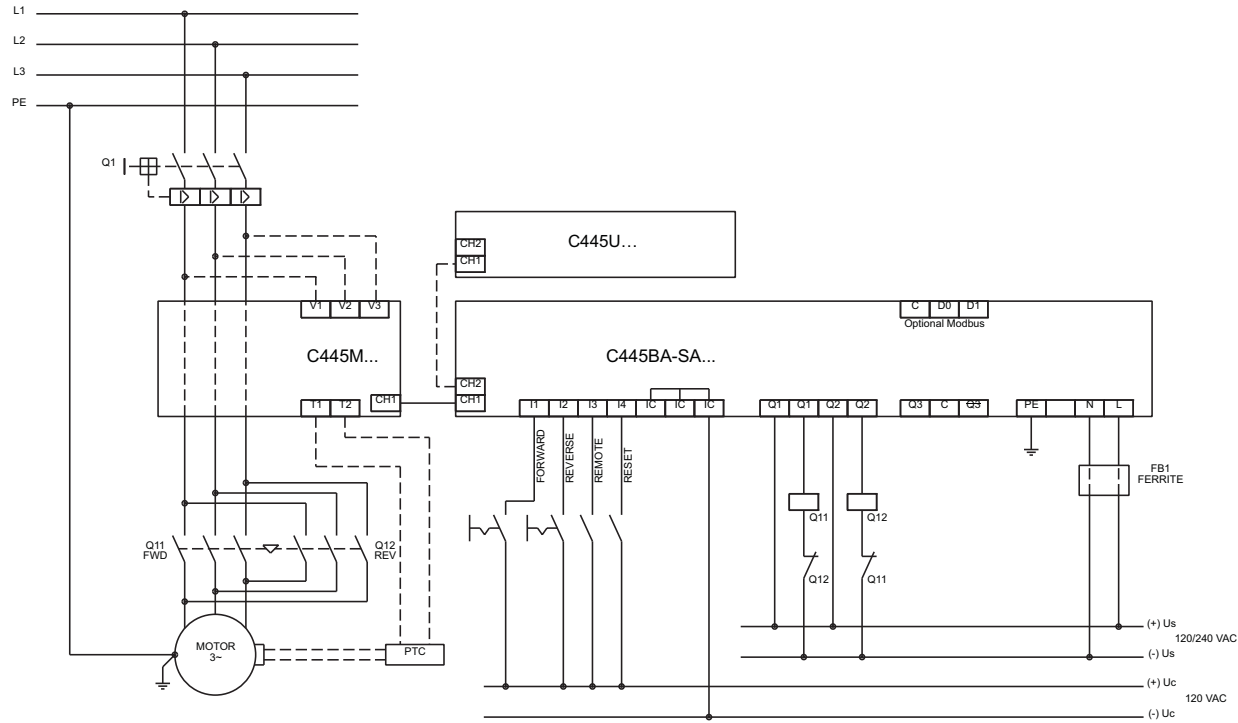


Figure 73. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power



Notes:

1. The inputs on the Base Control Module are only used by this Operation Mode if Fieldwire is selected for one of the control sources. If Fieldwire is not the Local or Remote control source, all 4 inputs may be used as general purpose inputs.
2. Output 3 may be used as a general purpose output for this Operation Mode.
3. If Fieldwire is the Local control source, Input 3 is the Remote input and 3-wire control is not allowed for this operation mode. When power is applied to Input 3, the C445 will be in Remote mode.
4. If Fieldwire is the Remote control source, 3-wire control is allowed and Input 3 is the Permissive Input.
5. Fusing: Although C445 product listings do not require fusing on the high impedance line voltage measurement inputs, it may be necessary to provide overcurrent protection of the supply leads in accordance with applicable final installation specific local, state and national electrical codes.

Star/Delta Operation Mode

Description

The Star/Delta starter control provides the logic to control a Star/Delta connected motor.

C445 outputs:

- Q1 output – star/delta motor starter LINE coil (NO)
- Q2 output – star/delta motor starter DELTA coil (NO)
- Q3 output – star/delta motor starter STAR coil (NO)

A STOP command deactivates all contactor controls effectively dropping out the motor.

A START command activates the STAR contactor control then activates the LINE contactor control after the Network Contactor Delay expires initiating a start in the STAR winding configuration. This parameter can be found in the Operation Mode category in the Power Xpert *inControl* Software Tool.

Switching to Delta: The control will switch to delta when the control detects the motor is up to speed or when the Maximum Star Winding Time expires. The STAR contactor control will first be deactivated. The DELTA contactor control will then be activated after the net delay time expires and current readings = 0. The Maximum Star Winding Time parameter can be found in the Operation Mode category in the Power Xpert *inControl* Software Tool.

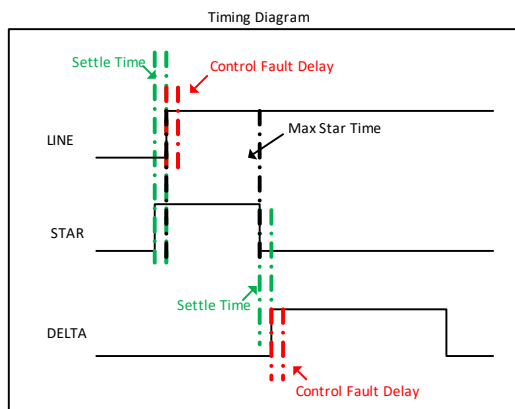
The control will set MOTOR1 as the active motor parameters when starting in the star configuration and will set MOTOR2 as the active motor parameters when running in the delta configuration.

The C445 will issue a control fault when:

- Run command is active and phase voltage is present with no phase current detected after delay expires
- Stop command active and current detected after delay expires

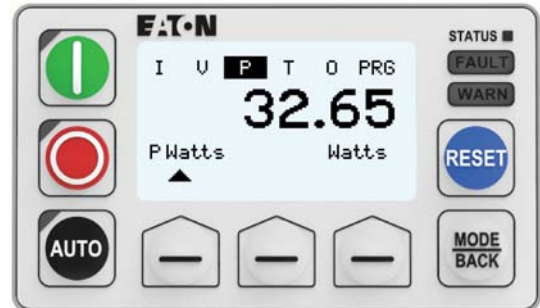
Note: Even with the control fault disabled, the C445 will NOT transition to the delta winding until current readings in star decrease to zero.

Figure 74. Timing Diagram for the Star/Delta Operation Mode



Recommended User Interface Options for the Star/Delta Operation Mode

Figure 75. C445UM: Monitoring User Interface



The Monitoring User Interface can be used with any operation mode. If selected as a local control source, the User Interface Start and Stop buttons are enabled in Star/Delta. Users may optionally disable local start or reset functionality if desired.

C445UM may still be used in Star/Delta if the User Interface is not the local control source. Start, Stop and Auto buttons will be disabled. If pressed, the screen will notify the user that this functionality is not enabled. Control Status LEDs indicating running, stopped and Auto status will still function.

Control Settings

The following parameters are used to configure the Star/Delta Operation Mode and the C445 sources of control.

Table 15. Star/Delta Configuration Parameters

| Configuration Parameter | Modbus Register | Description | Read/Write |
|---|-----------------|---|------------|
| Active Operation Mode ^① | 700 | This parameter selects the Operation Mode | R/W |
| Control Fault Delay | 701 | Delay time before a control fault is issued. A setting of "0" disables this protection. | R/W |
| Network Contactor Settle Time | 704 | Settle delay time before 2 nd contactor is activated – ensures the first contactor is sealed in before applying the line | R/W |
| Maximum Star Winding Time | 705 | Maximum time the control will stay on the star winding before transitioning to the delta winding in 100ms | R/W |
| Motor#1 Overload FLA Scaled | 900 | This parameter is to set the overload full load amp rating when on the star winding | R/W |
| Motor#2 Overload FLA Scaled | 901 | This parameter is to set the overload full load amp rating when on the delta winding | R/W |
| Motor Overload Trip FLA | 500 | This parameter contains the active motor overload FLA (will contain the motor1 setting when on the star winding and the motor2 setting when on the delta winding) | R |
| Trip Enable Bit Field | 1000-1001 | Trip (Fault) protection enable bits Set bits to enable desired motor protections | R/W |
| Warn Enable Bit Field | 1002-1003 | Warning protection enable bits Set bits to enable desired motor protections warnings | R/W |
| C445 Local Source Selector ^① | 711 | Select the Local Control source. | R/W |
| C445 Remote Source Selector | 712 | Select the Remote Control source. | R/W |

Note

^① Soft reset (power cycle) required for changes to these parameters to take effect.

Fieldbus Control Word

The star/delta motor starter profile will accept the following control commands over a fieldbus network.

Control Bits

- Bit 0 0 = Stop command, de-activate all control outputs
1 = Run1 command, begin start sequence
- Bit 2 This bit can be used to switch between Local and Remote from the network when the Allow Remote Control Switch parameter is enabled.
- Bit 3 0 = No action
1 = Reset fault (will clear fault provided condition has cleared)
- Bit 5 0 = No action
1 = The C445 will issue a "Test Trip" fault causing the Outputs 1-3 control relays to open

- Bit 3 0 = no fault present
1 = C445 fault present
- Bit 4 0 = no warning present
1 = C445 warning present
- Bit 5 0 = no inhibit present
1 = C445 control inhibit present
- Bit 6 0 = C445 not ready (fault and/or inhibit present)
1 = C445 ready for control (No fault or inhibit present)
- Bit 7 0 = motor is not up to speed (AtRef)
1 = C445 has detected motor is up to speed on delta winding (AtRef)

Two conditions will set the AtRef bit, signaling the motor is up to speed.

- After transitioning to the delta winding, if motor current increases above 115% of the active overload FLA rating and then decreases back below 115% of the active overload FLA rating, it is determined the motor has come up to speed and the AtRef bit will be set.
- After transitioning to the delta winding, if motor current exceeds 30% of the active overload FLA rating and remains until after the start delay time expires the motor is determined to be up to speed and the AtRef bit will be set.

Control Status Word

The control status word of the direct motor starter profile can be accessed over the fieldbus network.

Status Bits

- Bit 0 0 = Stopped (No active Run1 command)
1 = Running1 (Run1 command is present)
- Bit 2 0 = local control source active
1 = remote control source is active

Wiring Diagrams for the Star/Delta Operation Mode

Figure 76. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power

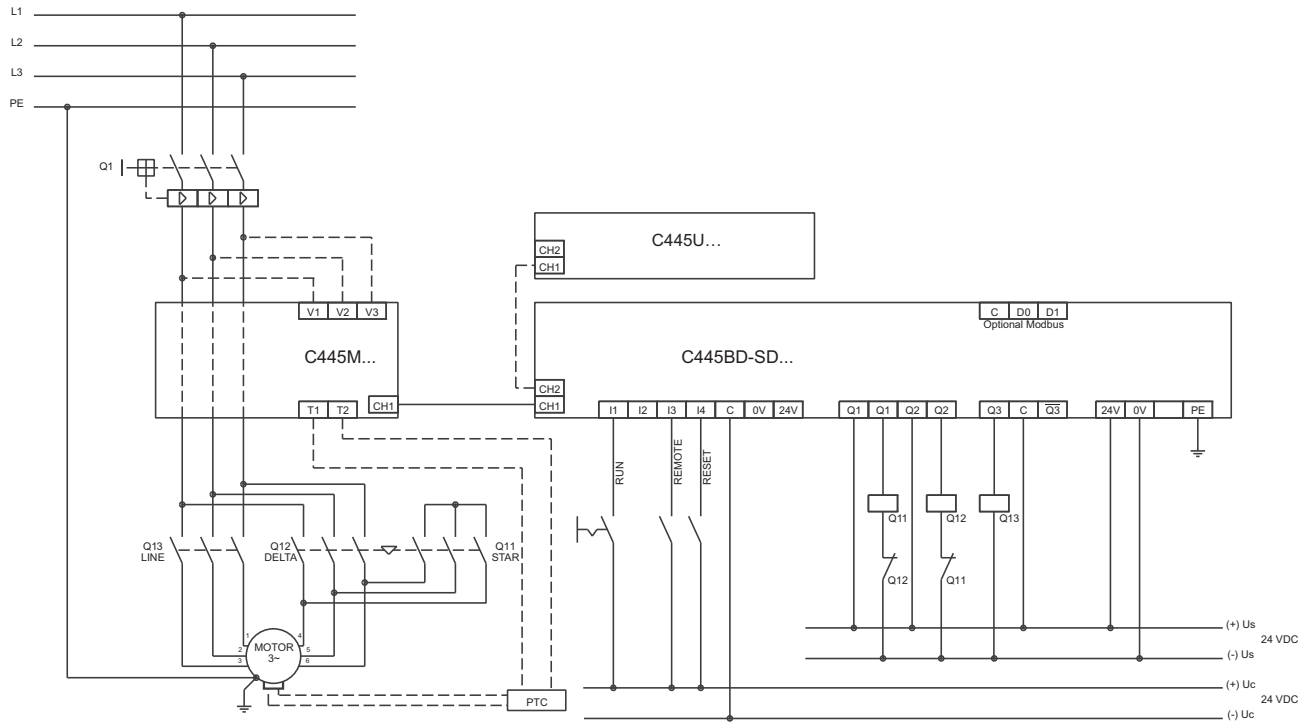


Figure 77. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power

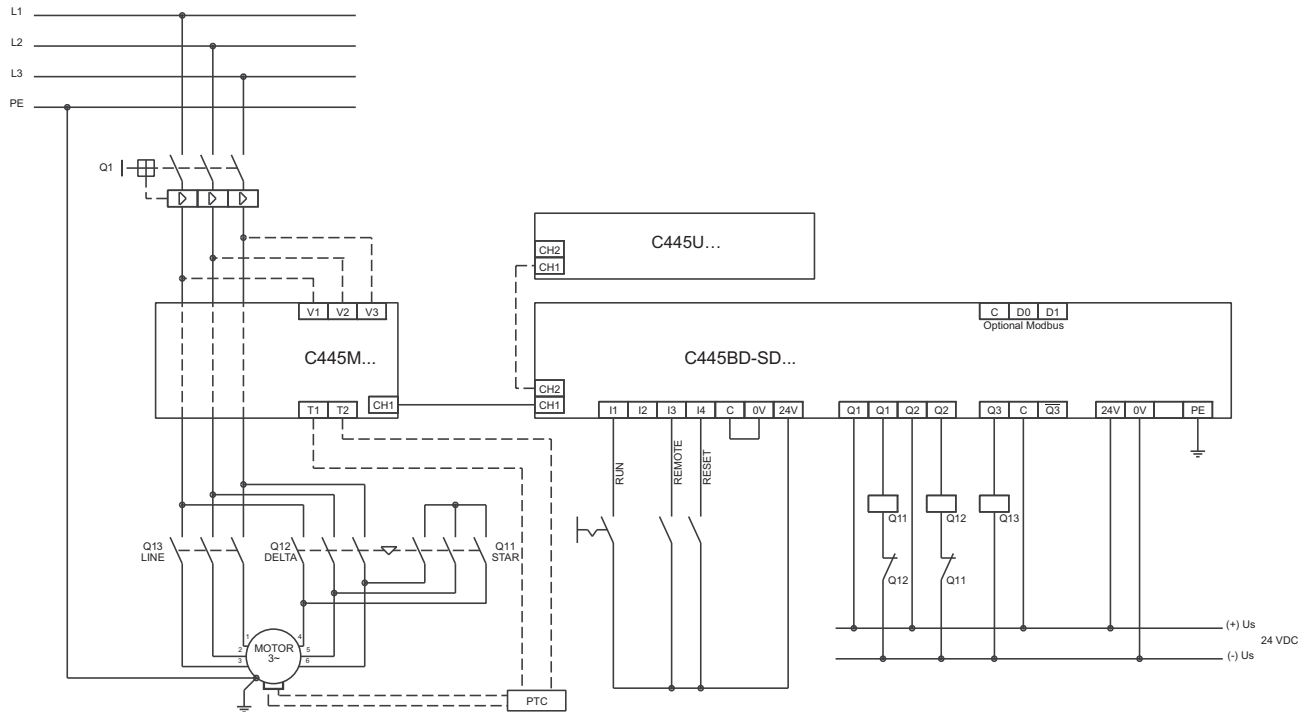
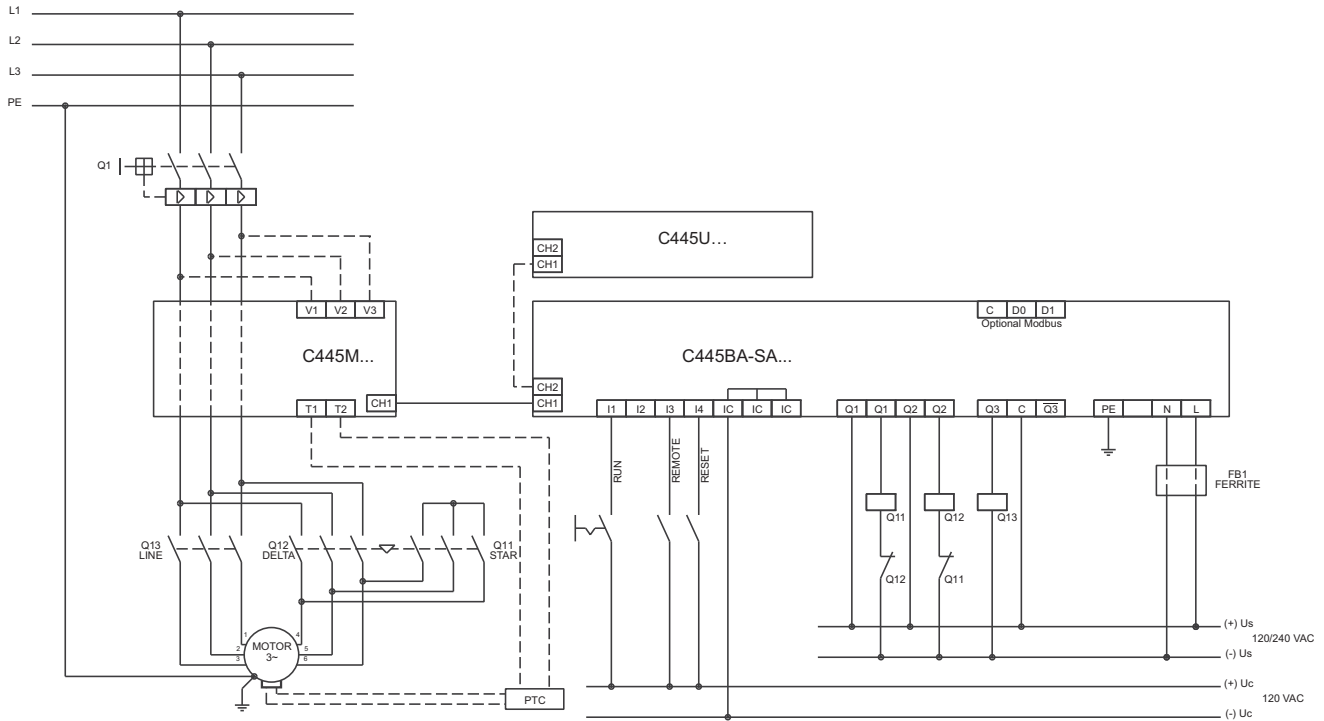


Figure 78. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power



Notes:

1. The inputs on the Base Control Module are only used by this Operation Mode if Fieldwire is selected for one of the control sources. If Fieldwire is not the Local or Remote control source, all 4 inputs may be used as general purpose inputs.
2. No outputs may be used as general purpose outputs for this Operation Mode.
3. If Fieldwire is the Local control source, Input 3 is the Remote input. When power is applied to Input 3, the C445 will be in Remote mode.
4. If Fieldwire is the Remote control source and 2-wire control (default) is selected, Inputs 2 and 3 are unused by this operation mode.
5. If 3-wire control is selected along with Fieldwire for either control source, Input 2 is Permissive.
6. Fusing: Although C445 product listings do not require fusing on the high impedance line voltage measurement inputs, it may be necessary to provide overcurrent protection of the supply leads in accordance with applicable final installation specific local, state and national electrical codes.

Two Speed Two Winding Operation Mode (Two Speed Poll Changing)

Description

The two speed motor starter operation mode accepts off/slow/fast commands to control two speed motor applications. A run slow command will activate Output 1(slow). A run fast command will activate Output 2(fast). A stop command de-activates both of the outputs.

When transitioning from fast → slow, the C445 will de-activate Output 2(fast) and will delay activating Output 1(slow) until the Control Switching Time expires, allowing the motor time to slow down before transitioning to the slow speed. The Control Switching Time parameter can be found in the Operation Mode category in the Power Xpert *inControl* Software Tool.

The C445 will issue a control fault when:

- The RunSlow or RunFast command is active and phase voltage is present and no phase current is detected.
- A Stop command is active and current is detected.

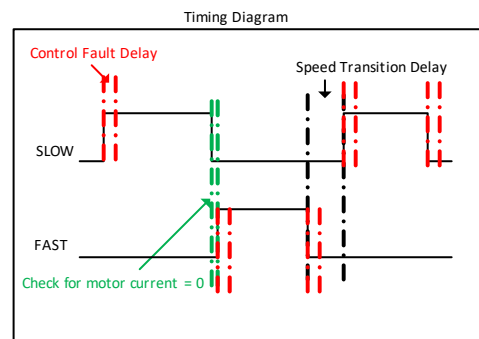
Note: Even with the control fault disabled, after de-activating the present speed, the C445 will NOT transition to the new speed until current readings decrease to zero.

- Outputs 1 and 2 will be de-activated anytime the C445 experiences a fault/inhibit condition.
- Output 1 – slow starter coil (NO)
- Output 2 – fast starter coil (NO)
- Output 3 – open for user configuration and function can be selected by the user.

The AtRef (At Reference) bit in the Motor Control Status register is set based on the following two conditions. At Reference signals that the motor is up to speed.

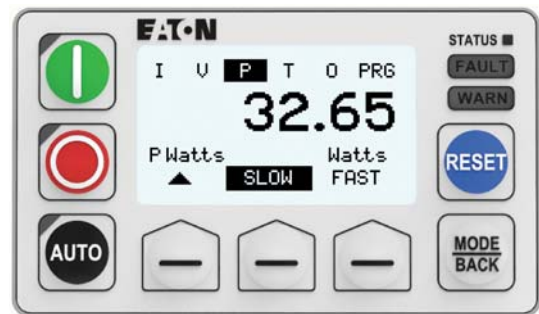
1. If motor current first exceeds 115% of the active overload FLA rating and then decreases back below 115% of the active overload FLA rating, it is determined the motor has come up to speed and the AtRef bit will be set.
2. If motor current exceeds 30% of the active overload FLA rating and remains until after the Motor State Transition to Run Delay from Start time expires the motor is determined to be up to speed and the AtRef bit will be set. This time delay parameter can be found in the General Protections category in the Power Xpert *inControl* Software Tool.

Figure 79. Timing Diagram for the Two Speed Operation Mode



Recommended User Interface Options for the Two Speed Two Winding Operation Mode

Figure 80. C445UM: Monitoring User Interface



The Monitoring User Interface can be used with any operation mode. If selected as a local control source, the User Interface Start and Stop buttons are enabled in Two Speed Two Winding. The screen provides selection and indication of Slow/Fast status. Use the soft keys to select Slow or Fast before pressing the Start button. When running, the highlighted selection indicates speed. Users may optionally disable local start or reset functionality if desired.

C445UM may still be used in Two Speed if the User Interface is not the local control source. Start, Stop and Auto buttons will be disabled. If pressed, the screen will notify the user that this functionality is not enabled. Control Status LEDs indicating running, stopped and Auto status will still function.

Control Settings

The following parameters are used to configure the Two Speed Two Winding Operation Mode and the C445 sources of control.

Table 16. Two Speed Two Winding Configuration Parameters

| Configuration Parameter | Modbus Register | Description | Read/Write |
|----------------------------------|-----------------|---|------------|
| Active Operation Mode ① | 700 | This parameter selects the Operation Mode | R/W |
| Control Fault Delay | 701 | Delay time before a control fault is issued. Setting of "0" disables protection. | R/W |
| Control Switch Time Delay | 703 | Time delay when transitioning from fast → slow. Delay to allow motor to slow before transitioning to the slow output | R/W |
| Motor#1 Overload FLA Scaled | 900 | Parameter to set overload full load amps for slow motor winding | R/W |
| Motor#2 Overload FLA Scaled | 901 | Parameter to set overload full load amps for fast motor winding | R/W |
| Motor Overload Trip FLA | 500 | Parameter holds active motor overload fla rating (will contain the motor1 setting when on the slow winding and the motor2 setting when on the fast winding) | R |
| Trip Enable Bit Field | 1000-1001 | Trip (Fault) protection enable bits Set bits to enable desired motor protections | R/W |
| Warn Enable Bit Field | 1002-1003 | Warning protection enable bits Set bits to enable desired motor protections warnings | R/W |
| C445 Local Source Selector ① | 711 | Select the Local Control source. | R/W |
| C445 Remote Source Selector | 712 | Select the Remote Control source. | R/W |
| C445 Q3 Output function select ① | 717 | Output 3 user function selection | R/W |

Note

① Soft reset (power cycle) required for changes to these parameters to take effect.

Fieldbus Control Word

The two speed motor starter profile will accept the following control commands over a fieldbus network.

Control Bits

Bit 0/1 00 = Stop command, de-activate all control outputs
 01 = Run Slow command, activate Output 1
 10 = Run Fast command, activate Output 2
 11 = Unknown command, No action

Bit 2 This bit can be used to switch between Local and Remote from the network when the Allow Remote Control Switch parameter is enabled.

Bit 3 0 = No action
 1 = Reset fault (will clear fault provided condition has cleared)

Bit 5 0 = No action
 1 = The C445 will issue a "Test Trip" fault causing the Outputs 1 & 2 control relays to open.

Bit 2 0 = local control source active
 1 = remote control source is active

Bit 3 0 = no fault present
 1 = C445 fault present

Bit 4 0 = no warning present
 1 = C445 warning present

Bit 5 0 = no inhibit present
 1 = C445 control inhibit present

Bit 6 0 = C445 not ready (fault and/or inhibit present)
 1 = C445 ready for control (No fault or inhibit present)

Bit 7 0 = motor is not up to speed (AtRef)
 1 = C445 has detected motor is up to speed (AtRef)

Two conditions will set the AtRef bit, signaling the motor is up to speed.

- If motor current first exceeds 115% of the active overload FLA rating and then decreases back below 115% of the active overload FLA rating, it is determined the motor has come up to speed and the AtRef bit will be set.
- If motor current exceeds 30% of the active overload FLA rating and remains until after the start delay time expires the motor is determined to be up to speed and the AtRef bit will be set.

Control Status Word

The control status word of the two speed motor starter profile can be accessed over the fieldbus network.

Status Bits

Bit 0/1 00 = Stopped (No active Run commands)
 01 = Running1 (Run Slow command is active)
 10 = Running2 (Run Fast command is active)

Wiring Diagrams for the Two Speed Two Winding Operation Mode

Figure 81. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power

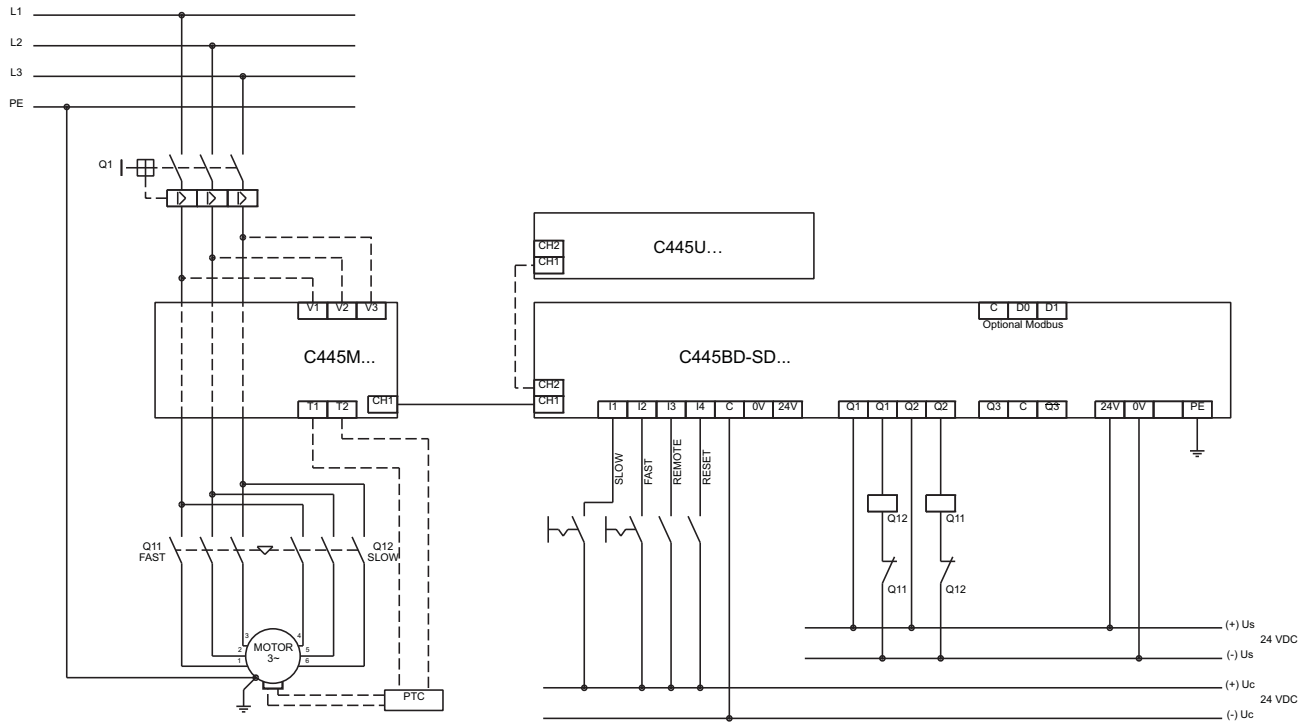


Figure 82. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power

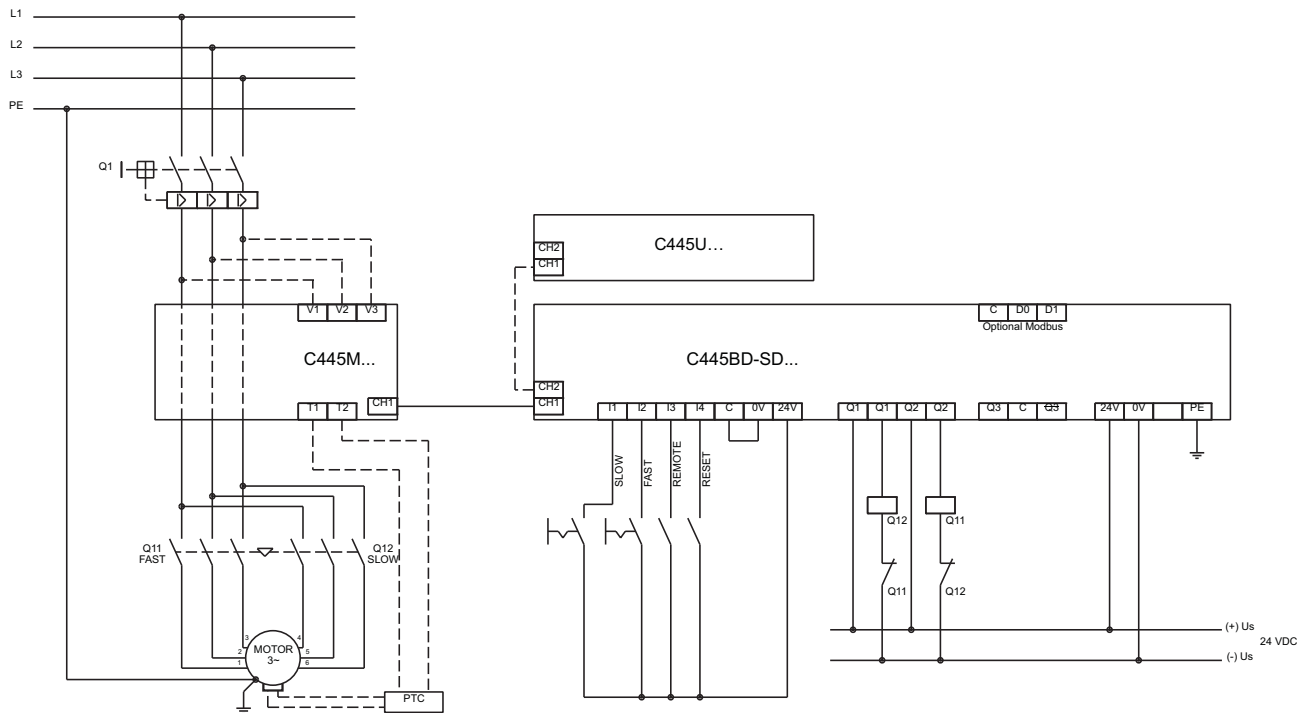
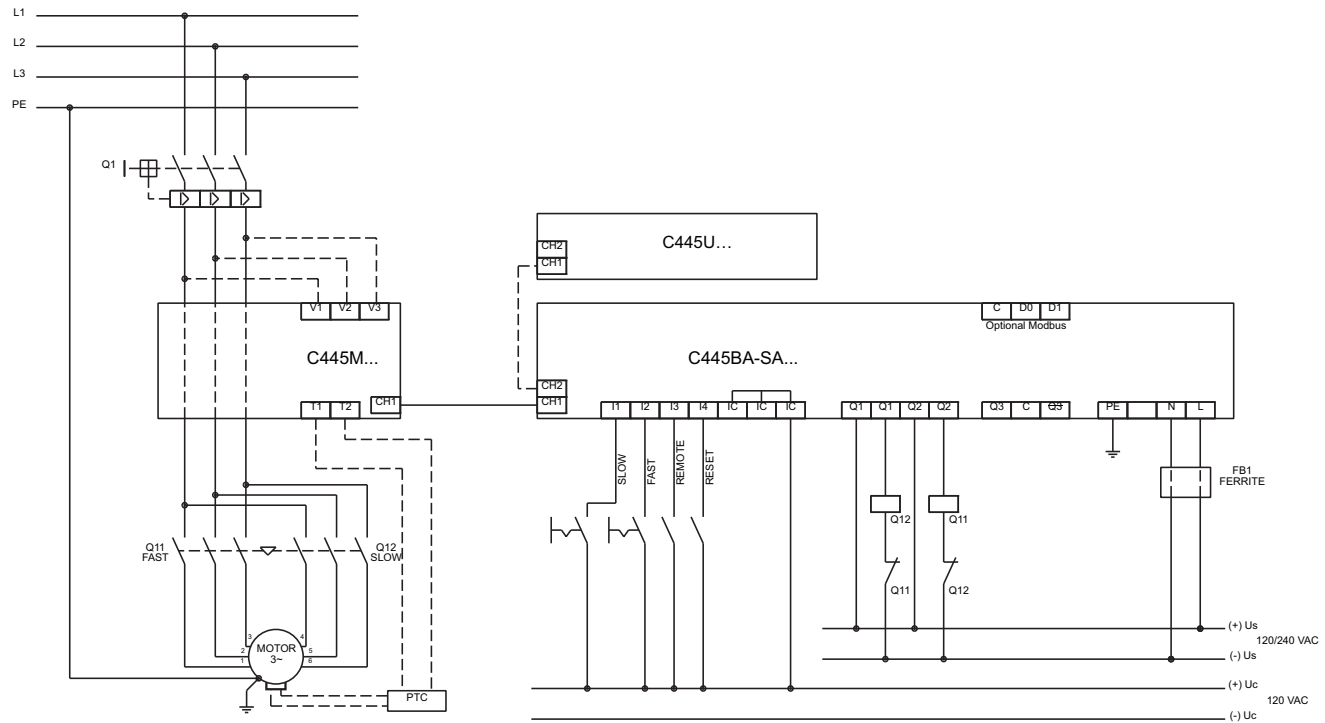


Figure 83. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power



Notes:

1. The inputs on the Base Control Module are only used by this Operation Mode if Fieldwire is selected for one of the control sources. If Fieldwire is not the Local or Remote control source, all 4 inputs may be used as general purpose inputs.
2. Output 3 may be used as a general purpose output for this Operation Mode.
3. If Fieldwire is the Local control source, Input 3 is the Remote input and 3-wire control is not allowed for this operation mode. When power is applied to Input 3, the C445 will be in Remote mode.
4. If fieldwire is the Remote control source, 3-wire control is allowed and Input 3 is the Permissive Input.
5. Fusing: Although C445 product listings do not require fusing on the high impedance line voltage measurement inputs, it may be necessary to provide overcurrent protection of the supply leads in accordance with applicable final installation specific local, state and national electrical codes.

Two Speed Dahlander Operation Mode

The Two Speed Dahlander motor starter operation mode accepts OFF/SLOW/FAST commands to control two speed motor applications. A RUN SLOW command will activate Output 1(slow). A RUN FAST command will activate Output 3(net). Then after the Network Contactor Delay time expires, Output 2(fast) activates starting the motor on the fast winding. A STOP command de-activates all 3 outputs.

When transitioning from fast → slow, the C445 will de-activate both Output 2(fast) and Output 3(net) and will delay activating Output 1(slow) until the Control Switching Time Delay expires, allowing the motor time to slow down before transitioning to the slow speed.

The C445 will issue a control fault when:

- The RUN SLOW or RUN FAST command is active and phase voltage is present and no phase current is detected.
- A STOP command is active and current is detected.

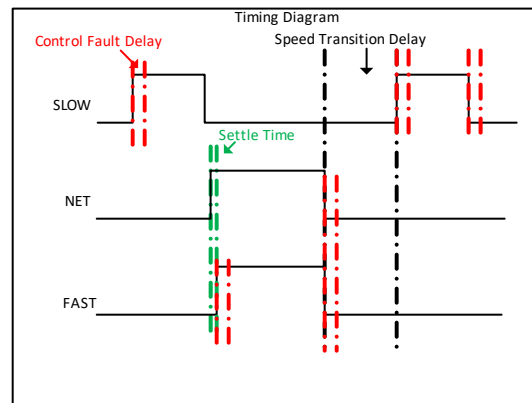
Note: Even with the control fault disabled, after de-activating the present speed, the C445 will NOT transition to the new speed until current readings decrease to zero.

- Outputs 1, 2 and 3 will be de-activated anytime the C445 experiences a fault/inhibit condition.
- Output 1 – SLOW STARTER coil (NO)
- Output 2 – FAST STARTER coil (NO)
- Output 3 – NET STARTER coil (NO)

The AtRef (At Reference) bit in the Motor Control Status register is set based on the following two conditions. At Reference signals that the motor is up to speed.

1. If motor current first exceeds 115% of the active overload FLA rating and then decreases back below 115% of the active overload FLA rating, it is determined the motor has come up to speed and the AtRef bit will be set.
2. If motor current exceeds 30% of the active overload FLA rating and remains until after the Motor State Transition to Run Delay from Start time expires the motor is determined to be up to speed and the AtRef bit will be set. This time delay parameter can be found in the General Protections category in the Power Xpert inControl Software Tool.

Figure 84. Timing Diagram for the Two Speed Dahlander Operation Mode



Recommended User Interface Options for the Two Speed Dahlander Operation Mode

Figure 85. C445UM: Monitoring User Interface



The Monitoring User Interface can be used with any operation mode. If selected as a local control source, the User Interface Start and Stop buttons are enabled in Two Speed Dahlander Mode. The screen provides selection and indication of Slow/Fast status. Use the soft keys to select Slow or Fast before pressing the Start button. When running, the highlighted selection indicates speed. Users may optionally disable local start or reset functionality if desired.

C445UM may still be used in Two Speed if the User Interface is not the local control source. Start, Stop and Auto buttons will be disabled. If pressed, the screen will notify the user that this functionality is not enabled. Control Status LEDs indicating running, stopped and Auto status will still function.

Control Settings

The following parameters are used to configure the Two Speed Dahlander Operation Mode and the C445 sources of control.

Table 17. Two Speed Dahlander Configuration Parameters

| Configuration Parameter | Modbus Register | Description | Read/Write |
|-------------------------------|-----------------|---|------------|
| Active Operation Mode ① | 700 | This parameter selects the Operation Mode | R/W |
| Control Fault Delay | 701 | Delay time before a control fault is issued. Setting of "0" disables protection. | R/W |
| Control Switch Time Delay | 703 | Time delay when transitioning from fast → slow. Delay to allow motor to slow before transitioning to the slow output (in 10ms) | R/W |
| Network Contactor Settle Time | 704 | Settle delay time before 2 nd contactor is activated – ensures the net contactor is sealed in before activating the fast output (in 10ms) | R/W |
| Motor#1 Overload FLA Scaled | 900 | Parameter to set overload full load amps for slow motor winding | R/W |
| Motor#2 Overload FLA Scaled | 901 | Parameter to set overload full load amps for fast motor winding | R/W |
| Motor Overload Trip FLA | 500 | This parameter contains the active motor overload FLA rating (will contain the motor1 setting when on the slow winding and the motor2 setting when on the fast winding) | R |
| Trip Enable Bit Field | 1000-1001 | Trip (Fault) protection enable bits Set bits to enable desired motor protections | R/W |
| Warn Enable Bit Field | 1002-1003 | Warning protection enable bits Set bits to enable desired motor protections warnings | R/W |
| C445 Local Source Selector ① | 711 | Select the Local Control source. | R/W |
| C445 Remote Source Selector | 712 | Select the Remote Control source. | R/W |

Note

① Soft reset (power cycle) required for changes to these parameters to take effect.

Fieldbus Control Word

The two speed Dahlander motor starter profile will accept the following control commands over a fieldbus network.

Control Bits

- Bit 0/1 00 = Stop command, de-activate all control outputs
01 = Run Slow command, activate Output 1
10 = Run Fast command, activate Outputs 2 & 3
11 = Unknown command, No action
- Bit 2 This bit can be used to switch between Local and Remote from the network when the Allow Remote Control Switch parameter is enabled.
- Bit 3 0 = No action
1= Reset fault (will clear fault provided condition has cleared)
- Bit 5 0 = No action
1= The C445 will issue a "Test Trip" fault causing the Outputs 1-3 control relays to open.

- Bit 2 0 = local control source active
1= remote control source is active
- Bit 3 0 = no fault present
1= C445 fault present
- Bit 4 0 = no warning present
1= C445 warning present
- Bit 5 0 = no inhibit present
1= C445 control inhibit present
- Bit 6 0 = C445 not ready (fault and/or inhibit present)
1= C445 ready for control (No fault or inhibit present)
- Bit 7 0 = motor is not up to speed (AtRef)
1= C445 has detected motor is up to speed (AtRef)

Two conditions will set the AtRef bit, signaling the motor is up to speed.

- If motor current first exceeds 115% of the active overload FLA rating and then decreases back below 115% of the active overload FLA rating, it is determined the motor has come up to speed and the AtRef bit will be set.
- If motor current exceeds 30% of the active overload FLA rating and remains until after the start delay time expires the motor is determined to be up to speed and the AtRef bit will be set.

Control Status Word

The control status word of the two speed Dahlander motor starter profile can be accessed over the fieldbus network.

Status Bits

- Bit 0/1 00 = Stopped (No active Run commands)
01= Running1 (Run Slow command is active)
10= Running2 (Run Fast command is active)

Wiring Diagrams for the Two Speed Dahlander Operation Mode

Figure 86. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power

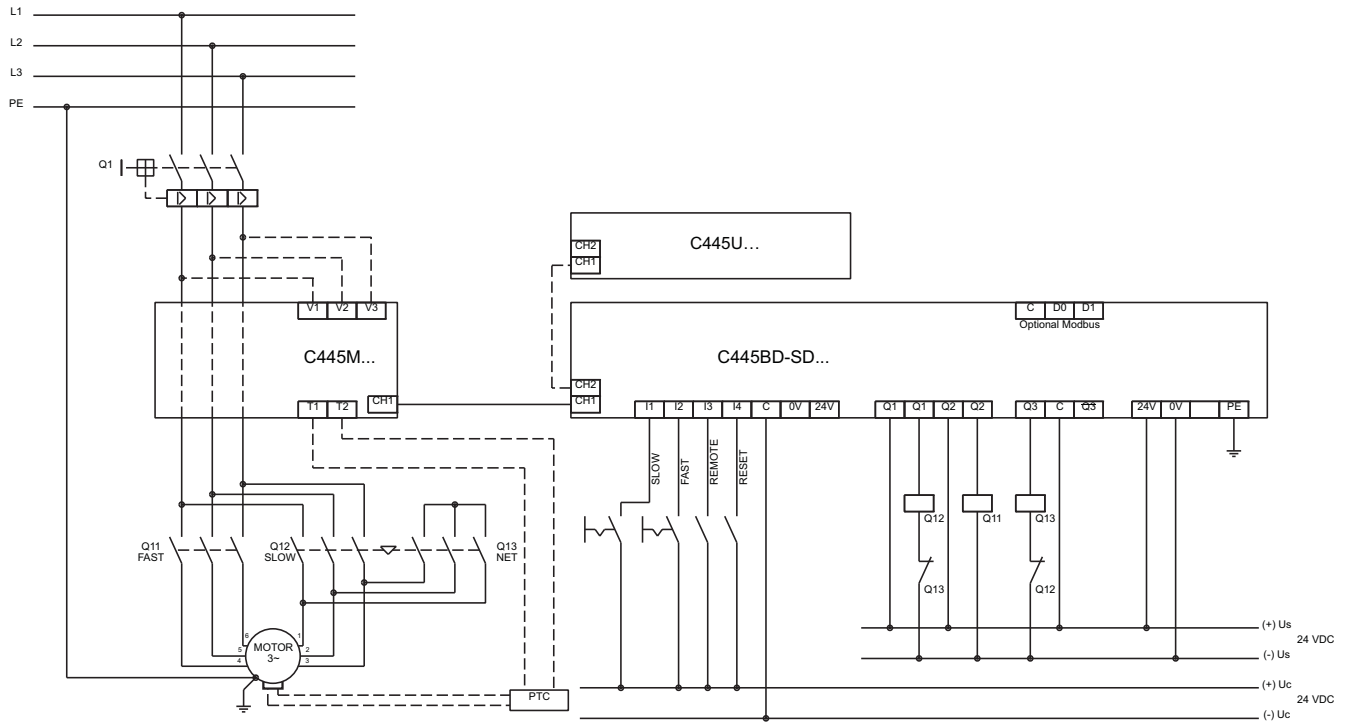


Figure 87. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power

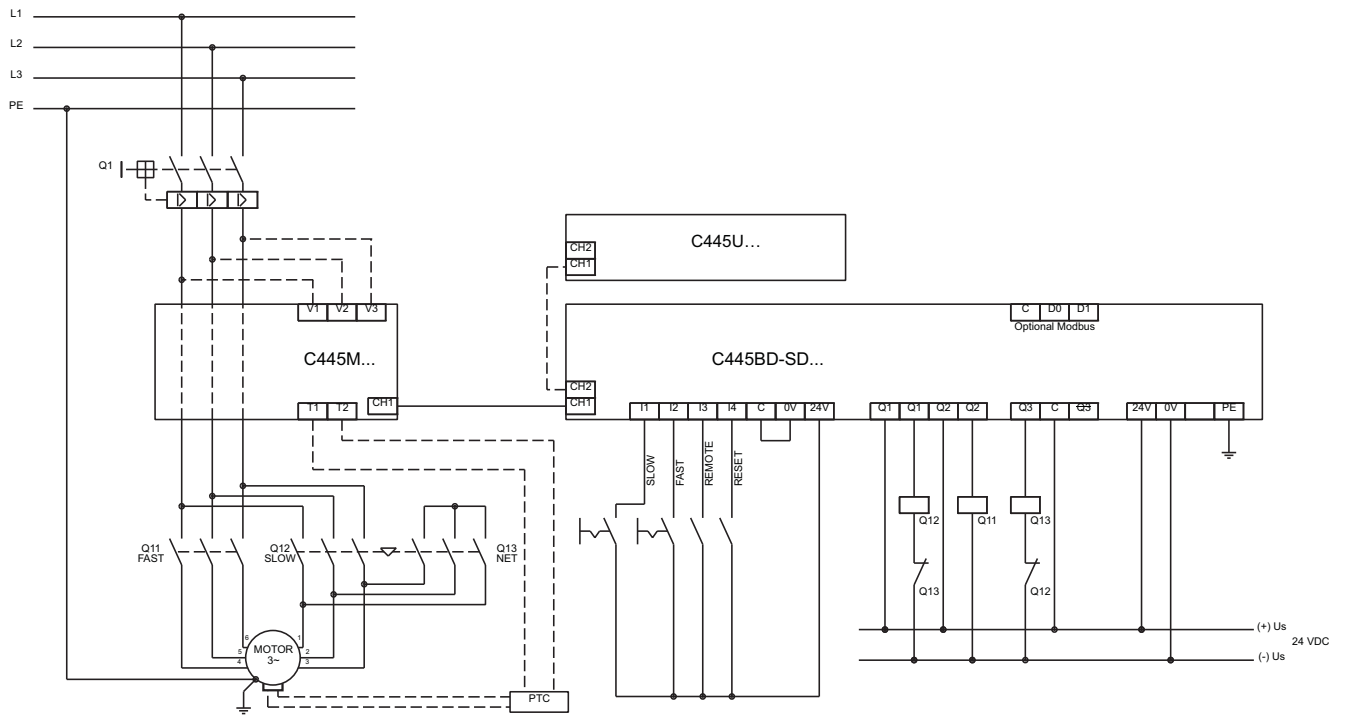
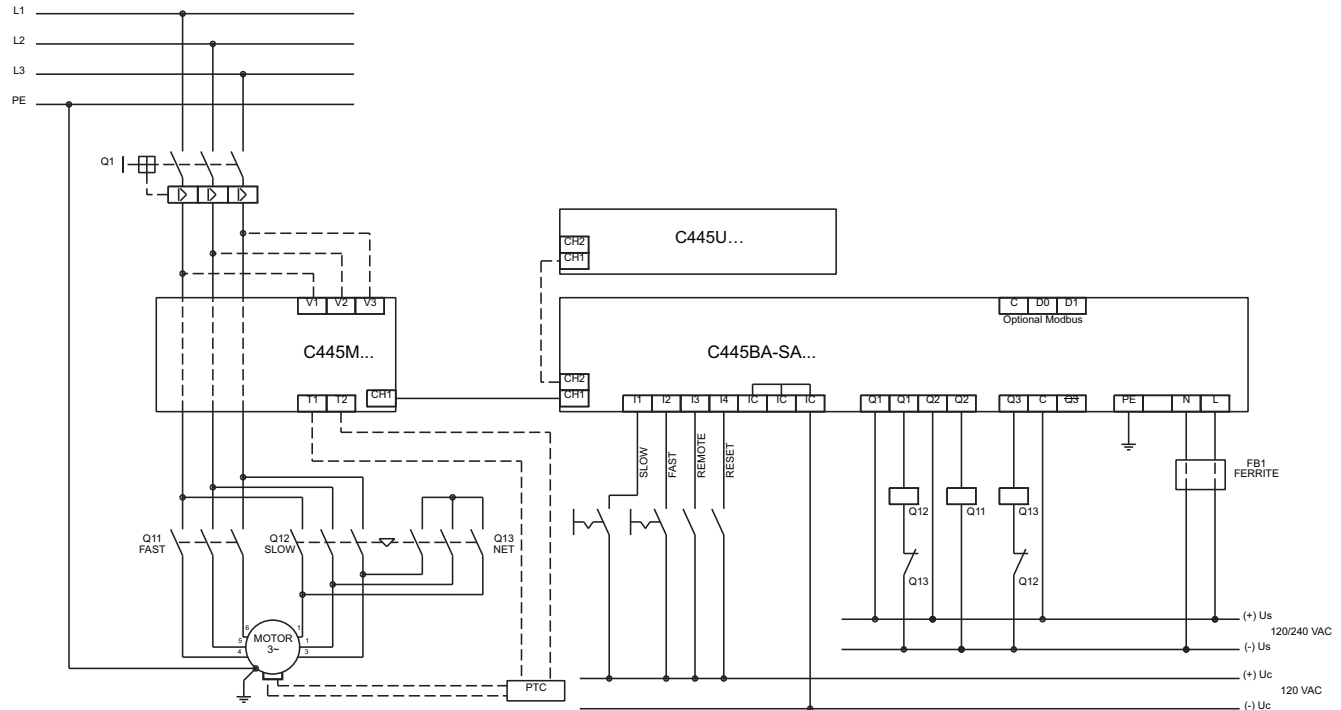


Figure 88. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power



Notes:

1. The inputs on the Base Control Module are only used by this Operation Mode if Fieldwire is selected for one of the control sources. If Fieldwire is not the Local or Remote control source, all 4 inputs may be used as general purpose inputs.
2. No outputs may be used as general purpose outputs for this Operation Mode.
3. If Fieldwire is the Local control source, Input 3 is the Remote input and 3-wire control is not allowed for this operation mode. When power is applied to Input 3, the C445 will be in Remote mode.
4. If fieldwire is the Remote control source, 3-wire control is allowed and Input 3 is the Permissive Input.
5. Fusing: Although C445 product listings do not require fusing on the high impedance line voltage measurement inputs, it may be necessary to provide overcurrent protection of the supply leads in accordance with applicable final installation specific local, state and national electrical codes.

Auto Transformer Operation Mode

The auto transformer reduced voltage motor starter profile accepts start/stop commands to control motors wired in a reduced voltage auto transformer configuration. When a start command is received Output 3(star) will be activated. Then after the Network Contactor Delay time expires, Output 1(start) activates starting the motor with the reduced voltage from the auto transformer. When the C445 detects the motor is up to speed or the Maximum Star Winding Time expires, whichever occurs first, the Network Contactor Delay timer is started and Output 3 is de-activated. After the Network Contactor Delay time expires, Output 2(run) also activates, which transitions the transformer to full voltage. After a second Network Contactor Delay time expires, Output 1(start) de-activates placing the control into full voltage run mode.

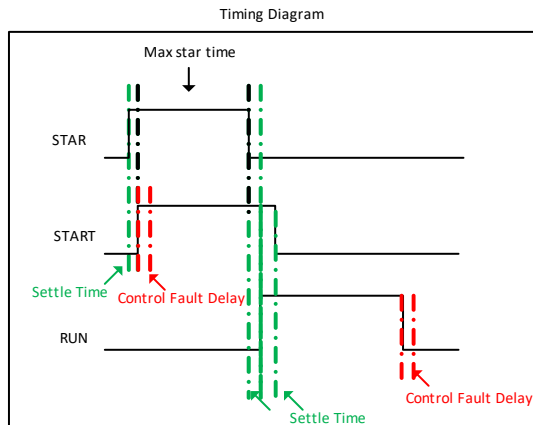
The C445 will issue a control fault when:

- A Run1 command is active and phase voltage is present and no phase current is detected after the Control Switching Time expires.
- A Stop command is active and current is detected after the Control Switching Time expires.

Outputs 1, 2 and 3 will be de-activated anytime the C445 experiences a fault/inhibit condition.

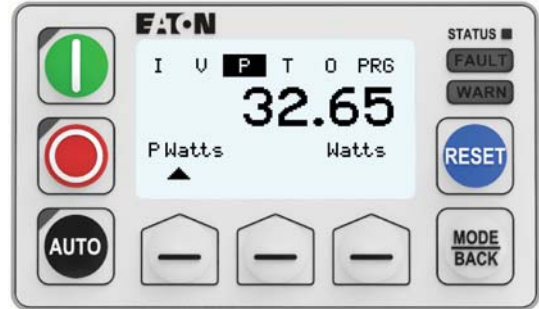
- Output 1 – auto transformer reduced voltage starter START coil (NO)
- Output 2 – auto transformer reduced voltage starter RUN coil (NO)
- Output 3 – auto transformer reduced voltage starter STAR coil (NO)

Figure 89. Timing Diagram for the Auto Transformer Operation Mode



Recommended User Interface Options for the Auto Transformer Operation Mode

Figure 90. C445UM: Monitoring User Interface



The Monitoring User Interface can be used with any operation mode. If selected as a local control source, the User Interface Start and Stop buttons are enabled in Auto Transformer Mode. Users may optionally disable local start or reset functionality if desired.

C445UM may still be used in Auto Transformer if the User Interface is not the local control source. Start, Stop and Auto buttons will be disabled. If pressed, the screen will notify the user that this functionality is not enabled. Control Status LEDs indicating running, stopped and Auto status will still function.

Control Settings

The following parameters are used to configure the auto transformer reduced voltage motor starter control profile and the C445 sources of control.

Table 18. Auto Transformer Configuration Parameters

| Configuration Parameter | Modbus Register | Description | Read/Write |
|-------------------------------|-----------------|---|------------|
| *C445 Active Operation Mode | 700 | Parameter selects control profile; Set to “6” for auto transformer reduced voltage motor starter | R/W |
| Control Fault Delay | 701 | Delay time from change in command before a control fault is issued. Setting of “0” disables this protection. | R/W |
| Network Contactor Settle Time | 704 | Settle delay time before second contactor is activated – ensures the first contactor is sealed in before applying the line (in 10 ms) | R/W |
| Maximum Star Winding Time | 705 | Maximum time the control will stay on the reduced voltage output before transitioning to full voltage (in 100 ms) | R/W |
| Motor#1 Overload FLA Scaled | 900 | Parameter to set motor nameplate full load amp rating for overload and motor protections | R/W |
| Motor#2 Overload FLA Scaled | 901 | Not used | R/W |
| Motor Overload Trip FLA | 500 | Parameter holds active motor overload FLA rating (will contain the motor1 setting) | R |
| Trip Enable Bit Field | 1000-1001 | Trip (Fault) protection enable bits Set bits to enable desired motor protections | R/W |
| Warn Enable Bit Field | 1002-1003 | Warning protection enable bits Set bits to enable desired motor protections warnings | R/W |
| *C445 Local Source Selector | 711 | See Section – C445 Local/Remote Control Source Selection | R/W |
| C445 Remote Source Selector | 712 | See Section – C445 Local/Remote Control Source Selection | R/W |

Fieldbus Control Word

The auto transformer reduced voltage motor starter profile will accept the following control commands over a fieldbus network.

Control Bits

- Bit 0 0 = Stop command, de-activate all control outputs
1 = Run1 command, begin start sequence
- Bit 2 This bit can be used to switch between Local and Remote from the network when the Allow Remote Control Switch parameter is enabled.
- Bit 3 0 = No action
1 = Reset fault (will clear fault provided condition has cleared)
- Bit 5 0 = No action
1 = The C445 will issue a “Test Trip” fault causing the Outputs 1-3 control relays to open

- Bit 2 0 = local control source active
1 = remote control source is active
- Bit 3 0 = no fault present
1 = C445 fault present
- Bit 4 0 = no warning present
1 = C445 warning present
- Bit 5 0 = no inhibit present
1 = C445 control inhibit present
- Bit 6 0 = C445 not ready (fault and/or inhibit present)
1 = C445 ready for control (No fault or inhibit present)
- Bit 7 0 = motor is not up to speed (AtRef)
1 = C445 has detected motor is up to speed on delta winding (AtRef)

Two conditions will set the AtRef bit, signaling the motor is up to speed.

- After transitioning to the full voltage output, if motor current increases above 115% of the active overload FLA rating and then decreases back below 115% of the active overload FLA rating, it is determined the motor has come up to speed and the AtRef bit will be set.
- After transitioning to the full voltage output, if motor current exceeds 30% of the active overload FLA rating and remains until after the start delay time expires the motor is determined to be up to speed and the AtRef bit will be set.

Control Status Word

The control status word of the auto transformer reduced voltage motor starter profile can be accessed over the fieldbus network.

Status Bits

- Bit 0 0 = Stopped (No active Run1 command)
1 = Running1 (Run1 command is present)

Wiring Diagrams for the Auto Transformer Operation Mode

Figure 91. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power

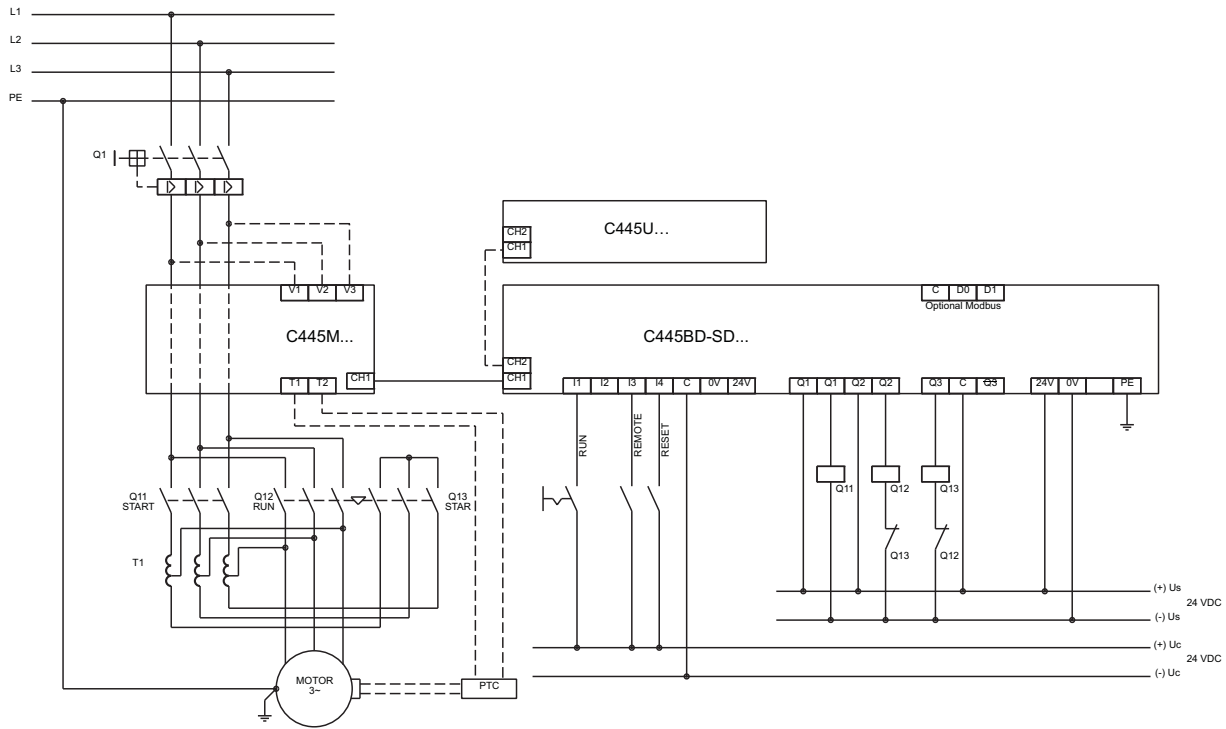


Figure 92. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power

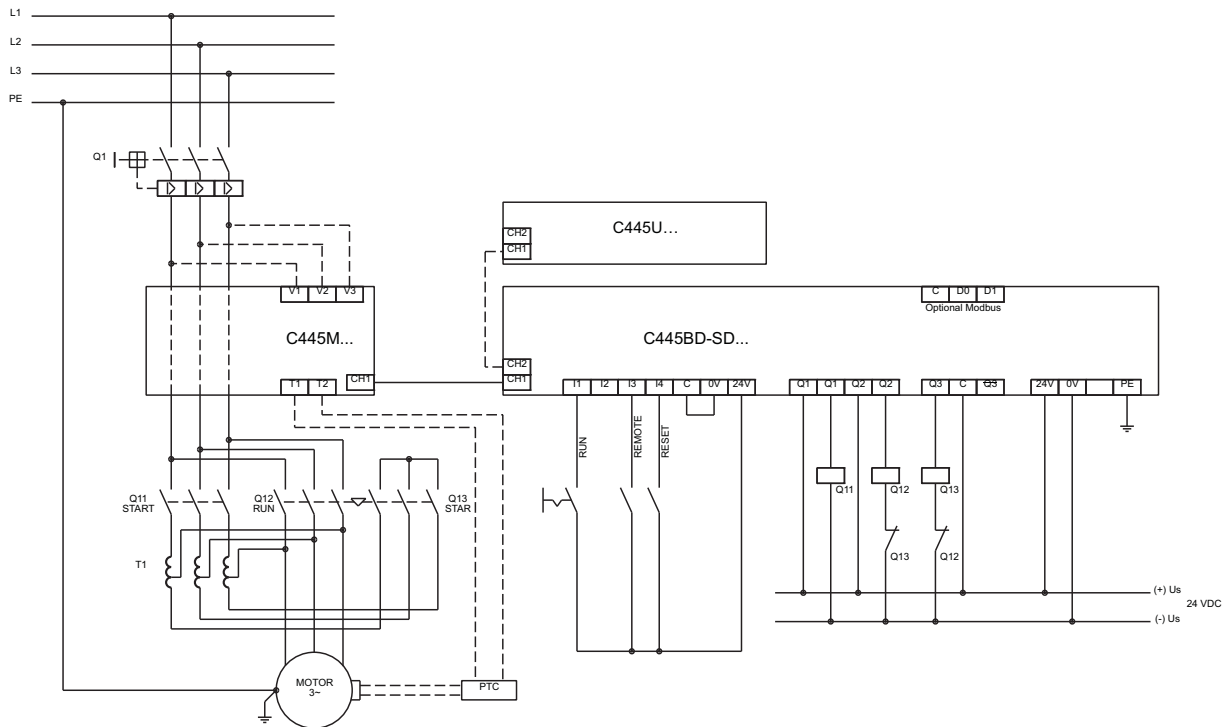
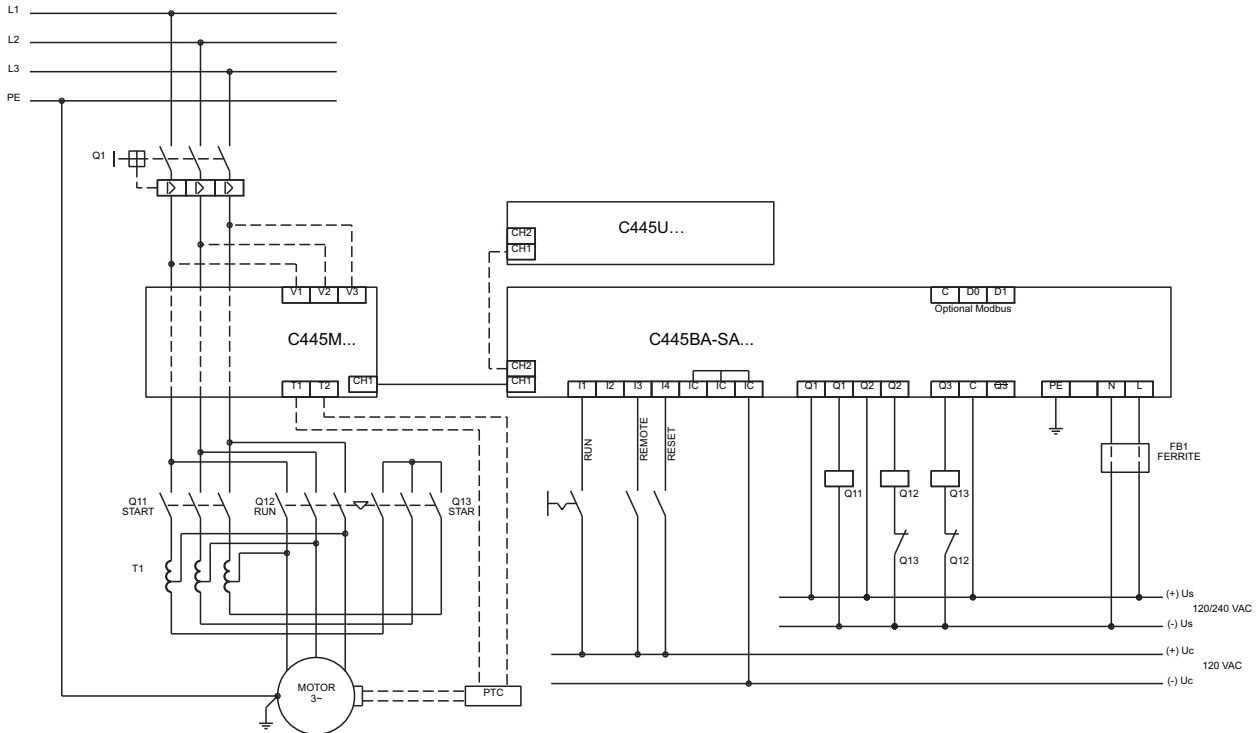


Figure 93. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power



Notes:

1. The inputs on the Base Control Module are only used by this Operation Mode if Fieldwire is selected for one of the control sources. If Fieldwire is not the Local or Remote control source, all 4 inputs may be used as general purpose inputs.
2. No outputs may be used as general purpose outputs for this Operation Mode.
3. If Fieldwire is the Local control source, Input 3 is the Remote input. When power is applied to Input 3, the C445 will be in Remote mode.
4. If Fieldwire is the Remote control source and 2-wire control (default) is selected, Inputs 2 and 3 are unused by this operation mode.
5. If 3-wire control is selected along with Fieldwire for either control source, Input 2 is Permissive.
6. Fusing: Although C445 product listings do not require fusing on the high impedance line voltage measurement inputs, it may be necessary to provide overcurrent protection of the supply leads in accordance with applicable final installation specific local, state and national electrical codes.

Solenoid Valve Operation Mode

The Solenoid Valve operation mode accepts energize/de-energize commands to open/close a solenoid controlled valve. The control can be adapted to both normally open & normally closed valves. An energize command will activate the Output 1. A de-energize command will de-activate Output 1. Limit switches can be used to provide feedback to the C445 indicating when the valve reaches open/closed positions.

Solenoid parameters:

- Solenoid Non-energized state
- Solenoid Open Delay
- Solenoid Close Delay

In this mode, inputs can be used to provide feedback on when the valve reaches the open/closed positions. If this feedback is provided, C445 will issue a control fault if the commanded state does not match the feedback signal. The parameter "Feedback Signal Source" selects where the inputs are wired to the C445. Options include the Base Control Module, the Control User Interface or to a controller where they are sent to the C445 via a communication network. For all three locations these input feedback signals may be wired, the actual input or bit is pre-defined for each as follows.

- 0 – No Feedback Source
- 1 – Base Control Module: Input 2 (open), Input 3 (closed)
- 2 – Control User Interface (C445UC.): Input 2 (open), Input 3 (closed)
- 3 – Input Register 602 from a controller: Bit 1 (open) and Bit 2 (closed)

The C445 will issue a control fault when:

- Both closed and open feedback is detected

Normally closed valve

- An Energize command is active and no open feedback is detected
- A De-energize command is active and no closed feedback is detected

Normally open valve

- An Energize command is active and no closed feedback is detected
- A De-energize command is active and no open feedback is detected

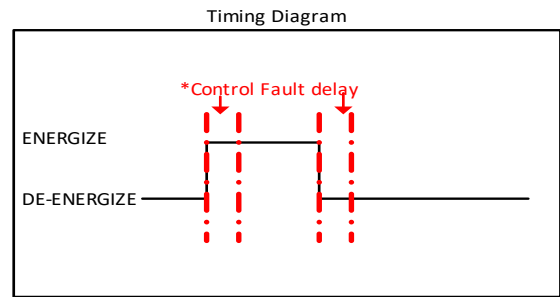
Output 1 will be de-activated when the C445 experiences a fault/inhibit condition.

Output 1 – solenoid coil (NO)

Output 2 – open for user configuration and their function can be selected by the user.

Output 3 – open for user configuration and their function can be selected by the user.

Figure 94. Timing Diagram for the Solenoid Valve Operation Mode

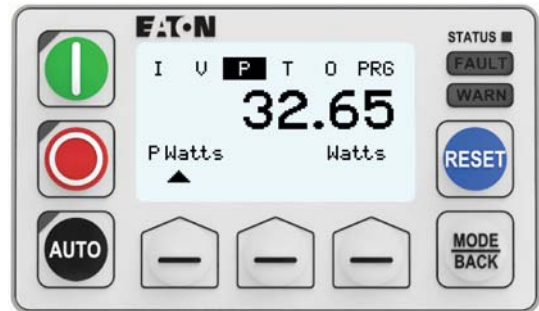


*Normal state = Closed
 De-energize to energize transition (open delay active)
 Energize to de-energize transition (close delay active)

*Normal state = Open
 De-energize to energize transition (close delay active)
 Energize to de-energize transition (open delay active)

Recommended User Interface Options for the Solenoid Valve Operation Mode

Figure 95. C445UM: Monitoring User Interface



The Monitoring User Interface can be used with any operation mode. If selected as a local control source, the User Interface Start and Stop buttons are enabled in Solenoid Valve Mode. Users may optionally disable local start or reset functionality if desired.

C445UM may still be used in Solenoid Valve if the User Interface is not the local control source. Start, Stop and Auto buttons will be disabled. If pressed, the screen will notify the user that this functionality is not enabled. Control Status LEDs indicating running, stopped and Auto status will still function.

Control Settings

The following parameters are used to configure the Solenoid Valve Operation Mode and the C445 sources of control.

Table 19. Solenoid Configuration Parameters

| Configuration Parameter | Modbus Register | Description | Read/Write |
|---|-----------------|---|------------|
| Active Operation Mode ^① | 700 | This parameter selects the Operation Mode | R/W |
| Solenoid Open Time Delay | 708 | Time for the solenoid to reach its open position, control fault is masked during this time. A setting of "0" disables control fault protection for opening. | |
| Solenoid Close Time Delay | 709 | Time for the solenoid to reach its closed position, control fault masked during this time. A setting of "0" disables control fault protection for closing. | |
| Solenoid Non-energized State | 710 | Non energized state of the solenoid valve 0 – normally closed (default) 1 – normally open | R/W |
| Trip Enable Bit Field | 1000-1001 | Trip (Fault) protection enable bits Set bits to enable desired protections | R/W |
| Warn Enable Bit Field | 1002-1003 | Warning protection enable bits Set bits to enable desired protection warnings | R/W |
| C445 Local Source Selector ^① | 711 | Select the Local Control source. | R/W |
| C445 Remote Source Selector | 712 | Select the Remote Control source. | R/W |
| C445 Feedback Signal Source Selector | 713 | Input source of the feedback signals 0 – No feedback source 1 – User interface inputs 2 – Base control inputs 3 – Fieldbus parameter | R/W |
| C445 Q2 Output function select ^① | 716 | Output 2 user function selection | R/W |
| C445 Q3 Output function select ^① | 717 | Output 3 user function selection | R/W |
| FieldBus Input Feedback Register | 602 | Feedback input parameter to write the status of the feedback signals when limit switches are connected to the inputs | R/W |

Note

^① Soft reset (power cycle) required for changes to these parameters to take effect.

Fieldbus Control Word

The solenoid valve control profile will accept the following control commands over a fieldbus network.

Control Bits

- Bit 0 0 = De-energize command, de-activate Output 1
1 = Energize command, activate Output 1
- Bit 2 This bit can be used to switch between Local and Remote from the network when the Allow Remote Control Switch parameter is enabled.
- Bit 3 0 = No action
1= Reset fault (will clear fault provided condition has cleared)
- Bit 5 0 = No action
1= The C445 will issue a "Test Trip" fault causing the Output 1 control relay to open.

Control Status Word

The control status word of the reverser motor starter profile can be accessed over the fieldbus network.

Status Bits

- Bit 0 0 = De-energize (No active energize command)
1= Energize (Energize command is active)
- Bit 2 0 = local control source active
1= remote control source is active
- Bit 3 0 = no fault present
1= C445 fault present
- Bit 4 0 = no warning present
1= C445 warning present
- Bit 5 0 = no inhibit present
1= C445 control inhibit present
- Bit 6 0 = C445 not ready (fault and/or inhibit present)
1= C445 ready for control (No fault or inhibit present)
- Bit 7 0 = valve is in not desired end position
1= valve is in desired end position

The following conditions will set the InPos bit in the status word, signaling the valve has reached the desired end position.

Normally closed valve

- Energize command is active and open feedback detected
- De-energize command is active and Closed feedback detected

Normally open valve

- Energize command is active and closed feedback detected
- De-energize command is active and open feedback detected.

Wiring Diagrams for the Solenoid Valve Operation Mode

Figure 96. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power

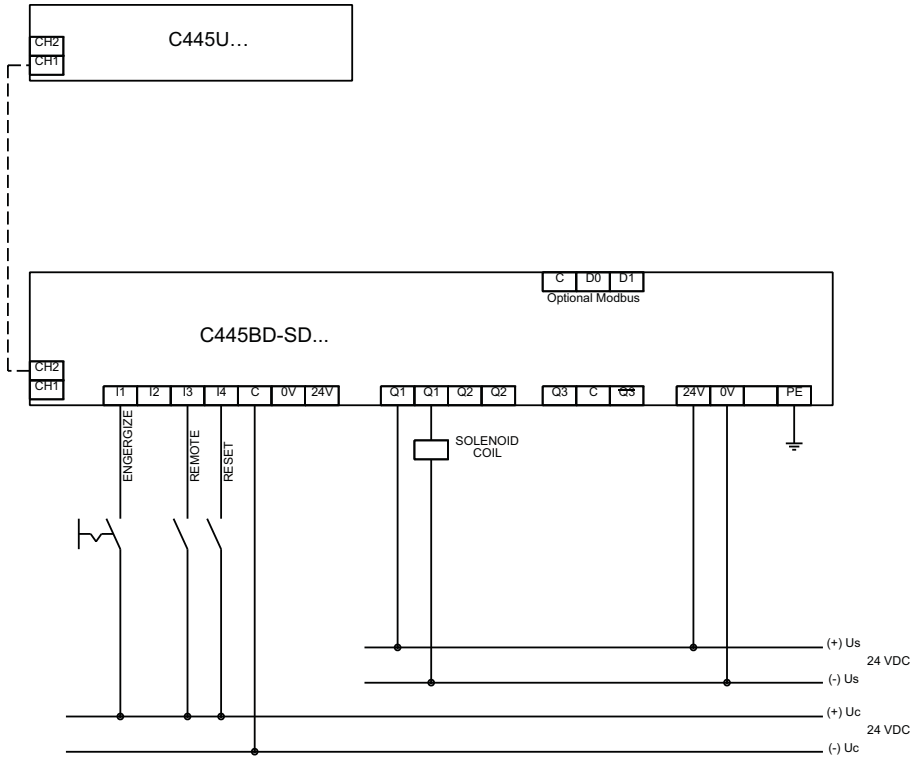


Figure 97. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power

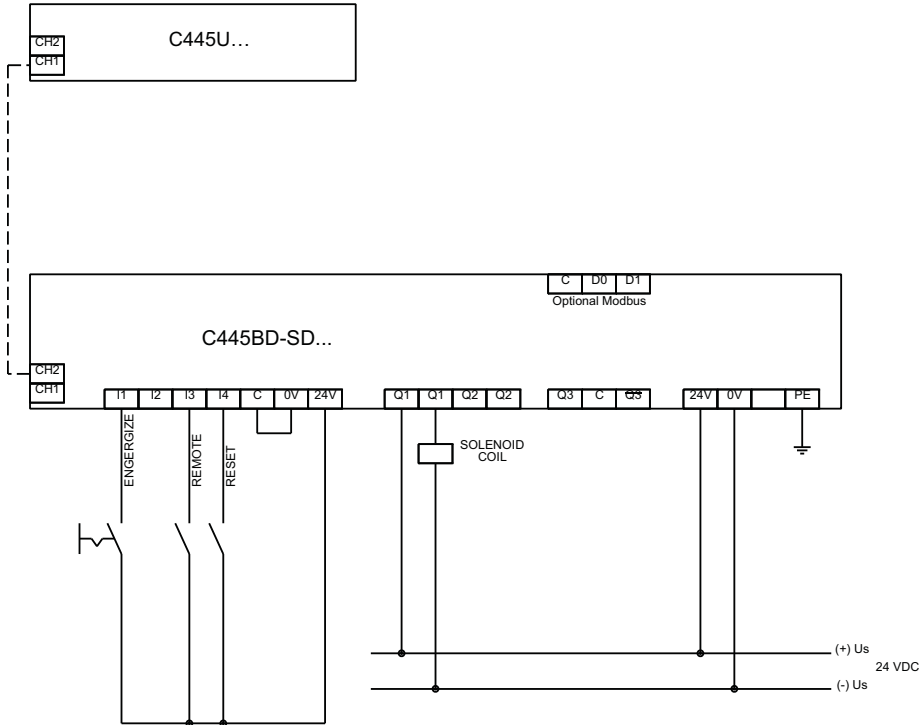
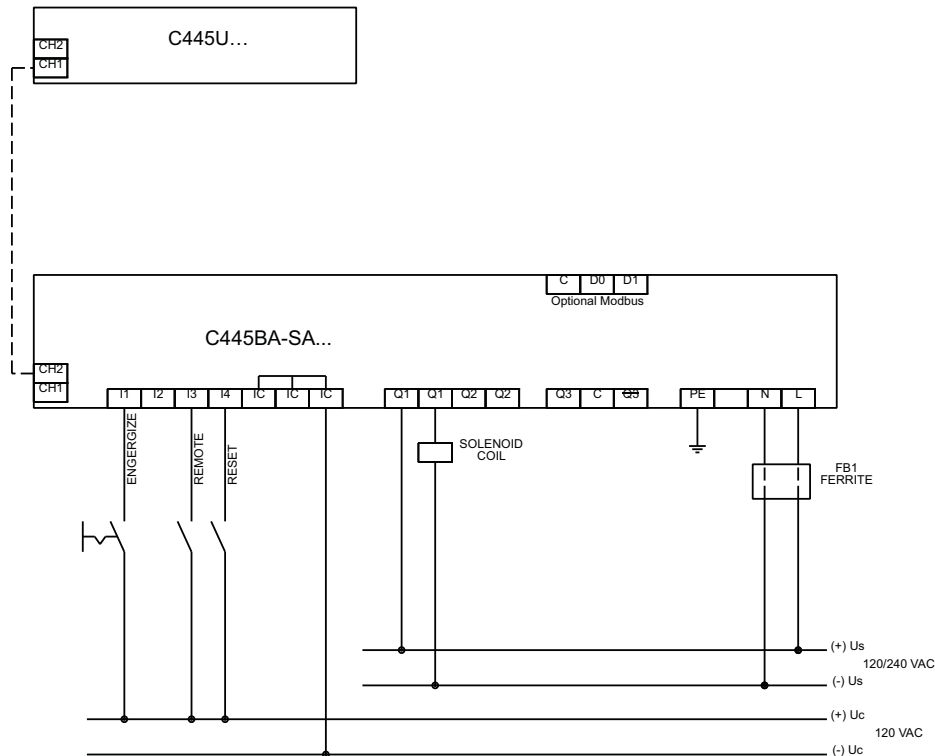


Figure 98. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power

**Notes:**

1. the inputs on the Base Control Module are only used by this Operation Mode if Fieldwire is selected for one of the control sources. If Fieldwire is not the Local or Remote control source, all 4 inputs may be used as general purpose inputs or can be selected as the feedback source for the solenoid limit switches.
2. Outputs 2 and 3 may be used as a general purpose outputs for this Operation Mode.
3. If Fieldwire is the Local control source, Input 3 is the Remote input. When power is applied to Input 3, the C445 will be in Remote mode.
4. If fieldwire is the Remote control source and 2-wire control (default) is selected, Inputs 2 and 3 are unused by this operation mode. They can be used as general purpose or selected as the feedback source for the solenoid limit switches.
5. If 3-wire control is selected along with Fieldwire for either control source, Input 2 is Permissive.
6. Fusing: Although C445 product listings do not require fusing on the high impedance line voltage measurement inputs, it may be necessary to provide overcurrent protection of the supply leads in accordance with applicable final installation specific local, state and national electrical codes.
7. C445UC... control user interfaces offer 4 additional 24 Vdc digital inputs for general purpose use. Inputs 2 and 3 can be selected as the feedback source for the solenoid limit switches.

MCCB Feeder Operation Mode

The MCCB feeder operation mode has two modes of operation with actuation and without actuation.

When MCCB actuation is enabled, it provides remote control capability for MCCB installed with motor operators. A close command will activate Output 1 for the programmed pulse width providing a close signal to the motor operator. An open command will activate Output 2 for the programmed pulse width providing an open signal to the motor operator.

MCCB parameters:

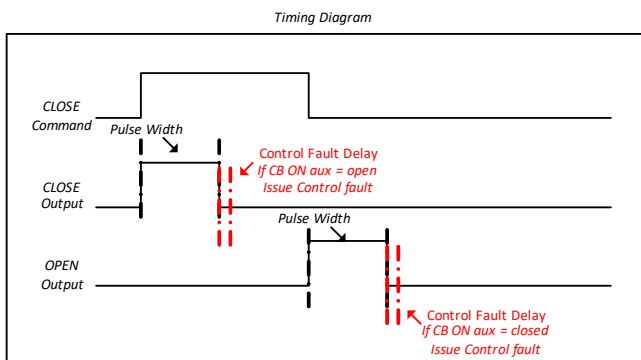
- MCCB Actuation Enable
- Actuation Pulse Width

CB On & CB Alarm auxiliary relays provide feedback, reporting MCCB feeder open, close, & trip status.

In this mode, inputs can be used to provide feedback on CB On and Alarm status. If this feedback is provided, C445 will issue a control fault if the commanded state does not match the feedback signal. The parameter “Feedback Signal Source” selects where the inputs are wired to the C445. Options include the Base Control Module, the Control User Interface or to a controller where they are sent to the C445 via a communication network. For all three locations these input feedback signals may be wired, the actual input or bit is pre-defined for each as follows.

- 0 – No Feedback Source
- 1 – Base Control Module: Input 2 (CB On), Input 3 (CB Alarm)
- 2 – Control User Interface (C445UC.): Input 2 (CB On), Input 3 (CB Alarm)
- 3 – Input Register 602 from a controller: Bit 1 (CB On) and Bit 2 (CB Alarm)

Figure 99. Timing Diagram for MCCB Feeder Operation Mode



The C445 will issue a control fault when:

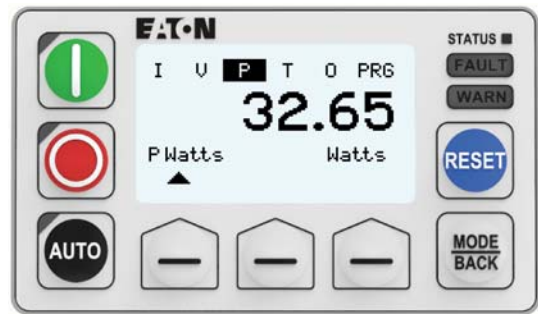
- An Open command is active and the CB On feedback input is true.
- The CB On & CB Alarm feedback inputs are both “high” at same time.
- Current is detected after an open command.
- A Close command is active and the CB On feedback input is false.

When the C445 experiences a fault/inhibit condition Output 2 will be activated for the programmed pulse width to open the breaker feeder.

- Output 1 – close control (NO)
- Output 2 – open control (NO)
- Output 3 – open for user configuration and their function can be selected by the user.

Recommended User Interface Options for the MCCB Feeder Operation Mode

Figure 100. C445UM: Monitoring User Interface



The Monitoring User Interface can be used with any operation mode. If selected as a local control source, the User Interface Start (Close) and Stop buttons are enabled in MCCB Feeder Mode. Users may optionally disable local Start (Close) or reset functionality if desired.

C445UM may still be used in MCCB Feeder if the User Interface is not the local control source. Start, Stop and Auto buttons will be disabled. If pressed, the screen will notify the user that this functionality is not enabled. Control Status LEDs indicating running, stopped and Auto status will still function.

Control Settings

The following parameters are used to configure the MCCB Feeder Operation Mode and the C445 sources of control.

Table 20. MCCB Configuration Parameters

| Configuration Parameter | Modbus Register | Description | Read/Write |
|---|-----------------|--|------------|
| Active Operation Mode ^① | 700 | This parameter selects the Operation Mode | R/W |
| Control Fault Delay | 701 | Delay time before a control fault is issued. Setting of "0" disables protection. | R/W |
| MCCB Actuation Enable | 705 | Enable/disables the actuation control for the MCCB feeder control profile | R/W |
| Actuation Pulse Width | 706 | Minimum required motor operator control signal pulse width (in 1ms) | R/W |
| Motor#1 Overload FLA Scaled | 900 | Parameter can be used to set load limits | R/W |
| Motor Overload Trip FLA | 500 | Parameter holds the active load rating | R |
| Trip Enable Bit Field | 1000-1001 | Trip (Fault) protection enable bits Set bits to enable desired protections | R/W |
| Warn Enable Bit Field | 1002-1003 | Warning protection enable bits Set bits to enable desired protections warnings | R/W |
| C445 Local Source Selector ^① | 711 | Select the Local Control source. | R/W |
| C445 Remote Source Selector | 712 | Select the Remote Control source. | R/W |
| C445 Feedback Signal Source Selector | 713 | Input source of the feedback signals 0 – No feedback source 1 – User interface inputs 2 – Base control inputs 3 – Fieldbus parameter | R/W |
| C445 Q3 Output function select ^① | 717 | Output 3 user function selection | R/W |
| FieldBus Input Feedback Register | 602 | Feedback input parameter to write the status of the feedback signals when MCCB aux switches are connected to the inputs | R/W |

Note

^① Soft reset (power cycle) required for changes to these parameters to take effect.

Fieldbus Control Word

The MCCB feeder control profile will accept the following control commands over a fieldbus network.

Control Bits

- Bit 0/1 0 = Open command, activate Output 2 for pulse width
1 = Close command, activate Output 1 for pulse width
- Bit 2 This bit can be used to switch between Local and Remote from the network when the Allow Remote Control Switch parameter is enabled.
- Bit 3 0 = No action
1 = Reset fault (will clear fault provided condition has cleared)
- Bit 5 0 = No action
1 = The C445 will issue a "Test Trip" fault causing the Output 2 control relay to produce an output pulse to open the MCCB feeder.

Control Status Word

The control status word of the MCCB feeder control profile can be accessed over the fieldbus network.

Status Bits

- Bit 0 0 = Open (open command is active)
1 = Close (close command is active)
- Bit 1 0 = circuit breaker not in tripped position (CB alarm = false)
1 = circuit breaker in tripped position (CB alarm = true)
- Bit 2 0 = local control source active
1 = remote control source is active
- Bit 3 0 = no fault present
1 = C445 fault present
- Bit 4 0 = no warning present
1 = C445 warning present
- Bit 5 0 = no inhibit present
1 = C445 control inhibit present
- Bit 6 0 = C445 not ready (fault and/or inhibit present)
1 = C445 ready for control (No fault or inhibit present)
- Bit 7 0 = MCCB feeder is in open/tripped position (CB on = false)
1 = MCCB feeder is in closed position (CB on = true)

Wiring Diagrams for the MCCB Feeder Operation Mode

Figure 101. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power

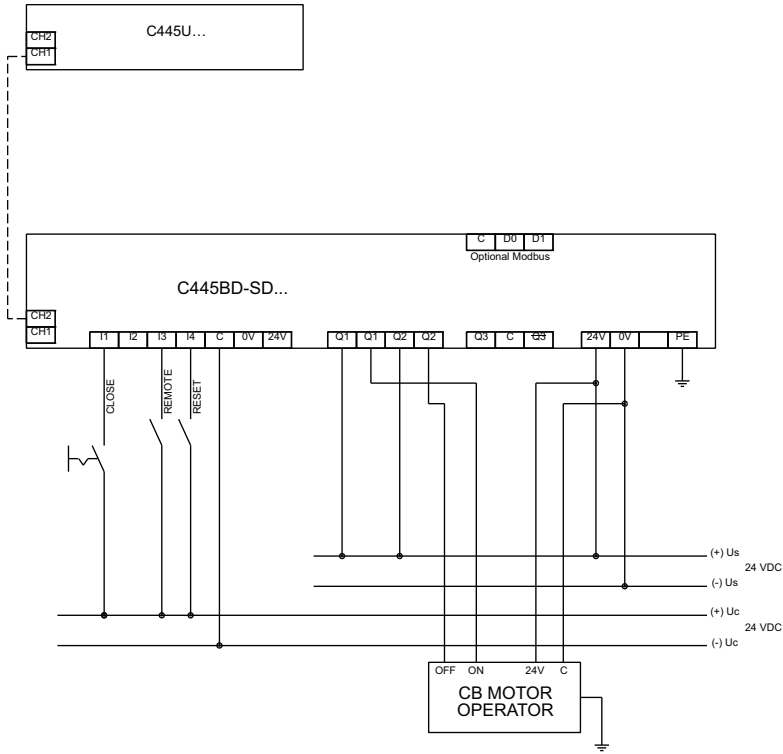


Figure 102. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power

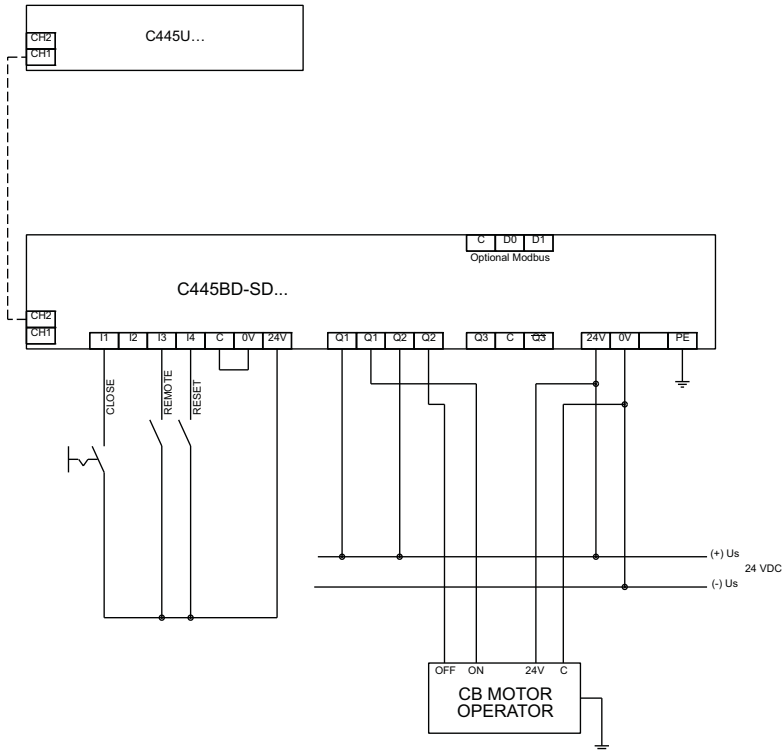
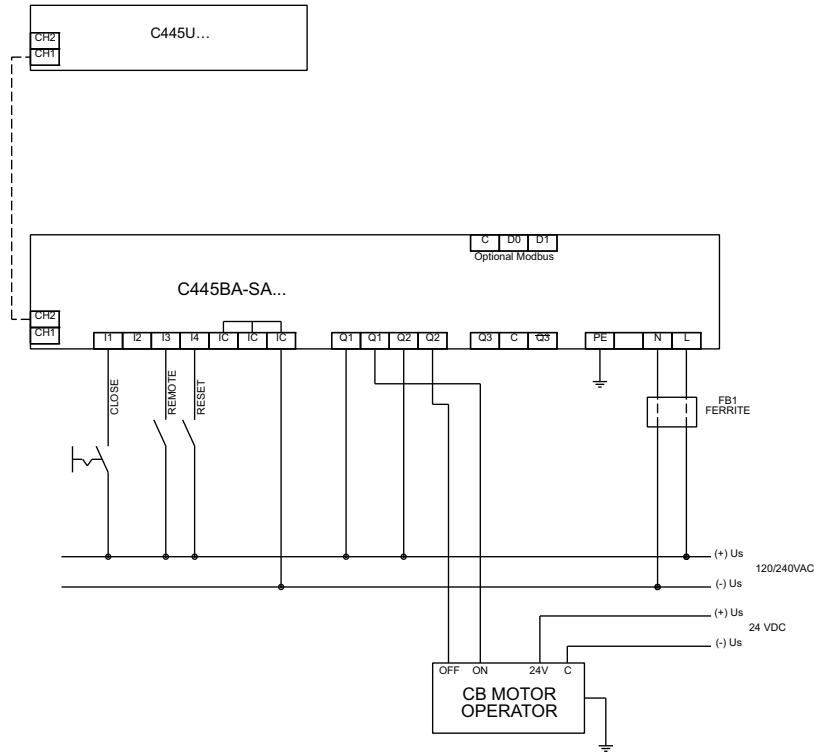


Figure 103. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power**Notes:**

1. The inputs on the Base Control Module are only used by this Operation Mode if Fieldwire is selected for one of the control sources. If Fieldwire is not the Local or Remote control source, all 4 inputs may be used as general purpose inputs or can be selected as the feedback source for the CB aux contacts.
2. Output 3 may be used as general purpose output for this Operation Mode.
3. If Fieldwire is the Local control source, Input 3 is the Remote input. When power is applied to Input 3, the C445 will be in Remote mode.
4. If fieldwire is the Remote control source and 2-wire control (default) is selected, Inputs 2 and 3 are unused by this operation mode. They can be used as general purpose or selected as the feedback source for the CB aux contacts.
5. Fusing: Although C445 product listings do not require fusing on the high impedance line voltage measurement inputs, it may be necessary to provide overcurrent protection of the supply leads in accordance with applicable final installation specific local, state and national electrical codes.
6. C445UC... control user interfaces offer 4 additional 24 Vdc digital inputs for general purpose use. Inputs 2 and 3 can optionally be used as the feedback source for the CB aux contacts.

Contactor Feeder Operation Mode

The Contactor Feeder operation mode accepts open/close commands to control the contactor in a feeder application.

A close command will activate Output 1. An open command will de-activate Output 1.

- In this mode, an input can be used to accept feedback on contactor on status from an Aux contact. If this feedback is provided, C445 will issue a control fault if the commanded state does not match the feedback signal. The parameter “Feedback Signal Source” selects where the inputs are wired to the C445. Options include the Base Control Module, the Control User Interface or to a controller where they are sent to the C445 via a communication network. For all three locations these input feedback signals may be wired, the actual input or bit is pre-defined for each as follows.

- 0 – No Feedback Source
- 1 – Base Control Module: Input 2 (Aux On)
- 2 – Control User Interface (C445UC.): Input 2 (Aux On)
- 3 – Input Register 602 from a controller: Bit 1 (Aux On)

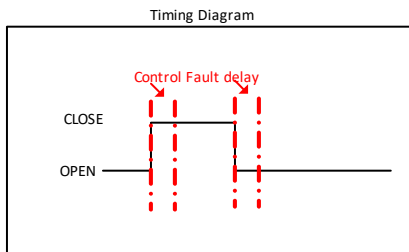
The C445 will issue a control fault when:

- An Open command active and the Aux On feedback input is true.
- Current is detected after an open command.
- A Close command is active and the Aux On feedback input is false.

When the C445 experiences a fault/inhibit condition Output 1 will be de-activated to open the feeder.

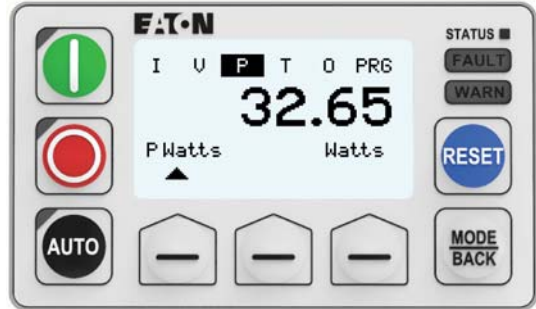
- Output 1 – feeder contactor coil (NO)
- Outputs 2 and 3 – open for user configuration and their function can be selected by the user.

Figure 104. Timing Diagram for the Contactor Feeder Operating Mode



Recommended User Interface Options for the Contactor Feeder Operating Mode

Figure 105. C445UM: Monitoring User Interface



The Monitoring User Interface can be used with any operation mode. If selected as a local control source, the User Interface Start (Close) and Stop buttons are enabled in Contactor Feeder Mode. Users may optionally disable local start (close) or reset functionality if desired.

C445UM may still be used in Contactor Feeder if the User Interface is not the local control source. Start, Stop and Auto buttons will be disabled. If pressed, the screen will notify the user that this functionality is not enabled. Control Status LEDs indicating running, stopped and Auto status will still function.

Control Settings

The following parameters are used to configure the Contactor Feeder Application Mode and the C445 sources of control.

Table 21. Contactor Feeder Configuration Parameters

| Configuration Parameter | Modbus Register | Description | Read/Write |
|---|-----------------|--|------------|
| Active Operation Mode ^① | 700 | This parameter selects the Operation Mode | R/W |
| Control Fault Delay | 701 | Delay time before a control fault is issued. Setting of "0" disables protection. | R/W |
| Motor#1 Overload FLA Scaled | 900 | This parameter can be used to set load limits | R/W |
| Motor Overload Trip FLA | 500 | This parameter contains the active load rating | R |
| Trip Enable Bit Field | 1000-1001 | Trip (Fault) protection enable bits Set bits to enable desired protections | R/W |
| Warn Enable Bit Field | 1002-1003 | Warning protection enable bits Set bits to enable desired protections warnings | R/W |
| C445 Local Source Selector ^① | 711 | Select the Local Control source. | R/W |
| C445 Remote Source Selector | 712 | Select the Remote Control source. | R/W |
| C445 Feedback Signal Source Selector | 713 | Input source of the feedback signals 0 – No feedback source 1 – User interface inputs 2 – Base control inputs 3 – Fieldbus parameter | R/W |
| C445 Q2 Output function select ^① | 716 | Output 2 user function selection | R/W |
| C445 Q3 Output function select ^① | 717 | Output 3 user function selection | R/W |
| FieldBus Input Feedback Register | 602 | Feedback input parameter to write the status of the feedback signals when aux switches are connected to the inputs. | R/W |

Note

^① Soft reset (power cycle) required for changes to these parameters to take effect.

Fieldbus Control Word

The contactor feeder control profile will accept the following control commands over a fieldbus network.

Control Bits

- Bit 0 0 = Open command, de-activate Output 1
1 = Close command, activate Output 1
- Bit 2 This bit can be used to switch between Local and Remote from the network when the Allow Remote Control Switch parameter is enabled.
- Bit 3 0 = No action
1 = Reset fault (will clear fault provided condition has cleared)
- Bit 5 0 = No action
1 = The C445 will issue a "Test Trip" fault de-activating the Output 1 control dropping out the contactor feeder.

Control Status Word

The control status word of the contactor feeder control profile can be accessed over the fieldbus network.

Status Bits

- Bit 0 0 = Open (open command is active)
1 = Close (close command is active)
- Bit 2 0 = local control source active
1 = remote control source is active
- Bit 3 0 = no fault present
1 = C445 fault present
- Bit 4 0 = no warning present
1 = C445 warning present
- Bit 5 0 = no inhibit present
1 = C445 control inhibit present
- Bit 6 0 = C445 not ready (fault and/or inhibit present)
1 = C445 ready for control (No fault or inhibit present)
- Bit 7 0 = feeder not in closed position (aux on = false)
1 = feeder is in closed position (aux on = true)

Wiring Diagrams for the Contactor Feeder Operation Mode

Figure 106. Isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc Power

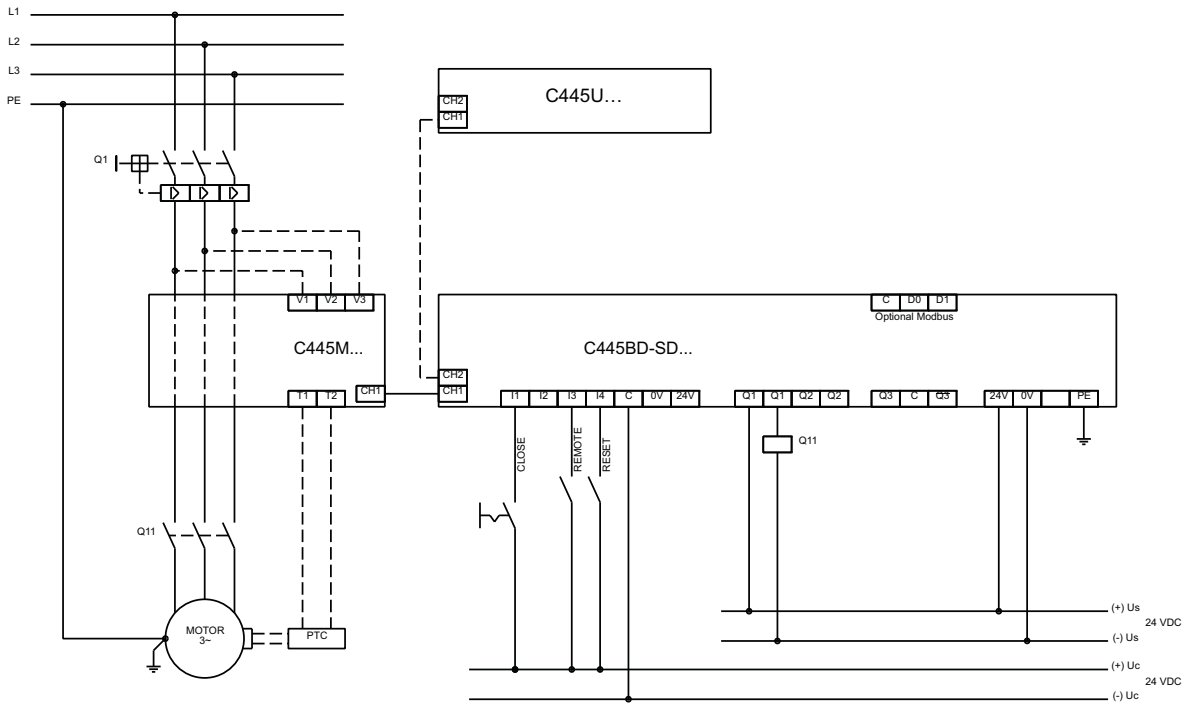


Figure 107. Non-isolated 24 Vdc Inputs/24 Vdc Outputs/24 Vdc C445 Power

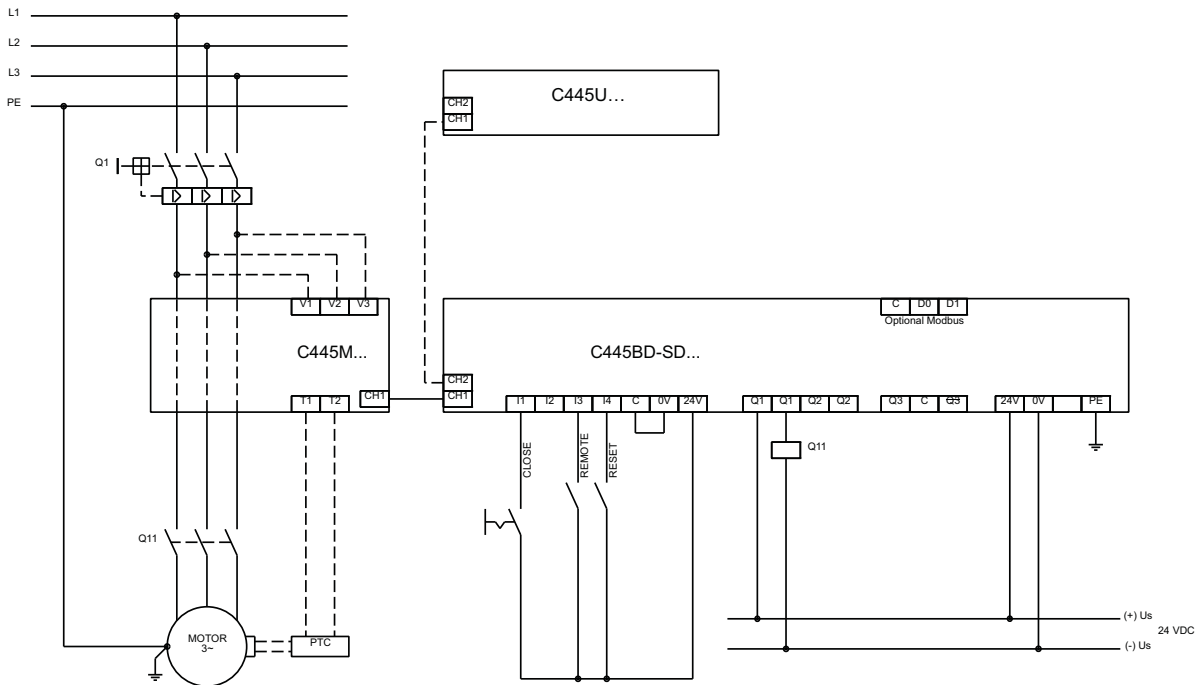
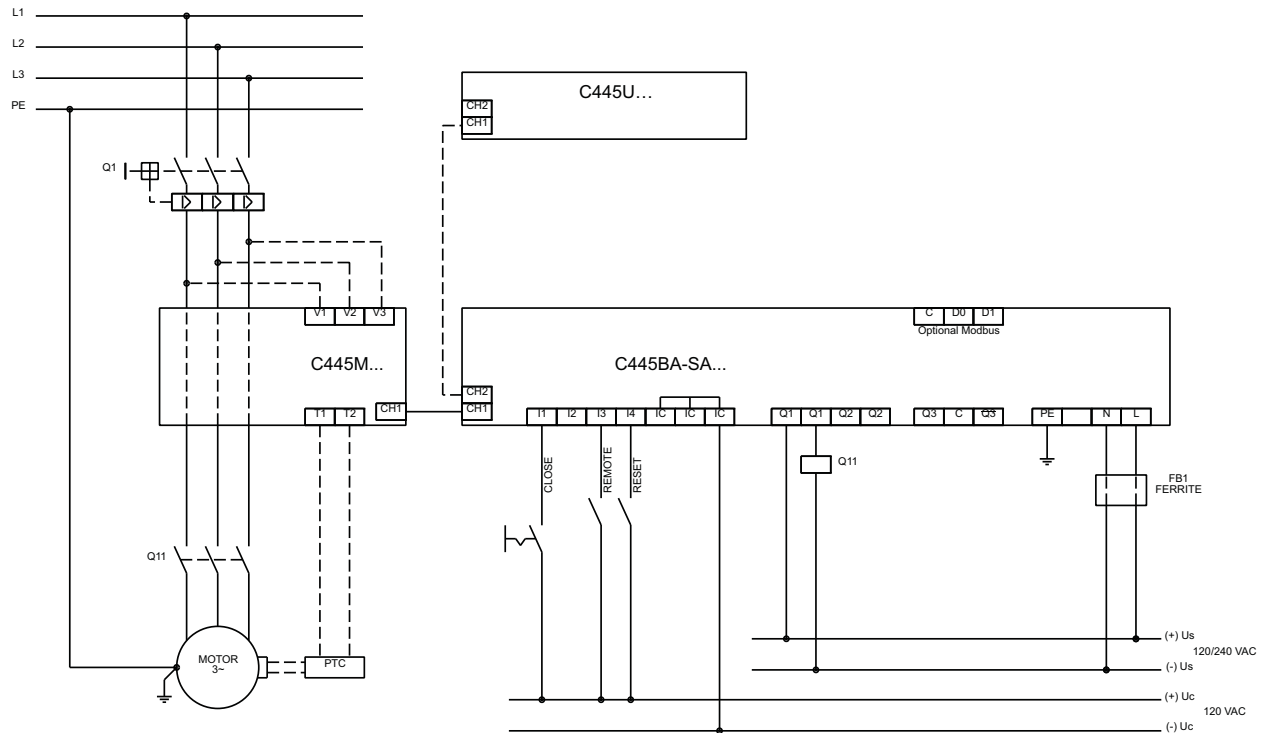


Figure 108. 120 Vac Inputs and 120/230 Vac Outputs/C445 Power**Notes:**

1. The inputs on the Base Control Module are only used by this Operation Mode if Fieldwire is selected for one of the control sources. If Fieldwire is not the Local or Remote control source, all 4 inputs may be used as general purpose inputs or can be selected as the feedback source for the feeder's aux_on contact.
2. Outputs 2 and 3 may be used as general purpose outputs for this Operation Mode.
3. If Fieldwire is the Local control source, Input 3 is the Remote input. When power is applied to Input 3, the C445 will be in Remote mode.
4. If Fieldwire is the Remote control source and 2-wire control (default) is selected, Inputs 2 and 3 are unused by this operation mode. Either may be used as the feedback source for the feeder's aux_on contact.
5. Fusing: Although C445 product listings do not require fusing on the high impedance line voltage measurement inputs, it may be necessary to provide overcurrent protection of the supply leads in accordance with applicable final installation specific local, state and national electrical codes.
6. C445UC... control user interfaces offer 4 additional 24 Vdc digital inputs for general purpose use. An input can also be used as the feedback source for the feeder's aux_on contact.

General Purpose Input / Output Operation Mode

The C445 can operate as general purpose I/O providing the user 4 discrete inputs and 3 discrete outputs that can be controlled over a fieldbus network.

The inputs on the Base Control Module are not used by this Operation Mode. All 4 inputs may be used as general purpose inputs.

No User Interface overlays are supported by this operation mode.

Outputs 1, 2 and 3 – open for user configuration and their function can be selected by the user.

Control Settings

The following parameters are used to configure the General Purpose IO Operation Mode and the C445 sources of control.

Table 22. Configuration Parameter

| Configuration Parameter | Modbus Register | Description | Read/Write |
|----------------------------------|-----------------|--|------------|
| Active Operation Mode ① | 700 | This parameter selects the Operation Mode | R/W |
| Trip Enable Bit Field | 1000-1001 | Trip (Fault) protection enable bits Set bits to enable desired protections | R/W |
| Warn Enable Bit Field | 1002-1003 | Warning protection enable bits Set bits to enable desired protection warnings | R/W |
| C445 Local Source Selector ① | 711 | Set to “1” no local control | R/W |
| C445 Remote Source Selector | 712 | Set to “1” Fieldbus is remote control | R/W |
| C445 Q1 Output function select ① | 715 | Output 1 user function selection | R/W |
| C445 Q2 Output function select ① | 716 | Output 2 user function selection | R/W |
| C445 Q3 Output function select ① | 717 | Output 3 user function selection | R/W |

Note

① Soft reset (power cycle) required for changes to these parameters to take effect.

Fieldbus Control Word

The General Purpose IO control profile will accept the following control commands over a fieldbus network.

Control Bits

- Bit 3 0 = No action
1 = Reset fault (will clear fault provided condition has cleared)
- Bit 5 0 = No action
1 = The C445 will issue a “Test Trip” fault (general purpose outputs are not affected by Test Trip)

Control Status Word

The control status word of the General Purpose IO profile can be accessed over the fieldbus network.

Status Bits

- Bit 2 0 = local control source active
1 = remote control source is active
- Bit 3 0 = no fault present
1 = C445 fault present
- Bit 4 0 = no warning present
1 = C445 warning present
- Bit 5 0 = no inhibit present
1 = C445 control inhibit present
- Bit 6 0 = C445 not ready (fault and/or inhibit present)
1 = C445 ready for control (No fault or inhibit present)

General Field Output Control Word

The general purpose output can be activated/de-activated over a fieldbus network.

Output Control Bits

- Bit 0 0 = de-activate the Output 1
1 = activate the Output 1
- Bit 1 0 = de-activate the Output 2
1 = activate the Output 2
- Bit 2 0 = de-activate the Output 3
1 = activate/set the Output 3
- Bit 3 0 = No action
1 = Output 3 latching relay reset

Note: The Outputs can be configured to be controlled by any of the bits of this control word. The above designations are showing the most common usage.

General Input Status Word

The general purpose inputs status over a fieldbus network.

Input Status Bits

- Bit 0 0 = base unit input 1 off
1 = base unit input 1 on
- Bit 1 0 = base unit input 2 off
1 = base unit input 2 on
- Bit 2 0 = base unit input 3 off
1 = base unit input 3 on
- Bit 3 0 = base unit input 4 on
1 = base unit input 4 off
- Bit 4 0 = control user interface input 1 off
1 = control user interface input 1 on
- Bit 5 0 = control user interface input 2 off
1 = control user interface input 2 on
- Bit 6 0 = control user interface input 3 off
1 = control user interface input 3 on
- Bit 7 0 = control user interface input 4 off
1 = control user interface input 4 on

Stand Alone Ground Fault Module

Description

The C445 system may be configured as a standalone system whereas only ground fault monitoring and indication is enabled. In such a configuration, a C445B... base module is coupled to an External Ground Fault Module connected to the appropriate sized CT to transmit monitoring information via a network. A C445M... measurement module and/or a C445UM user interface module may be added to provide local indication, control, and protection.

C445 outputs:

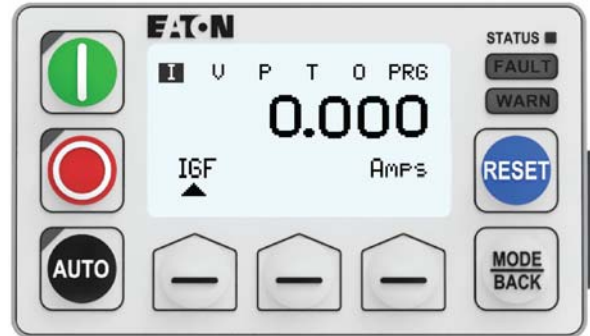
- Output 1 and 2 are general purpose outputs
- Output 3 is default as the ground current trip relay

When the C445 Motor Management relay is powered on for the first time with the External Ground Fault Module, output 3 will default as the ground trip relay.

If a different output relay is desired for this operation, outputs 1, 2 and 3 – open for user configuration and their function can be selected by the user.

Recommended User Interface Options for the Stand Alone Ground Fault Module Mode

Figure 109. C445UM: Monitoring User Interface



The Monitoring User Interface can be used with any operation mode. In Stand Alone Ground Fault Mode, the Start and Stop buttons will be disabled. If a user presses a Control button, the screen will notify them that the functionality is not enabled. The Reset button will still function but can be disabled if desired in User Interface Settings. Monitoring, Navigation, and Parameter settings are all available. Test Trip is also available in PRG R Service.

Table 23. Stand Alone Ground Fault Module Configuration Parameters

| Configuration Parameter | Modbus Register | Description | Read/Write |
|----------------------------------|-----------------|---|------------|
| Active Operation Mode ① | 700 | This parameter selects the Operation Mode. | R/W |
| Trip Enable Bit Field | 1000–1001 | Trip (Fault) protection enable bits Set bit #3 to enable protection. | R/W |
| Warn Enable Bit Field | 1002–1003 | Warning protection enable bits Set bit #3 to enable protection warning. | R/W |
| GF Trip Level Scaled | 1060 | Ground Fault Trip Level, if exceeded, will generate a trip of the motor following the Ground Fault Trip Delay time. | R/W |
| GF Alarm Level Scaled | 1061 | Ground Fault Alarm Level, if exceeded, will generate a warning following the Alarm Delay Time. | R/W |
| GF Protection Start Delay | 1062 | Delay when motor is first started to inhibit raising a ground fault trip condition until this time expires. | R/W |
| GF Trip Debounce | 1063 | Ground current must exceed threshold for debounce time before a trip occurs. | R/W |
| GF Protection Inhibit Current | 1064 | Ground Fault Protection Inhibit Current, if selected the GF Inhibit will be used. | R/W |
| GF Trip Delay | 1093 | Delay Trip, once trip is detected, the delay timer starts and when expired will fault the C445. | R/W |
| C445 Local Source Selector ① | 711 | Set to "1 no local control | R/W |
| C445 Remote Source Selector ① | 712 | Set to "1" Fieldbus is remote control | R/W |
| C445 Q1 Output function select ① | 715 | Output 1 user function selection | R/W |
| C445 Q2 Output function select ① | 716 | Output 2 user function selection | R/W |
| C445 Q3 Output function select ① | 717 | Output 3 user function selection | R/W |

Note

① Requires soft reset.

Fieldbus Control Word

The Stand Alone Ground Fault Module profile will accept the following control commands over a fieldbus network.

Control Bits

- Bit 3 0 = No action
1 = Reset fault (will clear fault provided condition has cleared)
- Bit 5 0 = No action
1 = The C445 will issue a "Test Trip" fault causing the ground current trip relay (Output 3 default) to close.

Control Status Word

The control status word of the Stand Alone Ground Fault Module profile can be accessed over the fieldbus network.

Status Bits

- Bit 2 0 = Local control source active
1 = Remote control source active
- Bit 3 0 = No fault present
1 = C445 fault present
- Bit 4 0 = No warning present
1 = C445 warning present
- Bit 5 0 = No inhibit present
1 = C445 control inhibit present
- Bit 6 0 = C445 not ready (fault and/or inhibit present)
1 = C445 ready for control (No fault or inhibit present)

Chapter 6—Motor Protection

Introduction

The Power Xpert C445 is capable of providing fully configurable intelligent motor protection. Programming the numerous protection parameters can be accomplished through a variety of methods including the monitoring user interface, Power Xpert *inControl* Software tool, communication networks, or built-in Web Pages (Ethernet options only).



WARNING

The C445 may reset at any time enabling a motor start.

The Base Control Module monitors motor current, supply voltage, power, and frequency to provide advanced motor protection. The software contained in the Base Control Module is central to the monitoring of a wide range of motor and load functionality. In this section, various features and protection options are described.

The purpose of this section is to provide detailed information regarding the trip and alarm thresholds and time delays of the warning functions of the monitoring user interface, Power Xpert *inControl* Software tool, communication networks, or built-in Web Pages (Ethernet options only).

Configuration Parameter Locking

The configuration parameters can be locked for three sets of registry values.

- Motor-running Lock
- Administrator Lock
- USB Lock

Each lock will prevent the changing of select parameters unless a password is entered. A password may be created for each lock separately using any number from 1 to 4,294,976,295. Setting the password to 0 will result in the lock being disabled.



CAUTION

Record all passwords in a safe location. Once a password has been set it cannot be displayed. If a password is forgotten the only method of resetting the password(s) is a factory reset.

For a list of the parameters that will be included for each of the three locks, refer to **Appendix D – Modbus Register Map**.

Motor Running Lock

When the motor is commanded to run and/or there is motor current flowing, this feature will lock selected parameters. Any attempt to write values to those parameters will be ignored. An error exception code will be returned to the sender. Reading the values is allowed. When parameters are not locked, reads and writes follow normal behaviors.

Using the C445UM user interface or the Power Xpert *inControl* Software Tool, navigate to the following parameter:

- Param Lock – to set the password (default 0). Register 5009
- Param Lock – to login (enter password). Register 5010.

Note: The Motor Running Lock parameter Param Lock will display a value of 0 if a no password has been programmed into the unit (default). If the C445 has been programmed with a password, a value of 0 will be displayed if logged out, or a value of 4,294,976,295 will be displayed when logged in, in order to obscure the set password value.

Administrator Lock

This feature sets an administrative password to lock selected parameters. Any attempt to write values to locked parameters will be ignored. An error exception code will be returned to the sender. Reading the values is allowed. When parameters are not locked, reads and writes follow normal behaviors.

Using the C445UM user interface or the Power Xpert *inControl* Software Tool, navigate to the following parameter. Password settings are in the PRG → Security menu in C445UM.

Admin Password – to set the password (default 0). Register 5000

Admin Password – to login (enter password). Register 5002

Note: The Administrator Password parameter Admin Password will display a value of 0 if a no password has been programmed into the unit (default). If the C445 has been programmed with a password, a value of 0 will be displayed if logged out, or a value of 4,294,976,295 will be displayed when logged in, in order to obscure the set password value.

USB Lock

This feature sets a password on USB communication access. Other communications are not locked.

Any attempt to write values to locked parameters will be ignored. An error exception code will be returned to the sender. Reading the values is allowed. When parameters are not locked, reads and writes follow normal behaviors.

Using the C445UM user interface or the Power Xpert *inControl* Software Tool, navigate to the following parameter. Password settings are in the PRG → Security menu in C445UM.

USB Password – to set the password (default 0). Register 5004

USB Password – to login (enter password). Register 5006

Note: The USB Password parameter USB Password will display a value of 0 if a no password has been programmed into the unit (default). If the C445 has been programmed with a password, a value of 0 will be displayed if logged out, or a value of 4,294,976,295 will be displayed when logged in, in order to obscure the set password value.

Fault Trip, Fault No Trip and Fault Warning

A Fault Trip event occurs when any enabled protective parameter causes motor stoppage. A Fault Trip must be corrected or cleared, before the C445 can enable return to running operation.

A Fault No Trip event may be configurable for all protections or combination of protections. When “Fault No Trip” is configured for a protection, the C445 shall perform the same protection logic as a “Fault trip” except the C445 shall not stop the motor when the fault is issued.

A Fault Warning message will remain as long as the fault condition is active. When the condition clears the Fault Warning message is removed. A Fault Warning reset is not required. There are five protection Fault Warnings that will change to Fault Trip status if the RUN command is active during the time in which Fault Warning occurs.

- Backspin
- Undervoltage
- Overvoltage
- Voltage Imbalance
- Starts Per Hour

All other protections have Fault Trip parameters that may be enabled or disabled. Any parameter set to Fault and Fault No Trip will require a reset when the trip condition occurs. Fault Trip parameters may be configured to enable an automatic restart when the Fault Trip condition clears or is reset. Motor status will indicate a Fault trip or Fault Warning condition. Then the Active Fault and Active Inhibit registers will indicate the reason for the motor stop.

Fault Trip and Fault No Trip are both written to the fault queue and both appear in the Fault Snapshot. Warnings are not written to the queue or the snapshot.

Register 312: Active Fault will indicate faults that must be cleared. Both user interface families will indicate a fault or warning condition is present with the FAULT/WARN LEDs. The C445UM monitoring user interface will also immediately provide a complete fault description with access to the trip snapshot and fault queue.

Note: Register 312: Active Fault and Value 25: Communication Loss on Active Fieldbus, may be configured to stop the operation of the C445 but not cause a fault. In this case when communications resume, the C445 will not need to be reset.

This behavior can also be modified in the user interface by going to PRG → Operation Mode → Comm Loss Behavior and Comm Idle Behavior.

Motor Control Operation

The Base Control Module monitors the motor during periods of normal operation (see **Table 24**). Normal operation includes the Start cycle, Run cycle, and Stop cycle. A Fault Trip event prior to the RUN command will prevent a motor start. A Fault Trip event during the Start cycle will abort the Start attempt, and a Fault Trip event during RUN will cause a motor coast-to-stop. For example, the mains voltage may dip due to the starting load imposed by the motor Start cycle. If the dip causes a Fault Trip, the Start cycle will be aborted and the motor will coast-to-stop.

Note: The thermal overload and residual ground fault functions are active at all times.

Start Cycle and Transition Timing

Motor Start, Motor Stop, and Motor Transition parameters are used by the C445 to recognize modes of operation for protection functions. The Transition Threshold does not control any external devices, but only changes protection/operation parameters based on Start or Run profiles. The following figure shows an example of how the C445 recognizes the stages in a normal operating-cycle current profile. Initially, the motor is stopped and the current is zero. As long as the C445 is not in a Fault Trip condition, it will permit contactor energization by closing its trip contact in series with the contactor coil. The contactor can be energized by the operator or by a Modbus command. The C445 recognizes a motor Start when it measures motor current exceeding 30% of the FLA setting. A motor Stop is recognized when the current falls below 5% of FLA. During the Start cycle the C445 detects a transition point, when the large starting currents have fallen below a transition level. The parameters that control the transition profile are defined below.

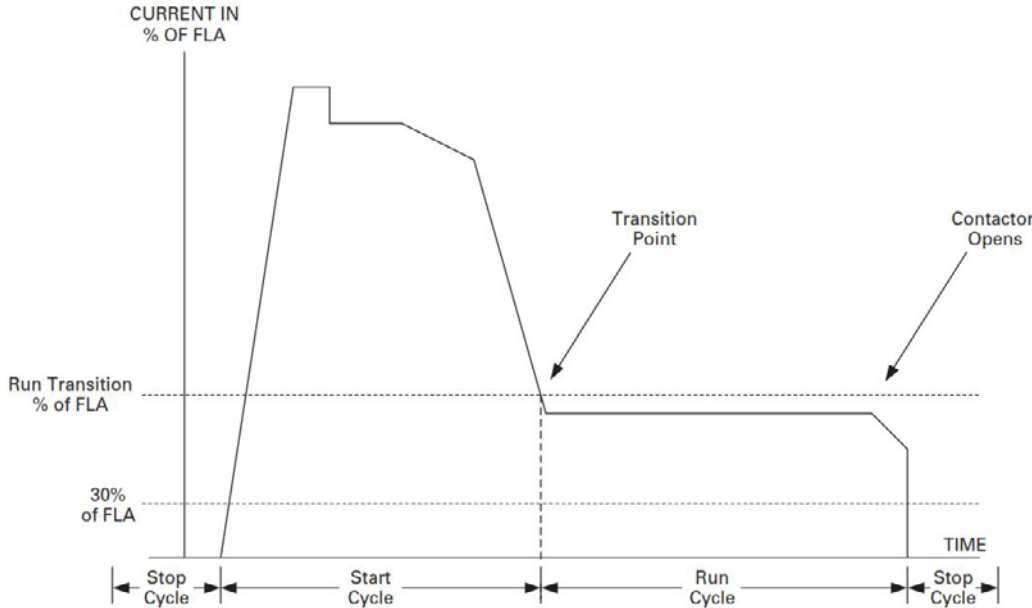
Note: The C445 transition from the Start cycle to the Run cycle is based on set time or current value, whichever occurs first.

Note: The start cycle time limit is also used as the stall inhibit time. See Stall protection for details.

Table 24. Parameters That Control the Transition Profile

| Parameter | Units | Increment | Minimum | Maximum | Default | Notes |
|------------------------------------|-------|-----------|---------|---------|---------|------------------------|
| Motor Transition Threshold Percent | % | 1% | 25 | 200 | 115% | Modbus Register = 1086 |
| Motor Start Threshold Percent | % | 1% | 1 | 100 | 30% | Modbus Register = 1084 |
| Motor Stop Threshold Percent | % | 1% | 1 | 50 | 5% | Modbus Register = 1085 |
| Start Cycle Time | s | 1% | 2 | 360 | 10% | Modbus Register = 1078 |

Figure 110. Start Cycle and Transition Timing



Motor Thermal Overload

The Overload function models the thermal characteristics of a motor and generates a Fault Trip event that de-energizes the motor before motor damage will occur. This is intended to protect the motor and power wiring from excessive current. Trip curves are defined by applicable agency standards. The trip class for any particular Overload class is user adjustable. When the FLA is entered for the motor, the thermal capacity value will be calculated to model the motor temperature during motor operation. Thermal capacity can be characterized by the calculated value representing the relative position with regard to the Trip Class curve. For example; a motor running at a thermal capacity value of 85% is much closer to an Overload Fault Trip than the same motor running at a thermal capacity value of 25%.

The following items are associated with the electronic Overload function of the C445.

- An Overload Fault Trip will occur when the calculated thermal capacity reaches 100%.
- An Overload Fault Trip cannot be cleared by power cycling the device – the thermal capacity calculated value is stored in non-volatile memory.

- Two thermal capacity models are used. One model is enabled while the coil is energized (motor is running) and a second model is enabled while the coil is de-energized (motor stopped). The second model has a longer time constant.
- A RESET button is located on the Base Control Module and the User Interface. Depressing this button will clear any Overload fault that has been latched, but is no longer present (thermal capacity must be less than 75%). Resets can also be initiated through the communication port.
- An auto-reset option is available. This provision enables the unit to automatically reset when the fault has cleared.

CAUTION

In the Auto Reset mode, caution must be exercised to assure that any restart occurs in a safe manner. Auto Reset mode should not be used in environments where excessive restart attempts may cause component damage and/or create unsafe conditions.

Figure 111. Overload Trip Curves—Cold Coil (–40 °C to +60 °C)

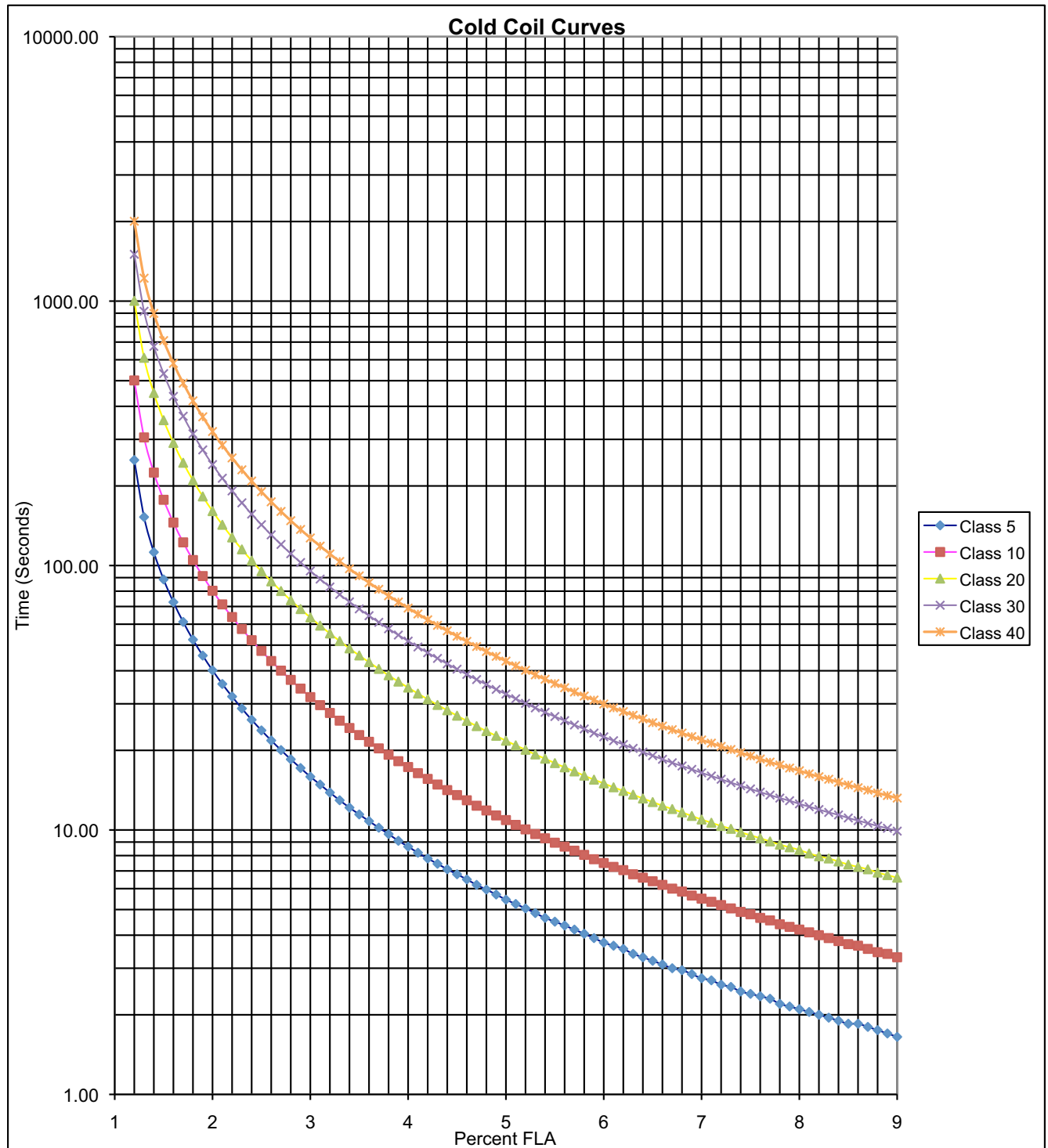
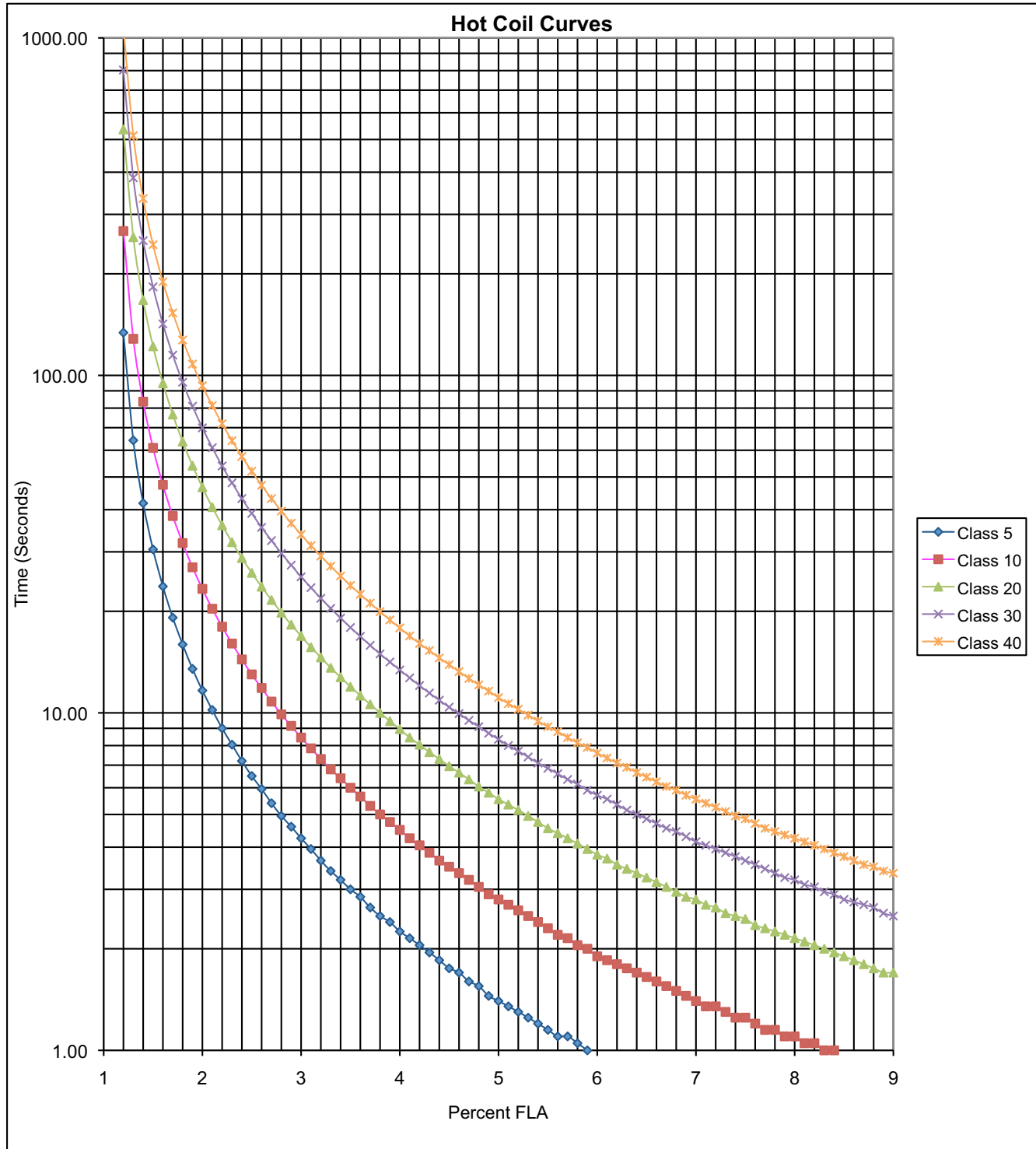


Figure 112. Overload Trip Curves—Hot Coil (–40 °C to +60 °C)



The thermal overload is designed to protect the motor from overheating caused by excessive current. If the motor is overloaded, the current level may rise above motor FLA and heats the motor.

The FLA sets the trip threshold and the trip class (5 to 40) is set with Overload Trip Class.

The trip class settings of the C445 motor management relay are suitable for both normal start-ups as well as for heavy duty starting. The Trip Class setting enables a particular tripping characteristic to be selected. These are the following:

 **CAUTION**

The motor, the wiring diameter and the switching device(s) must be suitable for the selected Trip Class.

 **CAUTION**

The current-dependent protective device must be selected so that not only is the motor current monitored but the blocked motor is switched OFF within the temperature rise time.

The thermal memory and the reset inhibit time are saved to the non-volatile memory. Cycling power on the device will NOT clear the thermal Fault Trip nor reset the thermal capacity stored in non-volatile memory. These values are reloaded when the device boots and the timer is restarted at the full reset time. This means if the 3 minute inhibit timer has been running for two minutes, cycling power will require the user to wait the full three minutes before a reset can clear the overload fault.

Note: The trip curves are based on a 115% Service Factor rating.

Application Configuration

Basic Parameters

Application dependent parameters need to be configured so that the monitoring and protection functions can be implemented.

The C445UM Monitoring User Interface and Power Xpert *inControl* software tool both walk users through an easy Setup Wizard for these parameters.

Table 25. Basic Parameters

| Parameter | Units | Increment | Minimum | Maximum | Default | Notes |
|-----------------|-------|-----------|---------|---------|---------|------------------------|
| FLA Motor1 | amps | 1 | 1 ① | 65535 ① | 101 ① | ModBus Register = 900 |
| FLA Motor2 | amps | 1 | 1 ② | 65535 ② | 101 ② | ModBus Register = 901 |
| Trip Class | | 1 | 5 | 40 | 5 | ModBus Register = 1004 |
| Rated Voltage | volts | 1 | 100 | 5000 | 480 | ModBus Register = 903 |
| HP Motor1 | hp | 1 | 1 | 500000 | 2000 | ModBus Register = 909 |
| HP Motor2 | hp | 1 | 1 | 500000 | 2000 | ModBus Register = 911 |
| Rated Frequency | Hz | 1 | 50 | 60 | 60 | ModBus Register = 904 |
| Phase Order | | | ABC | ACB | ABC | |
| Watts Motor1 | watts | | | | | |
| Watts Motor2 | watts | | | | | |

Notes

- ① These values may change depending on MM selection.
- ② These values may change depending on MM use.

Advanced Parameters

Application dependent parameters are required for some advanced applications. Users must set PT or CT Ratios if external CTs or PTs are used. Additionally, users who want to utilize motor torque and efficiency monitoring should set Motor Rated Speed and Motor Rated Stator Resistance for higher accuracy.

Table 26. Advanced Parameters

| Parameter | Units | Increment | Minimum | Maximum | Default | Notes |
|-------------------------------|-------|-----------|---------|---------|---------|-----------------------|
| CT Ratio – Primary | amps | 1 | 1 | | 1 | Modbus Register = 918 |
| CT Ratio – Secondary | amps | 1 | 1 | | 1 | Modbus Register = 919 |
| PT Ratio Primary | V | 1 | 1 | | 1 | Modbus Register = 920 |
| PT Ratio Secondary | V | 1 | 1 | | 1 | Modbus Register = 921 |
| Motor Rated Speed Motor1 | RPM | 1 | 300 | 3600 | 1750 | Modbus Register = 914 |
| Motor Rated Speed Motor2 | RPM | 1 | 300 | 3600 | 1750 | Modbus Register = 915 |
| Motor Rated Stator Resistance | ohms | 1 | 1 | 0 | 280 | Modbus Register = 917 |

Overview of Protection Features

In general, motor protection features will be controlled by a number of user settable parameters. The possible parameters are as follows.

- Fault Trip Enable—Any Fault Trip can be turned ON or OFF.
- Fault Trip Level—Level of a measurement element that will begin the timing of the delay (start or run).
- Fault Trip Delay—These delays prevent momentary disturbances in the system from causing nuisance trips by allowing the C445 to “ride through” temporary Fault Trip events.
- Fault Warning Enable—Any trip warning can be turned ON or OFF.
- Fault Warning Level—Level of a measurement element that will begin the timing of the delay (start or run).
- Fault Warning Delay—This delay parameter prevents momentary disturbances in the system from causing nuisance Fault Warning messages. One parameter is used for all Fault Warnings. Note that Fault Warnings will expire when the fault condition(s) is no longer active.
- Start Delay—An option on selected protection types that will inhibit a fault trip condition during the motor starting cycle.

The Fault Trip and Fault Warning protective functions are organized into 4 categories:

- Current Based
- Voltage Based
- Power Based
- Advanced Protection and Monitoring Algorithms
 - Voltage Loss Restart
 - Motor Torque
 - Motor Efficiency
 - Energy Deviation

Current Based Protection Parameters

Table 27. Current Based Protections

| Fault Code | Protection | Action | Default Status | Fault Action | | Motor FLA | | | Delay (Seconds) | | |
|------------|--|---------------|----------------|--------------|--------------|-------------------|-------------------|-------------------|-----------------|----------|---------|
| | | | | Units | Note | Min. | Max. | Default | Min. | Max. | Default |
| 19 | Thermal Overload | Fault Trip | Enabled | Amps | C445MA2P4... | 0.3 | 2.4 | 0.3 | Class 5 | Class 40 | Class 5 |
| | | | | | C445MA005... | 1 | 5 | 1 | Class 5 | Class 40 | Class 5 |
| | | | | | C445MA032... | 4 | 32 | 4 | Class 5 | Class 40 | Class 5 |
| | | | | | C445MA045... | 5.6 | 45 | 5.6 | Class 5 | Class 40 | Class 5 |
| | | | | | C445MB072... | 9 | 72 | 9 | Class 5 | Class 40 | Class 5 |
| | | | | | C445MC090... | 11 | 90 | 11 | Class 5 | Class 40 | Class 5 |
| | | | | | C445MC136... | 17 | 136 | 17 | Class 5 | Class 40 | Class 5 |
| | | C445...ext | ext | 800 | ext | Class 5 | Class 40 | Class 5 | | | |
| | | Fault Warning | Disabled | % | | 1 | 100 | 90 | 0 | 0 | 0 |
| 7 | Instantaneous Overcurrent | Fault Trip | Disabled | % FLA | | 50 | 400 | 400 | 0.001 | 2 | 2 |
| | | Fault Warning | Disabled | % FLA | | 50 | 400 | 400 | 0.2 | 5 | 2 |
| 8 | Jam | Fault Trip | Disabled | % FLA | | 50 | 400 | 400 | 1 | 60 | 10 |
| | | Fault Warning | Disabled | % FLA | | 50 | 400 | 400 | 0.2 | 5 | 2 |
| 20 | Stall | Fault Trip | Disabled | % FLA | | 50 | 400 | 200 | 0 | 0 | 0 |
| 14 | Undercurrent | Fault Trip | Disabled | % FLA | | 10 | 90 | 50 | 1 | 60 | 20 |
| | | Fault Warning | Disabled | % FLA | | 10 | 90 | 50 | 0.2 | 5 | 2 |
| 6 | Current Unbalance | Fault Trip | Enabled | % | | 1 | 60 | 15 | 1 | 60 | 15 |
| | | Fault Warning | Disabled | % | | 1 | 60 | 15 | 0.2 | 5 | 2 |
| 10 | Phase Loss | Fault Trip | Enabled | % | | 60 | 60 | 60 | 2 | 2 | 2 |
| 4 | Ground Fault (earth) (Debounce time is in milliseconds) | Fault Trip | Enabled | Amps | C445MA2P4... | 0.12 | 2.4 | 1 | 0 | 60,000 | 5,000 |
| | | | | | C445MA005... | 0.25 | 5 | 3 | 0 | 60,000 | 5,000 |
| | | | | | C445MA032... | 1 ① | 9.6 | 3 | 0 | 60,000 | 5,000 |
| | | | | | C445MA045... | 1 ① | 13.5 | 3 | 0 | 60,000 | 5,000 |
| | | | | | C445MB072... | 3 ① | 21.6 | 3 | 0 | 60,000 | 5,000 |
| | | | | | C445MC090... | 3 | 27 | 3 | 0 | 60,000 | 5,000 |
| | | | | | C445MC136... | 34 | 40.8 | 34 | 0 | 60,000 | 5,000 |
| | | | | | C445...ext | 30% of CT Primary | 50% of CT Primary | 50% of CT Primary | 0 | 60,000 | 5,000 |

Note
① ABC wiring recommended.

Voltage Based Protection Parameters

Table 28. Voltage Based Protections

| Fault Code | Protection | Action | Default Status | Fault Action | | | Delay (Seconds) | | | |
|------------|---------------------|---------------|----------------|--------------|------|------|-----------------|------|-------|-------|
| | | | | Units | Min. | Max. | Default | Min. | Max. | Units |
| 21 | Phase Rotation | Fault Trip | Disabled | | ABC | ACB | BC | 0 | 0 | 0 |
| 11 | Phase Loss | Fault Trip | Disabled | % | 80 | 80 | 80 | 2 | 2 | 2 |
| 2 | Overvoltage | Fault Trip | Disabled | % | 90 | 150 | 110 | 1 | 60 | 20 |
| | | Fault Warning | Disabled | % | 90 | 150 | 110 | 0.2 | 5 | 2 |
| 1 | Undervoltage | Fault Trip | Disabled | % | 10 | 100 | 90 | 1 | 60 | 20 |
| | | Fault Warning | Disabled | % | 10 | 100 | 90 | 0.2 | 5 | 2 |
| | Voltage Loss Auto | Auto Restart | Disabled | Seconds | 0.1 | 0.4 | 0.2 | 0 | 0 | 0 |
| | Voltage Loss Short | | | | 0.2 | 5.0 | 0.4 | 0.1 | 500.0 | 1.0 |
| | Voltage Loss Long | | | | 0 | 3600 | 4 | 1 | 3600 | 10 |
| 11 | Voltage Unbalance | Fault Trip | Disabled | % | 2 | 20 | 6 | 1 | 60 | 20 |
| | | Fault Warning | Disabled | % | 2 | 20 | 6 | 0.2 | 5 | 2 |
| 13 | Hz Deviation (Slow) | Fault Trip | Disabled | 0.01 Hz | 10 | 500 | 10 | 1 | 60 | 20 |
| | | Fault Warning | Disabled | 0.01 Hz | 10 | 500 | 10 | 0.2 | 5 | 2 |
| 12 | Hz Deviation (Fast) | Fault Trip | Disabled | 0.01 Hz | 2 | 200 | 10 | 0.02 | 60 | 1 |
| | | Fault Warning | Disabled | 0.01 Hz | 2 | 200 | 10 | 0.2 | 5 | 2 |

Power Based Protection Parameters

Table 29. Power Based Protections

| Fault Code | Protection | Action | Default Status | Fault Action | | | Delay (Seconds) | | | |
|------------|-------------------------------|---------------|----------------|--------------|--------|-------|-----------------|------|------|-------|
| | | | | Units | Min. | Max. | Default | Min. | Max. | Units |
| 16 | Low Power | Fault Trip | Disabled | % | 0 | 200 | 50 | 1 | 60 | 20 |
| | | Fault Warning | Disabled | % | 0 | 200 | 50 | 1 | 60 | 2 |
| 15 | High Power | Fault Trip | Disabled | % | -200 | 200 | 110 | 1 | 60 | 20 |
| | | Fault Warning | Disabled | % | -200 | 200 | 110 | 1 | 60 | 2 |
| 9 | Power Factor Deviation (High) | Fault Trip | Disabled | 0.01% | -10000 | 10000 | 10000 | 1 | 60 | 20 |
| | | Fault Warning | Disabled | 0.01% | -10000 | 10000 | 10000 | 1 | 60 | 2 |
| 9 | Power Factor Deviation (Low) | Fault Trip | Disabled | 0.01% | -10000 | 10000 | 0 | 1 | 60 | 20 |
| | | Fault Warning | Disabled | 0.01% | -10000 | 10000 | 0 | 1 | 60 | 2 |

Advanced Protection

Voltage Loss Restart

Voltage Loss Restart allows users to select how the C445 unit responds to a mains voltage dip or interruption. The feature is designed to safely reclose any contactor(s) that have opened during the voltage loss event. To use Voltage Loss Restart, traditional undervoltage protection must be disabled by the user.

Voltage Loss Restart provides three behaviors based on the duration of the event. The Auto-time interval uses no delay. C445 will hold its output shut throughout the auto-time interval so that the contactor will close as soon as enough current is available (assuming it has dropped out due to the dip). No time delay is used in Auto Time because the voltage dip is considered short enough to avoid out of sync restarting of the motor. The short- and long-time intervals both have settable restart delays. These delays should be used to prevent out-of-phase restarting. Both interval periods and delays can be set individually to each motor, additionally allowing staggering of restarts within the facility. If a second mains failure, with duration of less than the Auto-time interval, occurs within 1s after the first mains failure, a delayed restart shall be executed, respecting the delayed restart timeout and resetting to the beginning of the start sequence.

Two conditions must be present for C445 to execute or hold a command to close the contactor based on the Voltage Loss Restart Logic.

1. C445 must remain powered. If C445 is powered off 120 Vac CPTs from the same mains voltage source as the motor, control power to the device will also drop during the event. C445's ability to remain powered in this condition depends on the duration and severity of the Voltage Event. C445 will remain powered for Control Power dips not exceeding 50% of nominal (120 Vac) for at least 400 milliseconds. For C445 to remain powered beyond these conditions, a separate power source and or/UPS device must be used.
2. There must be a run signal present. Voltage Loss Restart is designed to safely re-start motors. C445 will not re-start a motor if no run signal is present. For this reason, Voltage Loss Restart should not be used with fieldwire control that relies on the contactor coil as a holding circuit because the run signal would drop out with the contactor. If you are using Voltage Loss Restart with Fieldwire control in C445, use the following fieldwire control options:
 - a 2-Wire Control: A Hand/Off/Auto (HOA) switch with a maintained Run (Hand) signal.
 - b 3-Wire Control: Any use of 3-Wire control will work with Voltage Loss Restart as long as the unit remains powered. 3-Wire control uses a dedicated start input and a separate Permissive (stop) Input. The start input can be momentary or maintained, eliminating the need for a holding circuit when a momentary input is used.

Traditional Undervoltage and Voltage Loss Restart Parameters ①

Table 30. Undervoltage

| Fault Code | Protection | Action | Modbus | Fault Action | | | Default | Delay (Seconds) | | | Modbus |
|------------|------------------|---------------|--------|-----------------------------|------|------|---------|-----------------|------|---------|--------|
| | | | | Units | Min. | Max. | | Min. | Max. | Default | |
| 1 | Undervoltage | Fault Trip | 1028 | % | 10 | 100 | 90 | 1 | 60 | 20 | 1031 |
| | | Fault Warning | 1029 | % | 10 | 100 | 90 | 0.2 | 5 | 2 | 1079 |
| | Start Trip Delay | | | Delay Fault Trip at Startup | | | | 0 | 60 | 20 | 1030 |

Note

① Turn off traditional undervoltage protection if planning to use Voltage Loss.

Table 31. Voltage Loss Restart

| Fault Code | Protection | Modbus | Fault Action | | | Default | Delay (Seconds) | | | Modbus |
|------------|----------------------|--------|--------------|------|------|---------|-----------------|-------|---------|--------|
| | | | Units | Min. | Max. | | Min. | Max. | Default | |
| | Voltage Loss Auto | 1034 | Seconds | 0.1 | 0.4 | 0.2 | 0 | 0 | 0 | |
| | Voltage Loss Short | 1037 | Seconds | 0.2 | 5.0 | 0.4 | 0.1 | 500.0 | 1.0 | 1035 |
| | Voltage Loss Long | 1040 | Seconds | 0 | 3600 | 4 | 1 | 3600 | 10 | 1039 |
| | Voltage Loss Level | 1032 | % | 65 | 90 | 70 | 0 | 0 | 0 | |
| | Voltage Return Level | 1033 | % | 80 | 100 | 90 | 0 | 0 | 0 | |

Voltage Loss Auto

A command to automatically pull a contactor back in to restart a motor in the event of an undervoltage condition.

No time delay is used in Voltage Loss Restart Auto Time mode as the voltage dip is considered to be short enough to avoid out of sync restart of the motor.

Operation

Main Voltage dips below Voltage Loss Level setting.

- Voltage Loss Level is user-definable but can be set as low as 65% (default 70%)
- Contactor may drop out from voltage dip (assuming no 3rd party device is used to hold it in).

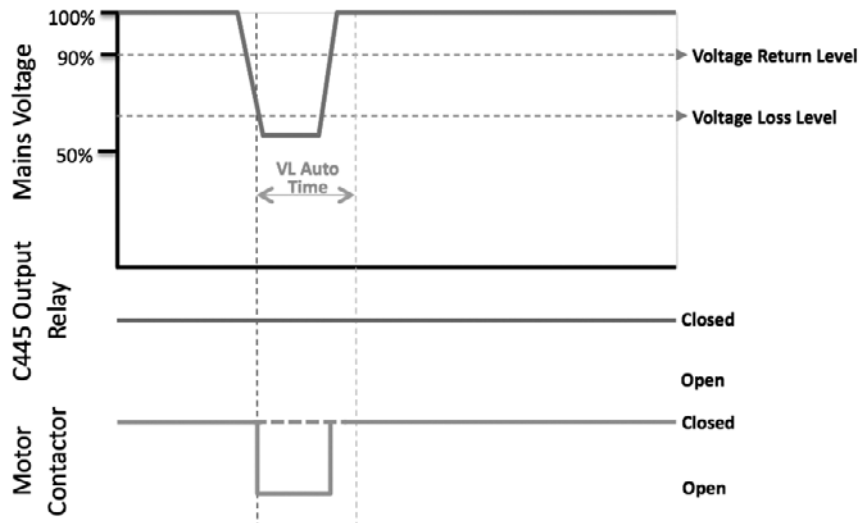
Example #1

Mains voltage returns above Voltage Return Level setting in <200 ms (default) ~ 12 Cycles.

Contactor re-closes and motor restarts automatically with no time delay. This is accomplished by holding the start-circuit aux relay closed during the Auto Time voltage loss duration.

Note: In the event of very short voltage drops, the contactor may or may not open. This is dependent on contactor specifications and power to the coil.

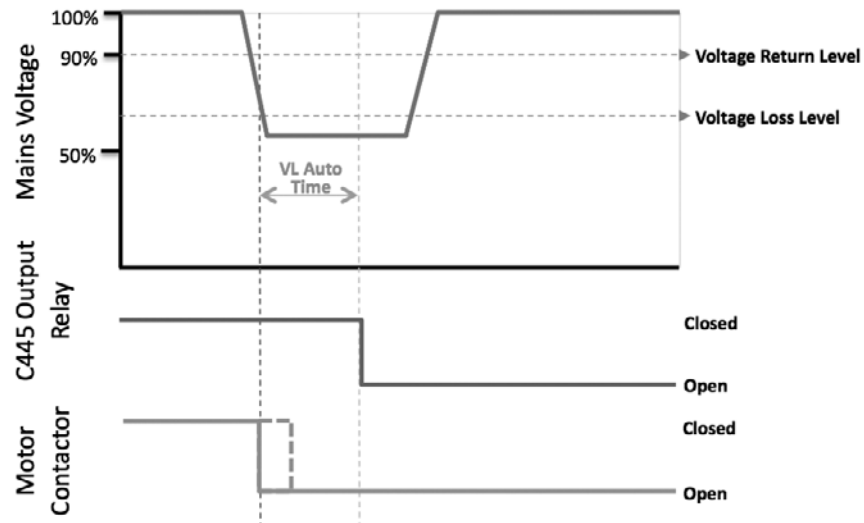
Figure 113. Example #1: Auto-Time—Mains Voltage Returns Before Auto Time Expires



Example #2

Mains voltage does not return above Voltage Return Level setting in <200 ms (default) ~ 12 Cycles. In this case the contactor does not re-close.

Figure 114. Example #2: Auto-Time—Mains Voltage Does Not Return Before Auto Time Expires



Voltage Loss Short

The Voltage Loss Short setting is a command to automatically reclose a contactor to restart a motor in the event of an undervoltage condition that has exceeded the VL Auto Time duration, if enabled. A user configurable time delay is available to prevent out of sync starting of motors. Time delays for multiple motors monitored by multiple C445 units can be staggered to avoid brownouts from all motors restarting together based on a common undervoltage condition.

Operation

Mains voltage dips below the Voltage Loss Level setting for longer than Auto time. The contactor remains open, and C445's relay output opens when Auto time expires. If voltage returns to the Voltage Return Level within the Short Time setting, C445 will close its relay output to restart the motor after a specified delay.

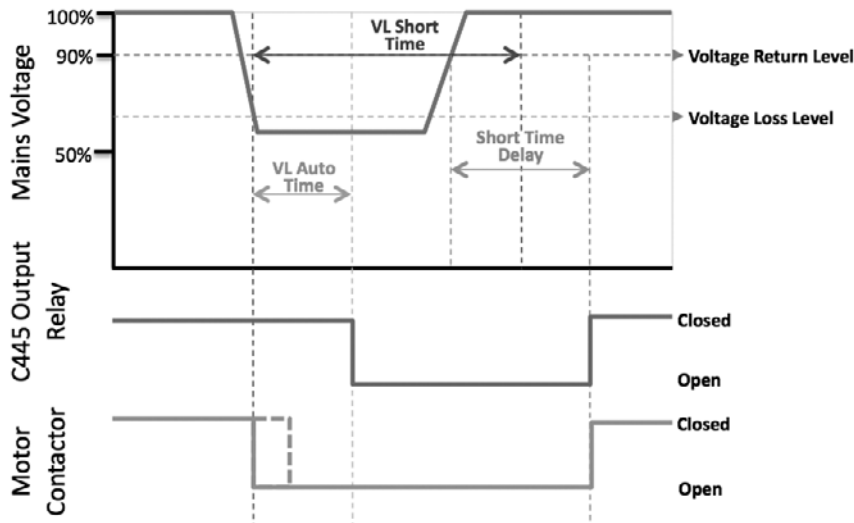
Note: C445 must maintain control power to execute short time behavior. If the relay powers down, the C445 will not execute restart logic. See beginning of section for more information.

Example #3

Main voltage returns above Voltage Return Level setting in <VL Short Time. Short Delay Time begins counting. Once the time delay has expired, the contactor is pulled back in and motor is restarted.

Note: A run signal must be present for restart to occur. If there is a run permissive in the circuit, it must also remain active.

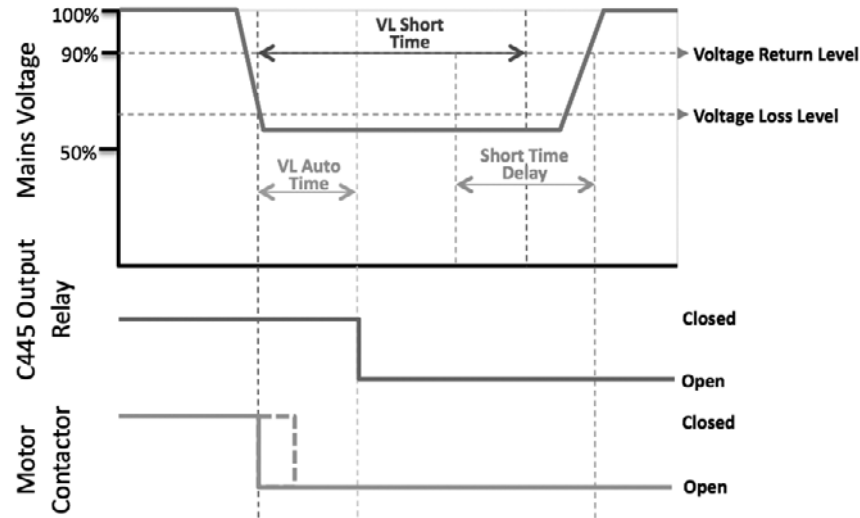
Figure 115. Example #3: Short-Time—Mains Voltage Returns Before Short Time Expires



Example #4

Main voltage does not return above Voltage Return Level setting in <VL Short Time. Contactor does not re-close.

Figure 116. Example #4: Short-Time—Mains Voltage Does Not Return Before Short Time Expires



Voltage Loss Long

The Voltage Loss Long setting is a command to automatically pull a contactor back in to restart a motor in the event of an undervoltage condition that has exceeded the Short Time duration. A user configurable time delay is available to prevent out of sync starting of motors. In addition to having the ability to vary Short Time delays for multiple motors, a second timer can be utilized after Long Time to further avoid brownouts from motors restarting together based on a common undervoltage condition. Any voltage loss longer than Long Time will require the user to manually go through the restart sequence.

Operation

Main voltage remains below Voltage Loss Level setting for longer than Voltage Loss Short Time. The contactor and C445 relay output remain open. C445 will close its relay output to pull in the contactor if Voltage Return level is seen within the Long Time interval.

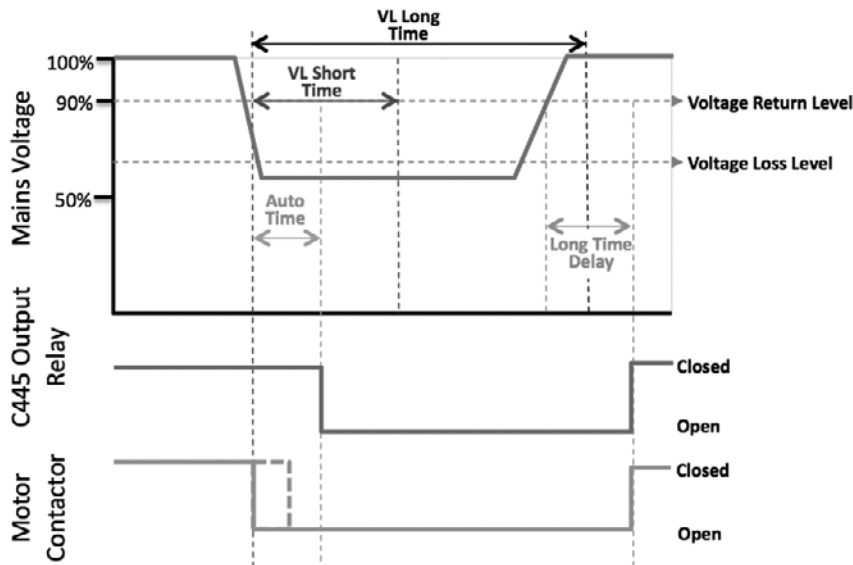
Note: C445 must maintain control power to execute short time behavior. If the relay powers down, the C445 will not execute restart logic. See beginning of section for more information.

Example #5

Main voltage returns above Voltage Return Level setting in <VL Long Time. Long Delay Time begins counting. Once time delay has expired, contactor is pulled back in and motor is restarted.

Note: A run signal must be present for restart to occur. If there is a run permissive in the circuit, it must also remain active.

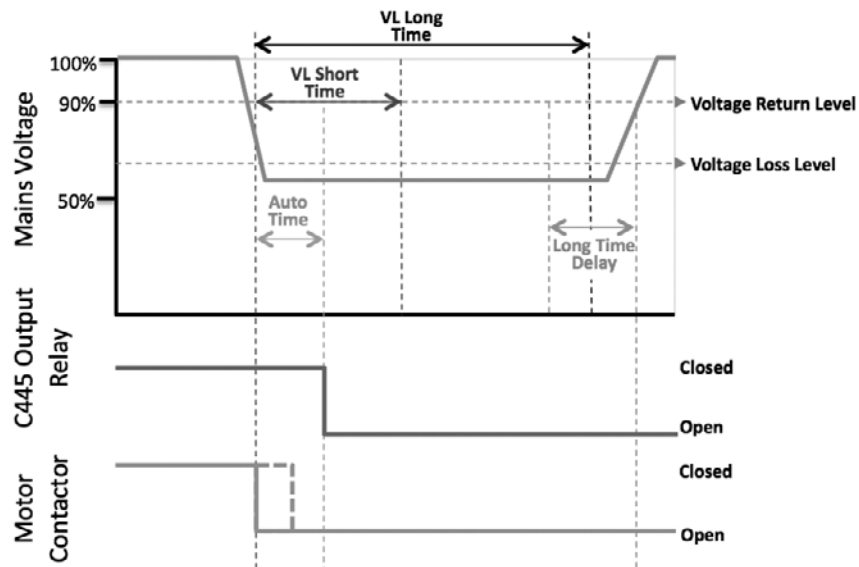
Figure 117. Example #5: Long-Time—Mains Voltage Returns Before Long Time Expires



Example #6

Mains voltage does not return above Voltage Return Level setting in <VL Long Time. Contactor does not re-close and voltage loss restart has ended. User must manually go through restart sequence once voltage returns.

Figure 118. Example #6: Long-Time—Mains Voltage Does Not Return Before Long Time Expires

**Protection and Monitoring**

The C445 Base Control Module monitors several parameters for motor protection. There are several ways to monitor parameters.

- The Monitoring User Interface
- Power Xpert *inControl*
- Over the communication network of choice
- Web pages

Trip Protection will stop the motor if select parameter values exceed set limits. There are data log records created and stored in non-volatile memory. These snapshots can be analyzed to determine the cause of failure. After a trip has occurred, a reset feature may be configured to attempt to reset the motor.

Advanced Protection Parameters

This table contains parameters that are applicable to all protections but are related to more advanced behavior.

Table 32. Protections

| Parameter | Units | Min. | Max. | Default | Modbus Register | Notes |
|---|-------|---------|-----------|-----------|-----------------|---|
| Auto Reset Delay | Sec | 0 | 3600 | 180 | 1075 | Time delay after a Fault Trip event occurs an auto-reset will be attempted |
| Backspin Inhibit Time | Sec | 0 | 3600 | 0 | 1077 | Anti-backspin inhibit time before a reset is allowed |
| Reset On Power Up | | Enable | Disable | Disable | 1076 | Enabled; perform a fault reset on power up Disabled; no action |
| Auto Reset Enable | | Disable | Enable | Disable | 1072 | Disabled; no auto reset functionality Enabled; auto reset functionality is based on trip auto-reset bit selections |
| Auto Reset Types | | | | | 1073 | Select Fault Trip Parameters to Auto Reset |
| Trip Enable | | Checked | Unchecked | Unchecked | 1000 | User input bit field that is used to enable or disable a protection function trip |
| Warning Enable | | Checked | Unchecked | Unchecked | 1002 | Only protections enabled by checking the associated box will provide a warning when that condition occurs |
| Positive Temperature Coefficient (PTC) (option) | | | | | 376 | 0 = No Fault 1 = Overtemp 2 = Shorted 3 = Open Fault Trip Code 22 |

Motor Protection

The motor protections functions that are listed in this section monitor motor current (average, minimum, or maximum phase currents) to detect various motor running faults.

These protections functions may be disabled during a start. These protections are also disabled if the maximum phase current is less than 50% of the Motor FLA set-point.

Note: For protections functions to operate appropriately, the motor FLA must be configured for the application.

Users can easily customize protection settings in the protection menu of the Monitoring User Interface or of Power Xpert *inControl*.

To enable/disable individual trip and warning protections, navigate to Protections → General → Trip Enable / Warning Enable.

To customize protection levels and delays for each protection feature, navigate to the category of that protection in Protections → Current / Voltage / Power / Frequency / Ground Fault.

Fault Warnings

Fault Warnings in many cases react to the same parameter values as Fault trips. Fault Warning events display the fault information but do not trip the controlled device. Similar to Fault Trips, Fault Warnings are subject to delay times noted in Modbus register 1079. This register sets the delay times for all Fault Warnings in all fault warnings protections.

Table 33. Fault Warnings

| Protection | Action | Modbus | Fault Action | | | |
|---------------|-------------|--------|--------------|------|------|---------|
| | | | Units | Min. | Max. | Default |
| Fault Warning | Alarm Delay | 1079 | ms | 20 | 5000 | 2000 |

Motor Thermal Overload

The Overload function models the thermal characteristics of a motor and generates a Fault Trip event that de-energizes the motor before motor damage will occur. This is intended to protect the motor and power wiring from excessive current. Trip curves are defined by applicable agency standards. The trip class for any particular Overload class is user adjustable.

Table 34. Overload

| Fault Code | Protection | Action | Default Status | Fault Action | | Delay (Seconds) | | | | | | |
|------------|------------------|--------------------------|----------------|--------------|--------------|-----------------|------|---------|---------|----------|----------|---------|
| | | | | Units | Note | Min. | Max. | Default | Min. | Max. | Default | |
| 19 | Thermal Overload | Fault Trip | Enabled | amps | C445MA2P2... | 0.3 | 2.4 | 0.3 | Class 5 | Class 40 | Class 5 | |
| | | | | | | C445MA005... | 1 | 5 | 1 | Class 5 | Class 40 | Class 5 |
| | | | | | | C445MA032... | 4 | 32 | 4 | Class 5 | Class 40 | Class 5 |
| | | | | | | C445MA045... | 6 | 45 | 6 | Class 5 | Class 40 | Class 5 |
| | | | | | | C445MB072... | 9 | 72 | 9 | Class 5 | Class 40 | Class 5 |
| | | | | | | C445MC090... | 11 | 90 | 11 | Class 5 | Class 40 | Class 5 |
| | | | | | | C445MC136... | 17 | 136 | 17 | Class 5 | Class 40 | Class 5 |
| | | | | | | C445...ext | ext | 800 | ext | Class 5 | Class 40 | Class 5 |
| | | Fault Warning | Disabled | % | | 1 | 100 | 90 | | | | |
| | | Overload Reset Threshold | | % | C445... | 1 | 99 | 75 | | | | |

Instantaneous Overcurrent

The Instantaneous Overcurrent protection monitors the maximum phase current of the motor and will trip the motor if the current exceeds the set threshold. The Instantaneous Current protection is active when the motor is energized but does have a separate Start delay to account for high starting currents that are characteristic of high efficiency induction motors.

Table 35. Instantaneous Overcurrent

| Fault Code | Protection | Action | Fault Action Settings | | | | Delay (mS) | | | | |
|------------|---------------------------|------------------|-----------------------|------------|------|------|------------|------|-------|---------|--------|
| | | | Modbus | Units | Min. | Max. | Default | Min. | Max. | Default | Modbus |
| 7 | Instantaneous Overcurrent | Fault Trip | 1012 | % FLA | 50 | 400 | 400 | 1 | 2000 | 2000 | 1015 |
| | | Fault Warning | 1013 | % FLA | 50 | 400 | 400 | 200 | 5000 | 2000 | 1079 |
| | | Fault Trip Delay | | At powerup | | | | 0 | 18000 | 0 | 1014 |

Jam

The C445 will monitor the average RMS value of the three phase currents. If the RMS value rises above the threshold for the required length of time a Fault is detected and the unit will trip. The Jam settings will only be active during the Motor Running state.

Table 36. Jam

| Fault Code | Protection | Action | Modbus | Fault Action | | | Delay (Seconds) | | | | |
|------------|------------|---------------|--------|--------------|------|------|-----------------|------|------|---------|--------|
| | | | | Units | Min. | Max. | Default | Min. | Max. | Default | Modbus |
| 8 | Jam | Fault Trip | 1008 | % FLA | 50 | 400 | 400 | 1 | 60 | 5 | 1010 |
| | | Fault Warning | 1009 | % FLA | 50 | 400 | 400 | 0.2 | 5 | 2 | 1079 |

Stall

The Stall protection monitors the average phase current as a percentage of FLA of the motor and will trip the motor if the current exceeds the set threshold. The Stall protection is only active as the motor transitions from the Starting to Running states.

Table 37. Stall ①

| Fault Code | Protection | Action | Modbus | Fault Action | | | Delay (Seconds) | | | | |
|------------|------------|------------|--------|--------------|------|------|-----------------|------|------|---------|--------|
| | | | | Units | Min. | Max. | Default | Min. | Max. | Default | Modbus |
| 20 | Stall | Fault Trip | 1007 | % FLA | 50 | 400 | 200 | 0 | 0 | 0 | |

Note

① Only active during transition from start cycle to run cycle.

Current Unbalance

Current unbalance is defined using the following equation:

$$\% \text{ unbalance} = 100 \times \left[\frac{(\text{max Irms} - \text{ave Irms}) \text{ or } (\text{ave Irms} - \text{min Irms}) \text{ whichever is greater}}{\text{ave Irms}} \right]$$

The C445 will monitor the Current Unbalance. If the value exceeds the threshold for the required length of time a fault is detected and the unit will trip. The Current Unbalance protection is enabled only in the Motor Running state.

Modifying the TRIP ENABLE/DISABLE register will enable or disable the Current Unbalance protection feature.

There is a minimum running current that needs to be met: 50% FLA. If the max current isn't greater than 50% FLA, no Current Unbalance fault will be issued.

Table 38. Current Unbalance

| Fault Code | Protection | Action | Modbus | Fault Action | | | Delay (Seconds) | | | | |
|------------|-------------------|---------------|--------|--------------|------|------|-----------------|------|------|---------|--------|
| | | | | Units | Min. | Max. | Default | Min. | Max. | Default | Modbus |
| 6 | Current Unbalance | Fault Trip | 1018 | % | 1 | 60 | 15 | 1 | 60 | 15 | 1020 |
| | | Fault Warning | 1019 | % | 1 | 60 | 15 | 0.2 | 5 | 2 | 1079 |

Current Phase Loss

The Current Phase Loss protection monitors the current unbalance of the motor and will trip the motor if the unbalance exceeds the set threshold. The Current Phase Loss protection is active when the motor is in the Running state.

If a C445 relay is commissioned to monitor an AC motor, the current must be fed on all three poles to prevent early tripping.

Measurement Precondition $I_{max} > 50\%$ of FLA, $I_{min} < 25\%$ of FLA, No V Phase Loss (or no voltage option)

Measurement Parameter Current unbalance percent

Table 39. Current Phase Loss

| Fault Code | Protection | Action | Modbus | Fault Action | | | Delay (Seconds) | | | | |
|------------|--------------------|------------|--------|--------------|------|------|-----------------|------|------|---------|--------|
| | | | | Units | Min. | Max. | Default | Min. | Max. | Default | Modbus |
| 5 | Current Phase Loss | Fault Trip | 1016 | % | 60 | 60 | 60 | 2 | 2 | 2 | 1017 |

Undercurrent

Undercurrent Trip Level protection monitors the three phase currents and will fault if the measured current drops below the set threshold.

Table 40. Undercurrent

| Fault Code | Protection | Action | Modbus | Fault Action | | | Delay (Seconds) | | | | |
|------------|--------------|---------------|--------|--------------|------|------|-----------------|------|------|---------|--------|
| | | | | Units | Min. | Max. | Default | Min. | Max. | Default | Modbus |
| 14 | Undercurrent | Fault Trip | 1021 | % FLA | 10 | 90 | 50 | 1 | 60 | 20 | 1023 |
| | | Fault Warning | 1022 | % FLA | 10 | 90 | 50 | 0.2 | 5 | 2 | 1079 |

Ground Fault

The Residual Ground Fault protection monitors the ground current of the motor and will trip the motor if the ground current exceeds the set threshold. The Ground Fault protection is always active.

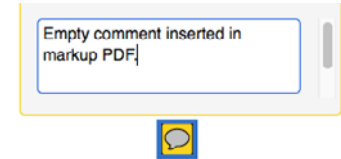


Table 41. Ground Fault

| Fault Code | Protection | Action | Modbus | Units | Fault Action | | | Delay (Seconds) | | | | |
|--------------------------|----------------------|------------|--------|------------|--------------|-------------------|-------------------|-------------------|------|------|---------|--------|
| | | | | | Frame | Min. | Max. | Default | Min. | Max. | Default | Modbus |
| 4 | Ground Fault (earth) | Fault Trip | 1060 | amps | C445MA2P4... | 0.12 | 2.4 | 1 | 1 | 60 | 5 | 1063 |
| | | | | | C445MA005... | 0.25 | 5 | 3 | 1 | 60 | 5 | 1063 |
| | | | | | C445MA032... | 1 ① | 9.6 | 3 | 1 | 60 | 5 | 1063 |
| | | | | | C445MA045... | 1 ① | 13.5 | 3 | 1 | 60 | 5 | 1063 |
| | | | | | C445MB072... | 3 ① | 21.6 | 3 | 1 | 60 | 5 | 1063 |
| | | | | | C445MC090... | 3 | 27 | 3 | 1 | 60 | 5 | 1063 |
| | | | | | C445MC136... | 34 | 40.8 | 34 | 1 | 60 | 5 | 1063 |
| | | | | | C445M...EXT | 30% of CT Primary | 50% of CT Primary | 50% of CT Primary | 1 | 60 | 5 | 1063 |
| Fault Warning | 1061 | | | | | | | 2 | 1079 | | | |
| Fault Trip Delay | | | | At powerup | | | | 0 | 5 | 0 | 1062 | |
| Use Fault Trip Inhibit | 1064 | | | | Disable | Enable | Disable | | | | | |
| Fault Trip Inhibit - Run | 1065 | % | | | 25 | 100 | 50 | 0 | 0 | 0 | | |

Note

① ABC wiring recommended.

Note: Refer to Chapter 10 for information concerning the External Ground Fault module and the Pulse Detect Ground Fault feature.

Supply Protection

The C445 monitors the supply voltage to the motor for the faults described below. These protections are only available if the C445 Measurement Module has the voltage option.

Users can easily customize protection settings in the protection menu of the Monitoring User Interface or of Power Xpert *inControl*.

To enable/disable individual trip and warning protections, navigate to Protections → General → Trip Enable / Warning Enable.

To customize protection levels and delays for each protection feature, navigate to the category of that protection in Protections → Current / Voltage / Power / Frequency / Ground Fault

When the Supply fault is enabled in Trip mode, the C445 will trip if a Voltage fault is detected when the motor is running. In this mode, a Start will be inhibited if the fault condition is present. Starts will be allowed as soon as the fault condition is cleared.

Users may also optionally inhibit starting based on presence of a voltage fault. To inhibit starting based on voltage faults, enable “Inhibit Start on Voltage Fault” in the Protections → General menu.

Undervoltage

The Undervoltage protection monitors the minimum phase voltage of the motor and will trigger a fault if the voltage drops below the set threshold. The Undervoltage protection is active when the motor is in the Running state. When the Low Voltage Start Inhibit Enable is set, the Undervoltage will prevent a start into an under voltage condition as determined by the Undervoltage Start Inhibit Level.

Table 42. Undervoltage

| Fault Code | Protection | Action | Modbus | Fault Action | | | Delay (Seconds) | | | | |
|------------|--------------|------------------|--------|--------------|-----------------------------|------|-----------------|------|------|---------|--------|
| | | | | Units | Min. | Max. | Default | Min. | Max. | Default | Modbus |
| 1 | Undervoltage | Fault Trip | 1028 | % | 10 | 100 | 90 | 1 | 60 | 20 | 1031 |
| | | Fault Warning | 1029 | % | 10 | 100 | 90 | 0.2 | 5 | 2 | 1079 |
| | | Start Trip Delay | | | Delay Fault Trip at Startup | | | 0 | 60 | 20 | 1030 |

Overvoltage

The Overvoltage protection monitors the maximum phase voltage of the motor and will trip the motor if the voltage exceeds the set threshold. The Overvoltage protection is active when the motor is in the Running state.

Table 43. Overvoltage

| Fault Code | Protection | Action | Modbus | Fault Action | | | Delay (Seconds) | | | | |
|------------|-------------|---------------|--------|--------------|------|------|-----------------|------|------|---------|--------|
| | | | | Units | Min. | Max. | Default | Min. | Max. | Default | Modbus |
| 2 | Overvoltage | Fault Trip | 1025 | % | 90 | 150 | 110 | 1 | 60 | 20 | 1027 |
| | | Fault Warning | 1026 | % | 90 | 150 | 110 | 0.2 | 5 | 2 | 1079 |

Voltage Unbalance

Voltage Unbalance is estimated using the following equation.

$$\%PhaseUnbalance = 100 \times \left[\frac{\max(Phase\ Vrms) - \min(Phase\ Vrms)}{\text{avg}(Phase\ Vrms)} \right]$$

The Voltage Unbalance protection monitors the voltage unbalance percentage of the supply and will trip the motor if the voltage exceeds the set threshold. The Voltage Unbalance protection is active when the motor is in the energized state. When the Voltage unbalance Start Inhibit protection is enabled, the Undervoltage protection will prevent a start into an unbalanced condition as determined by the Unbalance Start Inhibit Level.

Table 44. Voltage Unbalance

| Fault Code | Protection | Action | Modbus | Fault Action | | | Default | Delay (Seconds) | | | Modbus |
|------------|-------------------|---------------|--------|--------------|------|------|---------|-----------------|------|---------|--------|
| | | | | Units | Min. | Max. | | Min. | Max. | Default | |
| 11 | Voltage Unbalance | Fault Trip | 1043 | % | 1 | 20 | 6 | 1 | 60 | 20 | 1045 |
| | | Fault Warning | 1044 | % | 1 | 20 | 6 | 0.2 | 5 | 2 | 1079 |

Voltage Phase Loss

The Voltage Phase Loss protection monitors the phase voltage of the motor and will trip the motor if the voltage falls below 70% of the nominal mains voltage.

Table 45. Voltage Phase Loss

| Fault Code | Protection | Action | Modbus | Fault Action | | | Default | Delay (Seconds) | | | Modbus |
|------------|--------------------|------------|--------|--------------|------|------|---------|-----------------|------|---------|--------|
| | | | | Units | Min. | Max. | | Min. | Max. | Default | |
| 11 | Voltage Phase Loss | Fault Trip | 1041 | % | 70 | 70 | 70 | 2 | 2 | 2 | 1042 |

Phase Rotation

The Phase Sequence protection monitors the sequence of the supply. A fault will be generated if the supply sequence does not match the configured setting. The phase sequence protection is always active.

Table 46. Voltage Phase Rotation

| Fault Code | Protection | Action | Modbus | Fault Action | | | Delay (Seconds) | | | Modbus | |
|------------|----------------|------------|--------|--------------|-------|------|-----------------|------|------|--------|---------|
| | | | | Units | Value | Max. | Default | Min. | Max. | | Default |
| 21 | Phase Rotation | Fault Trip | 1024 | | 0 | Off | 1 | 0 | 0 | 0 | |
| | | | | | 1 | ABC | 1 | 0 | 0 | 0 | |
| | | | | | 2 | ACB | 1 | 0 | 0 | 0 | |

Power Factor Deviation

The Power Factor (PF) Deviation protection monitors the PF (supply side) of the load and will trip the motor if the measured deviation from rated exceeds the set threshold.

The power factor deviation protection is active when the motor is in the running state.

Measurement Precondition $V_{avg} > 40$ volts RMS & I_{avg} RMS $> 50\%$ of FLA.

Table 47. PF Deviation

| Fault Code | Protection | Action | Modbus | Fault Action | | | Delay (Seconds) | | | Modbus | |
|------------|-----------------------------|---------------|--------|--------------|--------|-------|-----------------|------|------|--------|---------|
| | | | | Units | Min. | Max. | Default | Min. | Max. | | Default |
| 9 | Power Factor Deviation Low | Fault Trip | 1056 | % | -10000 | 10000 | 0 | 1 | 60 | 20 | 1059 |
| | | Fault Warning | 1058 | % | -10000 | 10000 | 0 | 1 | 60 | 2 | 1079 |
| 9 | Power Factor Deviation High | Fault Trip | 1055 | % | -10000 | 10000 | 10000 | 1 | 60 | 20 | 1059 |
| | | Fault Warning | 1057 | % | -10000 | 10000 | 10000 | 1 | 60 | 2 | 1079 |

Frequency Deviation (Slow)

The Frequency Deviation (Slow) protection monitors the line frequency of the supply and will trip the motor if the deviation from rated exceeds the set threshold. The Frequency Deviation protection is active when the motor is in the Energized state.

Protections → Frequency → Frequency Deviation Slow

Table 48. Hz Dev – Slow

| Fault Code | Protection | Action | Modbus | Fault Action | | | Default | Delay (Seconds) | | | Modbus |
|------------|---------------------|---------------|--------|--------------|------|------|---------|-----------------|------|---------|--------|
| | | | | Units | Min. | Max. | | Min. | Max. | Default | |
| 13 | Hz Deviation (Slow) | Fault Trip | 1069 | 0.01 Hz | 10 | 500 | 10 | 1 | 60 | 20 | 1071 |
| | | Fault Warning | 1070 | 0.01 Hz | 10 | 500 | 10 | 1 | 60 | 2 | 1079 |

Frequency Deviation (Fast)

The Frequency Deviation (Fast) protection monitors the line frequency of the supply and will trip the motor if the deviation from rated exceeds the set threshold. The Frequency Deviation protection is active when the motor is in the Energized state.

Protections → Frequency → Frequency Deviation Fast

Table 49. Hz Dev – Fast

| Fault Code | Protection | Action | Modbus | Fault Action | | | Default | Delay (Seconds) | | | Modbus |
|------------|---------------------|---------------|--------|--------------|------|------|---------|-----------------|------|---------|--------|
| | | | | Units | Min. | Max. | | Min. | Max. | Default | |
| 12 | Hz Deviation (Fast) | Fault Trip | 1066 | 0.01 Hz | 2 | 200 | 10 | 20 | 2000 | 1000 | 1068 |
| | | Fault Warning | 1067 | 0.01 Hz | 2 | 200 | 10 | 20 | 2000 | 2000 | 1079 |

Load Protection

Power-based protections provide superior protection for load-based conditions such as a dead-headed or starved pump.

Users can easily customize protection settings in the protection menu of the Monitoring User Interface or of Power Xpert *inControl*.

To enable/disable individual trip and warning protections, navigate to Protections → General → Trip Enable / Warning Enable.

To customize protection levels and delays for each protection feature, navigate to the category of that protection in Protections → Current / Voltage / Power / Frequency / Ground Fault

Undercurrent

The Undercurrent protection monitors the average current of the motor and will trip the motor if the unbalance drops below the set threshold. The Undercurrent protection is active when the motor is in the Running state.

Table 50. Undercurrent

| Fault Code | Protection | Action | Modbus | Fault Action | | | Delay (Seconds) | | | | |
|------------|--------------|---------------|--------|--------------|------|------|-----------------|------|------|---------|--------|
| | | | | Units | Min. | Max. | Default | Min. | Max. | Default | Modbus |
| 14 | Undercurrent | Fault Trip | 1021 | % FLA | 10 | 90 | 50 | 1 | 60 | 20 | 1023 |
| | | Fault Warning | 1022 | % FLA | 10 | 90 | 50 | 1 | 60 | 2 | 1079 |

Low Power

The Low Power protection monitors the kW consumed (supply side) by the load and will trip the motor if the measured value is lower than the set threshold. The Low Power protection is active when the motor is in the Running state. The rated power is calculated from the rated HP input by the user.

Table 51. Low Power

| Fault Code | Protection | Action | Modbus | Fault Action | | | Delay (Seconds) | | | | |
|------------|------------|---------------|--------|--------------|------|------|-----------------|------|------|---------|--------|
| | | | | Units | Min. | Max. | Default | Min. | Max. | Default | Modbus |
| 16 | Low Power | Fault Trip | 1049 | % | 0 | 200 | 50 | 1 | 60 | 20 | 1051 |
| | | Fault Warning | 1050 | % | 0 | 200 | 50 | 1 | 60 | 2 | 1079 |

High Power

The High Power protection monitors the kW consumed (supply side) by the load and will trip the motor if the measured value exceeds the set threshold. The High Power protection is active when the motor is in the Running state. The rated power is calculated from the rated HP input by the user.

Table 52. High Power

| Fault Code | Protection | Action | Modbus | Fault Action | | | Delay (Seconds) | | | | |
|------------|------------|---------------|--------|--------------|------|------|-----------------|------|------|---------|--------|
| | | | | Units | Min. | Max. | Default | Min. | Max. | Default | Modbus |
| 15 | High Power | Fault Trip | 1046 | % | –200 | 200 | 110 | 1 | 60 | 20 | 1048 |
| | | Fault Warning | 1047 | % | –200 | 200 | 110 | 1 | 60 | 2 | 1079 |

Peak Demand Alarming

A utility company's bill is based on consumption (kWhr) and more typically on peak demand in the last month. In the US demand is typically calculated as the average kW in a 15 minute window. The peak demand is simply the maximum value of the calculated demand. Industrial users may have rather sophisticated load shedding and demand response processes running at the feeder level or higher.

The C445 will provide a simplified demand warning system that will provide the current demand estimate, a resettable peak demand (with date and time stamp) stored in nonvolatile memory, and a demand warning threshold. The time window for demand calculation will be adjustable to provide for more flexibility.

Table 53. Peak Demand

| Fault Code | Protection | Parameter | Modbus | Fault Action | | | |
|------------|-------------|-------------------------------|--------|--------------|------|------|---------|
| | | | | Units | Min. | Max. | Default |
| | Peak Demand | Demand Window Duration | 1054 | Minutes | 1 | 240 | 15 |
| | | Peak Demand Warning Threshold | 1052 | Watts | | | 0 |
| | | Peak Demand | | Watts | | | |
| | | Present Demand | | Watts | | | |
| | | Demand Timestamp | | Unix | | | |

Chapter 7—Monitoring and Diagnostics

Methods for Monitoring

C445 makes it simple to access advanced diagnostics. On any network, or even with no networking at all—we make it easy to connect to your system.

The easiest way to access local monitoring is with the Monitoring User Interface (C445UM). The LCD screen provides large font monitoring of all parameters broken into simple menus of current, voltage, power, thermal and other system parameters. There is no setup or network required.

Another easy option is the free Power Xpert *inControl* software tool. Common operating parameters are in the Control/Monitor tab while other parameters related to current, voltage, power and system data are viewable in the Measurement tab. Connect to *inControl* using the Micro-USB port on the user interface or Base Control module, or over ModbusTCP.

Users with the Ethernet option can also monitor data live over webpages: Simply enter the IP address of the device in your browser window.

Another way to monitor operating parameters from a C445 is via a fieldbus network from the system controller. If a fieldbus network such as EtherNet/IP, Modbus serial, Modbus TCP or PROFIBUS are being used for control, the master controller on these networks can monitor operating parameters constantly with other input and output polled/cyclic data or via specific one-time acyclic/explicit messages only when an event occurs.

The C445 supports both implicit polled messages as well as explicit messages of all operating parameters on EtherNet/IP.

The C445 supports acyclic DPV1 messages on PROFIBUS as well as cyclic messages used for control and monitoring on a constant basis. All operating parameters are supported for both types of messages.

For Modbus serial and Modbus TCP, all parameters including all operating parameters are available to monitor. **Appendix D** contains a complete list of all parameters and their associated Modbus register address.

An operator interface or HMI device can also be used to monitor operating parameters from a C445 via any of the above supported fieldbus networks.

Monitoring Parameters

A list and description of the available operating parameters for monitoring is shown below.

Table 54. Current Based Monitoring

| Parameter Name | Range/Units | Description |
|------------------------|---|--|
| I Phase A (L1) | Depends on frame size (amps) | Phase A (L1) motor current. 2% accuracy within 30–125% of FLA. |
| I Phase B (L2) | Depends on frame size (amps) | Phase B (L2) motor current. 2% accuracy within 30–125% of FLA. |
| I Phase C (L3) | Depends on frame size (amps) | Phase C (L3) motor current. 2% accuracy within 30–125% of FLA. |
| Average Current | Depends on frame size (amps) | Average motor current. 2% accuracy within 30–125% of FLA. |
| Current Unbalance | 0–100% | Motor current unbalance percent |
| I Average % of FLA | 0–720% of FLA (amps) | Average motor current as a percentage of FLA |
| Max Starting Current | Depends on frame size (amps) | Maximum motor starting current |
| GF Current RMS | Depends on frame size (amps), scaled via fieldbus | Motor ground fault current RMS. Accuracy meets UL-1053 / IEC Class II-B |
| I Phase A (L1) Scaled | Depends on frame size (amps, scaled) | Phase A (L1) motor current scaled. Scaled by parameter “I Scale Factor.” |
| I Phase B (L2) Scaled | Depends on frame size (amps, scaled) | Phase B (L2) motor current scaled. Scaled by parameter “I Scale Factor.” |
| I Phase C (L3) Scaled | Depends on frame size (amps, scaled) | Phase C (L3) motor current scaled. Scaled by parameter “I Scale Factor.” |
| Average Current Scaled | Depends on frame size (amps, scaled) | Average motor current scaled. Scaled by parameter “I Scale Factor.” |
| I Scale Factor | | Motor current scale factor |

Table 55. Current Scale Factor

| Scale | FLA Minimum | FLA Maximum |
|-------|-------------|-------------|
| 1000 | 0.300 | 2.400 |
| 1000 | 1.000 | 5.000 |
| 100 | 4.000 | 32.000 |
| 100 | 6.000 | 45.000 |
| 100 | 9.000 | 72.000 |
| 10 | 11.000 | 90.000 |
| 10 | 17.000 | 136.000 |

Table 56. Voltage Based Monitoring

| Parameter Name | Range/Units | Description |
|------------------------|--|---|
| L1-L2 | 0–690 V; max 4,160 V with PT ratios | Supply line-to-line voltage AB (L1-L2). 2% accuracy up to 690 Vac |
| L2-L3 | 0–690 V; max 4,160 V with PT ratios | Supply line-to-line voltage BC (L2-L3). 2% accuracy up to 690 Vac |
| L3-L1 | 0–690 V; max 4,160 V with PT ratios | Supply line-to-line voltage CA (L3-L1). 2% accuracy up to 690 Vac |
| Average Voltage | 0–690 V; max 4,160 V with PT ratios | Supply line-to-line voltage average. 2% accuracy up to 690 Vac |
| Frequency | 47–63 Hz (centi-Hz) | Supply frequency in centi-Hz |
| Phase Order | 0: unknown; 1: ABC (L1-L2-L3); 2: ACB (L1-L3-L2) | Reports phase sequence of the line voltage |
| Voltage Unbalance | 0–100% | Supply voltage unbalance percentage |
| L1-L2 Scaled | V, scaled | Supply line-to-line voltage AB (L1-L2) scaled |
| L2-L3 Scaled | V, scaled | Supply line-to-line voltage BC (L2-L3) scaled |
| L3-L1 Scaled | V, scaled | Supply line-to-line voltage CA (L3-L1) scaled |
| Average Voltage Scaled | V, scaled | Supply line-to-line voltage average scaled |
| Voltage Scale Factor | | Voltage scale factor applied to scaled voltage measurements |

Table 57. Power-Based Monitoring

| Parameter Name | Range/Units | Description |
|------------------------------|--|---|
| Watts Total | Depends on frame size (watts) | Total real power. 5% accuracy. |
| VA Total | Depends on frame size (Volt-Amps) | Total apparent power. 5% accuracy. |
| VARs Total | Depends on frame size (Vars) | Total reactive power. 5% accuracy. |
| Power factor | 0–100%, Scaled by 0.01% via fieldbus | Apparent power factor in percentage. 1% accuracy. |
| Speed RPM | Depends on motor (0.1 RPM) | Motor speed in RPM |
| Torque | Depends on motor (0.01 Nm) | Motor torque |
| Efficiency percent | PC tool in %, scaled by 0.01% via fieldbus | Motor efficiency in percentage |
| Real energy | Depends on frame size (0.1 kWh) | Real energy scaled. 5% accuracy. |
| Real energy (resettable) | Depends on frame size (0.1 kWh) | Real energy (resettable) scaled. 5% accuracy. |
| Apparent energy | Depends on frame size (0.1 kVAh) | Apparent energy scaled. 5% accuracy. |
| Apparent energy (resettable) | Depends on frame size (0.1 kVAh) | Apparent energy (resettable) scaled. 5% accuracy. |
| Reactive energy | Depends on frame size (0.1 kVARh) | Reactive energy scaled. 5% accuracy. |
| Reactive energy (resettable) | Depends on frame size (0.1 kVARh) | Reactive energy (resettable) scaled. 5% accuracy. |
| Current demand value | Depends on frame size (watts) | Latest estimate of the demand. 5% accuracy. |
| Demand (resettable) | Depends on frame size (watts) | Peak demand, user resettable. 5% accuracy |
| Peak demand time stamp | Time in seconds | Peak demand time stamp (in Unix time) |
| Demand window duration | Time in minutes | Demand window duration |

Table 58. System Monitoring

| Parameter Name | Range/Units | Description |
|--|---|---|
| Motor state (current based) | 0: stopped; 1: accelerating; 2: running | Current based motor state (independent of command) |
| Motor control status | See table below | Present motor control status bits |
| Number of operating seconds | Time in seconds | Number of operating seconds |
| Operating seconds (resettable) | Time in seconds | Number of operating seconds (resettable) |
| Time to trip overload | Time in seconds | Time for overload to reach trip threshold (100%) |
| Time to reset overload | Time in seconds | Time for overload to reach reset threshold (thermal memory must drop below 75%) |
| PTC status | See table below | PTC status |
| Digital input status | 0/1 | ON/OFF status of digital inputs. |
| Base Control Module relay status | 0/1 | Base Control Module relay status (output status) |
| Total motor run time | Time in seconds | Total motor run time in seconds |
| Total motor run time (resettable) | Time in seconds | Total run time user (resettable) |
| Last measured starting time | Time in seconds | The amount of time the motor took to reach up to speed on the last start. |
| Number of starts | Number | Total number of motor starts |
| Number of starts (resettable) | Number | Number of starts (resettable) |
| Number of contactor operations last hour | Number | Number of contactor operations during the last hour |
| Latest run time | Time in seconds | Duration in seconds of the last start-to-stop motor run time |
| Thermal capacity | 0–250% | Thermal capacity in percent—overload trip occurs at 100%. |

Table 59. Faults and Events

| Parameter Name | Range/Units | Description |
|-------------------------|---------------------------|--|
| Active fault | See Table 60 below | Active fault |
| Active warning | See Table 60 below | Active warning |
| Active inhibit | See Table 60 below | Active inhibit |
| Fault queue—event order | See Table 60 below | A list of the last 10 faults shown in the order they occurred. Most recent at top. |

Table 60. Trip Snapshot Parameters

| Parameter Name | Range/Units | Description |
|--------------------------------|--------------------------------------|---|
| Snap shot phase A (L1) current | Depends on frame size (Amps) | Phase A (L1) RMS current at time of trip |
| Snap shot phase B (L2) current | Depends on frame size (Amps) | Phase B (L2) RMS current at time of trip |
| Snap shot phase C (L3) current | Depends on frame size (Amps) | Phase C (L3) RMS current at time of trip |
| Snap shot ground current | Depends on frame size (Amps) | Ground fault current RMS at time of trip |
| Snap shot frequency | 47–63 Hz (centi-Hz) | Line frequency at time of trip scaled in centi-Hz |
| Snap shot thermal capacity | 0–250% | Overload thermal capacity percent at time of trip |
| Snap shot voltage AB (L1-L2) | 0–690 V; max 4,160 V with PT ratios | Voltage AB (L1-L2) RMS volts at time of trip |
| Snap shot voltage BC (L2-L3) | 0–690 V; max 4,160 V with PT ratios | Voltage BC (L2-L3) RMS volts at time of trip |
| Snap shot voltage CA (L3-L1) | 0–690 V; max 4,160 V with PT ratios | Voltage CA (L3-L1) RMS volts at time of trip |
| Snap shot VA | Depends on frame size (volt-amps) | Apparent power at time of trip |
| Snap shot watts | Depends on frame size (Watts) | Real power at time of trip |
| Snap shot power factor | 0–100%, scaled by 0.01% via fieldbus | Power factor at time of trip |

Table 61. PTC Status Bits

| Value | Description |
|-------|----------------------------|
| 0 | PTC OK—no fault |
| 1 | PTC over temperature fault |
| 2 | PTC shorted fault |
| 3 | PTC open fault |

Table 62. Motor Control Status Bits

| Value | Description | Coil |
|-------|----------------|------|
| 0 | Running 1 | 4785 |
| 1 | Running 2 | 4786 |
| 2 | Remote enabled | 4787 |
| 3 | Faulted | 4788 |
| 4 | Warning | 4789 |
| 5 | Inhibited | 4790 |
| 6 | Ready | 4791 |
| 7 | Motor at speed | 4792 |

Table 63. Active Fault, Warning and Inhibit Values

| Value | Description |
|---------------------|--|
| Active Fault | |
| 0 | No Faults |
| 1 | Under voltage |
| 2 | Over voltage |
| 3 | Reserved |
| 4 | Ground Current |
| 5 | Current phase loss |
| 6 | Current unbalance |
| 7 | Instantaneous over current |
| 8 | Jam |
| 9 | PF Deviation |
| 10 | Voltage phase loss |
| 11 | Voltage unbalance |
| 12 | Frequency deviation fast |
| 13 | Frequency deviation slow |
| 14 | Under current |
| 15 | High power |
| 16 | Low power |
| 17 | Contactora failure |
| 19 | Overload |
| 20 | Stall |
| 21 | Phase rotation mismatch |
| 22 | PTC - See PTC State for details |
| 23 | Under voltage restart |
| 24 | Measurement Module fault |
| 25 | Communication loss on active fieldbus |
| 26 | Measurement Module not available or communication loss with the module |
| 27 | User Interface not available or communication loss with the module |
| 28 | Test trip was triggered |
| 29 | Option Card not available or communication loss with the module |
| 30 | RTC / Backup Memory Option Board NV memory fail |
| 31 | Currently connected User Interface does not match with what was connected before |
| 32 | Currently connected Measurement Module does not match with what was connected before |
| 33 | Currently connected Option Card does not match with what was connected before |

Table 63. Active Fault, Warning and Inhibit Values, continued

| Value | Description |
|--------------------------------|---|
| Active Fault, continued | |
| 34 | Measurement Module firmware is incompatible |
| 35 | User Interface firmware is incompatible |
| 36 | Ethernet Option Card firmware is incompatible |
| 37 | Profi Option Card firmware is incompatible |
| 38 | Ground Fault Module firmware is incompatible |
| 39 | Ground Fault Module communication loss |
| 40 | Ground Fault Module mismatch |
| 41 | Ground Fault Module CT open |
| 42 | Ground Fault Module CT shorted |
| 43 | Ground Fault Module CT no cal |
| 44 | HRGF Pulse Detect |
| 200... | 200–232 are logic engine faults |
| 500 | Internal - communication loss with Power Supply Board |
| 501 | Internal - Power Supply Board is not responding to SPI |
| 502 | Internal - Checksums in NV memory (FRAM) didn't match during read (neither pair) |
| 503 | Internal - Checksums in NV memory (FRAM) didn't match during write (neither pair) |
| 504 | Internal - RTC / Backup Memory Option Card is missing |
| 505 | Internal - RTC / Backup Memory Option Card does not match actual |
| 506 | Internal - RTC / Backup Memory Option Card has NV Fault. |
| 507 | Internal - serial flash memory fault (Attempt Factory Reset first. Return to manufacturer if not cleared) |
| 508 | Internal - logic mapping error (Attempt factory reset) |
| 509 | Internal - UI NV memory error |
| 510 | Internal - Option card NV memory error |
| 511 | Internal Ground Fault Module NV memory error |
| 1000... | 1000–1049 Logic User faults |
| Active Warning | |
| 0 | No Warnings |
| 1 | Under voltage |
| 2 | Over voltage |
| 3 | Reserved |
| 4 | Ground Current |
| 5 | Current phase loss |
| 6 | Current unbalance |
| 7 | Instantaneous over current |

Table 63. Active Fault, Warning and Inhibit Values, continued

| Value | Description |
|----------------------------------|---|
| Active Warning, continued | |
| 8 | Jam |
| 9 | PF Deviation |
| 10 | Voltage phase loss |
| 11 | Voltage unbalance |
| 12 | Frequency deviation fast |
| 13 | Frequency deviation slow |
| 14 | Under current |
| 15 | High power |
| 16 | Low power |
| 17 | Contactora failure |
| 18 | Starts limit exceeded |
| 19 | Overload |
| 20 | Stall |
| 21 | Phase rotation mismatch |
| 22 | PTC - See PTC State for details |
| 23 | Peak demand |
| 24 | Measurement Module warning |
| 25 | Real Time Clock requires setting (has not been set) |
| 26 | RTC Battery Low. Replacement is recommended |
| 27 | Device ambient temperature high |
| 28 | MM high ambient temperature |
| 29 | UI high ambient temperature |
| 30 | Option card high ambient temperature |
| 31 | Ground Fault Module high ambient temp |
| 41 | Ground Fault Module CT open |
| 42 | Ground Fault Module CT shorted |
| 43 | Ground Fault Module CT no cal |
| 44 | HRGF Pulse Detect |
| 220... | 220–232 are logic engine warnings |
| 1000... | 1000–1049 Logic User warnings |

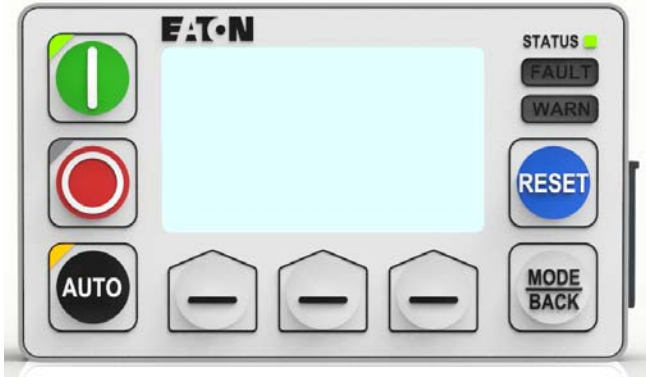
Table 63. Active Fault, Warning and Inhibit Values, continued

| Value | Description |
|-----------------------|---|
| Active Inhibit | |
| 0 | No inhibits |
| 1 | Incorrect configuration. See configuration inhibit reason |
| 2 | A soft reset is required |
| 3 | Backspin prevention |
| 4 | Under voltage restart timer active |
| 5 | Control voltage is low |
| 6 | Under voltage condition |
| 7 | Voltage unbalance |
| 8 | Starts per hour limit has been exceeded |
| 9 | Over voltage condition |
| 10 | ELC Hardware mismatch |
| 11 | Run Interlock input open |
| 1000... | 1000–1049 Logic User inhibits |

Chapter 8—C445UM Monitoring User Interface

C445UM Overview

Figure 119. C445UM



The monitoring user interface offers an easy way to access C445 safely from outside the enclosure door. Unlocking advanced functionality in an intuitive format, it is ideal for easy local diagnostics and commissioning with or without use of a network.

C445UM Catalog Numbers

Connect User Interface to the Base Control Module (C445B...) using D77E... cables in desired length.

Table 64. C445UM Catalog Numbers

| Catalog Number | Description |
|---------------------|--------------------------------|
| C445UM | C445 Monitoring User Interface |
| D77E-QPIP13 | Connection Cable, 13 cm |
| D77E-QPIP25 | Connection Cable, 25 cm |
| D77E-QPIP100 | Connection Cable, 100 cm |
| D77E-QPIP200 | Connection Cable, 200 cm |
| D77E-QPIP300 | Connection Cable, 300 cm |

C445UM Setup Wizard

The Setup Wizard sets basic system parameters required for optimal operation. The wizard prompts on first power-up and can also be accessed directly in:

PRG → *Services* → *Run Wizard*

Figure 120. C445UM Setup Wizard

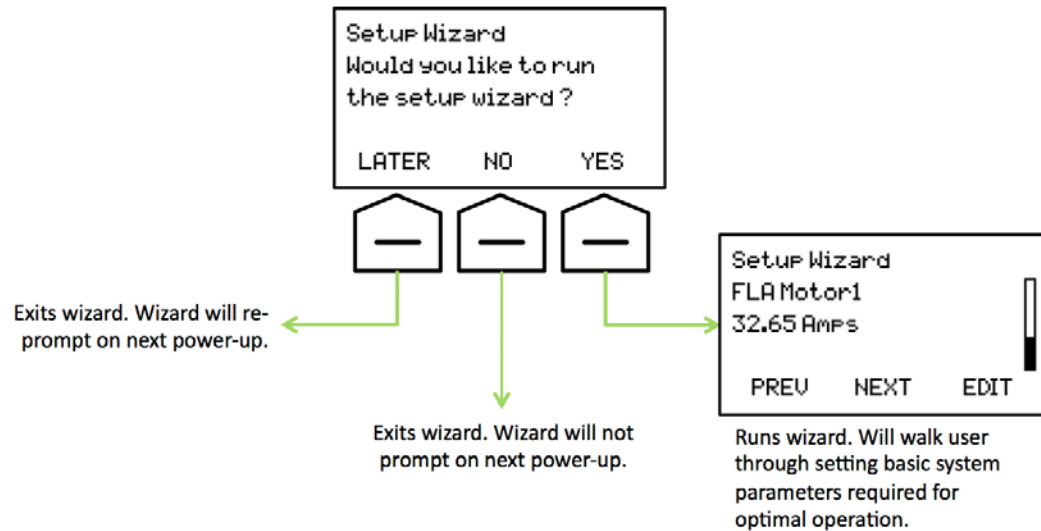
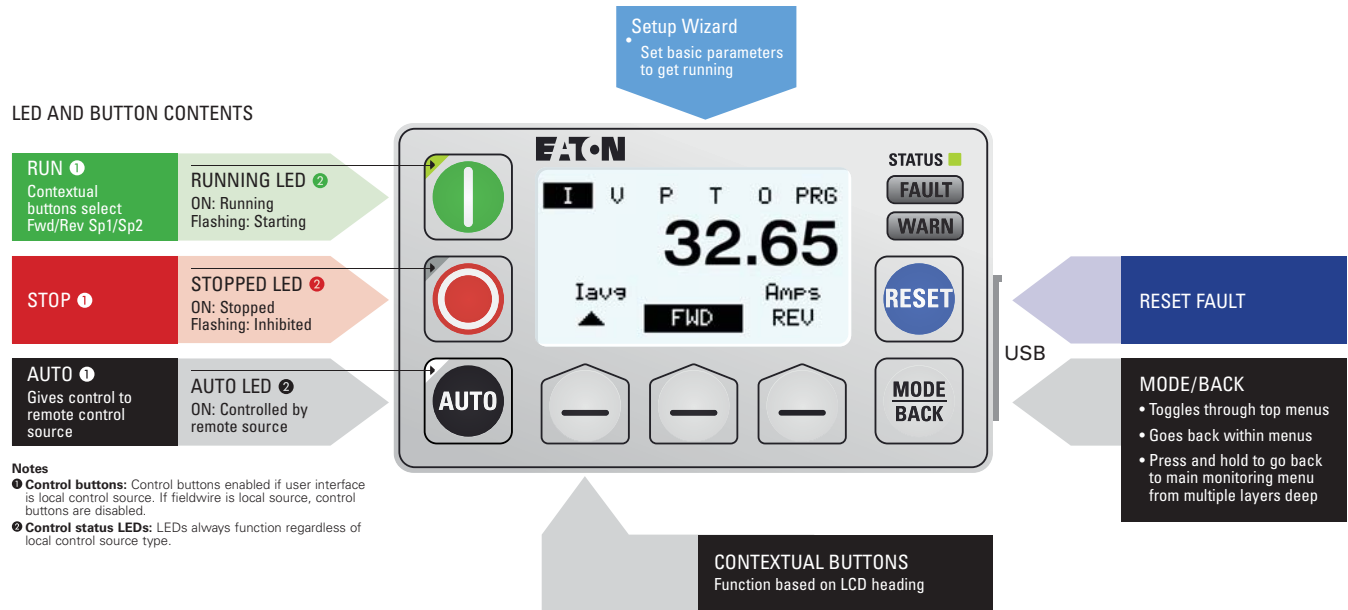


Table 65. C445UM Setup Wizard Parameters

| Catalog Number | Default Settings |
|----------------------------|---|
| Operation Mode | Direct Online |
| Local Control Source | Auto Detect User Interface |
| Remote Control Source | Fieldbus |
| 2-Wire/3-Wire | 2-Wire |
| Trip Class | 5 |
| Motor FLA | Low Range of Connected Measurement Module |
| Motor Rated HP/Watts | 20 HP / 14914 W |
| Motor Rated Speed | 1750 RPM |
| Motor Rated Service Factor | 1.15% |
| Motor Rated Voltage | 480 V |
| Motor Rated Frequency | 60 Hz |
| Motor Rated Power Factor | 83.50% |

C445UM LED and Button Overview

Figure 121. C445UM LED and Buttons



C445UM Monitoring

Five monitoring menus provide easy access to critical system data.

- I:** Current Monitoring
- V:** Voltage Monitoring
- P:** Power Monitoring
- T:** Thermal Monitoring
- O:** Other System Monitoring

Figure 122. C445UM Monitoring Menus

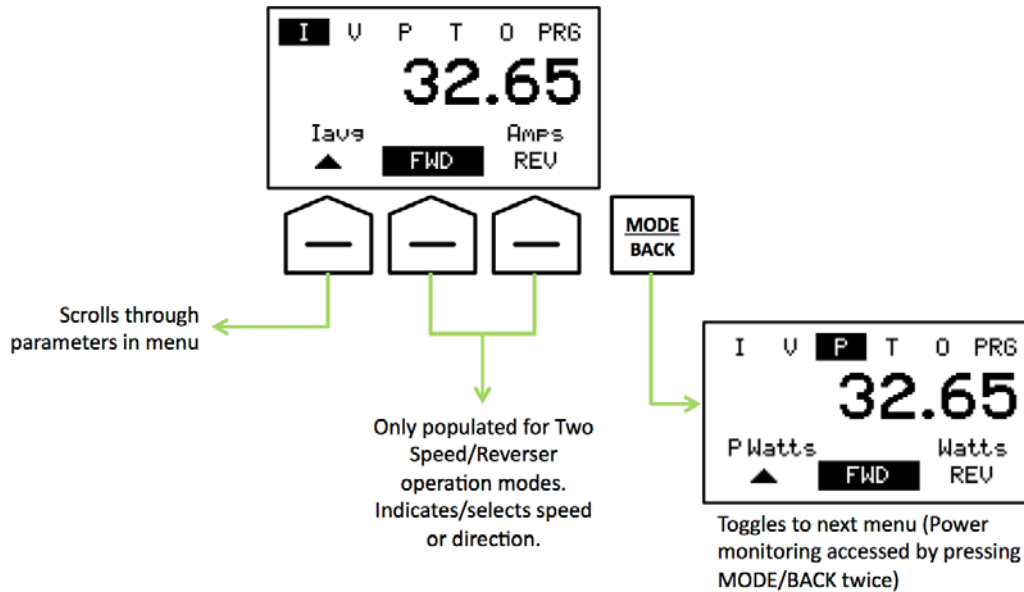


Figure 123. Monitoring Menu Data

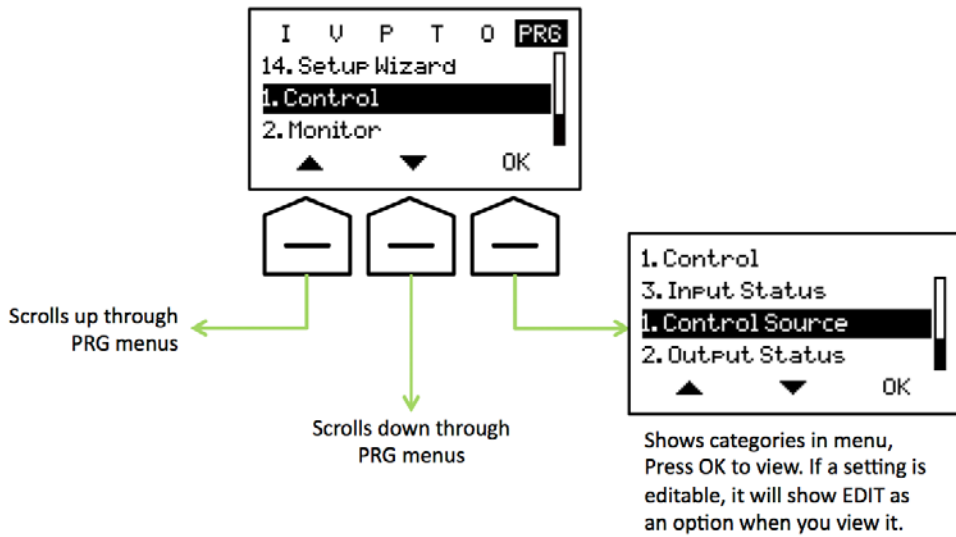
| Monitoring Menus: Press <MODE/BACK> to toggle through | | | | | |
|---|---|--|--|---|---|
| Data in menu | I (Current) | V (Voltage) | P (Power) | T (Thermal) | O (Other) |
| | Avg Current (Iavg) Iavg % of FLA (I%FLA) Current Unbalance (IUnb) Ground Fault Current (IGF) I Phase A (IA) I Phase B (IB) I Phase C (IC) | Avg Voltage(Vavg) Voltage Unbalance (VUnb) Phase Order (Ph Ord) Voltage L1-L2 (L1-L2) Voltage L2-L3 (L2-L3) Voltage L3-L1 (L3-L1) | Watts Total (P Watts) Power Factor (PF) VA Total (P VA) VARs Total (P VARS) Real Energy* (P kWh) | Thermal Memory % (TM%) Time to Reset (T to Rst) Thermal Capacity % (TC%) PTC state (PTC) | Run Time* (Run Time) # Motor Starts (#Starts) Max. Starting I (MaxStart) Last Start Time (LastStart) Frequency (Freq) RTC Time (RTC Time) IP Address (IP Addr) Operating Time* (Op Time) Contactor Ops Last Hr (Ctr Ops) Speed RPM (Speed) |
| Use ▲ to scroll | | | | | |

*Resettable parameter—Users can reset to zero in PRG menu.

C445UM PRG Menu (Customizing Settings)

The last menu accessed by pressing *MODE/BACK* is the *PRG* menu. This menu provides an easy way to view or change any C445 setting. Everything is organized in simple menu groups. Some menus have an “Advanced” sub-menu for options not commonly used or customized.

Figure 124. C445UM Program Menu



The following table summarizes functions available in each PRG Menu.

Table 66. Program Menu Groups

| Program (PRG) Menu Groups | | | | | |
|---------------------------|---|--|--|---|---|
| Go here to ... | 1. Control | 4. Wiring Configuration | 7. Protections | 11. User Interface Settings | 15. External I/O |
| | See active control source Control relay outputs View digital input status View relay output status | Set single phase/3-phase Set CT ratios Set PT ratios | Enable/disable fault trips/fault no trips/fault warnings Customize protection thresholds and delays | Set screen idle behavior Contrast/brightness Set control button delays Change LED colors | ELC I/O status Ext I/O comm config ELC I/O setup config |
| | 2. Monitor | 5. Operation Mode | 8. Real Time Clock | 12. Security | 16. User Logic |
| | Monitor voltage, current, power, system data (all monitoring values, not just favorites) Clear resettable monitor values | Select operation mode, local/remote control sources Set comm loss/idle behavior Select output functions Enable remote control source switch | Set time and time zone | Set passwords (local, admin, USB) | Logic run control Logic run status Error info |
| | 3. Motor Configuration | 6. Faults and Events | 9. Communications | 13. Services | |
| | Set/view motor nameplate data (also in Setup Wizard) | View active fault/warning/inhibit View or clear fault queue and trip snapshot | Configure Ethernet and Modbus settings (address, timeouts, baud rate, advanced, etc.) | Factory Reset Soft Reset Re-pair modules | |
| | 10. System View | 14. Launch Setup Wizard | | | |
| | | View product details (serial number, firmware version, etc.) | Re-run Setup Wizard | | |

Customizing Settings in PRG Menu

Press OK to view any parameter in the PRG Menu. Editable parameters will show EDIT on the view screen. Select *EDIT*, use button options to modify, and select *SAVE*. To cancel an edit, press *MODE/BACK* instead of saving. There are multiple editing modes:

- Checkbox Options** – Checkboxes are used for a group of options where each item in that category can be turned on or off. A good example of this is *Trip Enable* in the Protections Menu. Each trip type (Overvoltage, Low Power, etc) can be individually enabled or disabled so each offers a check box editing feature. Pressing edit will provide button options to select a checked or unchecked box for each trip type.
- Scrolling Options** – If there are multiple, non-numerical setting options arrow buttons scroll through available settings. Select the desired option by simply pressing *SAVE*.
- Numerical Options** – Numerical parameters offer two editing modes:
 - Numerical Edit Mode** – Provides two arrows to increment or decrement the entire value. This editing mode is default on pressing *EDIT*. Pressing and holding arrows will speed up the value changes.
 - Digit Edit Mode** – Use digit mode by pressing and *holding* the *EDIT* button. This mode provides individual incrementing for each digit in the string. One arrow key will increment the digit selected. Incrementing is scrolling—In order to go from 4 to 1 for example, scroll through 9 and it will wrap back to the beginning. The second arrow key moves across digits for editing.

Lock Icon:

If an editable setting shows a lock icon, it cannot be edited for one of two reasons. First, password protection may be in place. In this case, pressing the lock button will prompt the user to login before allowing them to edit. Second, most settings are not editable while running and will show the lock. This default feature may be disabled by selecting the “Run Lock Override” parameter in the Advanced section of the Operation Mode category.

Soft Reset After Editing:

Changes to the device often require a Soft Reset before re-starting. In this case, an inhibit becomes active in the background (Stopped LED will start blinking). The inhibit screen will prompt the user soft reset with *RESET* button. This prompt will not appear while in the PRG menu because the user may want to set multiple items. See Faults and Events section for more information on Inhibit screens.

C445UM Fault and Event Diagnostics

Faults: When a fault occurs, the *FAULT* LED will light and a notification screen will provide fault description and access to fault diagnostics. Users can view the trip snapshot or fault queue right from the fault screen.

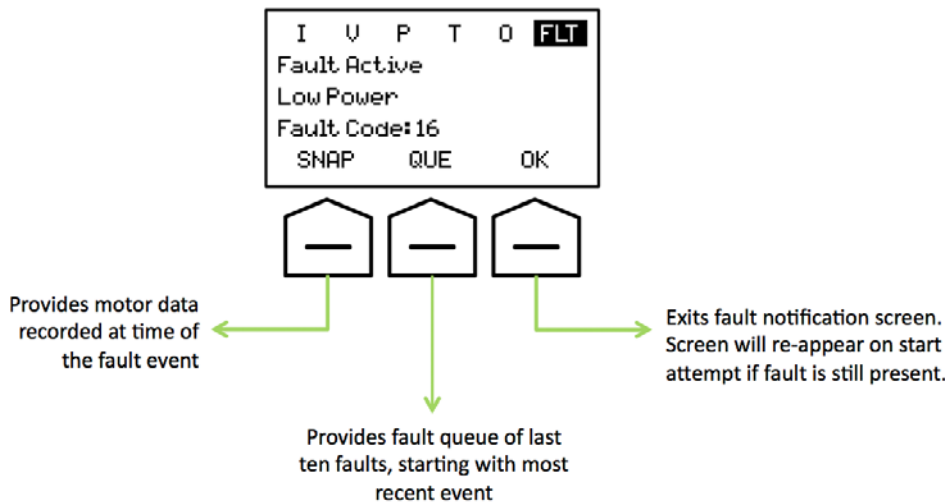
Figure 125. C445UM Diagnostics



The FLT screen can be cleared by pressing *OK*, but the *FAULT* LED remains lit. Clear a fault by pressing *RESET*. A failed reset attempt is indicated by a blinking *FAULT* LED. This means the reset command was received by the device but the fault cannot be cleared because the condition is still present.

The active fault can also always be viewed via *PRG* → *Faults and Events* → *Active Fault*

Figure 126. C445UM Faults and Events



Inhibits: An inhibit is a condition that occurs while stopped that will prevent starting. This could be a fault condition or a parameter change that requires soft reset or creates configuration conflicts.

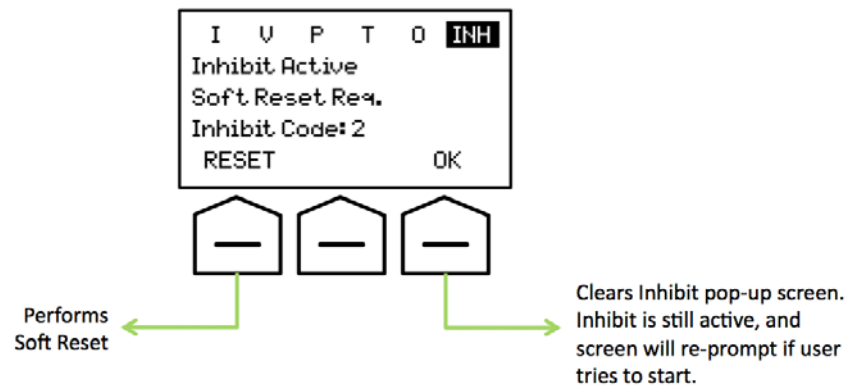
When an inhibit occurs, the stopped LED flashes and an Inhibit screen provides the reason. If an Inhibit is due to parameter changes requiring soft reset, the notification screen will provide a button to soft reset. If inhibit is due to a configuration problem, a button option provides details about the problem.

Inhibit notification screens will not appear within the *PRG* menu as the user may be changing multiple parameters and will only want to Soft Reset once. The screen will appear if the user takes any of the following actions:

1. Returns to the home monitoring screen by pressing *MODE/BACK*. Pressing *MODE/BACK* once steps out of each menu while pressing and holding will go immediately back to home.
2. Press the *START* button
3. Lets the idle timeout expire with “Return to Home Screen” enabled in timeout behavior (User Interface Settings)

The active inhibit can also always be viewed via *PRG* → *Faults and Events* → *Active Inhibit*

Figure 127. C445UM Inhibits



Warnings – If an alarm condition is present, the *WARN* LED will light. There is no pop-up screen for a warning. To view the active warning, go to *PRG* → *Faults and Events* → *Active Warning*

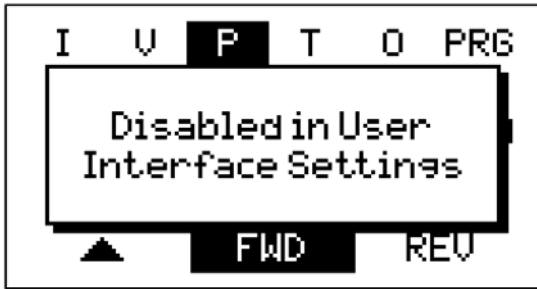
C445UM User Interface Settings

The monitoring user interface offers a number of customizable features. Navigate to *PRG → User Interface Settings* to view or change settings.

Control Button Enable/Disable—If the User Interface is the Local Control Source, control buttons are enabled. To prohibit local start, the start button can be disabled in *PRG → User Interface Settings → Enable Cntrl Buttons*

If the User Interface is not the Local Control Source (Local Control Source is set to “Fieldwire” or “No Local Control” OR Active Operation Mode is “Overload Only”), control buttons are disabled. If No Remote Control is set, the Auto button is disabled. Whether individually disabled or not used because the user interface is not a control source, the screen will notify the user if a button is not enabled when depressed:

Figure 128. C445UM Control Button Disabled Notification Screen



Reset Button Enable/Disable—*RESET* clears a fault. The User Interface *RESET* button is always enabled by default, even if the User Interface is not a Control Source. *RESET* does not stop the motor in a running condition, it simply clears the fault if the condition is no longer present. Users may also perform a reset over the Fieldbus network or with a Fieldwire input. If desired, the User Interface *RESET* button can be disabled. If depressed when disabled, the LCD screen will tell the user that the button is disabled.

PRG → User Interface Settings → Enable Cntrl Buttons

Button Debounce—Users can configure a debounce time for *START*, *STOP*, *AUTO* or *RESET* buttons. The button must be depressed for this time before the function actuates. This may be desired to prevent accidental actuation.

PRG → User Interface Settings → Advanced (UI Settings) → Start, Stop, Auto, Reset Debounce

LED Colors and Brightness—The User Interface provides control status LEDs indicating running, stopped and auto status. These status LEDs always function regardless of whether control buttons are enabled. Two additional LEDs indicate *FAULT* or *WARN* conditions.

Table 67. Running/Stopped/Auto LED Color Settings

| Button | Options | Default |
|--------|---------|---------|
| Run | RGAW | R |
| Stop | RGAW | G |
| Auto | AW | A |

PRG → User Interface Settings → Advanced (UI Settings) → Start, Stop, Auto LED Color

The brightness setting of all LEDs can also be adjusted. One setting applies to all LEDs.

PRG → User Interface Settings → LED Brightness

LCD Settings—Users can customize screen brightness and contrast for the LCD screen.

PRG → User Interface Settings → Brightness, Contrast

Screen Idle Behavior—Users can define an inactivity time period that will be considered screen idle and then set screen idle behavior. Optional behaviors include reducing brightness to a user settable idle level, returning to the last viewed measurement screen or to a specific measurement parameter, and/or logging out if password protection is used.

PRG → User Interface Settings → Inactivity Timeout (sets timeout time)

PRG → User Interface Settings → Timeout Behavior (sets behavior options at timeout)

PRG → User Interface Settings → Idle Brightness (sets idle brightness level, if used as a behavior)

PRG → User Interface Settings → Default Measure Param (sets the monitoring parameter the screen will return to on idle, if used as a behavior)

C445UM Security

Users can set different levels of password protection using the User Interface (PRG → Security). Password protection only locks out changes to device settings. All monitoring and diagnostics are still available. There are three types of password protection:

Local PW—Sets a password that only applies to the user interface.

Admin PW—Sets a password that applies to making changes from any source.

USB PW—Sets a password that only applies to making changes over the USB port.

Out-of-box, there is no password protection. When a password is already set, navigating to these menu items will first prompt the user to *LOGIN*. Once logged in with the correct password, the user has the option to disable password protection, change the password, or simply log out.

C445UM Services

The last menu in the PRG section is the Services Menu. From here, users can perform the following actions:

Test Trip—Sends a Test Trip, causing the control output to open.

Re-Pair Modules—Re-pairs devices after removing or replacing a module in the system after it has already been powered.

Factory Reset—Reboots and resets all values to factory default. This will erase any configuration settings and clear any passwords.

Soft Reset—Sends a reboot command for the entire system.

Proof Test—Executes a Test Trip and forces a Watchdog reset. This function is useful for maintenance purposes to confirm that the contactor opens on a trip and that the internal Watchdog is functioning.

Floating User Interface option

For C445s with a Base Control Module (BCM) with firmware version 3.0 or later and a Style Number of 3-4104-xxxD will support this feature. An optional configuration parameter exists that can be enabled to allow users to remove the User Interface without generating a fault (fault code 27).

Two possible use-cases for this feature:

1. Enable this feature so a User Interface can be moved from one C445 BCM to another to monitor faults and motor parameters. This is for applications where a user interface is not included with each C445.
2. If a user interface fails, this feature can be enabled via the inControl software or by writing a 1 to Modbus register 788. Then reset the fault and power cycle the C445. The C445 can then be used to continue controlling and protecting the motor without the user interface. A replacement user interface can then be plugged in at a later time and it will be accepted with no other action required.

This feature can be enabled in a number of ways as follows:

1. Power Xpert *inControl* software (V2.25 or later) under: PRG / User Interface Settings / Advanced (UI Settings) / Removeable MUI Enable. Checking the box enables this feature.
2. The User Interface under: PRG / 11. User Interface Settings / 9. Advanced (UI Settings) / 8. Removeable MUI Enable (True enables this feature). Only a User Interface with firmware version 1.00.0035 or later supports this parameter.
3. Web Pages (if an Ethernet module is installed): Program / User Interface Settings / Advanced (UI Settings) / Removeable MUI Enable (True enables this feature). This is only for Base Control Modules with firmware version 3.0 or later and Ethernet modules with firmware version 2.0 or later.
4. Writing a value of 1 to Modbus Register 788. If there is a 1 in this register the feature is enabled. A 0 disables this feature.

Notes:

1. For this feature to work, the User Interface cannot be the “Active” control source. If it is the active control source and it is removed, the C445 will fault on fault code 27 even with this feature enabled.
2. If the User Interface is the Local Control source, the Local Control source cannot be activated while the User Interface is removed. If this is attempted, the C445 will remain in Remote Control.
3. The default for this feature is Disabled.
4. This parameter may be modified via an explicit message from an Ethernet/IP scanner. The information to accomplish this is below.

Supported Services:
0x0E Get Attribute Single
0x10 Set Attribute Single

Access Rule Get/Set
Data Type UINT

Parameter address:
Class 178
Instance 1
Attribute 71

Attribute Name Removeable User Interface Enable
(0 = disabled, 1 = enabled)

Attribute Description Removeable User Interface Enable
(0 = disabled, 1 = enabled)

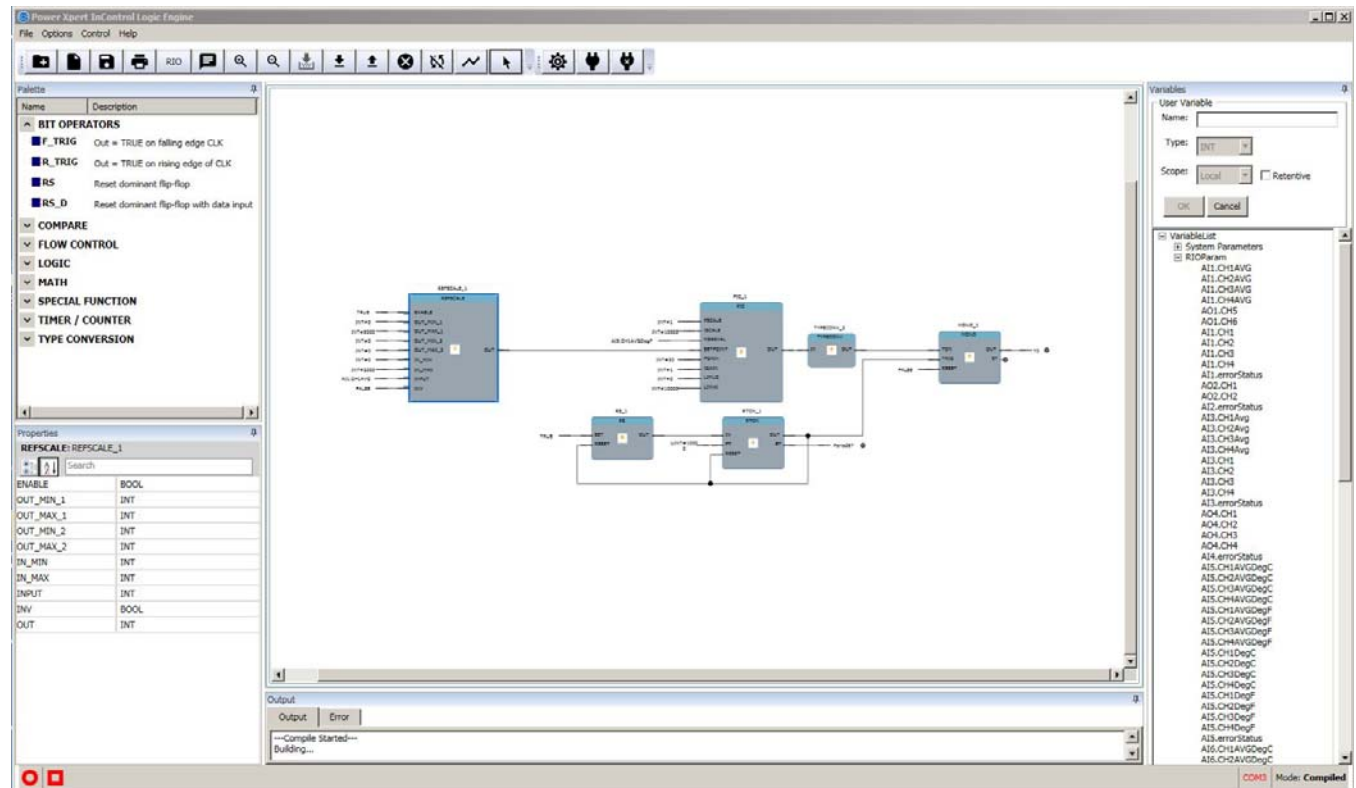
Chapter 9—C445 Logic Engine and Expansion I/O

Power Xpert *in*Control Logic Engine

The Logic Engine in the C445 Motor Management Relay has many applications. From monitoring temperature sensors attached to the windings of a motor to using it for distributed control and even eliminating a central controller. The C445 logic engine uses Function Block programming with an extensive, powerful instruction set and wide ranging data types. It can access the local I/O on the Base Control module, the expansion I/O as well as C445 system parameters allowing monitoring and control of the overload relay.

Power Xpert Logic Programming and I/O Configuration Tool

The software tool is used to create custom logic programs that reside in the C-445 MMR. The tool is also used to configure expansion I/O that is controlled from the logic engine over an RS-485 communication link. Users can create custom programs by selecting function blocks, creating variables, referencing remote I/O data items, setting properties, and accessing C-445 system variables from the logic editing screen. It is also possible to monitor live program execution in debug mode.



Chapter 9—C445 Logic Engine and Expansion I/O

The tool is also used to select I/O expansion modules, assign names to remote I/O points (tags), force I/O, and set module properties using the remote I/O (RIO) configuration screen:

The screenshot displays the Power Xpert InControl Logic Engine software interface. The main window shows a rack of I/O expansion modules, including ELC-C445S485, ELC-ANNA485, and several ELC-ANNA485 modules. The interface includes a menu bar, a toolbar, and a Properties panel on the left. The Properties panel is set to 'AnalogModule: ELC-ANNA485' and shows various configuration options for channels 1 through 4, such as CH1Mode, CH2Mode, CH3Mode, CH4Mode, and AO3.CH1AVNum.

| IsForced | System Name | User Name | Address | DType | Actual Value | Force Value | Comment |
|--------------------------|-----------------|-----------|---------|-------|--------------|-------------|---------|
| <input type="checkbox"/> | AI3.CH1Avg | | 2079 | INT | | 0 | |
| <input type="checkbox"/> | AI3.CH2Avg | | 2080 | INT | | 0 | |
| <input type="checkbox"/> | AI3.CH3Avg | | 2081 | INT | | 0 | |
| <input type="checkbox"/> | AI3.CH4Avg | | 2082 | INT | | 0 | |
| <input type="checkbox"/> | AI3.CH1 | | 2085 | INT | | 0 | |
| <input type="checkbox"/> | AI3.CH2 | | 2086 | INT | | 0 | |
| <input type="checkbox"/> | AI3.CH3 | | 2087 | INT | | 0 | |
| <input type="checkbox"/> | AI3.CH4 | | 2088 | INT | | 0 | |
| <input type="checkbox"/> | AI3_errorStatus | | 2103 | INT | | 0 | |

Expansion I/O

The expansion I/O consists of digital input and output modules, analog input and output modules as well as thermocouple and RTD temperature input modules. The digital I/O modules include 24 Vdc I/O modules, a 120 Vac input module and relay output modules that support 120 Vac/240 Vac and 24 Vdc. There are also combination analog and digital I/O modules consisting of both inputs and outputs.

The analog I/O modules support both –10 Vdc to 10 Vdc and –20 ma to 20 ma. There are analog input and output modules and a combination analog module with 4 inputs and 2 outputs.

The temperature input modules consist of a thermocouple input module and an RTD input module. The Thermocouple module supports 4 Type J, K, R, S and T thermocouple inputs. The RTD module allows for the connection of 4 platinum temperature sensors (PT 100, 3-wire, 100-ohm).

Data Types

Supported data types: BOOL, INT, DINT, UINT, SINT, USINT, UDINT, REAL, BYTE, WORD and DWORD.

Variables and constants used with any function block must be the same data type. There are data type conversion function blocks to allow for converting any variable or constant to another data type. For example, an ADD function block cannot add a DINT and a UINT. One of the variables must be converted. In this case, the UINT could be converted to a DINT and added to the other DINT. The result must be a data type DINT variable.

Note: Variables may be assigned to be retentive. Retentive variables retain their value through a power cycle. All other variable data is reset to 0 following a power cycle. To make a variable retentive, simply check the retentive box when creating the variable.

Constant Values

Enter constants to a user program by entering the following for the various supported data types into the Name field in User Variables. Select a position on the program screen by placing a “donut” before selecting OK. This will place the constant value in a specific position. Simply click on the program palette to add the “donut” where the constant is to be placed. Once placed, the constant can be moved. Below are examples of the syntax required for constant values for each data type supported.

```

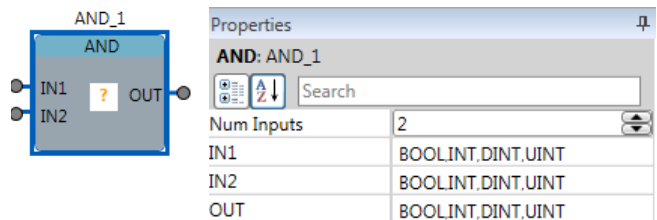
BOOL#1
INT#-123
UINT#123
DINT#100000
REAL#123.45
    
```

The Function Blocks

The Function Blocks execute from left to right, top to bottom. To alleviate any questions as to the execution order, following a program compile, a number appears inside of each Function Block indicating the order in which they will execute.

The data types for each Function Block must be the same, except where otherwise specified. When mixed values are needed, there is a conversion function block (TypeConvert) to convert each constant or variable to the same data type before using it in a specific Function Block operation.

The supported data types for each function block will be displayed in the Properties window. To view this for any FB, simply select the FB. Example below.



This section will provide a description and an example for each Function Block supported by the C445 Logic Engine. The function blocks are in groups to make them easier to locate, per the following.

Chapter 9—C445 Logic Engine and Expansion I/O

Below is the order the function blocks appear.

Bit Operators

| | |
|--------|--|
| F-TRIG | Falling edge trigger |
| R-TRIG | Rising edge trigger |
| RS | Reset dominant bi-stable |
| RS_D | Reset Dominant bi-stable with data input |

Compare Group

| | |
|-------|--------------------------|
| EQ | Equal to |
| GE | Greater than or equal to |
| GT | Greater than |
| LE | Less than or equal to |
| LIMIT | Limit Function |
| LT | Less than |
| NE | Not Equal to |

Flow Control Group

| | |
|-------------|----------------|
| First Scan | First Scan |
| JMP and LBL | Jump and Label |

Logic Group

| | |
|-----|----------------------|
| AND | Bitwise AND |
| NOT | Bitwise NOT |
| OR | Bitwise OR |
| XOR | Bitwise Exclusive OR |

Math

| | |
|-----|----------------|
| ABS | Absolute value |
| ADD | Addition |
| DIV | Divide |
| MOD | Modulo |
| MUL | Multiply |
| NEG | Negate |
| SUB | Subtract |

Special Function

| | |
|----------|----------------------------------|
| FAULT | User defined fault instruction |
| FILT | Single-pole low pass filter |
| MONO | Monostable vibrator |
| PIC | Proportional integral controller |
| REFSCALE | Range scaler |
| SEL | Select |

Timers and Counters Group

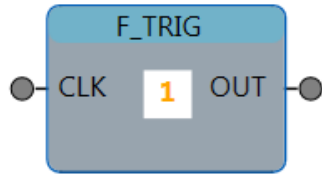
| | |
|------|---------------------------|
| CTD | Down counter |
| CTU | Up counter |
| TON | On-delay timer |
| TOF | Off-delay timer |
| RTON | Retentive On-delay timer |
| RTOF | Retentive Off-delay timer |

Type Conversion Group

| | |
|----------|-------------------------------|
| BINDEC | Binary to decimal with offset |
| BITGET | Extract bit |
| BITSET | Set bit |
| FROM_BIT | Binary to decimal |
| TO_BIT | Decimal to binary |
| TYPECONV | Data type conversion |

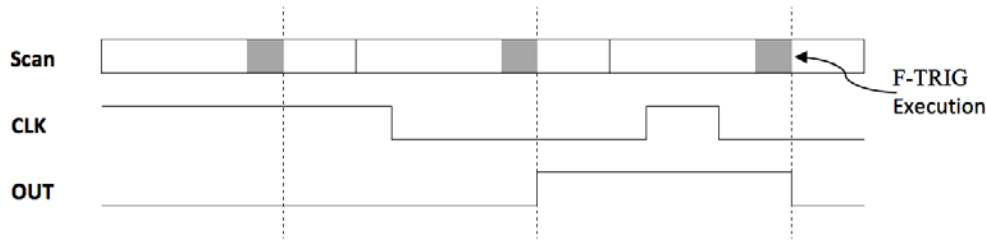
Bit Operators

F-TRIG—Falling Edge Trigger



The F-TRIG detects a TRUE to FALSE transition of the CLK. The OUT is set to TRUE when the transition is detected and it remains true until the instruction runs in the next scan where it is cleared.

| Parameter | Data type | Description |
|-----------|-----------|-----------------------|
| CLK | BOOL | Clock input |
| OUT | BOOL | Edge detection output |

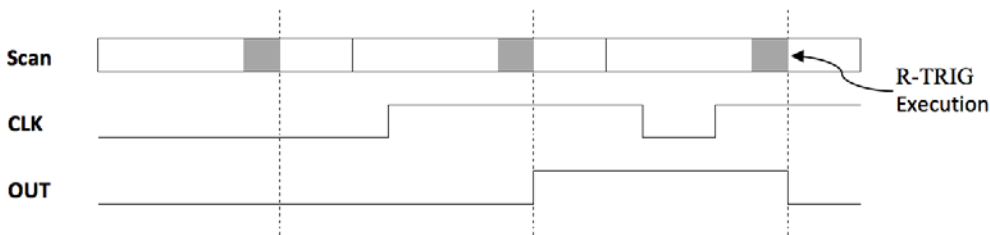


R-TRIG—Rising Edge Trigger

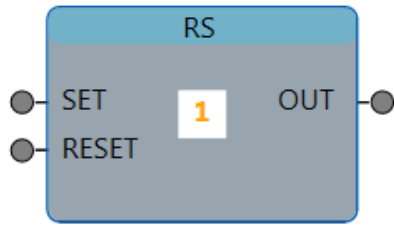


The R-TRIG detects a FALSE to TRUE transition of the CLK. The OUT is set to TRUE when the transition is detected and it remains true until the instruction runs in the next scan where it is cleared.

| Parameter | Data type | Description |
|-----------|-----------|-----------------------|
| CLK | BOOL | Clock input |
| OUT | BOOL | Edge detection output |



RS—Reset Dominant Bi-Stable

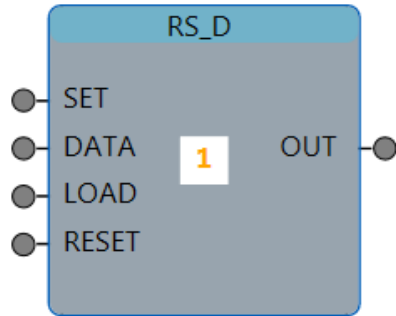


The RS is a reset dominant RS Flip Flop. If RESET is TRUE, OUT is set to FALSE regardless of the state of SET. If RESET is FALSE and SET is TRUE, OUT will be set to TRUE. If SET and RESET are FALSE, OUT will remain in its last state.

| SET | RESET | OUT (Last) | OUT |
|-----|-------|------------|-----|
| 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 1 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 |
| x | 1 | x | 0 |

| Parameter | Data type | Description |
|-----------|-----------|-------------|
| SET | BOOL | Set input |
| RESET | BOOL | Reset input |
| OUT | BOOL | Output |

RS_D—Reset Dominant Bi-Stable with Data Input



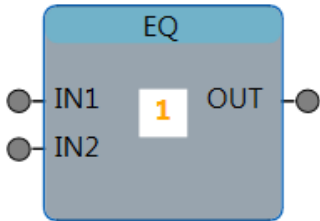
The RS_D function block performs as an RS function block with SET and RESET when LOAD is FALSE. But, when LOAD is set to TRUE, DATA is copied to the output.

| SET | RESET | DATA | LOAD | OUT (Previous) | OUT |
|-----|-------|------|------|----------------|-----|
| 0 | 0 | x | 0 | 0 | 0 |
| 0 | 0 | x | 0 | 1 | 1 |
| 1 | 0 | x | 0 | 0 | 1 |
| 1 | 0 | x | 0 | 1 | 1 |
| x | 0 | 1 | 1 | x | 1 |
| x | 0 | 0 | 1 | x | 0 |
| x | 1 | x | x | x | 0 |

| Parameter | Data type | Description |
|-----------|-----------|--|
| SET | BOOL | Set input |
| DATA | BOOL | Data input, will be copied to OUT when LOAD = TRUE |
| LOAD | BOOL | Load input for DATA |
| RESET | BOOL | Reset input |
| OUT | BOOL | Output |

Compare Group

EQ—Equal To

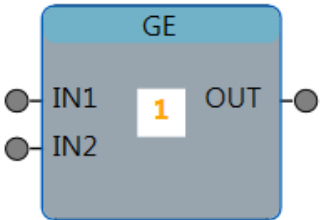


The EQ function block sets OUT to TRUE if all of its inputs are equal, else OUT is SET to FALSE. Up to 5 inputs IN1 – IN5 are supported.

OUT = TRUE IF IN1 = IN2 = ... INx

| Parameter | Data type | Description |
|-------------|-----------------------------|-----------------------|
| IN1 ... IN5 | BOOL, INT, DINT, UINT, REAL | Inputs to be compared |
| OUT | BOOL | Output |

GE—Greater Than or Equal To

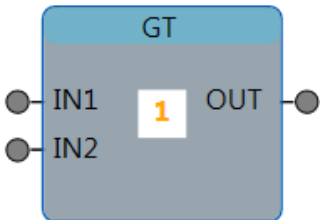


The GE function block sets OUT to TRUE if IN1 is greater than or equal to IN2.

OUT = TRUE IF IN1 ≥ IN2

| Parameter | Data type | Description |
|-----------|-----------------------|-----------------------|
| IN1, IN2 | INT, DINT, UINT, REAL | Inputs to be compared |
| OUT | BOOL | Output |

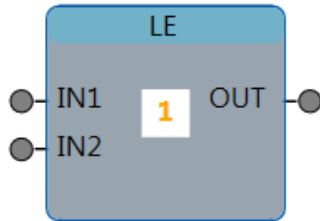
GT—Greater Than



The GE function block sets OUT to TRUE if IN1 is greater than IN2.

OUT = TRUE IF IN1 > IN2

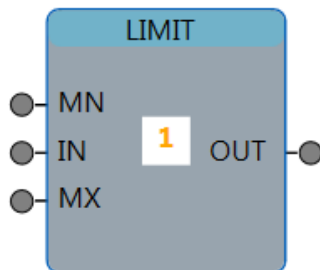
| Parameter | Data type | Description |
|-----------|-----------------------|-----------------------|
| IN1, IN2 | INT, DINT, UINT, REAL | Inputs to be compared |
| OUT | BOOL | Output |

LE—Less Than or Equal To

The LE function block sets OUT to TRUE if IN1 is lesser than or equal to IN2.

OUT = TRUE IF $IN1 \leq IN2$

| Parameter | Data type | Description |
|-----------|-----------------------|-----------------------|
| IN1, IN2 | INT, DINT, UINT, REAL | Inputs to be compared |
| OUT | BOOL | Output |

LIMIT—Limit Function

The LIMIT function block will limit IN within the data range specified by the minimum limit, MN and the maximum limit MX. The range limited input is written to OUT. OUT will only be updated if $MX \geq MN$.

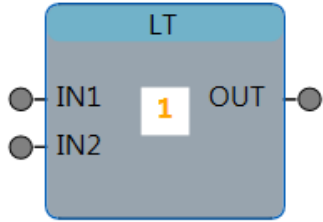
OUT = IN IF $MN \leq IN \leq MX$

OUT = MN IF $IN < MN$

OUT = MX IF $IN > MX$

| Parameter | Data type | Description |
|-----------|-----------------------|----------------------------------|
| MN | INT, DINT, UINT, REAL | Minimum limit of the input range |
| IN | INT, DINT, UINT, REAL | Input value |
| MX | INT, DINT, UINT, REAL | Maximum limit of the input range |
| OUT | INT, DINT, UINT, REAL | Range limited input value |

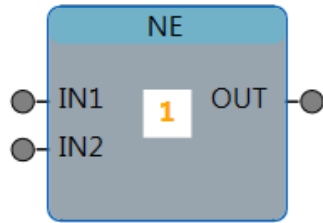
LT—Less Than



The LT function block sets OUT to TRUE if IN1 is lesser than IN2.
 OUT = TRUE IF $IN1 < IN2$

| Parameter | Data type | Description |
|-----------|-----------------------|-----------------------|
| IN1, IN2 | INT, DINT, UINT, REAL | Inputs to be compared |
| OUT | BOOL | Output |

NE—Not Equal To

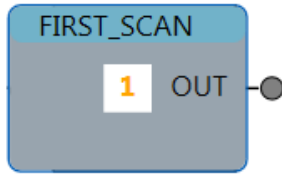


The NE function block sets OUT to TRUE if IN1 is not equal to IN2.
 OUT = TRUE IF $IN1 \neq IN2$

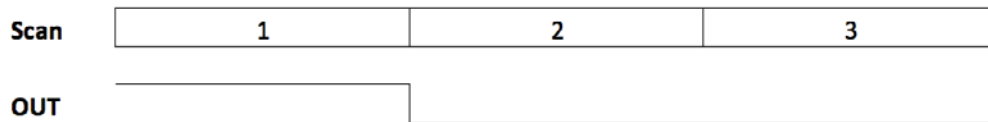
| Parameter | Data type | Description |
|-----------|-----------------------|-----------------------|
| IN1, IN2 | INT, DINT, UINT, REAL | Inputs to be compared |
| OUT | BOOL | Output |

Flow Control Group

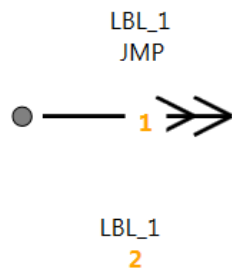
First Scan



The First Scan function block serves as a flag to indicate the first scan of the logic program. OUT is set to TRUE and remains true until the first scan of the program completes execution. This occurs when the logic program is started or restarted by enabling the logic run control or downloading a program or by power cycling the system that already has a loaded logic program. The first scan can be used as a flag for example, to initialize any variables once before executing the main program. This is often used in conjunction with the JMP function block. See the Flow Control example below.



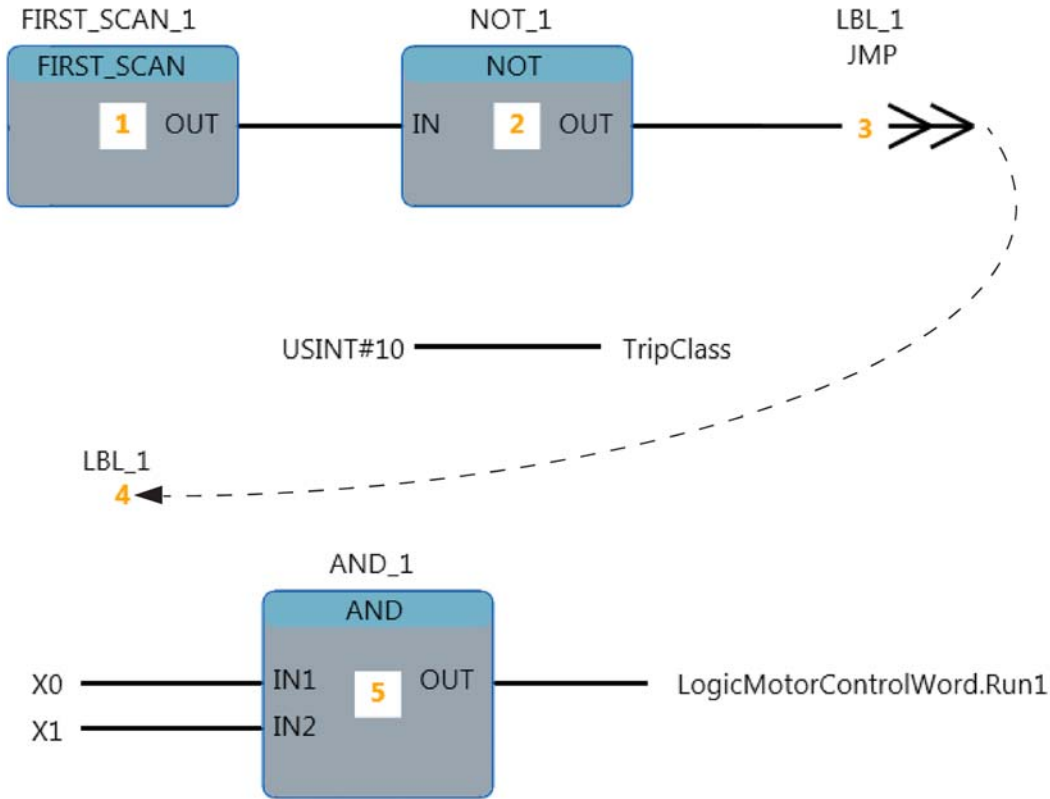
JMP and LBL



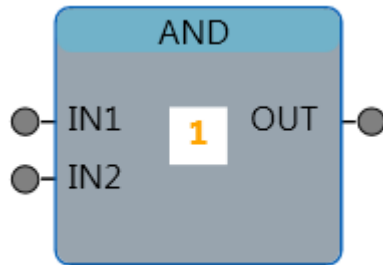
The JMP transfers the execution flow of the program to its paired label—LBL when the input condition of the JMP is TRUE. To Add a JMP LBL pair, add the JMP function block to the canvas and then click anywhere in the canvas to add the paired LBL. A JMP and an LBL are paired by using same names for the JMP and the LBL. In the example shown above, LBL_1 is the pairing name for the JMP and the LBL.

| Parameter | Data type | Description |
|---------------|-----------|-----------------------------|
| JMP Condition | BOOL | When TRUE, JMP is executed. |

Flow Control Example



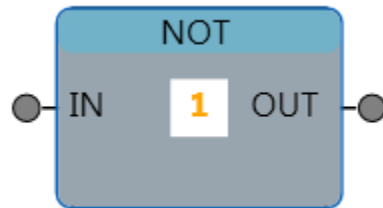
In this example, the TripClass System parameter is set to 10 during the first scan of the program before allowing external digital inputs X0 and X1 to start the motor. The JMP will always jump to LBL_1, skipping the segment of the program that sets the trip class except during the first scan when its input condition will be FALSE.

Logic Group**AND—Bitwise AND**

The AND function block performs a bitwise AND operation on all the inputs. Up to 5 inputs IN1 – IN5 are supported.

OUT = IN1 AND IN2 AND IN5

| Parameter | Data type | Description |
|-------------|-----------------------|----------------|
| IN1 ... IN5 | BOOL, INT, DINT, UINT | Input operands |
| OUT | BOOL, INT, DINT, UINT | Result |

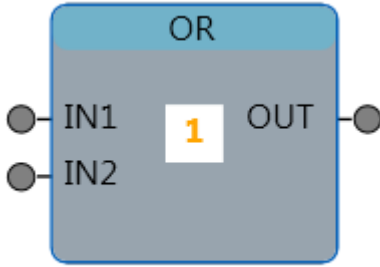
NOT—Bitwise NOT

The NOT function block performs a bitwise NOT operation on input.

OUT = !IN

| Parameter | Data type | Description |
|-----------|-----------------------|---------------|
| IN | BOOL, INT, DINT, UINT | Input operand |
| OUT | BOOL, INT, DINT, UINT | Result |

OR—Bitwise OR

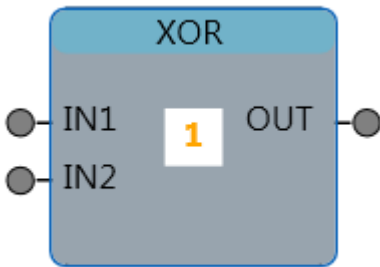


The OR function block performs a bitwise OR operation on all the inputs. Up to 5 inputs IN1 – IN5 are supported.

$$OUT = IN1 \text{ OR } IN2 \text{ OR } \dots \text{ IN5}$$

| Parameter | Data type | Description |
|-------------|-----------------------|----------------|
| IN1 ... IN5 | BOOL, INT, DINT, UINT | Input operands |
| OUT | BOOL, INT, DINT, UINT | Result |

XOR—Bitwise XOR



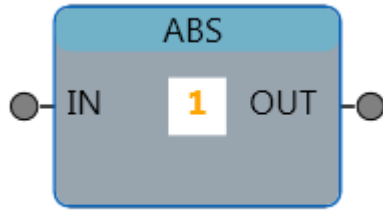
The XOR function block performs a bitwise exclusive OR operation on all the inputs. Up to 5 inputs IN1 – IN5 are supported.

$$OUT = IN1 \text{ XOR } IN2 \text{ XOR } \dots \text{ IN5}$$

| Parameter | Data type | Description |
|-------------|-----------------------|----------------|
| IN1 ... IN5 | BOOL, INT, DINT, UINT | Input operands |
| OUT | BOOL, INT, DINT, UINT | Result |

Examples with UINT inputs

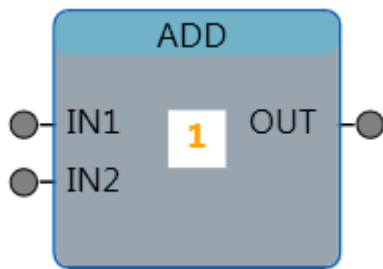
| Function | IN1 | IN2 | OUT |
|----------|--------|--------|--------|
| AND | 0x1234 | 0x4567 | 0x0024 |
| NOT | 0x1234 | | 0xEDCB |
| OR | 0x1234 | 0x4567 | 0x5777 |
| XOR | 0x1234 | 0x4567 | 0x5753 |

Math Group***ABS—Absolute Value***

The ABS function block converts the input to the non-negative equivalent (absolute) value.

$$\text{OUT} = |\text{IN}|$$

| Parameter | Data type | Description |
|-----------|-----------------------|---------------|
| IN | INT, DINT, UINT, REAL | Input operand |
| OUT | INT, DINT, UINT, REAL | Result |

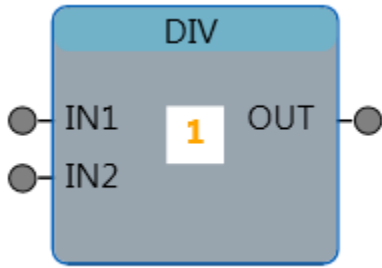
ADD—Addition

The ADD function block performs an addition of its inputs IN1 and IN2.

$$\text{OUT} = \text{IN1} + \text{IN2}$$

| Parameter | Data type | Description |
|-----------|-----------------------|----------------|
| IN1, IN2 | INT, DINT, UINT, REAL | Input operands |
| OUT | INT, DINT, UINT, REAL | Result |

DIV—Divide



The DIV function block performs a divide operation on the inputs with IN1 as the dividend and IN2 as the divisor and determines the quotient of the operation.

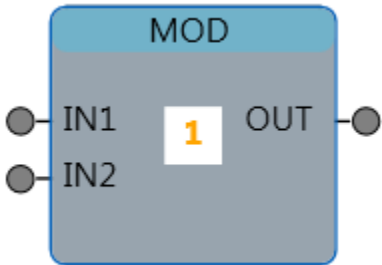
If IN2 is zero during the divide operation, the output will be set to 0 and a divide by zero fault or warning will be generated.

$$\text{OUT} = \text{IN1}/\text{IN2} \text{ IF } \text{IN2} \neq 0$$

$$\text{OUT} = 0 \text{ IF } \text{IN2} = 0$$

| Parameter | Data type | Description |
|-----------|-----------------------|-------------|
| IN1 | INT, DINT, UINT, REAL | Dividend |
| IN2 | INT, DINT, UINT, REAL | Divisor |
| OUT | INT, DINT, UINT, REAL | Quotient |

MOD—Modulo



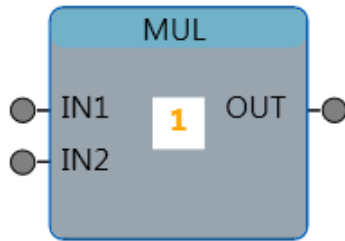
The MOD function block performs a divide operation on the inputs with IN1 as the dividend and IN2 as the divisor and determines the remainder of the operation.

If IN2 is zero during the divide operation, then the output will be set to 0 and a divide by zero fault or warning will be generated.

$$\text{OUT} = \text{IN1} \text{ modulo } \text{IN2} = \text{IN1} - (\text{IN1}/\text{IN2}) * \text{IN2} \text{ IF } \text{IN2} \neq 0$$

$$\text{OUT} = 0 \text{ IF } \text{IN2} = 0$$

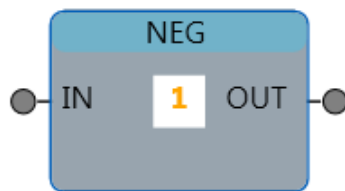
| Parameter | Data type | Description |
|-----------|-----------------------|-------------|
| IN1 | INT, DINT, UINT, REAL | Dividend |
| IN2 | INT, DINT, UINT, REAL | Divisor |
| OUT | INT, DINT, UINT, REAL | Remainder |

MUL—Multiply

The MUL function block performs a multiply operation on the inputs IN1 and IN2.

$$\text{OUT} = \text{IN1} * \text{IN2}$$

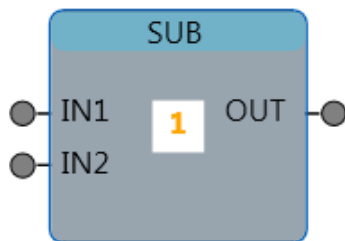
| Parameter | Data type | Description |
|-----------|-----------------------|----------------|
| IN1, IN2 | INT, DINT, UINT, REAL | Input operands |
| OUT | INT, DINT, UINT, REAL | Result |

NEG—Negate

The NEG function block performs a negate operation on the input. In other words, multiplies the input by -1.

$$\text{OUT} = \text{IN} * (-1)$$

| Parameter | Data type | Description |
|-----------|-----------------------|---------------|
| IN | INT, DINT, UINT, REAL | Input operand |
| OUT | INT, DINT, UINT, REAL | Result |

SUB—Subtract

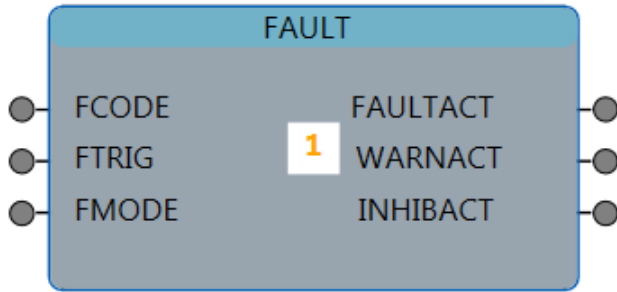
The SUB function block subtracts IN2 from IN1.

$$\text{OUT} = \text{IN1} - \text{IN2}$$

| Parameter | Data type | Description |
|-----------|-----------------------|----------------|
| IN1, IN2 | INT, DINT, UINT, REAL | Input operands |
| OUT | INT, DINT, UINT, REAL | Result |

Special Function Group

FAULT—User-Defined Fault Instruction



The FAULT function block can be used to generate up to 50 user-defined events—faults, warnings and inhibits. An event can be generated by providing an event code to the FCODE, specifying the type of event using the FMODE and triggering the event using the FTRIG.

The function block indicates an active event by setting FAULTACT, WARNACT or INHIBACT to TRUE.

Event Types

Fault—This is a latched event, meaning the event remains true even after FTRIG transitions to FALSE. The latched fault can be cleared using one of the standard C445 fault reset methods provided that FTRIG is FALSE when the fault reset is issued. A fault will stop a running motor.

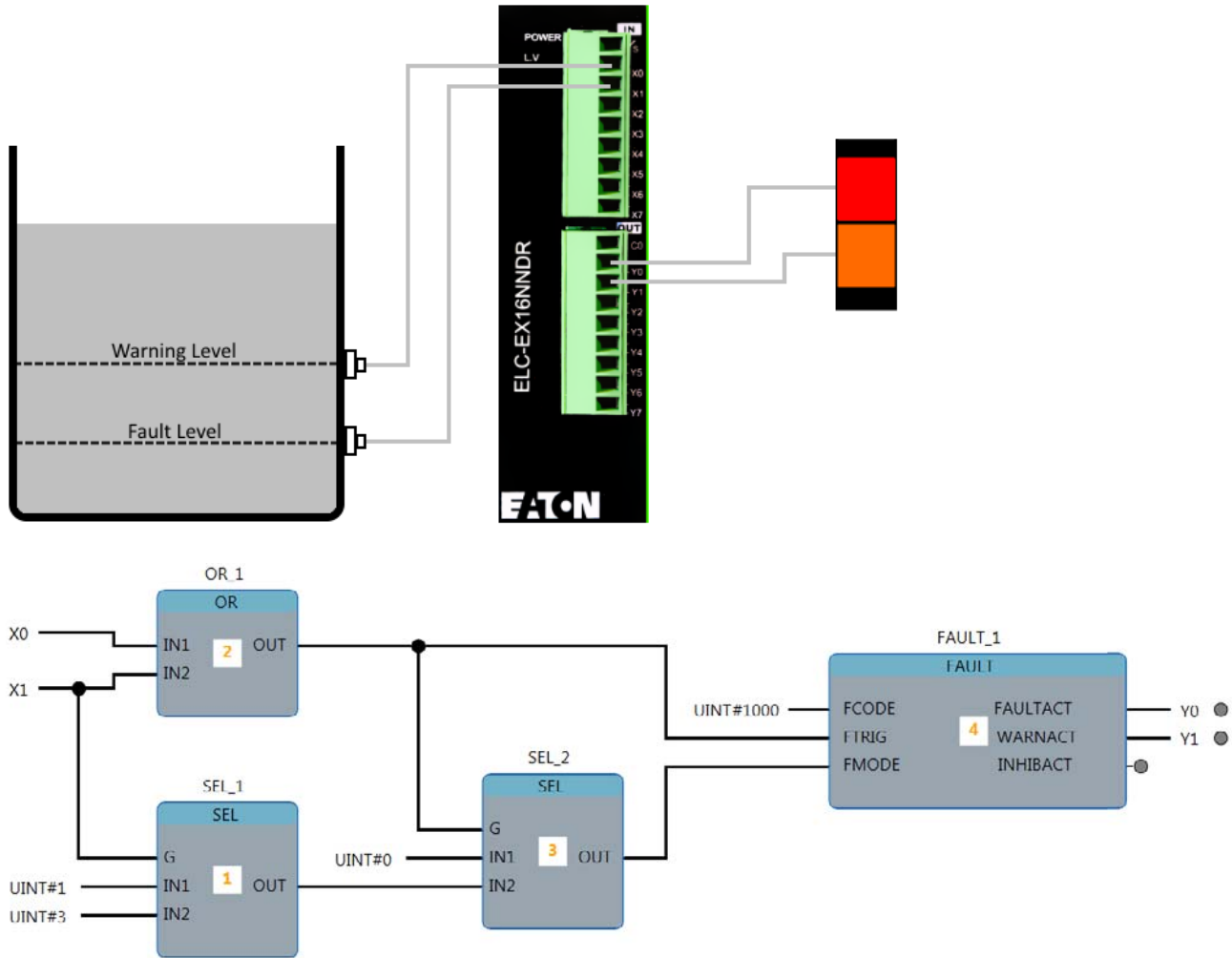
Warning—This is a non-latched event, meaning the event will clear when FTRIG transitions to FALSE. A warning will not stop a running motor.

Inhibit—This is a non-latched event, meaning the event will clear when FTRIG transitions to FALSE. An inhibit will stop a running motor.

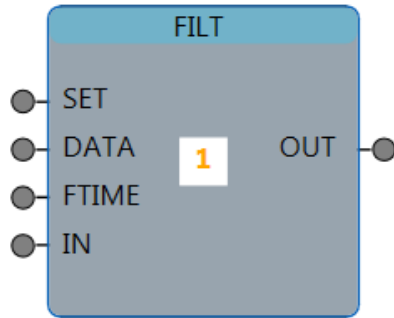
| Parameter | Data type | Description |
|-----------|-----------|--|
| FCODE | UINT | Event Code Range: 1000–1049 Note: Same code cannot be used with multiple FAULT blocks. |
| FTRIG | BOOL | Level sensitive trigger |
| FMODE | UINT | Event Mode 0 = Off 1 = Warning 2 = Inhibit 3 = Fault |
| FAULTACT | BOOL | TRUE when fault event is active |
| WARNACT | BOOL | TRUE when warning event is active |
| INHIBACT | BOOL | TRUE when inhibit event is active |

Example

In the following example, the fluid level in a tank is monitored by the program using level switches connected to the inputs of ELC-EX16NDR module. The FAULT function block is used to generate a warning when the fluid level falls below the warning level and a fault when the fluid level falls below the fault level. A stack light is turned on when either of the events occur.



FILT—Single-Pole Low Pass Filter



The FILT function block is a single-pole low pass filter that filters the input signal. The time constant is defined by FTIME.

The filter is implemented per the equation below.

$$OUT_n = OUT_{(n-1)} + (IN - OUT_n) \times \left(\frac{Program\ Scan\ Time(ms)}{FTIME} \right)$$

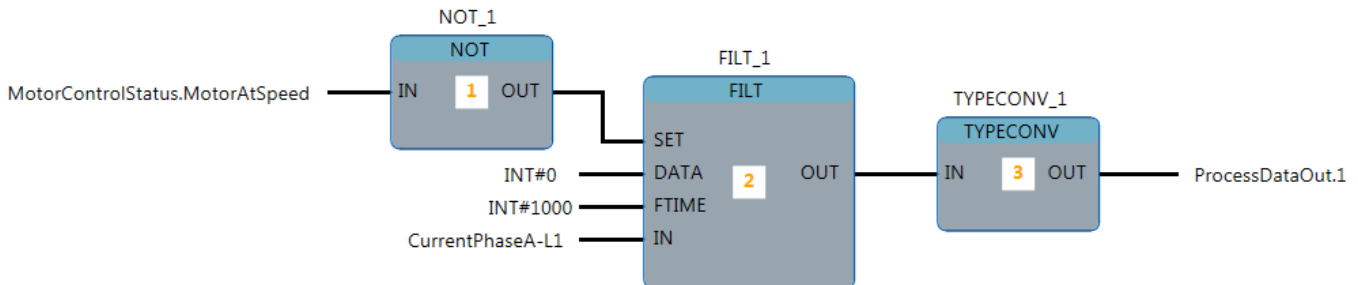
For the proper operation of the filter, FTIME has to be greater than or equal to the program scan time.

The filter can be pre-initialized using the SET and DATA inputs. When SET is true, the output of the filter is pre-initialized with the value specified by the DATA input.

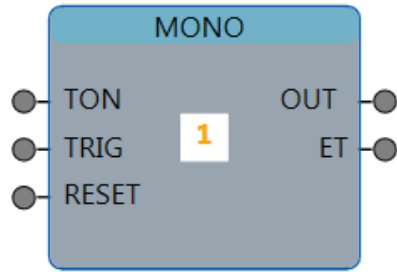
| Parameter | Data type | Description |
|-----------|-----------|--------------------------------------|
| SET | BOOL | Pre-initialize filter command |
| DATA | INT | Pre-initialize filter data |
| FTIME | INT | Filter time constant in milliseconds |
| IN | INT | Signal to be filtered |
| OUT | INT | Filtered output |

Example

In the following example, the FILT block is used to filter the Phase A current with the time constant at 1 second and the program scan time set at 10 ms. The filtered current is made available through a process data out. The filter is cleared when the motor is stopped.

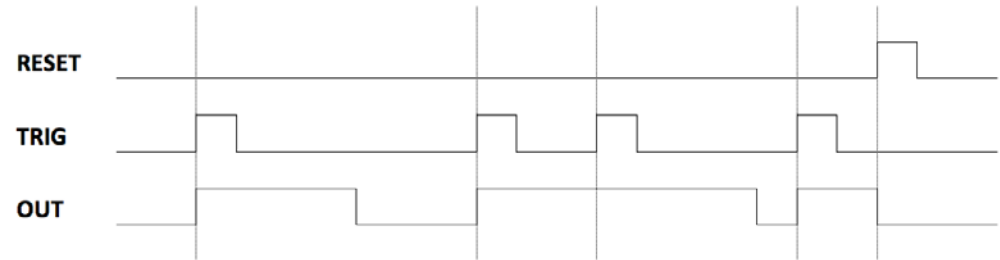


MONO—Monostable Multivibrator

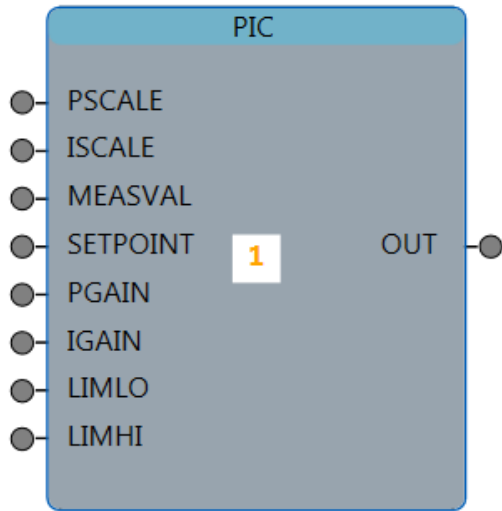


The MONO function block is a monostable multivibrator that generates an output pulse of duration defined by TON when a rising edge trigger is detected in the TRIG input. If a new trigger is detected before the output pulse has completed, the pulse is stretched out by another full pulse duration. The reset clears the OUT irrespective of the state of TON and TRIG.

| Parameter | Data type | Description |
|-----------|-----------|--|
| TON | UINT | Pulse duration (x1ms, x10ms, 100ms, x1s) |
| TRIG | BOOL | Input trigger |
| RESET | BOOL | Reset |
| OUT | BOOL | Generated pulse |
| ET | UINT | Elapsed time since pulse start |



PIC—Proportional Integral Controller



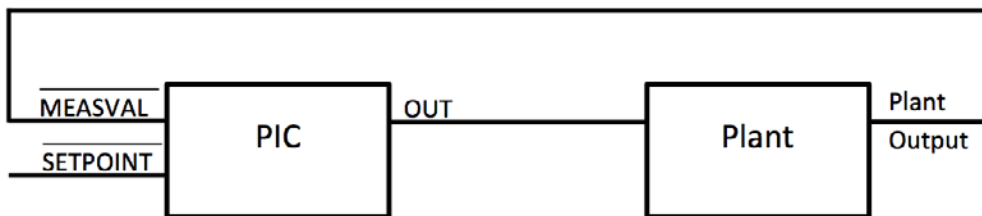
The PI function block is a proportional- and integral-based closed loop controller that tries to bring the error between the set-point command value and the measured feedback value from the plant using the provided gains.

This can be used to control parameters of a plant. Some examples would be temperature, pressure, flow, etc.

A typical use of the block would be to have:

1. A user-defined set-point that can be provided through any source such as an analog input or a process data in.
2. The output of the PIC connected to the plant, usually some driver.
3. The output of the plant fed back to the PI block through any analog source.

When the block starts executing, the PIC function block will try to reduce the error between the MEASVAL and the SETPOINT by altering the OUT.



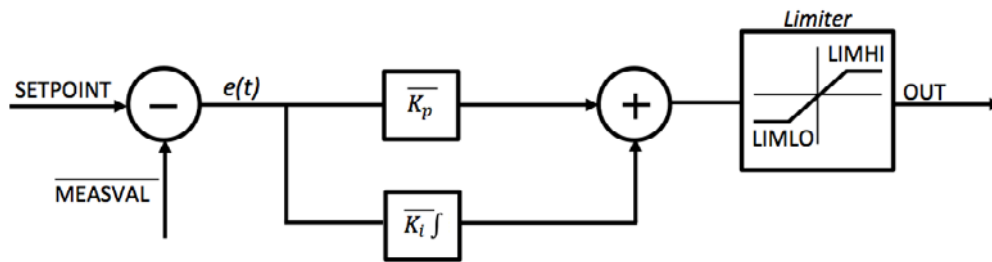
The internal implementation of the PI function block.

$$K_i = \frac{IGAIN}{ISCALE}$$

$$K_p = \frac{PGAIN}{PSCALE}$$

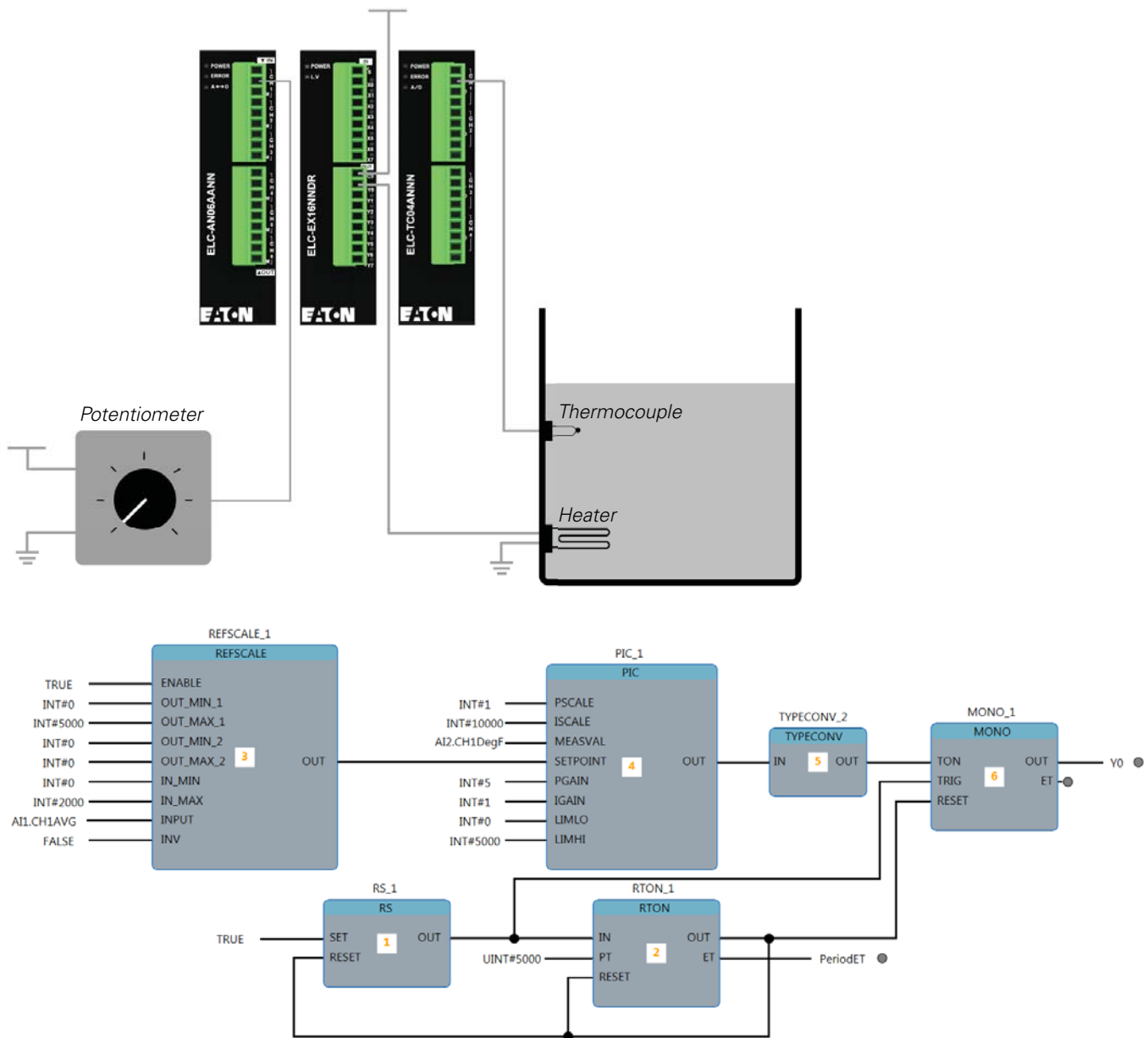
$$e(t) = MEASVAL - SETPOINT$$

$$OUT(t) = \begin{cases} K_p e(t) + K_i \int_0^t e(t) dt, & \text{if } LIMLO \leq OUT(t) \leq LIMHI \\ LIMLO, & \text{if } OUT(t) < LIMLO \\ LIMHI, & \text{if } OUT(t) > LIMHI \end{cases}$$

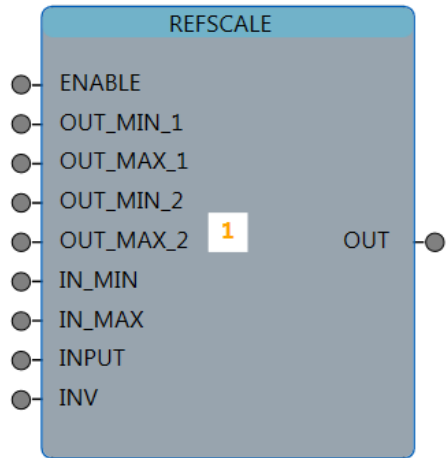


| Parameter | Data type | Description |
|-----------|-----------|----------------------------|
| PSCALE | INT | Divider for K_p |
| ISCALE | INT | Divider for K_i |
| MEASVAL | INT | Feedback from the plant |
| SETPOINT | INT | Set-point command |
| PGAIN | INT | Multiplier for K_p |
| IGAIN | INT | Multiplier for K_i |
| LIMLO | INT | Output limiter lower bound |
| LIMHI | INT | Output limiter upper bound |

In the following example, a proportional integral controller (PIC) is used to regulate the temperature of a liquid. The temperature is measured using an ELC-TC04ANN thermocouple module connected to the MEASVAL of the PIC controller acting as the feedback. The heater is turned ON/OFF using the Y0 relay output of ELC-EX16NNDR. The reference temperature is input from a potentiometer. The REFSCALE function converts the 0 to 2000 count analog input range of the analog input to engineering units of 0 to 500 degrees in 0.1 degree increments. The REFSCALE output is connected to the SETPOINT of the PIC controller. The PIC function block in the program compares the reference temperature to that of the thermocouple input. The error is applied to the PIC equation, and the output of the PIC is used as the ON time of a MONOSTABLE timer. The MONOSTABLE is retrIGGERED by a retentive timer that is triggered at a fixed rate, which is used as the period for the MONOSTABLE. This results in efficient PWM control of the heater temperature. In a real-world application, an ELC module with a transistor output module could be used to control a solid-state relay (SSR). Substitution of a transistor output module and SSR for the relay module will result in greater reliability and longer life.



REFSCALE—Range Scaler



The REFSCALE function block scales INPUT within the input range specified by IN_MIN and IN_MAX to one of the output ranges specified by OUT_MIN_1 and OUT_MAX_1 or OUT_MIN_2 and OUT_MAX_2.

When OUT_MIN_2 and OUT_MAX_2 are both set to zero, OUT_MIN_1 and OUT_MAX_1 is considered as the active output range. If either OUT_MIN_2 or OUT_MAX_2 has a non-zero value, then OUT_MIN_2 and OUT_MAX_2 will be considered as the active output range.

The output range can be flipped over the horizontal axis using by setting INV to TRUE.

Internal implementation of the REFSCALE block,

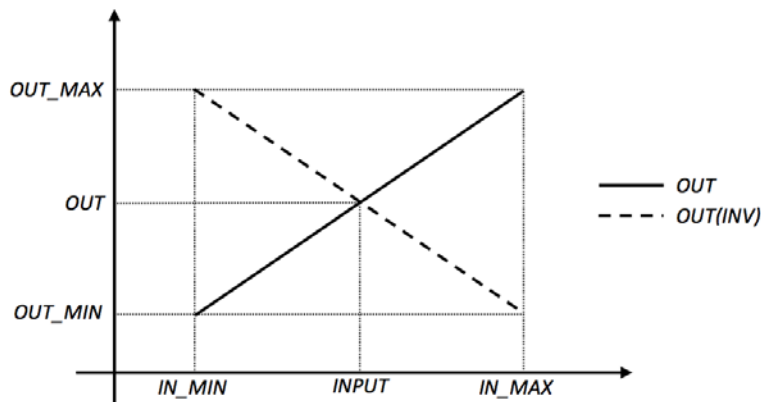
$$OUT_MIN = \begin{cases} OUT_MIN_1, & \text{if } OUT_MIN_2 = 0 \text{ AND } OUT_MAX_2 = 0 \\ OUT_MIN_2, & \text{if } OUT_MIN_2 \neq 0 \text{ OR } OUT_MAX_2 \neq 0 \end{cases}$$

$$OUT_MAX = \begin{cases} OUT_MAX_1, & \text{if } OUT_MIN_2 = 0 \text{ AND } OUT_MAX_2 = 0 \\ OUT_MAX_2, & \text{if } OUT_MIN_2 \neq 0 \text{ OR } OUT_MAX_2 \neq 0 \end{cases}$$

$$m = \frac{OUT_MAX - OUT_MIN}{IN_MAX - IN_MIN}$$

$$\bar{m} = \frac{OUT_MIN - OUT_MAX}{IN_MAX - IN_MIN}$$

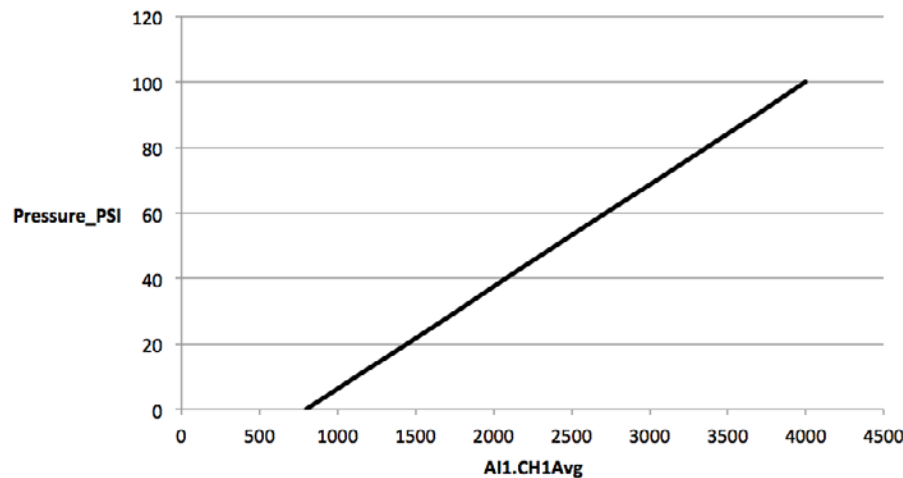
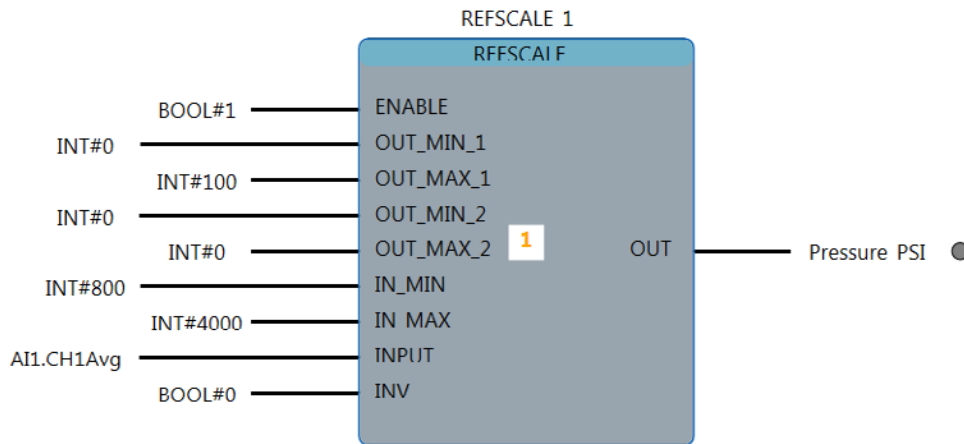
$$OUT = \begin{cases} m \times (INPUT - IN_MIN) + OUT_MIN, & \text{if } INV = FALSE \text{ AND } ENABLE = TRUE \\ \bar{m} \times (INPUT - IN_MIN) + OUT_MAX, & \text{if } INV = TRUE \text{ AND } ENABLE = TRUE \\ 0, & \text{if } ENABLE = FALSE \end{cases}$$

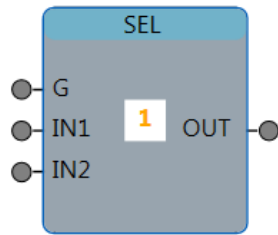


| Parameter | Data type | Description |
|-----------|-----------|------------------------------|
| ENABLE | BOOL | Enable scaling |
| OUT_MIN_1 | INT | Output range 1 – lower limit |
| OUT_MAX_1 | INT | Output range 1 – upper limit |
| OUT_MIN_2 | INT | Output range 2 – lower limit |
| OUT_MAX_2 | INT | Output range 2 – upper limit |
| IN_MIN | INT | Input range lower limit |
| IN_MAX | INT | Input range upper limit |
| INV | INT | Invert output |

Example

In this example, a pressure sensor is connected to the CH1 input of an ELC-AN04ANNN module in 4–20 mA, which when read, produces a decimal value of 800–4000. This decimal value can be scaled to a PSI value ranging from 0 to 100.



SEL—Select

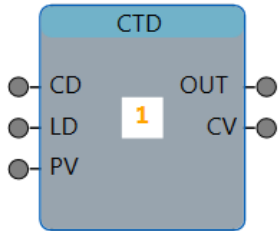
The SEL function block is a selector switch that can switch between two input sources based on the selector input G.

| G | OUT |
|----------|------------|
| 0 | IN1 |
| 1 | IN2 |

| Parameter | Data type | Description |
|------------------|-----------------------------|--------------------|
| G | BOOL | Selector |
| IN1 | BOOL, INT, DINT, UINT, REAL | Input 1 |
| IN2 | BOOL, INT, DINT, UINT, REAL | Input 2 |
| OUT | BOOL, INT, DINT, UINT, REAL | Output |

Timers and Counters Group

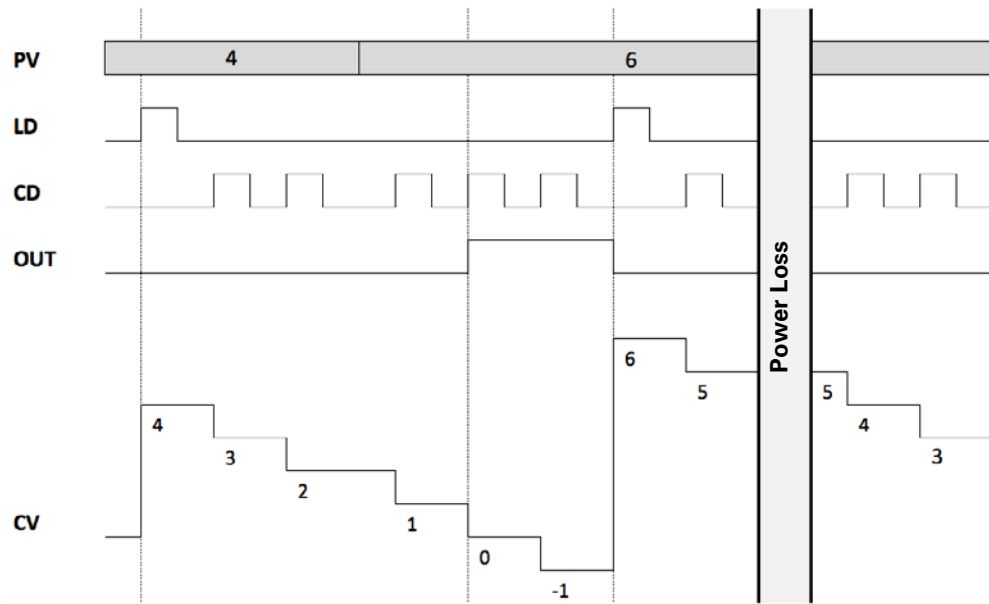
CTD—Down Counter



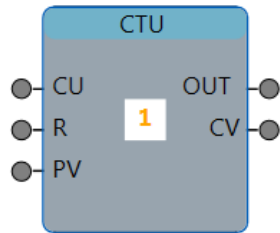
The CTD function block is a down counter that decrements the counter value (CV) by one at the rising edge of the count down (CD) trigger. The counter value is preloaded with the preset value (PV) at the rising edge of load preset (LD) trigger. The counter value is persistent through power cycle of the device.

$$OUT = \begin{cases} FALSE, & \text{if } CV > 0 \\ TRUE, & \text{if } CV \leq 0 \end{cases}$$

| Parameter | Data type | Description |
|-----------|-----------|------------------------------------|
| CD | BOOL | Count down trigger – rising edge |
| LD | BOOL | Trigger to preload counter with PV |
| PV | INT | Preset value |
| OUT | BOOL | Countdown complete flag |
| CV | INT | Counter value |



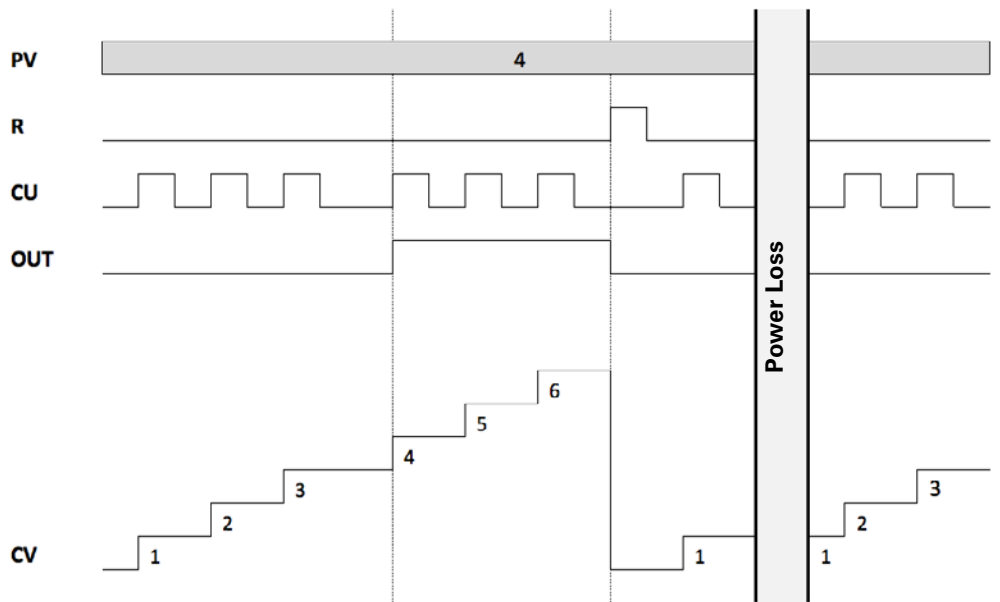
CTU—Up Counter



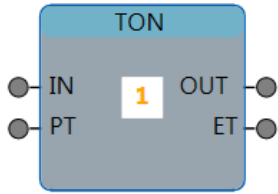
The CTU function block is an up counter that increments the counter value (CV) by one at the rising edge of the count up (CU) trigger. A rising edge reset (R) trigger will clear the counter value irrespective of the state of other inputs. The counter value is persistent through power cycle of the device.

$$OUT = \begin{cases} FALSE, & \text{if } CV < PV \\ TRUE, & \text{if } CV \geq PV \end{cases}$$

| Parameter | Data type | Description |
|-----------|-----------|------------------------------|
| CU | BOOL | Count up trigger—rising edge |
| R | BOOL | Reset counter value |
| PV | INT | Preset value |
| OUT | BOOL | Count-up complete flag |
| CV | INT | Counter value |

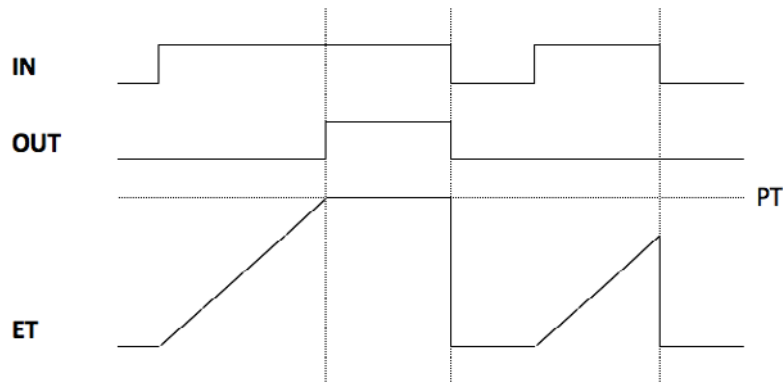


TON—On-Delay Timer

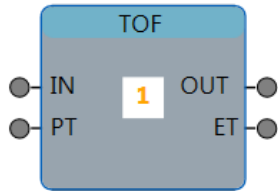


The TON function block is an on-delay timer that delays a FALSE to TRUE transition of IN to OUT by a time defined by PT. When IN is FALSE, OUT will be set to FALSE and the elapsed time (ET) will be set to zero. When IN transitions to TRUE, the timer starts running and updates the ET live. Once the timer reaches the PT, the timer stops running and sets the OUT to TRUE. If the IN transitions to FALSE before the ET could reach PT, the timer is stopped and ET is set to 0.

| Parameter | Data type | Description |
|-----------|-----------|--|
| IN | BOOL | Input trigger to start timer—rising edge |
| PT | UINT | Preset time (x1ms, x10ms, 100ms, x1s) |
| OUT | BOOL | Timer expired flag—active high |
| ET | UINT | Elapsed time (x1ms, x10ms, 100ms, x1s) |

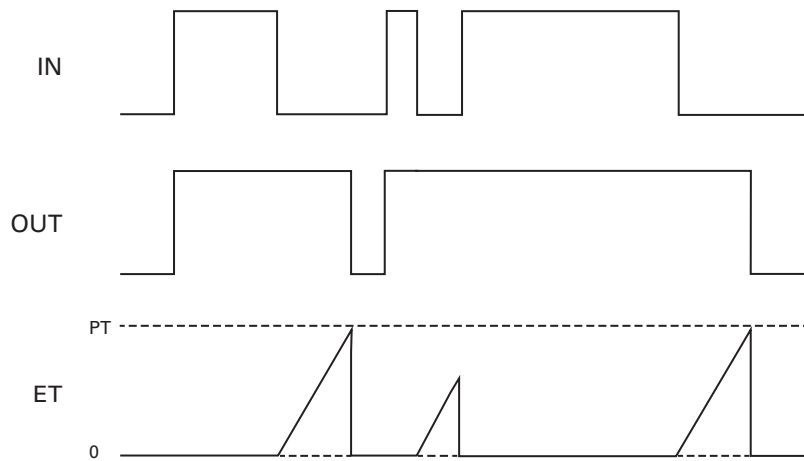


TOF—Off-Delay Timer

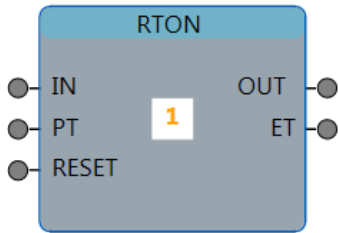


The TOF function block is an off-delay timer that delays a TRUE to FALSE transition of IN to OUT by a time defined by PT. When IN is TRUE, OUT will be set to TRUE and the elapsed time (ET) will be set to zero. When IN transitions to FALSE, the timer starts running and updates the ET live. Once the timer reaches the PT, the timer stops running and sets the OUT to FALSE. If the IN transitions to TRUE before the ET could reach PT, the timer is stopped and ET is set to 0.

| Parameter | Data type | Description |
|-----------|-----------|---|
| IN | BOOL | Input trigger to start timer—falling edge |
| PT | UINT | Preset time (x1ms, x10ms, 100ms, x1s) |
| OUT | BOOL | Timer expired flag—active low |
| ET | UINT | Elapsed time (x1ms, x10ms, 100ms, x1s) |

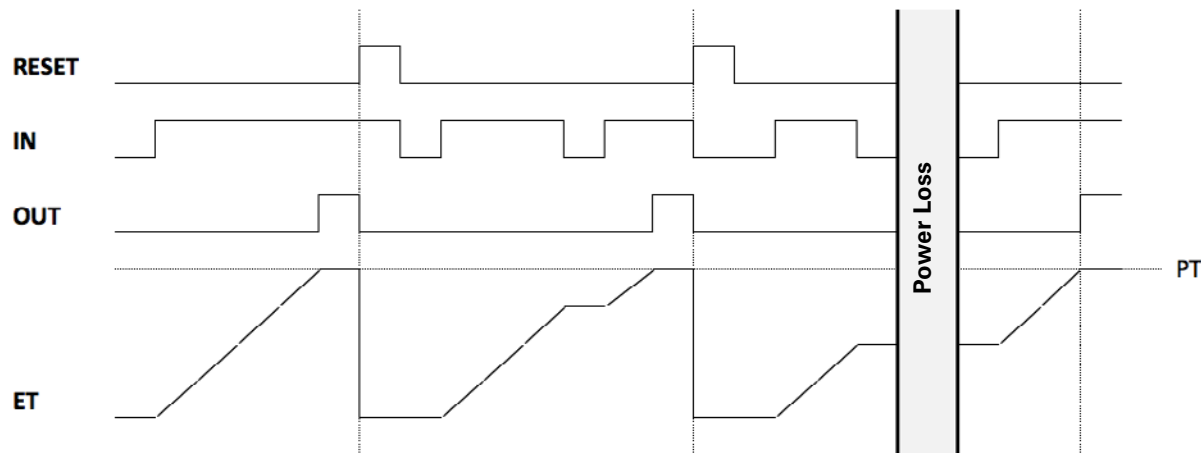


RTON—Retentive On-Delay Timer

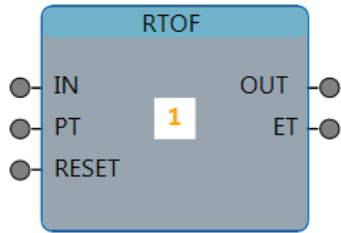


The RTON function block is a retentive on-delay timer that delays a FALSE to TRUE transition of IN to OUT by a time defined by PT. Once the timer reaches the PT, the timer stops running and sets the OUT to TRUE. This behavior is the same as that of the TON function block, but compared to TON, the RTON function block can retain the state of the timer when IN transitions from TRUE to FALSE before the timer could complete (ET = PT), essentially “pausing” the timer. When the IN transitions back to TRUE while the timer is in the paused state, the timer resumes from its retained state instead of starting from zero. The timer can be reset by providing a rising edge trigger to the RESET input. In addition to being retentive, the timer is also persistent through power cycle, meaning that the timer will retain its state in the event of a power loss to the device.

| Parameter | Data type | Description |
|-----------|-----------|--|
| IN | BOOL | Input trigger to start timer—rising edge |
| PT | UINT | Preset time (x1ms, x10ms, 100ms, x1s) |
| RESET | BOOL | Reset timer—rising edge |
| OUT | BOOL | Timer expired flag—active high |
| ET | UINT | Elapsed time (x1ms, x10ms, 100ms, x1s) |

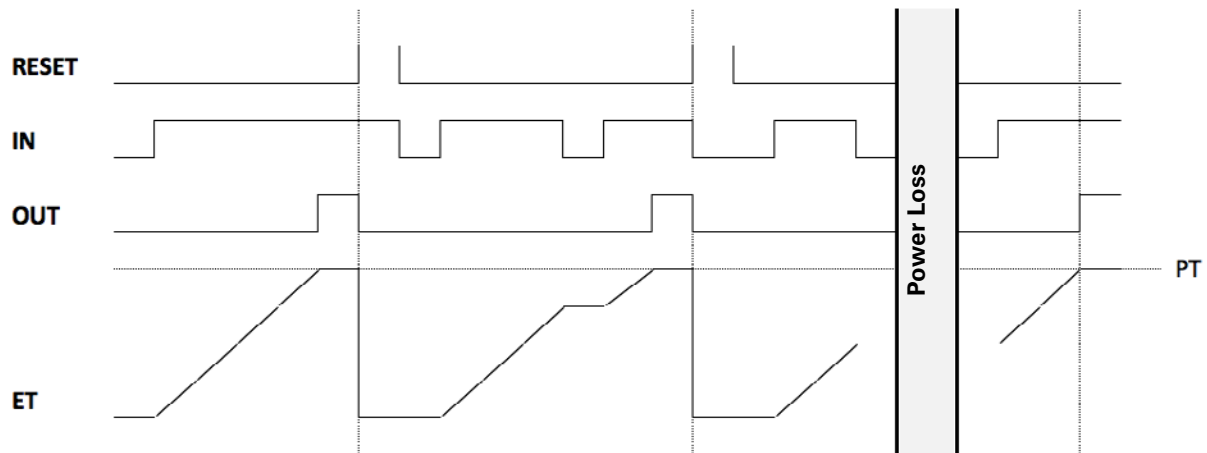


RTOF—Retentive Off-Delay Timer



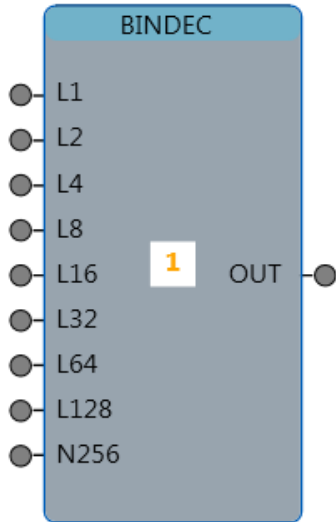
The RTOF function block is a retentive off-delay timer that delays a TRUE to FALSE transition of IN to OUT by a time defined by PT. Once the timer reaches the PT, the timer stops running and sets the OUT to FALSE. This behavior is the same as that of the TOF function block, but compared to TOF, the RTOF function block can retain the state of the timer when IN transitions from FALSE to TRUE before the timer could complete (ET = PT), essentially “pausing” the timer. When the IN transitions back to FALSE while the timer is in the paused state, the timer resumes from its retained state instead of starting from zero. The timer can be reset by providing a rising edge trigger to the RESET input. In addition to being retentive, the timer is also persistent through power cycle, meaning that the timer will retain its state in the event of a power loss to the device.

| Parameter | Data type | Description |
|-----------|-----------|---|
| IN | BOOL | Input trigger to start timer—falling edge |
| PT | UINT | Preset time (x1ms, x10ms, 100ms, x1s) |
| RESET | BOOL | Reset timer—rising edge |
| OUT | BOOL | Timer expired flag—active low |
| ET | UINT | Elapsed time (x1ms, x10ms, 100ms, x1s) |



Type Conversion Group

BINDEC—Binary to Decimal with Offset



The BINDEC function block is an 8-bit binary to decimal converter with an INT offset. Using this block, any number between –32768 and 32767 can be realized. Inputs L1 to L128 are 8-bit inputs and N256 is the INT offset.

The implementation is as shown below.

$$OUT = L1 \times 1 + L2 \times 2 + L4 \times 4 + L8 \times 8 + L16 \times 16 + L32 \times 32 + L64 \times 64 + L128 \times 128 + N256$$

| Parameter | Data type | Description |
|-----------|-----------|--------------------|
| L1 | BOOL | Binary input bit 0 |
| L2 | BOOL | Binary input bit 1 |
| L4 | BOOL | Binary input bit 2 |
| L8 | BOOL | Binary input bit 3 |
| L16 | BOOL | Binary input bit 4 |
| L32 | BOOL | Binary input bit 5 |
| L64 | BOOL | Binary input bit 6 |
| L128 | BOOL | Binary input bit 7 |
| N256 | INT | Offset |
| OUT | INT | Decimal output |

Examples

| L128...L1 | N256 | OUT |
|-----------|------|------|
| 01000001 | 500 | 565 |
| 00100000 | 1000 | 1032 |
| 01111110 | 1250 | 1376 |

BITGET—Extract Bit



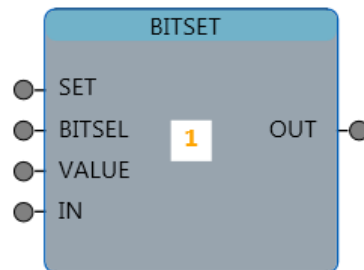
The BITGET function block extracts the bit at the bit position specified by BITSEL from the 16-bit value at IN.

| Parameter | Data type | Description |
|-----------|-----------|--------------------------------|
| BITSEL | INT | Bit position (0–15) to extract |
| IN | UINT | 16-bit input |
| OUT | BOOL | Extracted bit |

Examples

| IN | BITSEL | OUT |
|--------------------------|--------|-------|
| 65(00000000 01000001) | 0 | TRUE |
| 32(00000000 00100000) | 5 | TRUE |
| 12612(00110001 01000100) | 9 | FALSE |

BITSET—Set Bit



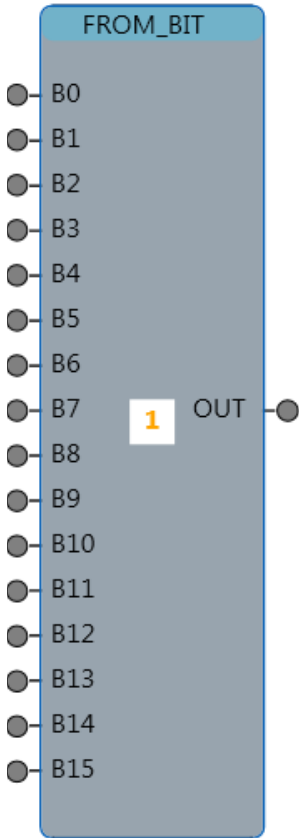
The BITSET function block can set or clear a bit specified by VALUE at the bit position specified by BITSEL of the 16-bit value IN and makes the modified 16-bit value available at the OUT. The bit modification happens only if the SET is set to TRUE else IN is just copied to the OUT.

| Parameter | Data type | Description |
|-----------|-----------|----------------------------|
| SET | BOOL | Perform bit setting |
| BITSEL | INT | Bit position (0–15) to set |
| VALUE | BOOL | Set/Clear the bit |
| IN | UINT | 16-bit input |
| OUT | UINT | Bit modified IN |

Examples

| IN | VALUE | BITSEL | OUT |
|--------------------------|-------|--------|-------------------------|
| 65(00000000 01000001) | TRUE | 2 | 67(00000000 01000011) |
| 32(00000000 00100000) | TRUE | 6 | 96(00000000 01100000) |
| 12612(00110001 01000100) | FALSE | 12 | 8516(00100001 01000100) |

FROM_BIT—Binary to Decimal



The FROM_BIT function block constructs a 16-bit UINT value using 16 individually controllable bits.

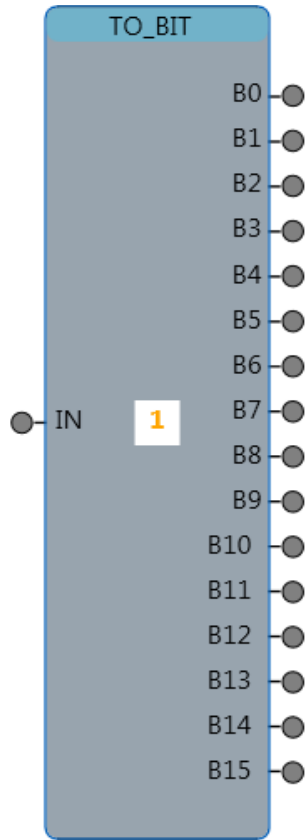
$$OUT = \sum_{n=0 \text{ to } 15} B_n \times 2^n$$

| Parameter | Data type | Description |
|-----------|-----------|----------------------------|
| B0...B15 | BOOL | Set/Clear for bits 0 to 15 |
| OUT | UINT | Constructed 16-bit value |

Examples

| B15...B0 | OUT |
|-------------------|-------|
| 00000000 01000001 | 65 |
| 00000000 00100000 | 32 |
| 00110001 01000100 | 12612 |

TO_BIT—Decimal to Binary



The TO_BIT function block extracts all 16-bits of a 16-bit UINT value.

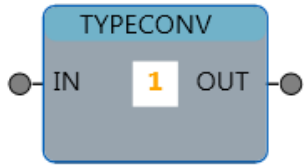
$$B_{n=0 \text{ to } 15} = \left(\frac{IN}{2^n}\right) \% 2$$

| Parameter | Data type | Description |
|-----------|-----------|----------------------|
| IN | UINT | 16-bit input |
| B0...B15 | BOOL | Extracted bits of IN |

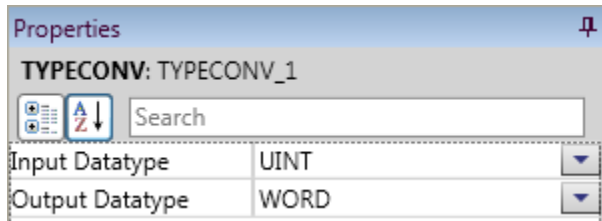
Examples

| OUT | B15...B0 |
|-------|-------------------|
| 65 | 00000000 01000001 |
| 32 | 00000000 00100000 |
| 12612 | 00110001 01000100 |

TYPECONV—Data type conversion



The TYPECONV function block converts between any of the supported data types—BOOL, SINT, INT, DINT, USINT, UINT, UDINT, REAL, BYTE, WORD, DWORD. The input and output data types can be chosen from the property inspector as shown below.



| Parameter | Data type | Description |
|-----------|--|----------------------------|
| IN | BOOL, SINT, INT, DINT, USINT, UINT, UDINT, REAL, BYTE, WORD, DWORD | Input to be type converted |
| OUT | BOOL, SINT, INT, DINT, USINT, UINT, UDINT, REAL, BYTE, WORD, DWORD | Type converted IN |

Accessing C445 System Parameters with the Logic Engine

C445 System Parameters are accessible in the Logic Engine in the Variables window. Open the Variables List, then System Parameters.

There are 2 categories under System Parameters.

1. System In
2. System Out

System In parameters are parameters that can be monitored from the C445 Motor Management Relay and the System Out parameters are either configuration parameters or parameters that can be used to control the C445. There are multiple categories under both the System In and System Out categories, to make finding specific parameters easier.


For example, to monitor the running status of the motor being controlled by the C445, the “MotorControlStatus.Running1” bit can be found under the System In / Control Monitor Control Source Status / Motor Control Status category. If the Logic Engine is the Remote Control source and the active control source for the C445 is the Remote control source, the Logic Engine can access the “LogicMotorControlWord.Run1” bit under the System Out / Logic Motor Control category and use it to run the motor.


For additional information concerning the system parameters, refer to the Modbus Register map in **Appendix D**.

C445 Expansion Inputs and Outputs

Connecting and Configuring Expansion I/O for the C445

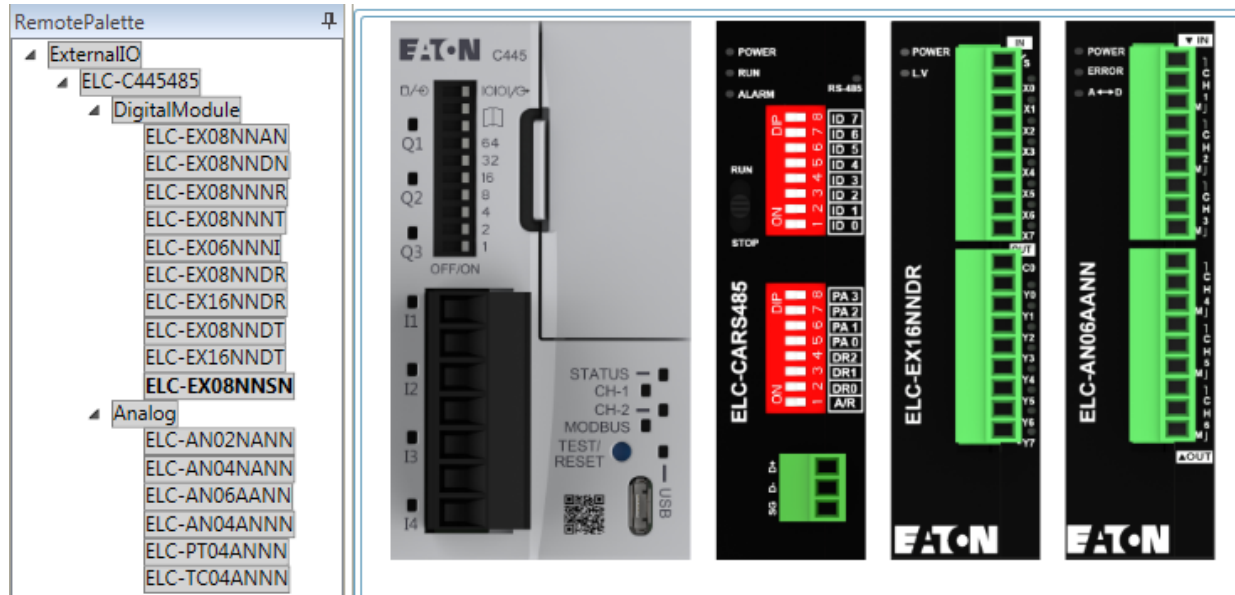
When expansion I/O modules are added to a C445 using the Logic and Expansion I/O software tool, these I/O variables, both digital and analog become accessible in the Logic Engine. Toggle between the Logic Engine and the expansion I/O configuration with the icons shown below.

 Access the Logic

 Access the Expansion I/O Configurator

Note that the I/O can be used without the Logic Engine. Configure the I/O in the Expansion I/O Configurator page and leave the Logic Engine canvas empty. Then, download the I/O configuration to the C445 with no program. Conversely, the Logic Engine can be used without expansion I/O. Write a logic program compile it and download it to the C445, without adding any I/O modules using the Expansion I/O Configurator page.

Below is a C445 with a digital and an analog expansion I/O module. Simply double click an I/O module on the left to add it to the expansion I/O on the right. The first I/O module added to the C445 also adds the ELC-CARS485 adapter.



Connecting the ELC-CARS485 module to the C445

The default interface parameters for the RS-485 port on the C445 that the ELC-CARS485 module connects to are as follows:

- Baud Rate: 115.2K
- Parity: Even
- Bits/byte: 8
- Stop Bits: 1
- Mode: RTU

For these default interface parameters, the DIP switches on the ELC-CARS485 module must be set as follows:

- PA3—OFF
- PA2—ON
- PA1—OFF
- PA0—ON
- DR2—ON
- DR1—ON
- DR0—ON
- A/R—OFF

To change these default interface parameters on the C445, use either the C445UM User Interface or the Power Xpert *inControl* software. The DIP switch settings for the various interface parameter options for the ELC-CARS485 module can be found in publication MN05002003E.

Note: Parity None is not supported.

The second set of DIP switches on the ELC-CARS485 module are for its node address. The address set on these DIP switches for this module must match the address configured for it in the C445 using the user interface or the *inControl* software. This parameter can be found in either tool under the Expansion IO category.

DIP switches labeled ID0 through ID7 are for the node ID. Weighted binary is used where the least significant DIP switch is ID0. For example, if ID2 and ID0 are ON and all the others are OFF, the unit, following a power cycle will be node ID 5.

Connect the ELC-CARS485 module to the RS-485 port on the bottom of the C445 Base Control Module as follows:

| C445/BCM | ELC-CARS485 |
|----------|-------------|
| D0 ----- | D- |
| D1 ----- | D+ |
| C ----- | SG |

To configure the C445 RS-485 port to communicate with the Expansion I/O, use one of the two methods.

1. C445UM User Interface.

Configure the following parameters with the User Interface:

1.9. Communications / 1. Modbus / 1. Base Control Module 485 port mode / ELC IO

2.15. Expansion IO / 2. Expansion IO Comm Config / 1. ELC IO Modbus Address / Make it the same address set on the ELC-CARS485 Adapter DIP switches ID0-ID7.

3.15. Expansion IO / 3. ELC IO Setup Config / Enter the number of digital inputs, the number of digital outputs and any analog or temperature cards by part number in the order they appear to the right of the ELC-CARS485 adapter. The analog and temperature modules are listed and just need to be selected from a list.

2. The Power Xpert One Installer software tool. This tool can be found at the following website as a free download: www.eaton.com/c445.


1. Under the Communications / Modbus category, then Advanced Settings, change the BCM 485 port mode to ELC IO.

2. Expansion IO

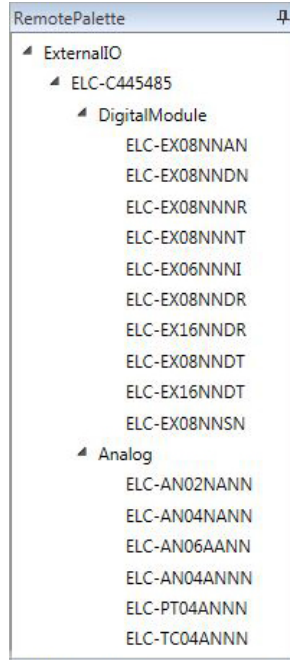
3. To configure the digital and analog IO modules, use the Logic Engine programming tool and configure the Expansion IO per the instructions below.

Adding Input and Output Modules with the Expansion IO Configurator

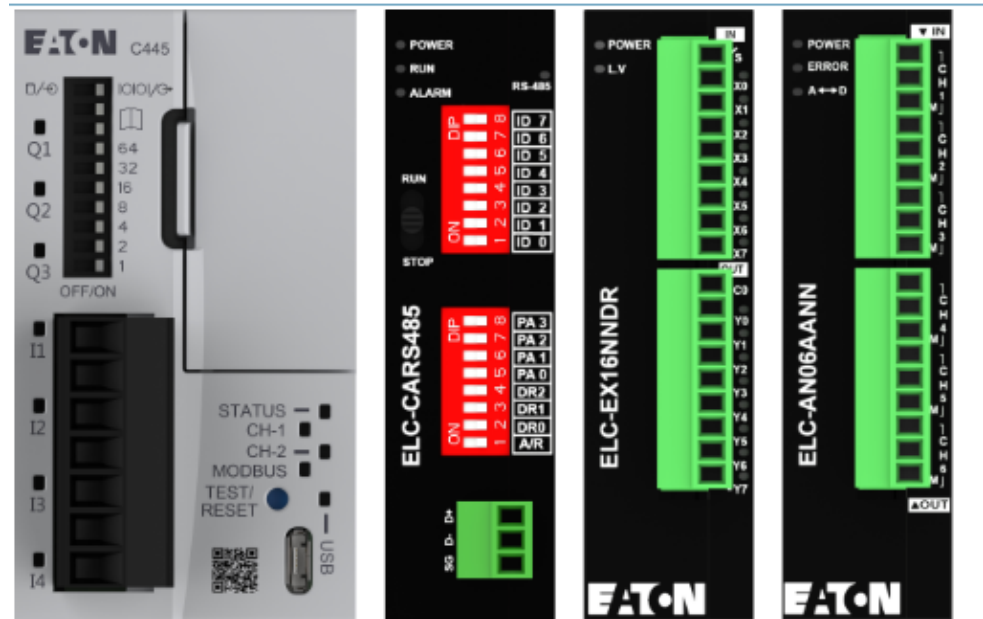
After starting the Logic Engine programming tool, the Logic Engine window will be displayed. From the toolbar, select the following icon to access the Expansion I/O Configurator:

 Access the Expansion I/O Configurator

In the Remote Palette on the left, open the Expansion I/O to reveal all available I/O modules as shown below.



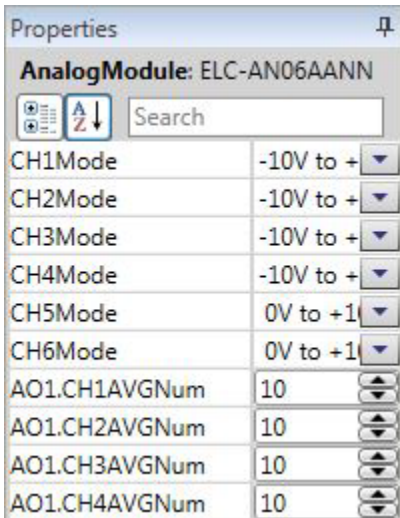
To add an I/O module to the C445 on the right, double click the I/O modules in the order they are to appear. The first I/O module selected will also add the necessary ELC-CARS485 communication adapter. After double clicking the ELC-EX16NNDR followed by the ELC-AN06AANN module, the C445 screen should look like the following.



There is nothing to configure for the digital modules, but the analog module channels need to be configured for the analog type. Select the analog module and below it will be displayed the variables available for it in the Logic Engine. The Average values are the analog input signals averaged over a default of 10 samples. The other values for the analog inputs are instantaneous values. The status for the module is also provided.

| IsForced | System Name | User Name | Address | DType | Actual Value | Force Value | Comment |
|-------------------------------------|-----------------|-----------|---------|-------|--------------|-------------|---------|
| <input checked="" type="checkbox"/> | | | | | | | |
| <input type="checkbox"/> | AI1.CH1AVG | | 2019 | UINT | 0 | | |
| <input type="checkbox"/> | AI1.CH2AVG | | 2020 | UINT | 0 | | |
| <input type="checkbox"/> | AI1.CH3AVG | | 2021 | UINT | 0 | | |
| <input type="checkbox"/> | AI1.CH4AVG | | 2022 | UINT | 0 | | |
| <input type="checkbox"/> | AO1.CH5 | | 2023 | UINT | 0 | | |
| <input type="checkbox"/> | AO1.CH6 | | 2024 | UINT | 0 | | |
| <input type="checkbox"/> | AI1.CH1 | | 2025 | UINT | 0 | | |
| <input type="checkbox"/> | AI1.CH2 | | 2026 | UINT | 0 | | |
| <input type="checkbox"/> | AI1.CH3 | | 2027 | UINT | 0 | | |
| <input type="checkbox"/> | AI1.CH4 | | 2028 | UINT | 0 | | |
| <input type="checkbox"/> | AI1.errorStatus | | 2043 | UINT | 0 | | |

Also, in the Properties window for this analog module are the selections for the analog type for each I/O channel as well as optional sample counts for average input values. There is a scale function block (REFSCALE) in the Logic Engine for scaling analog values. The “AVGNum” or average number values are the number of samples used for the average analog input values to smooth out the signals. The default is 10 and if used, nothing needs to be entered for these parameters.



Selecting the down arrows to the right of CH1Mode through CH6Mode allows the selection for the analog type for each analog input and output. For this analog combination input and output module, CH1 through CH4 are the inputs and CH5 and CH6 are the analog outputs.

Analog input mode selections:

- 10 Vdc to +10 Vdc
- 6 Vdc to +10 Vdc
- 12 mA to +20 mA
- 20 mA to +20 mA

Analog output mode selections:

- 0 Vdc to +10 Vdc
- +2 Vdc to +10 Vdc
- +4 mA to +20 mA
- 0 mA to +20 mA

Refer to the Instruction Leaflet for each analog module, thermocouple module and RTD module for the decimal range for each input or output type and specifications and wiring.

- ELC-AN04ANNN: IL05003002E
- ELC-AN04NANN: IL05003014E
- ELC-AN02NANN: IL05003001E
- ELC-AN06AANN: IL05003003E
- ELC-TC04ANNN: IL05003009E
- ELC-PT04ANNN: IL05003008E


The Instruction Leaflet for the Digital I/O modules is shown below:

- ELC Digital I/O Cards: IL05003004E
- ELC-EX08NNSN: IL05003017E
- ELC-CARS485 User Manual: MN05002003E

These documents can be found at: www.eaton.com/c445

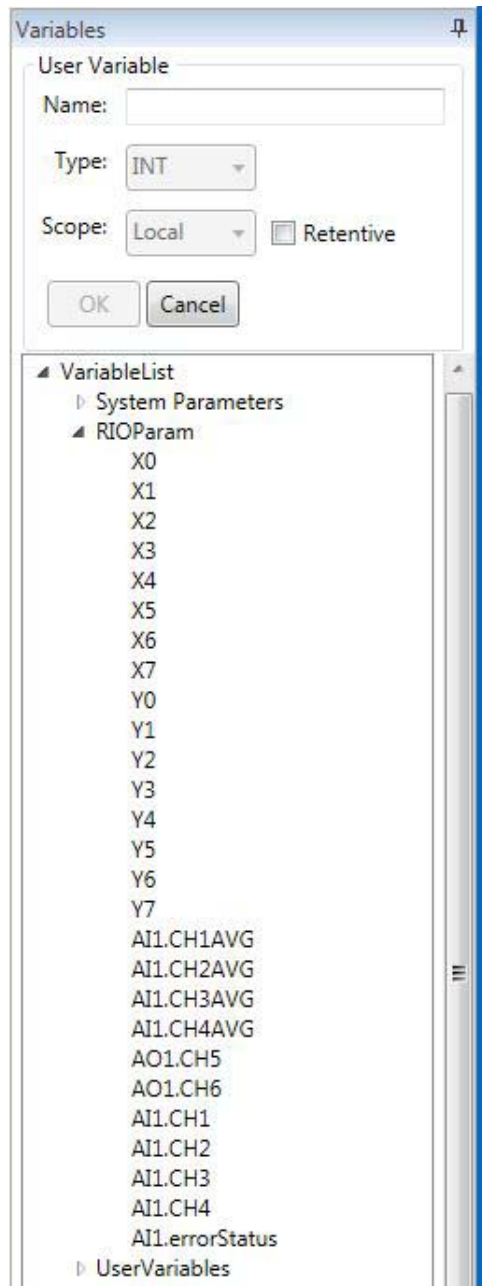
Accessing Expansion I/O with the Logic Engine

Once the I/O modules are added and the analog modules configured, switch to the Logic Engine by selecting the following icon on the toolbar.

 Access the Logic

On the Variables window on the right, open the Variable List, then the RIOParam list as follows.

These variables are for the combo 8 input (X0-X7) / 8 output (Y0-Y7) digital I/O card added earlier and for the 4 input / 2 output combo analog module added earlier. These variables are available to the Logic Engine. Refer to the Logic Engine Function Blocks described earlier in this chapter.



Addressing Digital Inputs

The digital input modules are addressed based on their position to the right of the communication adapter. The inputs for the first digital input module to the right of the adapter will always be X0–X7. If it is a module with 4 inputs the inputs will be addressed X0–X3. X4–X7 will simply be unused (this applies to all subsequent input modules as well). The next digital input module will be addressed as X10–X17, then X20–X27 through X70–X77 for the eighth digital input module. Note that the addresses are using the octal number system. Even if there are digital output and/or analog I/O cards between the first digital input card and the adapter, the input addresses for the digital input cards will be the same.

Addressing Digital Outputs

The digital output modules are addressed based on their position to the right of the communication adapter just as the digital inputs. The outputs for the first digital output module to the right of the adapter will always be Y0–Y7. If it is a module with 4 outputs the outputs will be addressed Y0–Y3. Y4–Y7 will simply be unused (this applies to all subsequent output modules as well). The next digital output module will be addressed as Y10–Y17, then Y20–Y27 through Y70–Y77 for the eighth output module. Note that the addresses are using the octal number system. Even if there are digital input and/or analog I/O cards between the first digital output card and the adapter, the output addresses for the digital output cards will be the same.

Addressing Combination Digital I/O cards

Combo digital I/O cards will have either 4 inputs and 4 outputs or 8 inputs and 8 outputs. The same addressing rules apply as described above. The combo cards are treated the same as far as addressing is concerned as if they were separate cards. For example, if an ELC-EX16NNDR 8 input and 8 output digital I/O card is the first digital card to the right of the adapter, the inputs are addressed as X0–X7 and the outputs as Y0–Y7.

A maximum of 16 I/O modules can be added to the ELC-CARS485 adapter. Any combination of 16 digital and analog modules, including thermocouple and RTD input modules can be added and accessed by the Logic Engine with a maximum of 8 analog modules. Below is how the digital I/O is addressed, assuming 16 digital modules are used, with 8 inputs and 8 outputs per module. Octal addressing is used due to the ease of using this number system when each card has 8 inputs and/or 8 outputs. Even for combination digital I/O cards that have 4 inputs and 4 outputs a full byte for the 4 bits of input and output data is allocated. In that case, only the low 4 bits of the input and output data is utilized. X represents inputs and Y outputs.

The addressing for the digital cards, whether separate or combo cards are as follows:

Module 1: X0-X7, Y0-Y7
Module 2: X10-X17, Y10-Y17
Module 3: X20-X27, Y20-Y27
Module 4: X30-X37, Y30-Y37
Module 5: X40-X47, Y40-Y47
Module 6: X50-X57, Y50-Y57
Module 7: X60-X67, Y60-Y67
Module 8: X70-X77, Y70-Y77
Module 9: X100-X107, Y100-Y107
Module 10: X110-X117, Y110-Y117
Module 11: X120-X127, Y120-Y127
Module 12: X130-X137, Y130-Y137
Module 13: X140-X147, Y140-Y147
Module 14: X150-X157, Y150-Y157
Module 15: X160-X167, Y160-Y167
Module 16: X170-X177, Y170-Y177

Addressing Analog I/O

Analog I/O modules will provide I/O addresses based on whether they are analog/temperature input modules, analog output modules or the analog I/O combination module. Again, a maximum of 8 analog modules are allowed.

Note, the Expansion I/O configurator software will display the proper I/O addresses for each module when it is selected. These addresses will then also be populated in the Logic Engine under VariableList/RIOParam.

If, for example, 3 digital modules are used, but an analog module is between the second digital module and the third digital module, the addressing used for the digital I/O on the 3 cards is the same as if the analog module was not present. Analog I/O addresses contain an I for input or a Q for output along with a number associated with its position relative to other analog modules. In other words, the first occurrence of an analog module to the right of the CARS-485 module is 1. If 8 analog modules are used, they will be 1-8. For analog inputs, there are 2 values for each input. One is an average value of 10 samples and the other is an instantaneous value. The average value will be a much smoother value, but the instantaneous value will show a change in the signal faster. The average value of 10 is configurable.

Expansion I/O Pass-through to fieldbus networks

Supported modules

Digital:

ELC-EX08NNDR: 4 24 Vdc inputs and 4 relay outputs

ELC-EX08NNDT: 4 24 Vdc inputs and 4 24 Vdc transistor outputs

ELC-EX16NNDR: 8 24 Vdc inputs and relay outputs

ELC-EX16NNDT: 8 24 Vdc inputs and 8 24 Vdc transistor outputs

ELC-EX08NNDN: 8 24 Vdc inputs

ELC-EX08NNAN: 8 120 Vac inputs

ELC-EX08NNNR: 8 relay outputs

ELC-EX08NNNT: 8 24 Vdc transistor outputs

ELC-EX06NNNI: 6 high current relay outputs (6 amps/point)

ELC-EX08NNSN: 8 toggle switch inputs

Analog:

ELC-AN04ANNN: 4 analog inputs

ELC-AN02NANN: 2 analog outputs

ELC-AN04NANN: 4 analog outputs

ELC-AN06AANN: 4 analog inputs and 2 analog outputs

ELC-TC04ANNN: 4 thermocouple inputs

ELC-PT04ANNN: 4 platinum thermocouple (PT 100-Ohm) inputs

Additional information for the expansion digital and analog I/O modules can also be accessed from the Instruction Leaflet for each module which can be found on the Eaton website: www.eaton.com. The publication number for the documents for each analog module and for the digital I/O are shown below. These documents also include specifications for the I/O for each card.

1. ELC-AN02NANN, 2 output analog card, IL05003001E.
2. ELC-AN04NANN, 4 output analog card, IL05003014E.
3. ELC-AN04ANNN, 4 input analog card, IL05003002E.
4. ELC-AN06AANN, 4 input and 2 output analog card, IL05003003E.
5. ELC-PT04ANNN, 4 RTD input card, IL05003008E.
6. ELC-TC04ANNN, 4 Thermocouple input card, IL05003009E.
7. Digital I/O, IL05003004E.
8. ELC-EX08NNSN, 8 toggle switch input card, IL05003017E.

In order to control expansion outputs from a remote fieldbus source, the Remote Control Source must be fieldbus or Logic Engine. And fieldbus must be the active control source. Inputs and Outputs can always be monitored via fieldbus even when fieldbus is not the active control source or even when it is not even the Remote Control Source.

Any digital or analog I/O addressed in the Logic Engine program, will not be allowed to be controlled via the remote fieldbus source.

Below are the I/O layouts for each expansion analog module on Ethernet/IP and PROFIBUS.

Input:

ELC-AN06AANN

CH1 AVG

CH2 AVG

CH3 AVG

CH4 AVG

Error Status

ELC-AN04ANNN

CH1 AVG

CH2 AVG

CH3 AVG

CH4 AVG

Error Status

ELC-TC04ANNN

CH1 Average degrees C

CH2 Average degrees C

CH3 Average degrees C

CH4 Average degrees C

CH1 Average degrees F

CH2 Average degrees F

CH3 Average degrees F

CH4 Average degrees F

Error Status

ELC-PT04ANNN

CH1 Average degrees C
 CH2 Average degrees C
 CH3 Average degrees C
 CH4 Average degrees C
 CH1 Average degrees F
 CH2 Average degrees F
 CH3 Average degrees F
 CH4 Average degrees F

Error Status

ELC-AN02NANN

Error Status

ELC-AN04NANN

Error Status

Output:

ELC-AN06AANN

CH5
 CH6

ELC-AN02NANN

CH1
 CH2

ELC-AN04NANN

CH1
 CH2
 CH3
 CH4

Note that all available registers are mapped in the Modbus register map for each analog I/O module used. This is not the case for Ethernet/IP and PROFIBUS. In order to keep the amount of data to a minimum for these networks, configuration of each module must be done using the I/O Configurator in the Logic Engine Programming software tool. Only input, output and error status is provided.

EtherNet/IP

The I/O Assemblies that have been added to support expansion I/O are shown below:

The following input assemblies have been added as extensions to the existing Input Assemblies 100, 107, 110 and 116. The Digital Input (DI) data and Analog Input (AI) referenced below is what has been added to the existing input assembly it corresponds to. Input Assemblies 120 and 124 are new assemblies containing only digital and analog input data. The data layout for each Input assembly can be found in the Ethernet/IP section of Appendix C in this manual.

Input

1. Extensions of Input Assembly 100:
 - a. 101: 2 bytes DI and 10 bytes AI
 - b. 102: 4 bytes DI and 20 bytes AI
 - c. 103: 8 bytes DI and 38 bytes AI
2. Extensions of Input Assembly 107:
 - a. 108: 4 bytes DI and 20 bytes AI
 - b. 109: 8 bytes DI and 80 bytes AI
3. Extensions of Input Assembly 110:
 - a. 111: 2 bytes DI and 2 bytes AI
 - b. 112: 4 bytes DI and 10 bytes AI
 - c. 113: 6 bytes DI and 20 bytes AI
 - d. 114: 8 bytes DI and 38 bytes AI
4. Extensions of Input Assembly 116:
 - a. 117: 2 bytes DI and 2 bytes AI #
 - b. 118: 4 bytes DI and 12 bytes AI #
 - c. 119: 8 bytes DI and 20 bytes AI #
5. New Input Assembly, inputs only:
 - a. 120: 4 bytes DI and 38 bytes AI
 - b. 122: 8 bytes DI and 80 bytes AI

The following output assemblies have been added as extensions to the existing output Assemblies 104, 105 and 106. The Digital Output (DQ) data and Analog Output (AQ) referenced below is what has been added to the existing Output assembly it corresponds to. Output Assemblies 130 and 131 are new assemblies containing only digital and analog output data. The data layout for each output assembly can be found in the Ethernet/IP section of **Appendix C** in this manual.

Output

1. Extensions of Output Assembly 104:
 - a. 123: 2 bytes DQ and 4 bytes AQ
 - b. 124: 4 bytes DQ and 12 bytes AQ
2. Extensions of Output Assembly 105:
 - a. 125: 4 bytes DQ and 8 bytes AQ
 - b. 126: 8 bytes DQ and 16 bytes DQ
3. Extension of Output Assembly 106:
 - a. 127: 2 bytes DQ and 4 bytes AQ
 - b. 128: 4 bytes DQ and 8 bytes AQ
 - c. 129: 8 bytes DQ and 16 bytes AQ
4. New Output Assemblies:
 - a. 130: 4 bytes DQ and 32 bytes AQ
 - b. 131: 8 bytes DQ and 64 bytes AQ

Note that all available registers are mapped in the Modbus register map for each analog I/O module used. This is not the case for Ethernet/IP and PROFIBUS. In order to keep the amount of data to a minimum for these networks, configuration of each module must be done using the Logic Engine Programming software tool. A minimum amount of data is provided for monitoring analog inputs and controlling analog outputs.

PROFIBUS

For PROFIBUS, additional selections have been added for the expansion I/O so the I/O modules can be monitored and controlled by a PROFIBUS master controller along with C445 motor parameters. Per the following there have also been two additional “Cyclic Modules” added to accommodate the additional I/O data. If Expansion I/O is not used, these larger “Cyclic Modules” shown below can be used to monitor additional motor data as well.

1. Cyclic Module 16: a 32 byte input and 16 byte output module
2. Cyclic Module 17: a 64 byte input and 32 byte output module.

Note: “Cyclic Modules” are what the selectable I/O data blocks in the GSD file are called. Motor and I/O data are mapped to input and/or output addresses assigned to these cyclic modules. Only two cyclic modules can be used per C445 PROFIBUS module with the following restrictions:

1. If 2 Cyclic Modules are assigned, only one may contain output words.
2. The Motor Control bits shown cannot be assigned if the Fieldbus Motor Control word is assigned. Below is an example of the Motor Control bits unassigned and the Fieldbus Motor Control word assigned to Cyclic Module 16, word 0.
3. If the Motor Control bits are assigned, they can only be assigned to Cyclic Modules 4, 5, 6 and 8.
4. If the Motor Control bits are assigned, then the Fieldbus Motor Control word should not be assigned as shown below. The example below is using Cyclic Module 8. In addition, when the Motor Control bits are assigned the first output word to the C445 is a control word based on the bit assignments. Subsequent word assignments such as assigning the System Services or digital or analog output words actually begin with the second output word sent to the C445.

| | |
|----------------------------|------------------------|
| Motor Control Run1: | OP BIT NOT CONNECTED |
| Motor Control Run2: | OP BIT NOT CONNECTED |
| Motor Control Reserved: | OP BIT NOT CONNECTED |
| Motor Control FaultReset: | OP BIT NOT CONNECTED |
| Motor Control Reserved: | OP BIT NOT CONNECTED |
| Motor Control Test Trip: | OP BIT NOT CONNECTED |
| Motor Control Reserved: | OP BIT NOT CONNECTED |
| Motor Control Reserved: | OP BIT NOT CONNECTED |
| BCM Field Output control0: | OP BIT NOT CONNECTED |
| BCM Field Output control1: | OP BIT NOT CONNECTED |
| BCM Field Output control2: | OP BIT NOT CONNECTED |
| BCM Field Output control3: | OP BIT NOT CONNECTED |
| BCM Field Output control: | OP WORD NOT CONNECTED |
| System Services: | OP WORD NOT CONNECTED |
| Fieldbus Motor Control: | Cyclic Module 16 WORD0 |

Note that even though Cyclic Module 8 contains 6 output bytes or 3 output words, once Motor Control bits are assigned, only 2 additional words are available to assign to other parameters. As shown below, these final 2 output words are assigned to Remote Digital Output 0 and 1. This means there are four 8 point digital expansion output cards connected to the C445. The Motor Control bits will be the first word sent to the C445, followed by the other 2 assigned words for controlling expansion output modules in this case.

| | |
|----------------------------|--------------------------------|
| Motor Control Run1: | Cyclic Module 8 Bit0 |
| Motor Control Run2: | OP BIT NOT CONNECTED |
| Motor Control Reserved: | OP BIT NOT CONNECTED |
| Motor Control FaultReset: | Cyclic Module 8 Bit3 |
| Motor Control Reserved: | OP BIT NOT CONNECTED |
| Motor Control Test Trip: | Cyclic Module 8 Bit5 |
| Motor Control Reserved: | OP BIT NOT CONNECTED |
| Motor Control Reserved: | OP BIT NOT CONNECTED |
| BCM Field Output control0: | OP BIT NOT CONNECTED |
| BCM Field Output control1: | Cyclic Module 8 Bit6 |
| BCM Field Output control2: | Cyclic Module 8 Bit7 |
| BCM Field Output control3: | OP BIT NOT CONNECTED |
| BCM Field Output control: | OP WORD NOT CONNECTED |
| System Services: | OP WORD NOT CONNECTED |
| Fieldbus Motor Control: | OP WORD NOT CONNECTED |
| Motor Control Word: | Motor Management Profile WORD0 |
| Remote Digital Output 0: | Cyclic Module 8 WORD0 |
| Remote Digital Output 1: | Cyclic Module 8 WORD1 |

Assigning I/O parameters to Cyclic Modules

To assign Input parameters, select the cyclic module to reveal the input assignments for each word as shown below for Cyclic Module 16 (16 input words). Below is an example. All parameters are available and may be assigned to each input word.

| Device-specific parameters | |
|----------------------------|------------------------------|
| Input Word 0: | Motor Status |
| Input Word 1: | I Scale Factor |
| Input Word 2: | I Unbalance Perc |
| Input Word 3: | Active Fault Code |
| Input Word 4: | Active Inhibit Code |
| Input Word 5: | Active Warning Code |
| Input Word 6: | IA Scaled |
| Input Word 7: | I Average Scaled |
| Input Word 8: | Total Power(watts) High word |
| Input Word 9: | Total Power(watts) Low word |
| Input Word 10: | Remote Digital input 0 |
| Input Word 11: | Remote Analog Input 0 |
| Input Word 12: | Remote Analog Input 1 |
| Input Word 13: | Remote Analog Input 2 |
| Input Word 14: | Remote Analog Input 3 |
| Input Word 15: | Remote Analog Input 4 |

To assign Output parameters, select the C445 to reveal the output assignments which are at the end of the configuration file parameters as shown below. These are assigned different than the input parameters. For Output assignments, select cyclic module words for each available parameter, including digital and analog output data. Below is an example for the 8 output words for Cyclic Module 16. All parameters are available and may be assigned to each output word for the cyclic modules. Rules concerning the Fieldbus Motor Control word and Motor Control bit assignments is discussed earlier in this section.

| | |
|--------------------------|--------------------------------|
| Fieldbus Motor Control: | Cyclic Module 16 WORD0 |
| Motor Control Word: | Motor Management Profile WORD0 |
| Remote Digital Output 0: | Cyclic Module 16 WORD1 |
| Remote Digital Output 1: | OP WORD NOT CONNECTED |
| Remote Digital Output 2: | OP WORD NOT CONNECTED |
| Remote Digital Output 3: | OP WORD NOT CONNECTED |
| Remote Analog Output 0: | Cyclic Module 16 WORD2 |
| Remote Analog Output 1: | Cyclic Module 16 WORD3 |
| Remote Analog Output 2: | Cyclic Module 16 WORD4 |
| Remote Analog Output 3: | Cyclic Module 16 WORD5 |
| Remote Analog Output 4: | Cyclic Module 16 WORD6 |
| Remote Analog Output 5: | Cyclic Module 16 WORD7 |
| Remote Analog Output 6: | OP WORD NOT CONNECTED |
| Remote Analog Output 7: | OP WORD NOT CONNECTED |

Modbus TCP and RS-485 Modbus

The digital I/O is stored in the following registers and is also mapped based on the position of each digital module to the right of the adapter.

Digital Inputs: registers 2255-2262

Digital Outputs: registers 2263-2270

The digital I/O modules are not configurable. The analog I/O modules do need to be configured. In addition, these modules have 30 registers that are mapped to the following registers, based on their position when connected to the ELC-CARS485 adapter module. The first analog module to the right of the adapter is mapped first and so on, with a maximum of 8 analog modules. The Modbus registers that contain the data for the 30 registers for each module are as follows:

Analog module #1: registers 2015-2044

Analog module #2: registers 2045-2074

Analog module #3: registers 2075-2104

Analog module #4: registers 2105-2134

Analog module #5: registers 2135-2164

Analog module #6: registers 2165-2194

Analog module #7: registers 2195-2224

Analog module #8: registers 2225-2254

The data contained in the 30 registers for each type of analog module is shown below. “ModeSetting” is the configuration word for each analog module type and can be configured using the Expansion I/O Configurator page in the Logic Engine programming software. This determines the type of analog I/O for each module (current or voltage) and the type of thermocouple inputs for the thermocouple input module.

| Module ID | ELC_AN06AANN | |
|------------|--------------|--------|
| Reg Offset | Name | Type |
| 0 | ModeSetting | CONFIG |
| 1 | CH1AvgNum | CONFIG |
| 2 | CH2AvgNum | CONFIG |
| 3 | CH3AvgNum | CONFIG |
| 4 | CH4AvgNum | CONFIG |
| 5 | CH1Avg | READ |
| 6 | CH2Avg | READ |
| 7 | CH3Avg | READ |
| 8 | CH4Avg | READ |
| 9 | CH5Out | WRITE |
| 10 | CH6Out | WRITE |
| 11 | CH1 | READ |
| 12 | CH2 | READ |
| 13 | CH3 | READ |
| 14 | CH4 | READ |
| 15 | | |
| 16 | | |
| 17 | CH1Offset | CONFIG |
| 18 | CH2Offset | CONFIG |
| 19 | CH3Offset | CONFIG |
| 20 | CH4Offset | CONFIG |
| 21 | CH5Offset | CONFIG |
| 22 | CH6Offset | CONFIG |
| 23 | CH1Gain | CONFIG |
| 24 | CH2Gain | CONFIG |
| 25 | CH3Gain | CONFIG |
| 26 | CH4Gain | CONFIG |
| 27 | CH5Gain | CONFIG |
| 28 | CH6Gain | CONFIG |
| 29 | errorStatus | READ |

| Module ID | ELC_AN04ANNN | |
|------------|--------------|--------|
| Reg Offset | Name | Type |
| 0 | ModeSetting | CONFIG |
| 1 | CH1AvgNum | CONFIG |
| 2 | CH2AvgNum | CONFIG |
| 3 | CH3AvgNum | CONFIG |
| 4 | CH4AvgNum | CONFIG |
| 5 | CH1Avg | READ |
| 6 | CH2Avg | READ |
| 7 | CH3Avg | READ |
| 8 | CH4Avg | READ |
| 9 | | |
| 10 | | |
| 11 | CH1 | READ |
| 12 | CH2 | READ |
| 13 | CH3 | READ |
| 14 | CH4 | READ |
| 15 | | |
| 16 | | |
| 17 | CH1Offset | CONFIG |
| 18 | CH2Offset | CONFIG |
| 19 | CH3Offset | CONFIG |
| 20 | CH4Offset | CONFIG |
| 21 | | |
| 22 | | |
| 23 | CH1Gain | CONFIG |
| 24 | CH2Gain | CONFIG |
| 25 | CH3Gain | CONFIG |
| 26 | CH4Gain | CONFIG |
| 27 | | |
| 28 | | |
| 29 | errorStatus | READ |

| Module ID | ELC_AN04NANN | |
|------------|--------------|--------|
| Reg Offset | Name | Type |
| 0 | ModeSetting | CONFIG |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | CH1Out | WRITE |
| 6 | CH2Out | WRITE |
| 7 | CH3Out | WRITE |
| 8 | CH4Out | WRITE |
| 9 | | |
| 10 | | |
| 11 | | |
| 12 | | |
| 13 | | |
| 14 | | |
| 15 | | |
| 16 | | |
| 17 | CH1Offset | CONFIG |
| 18 | CH2Offset | CONFIG |
| 19 | CH3Offset | CONFIG |
| 20 | CH4Offset | CONFIG |
| 21 | | |
| 22 | | |
| 23 | CH1Gain | CONFIG |
| 24 | CH2Gain | CONFIG |
| 25 | CH3Gain | CONFIG |
| 26 | CH4Gain | CONFIG |
| 27 | | |
| 28 | | |
| 29 | errorStatus | READ |

| Module ID | ELC_AN02NANN | |
|------------|--------------|--------|
| Reg Offset | Name | Type |
| 0 | ModeSetting | CONFIG |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | CH1Out | WRITE |
| 10 | CH2Out | WRITE |
| 11 | | |
| 12 | | |
| 13 | | |
| 14 | | |
| 15 | | |
| 16 | | |
| 17 | | |
| 18 | | |
| 19 | | |
| 20 | | |
| 21 | CH1Offset | CONFIG |
| 22 | CH2Offset | CONFIG |
| 23 | | |
| 24 | | |
| 25 | | |
| 26 | | |
| 27 | CH1Gain | CONFIG |
| 28 | CH1Gain | CONFIG |
| 29 | errorStatus | READ |

| Module ID | ELC_PT04ANNN | |
|------------|--------------|--------|
| Reg Offset | Name | Type |
| 0 | ModeSetting | CONFIG |
| 1 | CH1AvgNum | CONFIG |
| 2 | CH2AvgNum | CONFIG |
| 3 | CH3AvgNum | CONFIG |
| 4 | CH4AvgNum | CONFIG |
| 5 | CH1AvgDegC | READ |
| 6 | CH2AvgDegC | READ |
| 7 | CH3AvgDegC | READ |
| 8 | CH4AvgDegC | READ |
| 9 | | |
| 10 | | |
| 11 | CH1AvgDegF | READ |
| 12 | CH2AvgDegF | READ |
| 13 | CH3AvgDegF | READ |
| 14 | CH4AvgDegF | READ |
| 15 | | |
| 16 | | |
| 17 | CH1DegC | READ |
| 18 | CH2DegC | READ |
| 19 | CH3DegC | READ |
| 20 | CH4DegC | READ |
| 21 | | |
| 22 | | |
| 23 | CH1DegF | READ |
| 24 | CH2DegF | READ |
| 25 | CH3DegF | READ |
| 26 | CH4DegF | READ |
| 27 | | |
| 28 | | |
| 29 | errorStatus | READ |

| Module ID | ELC_TC04ANN | |
|------------|-------------|--------|
| Reg Offset | Name | Type |
| 0 | ThermoType | CONFIG |
| 1 | CH1AvgNum | CONFIG |
| 2 | CH2AvgNum | CONFIG |
| 3 | CH3AvgNum | CONFIG |
| 4 | CH4AvgNum | CONFIG |
| 5 | CH1AvgDegC | READ |
| 6 | CH2AvgDegC | READ |
| 7 | CH3AvgDegC | READ |
| 8 | CH4AvgDegC | READ |
| 9 | CH1AvgDegF | READ |
| 10 | CH2AvgDegF | READ |
| 11 | CH3AvgDegF | READ |
| 12 | CH4AvgDegF | READ |
| 13 | CH1DegC | READ |
| 14 | CH2DegC | READ |
| 15 | CH3DegC | READ |
| 16 | CH4DegC | READ |
| 17 | | |
| 18 | CH1DegF | READ |
| 19 | CH2DegF | READ |
| 20 | CH3DegF | READ |
| 21 | CH4DegF | READ |
| 22 | | |
| 23 | CH1Offset | CONFIG |
| 24 | CH2Offset | CONFIG |
| 25 | CH3Offset | CONFIG |
| 26 | CH4Offset | CONFIG |
| 27 | | CONFIG |
| 28 | | |
| 29 | errorStatus | READ |

The data for each I/O module is mapped in the order the modules are positioned. For example, the first physical module with digital outputs will have the data mapped to the first available Digital Output register, 2263. An 8-output or a 4-output card will be mapped to the low byte of register 2263. The next output card will have its data mapped to the high byte of register 2263 and so on. The first physical module with digital inputs will have the data mapped to the first available Digital Input register, 2255. An 8-input or a 4-input card will be mapped to the low byte of register 2255. The next input card will have its data mapped to the high byte of register 2255 and so on. The data for input and output cards with 4 points will be mapped to the 4 low bits in the byte they're mapped to, leaving the high 4 bits unused.

Chapter 10—C445 Ground Fault Monitoring and Protection

Ground Fault Monitoring Methods

- Residual Ground Fault Protection
- Zero-sequence (Core Balance) Fault Protection with Ground Fault Module
- Pulse Detection Protection – Low Voltage High Resistance Ground Fault Pulsing Systems (LVHRGPS)

The C445 Motor Management Relay provides three (3) ground fault monitoring and protection methods for use in industrial applications. These applications may encompass solid ground, low resistance ground, high resistance ground, or high resistance ground systems pulsed ground detection.

Only one (1) protection configuration (Residual or Zero-sequence) can be active in a system. The C445 can monitor and respond to an application that has been configured with a pulsing system. The C445 does not generate the pulse waveforms required for such systems.

All methods may incorporate Fault Trip, Fault trip Indication Only, and Fault Warning responses to events that trigger the C445 protection protocols. Additionally, delay times may be set for selected parameters to optimize system performance.

Residual Ground Fault Monitoring and Protection

Residual Ground Fault protection monitors the ground current of the motor and will react with a Fault action if the ground current exceeds the set threshold. The Ground Fault protection is always active. Ground Fault protection may be set to Fault Trip, Fault Warning, or Fault Trip Indication Only status.

The vector sum of the 3-phase currents is calculated from each phase current transformer (CT) in the C445M... Measurement Module and is transmitted to the C445B... Base Module for signal processing. At such time the signal exceeds a user settable threshold, the C445 will react with a Fault action in accordance with programmed parameters. At such time the signal returns to the allowable operating range programmed into the C445, the Fault action will extinguish. Fault reset requirements such as Manual Reset or Auto-Reset will occur in accordance with programmed parameters.

Table 68. Residual Ground Fault Parameterization

| Fault Code | Action | Modbus | Units | Frame | Parameter Value | | | Debounce (Milliseconds) | | | |
|------------|----------------------------|--------|-------|--------------|-------------------|-------------------|-------------------|-------------------------|--------|---------|--------|
| | | | | | Min. | Max. | Default | Min. | Max. | Default | Modbus |
| 4 | Fault Trip | 1060 | Amps | C445MA2P4... | 0.12 | 2.4 | 1 | 0 | 60,000 | 1,000 | 1063 |
| | | | | C445MA005... | 0.25 | 5 | 3 | 0 | 60,000 | 1,000 | 1063 |
| | | | | C445MA032... | 1 | 9.6 | 3 | 0 | 60,000 | 1,000 | 1063 |
| | | | | C445MA045 | 1 | 13.5 | 3 | 0 | 60,000 | 1,000 | 1063 |
| | | | | C445MB072... | 3 | 21.6 | 3 | 0 | 60,000 | 1,000 | 1063 |
| | | | | C445MC090 | 3 | 27.0 | 3 | 0 | 60,000 | 1,000 | 1063 |
| | | | | C445MC136... | 34 | 40.8 | 34 | 0 | 60,000 | 1,000 | 1063 |
| | | | | C445M...EXT | 30% of CT Primary | 50% of CT Primary | 50% of CT Primary | 0 | 60,000 | 1,000 | 1063 |
| | Fault Trip Indication Only | 1087 | | | | | 0 | 60,000 | 1,000 | 1063 | |
| | Shunt trip | 1089 | | | | | 0 | 60,000 | 1,000 | 1063 | |
| | Fault Warning | 1061 | | | | | 200 | 5,000 | 2,000 | 1079 | |
| | Fault Trip Delay | — | | | At Powerup | | 0s | 5s | 0s | 1062 | |
| | Fault Trip Inhibit | 1064 | | | Disable | Enable | Disable | | | | |
| | Fault Trip Inhibit - Run | 1065 | % | | 25 | 100 | 50 | | | | |

Zero-sequence Ground Fault Monitoring and Protection

The zero sequence sense current transformer (also called core balance current transformer, window current transformer, or toroidal current transformer) is the basis for sensitive ground fault protection of motors.

When Ground Fault Module (GFM) is recognized, the C445 system no longer uses current information from the C445M... measurement module for ground fault current calculations. The measurement module is still used for current, voltage, and power information including overload protection that is provided to the C445B... base module.

Table 69. Zero-sequence Ground Fault Parameterization

| Fault Code | Action | Modbus | Units | Frame | Parameter Value | | | Debounce (Milliseconds) | | | |
|------------|----------------------------|--------|-------|--------------|-----------------|---------|------------|-------------------------|--------|---------|--------|
| | | | | | Min. | Max. | Default | Min. | Max. | Default | Modbus |
| 4 | Fault Trip | 1060 | Amps | C445XG-CT... | 0.03 | 10.0 | 4 | 0 | 60,000 | 1,000 | 1063 |
| | Fault Trip Indication Only | 1087 | Amps | C445XG-CT... | 0.03 | 10.0 | 4 | 0 | 60,000 | 1,000 | 1063 |
| | Shunt trip | 1089 | Amps | C445XG-CT... | 0.03 | 10.0 | 4 | 0 | 60,000 | 1,000 | 1063 |
| | Fault Warning | 1061 | Amps | C445XG-CT... | 0.03 | 10.0 | 3.4 | 200 | 5,000 | 2,000 | 1079 |
| | Fault Trip Delay | | | | | | At Powerup | 0s | 5s | 0s | 1062 |
| | Fault Trip Inhibit | 1064 | | | | Disable | Enable | Disable | | | |

Zero-sequence Ground Fault monitoring requires the use of an external zero-sequence CT that is connected to a C445XG-MOD adapter module (GFM) coupled to a zero-sequence CT. Current sense range for the Ground Fault Module (GFM) is 0.03 – 10.0 Amps which encompasses all four (4) C445XG-CT... current transformers.

The C445XG-MOD GFM may be either DIN rail mounted or directly mounted with screws by utilizing the optional mounting tabs. The GFM has two (2) RJ12 terminals to enable easy connection to the C445 system with D77E-QPIP... cabling used on the base and measurement modules. Connection to the CT is made via a screw terminal connector on the GFM and screw terminals on the CT.

Table 70. C445 Zero-sequence Current Transformers

| Catalog Number | Current (A) | Aperture |
|-------------------|-------------|---------------------|
| C445XG-CT2 | 45 | 28mm round |
| C445XG-CT3 | 90 | 52mm round |
| C445XG-CT4 | 135 | 63mm round |
| C445XG-CT7 | 800 | 175mm(w) x 80mm (h) |

Note: If the C445 has been powered up and configured prior to connecting the GFM and/or the D77E-QPIP... cables have been moved to different RJ12 terminals, a *Repair* action may be necessary to reconfigure the C445 system.

The first time a GFM module is connected into a C445 system;

- The C445 system will automatically configure the ground current protection for *Fault Indication Only* and configure output relay Q3 for “*Ground Current Fault*”.
- The C445B... base module will auto-detect when a GFM module is present in a C445 system and enable the zero-sequence CT over the residual ground fault method (default). The residual ground fault method cannot be selected if the C445 system has recognized the GFM.
- The auto configuration will occur only when the GFM is connected into the C445 system for the very first time.
- The auto configuration will not reoccur when a GFM has already been detected, but a new or different GFM is installed into the C445 system.
- The auto configuration of output relay Q3 will only occur if the current setting is the default.

The C445 system with a GFM installed will fault trip within 50ms + debounce setting value in the event that the CT is exposed to a current in excess of 2X GFM range maximum value.

The C445 system may be configured as a standalone system whereas only ground fault monitoring and indication is enabled. In such a configuration, a C445B... base module is coupled to a GFM connected to the appropriate sized CT to transmit monitoring information via a network. A C445M... measurement module and/or a C445UM user interface module may be added to provide local indication, control, and protection.

The GFM also monitors the health of the CT and provides CT status information to the C445B... base module. Status information includes;

- CT ok
- CT secondary open
- CT secondary shorted
- CT calibration missing

The CT status information can be configured for No Action, Fault Trip, or Fault Warning actions to the C445 System.

Note: Output Q3 on the Base Control Module will automatically be set to “21 Trip Reason - Ground Current Fault” when a Ground Fault Module is connected. This is the default. This can be changed using the *inControl* software, the User Interface, or the Web Pages. This parameter can be found under the Operation Mode category, Advanced Settings.

Pulse Detection Protection

A pulse detection algorithm in the C445 works in conjunction with Low Voltage High Resistance Ground Fault Pulsing Systems. The pulse detection feature monitors the calculated residual ground current and signals when a pulse train is detected in the reading.

The C445B...base module monitors the residual ground current reading and will signal a pulse is active when it detects 4 similar pulses at least 80% of the programmed pulse amplitude.

The C445 will respond to pulse rates between 3 to 100 pulses per minute.

The pulse detection feature may be configured to produce a Fault trip, Fault No Trip, or Warning (default) reaction to a detected pulse waveform.

Pulse Detection amplitude is user settable between 0.03A – 10.00A.

The C445 Pulse Detection feature aids in troubleshooting the system by providing additional pulse information in addition to upstream pulse detection equipment. If pulse detection equipment upstream indicates that a pulse signal is present, but the S445 system does not, then the ground fault lies between the C445 measurement module and the upstream equipment. If both the upstream equipment and the S445 System indicates a pulse signal is detected, then the ground fault lies between the C445M... measurement module and the load (motor).

Table 71. Pulse Detection Protection Parameterization

| Fault Code | Action | Modbus | Units | Frame | Parameter Value | | |
|------------|----------------------------|--------|-------|-------------------|-----------------|---------|---------|
| | | | | | Minimum | Maximum | Default |
| 44 | Fault Trip | 1094 | Amps | C445XG-CT2 | 0.03 | 10.0 | 4 |
| | | | | C445XG-CT3 | 0.03 | 10.0 | 4 |
| | | | | C445XG-CT4 | 0.03 | 10.0 | 4 |
| | | | | C445XG-CT7 | 0.03 | 10.0 | 4 |
| | Fault Trip Indication Only | 1088 | | | | | |
| | Fault Warning | 1003 | Amps | C445XG-CT2 | 0.03 | 10.0 | 4 |
| | | | | C445XG-CT3 | 0.03 | 10.0 | 4 |
| | | | | C445XG-CT4 | 0.03 | 10.0 | 4 |
| | | | | C445XG-CT7 | 0.03 | 10.0 | 4 |



C445XG-MOD



C445XG-CT2



C445XG-CT3



C445XG-CT4



C445XG-CT7

Appendix A—Technical Data and Specifications

Communications Isolation Notes

The isolation between the Modbus Port and BCM electronics is functional isolation only. All connections to the Modbus terminal shall meet PELV requirements.

The isolation between the PROFIBUS Port and BCM electronics is functional isolation only. All connections to the PROFIBUS Port terminal shall meet PELV requirements.

The isolation between the Ethernet Port and BCM electronics is functional isolation only. All connections to the Ethernet Port terminal shall meet SELV/PELV requirements.

Table 72. Environmental Specifications

| Description | Specification |
|-------------------------|--|
| Temperature | –40 °C to 85 °C (–40 °F to 185 °F), non-operating –40 °C to 60 °C (–40 °F to 140 °F), operating Note: C445UM Monitoring User Interface LCD may not operate below –20 °C but buttons will operate across the operating temperature range. |
| Operating Humidity | 5–95% noncondensing |
| Altitude NEMA ICS1 | 2000 meters (6600 feet) |
| Shock IEC 60068-2-27 | 15 g any direction for 11 milliseconds, non-operating |
| Vibration IEC 60068-2-6 | 5 g non-operating and 3 g operating in any direction |
| Pollution Degree | 3 |
| Protection Degree | Internal Components: IP20 User Interface: IP54 & UL Type12 |
| Cooling | Convection (natural) |

Table 73. Power Supply Specifications Summary

| Description | Specification |
|--|---|
| AC Control Power ① | Rated supply voltage (operating range): 110–120 Vac/60 Hz, (94–132 Vac) 220–240 Vac/50 Hz, (187–264 Vac) Requirement of an external control power transformer when the product is used above 150 Vac (220–240 Vac) |
| DC Control Power ② | Rated supply voltage (operating range): 24 Vdc Nominal (18–30 Vdc) The common terminal of the 24 V power supply shall be earthed |
| Max. Power Consumption ③ | 8 W |
| AC Control Power Input Impulse Withstand Voltage U_{imp} | See Table 84 . |

Notes

- ① Fuse information—Recommend 1 A slow blow fuse for AC control power. Interrupting capability should be greater than available branch current.
- ② UL Listed Isolated Class 2/PELV Power Supply Rated Maximum 24 Vdc. Wiring must meet PELV requirements.
- ③ Base Control Module + Measurement Module + User Interface + Communication Card.

Table 74. Input/Output Specifications

| Description | Specification |
|---|---|
| Relay Rating | Relay Q1 / Q2 (from A – NO) B300 Pilot Duty, R300 Pilot Duty AC-15: 3 A at 120 Vac, 1.5 A at 240 Vac DC-13: 0.22 at 125 Vdc, 0.1 at 250 Vdc, 2 A at 24 Vdc Relay Q3 (from C – latching) B300 Pilot Duty, R300 Pilot Duty AC-15: 3 A at 120 Vac, 1.5 A at 240 Vac DC-13: 0.22 at 125 Vdc, 0.1 at 250 Vdc, 1.5 A at 24 Vdc Relay Q3 (from C – non-latching) B300 Pilot Duty, R300 Pilot Duty AC-15: 3 A at 120 Vac, 1.5 A at 240 Vac DC-13: 0.22 at 125 Vdc, 0.1 at 250 Vdc, 2 A at 24 Vdc The Q3 normally closed relay contacts should not be used for motor contactor control |
| AC Field Input [Ⓞ] | IEC 61131-2 Type 1 Digital Input Off State: 0 Vac to 20 Vac On State: 79 Vac to 132 Vac Max. ON current: 15 mA |
| DC Field Input | IEC 61131-2 Type 1 Digital Input Off State: 0 Vac to 5 Vdc On State: 15 Vdc to 30 Vdc Max. ON current: 15 mA |
| Mandatory Short Circuit Protection for Auxiliary Contacts (relay outputs) | 6 A Class gG fuse (IEC 60947-5-1) |
| Terminal Block | Wiring capacity: 0.2 mm ² (24 AWG) to 2.5 mm ² (12 AWG) Use only UL listed or recognized conductors. Copper wire rated 75C (75 °C UC wire) for all field wiring terminals and main overload conductor wiring. |

Table 75. PTC Specifications

| Description | Specification |
|------------------------------|---|
| Standard | EN 60947-8/A1:2006 “Mark A Control Unit” |
| Compatible Thermal Detectors | MARK A type (abrupt characteristic change) as described in EN 60947-8/A1:2006 Annex A wired in series |
| Terminals | Marked T1 & T2. 0.2 mm ² (24 AWG) to 2.5 mm ² (12 AWG) |
| Cold Resistance | <= 1500 ohms |
| Measuring Voltage T1-T2 | <= 2.5 V for resistance <= 1330 ohms <= 7.5 V for resistance <= 4 kohms <= 9.0 V open circuit |
| Temperature Rise Response | 3600 ohms ±10% |
| Over Temperature Reset | 1500 ohms ±10% |
| Short Circuit Response | Between 10 and 20 ohms |
| Short Circuit Reset | Between 20 and 40 ohms |
| Wire Break Response | 20 k to 40 kohms |
| Isolation | See Table 84 . |

Table 76. Measurement Module Specifications

| Description | Specification |
|---|---|
| 3 Phase Voltage input U12, U23, U31 RMS | Input ratings: 110–690 Vac (94–759 Vac) Grounded, Floating, and High-Resistance Ground Distribution systems supported. 4160 Vac with PT Ratios between 35:1 and 6:1 Connector: Removable screw terminal U_{imp} : See Table 84 . Line Frequency: 20–80 Hz |
| 3 Phase Current input I1, I2, I3 RMS | Depending on Measurement Module range Current as % of rated FLA 0–720% max rated FLA |

Note: Refer to **Chapter 10** for Ground Fault Module specifications.

Table 77. Measurement Module Frame Breaks

| Frame Size | Current Range | Aperture Dia. (mm) | Supported Conductor NA 600 V ① | Supported Conductor EMEA 690 V ① | Frequency Range |
|------------|---------------------------------|--------------------|--------------------------------|----------------------------------|-----------------|
| 45 mm | 0.3–2.4 Amp | 7.8 | 6 AWG | 16 mm ² | 20–80 Hz ② |
| 45 mm | 1–5 Amp | 7.8 | 6 AWG | 16 mm ² | 20–80 Hz ② |
| 45 mm | 4–32 Amp | 7.8 | 6 AWG | 16 mm ² | 20–80 Hz ② |
| 45 mm | 6–45 Amp | 7.8 | 6 AWG | 16 mm ² | 20–80 Hz ② |
| 55 mm | N.A. 9-68 Amp ① IEC 9-72 Amp | 10.5 | 3 AWG | 25 mm ² | 20–80 Hz ② |
| 90 mm | 11–90 Amp | 15.8 | 2/0 AWG | 70 mm ² | 20–80 Hz ② |
| 90 mm | 17–136 Amp | 15.8 | 2/0 AWG | 70 mm ² | 20–80 Hz ② |

Notes

- ① Use only insulated conductors. Conductor outer diameter vary with insulation type. Refer to aperture diameter for sizing.
- ② Linear to 1.2 FLA over the range of 20–80 Hz. Linear to 7.2x FLA over 47–63 Hz range.

Table 78. EMC Emissions

| Description | Specification |
|---------------------|---|
| Radiated Emissions | EN 55011 (CISPIR 11) Group 1, Class A, ISM Equipment for Industrial, Scientific, and Medical Equipment. 30 MHz to 1000 Mhz The ferrite bead needs to be applied to meet requirements. Bead should go over L1 and L2 terminals only. |
| Conducted Emissions | IEN 55011 (CISPIR 11) Group 1, Class A, ISM Equipment for Industrial, Scientific, and Medical Equipment. 0.15 MHz to 30 MHz. The ferrite bead needs to be applied to meet requirements. Bead should go over L1 and L2 terminals only. |

Table 79. EMC Immunity

| Description | Specification | |
|------------------------------|--------------------------|---|
| Surge | 61000-4-5 Criteria B | 2 kV Line to Earth 1 kV Line to Line |
| ESD | 61000-4-2 Criteria B | 8 kV air discharge 4 kV contact discharge |
| EFT | 61000-4-4 Criteria B | Power Ports: 2 kV, 5 kHz, Direct Method Signal Ports: 1 kV, 5 kHz, Clamp Method |
| Radiated Immunity | 61000-4-3 Criteria A | 10 V/m 80–2000 MHz, 80% amplitude modulation at 1 kHz 1 V/m 2000–2700 MHz, 80% amplitude modulation at 1 kHz |
| Conducted Immunity | 61000-4-6 Criteria A | 10 V/m, 0.15–80 MHz, 80% amplitude modulation a 1 kHz |
| Magnetic Field Immunity | 61000-4-8 Criteria A | 30 A/m, 50/60 Hz |
| Voltage Dips & Interruptions | 61000-4-11 Criteria A | 110 Vac 60 Hz, 220 Vac 50 Hz 0% rated voltage during 1/2 cycle 0% rated voltage during 1 cycle 70% rated voltage during 25/30 cycles |
| Voltage Interruptions | 61000-4-11 Criteria A | 110 Vac 60 Hz, 220 Vac 50 Hz Interruption (0% rated voltage) during 250/300 cycles |
| Voltage Interruptions | 61000-4-29 Criteria A | 24 Vdc Interruption (0% rated voltage) for 10 ms |

Table 80. Agency Certifications and Regulatory

| Description | Specification |
|-------------------------------|---|
| Agency Certifications | UL and CSA UL 60947-4-1 CSA 22.2 #60947-4-1 CSA C22.2 NO. 0-10 Low Voltage directive (2006/95/EC) IEC/EN 60947-4-1 IEC/EN 60947-5-1 EN 60947-8 EN 60079-7 (For increased safety method of protection of Ex e motor), EMC directive (2004/108/EC), Machine Directive (2006/42/EC), IEC/EN 61000-4 level 3, PROFIBUS/ODVA Conformance |
| Regulatory, self-declarations | Recast RoHS Directive/RoHS II (Restriction of the use of certain hazardous substances in electrical and electronic equipment (recast) Directive 2011/65/EU) WEEE Directive (Waste of Electrical and Electronic Equipment 2002/96/EC) REACH Directive 2006/121/EC (Registration, Evaluation, Authorization, and Restriction of Chemicals 1907/2006, 1. Compliance according with REACH article 67, and 2. The compliance of the duty to inform by the supplier according to REACH article 31 and 33) Life Cycle Assessment (LCA, reference ISO 14025) |

Table 81. Physical Size Specifications

| Description | Specification |
|---|---|
| Base Control Module | Estimated size (l x w x h): 82 x 45 x 102 mm Mounting: DIN and screw |
| Measurement Module | Estimated size (l x w x h): 82 x 45 x 63 mm, 32 A/45 A and below 82 x 56 x 116 mm, 68 A/72 A 82 x 90 x 125 mm, 90 A/136 A Mounting: DIN and screw |
| Base Control Module and Measurement Module Stack-up | Height = 155 mm, BCM and MM (32 A/45 A and below) 55 mm and 90 mm Measurement Modules will not be stackable |
| Use Interface | Estimated size (l x w x h): 99 x 52 x 37 Mounting: Panel mounted |

Note: Refer to **Chapter 10** for Ground Fault Module specifications.

Table 82. Short Circuit Ratings (North American CSA and UL) ①

| Measurement Module Frame | Overload FLA Range | Standard-Fault Short Circuit Data | | | | High-Fault Short Circuit Data Fuses (RK5) | | | Thermal-Magnetic Circuit Breakers | | |
|--------------------------|--------------------|-----------------------------------|------------|--------------------------|-----------------------|---|------------|--------------------------|-----------------------------------|------------|-----------------------|
| | | 480 V (kA) | 600 V (kA) | Max. Fuse Size (A) (RK5) | Max. Breaker Size (A) | 480 V (kA) | 600 V (kA) | Max. Fuse Size (A) (RK5) | 480 V (kA) | 600 V (kA) | Max. Breaker Size (A) |
| 45 mm | 0.3–2.4 A | 5 | 5 | 6 A | 15 A | 100 | 100 | 6 A | 100 | 35 | 15 A |
| 45 mm | 1–5 A | 5 | 5 | 20 A | 20 A | 100 | 100 | 20 A | 100 | 35 | 20 A |
| 45 mm | 4–32 A | 5 | 5 | 125 A | 125 A | 100 | 100 | 125 A | 100 | 35 | 125 A |
| 45 mm | 6–45 A | 5 | 5 | 175 A | 175 A | 100 | 100 | 175 A | 100 | 35 | 175 A |
| 55 mm | 9–72 A | 10 | 10 | 250 A | 250 A | 100 | 100 | 250 A | 100 | 35 | 250 A |
| 90 mm | 11–90 A | 10 | 10 | 360 A | 360 A | 100 | 100 | 360 A | 100 | 50 | 360 A |
| 90 mm | 17–136 A | 10 | 10 | 400 A | 400 A | 100 | 100 | 400 A | 100 | 50 | 400 A |

Note

① Short circuit protective device (SCPД) sizing per NEC: Max. = 400% of FLA for devices rated less than or equal to 100 A, 300% of FLA over 100 A.

Table 83. Short Circuit Ratings (IEC)

| Measurement Module Frame | Overload FLA Range | Standard-Fault Short Circuit Data | | | | | High-Fault Short Circuit Data Fuses (gG) | | | Thermal-Magnetic Circuit Breakers | | | |
|--------------------------|--------------------|-----------------------------------|------------|-------------------------|-----------------------------|-----------------------------|--|------------|-------------------------|-----------------------------------|------------|-----------------------------|-----------------------------|
| | | 480 V (kA) | 690 V (kA) | Max. Fuse Size (A) (gG) | Max. Breaker Size (A) 480 V | Max. Breaker Size (A) 690 V | 480 V (kA) | 690 V (kA) | Max. Fuse Size (A) (gG) | 480 V (kA) | 690 V (kA) | Max. Breaker Size (A) 480 V | Max. Breaker Size (A) 690 V |
| 45 mm | 0.3–2.4 A | 1 | 1 | 16 A | 15 A | N/A | 100 | 100 | 10 A | 100 | N/A | 15 A | N/A |
| 45 mm | 1–5 A | 1 | 1 | 20 A | 20 A | 20 A | 100 | 100 | 20 A | 100 | 80 | 20 A | 20 A |
| 45 mm | 4–32 A | 3 | 3 | 125 A | 125 A | 125 A | 100 | 100 | 125 A | 100 | 80 | 125 A | 125 A |
| 45 mm | 6–45 A | 3 | 3 | 200 A | 175 A | 160 A | 100 | 100 | 125 A | 100 | 80 | 175 A | 160 A |
| 55 mm | 9–72 A | 5 | 5 | 250 A | 250 A | 250 A | 100 | 100 | 160 A | 100 | 80 | 250 A | 250 A |
| 90 mm | 11–90 A | 5 | 5 | 360 A | 360 A | 360 A | 100 | 100 | 360 A | 100 | 80 | 360 A | 360 A |
| 90 mm | 17–136 A | 10 | 10 | 400 A | 400 A | 400 A | 100 | 100 | 400 A | 100 | 80 | 400 A | 400 A |

Table 84. Impulse Withstand Ratings

| C445 Device | Base Catalog Number | Circuit | Standard Ratings | | | Protective Separation (Annex N) Ratings | | |
|--------------------|---------------------|----------|----------------------|-----------------|--------------------------|---|-----------------|--------------------------|
| | | | Overvoltage Category | Working Voltage | Impulse Withstand Rating | Overvoltage Category | Working Voltage | Impulse Withstand Rating |
| Measurement module | C445M | Mains | III | 690 V | 6 kV | III | 690 V | 8 kV |
| | | PTC (DC) | — | — | — | — | — | 4 kV |
| AC BCM | C445BA | Power | III | 230 V | 4 kV | II (with CPT) | 230 V | 4 kV |
| | | Relays | III | 230 V | 4 kV | III | 230 V | 6 kV |
| | | K1 to K2 | III | >150 V | 4 kV | III | <150 V | 4 kV |
| | | Inputs | II | 120 V | 1.5 kV | II | 120 V | 2.5 kV |
| DC BCM | C445BD | Relays | III | 230 V | 4 kV | III | 230 V | 6 kV |
| | | K1 to K2 | III | >150 V | 4 kV | III | <150 V | 4 kV |
| | | Inputs | II | 120 V | 1.5 kV | II | 120 V | 2.5 kV |

Appendix B—Troubleshooting and Diagnostics

Table 85. Motor Protection Fault Definitions

| Definition | Source | Result | Power Xpert Protection |
|--|---|--|--|
| Thermal Overload | | | |
| Overload is a condition in which current draw to a motor exceeds 115% of the full load amperage rating over a period of time for an inductive motor. | <p>An increase in the load or torque that is being driven by the motor.</p> <p>A low voltage supply to the motor would cause the current to go high to maintain the power needed.</p> <p>A poor power factor would cause above normal current draw.</p> | <p>Increase in current draw. Current leads to heat and insulation breakdown, which can cause system failure.</p> <p>Additionally, an increase in current can increase power consumption and waste valuable energy.</p> | <p>Thermal trip behavior is defined by UL, CSA and IEC standards.</p> <p>Trip class is settable from 5–40 by 1</p> <p>Provides power factor monitoring and low voltage protection features.</p> |
| Jam | | | |
| Jam is similar to thermal overload in that it is a current draw on the motor above normal operating conditions. | Mechanical stall, interference, jam or seizure of the motor or motor load. | The motor attempts to drive the load, which has more resistive force due to the mechanical interference. In order to drive the load, the motor draws an abnormal amount of current, which can lead to insulation breakdown and system failure. | <p>Provides a configurable Jam setting that is active during “motor run state” to avoid nuisance trips.</p> <p>Trip Threshold 50–400% of FLA.</p> <p>Trip Delay 1–20 seconds.</p> |
| Ground Fault | | | |
| A line to ground fault. | A current leakage path to ground. | An undetected ground fault can burn through multiple insulation windings, ultimately leading to motor failure. | <p>Power Xpert has ground fault protection capability with a sensitivity of 3 A or less up through 90 A applications using the built in three phase CTs and the residual current method. That is, the three-phase current signals should sum to zero unless a Ground Fault (GF) condition is present. In the case of a GF, Power Xpert can alarm, trip the starter, or trip an alternative relay that can be used to shunt trip a breaker or light up a warning light. GF current can also be monitored in real-time through the advanced monitoring capabilities. For applications requiring higher ground fault sensitivity across all FLA ranges, add the C445XG-MOD External Ground Fault Module. Refer to Chapter 10 for more information.</p> <p>Note: GF settable thresholds vary with motor FLA. See Table 27 Current Based Protections for each minimum level.</p> |
| Imbalanced Phases (voltage and current) | | | |
| Uneven voltage or currents between phases in a three-phase system. | When a three-phase load is powered with a poor quality line, the voltage per phase may be imbalanced. | Imbalanced voltage causes large imbalanced currents and as a result this can lead to motor stator windings being overloaded, causing excessive heating, reduced motor efficiency and reduced insulation life. | <p>Provides two protection settings that address this problem. The user can choose to set current imbalance thresholds or voltage imbalance thresholds, each of which can trip the starter. Additionally, both of these may be monitored through Power Xpert’s advanced monitoring capabilities, allowing the customer to notice in real-time when and where a condition is present.</p> |
| Phase Loss—Current (single-phasing) | | | |
| One of the three-phase current is not present. | Multiple causes, loose wire, improper wiring, grounded phase, open fuse, and so on. | Single-phasing can lead to unwanted motor vibrations in addition to the results of imbalanced phases as listed above. | Fixed protective setting that takes the starter offline if a phase drops below 60% of the other two phases. |

Table 85. Motor Protection Fault Definitions, continued

| Definition | Source | Result | Power Xpert Protection |
|---|--|---|--|
| Phase Rotation (phase-reversal) | | | |
| Improper wiring, leading to phases being connected to the motor improperly. | A miswired motor. Inadvertent phase-reversal by the utility. | Phase-reversal can cause unwanted directional rotation of a motor. In the event that the load attached to the motor can only be driven in one direction, the result could be significant mechanical failure and/or injury to an operator. | Configurable phase protection, allowing the user to define the phase sequencing intended for that application. If no phase sequence is required, the user has the ability to disable this feature. |
| Frequency Variance | | | |
| When line frequency is inconsistent. | Malfunctioning alternator speed regulator, or poor line quality caused by an overload of a supply powered by individual sources. | Variations in frequency can cause increases in losses, decreasing the efficiency of the motor. In addition, this can result in interference with synchronous devices. | Advanced monitoring capabilities allow the user to monitor frequency in real time. Users can also optionally set an alarm or trip threshold for frequency variations from 70–110%. |

Table 86. Load Protection Fault Definitions

| Definition | Source | Result | Power Xpert Protection |
|---|---|---|--|
| Under Current or Low Power | | | |
| Average rms current provided to the motor falls below normal operating conditions. | Under current is usually associated with a portion of the user's load disappearing. Examples of this would be a broken belt, a dry-pump (low suction head) or a dead-headed centrifugal pump. | If under current goes undetected, a mechanical failure can and has occurred. In the case of a pump, running a pump dry or running a pump in a dead-headed condition can cause excessive heating, damaging expensive seals and breaking down desired fluid properties. | Power Xpert has two protection settings to detect this: under current and low power. Low power is a more consistent way of ensuring detection as power is linear with motor load, where as current is not. An unloaded motor may draw 50% of its rated current, but the power draw will be less than 10% of rated power due to a low power factor. |
| High Power | | | |
| The motor load is drawing more power than it should at normal operating conditions. | This is typical of batch processing applications where several ingredients flow into a mixer. When a substance's consistency changes and viscosity increases from what is expected, the motor may use more power to blend the mixture. Out-of-tolerance conditions can be detected using the High Power and Low Power settings. | If a high-power fault goes undetected, the result may be a batch of material that does not meet specification. | Monitors the three-phase real power. If the real power value is estimated above the set threshold for the set length of time, a fault is detected and the overload will trip the starter. Additionally, power can be monitored in real-time. |

Table 87. Line Protection Fault Definitions

| Definition | Source | Result | Power Xpert Protection |
|---|--------------------|---|---|
| Over Voltage | | | |
| When the line voltage to the motor exceeds the specified rating. | Poor line quality. | An over voltage condition leads to a lower than rated current draw and a poor power factor. A trip limit of 110% of rated voltage is recommended. Over voltage can also lead to exceeding insulation ratings. | Monitors the maximum rms value of the three-phase voltages. If the rms value rises above the set threshold for the set length of time, a fault is detected and the overload can trip the starter or send and display an alarm of the condition. All line-related faults have an “alarm-no-trip” mode. |
| Under Voltage | | | |
| When the line voltage to the motor is below the specified rating. | Poor line quality. | An under voltage condition leads to excessive current draw. This increases the heating of the motor windings and can shorten insulation life. A trip limit set to 90% of rated voltage is recommended. | Monitors the minimum rms value of the three-phase voltages. If the rms value drops below the set threshold for the set length of time, a fault is detected and the overload can trip the starter or send and display an alarm of the condition. All line-related faults have an “alarm-no-trip” mode. |

Appendix C—Optional Communication Cards

Ethernet Card (C445XC-E)

Introduction

The C445 Ethernet option card (C445XC-E) supports both the Modbus TCP and EtherNet/IP protocols. This card contains two Ethernet ports but only one IP address. The ports act as a two-port Ethernet switch, allowing the user to optionally daisy chain modules together in a Ring or Linear network, instead of running each module back to a centralized Ethernet switch in a Star Network. Three supported Ethernet network topologies for the C445XC-E card are shown below.

Figure 129. C445 Ethernet Star Network Connection Example

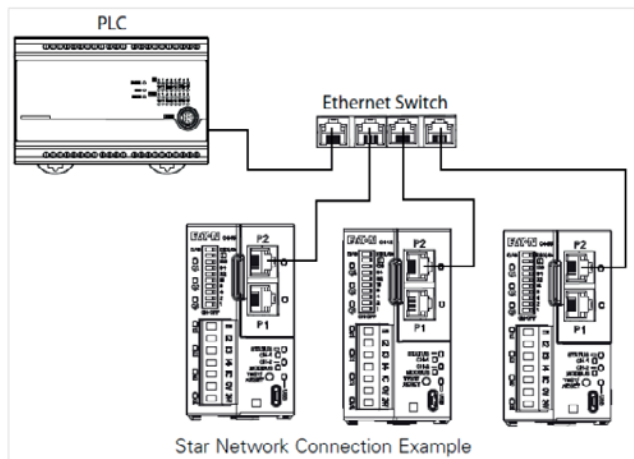


Figure 130. C445 Ethernet Ring Network Connection Example

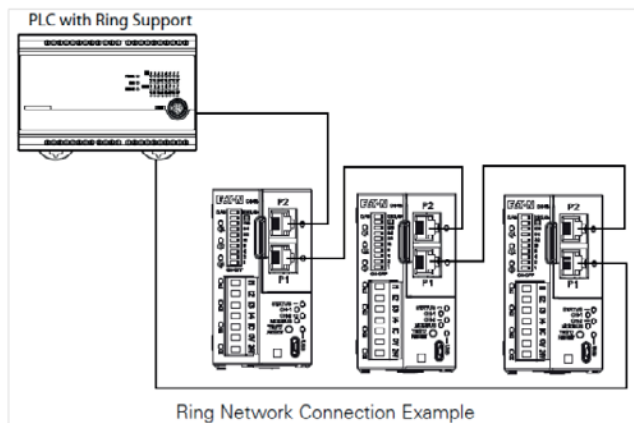
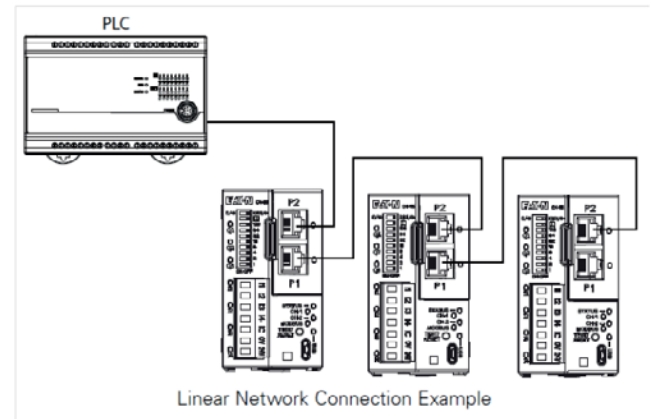


Figure 131. C445 Ethernet Linear Network Connection Example



Installing the Ethernet Communication Card

The Ethernet Communication Card is installed directly into the C445 Base Control Module. To install the card, follow the step by step directions:

1. Remove the blank cover with the unit not powered.
2. Locate the communication card slot
3. Plug the Ethernet communication card into location. Only remove or plug in modules with the unit not powered. Do not hot swap communication modules.

Figure 132. Installing the Ethernet Communication Card



Ethernet Communication Card and DIP Switches

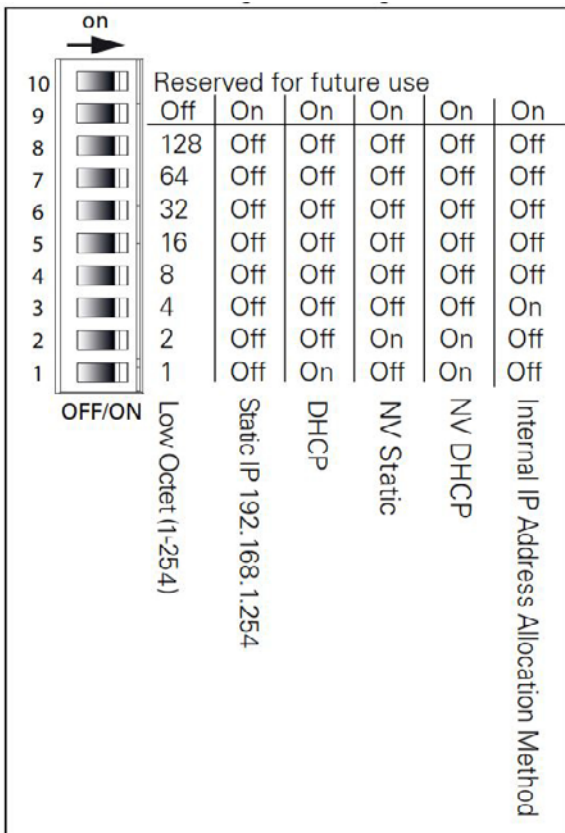
When an optional Ethernet card is connected to a C445, the DIP switches on the Base Control Module are dedicated to determining the IP address of this card per the diagram below.

If the C445 Base Control Module also includes the optional RS-485 Modbus serial port, the node address and the data rate for this port must be configured using the Monitoring User Interface, Web Pages or the *inControl* Configuration Software.

DIP Switch settings on the C445 Base Control Module when an Ethernet Card is installed.

DIP Switch 10 is reserved for future use.

Figure 133. Base Control Module DIP Switches with Ethernet Card



Descriptions

When switch 9 is OFF:

Low Octet: DIP Switch numbers set low octet of static IP address 192.168.1.X where X is 0 – 253

Ethernet Port Setting

The lower 8 switches (1-7) are each given a value based on weighted binary. If the switch second from the top (9) is Off, the 8 lower switches are provided a value from the bottom up as follows: 1, 2, 4, 8, 16, 32, 64, 128. The switches are turned On when they are pushed to the right. Add the value of all switches that are On to determine the overall value. This value represents the low octet of the IP address 192.168.1.x. This is an easy way to configure the Ethernet Card to a known IP address so a computer can be configured to easily and quickly communicate with the C445 via Modbus TCP Ethernet with the *inControl* software tool. Then, using this tool, the C445 Ethernet Card may be configured with any static IP address. Information on how to go online with the C445 using the software tool and Modbus TCP may be found in the *inControl* software user manual. The following procedure indicates a procedure using the software tool to set a static IP address, subnet mask and gateway address for the C445 Ethernet Card.

1. Set DIP Switch 9 to OFF.
2. Set the bottom 2 DIP Switches (1-2) ON and leave the others OFF resulting in a value of 3 and an IP address of 192.168.1.3 assigned to the Ethernet Card.
3. Power cycle the C445 so the new DIP Switch settings will be used.
4. Using the *inControl* software, go online with the C445 via Modbus TCP and the Ethernet Card.
5. Under the Communications/Ethernet categories in the software tool, configure a static IP address, subnet mask and gateway address. These will not take effect until a soft reset is issued to the C445 or until it receives a power cycle.
6. Go offline with the C445 in the software tool.
7. Set the DIP Switches so only the following switches are ON: 2 and 9. The Ethernet Card will now be configured for "NV Static IP Address".
8. Issue a soft reset or power cycle the C445. When it powers up the Ethernet Card will be configured with the static IP address, subnet mask and gateway address it was configured for with the *inControl* software tool.
9. This same process could be accomplished using the USB port or the RS-485 port with the *inControl* software tool.

When switch 9 is ON and other DIP switches are:

0 – Static IP: hardcoded IP address of 192.168.1.254

1 – DHCP: Pulls IP address from DHCP server

2 – NV Static: Full address taken from device Non-Volatile Memory (static)

3 – NV DHCP: Addresses are taken from the DHCP server and assigned to device NV memory. To keep this address as static, power down the device and then change DIP Switch setting to 2 (NV Static) before re-powering the device

4 – Internal IP Address Allocation Method: Device disregards DIP Switch selections and IP configuration is done via *inControl* software by setting parameter “IP ADDRESS ALLOCATION METHOD.” The available settings for this parameter are the same as settings 0 through 3 available via DIP Switches. Setting 3 NV DHCP allows devices to get addresses from DHCP and assigns them to NV memory. Next, setting the parameter to 2 in the software before power cycle will allow devices to retain the last active IP addresses as static without having to physically change DIP Switches on each device.

The DIP Switches are used to configure the IP address for the Ethernet port. Even though there are two Ethernet ports on the Ethernet Option card, these ports act as a two port switch and both have the same IP address. This allows multiple C445 Ethernet Cards to be daisy-chained rather than each being connected to the same switch or switches. It also provides for the capability of connecting in a redundant ring topology when connected through switches that support this technology.

LED Status Indicators

The Ethernet Card includes indicators for the module status (MS) and Network Status (NS). The Module Status Indicator states are described in the table below.

Table 88. Module Status Indicator

| Indicator State | Summary | Requirement |
|-----------------|--------------------|--|
| Steady Off | No power | If no power is supplied to device, the module status indicator shall be steady Off. |
| Steady Green | Device operational | If the device is operating correctly, the module status indicator shall be steady green |
| Flashing Green | Standby | If the device has not been configured, the module status indicator shall be flashing green. |
| Flashing Red | Minor Fault | If the device has detected a recoverable minor fault, the module status indicator shall be flashing red. |
| Steady Red | Major Fault | If the device has detected a non-recoverable major fault, the module status indicator shall be steady red. |

Table 89. Network Status Indicator

| Indicator State | Summary | Requirement |
|------------------------|----------------------------|--|
| Steady Off | Not Powered, No IP Address | The device is powered off, or is powered on but with no IP address configured (Interface Configuration attribute of the TCP/IP Interface Object). |
| Flashing Green | No Connections | An IP address is configured, but no CIP connections are established, and an Exclusive Owner connection has not timed out. |
| Steady Green | Connected | At least one CIP connection (any transport class) is established, and an Exclusive Owner connection has not timed out. |
| Flashing Red | Connection Time-out | An Exclusive Owner connection for which this device is the target has timed out. The network status indicator shall return to steady green only when all timed out Exclusive Owner connections are re-established. |
| Steady Red | Duplicate IP | If the device has detected a non-recoverable major fault, the module status indicator shall be steady red. |
| Flashing Green and Red | Self-test | While the device is performing its power up testing, the module status indicator shall be flashing green and red. |

Ethernet LED Indications

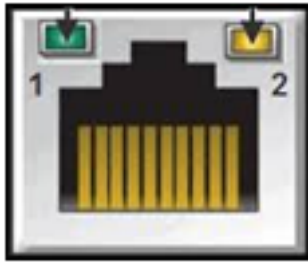


Table 90. Ethernet LED Description

| LED | Description |
|--------------------------|--|
| [1] Ethernet Link status | Flashes with Ethernet message activity. |
| [2] Ethernet Link speed | Displays the link speed: Amber LED on the Ethernet Jack is ON when link speed is 100 mbps Amber LED on the Ethernet Jack is OFF when link speed is 10 mbps |

Configuration Using a Web Browser

The Ethernet Card includes an embedded web page that provides the ability to monitor the status and set the configuration of the C445 Motor Management Relay System and the Ethernet Card. The Web Pages have been validated for use with Internet Explorer. To use the web page open your Internet Explorer browser and enter the IP address assigned to the Ethernet Card:

`http:// IP Address`

The web page provides five levels of authorization as shown in the chart below:

Table 91. Five Levels Of Authorization

| Level | Default User Name | Default Password | Description |
|------------|-------------------|------------------|--|
| Open | <none> | <none> | Open access, has no password. Allows opening web page to be viewed, but no additional information is available |
| Read_Only | readonly | readonly | Read_Only access allows parameters to be viewed, but no control or configuration |
| Control | control | control | Control provides capabilities of Read_Only plus allows motor and discrete outputs to be turned on and off |
| Config | configuration | configuration | Config provides capabilities of Control plus the ability to set configuration values |
| Super_User | superuser | superuser | Super_User provides the capabilities of Config plus the ability to change user names and passwords |

Note: In addition to the individual levels, a **password exemption** setting is provided. This setting specifies a level that can be accessed without any password protection. **The default value of the password exemption is Super_User.** All capabilities of the web page are accessible without a password prompt until the password exemption is changed to a lower level.

User names and passwords are case sensitive, and limited between 6~16 characters. For security reasons, it is recommended that the user change the default passwords and adjust the password exemption level to be lower than Super_User after configuration. It is also recommended that these changes be made within a local subnet.

Refer to Chapter 4, **System Configuration and Commissioning** on **Page 45** for a complete description and procedure on how to use the password feature for the Web Pages.

Configuration Using an EDS File

The C445 has an Ethernet/IP EDS file available. It can be imported into any Ethernet/IP configuration tools that support EDS files. This EDS file may be downloaded from the Eaton C445 website.

<http://www.eaton.com/c445>

Configuring Using the *inControl* Software Tool

There is a Modbus TCP Ethernet DTM/Driver for the *inControl* software tool. This interface may be used to connect to the C445 Motor Management Relay via the C445 Ethernet Card. Refer to the *inControl* software tool user manual for additional information (publication MN040013EN).

Ethernet/IP Protocol

The C445 Ethernet Card can be connected to any Ethernet/IP network. It can be connected both as an Explicit Message server and as an Implicit (I/O) Message target.

The Implicit connections supported include:

- Exclusive Owner
- Listen Only
- Input Only

Table 92. EtherNet/IP Object Model for the C445 Motor Management Relay

| No. | Class | Object | No. of Instances | Description |
|-----|------------|----------------------------------|--|---|
| 1 | 0x01 (1) | Identity | 1 | Provides module identity object. |
| 2 | 0x02 (2) | Message Router | 1 | Internal object implemented per ODVA specification |
| 3 | 0x04 (4) | Assembly Object | I/P:50, 51, 54, 100, 107, 110, 116, 121 O/P:2, 5,104, 105, 106 Dynamic I/P:150 | Binds attributes from multiple objects for access with a single Implicit (I/O) connection. |
| 4 | 0x06 (6) | Connection Manager | 1 | Internal object supporting connection management. Implemented per ODVA specification |
| 5 | 0x08 (8) | Discrete Input Point | 8 | Status information for the discrete Inputs. |
| 6 | 0x09 (9) | Discrete Output Point | 3 | Status and control for the discrete Outputs. |
| 7 | 0x29 (41) | Control Supervisor | 1 | Motor control functions. |
| 8 | 0x2C (44) | Overload | 1 | Motor overload protection. |
| 9 | 0x88 (136) | System Component Definition | 5 | Vendor Specific Object. |
| 10 | 0x93 (147) | Voltage Object | 1 | Vendor Specific object for monitoring voltage. |
| 11 | 0x96 (150) | Dynamic Input Assembly Interface | 1 | An interface to insert the parameter in dynamic assembly instance number 150. |
| 12 | 0xC7 (199) | Test Only | 1 | Vendor Specific Object. |
| 13 | 0x9B (155) | Motor Info | 1 | Vendor Specific Object. |
| 14 | 0x9F (159) | Operation Mode | 1 | Vendor Specific Object. |
| 15 | 0xA0 (160) | Modbus | 1 | Vendor Specific Object. |
| 16 | 0xA1 (161) | Motor Monitoring | 1 | Vendor Specific Object. |
| 17 | 0xA2 (162) | Motor Protection | 1 | Vendor Specific Object. |
| 18 | 0xA5 (165) | Snap Shot | 1 | Vendor Specific Object. |
| 19 | 0xAA (170) | Parameter Access | 1 | Vendor Specific Object. |
| 20 | 0xB0 (176) | RTC | 1 | Vendor Specific Object. Provides access to RTC |
| 21 | 0xB1 (177) | BCM | 1 | Vendor Specific Object. |
| 23 | 0xB3 (179) | Option Card | 1 | Vendor Specific Object. |
| 24 | 0xF4 (244) | Port Object | 1 | The Port Object describes the communication interfaces that are present on the device and visible to CIP. |
| 25 | 0xF5 (245) | TCP/IP Interface | 1 | EtherNet/IP Specific object. Information about the TCP/IP Interface. Implemented per ODVA specification |
| 26 | 0xF6 (246) | Ethernet Link | 2 | EtherNet/IP Specific object. Ethernet link object for each of the 2 Ethernet ports on the device. Implemented per ODVA specification. |

Object Details

Table 93. Identity Object—Class 0x01 (1)

Class Services

| ID | Service |
|------|----------------------|
| 0x0E | Get_Attribute_Single |
| 0x01 | Get_Attribute_All |

Instance Services

| ID | Service |
|------|---|
| 0x01 | Get_Attributes_All |
| 0x05 | Reset |
| | Reset |
| | Service data: 0 |
| | Soft Reset: Initializes adapter to the Power-up state. |
| | Service data: 1 |
| | Factory Reset: Writes default values to all instance attributes and then saves all non-volatile attributes to NV memory and then performs the equivalent of a Reset (0). |
| 0x0E | Get_Attribute_Single |

Class Attributes

| Sr. No. | ID | Access Rule | Data Type | Description | Remarks / Default Values |
|---------|---------|-------------|-----------|-------------------------------|--------------------------|
| 1 | 1 (0x1) | Get | UINT | Revision | 1 |
| 2 | 2 (0x2) | Get | UINT | Max Instances | 1 |
| 3 | 3 (0x3) | Get | UINT | Number of instances | 1 |
| 4 | 6 (0x6) | Get | UINT | Maximum ID Class Attribute | 7 |
| 5 | 7 (0x7) | Get | UINT | Maximum ID Instance Attribute | 7 |

Instance Attributes

| Sr. No. | ID | Access Rule | Data Type | Description | Remarks / Default Values |
|---------|---------|-------------|--------------|----------------|--|
| 1 | 1 (0x1) | Get | UINT | Vendor ID | 0x44 (68) (Eaton Vendor ID) |
| 2 | 2 (0x2) | Get | UINT | Device Type | Motor Starter Profile: 0x16 |
| 3 | 3 (0x3) | Get | UINT | Product Code | 0x830A |
| 4 | 4 (0x4) | Get | STRUCT of: | Revision | |
| | | | USINT | Major Revision | 1 |
| | | | USINT | Minor Revision | 1 |
| 5 | 5 (0x5) | Get | WORD | Status | Status will be as per CIP Specification. |
| 6 | 6 (0x6) | Get | UDINT | Serial Number | Unique number will be written during production. |
| 7 | 7 (0x7) | Get | SHORT_STRING | Product Name | C445 EtherNet Communication Card |

Table 94. Message Router Object—Class 0x2 (2)

Class Services

| Service code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |
| 0x01 | Get Attributes All |

Instance Services

| Service code | Service Name |
|--------------|------------------------------------|
| 0x0E | Get Attribute Single |
| 0x10 | Set Attribute Single |
| 0x0A | Multiple Service Packet (optional) |

Class Attributes

| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
|---------|--------------|-------------|-----------|---------------------------------------|---|
| 1 | 1 (0x1) | Get | UINT | Revision | Revision of this object |
| 2 | 2 (0x2) | Get | UINT | Max. Instance | Maximum instance number of an object currently created in this class level of the device. |
| 3 | 3 (0x3) | Get | UINT | Number of Instances | Number of object instances currently created at this class level of the device. |
| 4 | 4 (0x4) | Get | STRUCT | Optional Attribute List | List of optional instance attributes utilized in an object class implementation. |
| 5 | 5 (0x5) | Get | STRUCT | Optional service list | List of optional services utilized in an object class implementation. |
| 6 | 6 (0x6) | Get | UINT | Maximum ID Number Class Attributes | The attribute ID number of the last class attribute of the class definition implemented in the device. |
| 7 | 7 (0x7) | Get | UINT | Maximum ID Number Instance Attributes | The attribute ID number of the last instance attribute of the class definition implemented in the device. |

Instance Attributes

| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
|---------|--------------|-------------|-----------|-------------|--|
| 1 | 1 (0x1) | Nil | Get | STRUCT N.A. | A list of supported objects. No.of supported classes in the class array. List of supported class codes |
| 2 | 2 (0x2) | Nil | Get | UINT N.A. | Maximum connections supported |

Table 95. Assembly Object—Class 0x4 (4)**Class Services**

| ID | Service |
|------|----------------------|
| 0x0E | Get_Attribute_Single |
| 0x08 | Create |

Instance Services

| ID | Service |
|------|----------------------|
| 0x0E | Get_Attribute_Single |
| 0x10 | Set_Attribute_Single |
| 0x18 | Get_Member |
| 0x19 | Set_Member |
| 0x09 | Delete |

Class Attributes

| Sr. No. | ID | Access Rule | Data Type | Description | Remarks/Default |
|---------|---------|-------------|---------------|-------------------------------|-----------------|
| 1 | 1 (0x1) | Get | UINT | Revision | 2 |
| 2 | 2 (0x2) | Get | UINT | Max. Instance | 96 |
| 3 | 3 (0x3) | Get | UINT | Number of Instances | 09 |
| 4 | 4 (0x4) | Get | Struct of: | Optional Attribute List | |
| | | | UINT | Number of Attributes | 1 |
| | | | Array of UINT | Array of Attributes | 04 00 |
| 5 | 6 (0x6) | Get | USINT | Maximum ID Class Attribute | 07 00 |
| 6 | 7 (0x7) | Get | USINT | Maximum ID Instance Attribute | 04 00 |

Instance Attributes

| Sr. No. | ID | Access Rule | Data Type | Description | Remarks/Default |
|---------|---------|-------------|----------------|-------------|-----------------|
| 1 | 3 (0x3) | Get / Set | ARRAY of BYTES | Data | |
| 2 | 4 (0x4) | Get | | Size | |

Table 96. C445 Assembly Object Instances

| Type | Instance | Description |
|--------|------------|---|
| Output | 2 (0x02) | Basic Overload |
| | 3 (0x03) | Basic Motor Starter |
| | 5 (0x05) | Extended Motor Starter |
| | 104 (0x68) | Basic Starter Relay |
| | 105 (0x69) | Basic Output Control |
| | 106 (0x6A) | Extended Motor Starter 2 |
| | 123 (0x7B) | Basic Starter Relay with Analog and Digital Outputs |
| | 124 (0x7C) | Basic Starter Relay with Extended Analog and Digital Outputs |
| | 125 (0x7D) | Basic Output Control with Analog and Digital Outputs |
| | 126 (0x7E) | Basic Output Control with Extended Analog and Digital Outputs |
| | 127 (0x7F) | Extended Motor Starter 2 with Basic Analog and Digital Outputs |
| | 128 (0x80) | Extended Motor Starter 2 with Analog and Digital Outputs |
| | 129 (0x81) | Extended Motor Starter 2 with Extended Analog and Digital Outputs |
| | 130 (0x82) | Basic Analog and Digital Outputs |
| | 131 (0x83) | Extended Analog and Digital Outputs |

Table 96. C445 Assembly Object Instances, continued

| Type | Instance | Description |
|---------------|------------------------------------|--|
| Input | 50 (0x32) | Basic Overload |
| | 51 (0x33) | Extended Overload |
| | 52 (0x34) | Basic Motor Starter |
| | 54 (0x36) | Extended Motor Starter 2 |
| | 100 (0x64) | Status Current Monitoring |
| | 101 (0x65) | Status Current Monitoring with Basic Analog and Digital Inputs |
| | 102 (0x66) | Status Current Monitoring with Analog and Digital Inputs |
| | 103 (0x67) | Status Current Monitoring with Extended Analog and Digital Inputs |
| | 107 (0x6B) | Status Current Monitoring |
| | 108 (0x6C) | Extended Overload with Local IO and Expansion Analog and Digital Inputs |
| | 109 (0x6D) | Extended Overload with Local IO and Extended Expansion Analog and Digital Inputs |
| | 110 (0x6E) | Status, Current Voltage, Trip |
| | 111 (0x6F) | Status Current, Voltage, Trip with Basic Analog and Digital Inputs |
| | 112 (0x70) | Status Current, Voltage, Trip with Analog and Digital Inputs |
| | 113 (0x71) | Status Current, Voltage, Trip with Extended Analog and Digital Inputs |
| | 114 (0x72) | Status Current, Voltage, Trip with Extended Analog and Digital Inputs 2 |
| | 116 (0x74) | Full Monitoring |
| | 117 (0x75) | Full Monitoring with Basic Analog and Digital Inputs |
| | 118 (0x76) | Full Monitoring with Analog and Digital Inputs |
| | 119 (0x77) | Full Monitoring with Extended Analog and Digital Inputs |
| | 120 (0x78) | Basic Analog and Digital Inputs |
| | 121 (0x79) | Status and Short Measurements |
| 122 (0x7A) | Extended Analog and Digital Inputs | |
| Input-Dynamic | 150 (0x96) | Dynamic input Assembly |

Output Instance 2: Basic Overload**Length = 1 Byte**

| Byte | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|------|----------|----------|----------|----------|----------|------------|----------|----------|
| 0 | Reserved | Reserved | Reserved | Reserved | Reserved | FaultReset | Reserved | Reserved |

Output Instance 3: Basic Motor Starter**Length = 1 Byte**

| Byte | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|------|----------|----------|----------|----------|----------|------------|----------|-------|
| 0 | Reserved | Reserved | Reserved | Reserved | Reserved | FaultReset | Reserved | Run1 |

Output Instance 5: Extended Motor Starter**Length = 1 Byte**

| Byte | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|------|----------|----------|----------|----------|----------|------------|-------|-------|
| 0 | Reserved | Reserved | Reserved | Reserved | Reserved | FaultReset | Run2 | Run1 |

Input Instance 50: Basic Overload**Length = 1 Byte**

| Byte | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|------|----------|----------|----------|----------|----------|----------|----------|------------|
| 0 | Reserved | Reserved | Reserved | Reserved | Reserved | Reserved | Reserved | Fault/Trip |

Input Instance 51: Extended Overload**Length = 1 Byte**

| Byte | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|------|----------|----------|----------|----------|----------|----------|---------|------------|
| 0 | Reserved | Reserved | Reserved | Reserved | Reserved | Reserved | Warning | Fault/Trip |

Input Instance 52: Basic Motor Starter**Length = 1 Byte**

| Byte | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|------|----------|----------|----------|----------|----------|-----------|----------|-----------------|
| 0 | Reserved | Reserved | Reserved | Reserved | Reserved | Running 1 | Reserved | Faulted/Tripped |

Input Instance 54: Extended Motor Starter 2**Length = 1 Byte**

| Byte | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|------|----------|----------|----------------|-------|-----------|-----------|---------|--------------|
| 0 | Reserved | Reserved | Cntr lfrom Net | Ready | Running 2 | Running 1 | Warning | Faulted/Trip |

Input Instance 100 (0x64): Status, Current**Length = 8 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|---------------|---|
| 0 | 2 | Device Status | C445_DEVICE_STATUS: Device Bit Array Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |

Appendix C—Optional Communication Cards

Input Instance 100 (0x64): Status, Current, continued

Length = 8 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|------------|--|
| 2 | 2 | Current I1 | MOTOR_I_A_SCALED: Phase A (L1) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 4 | 2 | Current I2 | MOTOR_I_B_SCALED: Phase B (L2) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 6 | 2 | Current I3 | MOTOR_I_C_SCALED: Phase C (L3) Motor Current Scaled. Scaled by parameter "I Scale Factor." |

Input Instance 101 (0x65): Status Current Monitoring with Basic Analog and Digital Inputs

Length = 20 bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|----------------|---|
| 0 | 2 | Device Status | C445_DEVICE_STATUS: Device Bit Array Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |
| 2 | 2 | Current L1 | MOTOR_I_A_SCALED: Phase A (L1) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 4 | 2 | Current L2 | MOTOR_I_B_SCALED: Phase B (L2) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 6 | 2 | Current L3 | MOTOR_I_C_SCALED: Phase C (L3) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 8 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 10 | 10 | Analog Inputs | 5 Input words of data for analog inputs and status word(s) |

Input Instance 102 (0x66): Status Current Monitoring with Analog and Digital Inputs**Length = 32 bytes**

| Byte Offset | Size (bytes) | Name | Description |
|--------------------|---------------------|----------------|---|
| 0 | 2 | Device Status | C445_DEVICE_STATUS: Device Bit Array Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |
| 2 | 2 | Current L1 | MOTOR_I_A_SCALED: Phase A (L1) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 4 | 2 | Current L2 | MOTOR_I_B_SCALED: Phase B (L2) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 6 | 2 | Current L3 | MOTOR_I_C_SCALED: Phase C (L3) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 10 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 12 | 20 | Analog Inputs | 10 Input words of data for analog inputs and status word(s) |

Appendix C—Optional Communication Cards

Input Instance 103 (0x67): Status Current Monitoring with Extended Analog and Digital Inputs

Length = 32 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|----------------|---|
| 0 | 2 | Device Status | C445_DEVICE_STATUS: Device Bit Array Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |
| 2 | 2 | Current L1 | MOTOR_I_A_SCALED: Phase A (L1) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 4 | 2 | Current L2 | MOTOR_I_B_SCALED: Phase B (L2) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 6 | 2 | Current L3 | MOTOR_I_C_SCALED: Phase C (L3) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 8 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 10 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 12 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 14 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 16 | 38 | Analog Inputs | 19 Input words of data for analog inputs and status word(s) |

Output Instance 104 (0x68): Basic Starter Relay

Length = 2 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|--------------------------|---|
| 0 | 2 | Extended Motor Starter 2 | Vendor specific Extended Motor starter Bit 0 = Run1 Bit 1 = Run2 Bit 2 = Reserved Bit 3 = Fault Reset Bit 4 to 15 = Reserved |

Output Instance 105 (0x69): Basic Output Control**Length = 2 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|------------------------|--|
| 0 | 2 | Basic Overload w/Relay | Basic Overload with Relays Bit 0 = Output #1 Bit 1 = Output #2 Bit 2 = Output #3 (set) Bit 3 = Fault Reset Bit 4 = Output #3 (reset) Bit 5 = Test Trip Bit 6 to 15 = reserved |

Output Instance 106 (0x6A): Extended Motor Control 2**Length = 2 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|---------------------|--|
| 0 | 2 | Basic Control Relay | Basic Control Bits: (Byte1: NETCTRL_CONTROL_WORD) (Byte2: BCM_FIELD_OUTPUTS) Bit 0: Run1 Bit 1: Run2 Bit 2: Reserved Bit 3: Fault Reset Bit 4: Control from network / Switch to remote (see note below) Bit 5: Test Trip Bit 6: Reserved Bit 7: Reserved Bit 8: Output #1 (Conditional. Depends on profile selected) Bit 9: Output #2 (Conditional. Depends on profile selected) Bit 10: Output #3 (set) (Conditional. Depends on profile selected) Bit 11: Output #3 (reset) (Conditional. Depends on profile selected) Bits 12–15: Reserved |

Note: To use Bit 4 in Output Instances 106, 127, 128 and 129 to switch the Active Control source between Local (0) and Remote (1), the parameter “Remote Switch from Fieldbus” (Power Xpert *inControl* software) or “Allow Remote Control Switch” (User Interface), must be enabled. This can be found in the Operation Mode category under Advanced Parameters.

Output Instance 123 (0x7B): Basic Starter Relay with Analog and Digital Outputs**Length = 8 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|---|---|
| 0 | 2 | Basic Starter with Analog and Digital Outputs | Vendor specific Basic starter Bit 0 = Run1 Bit 1 = Run2 Bit 2 = Reserved Bit 3 = Fault Reset Bits 4 to 15 = Reserved |
| 2 | 2 | Digital Outputs | Bits 0-7 = Outputs for first digital output card Bits 8-15 = Outputs for second digital output card |
| 4 | 4 | Analog Outputs | 2 Output words of data for 2 analog outputs |

Output Instance 124 (0x7C): Basic Starter Relay with Extended Analog and Digital Outputs

Length = 18 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|---|---|
| 0 | 2 | Basic Starter with Analog and Digital Outputs | Vendor specific Basic starter Bit 0 = Run1 Bit 1 = Run2 Bit 2 = Reserved Bit 3 = Fault Reset Bits 4 to 15 = Reserved |
| 2 | 2 | Digital Outputs | Bits 0-7 = Outputs for the first digital output card Bits 8-15 = Outputs for the second digital output card |
| 4 | 2 | Digital Outputs | Bits 0-7 = Outputs for the third digital output card Bits 8-15 = Outputs for the fourth digital output card |
| 6 | 12 | Analog Outputs | 6 Output words of data for 6 analog outputs |

Output Instance 125 (0x7D): Basic Output Control with Analog and Digital Outputs

Length = 14 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|--|---|
| 0 | 2 | Basic Output Control With Analog and Digital Outputs | Basic Output Control Bit 0 = Output#1 Bit 1 = Output #2 Bit 2 = Output #3 Bit 3 = Fault Reset Bit 4 = Reserved Bit 5 = Test Trip Bits 6 to 15 = Reserved |
| 2 | 2 | Digital Outputs | Bits 0-7 = Outputs for the first digital output card Bits 8-15 = Outputs for the second digital output card |
| 4 | 2 | Digital Outputs | Bits 0-7 = Outputs for the third digital output card Bits 8-15 = Outputs for the fourth digital output card |
| 6 | 8 | Analog Outputs | 4 Output words of data for 4 analog outputs |

Output Instance 126 (0x7E): Basic Output Control with Extended Analog and Digital Outputs

Length = 26 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|---|---|
| 0 | 2 | Basic Output Control With Extended Analog and Digital Outputs | Bit 0 = Output#1 Bit 1 = Output #2 Bit 2 = Output #3 Bit 3 = Fault Reset Bit 4 = Reserved Bit 5 = Test Trip Bits 6 to 15 = Reserved |
| 2 | 2 | Digital Outputs | Bits 0-7 = Outputs for the first digital output card Bits 8-15 = Outputs for the second digital output card |
| 4 | 2 | Digital Outputs | Bits 0-7 = Outputs for the third digital output card Bits 8-15 = Outputs for the fourth digital output card |

Output Instance 126 (0x7E): Basic Output Control with Extended Analog and Digital Outputs, continued**Length = 26 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|-----------------|--|
| 6 | 2 | Digital Outputs | Bits 0-7 = Outputs for the fifth digital output card Bits 8-15 = Outputs for the sixth digital output card |
| 8 | 2 | Digital Outputs | Bits 0-7 = Outputs for the seventh digital output card Bits 8-15 = Outputs for the eighth digital output card |
| 10 | 16 | Analog Outputs | 8 Output words of data for 8 analog outputs |

Output Instance 127 (0x7F): Extended Motor Starter 2 with Basic Analog and Digital Outputs**Length = 8 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|--|--|
| 0 | 2 | Extended Motor Starter 2 with Basic Analog and Digital Outputs | Extended Motor Starter 2 bits (Byte 1: NETCTRL_CONTROL) (Byte 2: BCM_Field_Outputs) Bit 0: Run1 Bit 1: Run2 Bit 2: Reserved Bit 3: Fault Reset Bit 4: Control From Network / Switch to Remote (see note below) Bit 5: Test Trip Bit 6: Reserved Bit 7: Reserved Bit 8: Output#1 (Conditional. Depends on Operation Mode) Bit 9: Output#2 (Conditional. Depends on Operation Mode) Bit 10: Output#3 (Conditional. Depends on Operation Mode) Bits 11-15: Reserved |
| 2 | 2 | Digital Outputs | Bits 0-7 = Outputs for the first digital output card Bits 8-15 = Outputs for the second digital output card |
| 4 | 4 | Analog Outputs | 2 Output words of data for 2 analog outputs |

Note: To use Bit 4 in Output Instances 106, 127, 128 and 129 to switch the Active Control source between Local (0) and Remote (1), the parameter “Remote Switch from Fieldbus” (Power Xpert *inControl* software) or “Allow Remote Control Switch” (User Interface), must be enabled. This can be found in the Operation Mode category under Advanced Parameters.

Output Instance 128 (0x80): Extended Motor Starter 2 with Analog and Digital Outputs

Length = 14 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|--|--|
| 0 | 2 | Extended Motor Starter 2 with Analog and Digital Outputs | Extended Motor Starter 2 bits (Byte 1: NETCTRL_CONTROL) (Byte 2: BCM_Field_Outputs) Bit 0: Run1 Bit 1: Run2 Bit 2: Reserved Bit 3: Fault Reset Bit 4: Control From Network / Switch to Remote (see note below) Bit 5: Test Trip Bit 6: Reserved Bit 7: Reserved Bit 8: Output#1 (Conditional. Depends on Operation Mode) Bit 9: Output#2 (Conditional. Depends on Operation Mode) Bit 10: Output#3 (Conditional. Depends on Operation Mode) |
| 2 | 2 | Digital Outputs | Bits 0-7 = Outputs for the first digital output card Bits 8-15 = Outputs for the second digital output card |
| 4 | 2 | Digital Outputs | Bits 0-7 = Outputs for the third digital output card Bits 8-15 = Outputs for the fourth digital output card |
| 6 | 8 | Analog Outputs | 4 Output words of data for 4 analog outputs |

Note: To use Bit 4 in Output Instances 106, 127, 128 and 129 to switch the Active Control source between Local (0) and Remote (1), the parameter “Remote Switch from Fieldbus” (Power Xpert *inControl* software) or “Allow Remote Control Switch” (User Interface), must be enabled. This can be found in the Operation Mode category under Advanced Parameters.

Output Instance 129 (0x81): Extended Motor Starter 2 with Extended Analog and Digital Outputs**Length = 26 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|--|--|
| 0 | 2 | Extended Motor Starter 2 with Analog and Digital Outputs | Extended Motor Starter 2 bits (Byte 1: NETCTRL_CONTROL) (Byte 2: BCM_Field_Outputs) Bit 0: Run1 Bit 1: Run2 Bit 2: Reserved Bit 3: Fault Reset Bit 4: Control From Network / Switch to Remote (see note below) Bit 5: Test Trip Bit 6: Reserved Bit 7: Reserved Bit 8: Output#1 (Conditional. Depends on Operation Mode) Bit 9: Output#2 (Conditional. Depends on Operation Mode) Bit 10: Output#3 (Conditional. Depends on Operation Mode) Bits 11-15: Reserved |
| 2 | 2 | Digital Outputs | Bits 0-7 = Outputs for the first digital output card Bits 8-15 = Outputs for the second digital output card |
| 4 | 2 | Digital Outputs | Bits 0-7 = Outputs for the third digital output card Bits 8-15 = Outputs for the fourth digital output card |
| 6 | 2 | Digital Outputs | Bits 0-7 = Outputs for the fifth digital output card Bits 8-15 = Outputs for the sixth digital output card |
| 8 | 2 | Digital Outputs | Bits 0-7 = Outputs for the seventh digital output card Bits 8-15 = Outputs for the eighth digital output card |
| 10 | 16 | Analog Outputs | 8 Output words of data for 8 analog outputs |

Note: To use Bit 4 in Output Instances 106, 127, 128 and 129 to switch the Active Control source between Local (0) and Remote (1), the parameter “Remote Switch from Fieldbus” (Power Xpert *inControl* software) or “Allow Remote Control Switch” (User Interface), must be enabled. This can be found in the Operation Mode category under Advanced Parameters.

Appendix C—Optional Communication Cards

Output Instance 130 (0x82): Basic Analog and Digital Outputs

Length = 36 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|-----------------|--|
| 0 | 2 | Digital Outputs | Bits 0-7 = Outputs for the first digital output card Bits 8-15 = Outputs for the second digital output card |
| 2 | 2 | Digital Outputs | Bits 0-7 = Outputs for the third digital output card Bits 8-15 = Outputs for the fourth digital output card |
| 4 | 32 | Analog Outputs | 16 Output words of data for 16 analog outputs |

Output Instance 131 (0x83): Extended Analog and Digital Outputs

Length = 72 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|-----------------|--|
| 0 | 2 | Digital Outputs | Bits 0-7 = Outputs for the first digital output card Bits 8-15 = Outputs for the second digital output card |
| 2 | 2 | Digital Outputs | Bits 0-7 = Outputs for the first digital output card Bits 8-15 = Outputs for the second digital output card |
| 4 | 2 | Digital Outputs | Bits 0-7 = Outputs for the first digital output card Bits 8-15 = Outputs for the second digital output card |
| 6 | 2 | Digital Outputs | Bits 0-7 = Outputs for the first digital output card Bits 8-15 = Outputs for the second digital output card |
| 8 | 64 | Analog Outputs | 32 Output words of data for 32 analog outputs |

Input Instance 107 (0x6B): Extended Overload Input w/IO

Length = 2 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|------------------------|--|
| 0 | 2 | Basic Overload w/Relay | Extended overload assembly with IO Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |

Input Instance 108 (0x6C): Extended Overload with Local IO and Expansion Analog and Digital Inputs**Length = 26 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|-------------------|---|
| 0 | 2 | Extended Overload | Extended Overload with Inputs Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |
| 2 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 4 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 6 | 20 | Analog Inputs | 10 Input words of data for analog inputs and status word(s) |

Input Instance 109 (0x6D): Extended Overload with Local IO and Extended Expansion Analog and Digital Inputs**Length = 90 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|-------------------|---|
| 0 | 2 | Extended Overload | Extended Overload with Inputs Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |
| 2 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 4 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 6 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |

Input Instance 109 (0x6D): Extended Overload with Local IO and Extended Expansion Analog and Digital Inputs, continued

Length = 90 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|----------------|--|
| 8 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 10 | 80 | Analog Inputs | 40 Input words of data for analog inputs and status word(s) |

Input Instance 110 (0x6E): Status, Current, Voltage, Trip

Length = 22 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|---------------|--|
| 0 | 2 | Device Status | PACKED_C445_DEVICE_STATUS: Device Bit Array Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |
| 2 | 2 | Current I1 | MOTOR_I_A_SCALED: Phase A (L1) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 4 | 2 | Current I2 | MOTOR_I_B_SCALED: Phase B (L2) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 6 | 2 | Current I3 | MOTOR_I_C_SCALED: Phase C (L3) Motor Current Scaled. Scaled by parameter "I Scale Factor." |

Input Instance 110 (0x6E): Status, Current, Voltage, Trip, continued**Length = 22 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|--------------------|---|
| 8 | 4 | Trip Reason | STATUS_TRIPPED_BITS 0x0000 0001 - under voltage 0x0000 0002 - over voltage 0x0000 0004 - Reserved 0x0000 0008 - ground current fault 0x0000 0010 - current phase loss 0x0000 0020 - current unbalance 0x0000 0040 - instantaneous over current 0x0000 0080 - jam 0x0000 0100 - PF deviation 0x0000 0200 - voltage phase loss 0x0000 0400 - voltage unbalance 0x0000 0800 - freq deviation fast 0x0000 1000 - freq deviation slow 0x0000 2000 - under current 0x0000 4000 - high power 0x0000 8000 - low power 0x0001 0000 - Reserved 0x0004 0000 - overload 0x0008 0000 - stall 0x0010 0000 - phase rotation mismatch 0x0020 0000 - PTC 0x0040 0000 - undervoltage restart 0x0080 0000 - peak demand 0x0100 0000 - HRGF pulse detection |
| 12 | 2 | Current Average | MOTOR_I_AVE_SCALED: Average Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 14 | 2 | Voltage L1-L2 | LINE_V_LL_AB_RMS: Phase A RMS Voltage L1-L2 (V) |
| 16 | 2 | Voltage L2-L3 | LINE_V_LL_BC_RMS: Phase B RMS Voltage L2-L3 (V) |
| 18 | 2 | Voltage L3-L1 | LINE_V_LL_CA_RMS: Phase C RMS Voltage L3-L1 (V) |
| 20 | 2 | Voltage Average | LINE_V_LN_AVE_RMS: Average RMS Voltage (V) |

Appendix C—Optional Communication Cards

Input Instance 111 (0x6F): Status, Current, Voltage, Trip with Basic Analog and Digital Inputs

Length = 26 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|---------------|--|
| 0 | 2 | Device Status | C445_DEVICE_STATUS Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |
| 2 | 2 | Current L1 | MOTOR_I_A_SCALED: Phase A (L1) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 4 | 2 | Current L2 | MOTOR_I_B_SCALED: Phase B (L2) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 6 | 2 | Current L3 | MOTOR_I_C_SCALED: Phase C (L3) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 8 | 4 | Trip Reason | STATUS_TRIPPED_BITS 0x0000 0001 - under voltage 0x0000 0002 - over voltage 0x0000 0004 - Reserved 0x0000 0008 - ground current fault 0x0000 0010 - current phase loss 0x0000 0020 - current unbalance 0x0000 0040 - instantaneous over current 0x0000 0080 - jam 0x0000 0100 - PF deviation 0x0000 0200 - voltage phase loss 0x0000 0400 - voltage unbalance 0x0000 0800 - freq deviation fast 0x0000 1000 - freq deviation slow 0x0000 2000 - under current 0x0000 4000 - high power 0x0000 8000 - low power 0x0001 0000 - Reserved 0x0004 0000 - overload 0x0008 0000 - stall 0x0010 0000 - phase rotation mismatch 0x0020 0000 - PTC 0x0040 0000 - under voltage restart 0x0080 0000 - peak demand 0x0100 0000 - HRGF pulse detection |

Input Instance 111 (0x6F): Status, Current, Voltage, Trip with Basic Analog and Digital Inputs, continued**Length = 26 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|-----------------|--|
| 12 | 2 | Current Average | MOTOR_I_AVE_SCALED: Average Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 14 | 2 | Voltage L1-L2 | LINE_V_LL_AB_RMS: Phase A RMS Voltage L1-L2 (V) |
| 16 | 2 | Voltage L2-L3 | LINE_V_LL_BC_RMS: Phase B RMS Voltage L2-L3 (V) |
| 18 | 2 | Voltage L3-L1 | LINE_V_LL_CA_RMS: Phase C RMS Voltage L3-L1 (V) |
| 20 | 2 | Voltage Average | LINE_V_LN_AVE_RMS: Average RMS Voltage (V) |
| 22 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 24 | 2 | Analog Inputs | 1 Input word of data for an analog output card status |

Input Instance 112 (0x70): Status, Current, Voltage, Trip with Analog and Digital Inputs**Length = 36 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|---------------|--|
| 0 | 2 | Device Status | C445_DEVICE_STATUS Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |
| 2 | 2 | Current L1 | MOTOR_I_A_SCALED: Phase A (L1) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 4 | 2 | Current L2 | MOTOR_I_B_SCALED: Phase B (L2) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 6 | 2 | Current L3 | MOTOR_I_C_SCALED: Phase C (L3) Motor Current Scaled. Scaled by parameter "I Scale Factor." |

Appendix C—Optional Communication Cards

Input Instance 112 (0x70): Status, Current, Voltage, Trip with Analog and Digital Inputs, continued

Length = 36 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|-----------------|--|
| 8 | 4 | Trip Reason | STATUS_TRIPPED_BITS 0x0000 0001 - under voltage 0x0000 0002 - over voltage 0x0000 0004 - Reserved 0x0000 0008 - ground current fault 0x0000 0010 - current phase loss 0x0000 0020 - current unbalance 0x0000 0040 - instantaneous over current 0x0000 0080 - jam 0x0000 0100 - PF deviation 0x0000 0200 - voltage phase loss 0x0000 0400 - voltage unbalance 0x0000 0800 - freq deviation fast 0x0000 1000 - freq deviation slow 0x0000 2000 - under current 0x0000 4000 - high power 0x0000 8000 - low power 0x0001 0000 - Reserved 0x0004 0000 - overload 0x0008 0000 - stall 0x0010 0000 - phase rotation mismatch 0x0020 0000 - PTC 0x0040 0000 - under voltage restart 0x0080 0000 - peak demand 0x0100 0000 - HRGF pulse detection |
| 12 | 2 | Current Average | MOTOR_I_AVE_SCALED: Average Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 14 | 2 | Voltage L1-L2 | LINE_V_LL_AB_RMS: Phase A RMS Voltage L1-L2 (V) |
| 16 | 2 | Voltage L2-L3 | LINE_V_LL_BC_RMS: Phase B RMS Voltage L2-L3 (V) |
| 18 | 2 | Voltage L3-L1 | LINE_V_LL_CA_RMS: Phase C RMS Voltage L3-L1 (V) |
| 20 | 2 | Voltage Average | LINE_V_LN_AVE_RMS: Average RMS Voltage (V) |
| 22 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 24 | 2 | Digital Inputs | Bits 0-7 = Inputs for the third digital input card Bits 8-15 = Inputs for the fourth digital input card |
| 26 | 10 | Analog Inputs | 5 Input words of data for analog inputs and status word(s) |

Input Instance 113 (0x71): Status, Current, Voltage, Trip with Extended Analog and Digital Inputs**Length = 48 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|---------------|--|
| 0 | 2 | Device Status | C445_DEVICE_STATUS Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |
| 2 | 2 | Current L1 | MOTOR_I_A_SCALED: Phase A (L1) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 4 | 2 | Current L2 | MOTOR_I_B_SCALED: Phase B (L2) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 6 | 2 | Current L3 | MOTOR_I_C_SCALED: Phase C (L3) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 8 | 4 | Trip Reason | STATUS_TRIPPED_BITS 0x0000 0001 - under voltage 0x0000 0002 - over voltage 0x0000 0004 - Reserved 0x0000 0008 - ground current fault 0x0000 0010 - current phase loss 0x0000 0020 - current unbalance 0x0000 0040 - instantaneous over current 0x0000 0080 - jam 0x0000 0100 - PF deviation 0x0000 0200 - voltage phase loss 0x0000 0400 - voltage unbalance 0x0000 0800 - freq deviation fast 0x0000 1000 - freq deviation slow 0x0000 2000 - under current 0x0000 4000 - high power 0x0000 8000 - low power 0x0001 0000 - Reserved 0x0004 0000 - overload 0x0008 0000 - stall 0x0010 0000 - phase rotation mismatch 0x0020 0000 - PTC 0x0040 0000 - under voltage restart 0x0080 0000 - peak demand 0x0100 0000 - HRGF pulse detection |

Appendix C—Optional Communication Cards

Input Instance 113 (0x71): Status, Current, Voltage, Trip with Extended Analog and Digital Inputs, continued

Length = 48 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|-----------------|--|
| 12 | 2 | Current Average | MOTOR_I_AVE_SCALED: Average Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 14 | 2 | Voltage L1-L2 | LINE_V_LL_AB_RMS: Phase A RMS Voltage L1-L2 (V) |
| 16 | 2 | Voltage L2-L3 | LINE_V_LL_BC_RMS: Phase B RMS Voltage L2-L3 (V) |
| 18 | 2 | Voltage L3-L1 | LINE_V_LL_CA_RMS: Phase C RMS Voltage L3-L1 (V) |
| 20 | 2 | Voltage Average | LINE_V_LN_AVE_RMS: Average RMS Voltage (V) |
| 22 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 24 | 2 | Digital Inputs | Bits 0-7 = Inputs for the third digital input card Bits 8-15 = Inputs for the fourth digital input card |
| 26 | 2 | Digital Inputs | Bits 0-7 = Inputs for the fifth digital input card Bits 8-15 = Inputs for the sixth digital input card |
| 28 | 20 | Analog Inputs | 10 Input words of data for analog inputs and status word(s) |

Input Instance 114 (0x72): Status, Current, Voltage, Trip with Extended Analog and Digital Inputs 2

Length = 68 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|---------------|--|
| 0 | 2 | Device Status | C445_DEVICE_STATUS Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |
| 2 | 2 | Current L1 | MOTOR_I_A_SCALED: Phase A (L1) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 4 | 2 | Current L2 | MOTOR_I_B_SCALED: Phase B (L2) Motor Current Scaled. Scaled by parameter "I Scale Factor." |

Input Instance 114 (0x72): Status, Current, Voltage, Trip with Extended Analog and Digital Inputs 2, continued**Length = 68 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|--------------------|---------------------|-----------------|--|
| 6 | 2 | Current L3 | MOTOR_I_C_SCALED: Phase C (L3) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 8 | 4 | Trip Reason | STATUS_TRIPPED_BITS 0x0000 0001 - under voltage 0x0000 0002 - over voltage 0x0000 0004 - Reserved 0x0000 0008 - ground current fault 0x0000 0010 - current phase loss 0x0000 0020 - current unbalance 0x0000 0040 - instantaneous over current 0x0000 0080 - jam 0x0000 0100 - PF deviation 0x0000 0200 - voltage phase loss 0x0000 0400 - voltage unbalance 0x0000 0800 - freq deviation fast 0x0000 1000 - freq deviation slow 0x0000 2000 - under current 0x0000 4000 - high power 0x0000 8000 - low power 0x0001 0000 - Reserved 0x0004 0000 - overload 0x0008 0000 - stall 0x0010 0000 - phase rotation mismatch 0x0020 0000 - PTC 0x0040 0000 - under voltage restart 0x0080 0000 - peak demand 0x0100 0000 - HRGF pulse detection |
| 12 | 2 | Current Average | MOTOR_I_AVE_SCALED: Average Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 14 | 2 | Voltage L1-L2 | LINE_V_LL_AB_RMS: Phase A RMS Voltage L1-L2 (V) |
| 16 | 2 | Voltage L2-L3 | LINE_V_LL_BC_RMS: Phase B RMS Voltage L2-L3 (V) |
| 18 | 2 | Voltage L3-L1 | LINE_V_LL_CA_RMS: Phase C RMS Voltage L3-L1 (V) |
| 20 | 2 | Voltage Average | LINE_V_LN_AVE_RMS: Average RMS Voltage (V) |
| 22 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 24 | 2 | Digital Inputs | Bits 0-7 = Inputs for the third digital input card Bits 8-15 = Inputs for the fourth digital input card |
| 26 | 2 | Digital Inputs | Bits 0-7 = Inputs for the fifth digital input card Bits 8-15 = Inputs for the sixth digital input card |
| 28 | 2 | Digital Inputs | Bits 0-7 = Inputs for the seventh digital input card Bits 8-15 = Inputs for the eighth digital input card |
| 30 | 38 | Analog Inputs | 19 Input words of data for analog inputs and status word(s) |

Appendix C—Optional Communication Cards

Input Instance 116 (0x74): Full Monitoring

Length = 41 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|---------------------------------|--|
| 0 | 2 | Device Status | PACKED_C445_DEVICE_STATUS: Device Bit Array Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |
| 2 | 2 | Current I1 | MOTOR_I_A_SCALED: Phase A (L1) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 4 | 2 | Current I2 | MOTOR_I_B_SCALED: Phase B (L2) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 6 | 2 | Current I3 | MOTOR_I_C_SCALED: Phase C (L3) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 8 | 2 | Field inputs | LOGIC_INPUT_STATE_BITFIELD: Digital Input Status. |
| 10 | 2 | Current Average | MOTOR_I_AVE_SCALED: Average Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 12 | 2 | Voltage L1-L2 | LINE_V_LL_AB_RMS: Phase A RMS Voltage L1-L2 (V) |
| 14 | 2 | Voltage L2-L3 | LINE_V_LL_BC_RMS: Phase B RMS Voltage L2-L3 (V) |
| 16 | 2 | Voltage L3-L1 | LINE_V_LL_CA_RMS: Phase C RMS Voltage L3-L1 (V) |
| 18 | 2 | Voltage Average | LINE_V_LN_AVE_RMS: Average RMS Voltage (V) |
| 20 | 4 | Motor Power | POWER_WATTS: Motor Power Watts |
| 24 | 1 | Voltage Unbalance Percentage | LINE_V_UNBALANCE_PERC: Max Deviation from Average Voltage Divided by Average Voltage (%). |
| 25 | 1 | Current Unbalance Percentage | MOTOR_I_UNBALANCE_PERC: Max Deviation from Average Current Divided by Average Current (%) |

Input Instance 116 (0x74): Full Monitoring, continued**Length = 41 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|--------------------|---------------------|-----------------------|--|
| 26 | 2 | Apparent Power Factor | POWER_PF_APPARENT: (%) (x0.01) |
| 28 | 2 | Ground Current | MOTOR_GF_I_RES_RMS: Ground Current in Amps x current scale factor |
| 30 | 2 | Line frequency | LINE_FREQ Line Frequency (x0.01Hz) |
| 32 | 4 | Trip Reason | STATUS_TRIPPED_BITS 0x0000 0001 - under voltage 0x0000 0002 - over voltage 0x0000 0004 - Reserved 0x0000 0008 - ground fault current 0x0000 0010 - current phase loss 0x0000 0020 - current unbalance 0x0000 0040 - instantaneous over current 0x0000 0080 - jam 0x0000 0100 - PF deviation 0x0000 0200 - voltage phase loss 0x0000 0400 - voltage unbalance 0x0000 0800 - freq deviation fast 0x0000 1000 - freq deviation slow 0x0000 2000 - under current 0x0000 4000 - high power 0x0000 8000 - low power 0x0001 0000 - Reserved 0x0004 0000 - overload 0x0008 0000 - stall 0x0010 0000 - phase rotation mismatch 0x0020 0000 - PTC 0x0040 0000 - under voltage restart 0x0080 0000 - peak demand 0x0100 0000 - HRGF pulse detection |
| 36 | 4 | Warning Reason | STATUS_WARNING_BITS Warning/Alarm Indications 0x0000 0001 - under voltage 0x0000 0002 - over voltage 0x0000 0004 - Reserved 0x0000 0008 - ground current warning 0x0000 0010 - current phase loss 0x0000 0020 - current unbalance 0x0000 0040 - instantaneous over current 0x0000 0080 - jam 0x0000 0100 - PF deviation 0x0000 0200 - voltage phase loss 0x0000 0400 - voltage unbalance 0x0000 0800 - freq deviation fast 0x0000 1000 - freq deviation slow 0x0000 2000 - under current |

Appendix C—Optional Communication Cards

Input Instance 116 (0x74): Full Monitoring, continued

Length = 41 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|-------------------------|--|
| 36 | 4 | Warning Reason | STATUS_WARNING_BITS, continued 0x0000 4000 - high power 0x0000 8000 - low power 0x0001 0000 - Reserved 0x0002 0000 - exceeds starts limit 0x0004 0000 - overload 0x0008 0000 - stall 0x0010 0000 - phase rotation mismatch 0x0020 0000 - PTC 0x0040 0000 - under voltage restart 0x0080 0000 - peak demand 0x0100 0000 - HRGF pulse detection |
| 40 | 1 | Thermal Pile Percentage | OVLD_THERMAL_MEM_PERCENT: Thermal Capacity 0% Cold Motor 100% Will Cause an Overload Trip (%) |

Input Instance 117 (0x75): Full Monitoring with Basic Analog and Digital Inputs

Length = 46 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|---------------|---|
| 0 | 2 | Device Status | C445_DEVICE_STATUS: Device Bit Array Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |
| 2 | 2 | Current L1 | MOTOR_I_A_SCALED: Phase A (L1) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 4 | 2 | Current L2 | MOTOR_I_B_SCALED: Phase B (L2) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 6 | 2 | Current L3 | MOTOR_I_C_SCALED: Phase C (L3) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 8 | 2 | Field Inputs | LOGIC_INPUT_STATE_BITFIELD: Digital Input Status. |

Input Instance 117 (0x75): Full Monitoring with Basic Analog and Digital Inputs, continued**Length = 46 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|--------------------|---------------------|------------------------------|---|
| 10 | 2 | Current Average | MOTOR_I_AVE_SCALED: Average Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 12 | 2 | Voltage L1-L2 | LINE_V_LL_AB_RMS: Phase A RMS Voltage L1-L2 (V) |
| 14 | 2 | Voltage L2-L3 | LINE_V_LL_BC_RMS: Phase B RMS Voltage L2-L3 (V) |
| 16 | 2 | Voltage L3-L1 | LINE_V_LL_CA_RMS: Phase C RMS Voltage L3-L1 (V) |
| 18 | 2 | Voltage Average | LINE_V_LN_AVE_RMS: Average RMS Voltage (V) |
| 20 | 4 | Motor Power | POWER_WATTS: Motor Power Watts |
| 24 | 1 | Voltage Unbalance Percentage | LINE_V_UNBALANCE_PERC: Max Deviation from Average Voltage Divided by Average Voltage (%) |
| 25 | 1 | Current Unbalance Percentage | MOTOR_I_UNBALANCE_PERC: Max Deviation from Average Current Divided by Average Current (%) |
| 26 | 2 | Apparent Power Factor | POWER_PF_APPARENT: (%) (x0.01) |
| 28 | 2 | Ground Current | MOTOR_GF_I_RES_RMS: Ground Current in Amps x current scale factor |
| 30 | 2 | Line Frequency | LINE_FREQ Line Frequency (x0.01Hz) |
| 32 | 4 | Trip Reason | STATUS_TRIPPED_BITS 0x0000 0001 - under voltage 0x0000 0002 - over voltage 0x0000 0004 - Reserved 0x0000 0008 - ground current fault 0x0000 0010 - current phase loss 0x0000 0020 - current unbalance 0x0000 0040 - instantaneous over current 0x0000 0080 - jam 0x0000 0100 - PF deviation 0x0000 0200 - voltage phase loss 0x0000 0400 - voltage unbalance 0x0000 0800 - freq deviation fast 0x0000 1000 - freq deviation slow 0x0000 2000 - under current 0x0000 4000 - high power 0x0000 8000 - low power 0x0001 0000 - Reserved |

Appendix C—Optional Communication Cards

Input Instance 117 (0x75): Full Monitoring with Basic Analog and Digital Inputs, continued

Length = 46 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|-------------------------|---|
| 32 | 4 | Trip Reason | STATUS_TRIPPED_BITS, continued 0x0004 0000 - overload 0x0008 0000 - stall 0x0010 0000 - phase rotation mismatch 0x0020 0000 - PTC 0x0040 0000 - under voltage restart 0x0080 0000 - peak demand 0x0100 0000 - HRGF pulse detection |
| 36 | 4 | Warning Reason | STATUS_WARNING_BITS Warning/Alarm Indications 0x0000 0001 - under voltage 0x0000 0002 - over voltage 0x0000 0004 - Reserved 0x0000 0008 - ground current warning 0x0000 0010 - current phase loss 0x0000 0020 - current unbalance 0x0000 0040 - instantaneous over current 0x0000 0080 - jam 0x0000 0100 - PF deviation 0x0000 0200 - voltage phase loss 0x0000 0400 - voltage unbalance 0x0000 0800 - freq deviation fast 0x0000 1000 - freq deviation slow 0x0000 2000 - under current 0x0000 4000 - high power 0x0000 8000 - low power 0x0001 0000 - Reserved 0x0002 0000 - exceeds starts limit 0x0004 0000 - overload 0x0008 0000 - stall 0x0010 0000 - phase rotation mismatch 0x0020 0000 - PTC 0x0040 0000 - under voltage restart 0x0080 0000 - peak demand 0x0100 0000 - HRGF pulse detection |
| 40 | 2 | Thermal Pile Percentage | OVLDTHERMALMEMPERCENT: Thermal Capacity 0% Cold Motor 100% Will Cause an Overload Trip (%) |
| 42 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 44 | 2 | Analog Inputs | 1 Input word of data for an analog output card status |

Input Instance 118 (0x76): Full Monitoring with Analog and Digital Inputs**Length = 58 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|------------------------------|---|
| 0 | 2 | Device Status | C445_DEVICE_STATUS: Device Bit Array Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |
| 2 | 2 | Current L1 | MOTOR_I_A_SCALED: Phase A (L1) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 4 | 2 | Current L2 | MOTOR_I_B_SCALED: Phase B (L2) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 6 | 2 | Current L3 | MOTOR_I_C_SCALED: Phase C (L3) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 8 | 2 | Field Inputs | LOGIC_INPUT_STATE_BITFIELD: Digital Input Status. |
| 10 | 2 | Current Average | MOTOR_I_AVE_SCALED: Average Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 12 | 2 | Voltage L1-L2 | LINE_V_LL_AB_RMS: Phase A RMS Voltage L1-L2 (V) |
| 14 | 2 | Voltage L2-L3 | LINE_V_LL_BC_RMS: Phase B RMS Voltage L2-L3 (V) |
| 16 | 2 | Voltage L3-L1 | LINE_V_LL_CA_RMS: Phase C RMS Voltage L3-L1 (V) |
| 18 | 2 | Voltage Average | LINE_V_LN_AVE_RMS: Average RMS Voltage (V) |
| 20 | 4 | Motor Power | POWER_WATTS: Motor Power Watts |
| 24 | 1 | Voltage Unbalance Percentage | LINE_V_UNBALANCE_PERC: Max Deviation from Average Voltage Divided by Average Voltage (%) |
| 25 | 1 | Current Unbalance Percentage | MOTOR_I_UNBALANCE_PERC: Max Deviation from Average Current Divided by Average Current (%) |

Appendix C—Optional Communication Cards

Input Instance 118 (0x76): Full Monitoring with Analog and Digital Inputs, continued

Length = 58 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|-----------------------|--|
| 26 | 2 | Apparent Power Factor | POWER_PF_APPARENT: (%) (x0.01) |
| 28 | 2 | Ground Current | MOTOR_GF_I_RES_RMS: Ground Current in Amps x current scale factor |
| 30 | 2 | Line Frequency | LINE_FREQ Line Frequency (x0.01Hz) |
| 32 | 4 | Trip Reason | STATUS_TRIPPED_BITS 0x0000 0001 - under voltage 0x0000 0002 - over voltage 0x0000 0004 - Reserved 0x0000 0008 - ground current fault 0x0000 0010 - current phase loss 0x0000 0020 - current unbalance 0x0000 0040 - instantaneous over current 0x0000 0080 - jam 0x0000 0100 - PF deviation 0x0000 0200 - voltage phase loss 0x0000 0400 - voltage unbalance 0x0000 0800 - freq deviation fast 0x0000 1000 - freq deviation slow 0x0000 2000 - under current 0x0000 4000 - high power 0x0000 8000 - low power 0x0001 0000 - Reserved 0x0004 0000 - overload 0x0008 0000 - stall 0x0010 0000 - phase rotation mismatch 0x0020 0000 - PTC 0x0040 0000 - under voltage restart 0x0080 0000 - peak demand 0x0100 0000 - HRGF pulse detection |
| 36 | 4 | Warning Reason | STATUS_WARNING_BITS Warning/Alarm Indications 0x0000 0001 - under voltage 0x0000 0002 - over voltage 0x0000 0004 - Reserved 0x0000 0008 - ground current warning 0x0000 0010 - current phase loss 0x0000 0020 - current unbalance 0x0000 0040 - instantaneous over current 0x0000 0080 - jam 0x0000 0100 - PF deviation 0x0000 0200 - voltage phase loss 0x0000 0400 - voltage unbalance 0x0000 0800 - freq deviation fast 0x0000 1000 - freq deviation slow 0x0000 2000 - under current 0x0000 4000 - high power 0x0000 8000 - low power |

Input Instance 118 (0x76): Full Monitoring with Analog and Digital Inputs, continued**Length = 58 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|-------------------------|---|
| 36 | 4 | Warning Reason | STATUS_WARNING_BITS, continued 0x0001 0000 - Reserved 0x0002 0000 - exceeds starts limit 0x0004 0000 - overload 0x0008 0000 - stall 0x0010 0000 - phase rotation mismatch 0x0020 0000 - PTC 0x0040 0000 - under voltage restart 0x0080 0000 - peak demand 0x0100 0000 - HRGF pulse detection |
| 40 | 2 | Thermal Pile Percentage | OVLD_THERMAL_MEM_PERCENT: Thermal Capacity 0% Cold Motor 100% Will Cause an Overload Trip (%) |
| 42 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 44 | 2 | Digital Inputs | Bits 0-7 = Inputs for the third digital input card Bits 8-15 = Inputs for the fourth digital input card |
| 46 | 12 | Analog Inputs | 6 Input words of data for analog inputs and status word(s) |

Input Instance 119 (0x77): Full Monitoring with Extended Analog and Digital Inputs**Length = 70 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|---------------|---|
| 0 | 2 | Device Status | C445_DEVICE_STATUS: Device Bit Array Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |
| 2 | 2 | Current L1 | MOTOR_I_A_SCALED: Phase A (L1) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 4 | 2 | Current L2 | MOTOR_I_B_SCALED: Phase B (L2) Motor Current Scaled. Scaled by parameter "I Scale Factor." |

Appendix C—Optional Communication Cards

Input Instance 119 (0x77): Full Monitoring with Extended Analog and Digital Inputs, continued

Length = 70 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|------------------------------|---|
| 6 | 2 | Current L3 | MOTOR_I_C_SCALED: Phase C (L3) Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 8 | 2 | Field Inputs | LOGIC_INPUT_STATE_BITFIELD: Digital Input Status. |
| 10 | 2 | Current Average | MOTOR_I_AVE_SCALED: Average Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 12 | 2 | Voltage L1-L2 | LINE_V_LL_AB_RMS: Phase A RMS Voltage L1-L2 (V) |
| 14 | 2 | Voltage L2-L3 | LINE_V_LL_BC_RMS: Phase B RMS Voltage L2-L3 (V) |
| 16 | 2 | Voltage L3-L1 | LINE_V_LL_CA_RMS: Phase C RMS Voltage L3-L1 (V) |
| 18 | 2 | Voltage Average | LINE_V_LN_AVE_RMS: Average RMS Voltage (V) |
| 20 | 4 | Motor Power | POWER_WATTS: Motor Power Watts |
| 24 | 1 | Voltage Unbalance Percentage | LINE_V_UNBALANCE_PERC: Max Deviation from Average Voltage Divided by Average Voltage (%) |
| 25 | 1 | Current Unbalance Percentage | MOTOR_I_UNBALANCE_PERC: Max Deviation from Average Current Divided by Average Current (%) |
| 26 | 2 | Apparent Power Factor | POWER_PF_APPARENT: (%) (x0.01) |
| 28 | 2 | Ground Current | MOTOR_GF_I_RES_RMS: Ground Current in Amps x current scale factor |
| 30 | 2 | Line Frequency | LINE_FREQ Line Frequency (x0.01Hz) |
| 32 | 4 | Trip Reason | STATUS_TRIPPED_BITS 0x0000 0001 - under voltage 0x0000 0002 - over voltage 0x0000 0004 - Reserved 0x0000 0008 - ground current fault 0x0000 0010 - current phase loss 0x0000 0020 - current unbalance 0x0000 0040 - instantaneous over current 0x0000 0080 - jam 0x0000 0100 - PF deviation 0x0000 0200 - voltage phase loss 0x0000 0400 - voltage unbalance 0x0000 0800 - freq deviation fast 0x0000 1000 - freq deviation slow 0x0000 2000 - under current 0x0000 4000 - high power 0x0000 8000 - low power |

Input Instance 119 (0x77): Full Monitoring with Extended Analog and Digital Inputs, continued**Length = 70 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|--------------------|---------------------|-------------------------|---|
| 32 | 4 | Trip Reason | STATUS_TRIPPED_BITS, continued 0x0001 0000 - Reserved 0x0004 0000 - overload 0x0008 0000 - stall 0x0010 0000 - phase rotation mismatch 0x0020 0000 - PTC 0x0040 0000 - under voltage restart 0x0080 0000 - peak demand 0x0100 0000 - HRGF pulse detection |
| 36 | 4 | Warning Reason | STATUS_WARNING_BITS Warning/Alarm Indications 0x0000 0001 - under voltage 0x0000 0002 - over voltage 0x0000 0004 - Reserved 0x0000 0008 - ground current warning 0x0000 0010 - current phase loss 0x0000 0020 - current unbalance 0x0000 0040 - instantaneous over current 0x0000 0080 - jam 0x0000 0100 - PF deviation 0x0000 0200 - voltage phase loss 0x0000 0400 - voltage unbalance 0x0000 0800 - freq deviation fast 0x0000 1000 - freq deviation slow 0x0000 2000 - under current 0x0000 4000 - high power 0x0000 8000 - low power 0x0001 0000 - Reserved 0x0002 0000 - exceeds starts limit 0x0004 0000 - overload 0x0008 0000 - stall 0x0010 0000 - phase rotation mismatch 0x0020 0000 - PTC 0x0040 0000 - under voltage restart 0x0080 0000 - peak demand 0x0100 0000 - HRGF pulse detection |
| 40 | 2 | Thermal Pile Percentage | OVLD_THERMAL_MEM_PERCENT: Thermal Capacity 0% Cold Motor 100% Will Cause an Overload Trip (%) |
| 42 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 44 | 2 | Digital Inputs | Bits 0-7 = Inputs for the third digital input card Bits 8-15 = Inputs for the fourth digital input card |
| 46 | 2 | Digital Inputs | Bits 0-7 = Inputs for the fifth digital input card Bits 8-15 = Inputs for the sixth digital input card |
| 48 | 2 | Digital Inputs | Bits 0-7 = Inputs for the seventh digital input card Bits 8-15 = Inputs for the eighth digital input card |
| 50 | 20 | Analog Inputs | 10 Input words of data for analog inputs and status word(s) |

Input Instance 120 (0x78): Basic Analog and Digital Inputs

Length = 42 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|----------------|--|
| 0 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 2 | 2 | Digital Inputs | Bits 0-7 = Inputs for the third digital input card Bits 8-15 = Inputs for the fourth digital input card |
| 4 | 38 | Analog Inputs | 19 Input words of data for analog inputs and status word(s) |

Input Instance 121 (0x79): Status And Short Measurements

Length = 10 Bytes

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|---------------|---|
| 0 | 2 | Device Status | C445_DEVICE_STATUS: Device Bit Array Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |
| 0 | 2 | Device Status | C445_DEVICE_STATUS: Device Bit Array Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |

Input Instance 121 (0x79): Status And Short Measurements, continued**Length = 10 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|-----------------|--|
| 2 | 2 | Current Average | MOTOR_I_AVE_SCALED: Average Motor Current Scaled. Scaled by parameter "I Scale Factor." |
| 4 | 2 | Voltage Average | LINE_V_LN_AVE_RMS: Average RMS Voltage (V) |
| 6 | 4 | Trip Reason | STATUS_TRIPPED_BITS 0x0000 0001 - under voltage 0x0000 0002 - over voltage 0x0000 0004 - Reserved 0x0000 0008 - ground current fault 0x0000 0010 - current phase loss 0x0000 0020 - current unbalance 0x0000 0040 - instantaneous over current 0x0000 0080 - jam 0x0000 0100 - PF deviation 0x0000 0200 - voltage phase loss 0x0000 0400 - voltage unbalance 0x0000 0800 - freq deviation fast 0x0000 1000 - freq deviation slow 0x0000 2000 - under current 0x0000 4000 - high power 0x0000 8000 - low power 0x0001 0000 - Reserved 0x0004 0000 - overload 0x0008 0000 - stall 0x0010 0000 - phase rotation mismatch 0x0020 0000 - PTC 0x0040 0000 - under voltage restart 0x0080 0000 - peak demand 0x0100 0000 - HRGF pulse detection |

Input Instance 122 (0x7A): Extended Analog and Digital Inputs**Length = 42 Bytes**

| Byte Offset | Size (bytes) | Name | Description |
|-------------|--------------|----------------|--|
| 0 | 2 | Digital Inputs | Bits 0-7 = Inputs for the first digital input card Bits 8-15 = Inputs for the second digital input card |
| 2 | 2 | Digital Inputs | Bits 0-7 = Inputs for the third digital input card Bits 8-15 = Inputs for the fourth digital input card |
| 4 | 2 | Digital Inputs | Bits 0-7 = Inputs for the fifth digital input card Bits 8-15 = Inputs for the sixth digital input card |
| 6 | 2 | Digital Inputs | Bits 0-7 = Inputs for the seventh digital input card Bits 8-15 = Inputs for the eighth digital input card |
| 8 | 80 | Analog Inputs | 40 Input words of data for analog inputs and status word(s) |

Table 97. Connection Manager Object—Class 0x6 (6)

Class Services

| Service Code | Service Name |
|---------------------|----------------------|
| 0x0E | Get Attribute Single |
| 0x01 | Get Attributes All |

Instance Services

| Service Code | Service Name |
|---------------------|----------------------|
| 0x0E | Get Attribute Single |
| 0x01 | Get Attributes All |
| 0x10 | Set Attribute Single |
| 0x02 | Set Attributes All |
| 0x4E | Forward Close |
| 0x52 | Unconnected Send |
| 0x54 | Forward Open |
| 0x5A | Get Connection Owner |
| 0x5B | Large Forward Open |

Class Attributes

| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
|----------------|---------------------|--------------------|------------------|---------------------------------------|---|
| 1 | 1 (0x1) | Get | UINT | Revision | Revision of this object |
| 2 | 2 (0x2) | Get | UINT | Max. Instance | Maximum instance number of an object currently created in this class level of the device. |
| 3 | 3 (0x3) | Get | UINT | Number of Instances | Number of object instances currently created at this class level of the device. |
| 4 | 4 (0x4) | Get | STRUCT | Optional Attribute List | List of optional instance attributes utilized in an object class implementation. |
| 5 | 6 (0x6) | Get | UINT | Maximum ID Number Class Attributes | The attribute ID number of the last class attribute of the class definition implemented in the device. |
| 6 | 7 (0x7) | Get | UINT | Maximum ID Number Instance Attributes | The attribute ID number of the last instance attribute of the class definition implemented in the device. |

Instance Attributes

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|----------------|---------------------|---------------|------------------|-----------------------|---|
| 1 | 1 (0x1) | Set | UINT | Open Requests | Number of Forward Open service requests received. |
| 2 | 2 (0x2) | Set | UINT | Open Format Rejects | Number of Forward Open service requests which were rejected due to bad format. |
| 3 | 3 (0x3) | Set | UINT | Open Resource Rejects | Number of Forward Open service requests which were rejected due to lack of resources. |
| 4 | 4 (0x4) | Set | UINT | Open Other Rejects | Number of Forward Open service requests which were rejected for reasons other than bad format or lack of resources. |
| 5 | 5 (0x5) | Set | UINT | Close Requests | Number of Forward Close service requests received. |
| 6 | 6 (0x6) | Set | UINT | Close Format Requests | Number of Forward Close service requests which were rejected due to bad format. |
| 7 | 7 (0x7) | Set | UINT | Close Other Requests | Number of Forward Close service requests which were rejected for reasons other than bad format. |
| 8 | 8 (0x8) | Set | UINT | Connection Timeouts | Total number of connection timeouts that have occurred in connections controlled by this Connection Manager. |

Table 98. Discrete Input Object—Class 0x8 (8)**Class Services**

| Service code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |

Instance Services

| Service code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |
| 0x10 | Set Attribute Single |

Class Attributes

| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
|---------|--------------|-------------|-----------|---------------------|---|
| 1 | 1 (0x1) | Get | UINT | Revision | Revision of this object |
| 2 | 2 (0x2) | Get | UINT | Max. Instance | Maximum instance number of an object currently created in this class level of the device. |
| 3 | 3 (0x3) | Get | UINT | Number of Instances | Number of object instances currently created at this class level of the device. |

Instance Attributes

| Sr. No. | Instance | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|----------|--------------|---------|-----------|----------------|--|
| 1 | 1 (0x1), | 3 (0x3) | Get | BOOL | value | ON/OFF Status of BCM Digital Inputs: 0: OFF, 1: ON Instance 1- BCM Digital i/p-1 |
| 2 | 2 (0x2) | 3 (0x3) | Get | BOOL | value | ON/OFF Status of BCM Digital Inputs: 0: OFF, 1: ON Instance 2-BCM Digital i/p-2 |
| 3 | 3 (0x3) | 3 (0x3) | Get | BOOL | value | ON/OFF Status of BCM Digital Inputs: 0: OFF, 1: ON Instance 3-Digital i/p-3 |
| 4 | 4 (0x4) | 3 (0x3) | Get | BOOL | value | ON/OFF Status of BCM Digital Inputs: 0: OFF, 1: ON Instance 4-BCM Digital i/p-4 |
| 9 | 1 (0x1) | 101 (0x65) | Get/Set | UINT | Debounce | BCM Digital i/p-1 debounce time. Applies to both raising & Falling edge. (mSec) |
| 10 | 2 (0x2) | 101 (0x65) | Get/Set | UINT | Debounce | BCM Digital i/p-2 debounce time. Applies to both raising & Falling edge. (mSec) |
| 11 | 3 (0x3) | 101 (0x65) | Get/Set | UINT | Debounce | BCM Digital i/p-3 debounce time. Applies to both raising & Falling edge. (mSec) |
| 12 | 4 (0x4) | 101 (0x65) | Get/Set | UINT | Debounce | BCM Digital i/p-4 debounce time. Applies to both raising & Falling edge. (mSec) |

Table 99. Discrete Output Object—Class 0x9 (9)**Class Services**

| Service code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |

Instance Services

| Service code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |
| 0x10 | Set Attribute Single |

Class Attributes

| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
|---------|--------------|-------------|-----------|---------------------|---|
| 1 | 1 (0x1) | Get | UINT | Revision | Revision of this object |
| 2 | 2 (0x2) | Get | UINT | Max. Instance | Maximum instance number of an object currently created in this class level of the device. |
| 3 | 3 (0x3) | Get | UINT | Number of Instances | Number of object instances currently created at this class level of the device. |

Instance Attributes

| Sr. No. | Instance | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|---|--------------|--------|-----------|------------------------------|--|
| 1 | 1 (0x1), 2 (0x2), 3 (0x3), 4 (0x4) | 3 (0x3) | Set | BOOL | Logic output state bit field | ON/OFF Status of Digital Outputs. (BCM Field Output control) |
| 2 | 1 (0x1), 2 (0x2), 3 (0x3) | 5 (0x5) | Set | BOOL | Fault Action | Action taken on output's value in Communication Fault state |
| 3 | 1 (0x1), 2 (0x2), 3 (0x3) | 6 (0x6) | Set | BOOL | Fault Value | User-defined value for use with Fault Action attribute |
| 4 | 1 (0x1), 2 (0x2), 3 (0x3) | 7 (0x7) | Set | BOOL | Idle Action | Action taken on output's value in Communication Idle state |
| 5 | 1 (0x1), 2 (0x2), 3 (0x3) | 8 (0x8) | Set | BOOL | Idle Value | User-defined value for use with Idle Action attribute |

Table 100. Control Supervisor Object—Class 0x29 (41)**Class Services**

| ID | Service | Requirements |
|------|----------------------|--------------|
| 0x0E | Get Attribute Single | |

Instance Services

| ID | Service | Requirements |
|------|----------------------|--------------|
| 0x0E | Get_Attribute_Single | |
| 0x10 | Set_Attribute_Single | |
| 0x05 | Reset Service | Type 0 |

Class Attributes

| Sr. No. | ID | Access Rule | Data Type | Name | Description | Default | Range |
|---------|---------|-------------|-----------|---------------------|-------------|---------|-------|
| 1 | 1 (0x1) | Get | UINT | Revision | | 1 | — |
| 2 | 2 (0x2) | Get | UINT | Max Instance | | 1 | — |
| 3 | 3 (0x3) | Get | UINT | Number of Instances | | 1 | — |

Instance Attributes

| Sr. No. | ID | Access Rule | Data Type | Description | Description | Default | Range |
|---------|-----------|-------------|-----------|--|--|---------|-------|
| 1 | 3 (0x3) | Set | BOOL | Run1 | Run/Stop Event Matrix | 0 | 0–1 |
| 2 | 4 (0x4) | Set | BOOL | Run2 | Run/Stop Event Matrix | 0 | 0–1 |
| 3 | 5 (0x5) | Set | BOOL | NetCtrl | Requests Run/Stop control to be local or from network. 0 = Local Control 1 = Network Control Note that the actual status of Run/Stop control is reflected in attribute 15, CtrlFromNet. | 0 | 0–1 |
| 4 | 7 (0x7) | Get | BOOL | Running1 | 1 = (Enabled and Run1) or (Stopping and Running1) or (Fault_Stop and Running1) 0 = Other state | 0 | 0–1 |
| 5 | 8 (0x8) | Get | BOOL | Running2 | 1 = (Enabled and Run1) or (Stopping and Running1) or (Fault_Stop and Running1) 0 = Other state | 0 | 0–1 |
| 6 | 9 (0x9) | Get | BOOL | Ready | 1 = Ready or Enabled or Stopping 0 = Other state | 0 | 0–1 |
| 7 | 11 (0xB) | Get | BOOL | Warning | 1 = Warning (not latched) 0 = No Warnings present | 0 | 0-1 |
| 8 | 12 (0xC) | Set | BOOL | FaultRst | 0→1 = Fault Reset 0 = No action | 0 | 0–1 |
| 9 | 13 (0xD) | Get | UINT | Fault Queue-1 | A list of faults based on most recent. Duplicates are not allowed. They are sorted by event with the newest at the top of the queue. | | |
| 10 | 15 (0xF) | Get | BOOL | CtrlFromNet | Status of Run/Stop control source. 0=Control is local 1=Control is from network | 0 | 0–1 |
| 11 | 17 (0x11) | Set | BOOL | CIP Force Fault (Need Dependent DCID in BCM) | 0→1 = Force | | |

Table 100. Control Supervisor Object—Class 0x29 (41), continued**Instance Attributes**

| Sr. No. | ID | Access Rule | Data Type | Description |
|---------|------------|-------------|-----------|--|
| 12 | 101 (0x65) | Get/Set | BYTE | Fieldbus Motor Control Device Bit Array Bit 0: Run1 Bit 1: Run2 Bit 2: Reserved Bit 3: Fault Reset Bit 4: Reserved Bit 5: Test Trip Bit 6: Reserved Bit 7: Reserved |
| 13 | 102 (0x66) | Get/Set | BYTE | Network Control Word with NetCtrl bit Device Bit Array Bit 0: Run1 Bit 1: Run2 Bit 2: Reserved Bit 3: Fault Reset Bit 4: NetCtrl Bit 5: Test Trip Bit 6: Reserved Bit 7: Reserved |
| 14 | 103 (0x67) | Get/Set | BYTE | FieldBus Input Feedback Register Bit 0: Network feedback input0 Bit 1: Network feedback input1 Bit 2: Network feedback input2 Bit 3: Network feedback input3 Bit 4: Network feedback input4 Bit 5: Network feedback input5 Bit 6: Network feedback input6 Bit 7: Network feedback input7 |
| 15 | 104 (0x68) | Get | WORD | Packed Device Status Bit 0: Faulted/Tripped Bit 1: Warning Bit 2: Output #1 Bit 3: Output #2 Bit 4: Input #1 Bit 5: Input #2 Bit 6: Input #3 Bit 7: Input #4 Bit 8: Running1 Bit 9: Running2 Bit 10: Remote or CtrlFromNet Bit 11: Output #3 Bit 12: Reserved Bit 13: Inhibited Bit 14: Ready Bit 15: AtRef or Up-To-Speed |
| 16 | 105 (0x69) | Get | BYTE | Motor Control Status Bit 0: Running1 Bit 1: Running2 Bit 2: Remote or CtrlFromNet Bit 3: Faulted/Tripped Bit 4: Warning Bit 5: Inhibited Bit 6: Ready Bit 7: AtRef or Up-To-Speed |

Table 100. Control Supervisor Object—Class 0x29 (41), continued**Instance Attributes**

| Sr. No. | ID | Access Rule | Data Type | Description |
|---------|------------|-------------|------------------|--|
| 17 | 106 (0x6A) | Get | Array of 4 Bytes | Tripped Status Bits Bit 0: Undervoltage Bit 1: Overvoltage Bit 2: Reserved Bit 3: Ground current fault Bit 4: Current phase loss Bit 5: Current unbalance Bit 6: Instantaneous over current Bit 7: Jam Bit 8: PF deviation Bit 9: Voltage phase loss Bit 10: voltage unbalance Bit 11: Freq deviation fast Bit 12: Freq deviation slow Bit 13: Under current Bit 14: High power Bit 15: Low power Bit 16: Reserved Bit 18: Overload Bit 19: Stall Bit 20: Phase rotation mismatch Bit 21: PTC Bit 22: Under voltage restart Bit 23: Peak demand Bit 24: HRGF Pulse Detection |
| 18 | 107 (0x6B) | Get | Array of 4 Bytes | Warning Status Bits Bit 0: Undervoltage Bit 1: Overvoltage Bit 2: Reserved Bit 3: Ground current warning Bit 4: Current phase loss Bit 5: Current unbalance Bit 6: Instantaneous over current Bit 7: Jam Bit 8: PF deviation Bit 9: Voltage phase loss Bit 10: Voltage unbalance Bit 11: Freq deviation fast Bit 12: Freq deviation slow Bit 13: Under current Bit 14: High power Bit 15: Low power Bit 16: Reserved Bit 17: Exceeds starts limit Bit 18: Overload Bit 19: Stall Bit 20: Phase rotation mismatch Bit 21: PTC Bit 22: Under voltage restart Bit 23: Peak demand Bit 24: HRGF Pulse Detection |

Table 100. Control Supervisor Object—Class 0x29 (41), continued

Instance Attributes

| Sr. No. | ID | Access Rule | Data Type | Description |
|---------|------------|-------------|-----------|--|
| 19 | 108 (0x6C) | Get | UINT | Active Fault 0: No Faults 1: Undervoltage 2: Overvoltage 3: Reserved 4: Ground current 5: Current phase loss 6: Current unbalance 7: Instantaneous over current 8: Jam 9: PF deviation 10: Voltage phase loss 11: Voltage unbalance 12: Freq deviation fast 13: Freq deviation slow 14: Under current 15: High power 16: Low power 17: Contactor failure 19: Overload 20: Stall 21: Phase rotation 22: PTC - See PTC State for details 23: Under voltage restart 24: Measurement Module fault 25: Communication loss on active fieldbus 26: Measurement Module not available or comm loss with the module 27: User Interface not available or comm loss with the module 28: Test trip device fault 29: Option card not available or comm loss with the module 30: RTC Option board NV memory fail 31: Currently connected User Interface does not match with what was connected before. 32: Currently connected Measurement Module does not match with what was connected before. 33: Currently connected Comm Card does not match with what was connected before 38: Ground Fault Module firmware is incompatible 39: Ground Fault Module communication loss 40: Ground Fault Module mismatch 41: Ground Fault Module CT open 42: Ground Fault Module CT shorted 43: Ground Fault Module CT no cal 44: HRGF Pulse Detect 200–232: Logic engine faults 500: Internal - Communication loss with Power Supply Board 501: Internal - Power Supply Board is not responding to SPI 502: Internal - Checksums in NV Memory (F-RAM) didn't match during read (neither pair) 503: Internal - Checksums in NV Memory (F-RAM) didn't match during write (neither pair) 504: Internal - Expected backup memory RTC module is missing 505: Internal - Expected backup memory RTC module is mismatched with actual 506: Internal - Backup Memory RTC module has NV fault. 507: Internal - Serial flash memory fault in BCM 508: Internal - Mapping Error 511: Internal Ground Fault Module NV memory error 1000–1049: Logic User faults |

Table 100. Control Supervisor Object—Class 0x29 (41), continued**Instance Attributes**

| Sr. No. | ID | Access Rule | Data Type | Description |
|---------|------------|-------------|-----------|--|
| 20 | 109 (0x6D) | Get | UINT | Active Warning 0: No warnings 1: Undervoltage 2: Overvoltage 3: Reserved 4: Ground current 5: Current phase loss 6: Current unbalance 7: Instantaneous over current 8: Jam 9: PF deviation 10: Voltage phase loss 11: Voltage unbalance 12: Freq deviation fast 13: Freq deviation slow 14: Under current 15: High power 16: Low power 17: Contactor failure 18: Exceeds starts limit 19: Overload 20: Stall 21: Phase rotation 22: PTC - See PTC State for details 23: Peak demand 24: Measurement Module warning 25: Real time clock default value loaded 26: RTC battery voltage too low 27: Base Control Module high temperature warning 31: Ground Fault Module high ambient temp 41: Ground Fault Module CT open 42: Ground Fault Module CT shorted 43: Ground Fault Module CT no cal 44: HRGF Pulse Detect 220–232: Logic engine warnings 1000–1049: Logic User warnings |
| 21 | 110 (0x6E) | Get | UINT | Active Inhibit 0: No Inhibits 1: Incorrect Configuration 2: Soft reset required 3: Backspin 4: Undervoltage restart timer active 5: Measurement Module inhibit 6: Under voltage 7: Voltage unbalance 8: Starts per hour limit 9: Over voltage inhibit 10: ELC Hardware mismatch 11: Run Interlock input open 1000–1049: Logic User inhibits |

Table 100. Control Supervisor Object—Class 0x29 (41), continued

Instance Attributes

| Sr. No. | ID | Access Rule | Data Type | Description | |
|---------|------------|-------------|-----------|---|---|
| 22 | 111 (0x6F) | Get | USINT | Config Inhibit Reason | 0: No active inhibits 1: Local and Remote motor control sources both point to Fieldwire 2: Local motor control source is set to User Interface but the User Interface type does not match 3: One or more enabled protection features requires a voltage option card in the Measurement Module 4: One or more enabled protection features requires a PTC (Temperature) option card in the Measurement Module 5: Selected starter profile is incompatible with fieldwire as local control or fieldwire type 6: Cannot choose fieldwire as the feedback source when the fieldwire is used as a local / remote source with the selected starter 7: UI Custom Overlay - Multiple buttons assigned to same function 8: UI Custom Overlay - Multiple functions assigned to the same button LED 9: UI Custom Overlay - Multiple functions assigned to the same status LED 10: Selected starter profile is incompatible with the connected UI 11: The General Purpose I/O operational mode does not use fieldwire as a control source 12: Q3 configured for latching relay and shunt trip output |
| 23 | 112 (0x70) | Get/Set | USINT | Motor Control Communication Loss Behavior | 0: Stop on comloss event - no fault 1: Ignore comloss and keep present state 2: Send RUN1 command on comloss event 3: Send RUN2 command on comloss event 4: Stop C445 controller and issue comloss fault |
| 24 | 113 (0x71) | Get/Set | USINT | Motor Control Network Idle Behavior | 0: Stop on idle event 1: Ignore idle and keep present state 2: Send RUN1 command on idle event 3: Send RUN2 command on idle event |
| 25 | 114 (0x72) | Get/Set | USINT | System Services | 0: No Active Service 1: Clear fault queue 2: Clear trip snapshot 3: Test trip 4: Re-pair external modules 5: Factory reset 6: Soft reset 7: Reset Fault 8: Proof Test |
| 26 | 115 (0x73) | Get | USINT | Proof Test Status | 0: Proof Test was never run after a power cycle 1: Proof Test currently running 2: Proof Test passed 3: Proof Test failed |
| 27 | 116 (0x74) | Get | UINT | Base Control Module Fault Queue - 1 | A list of faults based on most recent. Duplicates are not allowed. They are sorted by event with the newest at the top of the queue. |
| 28 | 117 (0x75) | Get | UINT | Base Control Module Fault Queue - 2 | A list of faults based on most recent. Duplicates are not allowed. They are sorted by event with the newest at the top of the queue. |
| 29 | 118 (0x76) | Get | UINT | Base Control Module Fault Queue - 3 | A list of faults based on most recent. Duplicates are not allowed. They are sorted by event with the newest at the top of the queue. |

Table 100. Control Supervisor Object—Class 0x29 (41), continued**Instance Attributes**

| Sr. No. | ID | Access Rule | Data Type | Description |
|---------|------------|-------------|-----------|--|
| 30 | 119 (0x77) | Get | UINT | Base Control Module Fault Queue - 4 A list of faults based on most recent. Duplicates are not allowed. They are sorted by event with the newest at the top of the queue. |
| 31 | 120 (0x78) | Get | UINT | Base Control Module Fault Queue - 5 A list of faults based on most recent. Duplicates are not allowed. They are sorted by event with the newest at the top of the queue. |
| 32 | 121 (0x79) | Get | UINT | Base Control Module Fault Queue - 6 A list of faults based on most recent. Duplicates are not allowed. They are sorted by event with the newest at the top of the queue. |
| 33 | 122 (0x7A) | Get | UINT | Base Control Module Fault Queue - 7 A list of faults based on most recent. Duplicates are not allowed. They are sorted by event with the newest at the top of the queue. |
| 34 | 123 (0x7B) | Get | UINT | Base Control Module Fault Queue - 8 A list of faults based on most recent. Duplicates are not allowed. They are sorted by event with the newest at the top of the queue. |
| 35 | 124 (0x7C) | Get | UINT | Base Control Module Fault Queue - 9 A list of faults based on most recent. Duplicates are not allowed. They are sorted by event with the newest at the top of the queue. |
| 36 | 125 (0x7D) | Get | UINT | Base Control Module Fault Queue - 10 A list of faults based on most recent. Duplicates are not allowed. They are sorted by event with the newest at the top of the queue. |

Table 101. Overload Object—Class 0x2C (44)**Class Services****Service****Code Service Name**

0x0E Get Attribute Single

Instance Services**Service****Code Service Name**

0x0E Get Attribute Single

0x10 Set Attribute Single

Class Attributes

| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
|---------|--------------|-------------|-----------|---------------------|---|
| 1 | 1 | Get | UINT | Revision | Revision of this object |
| 2 | 2 | Get | UINT | Max Instance | Maximum instance number of an object currently created in this class level of the device. |
| 3 | 3 | Get | UINT | Number of Instances | Number of object instances currently created at this class level of the device. |

Instance Attributes

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|--------------|---------|-----------|--------------------------------|---------------------------------|
| 1 | 4 (0x4) | Get/Set | USINT | Motor Overload Trip Class | Overload trip class |
| 2 | 5 (0x5) | Get | UINT | Motor Current Average - Scaled | Scaled motor current average |
| 3 | 6 (0x6) | Get | USINT | Motor I Unbalance Percent | Motor current unbalance percent |
| 4 | 7 (0x7) | Get | USINT | Thermal memory Percent | Thermal memory |
| 5 | 8 (0x8) | Get | UINT | Motor Current Phase A - Scaled | Scaled phase A motor current |
| 6 | 9 (0x9) | Get | UINT | Motor Current Phase B - Scaled | Scaled phase B motor current |
| 7 | 10 (0xA) | Get | UINT | Motor Current Phase C - Scaled | Scaled phase C motor current |
| 8 | 11 (0xB) | Get | UINT | Ground Current - RMS | Motor ground fault current RMS |

Table 101. Overload Object—Class 0x2C (44), continued**Instance Attributes**

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|--------------|---------|-----------|--|--|
| 9 | 101 (0x65) | Get | UINT | Motor Overload Trip FLA | Motor Overload Trip FLA |
| 10 | 102 (0x66) | Get/Set | UINT | Motor Overload Trip FLA Motor1 | Motor Overload Trip FLA Motor1 |
| 11 | 103 (0x67) | Get/Set | UINT | Motor Overload Trip FLA Motor2 | Motor Overload Trip FLA Motor2 |
| 12 | 104 (0x68) | Get | UINT | Motor Current Scale Factor | Motor Current Scale Factor |
| 13 | 105 (0x69) | Get | UINT | Motor Current Average Percent FLA | Motor Current Average Percent FLA |
| 14 | 106 (0x6A) | Get | USINT | Thermal capacity level remaining | Thermal capacity level remaining |
| 15 | 107 (0x6B) | Get | UINT | Time for overload to reach reset threshold | Time for overload to reach reset threshold |
| 16 | 108 (0x6C) | Get | UINT | Time to Trip (overload) | Time to Trip (overload) |
| 17 | 109 (0x6D) | Get/Set | USINT | Motor Overload Alarm Threshold | Motor Overload Alarm Threshold |
| 18 | 110 (0x6E) | Get/Set | USINT | Thermal overload reset threshold. Level where reset is possible. | Thermal overload reset threshold. Level where reset is possible. |
| 19 | 111 (0x6F) | Get/Set | UINT | CT Ratio Active - Primary | CT Ratio Active - Primary |
| 20 | 112 (0x70) | Get/Set | UINT | CT Ratio Active - Secondary | CT Ratio Active - Secondary |
| 21 | 113 (0x71) | Get | REAL | Motor Current Average - Float | Motor Current Average - Float |
| 22 | 114 (0x72) | Get | REAL | Motor Current Phase A - Float | Motor Current Phase A - Float |
| 23 | 115 (0x73) | Get/ | REAL | Motor Current Phase B - Float | Motor Current Phase B - Float |
| 24 | 116 (0x74) | Get | REAL | Motor Current Phase C - Float | Motor Current Phase C - Float |
| 25 | 117 (0x75) | Get | UINT | Measurement Module FLA - Min | Measurement Module FLA - Min |
| 26 | 118 (0x76) | Get | UINT | Measurement Module FLA - Max | Measurement Module FLA - Max |

Table 102. System Component Definition Object—Class 0x88 (136)**Class Services**

| Service Code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |

Instance Services

| Service Code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |
| 0x10 | Set Attribute Single |

Class Attributes

| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
|---------|--------------|-------------|-----------|---------------------|---|
| 1 | 1 | Get | UINT | Revision | Revision of this object |
| 2 | 2 | Get | UINT | Max Instance | Maximum instance number of an object currently created in this class level of the device. |
| 3 | 3 | Get | UINT | Number of Instances | Number of object instances currently created at this class level of the device. |

Instance Attributes

| Sr. No. | Instance | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|----------|--------------|--------|-----------|------------------------|---|
| 1 | 1 (0x01) | 1 (0x1) | Get | UINT | BCM hardware rev | BCM Product hardware revision numerical |
| 2 | 1 (0x01) | 2 (0x2) | Get | UINT | BCM firmware rev | BCM Firmware revision numerical |
| 3 | 1 (0x01) | 3 (0x3) | Get | UDINT | BCM product Serial No. | BCM Device Product Serial Number |
| 4 | 1 (0x01) | 4 (0x4) | Get | UINT | BCM Product code | BCM Product code. |
| 5 | 1 (0x01) | 5 (0x5) | Get | UINT | BCM Product Sub code | BCM Product Subcode. |

Table 102. System Component Definition Object—Class 0x88 (136), continued**Instance Attributes**

| Sr. No. | Instance | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|----------|--------------|--------|-----------------|--------------------------------|---|
| 6 | 2 (0x02) | 1 (0x1) | Get | UINT | Power Board hardware rev | Power Board Product hardware revision numerical |
| 7 | 2 (0x02) | 2 (0x2) | Get | UINT | Power Board firmware rev | Power Board Firmware revision numerical |
| 8 | 2 (0x02) | 3 (0x3) | Get | UDINT | Power Board product Serial No. | Power Board Device Product Serial Number |
| 9 | 3 (0x03) | 1 (0x1) | Get | UINT | MM hardware rev | MM Product hardware revision numerical |
| 10 | 3 (0x03) | 2 (0x2) | Get | UINT | MM firmware rev | MM Firmware revision numerical |
| 11 | 3 (0x03) | 3 (0x3) | Get | UDINT | MM product Serial No. | MM Device Product Serial Number |
| 12 | 3 (0x03) | 4 (0x4) | Get | UINT | MM Product code | MM Product code. |
| 13 | 3 (0x03) | 5 (0x5) | Get | UINT | MM Product Sub code | MM Product Subcode. |
| 14 | 4 (0x04) | 1 (0x1) | Get | UINT | OPTION CARD hardware rev | OPTION CARD Product hardware revision numerical |
| 15 | 4 (0x04) | 2 (0x2) | Get | Array of 2 UINT | OPTION CARD firmware rev | OPTION CARD Firmware revision numerical |
| 16 | 4 (0x04) | 3 (0x3) | Get | UDINT | OPTION CARD product Serial No. | OPTION CARD Device Product Serial Number |
| 17 | 4 (0x04) | 4 (0x4) | Get | UINT | OPTION CARD Product code | OPTION CARD Product code. |
| 18 | 4 (0x04) | 5 (0x5) | Get | UINT | OPTION CARD Product Sub code | OPTION CARD Product Subcode. |
| 19 | 5 (0x05) | 2 (0x2) | Get | Array of 2 UINT | UI firmware rev | UI Firmware revision numerical |
| 20 | 5 (0x05) | 3 (0x3) | Get | UDINT | UI product Serial No. | UI Device Product Serial Number |
| 21 | 5 (0x05) | 4 (0x4) | Get | UINT | UI Product code | UI Product code. |
| 22 | 5 (0x05) | 5 (0x5) | Get | UINT | UI Product Sub code | UI Product Subcode. |

Table 103. Voltage Object—Class 0x93 (147)**Class Services****Service****Code Service Name**

0x0E Get Attribute Single

Instance Services**Service****Code Service Name**

0x0E Get Attribute Single

0x10 Set Attribute Single

Class Attributes

| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
|---------|--------------|-------------|-----------|---------------------|---|
| 1 | 0x1 | Get | UINT | Revision | Revision of this object |
| 2 | 0x2 | Get | UINT | Max Instance | Maximum instance number of an object currently created in this class level of the device. |
| 3 | 0x3 | Get | UINT | Number of Instances | Number of object instances currently created at this class level of the device. |

Instance Attributes

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|--------------|--------|-----------|---------------------------|-------------------------------------|
| 1 | 1 (0x1) | Get | UINT | Line Voltage LL Phases AB | Supply Line-to-Line Voltage AB |
| 2 | 2 (0x2) | Get | UINT | Line Voltage LL Phases BC | Supply Line-to-Line Voltage BC |
| 3 | 3 (0x3) | Get | UINT | Line Voltage LL Phases CA | Supply Line-to-Line Voltage CA |
| 4 | 4 (0x4) | Get | UINT | Line Voltage LL Average | Supply Line-to-Line Voltage Average |
| 5 | 5 (0x5) | Get | USINT | Line V Unbalance Percent | Supply Voltage Unbalance percentage |

Appendix C—Optional Communication Cards

Table 103. Voltage Object—Class 0x93 (147), continued

Instance Attributes

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|--------------|---------|-----------|--|--|
| 6 | 6 (0x6) | Get | USINT | Line Voltage Phase Order | Supply frequency in centi-Hz |
| 7 | 7 (0x7) | Get/Set | UINT | PT Ratio (only available with external PT) - Primary | PT Ratio (only available with external PT) - Primary |
| 8 | 8 (0x8) | Get | UINT | Line Frequency - Scaled | Line Frequency - Scaled |
| 9 | 9 (0x9) | Get/Set | UINT | PT Ratio (only available with external PT) - Secondary | PT Ratio (only available with external PT) - Secondary |
| 10 | 10 (0xA) | Get | UINT | Measurement Module Voltage Scale Factor | Measurement Module Voltage Scale Factor |
| 11 | 11 (0xB) | Get/Set | USINT | Protection UnderVoltage Trip Level | Protection UnderVoltage Trip Level |
| 12 | 12 (0xC) | Get/Set | UINT | Protection UnderVoltage Trip Debounce | Protection UnderVoltage Trip Debounce |
| 13 | 13 (0xD) | Get/Set | USINT | Protection UnderVoltage Alarm Level | Protection UnderVoltage Alarm Level |
| 14 | 14 (0xE) | Get/Set | UINT | Protection UnderVoltage Start Delay | Protection UnderVoltage Start Delay |
| 15 | 15 (0xF) | Get/Set | UINT | Protection OverVoltage Trip Level | Protection OverVoltage Trip Level |
| 16 | 16 (0x10) | Get/Set | UINT | Protection OverVoltage Trip Debounce | Protection OverVoltage Trip Debounce |
| 17 | 17 (0x11) | Get/Set | UINT | Protection OverVoltage Alarm Level | Protection OverVoltage Alarm Level |
| 18 | 18 (0x12) | Get/Set | USINT | Protection V Unbalance Trip Percent Level | Protection V Unbalance Trip Percent Level |
| 19 | 19 (0x13) | Get/Set | UINT | Protection V Unbalance Trip Debounce Time | Protection V Unbalance Trip Debounce Time |
| 20 | 20 (0x14) | Get/Set | USINT | Protection V Unbalance Alarm Percent Level | Protection V Unbalance Alarm Percent Level |
| 21 | 21 (0x15) | Get | USINT | V Phase Loss Trip Level in percent | V Phase Loss Trip Level in percent |
| 22 | 22 (0x16) | Get | UINT | V Phase Loss Debounce | V Phase Loss Debounce |
| 23 | 23 (0x17) | Get/Set | BOOL | Protection start inhibit enable | Protection start inhibit enable |
| 24 | 24 (0x18) | Get/Set | USINT | Undervoltage start inhibit threshold | Undervoltage start inhibit threshold |
| 25 | 25 (0x19) | Get/Set | USINT | Voltage Imbalance start inhibit threshold | Voltage Imbalance start inhibit threshold |
| 26 | 26 (0x1A) | Get/Set | USINT | Over Voltage start inhibit threshold | Over Voltage start inhibit threshold |
| 27 | 27 (0x1B) | Get/Set | USINT | Protection Under Voltage Restart Fault Level (Percent) | Protection Under Voltage Restart Fault Level (Percent) |
| 28 | 28 (0x1C) | Get/Set | USINT | Protection Under Voltage Restart Restoration Level (Percent) | Protection Under Voltage Restart Restoration Level (Percent) |
| 29 | 29 (0x1D) | Get/Set | UINT | Undervoltage restart max time for immediate restart | Undervoltage restart max time for immediate restart |
| 30 | 30 (0x1E) | Get/Set | UDINT | Undervoltage restart delay short | Undervoltage restart delay short |
| 31 | 31 (0x1F) | Get/Set | UDINT | Undervoltage restart max time for delayed restart short | Undervoltage restart max time for delayed restart short |
| 32 | 32 (0x20) | Get/Set | UINT | Undervoltage restart delay long | Undervoltage restart delay long |
| 33 | 33 (0x21) | Get/Set | UINT | Undervoltage restart max time for delayed restart long | Undervoltage restart max time for delayed restart long |

Table 104. Dynamic input Assembly Interface Object—Class 0x96 (150)**Class Services**

| Service code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |

Instance Services

| Service code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |
| 0x10 | Set Attribute Single |

Class Attributes

| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
|---------|--------------|-------------|-----------|---------------------|---|
| 1 | 0x1 | Get | UINT | Revision | Revision of this object |
| 2 | 0x2 | Get | UINT | Max. Instance | Maximum instance number of an object currently created in this class level of the device. |
| 3 | 0x3 | Get | UINT | Number of Instances | Number of object instances currently created at this class level of the device. |

Instance Attributes

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description | Default |
|---------|--------------|---------|-----------|------------------------------------|--|---------|
| 1 | 1 (0x1) | Get/Set | UINT | Dynamic Assembly Interface-Index-1 | An interface to insert the parameter in dynamic assembly instance number 150, Index-1. | 1 |
| 2 | 2 (0x2) | Get/Set | UINT | Dynamic Assembly Interface-Index-2 | An interface to insert the parameter in dynamic assembly instance number 150, Index-2. | 18 |
| 3 | 3 (0x3) | Get/Set | UINT | Dynamic Assembly Interface-Index-3 | An interface to insert the parameter in dynamic assembly instance number 150, Index-3. | 2 |
| 4 | 4 (0x4) | Get/Set | UINT | Dynamic Assembly Interface-Index-4 | An interface to insert the parameter in dynamic assembly instance number 150, Index-4. | 3 |
| 5 | 5 (0x5) | Get/Set | USINT | Dynamic Assembly Interface-Index-5 | An interface to insert the parameter in dynamic assembly instance number 150, Index-5. | 4 |
| 6 | 6 (0x6) | Get/Set | UINT | Dynamic Assembly Interface-Index-6 | An interface to insert the parameter in dynamic assembly instance number 150, Index-6. | 6 |
| 7 | 7 (0x7) | Get/Set | USINT | Dynamic Assembly Interface-Index-7 | An interface to insert the parameter in dynamic assembly instance number 150, Index-7. | 7 |
| 8 | 8 (0x8) | Get/Set | USINT | Dynamic Assembly Interface-Index-8 | An interface to insert the parameter in dynamic assembly instance number 150, Index-8. | 8 |

Appendix C—Optional Communication Cards

C445 supports following parameters as a member of dynamic input assembly instance.

Table 105. Dynamic Input Assembly Instance Parameters

| Value | Parameter Name | Description |
|-------|--|---------------------------------|
| 0 | Assembly Terminator | D_IN_ASM_TERMINATOR |
| 1 | Packed Device status (See Control Supervisor Object) | C445_DEVICE_STATUS |
| 2 | Motor Current Phase A - Scaled | MOTOR_I_A_SCALED |
| 3 | Motor Current Phase B - Scaled | MOTOR_I_B_SCALED |
| 4 | Motor Current Phase C - Scaled | MOTOR_I_C_SCALED |
| 5 | Motor Current Average - Scaled | MOTOR_I_AVE_SCALED |
| 6 | Line Voltage LL Phases AB | LINE_V_LL_AB_RMS |
| 7 | Line Voltage LL Phases BC | LINE_V_LL_BC_RMS |
| 8 | Line Voltage LL Phases CA | LINE_V_LL_CA_RMS |
| 9 | Line Voltage LL Average | LINE_V_LL_AVE_RMS |
| 10 | Total Watts for all three phases | POWER_WATTS |
| 11 | Line V Unbalance Percent | LINE_V_UNBALANCE_PERC |
| 12 | Motor Current Average Percent FLA | MOTOR_I_AVE_PERCENT_FL A |
| 13 | Apparent Power Factor | POWER_PF_APPARENT |
| 14 | GF High Resistance - RMS | MOTOR_GF_I_HR_RMS |
| 15 | Line Frequency - Scaled | LINE_FREQ |
| 16 | Thermal memory Percent | STATUS_OVLD_THERMAL_MEM_PERCENT |
| 17 | Signal Status Bits | STATUS_SIGNAL_BITS |
| 18 | Warning Status Bits | STATUS_WARNING_BITS |
| 19 | BCM Digital Input Status | LOGIC_INPUT_STATE_BITFIELD |

Table 106. Motor Info Object—Class 0x9B (155)

Class Services

Service

| Service Code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |

Instance Services

Service

| Service Code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |
| 0x10 | Set Attribute Single |

Class Attributes

| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
|---------|--------------|-------------|-----------|---------------------|---|
| 1 | 1 (0x1) | Get | UINT | Revision | Revision of this object |
| 2 | 2 (0x2) | Get | UINT | Max Instance | Maximum instance number of an object currently created in this class level of the device. |
| 3 | 3 (0x3) | Get | UINT | Number of Instances | Number of object instances currently created at this class level of the device. |

Instance Attributes

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|--------------|---------|-----------|---------------------------------------|------------------------|
| 1 | 1 (0x1) | Get/Set | UINT | Rated Voltage | Motor rated voltage |
| 2 | 2 (0x2) | Get/Set | UDINT | Motor Rated Hp Motor1 (Scaled by 100) | Motor Rated Hp Run1 |
| 3 | 3 (0x3) | Get/Set | UDINT | Motor Rated Hp Motor2 (Scaled by 100) | Motor Rated Hp Run2 |
| 4 | 4 (0x4) | Get/Set | UDINT | Motor Rated Watts Motor1 | Motor Rated Watts Run1 |

Table 106. Motor Info Object—Class 0x9B (155), continued**Instance Attributes**

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|--------------|---------|-----------|--|--|
| 5 | 5 (0x5) | Get/Set | UDINT | Motor Rated Watts Motor2 | Motor Rated Watts Run2 |
| 6 | 6 (0x6) | Get/Set | UINT | Motor Rated Speed Motor1 | Motor Rated Speed RPM Run1 |
| 7 | 7 (0x7) | Get/Set | UINT | Motor Rated Speed Motor2 | Motor Rated Speed RPM Run2 |
| 8 | 8 (0x8) | Get/Set | UINT | Rated Freq | Motor rated frequency in Hz |
| 9 | 9 (0x9) | Get/Set | UINT | Motor Rated Efficiency | Motor rated efficiency in percentage |
| 10 | 10 (0xA) | Get/Set | INT | Motor Rated PF (scaled by 100) | Motor rated power factor in percentage |
| 11 | 11 (0xB) | Get/Set | USINT | Motor Rated Service Factor | Motor Rated Service Factor |
| 12 | 12 (0xC) | Get/Set | UINT | Motor Rated Stator Resistance (Scaled x1000) | Motor Rated Stator Resistance (Scaled x1000) |
| 13 | 13 (0xD) | Get | UDINT | Motor Rated Hp Active (Scaled by 100) | Motor Rated Hp Active |
| 14 | 14 (0xE) | Get | UINT | Motor Rated Speed Active | Motor Rated Speed RPM active |
| 15 | 15 (0xF) | Get | UDINT | Motor Rated Watts Active | Motor Rated Watts Active |

Table 107. Operation Mode Object—Class 0x9F (159)**Class Services****Service**

| Service Code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |

Instance Services**Service**

| Service Code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |
| 0x10 | Set Attribute Single |

Class Attributes

| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
|---------|--------------|-------------|-----------|---------------------|---|
| 1 | 1 (0x1) | Get | UINT | Revision | Revision of this object |
| 2 | 2 (0x2) | Get | UINT | Max Instance | Maximum instance number of an object currently created in this class level of the device. |
| 3 | 3 (0x3) | Get | UINT | Number of Instances | Number of object instances currently created at this class level of the device. |

Instance Attributes

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|--------------|---------|-----------|--|--|
| 1 | 1 (0x1) | Get/Set | USINT | Used to select the desired control profile (soft reset required) | Used to select the desired control profile (soft reset required) |
| 2 | 2 (0x2) | Get/Set | UINT | Delay before control fault is issued (in 10ms) | Delay before control fault is issued (in 10ms) |
| 3 | 3 (0x3) | Get/Set | UINT | Interlocking time between contactor direction changes (in 0.01sec) | Interlocking time between contactor direction changes (in 0.01sec) |
| 4 | 4 (0x4) | Get/Set | UINT | Switching time between contactor speed changes (in 0.01sec) | Switching time between contactor speed changes (in 0.01sec) |
| 5 | 5 (0x5) | Get/Set | UINT | Settling time delay when a network contactor is used. (in 10ms) | Settling time delay when a network contactor is used. (in 10ms) |
| 6 | 6 (0x6) | Get/Set | UINT | Maximum star (wye) wiring time (in 0.1sec) | Maximum star (wye) wiring time (in 0.1sec) |
| 7 | 7 (0x7) | Get/Set | BOOL | Enables MCCB Feeder actuation control | Enables MCCB Feeder actuation control |
| 8 | 8 (0x8) | Get/Set | UINT | Output pulse width for MCCB actuation (in 1.0 ms) | Output pulse width for MCCB actuation (in 1.0 ms) |

Table 107. Operation Mode Object—Class 0x9F (159), continued

Instance Attributes

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|--------------|---------|-----------|---|---|
| 9 | 9 (0x9) | Get/Set | UINT | Delay time for solenoid valve to open (in 10ms) | Delay time for solenoid valve to open (in 10ms) |
| 10 | 10 (0xA) | Get/Set | UINT | Delay time for solenoid valve to close (in 10ms) | Delay time for solenoid valve to close (in 10ms) |
| 11 | 11 (0xB) | Get/Set | USINT | Non energized state of solenoid valve | Non energized state of solenoid valve |
| 12 | 12 (0xC) | Get | USINT | Present source of control | Present source of control |
| 13 | 13 (0xD) | Get/Set | USINT | Base Control Module Local Source Selector | Base Control Module Local Source Selector |
| 14 | 14 (0xE) | Get/Set | USINT | Base Control Module Remote Source Selector | Base Control Module Remote Source Selector |
| 15 | 15 (0xF) | Get/Set | USINT | Base Control Module Local/Remote Power up mode | Base Control Module Local/Remote Power up mode |
| 16 | 16 (0x10) | Get/Set | USINT | Base Control Module Feedback Signal Source Selector | Base Control Module Feedback Signal Source Selector |
| 17 | 17 (0x11) | Get/Set | USINT | Base Control Module Field Wiring Configuration Selector | Base Control Module Field Wiring Configuration Selector |
| 18 | 18 (0x12) | Get/Set | USINT | Measurement Module Wire Configuration | Measurement Module Wire Configuration |
| 19 | 19 (0x13) | Get | UINT | C445 Q1 Output function select | C445 Q1 Output function select |
| 20 | 20 (0x14) | Get | USINT | C445 Q2 Output function select | C445 Q2 Output function select |
| 21 | 21 (0x15) | Get | USINT | C445 Q3 Output function select | C445 Q3 Output function select |
| 22 | 22 (0x16) | Get/Set | UINT | C445 Latching Q3 Relay Reset Source select | C445 Latching Q3 Relay Reset Source select |
| 23 | 23 (0x17) | Get/Set | USINT | Relay 3 Behavior | Relay 3 Behavior |
| 24 | 24 (0x18) | Get/Set | USINT | Latching Relay Behavior at Power-down | Latching Relay Behavior at Power-down |

Table 108. Modbus Object—Class 0xA0 (160)

Class Services

| Service Code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |

Instance Services

| Service Code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |
| 0x10 | Set Attribute Single |

Class Attributes

| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
|---------|--------------|-------------|-----------|---------------------|---|
| 1 | 1 (0x1) | Get | UINT | Revision | Revision of this object |
| 2 | 2 (0x2) | Get | UINT | Max Instance | Maximum instance number of an object currently created in this class level of the device. |
| 3 | 3 (0x3) | Get | UINT | Number of Instances | Number of object instances currently created at this class level of the device. |

Table 108. Modbus Object—Class 0xA0 (160), continued**Instance Attributes**

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|--------------|---------|-----------|--|--|
| 1 | 1 (0x1) | Get/Set | USINT | Remote Modbus Address | Remote Modbus Address |
| 2 | 2 (0x2) | Get/Set | USINT | Remote Modbus Baud Rate | Remote Modbus Baud Rate |
| 3 | 3 (0x3) | Get/Set | USINT | Remote Modbus Parity and Stop Bits | Remote Modbus Parity and Stop Bits |
| 4 | 4 (0x4) | Get/Set | USINT | Remote Modbus TX Mode | Remote Modbus TX Mode |
| 5 | 5 (0x5) | Get/Set | UINT | Remote Modbus Communication Timeout | Remote Modbus Communication Timeout |
| 6 | 6 (0x6) | Get/Set | UINT | Base Control Module USB Modbus CommTimeout | Base Control Module USB Modbus CommTimeout |
| 7 | 7 (0x7) | Get/Set | UINT | User Interface USB Modbus CommTimeout | User Interface USB Modbus CommTimeout |
| 8 | 8 (0x8) | Get/Set | UINT | Modbus Scan Data | Modbus Scan Data |
| 9 | 9 (0x9) | Get/Set | UINT | Modbus Scan List | Modbus Scan List |

Table 109. Motor Monitoring Object—Class 0xA1 (161)**Class Services****Service**

| Service Code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |

Instance Services**Service**

| Service Code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |
| 0x10 | Set Attribute Single |

Class Attributes

| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
|---------|--------------|-------------|-----------|---------------------|---|
| 1 | 1 (0x1) | Get | UINT | Revision | Revision of this object |
| 2 | 2 (0x2) | Get | UINT | Max Instance | Maximum instance number of an object currently created in this class level of the device. |
| 3 | 3 (0x3) | Get | UINT | Number of Instances | Number of object instances currently created at this class level of the device. |

Instance Attributes

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|--------------|---------|-----------|---|---|
| 1 | 1 (0x1) | Get | USINT | Motor State (enum) | Motor State (enum) |
| 2 | 2 (0x2) | Get | UINT | Speed (RPM) | Speed (RPM) |
| 3 | 3 (0x3) | Get | INT | Torque | Torque |
| 4 | 4 (0x4) | Get | UINT | Efficiency in percent | Efficiency in percent |
| 5 | 5 (0x5) | Get | USINT | PTC Status | PTC Status |
| 6 | 6 (0x6) | Get | UDINT | Number of Motor Starts | Number of Motor Starts |
| 7 | 7 (0x7) | Get | UINT | Number of Contactor Operations During Last Hour | Number of Contactor Operations During Last Hour |
| 8 | 8 (0x8) | Get/Set | UDINT | Number of Motor Starts User | Number of Motor Starts User |
| 9 | 9 (0x9) | Get | UDINT | Number of Operating Seconds | Number of Operating Seconds |
| 10 | 10 (0xA) | Get/Set | UDINT | Number of Operating Seconds (user) | Number of Operating Seconds (user) |
| 11 | 11 (0xB) | Get | UINT | Last Measured Starting Time. Time to get up to speed. | Last Measured Starting Time. Time to get up to speed. |
| 12 | 12 (0xC) | Get | UDINT | Motor Run Time Latest Run - How long the motor was running last time. | Motor Run Time Latest Run - How long the motor was running last time. |
| 13 | 13 (0xD) | Get | UDINT | Motor Run Time Total | Motor Run Time Total |

Table 109. Motor Monitoring Object—Class 0xA1 (161), continued**Instance Attributes**

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|--------------|---------|-----------|-------------------------------------|-------------------------------------|
| 14 | 14 (0xE) | Get/Set | UDINT | Motor Run Time Total Reset | Motor Run Time Total Reset |
| 15 | 15 (0xF) | Get/Set | UINT | Motor Max Starting Current - Scaled | Motor Max Starting Current - Scaled |
| 16 | 16 (0x10) | Get/Set | REAL | Motor Max Starting Current - Float | Motor Max Starting Current - Float |
| 17 | 17 (0x11) | Get | INT | Power Apparent Power Factor | Power Apparent Power Factor |
| 18 | 18 (0x12) | Get | UDINT | Current Demand Value | Current Demand Value |
| 19 | 19 (0x13) | Get/Set | UDINT | Demand Peak Resettable | Demand Peak Resettable |
| 20 | 20 (0x14) | Get | UDINT | Peak Demand Timestamp | Peak Demand Timestamp |
| 21 | 21 (0x15) | Get | DINT | VA | VA |
| 22 | 22 (0x16) | Get | DINT | VARs | VARs |
| 23 | 23 (0x17) | Get | DINT | Total Watts for all three phases | Total Watts for all three phases |
| 24 | 24 (0x18) | Get | DINT | Real Energy | Real Energy |
| 25 | 25 (0x19) | Get/Set | DINT | Real Energy (Resettable) | Real Energy (Resettable) |
| 26 | 26 (0x1A) | Get | DINT | Reactive Energy | Reactive Energy |
| 27 | 27 (0x1B) | Get/Set | DINT | Reactive Energy (Resettable) | Reactive Energy (Resettable) |
| 28 | 28 (0x1C) | Get | DINT | Apparent Energy | Apparent Energy |
| 29 | 29 (0x1D) | Get/Set | DINT | Apparent Energy (Resettable) | Apparent Energy (Resettable) |
| 30 | 30 (0x1E) | Get | INT | Seq Comp - I Pos Real | Seq Comp - I Pos Real |
| 31 | 31 (0x1F) | Get | INT | Seq Comp - I Pos Imag | Seq Comp - I Pos Imag |
| 32 | 32 (0x20) | Get | INT | Seq Comp - I Neg Real | Seq Comp - I Neg Real |
| 33 | 33 (0x21) | Get | INT | Seq Comp - I Neg Imag | Seq Comp - I Neg Imag |
| 34 | 34 (0x22) | Get | INT | Seq Comp - V Pos Real | Seq Comp - V Pos Real |
| 35 | 35 (0x23) | Get | INT | Seq Comp - V Pos Imag | Seq Comp - V Pos Imag |
| 36 | 36 (0x24) | Get | INT | Seq Comp - V Neg Real | Seq Comp - V Neg Real |
| 37 | 37 (0x25) | Get | INT | Seq Comp - V Neg Imag | Seq Comp - V Neg Imag |

Table 110. Motor Protection Object—Class 0xA2 (162)**Class Services****Service****Code Service Name**

0x0E Get Attribute Single

Instance Services**Service****Code Service Name**

0x0E Get Attribute Single

0x10 Set Attribute Single

Class Attributes

| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
|---------|--------------|-------------|-----------|---------------------|---|
| 1 | 1 (0x1) | Get | UINT | Revision | Revision of this object |
| 2 | 2 (0x2) | Get | UINT | Max Instance | Maximum instance number of an object currently created in this class level of the device. |
| 3 | 3 (0x3) | Get | UINT | Number of Instances | Number of object instances currently created at this class level of the device. |

Table 110. Motor Protection Object—Class 0xA2 (162), continued**Instance Attributes**

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|----------------|---------------------|---------------|------------------|------------------------------------|--|
| 1 | 1 (0x1) | Get/Set | BYTE | Trip Enable Bit Field | Enabling bits for tripping. Bit location - condition 0 - under voltage 1 - over voltage 2 - Reserved 3 - ground current warning 4 - current phase loss 5 - current unbalance 6 - instantaneous over current 7 - jam 8 - PF deviation 9 - voltage phase loss 10 - voltage unbalance 11 - freq deviation fast 12 - freq deviation slow 13 - under current 14 - high power 15 - low power 16 - Reserved 18 - overload 19 - stall 20 - phase rotation mismatch 21 - PTC 22 - under voltage restart 23 - peak demand 24 - HRGF pulse detection |
| 2 | 2 (0x2) | Get/Set | BYTE | Warn Enable Bit Field | Enabling bits for warning. Bit location - condition 0 - under voltage 1 - over voltage 2 - Reserved 3 - ground current warning 4 - current phase loss 5 - current unbalance 6 - instantaneous over current 7 - jam 8 - PF deviation 9 - voltage phase loss 10 - voltage unbalance 11 - freq deviation fast 12 - freq deviation slow 13 - under current 14 - high power 15 - low power 16 - Reserved 17 - exceeds starts limit 18 - overload 19 - stall 20 - phase rotation mismatch 21 - PTC 22 - under voltage restart 23 - peak demand 24 - HRGF pulse detection |
| 3 | 3 (0x3) | Get/Set | UINT | Alarm Debounce Time | Alarm Debounce Time |
| 4 | 4 (0x4) | Get/Set | BOOL | Global Auto Reset Enable (Boolean) | If disabled, no auto reset; if enabled, auto reset based on trip auto-reset bits |

Table 110. Motor Protection Object—Class 0xA2 (162), continued

Instance Attributes

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|--------------|---------|-----------|---|--|
| 5 | 5 (0x5) | Get/Set | BYTE | Auto reset enable capability for each trip bit | Per tripping type auto reset enable bits. Bit location - condition 0 - under voltage 1 - over voltage 2 - Reserved 3 - ground current fault 4 - current phase loss 5 - current unbalance 6 - instantaneous over current 7 - jam 8 - PF deviation 9 - voltage phase loss 10 - voltage unbalance 11 - freq deviation fast 12 - freq deviation slow 13 - under current 14 - high power 15 - low power 16 - Reserved 18 - overload 19 - stall 20 - phase rotation mismatch 21 - PTC 22 - under voltage restart 23 - peak demand 24 - HRGF pulse detection |
| 6 | 6 (0x6) | Get/Set | UINT | Reset time delay. The amount of time to wait until we do an auto reset. | Time delay before auto-reset |
| 7 | 7 (0x7) | Get/Set | BOOL | Perform reset on power up. | Protection allowed after delay since start |
| 8 | 8 (0x8) | Get/Set | UINT | Motor State time delay after which the RUN state is declared if not reached via current thresholds. | Motor State time delay after which the RUN state is declared if not reached via current thresholds. |
| 9 | 9 (0x9) | Get/Set | BOOL | Start inhibited protection enable when motor is up to speed. | If enabled, only allows protection when motor is up to speed |
| 10 | 10 (0xA) | Get/Set | UINT | Phase Rotation | Phase Rotation |
| 11 | 11 (0xB) | Get/Set | UINT | Protection Instantaneous Overcurrent Trip Level | Protection Instantaneous Overcurrent Trip Level |
| 12 | 12 (0xC) | Get/Set | UINT | Protection Instantaneous Overcurrent Debounce | Protection Instantaneous Overcurrent Debounce |
| 13 | 13 (0xD) | Get/Set | UINT | Protection Instantaneous Overcurrent Alarm Level | Protection Instantaneous Overcurrent Alarm Level |
| 14 | 14 (0xE) | Get/Set | UINT | Protection Instantaneous Overcurrent Start Delay | Protection Instantaneous Overcurrent Start Delay |
| 15 | 15 (0xF) | Get/Set | USINT | Protection UnderCurrent Trip Level | Protection UnderCurrent Trip Level |
| 16 | 16 (0x10) | Get/Set | UINT | Protection UnderCurrent Trip Debounce | Protection UnderCurrent Trip Debounce |
| 17 | 17 (0x11) | Get/Set | USINT | Protection UnderCurrent Alarm Level | Protection UnderCurrent Alarm Level |
| 18 | 18 (0x12) | Get/Set | USINT | Protection I Unbalance Trip Percent Level | Protection I Unbalance Trip Percent Level |
| 19 | 19 (0x13) | Get/Set | UINT | Protection I Unbalance Trip Debounce Time | Protection I Unbalance Trip Debounce Time |
| 20 | 20 (0x14) | Get/Set | USINT | Protection I Unbalance Alarm Percent Level | Protection I Unbalance Alarm Percent Level |
| 21 | 21 (0x15) | Get | USINT | I Phase Loss Trip Level in percent | I Phase Loss Trip Level in percent |
| 22 | 22 (0x16) | Get | UINT | I Phase Loss Debounce | I Phase Loss Debounce |

Table 110. Motor Protection Object—Class 0xA2 (162), continued**Instance Attributes**

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|----------------|---------------------|---------------|------------------|---|---|
| 23 | 23 (0x17) | Get/Set | UINT | Protection Jam Trip Level | Protection Jam Trip Level |
| 24 | 24 (0x18) | Get/Set | UINT | Protection Jam Trip Debounce | Protection Jam Trip Debounce |
| 25 | 25 (0x19) | Get/Set | UINT | Protection Jam Alarm Level | Protection Jam Alarm Level |
| 26 | 26 (0x1A) | Get/Set | UINT | Protection Stall Trip Level | Protection Stall Trip Level |
| 27 | 27 (0x1B) | Get/Set | INT | Protection High KW Trip Level | Protection High KW Trip Level |
| 28 | 28 (0x1C) | Get/Set | UINT | Protection High KW Trip Time Debounce | Protection High KW Trip Time Debounce |
| 29 | 29 (0x1D) | Get/Set | INT | Protection High KW Alarm Level | Protection High KW Alarm Level |
| 30 | 30 (0x1E) | Get/Set | INT | Protection Low KW Trip Level | Protection Low KW Trip Level |
| 31 | 31 (0x1F) | Get/Set | UINT | Protection Low KW Trip Time Debounce | Protection Low KW Trip Time Debounce |
| 32 | 32 (0x20) | Get/Set | INT | Protection Low KW Alarm Level | Protection Low KW Alarm Level |
| 33 | 33 (0x21) | Get/Set | INT | Power Factor Deviation Trip Level High | Power Factor Deviation Trip Level High |
| 34 | 34 (0x22) | Get/Set | INT | Power Factor Deviation Trip Level | Power Factor Deviation Trip Level |
| 35 | 35 (0x23) | Get/Set | INT | Power Factor Deviation Debounce | Power Factor Deviation Debounce |
| 36 | 36 (0x24) | Get/Set | INT | Power Factor Deviation Alarm Level High | Power Factor Deviation Alarm Level High |
| 37 | 37 (0x25) | Get/Set | INT | Power Factor Deviation Alarm Level Low | Power Factor Deviation Alarm Level Low |
| 38 | 38 (0x26) | Get/Set | UDINT | Peak Demand Warning Threshold | Peak Demand Warning Threshold |
| 39 | 39 (0x27) | Get/Set | UINT | Demand Window Duration | Demand Window Duration |
| 40 | 40 (0x28) | Get/Set | UINT | Ground Fault Threshold - Scaled | Ground Fault Threshold - Scaled |
| 41 | 41 (0x29) | Get/Set | UINT | Ground Fault Debounce | Ground Fault Debounce |
| 42 | 42 (0x2A) | Get/Set | UINT | Ground Fault Alarm Threshold - Scaled | Ground Fault Alarm Threshold - Scaled |
| 43 | 43 (0x2B) | Get/Set | UINT | Ground Fault Start Delay | Ground Fault Start Delay |
| 44 | 44 (0x2C) | Get/Set | BOOL | Ground Fault Apply Inhibit Current | Ground Fault Apply Inhibit Current |
| 45 | 45 (0x2D) | Get/Set | UINT | Ground Fault Inhibit Current - Percent | Ground Fault Inhibit Current - Percent |
| 46 | 46 (0x2E) | Get/Set | UINT | Frequency Deviation Fast Trip Level | Frequency Deviation Fast Trip Level |
| 47 | 47 (0x2F) | Get/Set | UINT | Frequency Deviation Fast Debounce | Frequency Deviation Fast Debounce |
| 48 | 48 (0x30) | Get/Set | UINT | Frequency Deviation Fast Alarm Level | Frequency Deviation Fast Alarm Level |
| 49 | 49 (0x31) | Get/Set | UINT | Frequency Deviation Slow Trip Level | Frequency Deviation Slow Trip Level |
| 50 | 50 (0x32) | Get/Set | UINT | Frequency Deviation Slow Debounce | Frequency Deviation Slow Debounce |
| 51 | 51 (0x33) | Get/Set | UINT | Frequency Deviation Slow Alarm Level | Frequency Deviation Slow Alarm Level |
| 52 | 52 (0x34) | Get/Set | UINT | Number of Starts per Hour allowed before trip | Number of Starts per Hour allowed before trip |
| 53 | 53 (0x35) | Get/Set | UINT | Backspin reset inhibit time | Backspin reset inhibit time |
| 54 | 54 (0x36) | Get/Set | USINT | Motor Start Threshold Percentage | Motor Start Threshold Percentage |
| 55 | 55 (0x37) | Get/Set | USINT | Motor Stop Threshold Percentage | Motor Stop Threshold Percentage |
| 56 | 56 (0x38) | Get/Set | USINT | Motor Transition Threshold Percentage | Motor Transition Threshold Percentage |

Table 111. Snapshot Object—Class 0xA5 (165)**Class Services**

| Service Code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |

Instance Services

| Service Code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |
| 0x10 | Set Attribute Single |

Class Attributes

| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
|---------|--------------|-------------|-----------|---------------------|---|
| 1 | 1 (0x1) | Get | UINT | Revision | Revision of this object |
| 2 | 2 (0x2) | Get | UINT | Max Instance | Maximum instance number of an object currently created in this class level of the device. |
| 3 | 3 (0x3) | Get | UINT | Number of Instances | Number of object instances currently created at this class level of the device. |

Instance Attributes

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|--------------|--------|-----------|---|---|
| 1 | 1 (0x1) | Get | UINT | Fault Snap Shot Log Year | Fault Snap Shot Log Year |
| 2 | 2 (0x2) | Get | USINT | Fault Snap Shot Log Month | Fault Snap Shot Log Month |
| 3 | 3 (0x3) | Get | USINT | Fault Snap Shot Log Day | Fault Snap Shot Log Day |
| 4 | 4 (0x4) | Get | USINT | Fault Snap Shot Log Hour | Fault Snap Shot Log Hour |
| 5 | 5 (0x5) | Get | USINT | Fault Snap Shot Log Minute | Fault Snap Shot Log Minute |
| 6 | 6 (0x6) | Get | USINT | Fault Snap Shot Log Second | Fault Snap Shot Log Second |
| 7 | 7 (0x7) | Get | UINT | Fault Snap Shot Trip Reason | Fault Snap Shot Trip Reason |
| 8 | 8 (0x8) | Get | USINT | Fault Snap Shot Log TP | Fault Snap Shot Log TP |
| 9 | 9 (0x9) | Get | UINT | Fault Snap Shot Log Ia | Fault Snap Shot Log Ia |
| 10 | 10 (0xA) | Get | UINT | Fault Snap Shot Log Ib | Fault Snap Shot Log Ib |
| 11 | 11 (0xB) | Get | UINT | Fault Snap Shot Log Ic | Fault Snap Shot Log Ic |
| 12 | 12 (0xC) | Get | UINT | Fault Snap Shot Log Vab | Fault Snap Shot Log Vab |
| 13 | 13 (0xD) | Get | UINT | Fault Snap Shot Log Vbc | Fault Snap Shot Log Vbc |
| 14 | 14 (0xE) | Get | UINT | Fault Snap Shot Log Vca | Fault Snap Shot Log Vca |
| 15 | 15 (0xF) | Get | UINT | Fault Snap Shot Log Frequency | Fault Snap Shot Log Frequency |
| 16 | 16 (0x10) | Get | DINT | Fault Snap Shot Log Real Power (watts) | Fault Snap Shot Log Real Power (watts) |
| 17 | 17 (0x11) | Get | DINT | Fault Snap Shot Log Apparent Power (VA) | Fault Snap Shot Log Apparent Power (VA) |
| 18 | 18 (0x12) | Get | INT | Fault Snap Shot Log Power Factor | Fault Snap Shot Log Power Factor |
| 19 | 19 (0x13) | Get | UINT | Fault Snap Shot Log Ground Fault RMS | Fault Snap Shot Log Ground Fault RMS |

Table 112. Parameter Access Object—Class 0xAA (170)

| Class Services | | | | | |
|----------------------------|----------------------|--------------------|------------------|---------------------------------------|---|
| Service Code | Service Name | | | | |
| 0x0E | Get Attribute Single | | | | |
| Instance Services | | | | | |
| Service Code | Service Name | | | | |
| 0x0E | Get Attribute Single | | | | |
| 0x10 | Set Attribute Single | | | | |
| Class Attributes | | | | | |
| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
| 1 | 1 (0x1) | Get | UINT | Revision | Revision of this object |
| 2 | 2 (0x2) | Get | UINT | Max Instance | Maximum instance number of an object currently created in this class level of the device. |
| 3 | 3 (0x3) | Get | UINT | Number of Instances | Number of object instances currently created at this class level of the device. |
| Instance Attributes | | | | | |
| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
| 1 | 1 (0x1) | Get/Set | UDINT | Set Admin Password | Set Admin Password |
| 2 | 2 (0x2) | Get/Set | UDINT | Admin Login | Admin Login |
| 3 | 3 (0x3) | Get/Set | UDINT | Set USB Password | Set USB Password |
| 4 | 4 (0x4) | Get/Set | UDINT | USB Login | USB Login |
| 5 | 5 (0x5) | Get/Set | BOOL | Motor Running Parameter Lock Override | Motor Running Parameter Lock Override |
| 6 | 6 (0x6) | Get | USINT | Motor Running Parameter Lock | Motor Running Parameter Lock |
| 7 | 7 (0x7) | Get | USINT | Password Parameter Lock | Password Parameter Lock |
| 8 | 8 (0x8) | Get | USINT | USB Parameter Lock | USB Parameter Lock |
| 9 | 9 (0x9) | Get/Set | UDINT | Set Manufacturing Password | Set Manufacturing Password |
| 10 | 10 (0xA) | Get/Set | UDINT | Manufacturing Login | Manufacturing Login |

Table 113. RTC Object—Class 0xB0 (176)

| Class Services | | | | | |
|--------------------------|----------------------|--------------------|------------------|---------------------|---|
| Service Code | Service Name | | | | |
| 0x0E | Get Attribute Single | | | | |
| Instance Services | | | | | |
| Service Code | Service Name | | | | |
| 0x0E | Get Attribute Single | | | | |
| 0x10 | Set Attribute Single | | | | |
| Class Attributes | | | | | |
| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
| 1 | 1 (0x1) | Get | UINT | Revision | Revision of this object |
| 2 | 2 (0x2) | Get | UINT | Max Instance | Maximum instance number of an object currently created in this class level of the device. |
| 3 | 3 (0x3) | Get | UINT | Number of Instances | Number of object instances currently created at this class level of the device. |

Table 113. RTC Object—Class 0xB0 (176), continued**Instance Attributes**

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|--------------|---------|-----------|----------------------------------|---|
| 1 | 1 (0x1) | Get/Set | USINT | RTC Time | RTC Time in hh:mm:ss format (24 hour format) |
| 2 | 2 (0x2) | Get/Set | UINT | RTC Year | RTC year |
| 3 | 3 (0x3) | Get/Set | USINT | RTC Month | RTC month |
| 4 | 4 (0x4) | Get/Set | USINT | RTC Day of Month | RTC day of month |
| 5 | 5 (0x5) | Get/Set | USINT | RTC Disable Oscillator | If a 1 is set, oscillator on RTC will be stopped to save batter power |
| 6 | 6 (0x6) | Get/Set | USINT | RTC Power Interrupted | RTC backup power has been interrupted |
| 7 | 7 (0x7) | Get | USINT | RTC Status | RTC Status Enum |
| 8 | 8 (0x8) | Get | USINT | RTC Time Set Status | If 0 successful, 1 pending, 2 failure |
| 9 | 9 (0x9) | Get/Set | USINT | RTC Time Zone Hours and Minutes | hh:mm in time zone assignment (UTC+/-hh:mm) |
| 10 | 10 (0xA) | Get/Set | USINT | RTC Time Zone Ahead of UTC | If true, UTC+hh:mm; otherwise UTC-hh:mm |
| 11 | 11 (0xB) | Get | USINT | RTC Time Zone DST Setting Status | RTC Time Zone DST Setting Status |
| 12 | 12 (0xC) | Get/Set | USINT | RTC DST Rule | RTC DST Rule |
| 13 | 13 (0xD) | Get/Set | USINT | RTC Manual DST Rule Start Time | RTC Manual DST Rule Start Spec (month, week, weekday, hour, minute) |
| 14 | 14 (0xE) | Get/Set | USINT | RTC Manual DST Rule End Time | RTC Manual DST Rule End Spec (month, week, weekday, hour, minute) |
| 15 | 15 (0xF) | Get | UDINT | RTC Time UNIX format | RTC time in seconds from UNIX epoch |
| 16 | 16 (0x10) | Get/Set | USINT | RTC Time Hours | RTC Time Hours |
| 17 | 17 (0x11) | Get/Set | USINT | RTC Time Minutes | RTC Time Minutes |
| 18 | 18 (0x12) | Get/Set | USINT | RTC Time Seconds | RTC Time Seconds |
| 19 | 19 (0x13) | Get | UINT | RTC Time | RTC Time |
| 20 | 20 (0x14) | Get | USINT | RTC Month and Date | RTC Month and Date |

Table 114. BCM Object—Class 0xB1 (177)**Class Services****Service**

| Service Code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |

Instance Services**Service**

| Service Code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |

0x10

Class Attributes

| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
|---------|--------------|-------------|-----------|---------------------|---|
| 1 | 1 (0x1) | Get | UINT | Revision | Revision of this object |
| 2 | 2 (0x2) | Get | UINT | Max Instance | Maximum instance number of an object currently created in this class level of the device. |
| 3 | 3 (0x3) | Get | UINT | Number of Instances | Number of object instances currently created at this class level of the device. |

Table 114. BCM Object—Class 0xB1 (177), continued**Instance Attributes**

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|--------------|---------|-----------|---|---|
| 1 | 1 (0x1) | Get | Word | Base Control Module DIP Switches | Base Control Module DIP Switches |
| 2 | 2 (0x2) | Get | UINT | Base Control Module Control Voltage (24VDC) | Base Control Module Control Voltage (24VDC) |
| 3 | 3 (0x3) | Get | INT | Base Control Module Ambient Board Temperature | Base Control Module Ambient Board Temperature |
| 4 | 4 (0x4) | Get/Set | INT | Base Control Module Maximum Control Board Temperature | Base Control Module Maximum Control Board Temperature |

Table 115. Option Card Object—Class 0xB3 (179)**Class Services****Service****Code** **Service Name**

0x0E Get Attribute Single

Instance Services**Service****Code** **Service Name**

0x0E Get Attribute Single

0x10 Set Attribute Single

Class Attributes

| Sr. No. | Attribute ID | Access Rule | Data Type | Name | Attribute Description |
|---------|--------------|-------------|-----------|---------------------|---|
| 1 | 1 (0x1) | Get | UINT | Revision | Revision of this object |
| 2 | 2 (0x2) | Get | UINT | Max Instance | Maximum instance number of an object currently created in this class level of the device. |
| 3 | 3 (0x3) | Get | UINT | Number of Instances | Number of object instances currently created at this class level of the device. |

Instance Attributes

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|--------------|---------|------------------|---|---|
| 1 | 1 (0x1) | Get/Set | UINT | Modbus Comm Loss Timeout Value (ms) | Modbus Comm Loss Timeout Value (ms) |
| 3 | 3 (0x3) | Get/Set | BOOL | Master Key for Hardcoded IP Address Selection | Master Key for Hardcoded IP Address Selection |
| 4 | 4 (0x4) | Get | Array of 4 USINT | Active IP Address | Active IP Address |

Table 115. Option Card Object—Class 0xB3 (179), continued

Instance Attributes

| Sr. No. | Attribute ID | Access | Data Type | Attribute Name | Attribute Description |
|---------|--------------|---------|------------------|---|---|
| 5 | 5 (0x5) | Get | Array of 4 USINT | Active Subnet Mask | Active Subnet Mask |
| 6 | 6 (0x6) | Get | Array of 4 USINT | Active Default Gateway | Active Default Gateway |
| 7 | 7 (0x7) | Get/Set | Array of 4 USINT | Static IP Address | Static IP Address |
| 8 | 8 (0x8) | Get/Set | Array of 4 USINT | Static Subnet Mask | Static Subnet Mask |
| 9 | 9 (0x9) | Get/Set | Array of 4 USINT | Static Default Gateway | Static Default Gateway |
| 10 | 10 (0xA) | Get/Set | UINT | Ethernet PHY 1 - Link Speed Select | Ethernet PHY 1 - Link Speed Select |
| 11 | 11 (0xB) | Get | UINT | Ethernet PHY 1 - Link Speed Actual | Ethernet PHY 1 - Link Speed Actual |
| 12 | 12 (0xC) | Get/Set | BOOL | Ethernet PHY 1 - Duplex Select | Ethernet PHY 1 - Duplex Select |
| 13 | 13 (0xD) | Get | BOOL | Ethernet PHY 1 - Duplex Actual | Ethernet PHY 1 - Duplex Actual |
| 14 | 14 (0xE) | Get/Set | BOOL | Ethernet PHY 1 - Link Auto-Negotiate Enable | Ethernet PHY 1 - Link Auto-Negotiate Enable |
| 15 | 15 (0xF) | Get | USINT | Ethernet PHY 1 - Link Auto-Negotiate State | Ethernet PHY 1 - Link Auto-Negotiate State |
| 16 | 16 (0x10) | Get/Set | BOOL | Ethernet PHY 1 - Port Enable | Ethernet PHY 1 - Port Enable |
| 17 | 17 (0x11) | Get/Set | UINT | Ethernet PHY 2 - Link Speed Select | Ethernet PHY 2 - Link Speed Select |
| 18 | 18 (0x12) | Get | UINT | Ethernet PHY 2 - Link Speed Actual | Ethernet PHY 2 - Link Speed Actual |
| 19 | 19 (0x13) | Get/Set | BOOL | Ethernet PHY 2 - Duplex Select | Ethernet PHY 2 - Duplex Select |
| 20 | 20 (0x14) | Get | BOOL | Ethernet PHY 2 - Duplex Actual | Ethernet PHY 2 - Duplex Actual |
| 21 | 21 (0x15) | Get/Set | BOOL | Ethernet PHY 2 - Link Auto-Negotiate Enable | Ethernet PHY 2 - Link Auto-Negotiate Enable |
| 22 | 22 (0x16) | Get | USINT | Ethernet PHY 2 - Link Auto-Negotiate State | Ethernet PHY 2 - Link Auto-Negotiate State |
| 23 | 23 (0x17) | Get/Set | BOOL | Ethernet PHY 2 - Port Enable | Ethernet PHY 2 - Port Enable |
| 24 | 24 (0x18) | Get/Set | BOOL | ACD Enable | ACD Enable |
| 25 | 25 (0x19) | Ge | USINT | ACD Conflict State | ACD Conflict State |
| 26 | 26 (0x1A) | Get/Set | USINT | ACD Conflicted State | ACD Conflicted State |
| 27 | 27 (0x1B) | Get/Set | USINT | ACD Conflicted Device MAC | ACD Conflicted Device MAC |
| 28 | 28 (0x1C) | Get | Array of 6 USINT | Ethernet MAC Address | Ethernet MAC Address |

Table 116. Port Object—Class 0xF4 (244)

Class Services

Service

| Service Code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |
| 0x01 | Get Attributes All |

Instance Services

Service

| Service Code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |
| 0x01 | Get Attributes All |

Table 116. Port Object—Class 0xF4 (244), continued**Class Attributes**

| Sr. No. | ID | Description | Access Rule | Data Type | Remarks/Default |
|---------|---------|-------------------------------|-------------|--------------------|------------------------|
| 1 | 1 (0x1) | Revision | Get | UINT | 1 |
| 2 | 2 (0x2) | Max Instance | Get | UINT | 2 |
| 3 | 3 (0x3) | Number of Instances | Get | UINT | 2 |
| 4 | 6 (0x6) | Maximum ID Class Attribute | Get | UINT | 9 |
| 5 | 7 (0x7) | Maximum ID Instance Attribute | Get | UINT | 7 |
| 6 | 8 (0x8) | Entry Port | Get | UINT | 2 |
| 7 | 9 (0x9) | Port Instance Info | Get | Array of Struct of | |
| | | Port Type | | UINT | See Instance attribute |
| | | Port Number | | UINT | See Instance attribute |

Instance Attributes

Number of instances: 2

| Sr. No. | ID | Description | Access Rule | Data Type | Remarks/Default |
|---------|---------|------------------------------|-------------|--------------|------------------------------|
| 1 | 1 (0x1) | Port Type | Get | UINT | 4 |
| 2 | 2 (0x2) | Port Number | Get | UINT | 1 or 2 |
| 3 | 3 (0x3) | Link Object | Get | Struct of: | |
| | | Path Length | | UINT | 2 |
| | | Link Path | | Padded EPATH | 20 F5 24 01 |
| 4 | 4 (0x4) | Port Name | Get | Short String | Ethernet/IP Port (in ASCII) |
| 7 | 7 (0x7) | Port Number and Node address | Get | Padded EPATH | Active IP address (in ASCII) |

Table 117. TCP/IP Object—Class 0xF5 (245)**Class Services****Service****Code** **Service Name**

0x0E Get Attribute Single

0x01 Get Attributes All

Instance Services**Service****Code** **Service Name**

0x0E Get Attribute Single

0x10 Set Attribute Single

0x01 Get Attributes All

Class Services

| Sr. No. | ID | Description | Access Rule | Data | Remarks/Default |
|---------|---------|-------------------------------|-------------|---------------|-------------------------------|
| 1 | 1 (0x1) | Revision | Get | UINT | 4 |
| 2 | 2 (0x2) | Max Instance | Get | UINT | 1 |
| 3 | 3 (0x3) | Number of instances | Get | UINT | 1 |
| 4 | 4 (0x4) | Optional attribute list | Get | Array of UINT | 04 00 08 00 09 00 0A 00 0B 00 |
| 5 | 6 (0x6) | Maximum ID Class Attribute | Get | UINT | |
| 6 | 7 (0x7) | Maximum ID Instance Attribute | Get | UINT | 0B 00 |

Table 117. TCP/IP Object—Class 0xF5 (245), continued**Instance Attributes**

| Sr. No. | ID | Description | Access Rule | Data Type | Remarks |
|---------|----------|----------------------------------|-------------|-------------------|---|
| 1 | 1 (0x1) | Status | Get | DWORD | 01 00 00 00 |
| 2 | 2 (0x2) | Configuration Capability | Get | DWORD | F4 00 00 00 |
| 3 | 3 (0x3) | Configuration Control | Get / Set | DWORD | 02-dhcp, 0- static |
| 4 | 4 (0x4) | Physical Link | Get | STRUCT of | |
| | | Path Size | | UINT | 0 |
| | | Path | | Padded EPATH | 0 |
| 5 | 5 (0x5) | Interface Configuration | Get / Set | Struct of:-NV | |
| | | IP Address | | UDINT | 192.168.1.254 |
| | | Network Mask | | UDINT | 255.255.255.0 |
| | | Gateway Address | | UDINT | 192.168.1.1 |
| | | Name Server | | UDINT | 0 |
| | | Name Server 2 | | UDINT | 0 |
| | | Domain Name | | STRING | 0 |
| 6 | 6 (0x6) | Host Name | Get / Set | STRING | 0 |
| 7 | 8 (0x8) | TTL Value | Get | USINT | 1 |
| 8 | 9 (0x9) | Multicast Configuration | Get | Struct of: | |
| | | Alloc Control | | USINT | 0 |
| | | Reserved | | USINT | 0 |
| | | Number of Mcast | | UINT | 0x20 |
| | | Starting Multicast Address | | DWORD | 80 20 C0 EE |
| 9 | 10 (0xA) | SelectAcq | Set / Get | BOOL | 1 |
| 10 | 11 (0xB) | Last Conflict Detected | Set / Get | Struct of: | |
| | | ACD activity | | USINT | 0 |
| | | Remote MAC | | Array of 6 USINT | 0 |
| | | ARP PDU | | Array of 28 USINT | 0 |
| 11 | 13 (0xD) | Encapsulation Inactivity Timeout | Set / Get | UINT | 0 = Disable 1-3600 = timeout in seconds Default = 120 |

Table 118. Ethernet Link Object—Class 0xF6 (246)**Class Services****Service**

| Service Code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |
| 0x01 | Get Attributes All |

Instance Services**Service**

| Service Code | Service Name |
|--------------|----------------------|
| 0x0E | Get Attribute Single |
| 0x10 | Set Attribute Single |
| 0x01 | Get Attributes All |

Table 118. Ethernet Link Object—Class 0xF6 (246), continued**Class Attributes**

| Sr. No. | ID | Description | Access Rule | Data Type | Remarks/Default |
|---------|---------|-------------------------------|-------------|---------------|-------------------------|
| 1 | 1 (0x1) | Revision | Get | UINT | 3 |
| 2 | 2 (0x2) | Max Instance | Get | UINT | 2 |
| 3 | 3 (0x3) | Number of Instances | Get | UINT | 2 |
| 4 | 4 (0x4) | Optional Attribute List | Get | Struct of: | |
| | | Number of Attributes | | UINT | 03 00 04 00 |
| | | Array of Attributes | | Array of UINT | 07 00 08 00 09 00 0A 00 |
| 5 | 6 (0x6) | Maximum ID Class Attribute | Get | UINT | 7 |
| 6 | 7 (0x7) | Maximum ID Instance Attribute | Get | UINT | 0A |

Instance Attributes

Number of instances: 2

| Sr. No. | ID | Description | Access Rule | Data Type | Remarks/Default |
|---------|----------|------------------------|-------------|-------------------|---|
| 1 | 1 (0x1) | Interface Speed | Get | UDINT | 64 00 00 00 |
| 2 | 2 (0x2) | Interface Flags | Get | DWORD | 2D |
| 3 | 3 (0x3) | Physical Address | Get | ARRAY of 6 USINTs | Range of 00:D0:AF:1A:00:00 to 00:D0:AF:1D:D0:FF |
| 4 | 6 (0x6) | Interface Control | Get/Set | Struct of: | |
| | | Control Bits | | WORD | 1 |
| | | Forced Interface Speed | | UINT | 0A (10) or 64 (100) |
| 5 | 7 (0x7) | Interface Type | Get | USINT | 2 |
| 6 | 8 (0x8) | Interface State | Get | USINT | 1 |
| 7 | 9 (0x9) | Admin State | Set | USINT | As per EIP Specs |
| 8 | 10 (0xA) | Interface Label | Get | Short String | "Port 1" for Instance 1 and "Port 2" for Instance 2 |

Modbus TCP Protocol

The C445 Ethernet Card supports the Modbus TCP protocol as a server device.

The supported function codes are shown below. The Modbus register map for the C445 is identical for the Modbus TCP and the Modbus serial protocols and may be found in **Appendix D** of this user manual.

Table 119. Modbus TCP Function Codes

| Function Code | Name |
|---------------------------------------|-------------------------------|
| Standard Function Codes | |
| 0x01 | Read Coils |
| 0x02 | Read Discrete Inputs |
| 0x03 | Read Holding registers |
| 0x04 | Read input registers |
| 0x05 | Write single coil |
| 0x06 | Preset Single register |
| 0x07 | Read exception status |
| 0x08 | Diagnostics |
| 0x0F | Write Multiple Coils |
| 0x10 | Write Multiple Registers |
| 0x17 | Read/Write Multiple Registers |
| 0x2B/0x0E | Read device identification |
| Vendor Specific Function Codes | |
| 0x42 | Device Services |
| 0x43 | Read Attribute |
| 0x44 | Write Attribute |
| 0x45 | Read/Write attribute |

PROFIBUS Communication Card

Introduction

The PROFIBUS communication card is an optional add on to the C445 Base Control Module that allows the user to communicate via PROFIBUS. This module allows a PROFIBUS master to fully control and monitor the C445. This module functionally supports both PROFIBUS DPV0 and DPV1 functionality.

The main purpose of PROFIBUS DPV0 is fast Cyclic Data exchange between the DP master and periphery devices such as the C445 Motor Management Relay.

PROFIBUS DPV1 is an extension of the DP protocol. The main purpose for PROFIBUS DPV1 is to add Acyclic Data exchange of parameters.

Installing the PROFIBUS Communication Card

The PROFIBUS Communication Card is installed directly into the Base Control Module. To install the module, follow the step by step directions:

1. Remove the blank cover when the unit is not powered
2. Locate the communication card slot
3. Plug the PROFIBUS communication card into location

Figure 134. Installing the PROFIBUS Communication Card



PROFIBUS Communication Card & DIP Switches

The DIP Switches on the Base Control Module are used for two purposes when an optional PROFIBUS card is installed – to set the node address and baud rate for an optional Modbus port if included and for the PROFIBUS node address. Per the diagram, if the optional RS-485 Modbus serial port is present, DIP Switches 1 – 7 are used to determine the node address on both the PROFIBUS and Modbus serial protocols. When the Modbus serial port is present, it also uses switches 8 – 9 to set the baud rate for that port. If the optional Modbus serial port is not present, the DIP Switches are used for the PROFIBUS node address only. The C445 PROFIBUS card auto-detects the data rate set by the PROFIBUS master.

Supported PROFIBUS Data Rates

- 9600
- 19200
- 45450
- 93750
- 187500
- 500000
- 1.5M
- 3M
- 6M
- 12M

Figure 135. Base Control Module DIP Switches with PROFIBUS Card

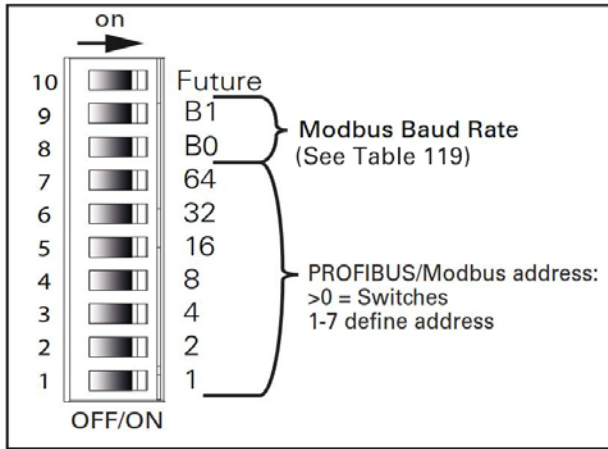


Table 120. Modbus Data Rate

| B1 | B0 | Rate |
|----|----|-----------------------|
| 0 | 0 | Software Configurable |
| 0 | 1 | 9600 |
| 1 | 0 | 115200 |
| 1 | 1 | 19200 |

PROFIBUS Cable Connection Options

The PROFIBUS card provides two options for PROFIBUS cable connections

1. PROFIBUS 9-pin D-SUB connector
2. 3-position screw connector with the following pin assignment:
 - Pin 1 – RxD/TxD negative (green)
 - Pin 2 – RxD/TxD positive (red)
 - Pin 3 – Protective Earth

Note: The DIP Switches located beside the 3-position connector are only used when the 3-position connector is used for connecting the card to the PROFIBUS network. These switches must be turned Off if the D-shell connector is used to connect this card to PROFIBUS. These switches are used to turn network termination On/Off. If the 3-position connector is used to connect the C445 PROFIBUS card to the PROFIBUS network and if this card is an end device on the network, turn both switches On to enable termination. Otherwise, turn both switches Off to disable termination.

PROFIBUS D-shell connector information is shown below.

Table 121. PROFIBUS D-Shell Connector Specifications

| Items | Value |
|----------------------|---|
| Terminal | DB9 connector (Female) or 5.00mm connector (male) |
| Data transfer method | RS-485 half-duplex |
| Cable | Twisted pair (1pair and shield) |
| Isolation | 500 Vdc |
| Protocol | PROFIBUS DP-V1 |
| Baud rate | 9.6K~12M |
| Addresses | 3~125 |

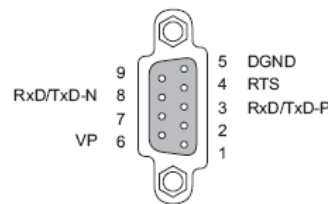


Table 122. DB-9 Connector

| Pin # | Purpose |
|---------|---|
| Housing | Shield, Connected to PE |
| 1 | Not used (or Shield, shield or protect GND) |
| 2 | Not used (or M24, Minus 24V output Voltage) |
| 3 | RXD/TXD-P, Positive of Receive or Transmit signal |
| 4 | RTS, Request To Send |
| 5 | DGND, GND of signal (Isolated GND from RS-485 side) |
| 6 | VP, +5V, (Voltage- Plus, Isolated 5V from RS-485side) |
| 7 | Not used (or P24, Plus 24V Output Voltage) |
| 8 | RXD/TXD-N, Negative of Receive or Transmit signal |
| 9 | Not used (or CNTR_N, Control-N) |

Configuring using the inControl software tool

There is a Modbus serial DTM/Driver for the inControl software tool. This DTM is used to communicate from a computer running the inControl software tool using either a USB to micro USB cable or a USB to RS-485 serial cable. These interfaces may be used to connect to the C445 Motor Management Relay. Refer to the inControl software tool user manual for additional information (publication MN040013EN).

Configuring using The C445 PROFIBUS GSD file

The GSD file for the C445 Motor Management Relay may be found at the Eaton website:

<http://www.eaton.com/C445>

This file is compatible with any PROFIBUS software used to configure a PROFIBUS network. It provides input/output information for cyclic polling, configuration file parameters and diagnostic data. It also contains parameter information that may be used for acyclic messaging.

PROFIBUS Card LED Definitions

Table 123. PROFIBUS Card LED Definitions

| State | Wait_Param state | Wait_CFG state | Data exchange | DP_Error state | Fault State |
|-----------------------------|----------------------------------|--------------------------|---------------|------------------------------------|---|
| PROFIBUS display state ① | No Communication, Master Offline | Communication No Data Ex | Everything OK | CFG_Error, Parameterization Error, | H/W ID Fault, Board revision Fault, Incorrect Slave address, Fault on BCM |
| LED Profibus Active (Green) | ON | ON | ON | ON | NA |
| LED_SF (Red) | OFF | OFF | OFF | OFF | ON |
| LED_BF (Red) | ON | Flashing (500 mSec) | OFF | Flashing (500 mSec) | NA |

Note

① In the table above, while there are only two LEDs, the LED labeled BF acts as both the Active and BF LED.

C445 Cyclic (Polling)

The most common way of exchanging data with the C445 is via cyclic messages from a PROFIBUS master. The master sends control data to the C445 and reads monitoring data from the C445. Typically the control information involves a single or more bytes to instruct the C445 to run the motor or reset a fault. Data read from the C445 typically involves running status and fault state, along with motor parameters such as motor current, voltage, power and so on. The GSD file for the C445, available from the Eaton website defines the cyclic modules used to read and write to a C445 by the PROFIBUS master. The GSD file is installed into the PROFIBUS master's programming software and used to configure the master for the data it will exchange with the C445.

The following are the various modules from the C445 GSD file:

| |
|--------------------------|
| Motor Management Profile |
| Cyclic Module 2 |
| Cyclic Module 3 |
| Cyclic Module 4 |
| Cyclic Module 5 |
| Cyclic Module 6 |
| Cyclic Module 7 |
| Cyclic Module 8 |
| Cyclic Module 9 |
| Cyclic Module 10 |
| Cyclic Module 11 |
| Cyclic Module 12 |
| Cyclic Module 13 |
| Cyclic Module 14 |
| Cyclic Module 15 |
| Cyclic Module 16 |
| Cyclic Module 17 |

Select a maximum of 2 cyclic modules, as long as only one of them includes output/control words. A maximum of 8 control words from any one cyclic module containing output data is allowed.

Each module contains a different number of input and/or output bytes. There are 16 different Modules, where any 1 or 2 of these modules may be selected for each C445.

Motor Management Profile as per IEC 61915-2, Command format 200 and Monitor Format 200

This profile is the only one that does not have selectable data. The I/O data is fixed. This profile includes the following:

Output data: The Motor Control Word (2 bytes).

Input data: The Motor Status word and Average Current Scaled (4 bytes total).

The Motor Control Word is defined as follows.

Bit 0: Run Reverse
 Bit 1: Reserved
 Bit 2: Run Forward
 Bit 3: Reserved
 Bit 4: Reserved
 Bit 5: Reserved
 Bit 6: Reset
 Bit 7: Reserved
 Bits 8-15: Reserved

The Motor Status Word is defined as follows:

Bit 0: Running Reverse
 Bit 1: Reserved
 Bit 2: Running Forward
 Bit 3: Overload Warning
 Bit 4: Reserved
 Bit 5: Reserved
 Bit 6: Fault
 Bit 7: Warning
 Bits 8-15: Reserved

Fieldbus Motor Control Word

This control word applies to all Cyclic Modules with output data except the Motor Management Profile shown above.

The Fieldbus Motor Control word is defined as follows:

- Bit 0: Run1
- Bit 1: Run2
- Bit 2: Switch To Remote
- Bit 3: Reset Fault
- Bit 4: Reserved
- Bit 5: Test Trip
- Bits 6-15: Reserved

Bit 2, the Switch To Remote bit is only active when the “Allow Remote Control Switch” parameter is Enabled. This parameter can be found in the Operation Mode category, in the Advanced parameters. This feature only works with the Fieldbus Motor Control word.

The Motor Control bits cannot be assigned if the Fieldbus Motor Control word is assigned.

If the Motor Control bits are assigned, then the Fieldbus Motor Control word should not be assigned. In addition, when the Motor Control bits are assigned, the first output word to the C445 is a control word based on the bit assignments. Subsequent word assignments such as assigning the System Services or digital or analog output words actually begin with the second output word sent to the C445.

Module 2: Cyclic Module 2

This profile includes one input byte. Each bit is selectable via the C445 GSD file installed in the PROFIBUS master’s configuration software tool.

Module 3: Cyclic Module 3

This profile includes 2 input bytes. Each bit is selectable via the C445 GSD file installed in the PROFIBUS master’s configuration software tool.

Module 4: Cyclic Module 4

This profile includes 1 output byte. The output data is under the “Slave” module, after the Configuration Parameters.

Module 5: Cyclic Module 5

This profile includes 2 output bytes. The output data is under the “Slave” module, after the Configuration Parameters.

Module 6: Cyclic Module 6

This profile includes 2 input bytes and 2 output bytes. The input data is selectable under the cyclic module in the PROFIBUS master’s programming software. The output data is under the “Slave” module, after the Configuration Parameters.

Module 7: Cyclic Module 7

This profile includes 8 input bytes and 4 output bytes. The input data is selectable under the cyclic module in the PROFIBUS master’s programming software. The output data is under the “Slave” module, after the Configuration Parameters.

Module 8: Cyclic Module 8

This profile includes total 6 output bytes and 10 input bytes. The input data is selectable under the cyclic module in the PROFIBUS master’s programming software. The output data is under the “Slave” module, after the Configuration Parameters.

Module 9: Cyclic Module 9

This profile includes 2 input bytes. 1 word parameter may be selected for the input data. The input data is selectable under the module in the PROFIBUS master’s programming software.

Module 10: Cyclic Module 10

This profile includes 4 input bytes. 2 word parameters may be selected for the input data. The input data is selectable under the module in the PROFIBUS master’s programming software.

Module 11: Cyclic Module 11

This profile includes 8 input bytes. 4 word parameters may be selected for the input data. The input data is selectable under the module in the PROFIBUS master's programming software.

Module 12: Cyclic Module 12

This profile includes 16 input bytes. 8 word parameters may be selected for the input data. The input data is selectable under the module in the PROFIBUS master's programming software.

Module 13: Cyclic Module 13

This profile includes 32 input bytes and 4 output bytes. The input data is selectable under the cyclic module in the PROFIBUS master's programming software. The output data is under the "Slave" module, after the Configuration Parameters.

Module 14: Cyclic Module 14

This profile includes 2 output bytes. 1 word parameter may be selected. This output data is selectable under the "Slave module in the PROFIBUS master's programming software.

Module 15: Cyclic Module 15

This profile includes 4 output bytes. 2 word parameters may be selected. This output data is selectable under the "Slave module in the PROFIBUS master's programming software.

Module 16: Cyclic Module 16

This profile includes 32 input bytes. 16 word parameters may be selected along with 16 input bytes where 8 word parameters may be selected. The input data is selectable under the cyclic module in the PROFIBUS master's programming software and the output data is under the "Slave" module itself, after the Configuration Parameters.

Module 17: Cyclic Module 17

This profile includes 64 input bytes. 32 word parameters may be selected along with 32 input bytes where 16 word parameters may be selected. The input data is selectable under the cyclic module in the PROFIBUS master's programming software and the output data is under the "Slave" module itself, after the Configuration Parameters.

Acyclic PROFIBUS Messages

The C445 supports the acyclic messages added with the DPV1 version of PROFIBUS. All parameters in the C445 are mapped using Modbus Register addresses. This register map can be found in **Appendix D**. Modbus commands and registers are used to read and write parameters for the C445 via acyclic PROFIBUS messages.

Reading Data from a C445 via Acyclic Messages

1. An acyclic write message must be sent by the master containing a Modbus read command.
2. An acyclic read message must be sent by the master to obtain the data.

Reading data:

1. Send an acyclic write message per the following:

Slot number (always 0 for the C445)

Index: 45

Data length including the Modbus command in bytes

Data Field:

- a. 03 Modbus Read command (1 byte)
 - b. Two bytes representing the Modbus register address in hexadecimal or decimal depending on what the master requires. (2 bytes)
 - c. Length of data to be read. This is the number of 16-bit registers being requested.
2. Send acyclic read message to obtain the requested data per the following:

Slot number (always 0 for the C445)

Index: 45

Data Length in bytes (example, if 1 register is being read, this length would be 2)

Writing data:

Only one step is needed to write data as follows:

Slot number (always 0 for the C445)

Index 45

Length in bytes, including the Modbus command in bytes

Data Field:

- a. 06 Modbus single register write command (1 byte)
- b. Two bytes representing the Modbus register address in hexadecimal or decimal depending on what the master requires. (2 bytes)
- c. The two bytes (1 word) of data

Appendix C—Optional Communication Cards

Acyclic Message Examples

Example #1: Read the Active Fault Code from the C445.

The Active Fault Code is Modbus register 312 (address = 311) from **Appendix D**. This register address is converted to two hexadecimal bytes and two decimal bytes below:

01 37 hexadecimal

01 55 decimal

Note: The byte format depends on the PROFIBUS master.

The following two acyclic messages must be sent by the PROFIBUS master to the C445 to read the Active Fault Code:

1. Acyclic write message:

Slot 0

Index 45

Length 4 bytes

03 Modbus read command

01 37 hex or 01 55 decimal

01 length (1 register to read)

2. Acyclic read message:

Slot 0

Index 45

Length 2 bytes

Example #2: Write to the Base Control Module Field Output Control word.

The Modbus register address for this parameter from **Appendix D** is 601 (address = 600). This register is converted to two hexadecimal bytes or two decimal bytes below:

02 58 hexadecimal

02 88 decimal

Note: The byte format depends on the PROFIBUS master.

The following acyclic message must be sent to write a value of 128 to the System Services register to issue a Soft Reset (bit 6 = 1, so the value is 64 decimal).

1. Acyclic write message:

Slot 0

Index 45

Length 5 bytes

Data Field:

06 Command

02 58 hexadecimal or 02 88 decimal

Data: 00 40 hexadecimal or 00 64 decimal

PROFIBUS Diagnostics

The C445 PROFIBUS communication card uses extended diagnostics to provide the status information along with fault and warning data relevant to the operation of the system.

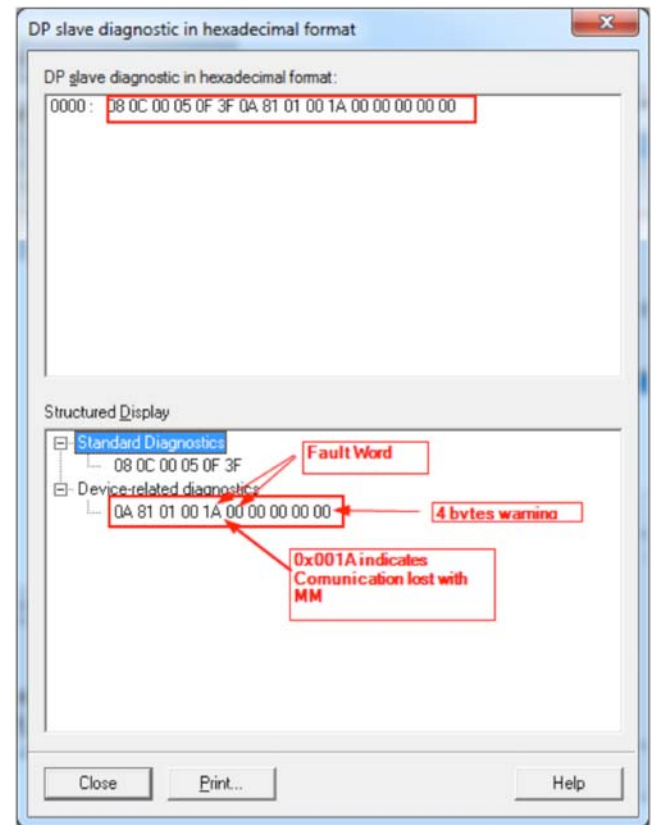
Any time a fault condition is present in the system, the “ext.diag.” bit (bit3 in first diagnostic data byte) will be set high, indicating to the Master, a high level diagnostic message and fault is present. The C445 PROFIBUS communication card will also set the appropriate word/bit/bits in diagnostic data bytes 11 and 16 to indicate to the user the reason for the fault/warning condition.

When the fault condition is cleared, the “ext. diag.” bit (bit3 in first diagnostic data byte) will also clear, indicating to the Master that the C445 system is healthy and ready for operation.

Table 124. C445 Diagnostic Telegram Details

| Byte No. | Description |
|----------|--|
| 1 to 6 | PROFIBUS DP standard diagnostics |
| 7 to 10 | Extended diagnostics header |
| 11 to 12 | Active Fault Code (Modbus Register No.312) |
| 13 to 16 | Warning Status Bits (Modbus Register No.318) |

Below picture shows how diagnostics message is sent to Master.



Extended diagnostics frame has 10 bytes where first 4 bytes are header followed by 6 bytes fault and warning data. For example in above picture 0A 81 01 00 bytes are header information. 1A 00 00 00 00 00 are diagnostics information where 1A 00 forms a fault code word 0x001A, which means Communication lost with MM. 00 00 00 00 are the warning bits per Modbus register 318. When there is no fault or warning in the system, all 6 bytes of diagnostics data will be 0.

Optional Features

Freeze Mode

Freeze Mode is supported in the C445 PROFIBUS communication card.

Sync Mode

Sync Mode is supported in the C445 PROFIBUS communication card.

Fail Safe Mode

Fail Safe Mode is supported in the C445 PROFIBUS communication card. On the reception of a Clear Data frame from the Master, the C445 PROFIBUS communication module outputs will go to fail safe mode—outputs disabled.

C445 PROFIBUS Configuration File

PROFIBUS communication uses “User Parameterization” to configure the device. C445 PROFIBUS card has several parameters added to “User Parameterization” to aid the configuration. At situations when user does not want PROFIBUS to do the configuration, this configuration can be disabled by parameter “Parameterization Download Enable.”

Table 125. PROFIBUS Configuration File

| Operation Mode | Operation Mode |
|--|---|
| Parameterization Download Enable | Protection I Unbalance Alarm Percent Level |
| Active Starter Profile | Protection Stall Trip Level |
| Remote Control Source Select | Protection Jam Trip Level |
| Local Motor Control Select | Protection Jam Alarm Level |
| Motor Control Communication Loss Behavior | Motor Overload Alarm Threshold |
| Motor Control Network Idle Behavior | Residual Ground Fault Threshold - Scaled |
| Delay before control fault is issued (in 10ms) | Residual Ground Fault Alarm Threshold - Scaled |
| Interlocking time between contactor direction changes (in 0.1sec) | Residual Ground Fault Start Delay |
| Output function select 0 | Residual Ground Fault Apply Inhibit Current |
| Output function select 1 | Protection UnderVoltage Alarm Level |
| Output function select 2 | Protection UnderVoltage Start Delay |
| Latching Relay Behavior at Power-down | Protection UnderVoltage Trip Level |
| Motor Overload Trip Class | Protection V Unbalance Trip Percent Level |
| Motor Overload Trip FLA Motor1 | Protection V Unbalance Alarm Percent Level |
| Motor Overload Trip FLA Motor2 | Protection V Unbalance Trip Debounce Time |
| Rated Voltage | Protection OverVoltage Alarm Level |
| Rated Freq | Protection OverVoltage Trip Level |
| Motor Rated Efficiency | Protection OverVoltage Trip Level |
| Motor Rated Watts Motor1 | Protection High KW Alarm Level |
| Motor Rated Watts Motor2 | Protection High KW Trip Level |
| Global Auto Reset Enable (boolean) | Protection Low KW Alarm Level |
| Motor Rated PF | Protection Low KW Trip Time Debounce |
| Motor Rated Service Factor | Protection Low KW Trip Level |
| Phase Rotation | Peak Demand Warning Threshold |
| Perform reset on power up. | Protection Under Voltage Restart Fault Level (Percent) |
| Auto reset enable capability for each trip bit | Undervoltage restart max time for delayed restart long |
| Reset time delay. The amount of time to wait until we do an auto reset | Undervoltage restart delay long |
| Trip Enable Bit Field | Undervoltage restart delay short |
| Warn Enable Bit Field | Protection Under Voltage Restart Restoration Level (Percent) |
| Protection Instantaneous Overcurrent Alarm Level | Undervoltage restart max time for delayed restart short |
| Protection Instantaneous Overcurrent Start Delay | Undervoltage restart max time for immediate restart |
| Protection Instantaneous Overcurrent Trip Level | Backspin reset inhibit time |
| Protection UnderCurrent Alarm Level | Number of Starts per Hour allowed before trip |
| Protection UnderCurrent Trip Level | Motor State time delay after which the RUN state is declared if not reached via current thresholds. |
| Protection I Unbalance Trip Percent Level | Protection start inhibit enable |

C445 PROFIBUS Bit Mapping Parameters

C445 has option of mapping individual bits in input/output modules. Below are the bits available for bit mapping.

C445 PROFIBUS Cyclic/Acyclic Writable Parameters

Table 126. Bit Mapping Parameters for Cyclic/Acyclic Writable Parameters

| Bit Description | Parameter Description |
|---------------------------|--------------------------|
| Run 1 | Fieldbus Motor Control |
| Run 2 | Fieldbus Motor Control |
| Reserved | Fieldbus Motor Control |
| Fault Reset | Fieldbus Motor Control |
| Reserved | Fieldbus Motor Control |
| Test Trip | Fieldbus Motor Control |
| Reserved | Fieldbus Motor Control |
| Reserved | Fieldbus Motor Control |
| BCM Field Output control0 | BCM Field Output control |
| BCM Field Output control1 | BCM Field Output control |
| BCM Field Output control2 | BCM Field Output control |
| BCM Field Output control3 | BCM Field Output control |

Note: For more information about any of the parameters listed above, refer to **System Configuration and Commissioning** on **Page 45** or **Appendix E**.

Table 127. Fieldbus Motor Control Bits

| Bit Position | Bit Description |
|--------------|------------------|
| Bit 0 | Run 1 |
| Bit 1 | Run 2 |
| Bit 2 | Switch to Remote |
| Bit 3 | Fault Reset |
| Bit 4 | Reserved |
| Bit 5 | Test Trip |
| Bit 6 | Reserved |
| Bit 7 | Reserved |

C445 PROFIBUS Cyclic/Acyclic Readable Parameters

Table 128. Bit Mapping Parameters for Cyclic/Acyclic Readable Parameters

| Bit Description | Parameter Description |
|-----------------|-----------------------|
| Running 1 | Status Word |
| Running 2 | Status Word |
| Remote Enabled | Status Word |
| Faulted | Status Word |
| Warning | Status Word |
| Inhibited | Status Word |
| Ready | Status Word |
| Up to Speed | Status Word |

System Services is one of the selections for an output data word. The following are decimal values that when sent to the C445 with the System Services word cause the C445 to perform the designated function:

- 0: No Active Service
- 1: Clear Fault Queue
- 2: Clear Trip Snapshot
- 3: Test Trip
- 4: Re-pair external modules
- 5: Factory Reset
- 6: Soft Reset
- 7: Reset Fault
- 8: Proof Test

BCM Field Output Control Word is one of the selections for an output data word. The following are the bits that control the 3 outputs on the Base Control Module:

- Bit 0: Output 1
- Bit 1: Output 2
- Bit 2: Output 3 (if a Base Control Module with the latching relay option is being used, this bit is used to Set this output)
- Bit 3: This bit is only used when a BCM with the latching relay option is used. This bit resets the latching relay output.

Appendix C—Optional Communication Cards

Table 129. PROFIBUS Cyclic/Acyclic Readable Parameters

| Parameter Description |
|--|
| Motor Control Status (Running1, Running2, Auto, Tripped, Warned) |
| Active Fault |
| Active Inhibit |
| Active Warning |
| Motor Current Phase A - Scaled |
| Motor Current Average Percent FLA |
| Motor Current Average - Scaled |
| Motor Current Phase B - Scaled |
| Motor Current Phase C - Scaled |
| Motor Current Scale Factor |
| Motor I Unbalance Percent |
| Line Frequency - Scaled |
| Line Voltage LL Phases AB |
| Line Voltage LL Average |
| Line Voltage LL Phases BC |
| Line Voltage LL Phases CA |
| Line V Unbalance Percent |
| Power Apparent Power Factor |
| Efficiency in percent |
| Config Inhibit Reason |
| Motor State (enum) |
| Number of Contactor Operations During Last Hour |
| Thermal memory Percent |
| BCM Control Voltage (24VDC) |
| Fault Snap Shot Log Day |
| Fault Snap Shot Log Hour |
| Fault Snap Shot Log Minute |
| Fault Snap Shot Log Month |
| Fault Snap Shot Log Second |
| Fault Snap Shot Log Year |
| Digital Input Status |
| Line Voltage Phase Order |
| GF Residual - RMS |
| PTC Status |
| Torque |
| Motor Rated Speed Active |
| MM Voltage Scale Factor |
| Proof Test Status |

Appendix D—Modbus Register Map

C445 Modbus Register Map

Table 130. C445 Modbus Register Map

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|----------------------------|------------------------------------|--|-----|-------------|------|---|-----------|------|---|-----------|------|---|----------------|------|---|---------|------|---|---------|------|---|-----------|------|---|-------|------|---|----------------|------|
| 300 | Motor Control Status | BYTE RO Bitfield | Present Motor Control Status Bits (Running1, Running2, Remote, Tripped, Warned). <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Running 1</td> <td>4785</td> </tr> <tr> <td>1</td> <td>Running 2</td> <td>4786</td> </tr> <tr> <td>2</td> <td>Remote enabled</td> <td>4787</td> </tr> <tr> <td>3</td> <td>Faulted</td> <td>4788</td> </tr> <tr> <td>4</td> <td>Warning</td> <td>4789</td> </tr> <tr> <td>5</td> <td>Inhibited</td> <td>4790</td> </tr> <tr> <td>6</td> <td>Ready</td> <td>4791</td> </tr> <tr> <td>7</td> <td>Motor at speed</td> <td>4792</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Running 1 | 4785 | 1 | Running 2 | 4786 | 2 | Remote enabled | 4787 | 3 | Faulted | 4788 | 4 | Warning | 4789 | 5 | Inhibited | 4790 | 6 | Ready | 4791 | 7 | Motor at speed | 4792 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Running 1 | 4785 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Running 2 | 4786 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Remote enabled | 4787 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Faulted | 4788 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Warning | 4789 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Inhibited | 4790 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Ready | 4791 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Motor at speed | 4792 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 301 | I Phase A (L1) Scaled | UINT16 RO Units: scaled A | Phase A (L1) Motor Current Scaled. Scaled by parameter "I Scale Factor". | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 302 | I Phase B (L2) Scaled | UINT16 RO Units: scaled A | Phase B (L2) Motor Current Scaled. Scaled by parameter "I Scale Factor". | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 303 | I Phase C (L3) Scaled | UINT16 RO Units: scaled A | Phase C (L3) Motor Current Scaled. Scaled by parameter "I Scale Factor". | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 304 | Avg Current Scaled | UINT16 RO Units: scaled A | Average motor Current Scaled. Scaled by parameter "I Scale Factor". | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 305 | I Scale Factor | UINT16 RO | This scale factor is applied to all current values monitored via a communication network. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 306 | Current Unbalance | UINT8 RO Units: % | Motor Current Unbalance Percent | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 307 | GF Current RMS Scaled | UINT16 RO Units: scaled A | Motor Ground Fault scaled current RMS. Scaled by parameter "I Scale Factor". | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 308 | Thermal Capacity | UINT8 RO Default: 0 Units: % | Thermal Capacity in Percent - An overload trip occurs when the Thermal Capacity reaches 100%. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 309 | Time to Trip Overload | UINT16 RO Units: seconds | Estimated Time for Overload to Reach Trip Threshold (100% Thermal Memory) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 310 | Remaining Thermal Capacity | UINT8 RO Units: % | Thermal Capacity (Percent) Remaining to Trip | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 311 | Time to Reset Overload | UINT16 RO Units: seconds | Time for overload to reach reset threshold. The Thermal Memory must drop below 75% (default value) before a reset is allowed. | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--|---------------------------------|---|-------|-------------|---|-----------|---|---------------|---|--------------|---|----------|---|----------------------|---|--------------------|---|-------------------|---|----------------------------|---|-----|---|--------------|----|--------------------|----|-------------------|----|--------------------------|----|--------------------------|----|---------------|----|------------|----|-----------|----|--------------------|----|----------|----|----------|----|-------|----|-------------------------|----|---------------------------------|----|-----------------------|----|--------------------------|----|---------------------------------------|----|--|----|--|----|-------------------------|----|---|----|---|----|--|----|--|----|---|----|---|----|---|----|---|----|--|
| 312 | Active Fault | UINT16 RO Default: 0 Enum | Current Active Fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>0</td><td>No Faults</td></tr> <tr><td>1</td><td>Under voltage</td></tr> <tr><td>2</td><td>Over voltage</td></tr> <tr><td>3</td><td>Reserved</td></tr> <tr><td>4</td><td>Ground current fault</td></tr> <tr><td>5</td><td>Current phase loss</td></tr> <tr><td>6</td><td>Current unbalance</td></tr> <tr><td>7</td><td>Instantaneous over current</td></tr> <tr><td>8</td><td>Jam</td></tr> <tr><td>9</td><td>PF Deviation</td></tr> <tr><td>10</td><td>Voltage phase loss</td></tr> <tr><td>11</td><td>Voltage unbalance</td></tr> <tr><td>12</td><td>Frequency deviation fast</td></tr> <tr><td>13</td><td>Frequency deviation slow</td></tr> <tr><td>14</td><td>Under current</td></tr> <tr><td>15</td><td>High power</td></tr> <tr><td>16</td><td>Low power</td></tr> <tr><td>17</td><td>Contactora failure</td></tr> <tr><td>18</td><td>Reserved</td></tr> <tr><td>19</td><td>Overload</td></tr> <tr><td>20</td><td>Stall</td></tr> <tr><td>21</td><td>Phase rotation mismatch</td></tr> <tr><td>22</td><td>PTC - See PTC State for details</td></tr> <tr><td>23</td><td>Under voltage restart</td></tr> <tr><td>24</td><td>Measurement Module fault</td></tr> <tr><td>25</td><td>Communication loss on active fieldbus</td></tr> <tr><td>26</td><td>Measurement Module not available or communication loss with the module</td></tr> <tr><td>27</td><td>User Interface not available or communication loss with the module</td></tr> <tr><td>28</td><td>Test trip was triggered</td></tr> <tr><td>29</td><td>Option Card not available or communication loss with the module</td></tr> <tr><td>30</td><td>RTC / Backup Memory Option Board NV memory fail</td></tr> <tr><td>31</td><td>Currently connected User Interface does not match with what was connected before</td></tr> <tr><td>32</td><td>Currently connected Measurement Module does not match with what was connected before</td></tr> <tr><td>33</td><td>Currently connected Option Card does not match with what was connected before</td></tr> <tr><td>34</td><td>Measurement Module firmware is incompatible</td></tr> <tr><td>35</td><td>User Interface firmware is incompatible</td></tr> <tr><td>36</td><td>Ethernet Option Card firmware is incompatible</td></tr> <tr><td>37</td><td>Profi Option Card firmware is incompatible</td></tr> </tbody> </table> | Value | Description | 0 | No Faults | 1 | Under voltage | 2 | Over voltage | 3 | Reserved | 4 | Ground current fault | 5 | Current phase loss | 6 | Current unbalance | 7 | Instantaneous over current | 8 | Jam | 9 | PF Deviation | 10 | Voltage phase loss | 11 | Voltage unbalance | 12 | Frequency deviation fast | 13 | Frequency deviation slow | 14 | Under current | 15 | High power | 16 | Low power | 17 | Contactora failure | 18 | Reserved | 19 | Overload | 20 | Stall | 21 | Phase rotation mismatch | 22 | PTC - See PTC State for details | 23 | Under voltage restart | 24 | Measurement Module fault | 25 | Communication loss on active fieldbus | 26 | Measurement Module not available or communication loss with the module | 27 | User Interface not available or communication loss with the module | 28 | Test trip was triggered | 29 | Option Card not available or communication loss with the module | 30 | RTC / Backup Memory Option Board NV memory fail | 31 | Currently connected User Interface does not match with what was connected before | 32 | Currently connected Measurement Module does not match with what was connected before | 33 | Currently connected Option Card does not match with what was connected before | 34 | Measurement Module firmware is incompatible | 35 | User Interface firmware is incompatible | 36 | Ethernet Option Card firmware is incompatible | 37 | Profi Option Card firmware is incompatible |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | No Faults | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Under voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Over voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Ground current fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Current phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Current unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Instantaneous over current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Jam | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | PF Deviation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Voltage phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Frequency deviation fast | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Frequency deviation slow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Under current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | High power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Contactora failure | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Overload | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Stall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | Phase rotation mismatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | PTC - See PTC State for details | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Under voltage restart | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | Measurement Module fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | Communication loss on active fieldbus | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | Measurement Module not available or communication loss with the module | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | User Interface not available or communication loss with the module | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | Test trip was triggered | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | Option Card not available or communication loss with the module | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | RTC / Backup Memory Option Board NV memory fail | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | Currently connected User Interface does not match with what was connected before | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | Currently connected Measurement Module does not match with what was connected before | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | Currently connected Option Card does not match with what was connected before | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | Measurement Module firmware is incompatible | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | User Interface firmware is incompatible | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | Ethernet Option Card firmware is incompatible | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | Profi Option Card firmware is incompatible | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|---------------------------------|---|-------|-------------|----|--|----|---|----|--|----|---------------------------|----|------------------------------|----|--|----|---------------------------|-----|----------------------|-----|---------------------------|-----|----------------------------|-----|-----------------------------|-----|------------------------------|-----|-----------------------|-----|----------------------------|-----|---------------------------|-----|------------------------|-----|-----------------------|-----|---------------------|-----|---|-----|------------------------------------|-----|-----------------------------|-----|------------------------|-----|-----------------------|-----|------------------|-----|--|-----|--------------------------------|-----|---|-----|--|-----|---|-----|--|-----|--|-----|---|-----|---|-----|--|-----|--|-----|---|-----|--|-----|-------------------------------|-----|--|-----|--------------------------------|
| 312 | Active Fault | UINT16 RO Default: 0 Enum | Current Active Fault, continued | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>38</td><td>Ground Fault Module firmware is incompatible</td></tr> <tr><td>39</td><td>External ground fault module not available or</td></tr> <tr><td>40</td><td>Currently connected Ground Fault Module does not match current configuration</td></tr> <tr><td>41</td><td>GFM CT connection is open</td></tr> <tr><td>42</td><td>GFM CT connection is shorted</td></tr> <tr><td>43</td><td>GFM CT input has no calibration values</td></tr> <tr><td>44</td><td>HRGF pulse detection trip</td></tr> <tr><td>200</td><td>Logic Internal Fault</td></tr> <tr><td>201</td><td>Logic call stack overflow</td></tr> <tr><td>202</td><td>Logic call stack underflow</td></tr> <tr><td>203</td><td>Logic memory read violation</td></tr> <tr><td>204</td><td>Logic memory write violation</td></tr> <tr><td>205</td><td>Logic invalid program</td></tr> <tr><td>206</td><td>Logic incompatible program</td></tr> <tr><td>207</td><td>Logic invalid instruction</td></tr> <tr><td>220</td><td>Logic program underrun</td></tr> <tr><td>221</td><td>Logic program overrun</td></tr> <tr><td>222</td><td>Logic task watchdog</td></tr> <tr><td>223</td><td>Logic instruction invalid instance number</td></tr> <tr><td>224</td><td>Logic instruction invalid argument</td></tr> <tr><td>225</td><td>Logic math - divide by zero</td></tr> <tr><td>226</td><td>Logic math - underflow</td></tr> <tr><td>227</td><td>Logic math - overflow</td></tr> <tr><td>228</td><td>ELC IO Comm Loss</td></tr> <tr><td>229</td><td>ELC IO is connected but unable to read/write</td></tr> <tr><td>230</td><td>Generic Modbus Slave Comm Loss</td></tr> <tr><td>231</td><td>Generic Modbus slave device is connected but read/write returned an error</td></tr> <tr><td>232</td><td>Logic Program accessing ELC IO but ELC IO not configured</td></tr> <tr><td>500</td><td>Internal - communication loss with Power Supply Board</td></tr> <tr><td>501</td><td>Internal - Power Supply Board is not responding to SPI</td></tr> <tr><td>502</td><td>Internal - Checksums in NV memory (FRAM) didn't match during read (neither pair)</td></tr> <tr><td>503</td><td>Internal - Checksums in NV memory (FRAM) didn't match during write (neither pair)</td></tr> <tr><td>504</td><td>Internal - RTC / Backup Memory Option Card is missing</td></tr> <tr><td>505</td><td>Internal - RTC / Backup Memory Option Card does not match actual</td></tr> <tr><td>506</td><td>Internal - RTC / Backup Memory Option Card has NV Fault.</td></tr> <tr><td>507</td><td>Internal - serial flash memory fault (Attempt Factory Reset first. Return to manufacturer if not cleared)</td></tr> <tr><td>508</td><td>Internal - logic mapping error (Attempt factory reset)</td></tr> <tr><td>509</td><td>Internal - UI NV memory error</td></tr> <tr><td>510</td><td>Internal - Option card NV memory error</td></tr> <tr><td>511</td><td>Internal - GFM NV memory error</td></tr> </tbody> </table> | Value | Description | 38 | Ground Fault Module firmware is incompatible | 39 | External ground fault module not available or | 40 | Currently connected Ground Fault Module does not match current configuration | 41 | GFM CT connection is open | 42 | GFM CT connection is shorted | 43 | GFM CT input has no calibration values | 44 | HRGF pulse detection trip | 200 | Logic Internal Fault | 201 | Logic call stack overflow | 202 | Logic call stack underflow | 203 | Logic memory read violation | 204 | Logic memory write violation | 205 | Logic invalid program | 206 | Logic incompatible program | 207 | Logic invalid instruction | 220 | Logic program underrun | 221 | Logic program overrun | 222 | Logic task watchdog | 223 | Logic instruction invalid instance number | 224 | Logic instruction invalid argument | 225 | Logic math - divide by zero | 226 | Logic math - underflow | 227 | Logic math - overflow | 228 | ELC IO Comm Loss | 229 | ELC IO is connected but unable to read/write | 230 | Generic Modbus Slave Comm Loss | 231 | Generic Modbus slave device is connected but read/write returned an error | 232 | Logic Program accessing ELC IO but ELC IO not configured | 500 | Internal - communication loss with Power Supply Board | 501 | Internal - Power Supply Board is not responding to SPI | 502 | Internal - Checksums in NV memory (FRAM) didn't match during read (neither pair) | 503 | Internal - Checksums in NV memory (FRAM) didn't match during write (neither pair) | 504 | Internal - RTC / Backup Memory Option Card is missing | 505 | Internal - RTC / Backup Memory Option Card does not match actual | 506 | Internal - RTC / Backup Memory Option Card has NV Fault. | 507 | Internal - serial flash memory fault (Attempt Factory Reset first. Return to manufacturer if not cleared) | 508 | Internal - logic mapping error (Attempt factory reset) | 509 | Internal - UI NV memory error | 510 | Internal - Option card NV memory error | 511 | Internal - GFM NV memory error |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | Ground Fault Module firmware is incompatible | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | External ground fault module not available or | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | Currently connected Ground Fault Module does not match current configuration | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | GFM CT connection is open | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | GFM CT connection is shorted | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | GFM CT input has no calibration values | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | HRGF pulse detection trip | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 200 | Logic Internal Fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 201 | Logic call stack overflow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 202 | Logic call stack underflow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 203 | Logic memory read violation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 204 | Logic memory write violation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 205 | Logic invalid program | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 206 | Logic incompatible program | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 207 | Logic invalid instruction | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 220 | Logic program underrun | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 221 | Logic program overrun | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 222 | Logic task watchdog | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 223 | Logic instruction invalid instance number | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 224 | Logic instruction invalid argument | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 225 | Logic math - divide by zero | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 226 | Logic math - underflow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 227 | Logic math - overflow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 228 | ELC IO Comm Loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 229 | ELC IO is connected but unable to read/write | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 230 | Generic Modbus Slave Comm Loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 231 | Generic Modbus slave device is connected but read/write returned an error | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 232 | Logic Program accessing ELC IO but ELC IO not configured | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 500 | Internal - communication loss with Power Supply Board | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 501 | Internal - Power Supply Board is not responding to SPI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 502 | Internal - Checksums in NV memory (FRAM) didn't match during read (neither pair) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 503 | Internal - Checksums in NV memory (FRAM) didn't match during write (neither pair) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 504 | Internal - RTC / Backup Memory Option Card is missing | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 505 | Internal - RTC / Backup Memory Option Card does not match actual | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 506 | Internal - RTC / Backup Memory Option Card has NV Fault. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 507 | Internal - serial flash memory fault (Attempt Factory Reset first. Return to manufacturer if not cleared) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 508 | Internal - logic mapping error (Attempt factory reset) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 509 | Internal - UI NV memory error | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 510 | Internal - Option card NV memory error | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 511 | Internal - GFM NV memory error | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---------------------|---------------------------------|--|-------|-------------|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|
| 312 | Active Fault | UINT16 RO Default: 0 Enum | Current Active Fault, continued | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>1000</td><td>Logic User Fault 1</td></tr> <tr><td>1001</td><td>Logic User Fault 2</td></tr> <tr><td>1002</td><td>Logic User Fault 3</td></tr> <tr><td>1003</td><td>Logic User Fault 4</td></tr> <tr><td>1004</td><td>Logic User Fault 5</td></tr> <tr><td>1005</td><td>Logic User Fault 6</td></tr> <tr><td>1006</td><td>Logic User Fault 7</td></tr> <tr><td>1007</td><td>Logic User Fault 8</td></tr> <tr><td>1008</td><td>Logic User Fault 9</td></tr> <tr><td>1009</td><td>Logic User Fault 10</td></tr> <tr><td>1010</td><td>Logic User Fault 11</td></tr> <tr><td>1011</td><td>Logic User Fault 12</td></tr> <tr><td>1012</td><td>Logic User Fault 13</td></tr> <tr><td>1013</td><td>Logic User Fault 14</td></tr> <tr><td>1014</td><td>Logic User Fault 15</td></tr> <tr><td>1015</td><td>Logic User Fault 16</td></tr> <tr><td>1016</td><td>Logic User Fault 17</td></tr> <tr><td>1017</td><td>Logic User Fault 18</td></tr> <tr><td>1018</td><td>Logic User Fault 19</td></tr> <tr><td>1019</td><td>Logic User Fault 20</td></tr> <tr><td>1020</td><td>Logic User Fault 21</td></tr> <tr><td>1021</td><td>Logic User Fault 22</td></tr> <tr><td>1022</td><td>Logic User Fault 23</td></tr> <tr><td>1023</td><td>Logic User Fault 24</td></tr> <tr><td>1024</td><td>Logic User Fault 25</td></tr> <tr><td>1025</td><td>Logic User Fault 26</td></tr> <tr><td>1026</td><td>Logic User Fault 27</td></tr> <tr><td>1027</td><td>Logic User Fault 28</td></tr> <tr><td>1028</td><td>Logic User Fault 29</td></tr> <tr><td>1029</td><td>Logic User Fault 30</td></tr> <tr><td>1030</td><td>Logic User Fault 31</td></tr> <tr><td>1031</td><td>Logic User Fault 32</td></tr> <tr><td>1032</td><td>Logic User Fault 33</td></tr> <tr><td>1033</td><td>Logic User Fault 34</td></tr> <tr><td>1034</td><td>Logic User Fault 35</td></tr> <tr><td>1035</td><td>Logic User Fault 36</td></tr> <tr><td>1036</td><td>Logic User Fault 37</td></tr> <tr><td>1037</td><td>Logic User Fault 38</td></tr> <tr><td>1038</td><td>Logic User Fault 39</td></tr> <tr><td>1039</td><td>Logic User Fault 40</td></tr> <tr><td>1040</td><td>Logic User Fault 41</td></tr> <tr><td>1041</td><td>Logic User Fault 42</td></tr> <tr><td>1042</td><td>Logic User Fault 43</td></tr> </tbody> </table> | Value | Description | 1000 | Logic User Fault 1 | 1001 | Logic User Fault 2 | 1002 | Logic User Fault 3 | 1003 | Logic User Fault 4 | 1004 | Logic User Fault 5 | 1005 | Logic User Fault 6 | 1006 | Logic User Fault 7 | 1007 | Logic User Fault 8 | 1008 | Logic User Fault 9 | 1009 | Logic User Fault 10 | 1010 | Logic User Fault 11 | 1011 | Logic User Fault 12 | 1012 | Logic User Fault 13 | 1013 | Logic User Fault 14 | 1014 | Logic User Fault 15 | 1015 | Logic User Fault 16 | 1016 | Logic User Fault 17 | 1017 | Logic User Fault 18 | 1018 | Logic User Fault 19 | 1019 | Logic User Fault 20 | 1020 | Logic User Fault 21 | 1021 | Logic User Fault 22 | 1022 | Logic User Fault 23 | 1023 | Logic User Fault 24 | 1024 | Logic User Fault 25 | 1025 | Logic User Fault 26 | 1026 | Logic User Fault 27 | 1027 | Logic User Fault 28 | 1028 | Logic User Fault 29 | 1029 | Logic User Fault 30 | 1030 | Logic User Fault 31 | 1031 | Logic User Fault 32 | 1032 | Logic User Fault 33 | 1033 | Logic User Fault 34 | 1034 | Logic User Fault 35 | 1035 | Logic User Fault 36 | 1036 | Logic User Fault 37 | 1037 | Logic User Fault 38 | 1038 | Logic User Fault 39 | 1039 | Logic User Fault 40 | 1040 | Logic User Fault 41 | 1041 | Logic User Fault 42 | 1042 | Logic User Fault 43 |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1000 | Logic User Fault 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1001 | Logic User Fault 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1002 | Logic User Fault 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1003 | Logic User Fault 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1004 | Logic User Fault 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1005 | Logic User Fault 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1006 | Logic User Fault 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1007 | Logic User Fault 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1008 | Logic User Fault 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1009 | Logic User Fault 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1010 | Logic User Fault 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1011 | Logic User Fault 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1012 | Logic User Fault 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1013 | Logic User Fault 14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1014 | Logic User Fault 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1015 | Logic User Fault 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1016 | Logic User Fault 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1017 | Logic User Fault 18 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1018 | Logic User Fault 19 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1019 | Logic User Fault 20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1020 | Logic User Fault 21 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1021 | Logic User Fault 22 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1022 | Logic User Fault 23 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1023 | Logic User Fault 24 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1024 | Logic User Fault 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1025 | Logic User Fault 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1026 | Logic User Fault 27 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1027 | Logic User Fault 28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1028 | Logic User Fault 29 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1029 | Logic User Fault 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1030 | Logic User Fault 31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1031 | Logic User Fault 32 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1032 | Logic User Fault 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1033 | Logic User Fault 34 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1034 | Logic User Fault 35 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1035 | Logic User Fault 36 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1036 | Logic User Fault 37 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1037 | Logic User Fault 38 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1038 | Logic User Fault 39 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1039 | Logic User Fault 40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1040 | Logic User Fault 41 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1041 | Logic User Fault 42 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1042 | Logic User Fault 43 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|---------------------------------|--|-------|-------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|------------------------|------|---------------------|------|---------------------|---|----------------------------|---|-----|---|--------------|----|--------------------|----|-------------------|----|--------------------------|----|--------------------------|----|---------------|----|------------|----|-----------|----|--------------------|----|-----------------------|----|----------|----|-------|----|-------------------------|----|---------------------------------|----|-------------|----|----------------------------|----|---|----|---|----|---------------------------------|----|-----------------------------|----|-----------------------------|----|--------------------------------------|----|--|
| 312 | Active Fault | UINT16 RO Default: 0 Enum | Current Active Fault, continued <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>1043</td><td>Logic User Fault 44</td></tr> <tr><td>1044</td><td>Logic User Fault 45</td></tr> <tr><td>1045</td><td>Logic User Fault 46</td></tr> <tr><td>1046</td><td>Logic User Fault 47</td></tr> <tr><td>1047</td><td>Logic User Fault 48</td></tr> <tr><td>1048</td><td>Logic User Fault 49</td></tr> <tr><td>1049</td><td>Logic User Fault 50</td></tr> </tbody> </table> | Value | Description | 1043 | Logic User Fault 44 | 1044 | Logic User Fault 45 | 1045 | Logic User Fault 46 | 1046 | Logic User Fault 47 | 1047 | Logic User Fault 48 | 1048 | Logic User Fault 49 | 1049 | Logic User Fault 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1043 | Logic User Fault 44 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1044 | Logic User Fault 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1045 | Logic User Fault 46 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1046 | Logic User Fault 47 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1047 | Logic User Fault 48 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1048 | Logic User Fault 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1049 | Logic User Fault 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 313 | Active Warning | UINT16 RO Enum | Current Active Warning <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>0</td><td>No Warnings</td></tr> <tr><td>1</td><td>Under voltage</td></tr> <tr><td>2</td><td>Over voltage</td></tr> <tr><td>3</td><td>Reserved</td></tr> <tr><td>4</td><td>Ground current warning</td></tr> <tr><td>5</td><td>Current phase loss</td></tr> <tr><td>6</td><td>Current unbalance</td></tr> <tr><td>7</td><td>Instantaneous over current</td></tr> <tr><td>8</td><td>Jam</td></tr> <tr><td>9</td><td>PF Deviation</td></tr> <tr><td>10</td><td>Voltage phase loss</td></tr> <tr><td>11</td><td>Voltage unbalance</td></tr> <tr><td>12</td><td>Frequency deviation fast</td></tr> <tr><td>13</td><td>Frequency deviation slow</td></tr> <tr><td>14</td><td>Under current</td></tr> <tr><td>15</td><td>High power</td></tr> <tr><td>16</td><td>Low power</td></tr> <tr><td>17</td><td>Contactors failure</td></tr> <tr><td>18</td><td>Starts limit exceeded</td></tr> <tr><td>19</td><td>Overload</td></tr> <tr><td>20</td><td>Stall</td></tr> <tr><td>21</td><td>Phase rotation mismatch</td></tr> <tr><td>22</td><td>PTC - See PTC State for details</td></tr> <tr><td>23</td><td>Peak demand</td></tr> <tr><td>24</td><td>Measurement Module warning</td></tr> <tr><td>25</td><td>Real Time Clock requires setting (has not been set)</td></tr> <tr><td>26</td><td>RTC Battery Low. Replacement is recommended</td></tr> <tr><td>27</td><td>Device ambient temperature high</td></tr> <tr><td>28</td><td>MM high ambient temperature</td></tr> <tr><td>29</td><td>UI high ambient temperature</td></tr> <tr><td>30</td><td>Option card high ambient temperature</td></tr> <tr><td>31</td><td>Ground fault module high ambient temperature</td></tr> </tbody> </table> | Value | Description | 0 | No Warnings | 1 | Under voltage | 2 | Over voltage | 3 | Reserved | 4 | Ground current warning | 5 | Current phase loss | 6 | Current unbalance | 7 | Instantaneous over current | 8 | Jam | 9 | PF Deviation | 10 | Voltage phase loss | 11 | Voltage unbalance | 12 | Frequency deviation fast | 13 | Frequency deviation slow | 14 | Under current | 15 | High power | 16 | Low power | 17 | Contactors failure | 18 | Starts limit exceeded | 19 | Overload | 20 | Stall | 21 | Phase rotation mismatch | 22 | PTC - See PTC State for details | 23 | Peak demand | 24 | Measurement Module warning | 25 | Real Time Clock requires setting (has not been set) | 26 | RTC Battery Low. Replacement is recommended | 27 | Device ambient temperature high | 28 | MM high ambient temperature | 29 | UI high ambient temperature | 30 | Option card high ambient temperature | 31 | Ground fault module high ambient temperature |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | No Warnings | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Under voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Over voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Ground current warning | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Current phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Current unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Instantaneous over current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Jam | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | PF Deviation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Voltage phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Frequency deviation fast | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Frequency deviation slow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Under current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | High power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Contactors failure | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Starts limit exceeded | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Overload | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Stall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | Phase rotation mismatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | PTC - See PTC State for details | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Peak demand | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | Measurement Module warning | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | Real Time Clock requires setting (has not been set) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | RTC Battery Low. Replacement is recommended | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | Device ambient temperature high | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | MM high ambient temperature | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | UI high ambient temperature | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | Option card high ambient temperature | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | Ground fault module high ambient temperature | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|-------------------|---|-------|-------------|----|---------------------------|----|------------------------------|----|-------------------------------|----|----------------------|-----|------------------------|-----|-----------------------|-----|---------------------|-----|---|-----|------------------------------------|-----|-----------------------------|-----|------------------------|-----|-----------------------|-----|------------------|-----|--|-----|--------------------------------|-----|---|-----|--|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|
| 313 | Active Warning | UINT16 RO Enum | Current Active Warning, continued | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>41</td><td>GFM CT connection is open</td></tr> <tr><td>42</td><td>GFM CT connection is shorted</td></tr> <tr><td>43</td><td>GFM CT calibration is missing</td></tr> <tr><td>44</td><td>HRGF pulse detection</td></tr> <tr><td>220</td><td>Logic program underrun</td></tr> <tr><td>221</td><td>Logic program overrun</td></tr> <tr><td>222</td><td>Logic task watchdog</td></tr> <tr><td>223</td><td>Logic instruction invalid instance number</td></tr> <tr><td>224</td><td>Logic instruction invalid argument</td></tr> <tr><td>225</td><td>Logic math - divide by zero</td></tr> <tr><td>226</td><td>Logic math - underflow</td></tr> <tr><td>227</td><td>Logic math - overflow</td></tr> <tr><td>228</td><td>ELC IO Comm Loss</td></tr> <tr><td>229</td><td>ELC IO is connected but unable to read/write</td></tr> <tr><td>230</td><td>Generic Modbus Slave Comm Loss</td></tr> <tr><td>231</td><td>Generic Modbus slave device is connected but read/write returned an error</td></tr> <tr><td>232</td><td>Logic Program accessing ELC IO but ELC IO not configured</td></tr> <tr><td>1000</td><td>Logic User Warning 1</td></tr> <tr><td>1001</td><td>Logic User Warning 2</td></tr> <tr><td>1002</td><td>Logic User Warning 3</td></tr> <tr><td>1003</td><td>Logic User Warning 4</td></tr> <tr><td>1004</td><td>Logic User Warning 5</td></tr> <tr><td>1005</td><td>Logic User Warning 6</td></tr> <tr><td>1006</td><td>Logic User Warning 7</td></tr> <tr><td>1007</td><td>Logic User Warning 8</td></tr> <tr><td>1008</td><td>Logic User Warning 9</td></tr> <tr><td>1009</td><td>Logic User Warning 10</td></tr> <tr><td>1010</td><td>Logic User Warning 11</td></tr> <tr><td>1011</td><td>Logic User Warning 12</td></tr> <tr><td>1012</td><td>Logic User Warning 13</td></tr> <tr><td>1013</td><td>Logic User Warning 14</td></tr> <tr><td>1014</td><td>Logic User Warning 15</td></tr> <tr><td>1015</td><td>Logic User Warning 16</td></tr> <tr><td>1016</td><td>Logic User Warning 17</td></tr> <tr><td>1017</td><td>Logic User Warning 18</td></tr> <tr><td>1018</td><td>Logic User Warning 19</td></tr> <tr><td>1019</td><td>Logic User Warning 20</td></tr> <tr><td>1020</td><td>Logic User Warning 21</td></tr> <tr><td>1021</td><td>Logic User Warning 22</td></tr> <tr><td>1022</td><td>Logic User Warning 23</td></tr> <tr><td>1023</td><td>Logic User Warning 24</td></tr> <tr><td>1024</td><td>Logic User Warning 25</td></tr> </tbody> </table> | Value | Description | 41 | GFM CT connection is open | 42 | GFM CT connection is shorted | 43 | GFM CT calibration is missing | 44 | HRGF pulse detection | 220 | Logic program underrun | 221 | Logic program overrun | 222 | Logic task watchdog | 223 | Logic instruction invalid instance number | 224 | Logic instruction invalid argument | 225 | Logic math - divide by zero | 226 | Logic math - underflow | 227 | Logic math - overflow | 228 | ELC IO Comm Loss | 229 | ELC IO is connected but unable to read/write | 230 | Generic Modbus Slave Comm Loss | 231 | Generic Modbus slave device is connected but read/write returned an error | 232 | Logic Program accessing ELC IO but ELC IO not configured | 1000 | Logic User Warning 1 | 1001 | Logic User Warning 2 | 1002 | Logic User Warning 3 | 1003 | Logic User Warning 4 | 1004 | Logic User Warning 5 | 1005 | Logic User Warning 6 | 1006 | Logic User Warning 7 | 1007 | Logic User Warning 8 | 1008 | Logic User Warning 9 | 1009 | Logic User Warning 10 | 1010 | Logic User Warning 11 | 1011 | Logic User Warning 12 | 1012 | Logic User Warning 13 | 1013 | Logic User Warning 14 | 1014 | Logic User Warning 15 | 1015 | Logic User Warning 16 | 1016 | Logic User Warning 17 | 1017 | Logic User Warning 18 | 1018 | Logic User Warning 19 | 1019 | Logic User Warning 20 | 1020 | Logic User Warning 21 | 1021 | Logic User Warning 22 | 1022 | Logic User Warning 23 | 1023 | Logic User Warning 24 | 1024 | Logic User Warning 25 |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | GFM CT connection is open | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | GFM CT connection is shorted | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | GFM CT calibration is missing | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | HRGF pulse detection | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 220 | Logic program underrun | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 221 | Logic program overrun | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 222 | Logic task watchdog | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 223 | Logic instruction invalid instance number | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 224 | Logic instruction invalid argument | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 225 | Logic math - divide by zero | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 226 | Logic math - underflow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 227 | Logic math - overflow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 228 | ELC IO Comm Loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 229 | ELC IO is connected but unable to read/write | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 230 | Generic Modbus Slave Comm Loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 231 | Generic Modbus slave device is connected but read/write returned an error | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 232 | Logic Program accessing ELC IO but ELC IO not configured | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1000 | Logic User Warning 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1001 | Logic User Warning 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1002 | Logic User Warning 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1003 | Logic User Warning 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1004 | Logic User Warning 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1005 | Logic User Warning 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1006 | Logic User Warning 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1007 | Logic User Warning 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1008 | Logic User Warning 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1009 | Logic User Warning 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1010 | Logic User Warning 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1011 | Logic User Warning 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1012 | Logic User Warning 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1013 | Logic User Warning 14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1014 | Logic User Warning 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1015 | Logic User Warning 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1016 | Logic User Warning 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1017 | Logic User Warning 18 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1018 | Logic User Warning 19 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1019 | Logic User Warning 20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1020 | Logic User Warning 21 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1021 | Logic User Warning 22 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1022 | Logic User Warning 23 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1023 | Logic User Warning 24 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1024 | Logic User Warning 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|-------------------|---|-------|-------------|------|-----------------------|------|---|------|--------------------------|------|-----------------------|------|------------------------------------|------|------------------------|------|-------------------------|------|-----------------------|------|---|------|------------------------|------|--|------|-----------------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|
| 313 | Active Warning | UINT16 RO Enum | Current Active Warning, continued <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>1025</td><td>Logic User Warning 26</td></tr> <tr><td>1026</td><td>Logic User Warning 27</td></tr> <tr><td>1027</td><td>Logic User Warning 28</td></tr> <tr><td>1028</td><td>Logic User Warning 29</td></tr> <tr><td>1029</td><td>Logic User Warning 30</td></tr> <tr><td>1030</td><td>Logic User Warning 31</td></tr> <tr><td>1031</td><td>Logic User Warning 32</td></tr> <tr><td>1032</td><td>Logic User Warning 33</td></tr> <tr><td>1033</td><td>Logic User Warning 34</td></tr> <tr><td>1034</td><td>Logic User Warning 35</td></tr> <tr><td>1035</td><td>Logic User Warning 36</td></tr> <tr><td>1036</td><td>Logic User Warning 37</td></tr> <tr><td>1037</td><td>Logic User Warning 38</td></tr> <tr><td>1038</td><td>Logic User Warning 39</td></tr> <tr><td>1039</td><td>Logic User Warning 40</td></tr> <tr><td>1040</td><td>Logic User Warning 41</td></tr> <tr><td>1041</td><td>Logic User Warning 42</td></tr> <tr><td>1042</td><td>Logic User Warning 43</td></tr> <tr><td>1043</td><td>Logic User Warning 44</td></tr> <tr><td>1044</td><td>Logic User Warning 45</td></tr> <tr><td>1045</td><td>Logic User Warning 46</td></tr> <tr><td>1046</td><td>Logic User Warning 47</td></tr> <tr><td>1047</td><td>Logic User Warning 48</td></tr> <tr><td>1048</td><td>Logic User Warning 49</td></tr> <tr><td>1049</td><td>Logic User Warning 50</td></tr> </tbody> </table> | Value | Description | 1025 | Logic User Warning 26 | 1026 | Logic User Warning 27 | 1027 | Logic User Warning 28 | 1028 | Logic User Warning 29 | 1029 | Logic User Warning 30 | 1030 | Logic User Warning 31 | 1031 | Logic User Warning 32 | 1032 | Logic User Warning 33 | 1033 | Logic User Warning 34 | 1034 | Logic User Warning 35 | 1035 | Logic User Warning 36 | 1036 | Logic User Warning 37 | 1037 | Logic User Warning 38 | 1038 | Logic User Warning 39 | 1039 | Logic User Warning 40 | 1040 | Logic User Warning 41 | 1041 | Logic User Warning 42 | 1042 | Logic User Warning 43 | 1043 | Logic User Warning 44 | 1044 | Logic User Warning 45 | 1045 | Logic User Warning 46 | 1046 | Logic User Warning 47 | 1047 | Logic User Warning 48 | 1048 | Logic User Warning 49 | 1049 | Logic User Warning 50 |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1025 | Logic User Warning 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1026 | Logic User Warning 27 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1027 | Logic User Warning 28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1028 | Logic User Warning 29 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1029 | Logic User Warning 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1030 | Logic User Warning 31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1031 | Logic User Warning 32 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1032 | Logic User Warning 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1033 | Logic User Warning 34 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1034 | Logic User Warning 35 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1035 | Logic User Warning 36 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1036 | Logic User Warning 37 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1037 | Logic User Warning 38 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1038 | Logic User Warning 39 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1039 | Logic User Warning 40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1040 | Logic User Warning 41 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1041 | Logic User Warning 42 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1042 | Logic User Warning 43 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1043 | Logic User Warning 44 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1044 | Logic User Warning 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1045 | Logic User Warning 46 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1046 | Logic User Warning 47 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1047 | Logic User Warning 48 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1048 | Logic User Warning 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1049 | Logic User Warning 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 314 | Active Inhibit | UINT16 RO Enum | Current Active Inhibit <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>0</td><td>No inhibits</td></tr> <tr><td>1</td><td>Incorrect configuration. See configuration inhibit reason</td></tr> <tr><td>2</td><td>A soft reset is required</td></tr> <tr><td>3</td><td>Backspin prevention</td></tr> <tr><td>4</td><td>Under voltage restart timer active</td></tr> <tr><td>5</td><td>Control voltage is low</td></tr> <tr><td>6</td><td>Under voltage condition</td></tr> <tr><td>7</td><td>Voltage unbalance</td></tr> <tr><td>8</td><td>Starts per hour limit has been exceeded</td></tr> <tr><td>9</td><td>Over voltage condition</td></tr> <tr><td>10</td><td>ELC IO hardware does not match the configuration</td></tr> <tr><td>11</td><td>Run interlock input is open</td></tr> </tbody> </table> | Value | Description | 0 | No inhibits | 1 | Incorrect configuration. See configuration inhibit reason | 2 | A soft reset is required | 3 | Backspin prevention | 4 | Under voltage restart timer active | 5 | Control voltage is low | 6 | Under voltage condition | 7 | Voltage unbalance | 8 | Starts per hour limit has been exceeded | 9 | Over voltage condition | 10 | ELC IO hardware does not match the configuration | 11 | Run interlock input is open | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | No inhibits | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Incorrect configuration. See configuration inhibit reason | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | A soft reset is required | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Backspin prevention | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Under voltage restart timer active | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Control voltage is low | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Under voltage condition | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Starts per hour limit has been exceeded | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Over voltage condition | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | ELC IO hardware does not match the configuration | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Run interlock input is open | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|-----------------------|-------------------|---|-------|-------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|
| 314 | Active Inhibit | UINT16 RO Enum | Current Active Inhibit, continued | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>1000</td><td>Logic User Inhibit 1</td></tr> <tr><td>1001</td><td>Logic User Inhibit 2</td></tr> <tr><td>1002</td><td>Logic User Inhibit 3</td></tr> <tr><td>1003</td><td>Logic User Inhibit 4</td></tr> <tr><td>1004</td><td>Logic User Inhibit 5</td></tr> <tr><td>1005</td><td>Logic User Inhibit 6</td></tr> <tr><td>1006</td><td>Logic User Inhibit 7</td></tr> <tr><td>1007</td><td>Logic User Inhibit 8</td></tr> <tr><td>1008</td><td>Logic User Inhibit 9</td></tr> <tr><td>1009</td><td>Logic User Inhibit 10</td></tr> <tr><td>1010</td><td>Logic User Inhibit 11</td></tr> <tr><td>1011</td><td>Logic User Inhibit 12</td></tr> <tr><td>1012</td><td>Logic User Inhibit 13</td></tr> <tr><td>1013</td><td>Logic User Inhibit 14</td></tr> <tr><td>1014</td><td>Logic User Inhibit 15</td></tr> <tr><td>1015</td><td>Logic User Inhibit 16</td></tr> <tr><td>1016</td><td>Logic User Inhibit 17</td></tr> <tr><td>1017</td><td>Logic User Inhibit 18</td></tr> <tr><td>1018</td><td>Logic User Inhibit 19</td></tr> <tr><td>1019</td><td>Logic User Inhibit 20</td></tr> <tr><td>1020</td><td>Logic User Inhibit 21</td></tr> <tr><td>1021</td><td>Logic User Inhibit 22</td></tr> <tr><td>1022</td><td>Logic User Inhibit 23</td></tr> <tr><td>1023</td><td>Logic User Inhibit 24</td></tr> <tr><td>1024</td><td>Logic User Inhibit 25</td></tr> <tr><td>1025</td><td>Logic User Inhibit 26</td></tr> <tr><td>1026</td><td>Logic User Inhibit 27</td></tr> <tr><td>1027</td><td>Logic User Inhibit 28</td></tr> <tr><td>1028</td><td>Logic User Inhibit 29</td></tr> <tr><td>1029</td><td>Logic User Inhibit 30</td></tr> <tr><td>1030</td><td>Logic User Inhibit 31</td></tr> <tr><td>1031</td><td>Logic User Inhibit 32</td></tr> <tr><td>1032</td><td>Logic User Inhibit 33</td></tr> <tr><td>1033</td><td>Logic User Inhibit 34</td></tr> <tr><td>1034</td><td>Logic User Inhibit 35</td></tr> <tr><td>1035</td><td>Logic User Inhibit 36</td></tr> <tr><td>1036</td><td>Logic User Inhibit 37</td></tr> <tr><td>1037</td><td>Logic User Inhibit 38</td></tr> <tr><td>1038</td><td>Logic User Inhibit 39</td></tr> <tr><td>1039</td><td>Logic User Inhibit 40</td></tr> </tbody> </table> | Value | Description | 1000 | Logic User Inhibit 1 | 1001 | Logic User Inhibit 2 | 1002 | Logic User Inhibit 3 | 1003 | Logic User Inhibit 4 | 1004 | Logic User Inhibit 5 | 1005 | Logic User Inhibit 6 | 1006 | Logic User Inhibit 7 | 1007 | Logic User Inhibit 8 | 1008 | Logic User Inhibit 9 | 1009 | Logic User Inhibit 10 | 1010 | Logic User Inhibit 11 | 1011 | Logic User Inhibit 12 | 1012 | Logic User Inhibit 13 | 1013 | Logic User Inhibit 14 | 1014 | Logic User Inhibit 15 | 1015 | Logic User Inhibit 16 | 1016 | Logic User Inhibit 17 | 1017 | Logic User Inhibit 18 | 1018 | Logic User Inhibit 19 | 1019 | Logic User Inhibit 20 | 1020 | Logic User Inhibit 21 | 1021 | Logic User Inhibit 22 | 1022 | Logic User Inhibit 23 | 1023 | Logic User Inhibit 24 | 1024 | Logic User Inhibit 25 | 1025 | Logic User Inhibit 26 | 1026 | Logic User Inhibit 27 | 1027 | Logic User Inhibit 28 | 1028 | Logic User Inhibit 29 | 1029 | Logic User Inhibit 30 | 1030 | Logic User Inhibit 31 | 1031 | Logic User Inhibit 32 | 1032 | Logic User Inhibit 33 | 1033 | Logic User Inhibit 34 | 1034 | Logic User Inhibit 35 | 1035 | Logic User Inhibit 36 | 1036 | Logic User Inhibit 37 | 1037 | Logic User Inhibit 38 | 1038 | Logic User Inhibit 39 | 1039 | Logic User Inhibit 40 |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1000 | Logic User Inhibit 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1001 | Logic User Inhibit 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1002 | Logic User Inhibit 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1003 | Logic User Inhibit 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1004 | Logic User Inhibit 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1005 | Logic User Inhibit 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1006 | Logic User Inhibit 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1007 | Logic User Inhibit 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1008 | Logic User Inhibit 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1009 | Logic User Inhibit 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1010 | Logic User Inhibit 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1011 | Logic User Inhibit 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1012 | Logic User Inhibit 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1013 | Logic User Inhibit 14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1014 | Logic User Inhibit 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1015 | Logic User Inhibit 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1016 | Logic User Inhibit 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1017 | Logic User Inhibit 18 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1018 | Logic User Inhibit 19 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1019 | Logic User Inhibit 20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1020 | Logic User Inhibit 21 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1021 | Logic User Inhibit 22 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1022 | Logic User Inhibit 23 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1023 | Logic User Inhibit 24 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1024 | Logic User Inhibit 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1025 | Logic User Inhibit 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1026 | Logic User Inhibit 27 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1027 | Logic User Inhibit 28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1028 | Logic User Inhibit 29 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1029 | Logic User Inhibit 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1030 | Logic User Inhibit 31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1031 | Logic User Inhibit 32 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1032 | Logic User Inhibit 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1033 | Logic User Inhibit 34 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1034 | Logic User Inhibit 35 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1035 | Logic User Inhibit 36 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1036 | Logic User Inhibit 37 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1037 | Logic User Inhibit 38 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1038 | Logic User Inhibit 39 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1039 | Logic User Inhibit 40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--|-------------------|--|-------|-------------|------|-----------------------|------|--|------|--|------|--|------|--|------|---|------|--|------|--|------|--|------|--|----|---|----|---|----|---|
| 314 | Active Inhibit | UINT16 RO Enum | Current Active Inhibit, continued <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>1040</td><td>Logic User Inhibit 41</td></tr> <tr><td>1041</td><td>Logic User Inhibit 42</td></tr> <tr><td>1042</td><td>Logic User Inhibit 43</td></tr> <tr><td>1043</td><td>Logic User Inhibit 44</td></tr> <tr><td>1044</td><td>Logic User Inhibit 45</td></tr> <tr><td>1045</td><td>Logic User Inhibit 46</td></tr> <tr><td>1046</td><td>Logic User Inhibit 47</td></tr> <tr><td>1047</td><td>Logic User Inhibit 48</td></tr> <tr><td>1048</td><td>Logic User Inhibit 49</td></tr> <tr><td>1049</td><td>Logic User Inhibit 50</td></tr> </tbody> </table> | Value | Description | 1040 | Logic User Inhibit 41 | 1041 | Logic User Inhibit 42 | 1042 | Logic User Inhibit 43 | 1043 | Logic User Inhibit 44 | 1044 | Logic User Inhibit 45 | 1045 | Logic User Inhibit 46 | 1046 | Logic User Inhibit 47 | 1047 | Logic User Inhibit 48 | 1048 | Logic User Inhibit 49 | 1049 | Logic User Inhibit 50 | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1040 | Logic User Inhibit 41 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1041 | Logic User Inhibit 42 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1042 | Logic User Inhibit 43 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1043 | Logic User Inhibit 44 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1044 | Logic User Inhibit 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1045 | Logic User Inhibit 46 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1046 | Logic User Inhibit 47 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1047 | Logic User Inhibit 48 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1048 | Logic User Inhibit 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1049 | Logic User Inhibit 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 315 | Configuration Inhibit Reason | UINT8 RO Enum | The reason for an active inhibit due to an incorrect or out-of-range configuration parameter. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>0</td><td>No active inhibits</td></tr> <tr><td>1</td><td>Local and Remote motor control sources both point to Fieldwire</td></tr> <tr><td>2</td><td>Local motor control source is set to User Interface but the User Interface type does not match</td></tr> <tr><td>3</td><td>One or more enabled protection features requires a voltage option card in the Measurement Module</td></tr> <tr><td>4</td><td>One or more enabled protection features requires a PTC (Temperature) option card in the Measurement Module</td></tr> <tr><td>5</td><td>Selected operational mode is incompatible with 3wire cfg fieldwire as local control</td></tr> <tr><td>6</td><td>Cannot choose fieldwire as the feedback source when the fieldwire is used as a local / remote source with the selected starter</td></tr> <tr><td>7</td><td>UI Custom Overlay - Multiple buttons assigned to same function</td></tr> <tr><td>8</td><td>UI Custom Overlay - Multiple button LEDs assigned to the same function</td></tr> <tr><td>9</td><td>UI Custom Overlay - Multiple status LEDs assigned to the same function</td></tr> <tr><td>10</td><td>Selected operational mode is incompatible with the connected UI</td></tr> <tr><td>11</td><td>The General Purpose I/O operational mode does not use fieldwire as a control source</td></tr> <tr><td>12</td><td>Q3 configured for both latching relay and shunt trip output</td></tr> </tbody> </table> | Value | Description | 0 | No active inhibits | 1 | Local and Remote motor control sources both point to Fieldwire | 2 | Local motor control source is set to User Interface but the User Interface type does not match | 3 | One or more enabled protection features requires a voltage option card in the Measurement Module | 4 | One or more enabled protection features requires a PTC (Temperature) option card in the Measurement Module | 5 | Selected operational mode is incompatible with 3wire cfg fieldwire as local control | 6 | Cannot choose fieldwire as the feedback source when the fieldwire is used as a local / remote source with the selected starter | 7 | UI Custom Overlay - Multiple buttons assigned to same function | 8 | UI Custom Overlay - Multiple button LEDs assigned to the same function | 9 | UI Custom Overlay - Multiple status LEDs assigned to the same function | 10 | Selected operational mode is incompatible with the connected UI | 11 | The General Purpose I/O operational mode does not use fieldwire as a control source | 12 | Q3 configured for both latching relay and shunt trip output |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | No active inhibits | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Local and Remote motor control sources both point to Fieldwire | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Local motor control source is set to User Interface but the User Interface type does not match | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | One or more enabled protection features requires a voltage option card in the Measurement Module | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | One or more enabled protection features requires a PTC (Temperature) option card in the Measurement Module | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Selected operational mode is incompatible with 3wire cfg fieldwire as local control | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Cannot choose fieldwire as the feedback source when the fieldwire is used as a local / remote source with the selected starter | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | UI Custom Overlay - Multiple buttons assigned to same function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | UI Custom Overlay - Multiple button LEDs assigned to the same function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | UI Custom Overlay - Multiple status LEDs assigned to the same function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Selected operational mode is incompatible with the connected UI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | The General Purpose I/O operational mode does not use fieldwire as a control source | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Q3 configured for both latching relay and shunt trip output | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|----------------------------|--------------------------------------|--|-----|-------------|------|---|---------------|------|---|--------------|------|---|----------|------|---|----------------------|------|---|--------------------|------|---|-------------------|------|---|----------------------------|------|---|-----|------|---|------------------------|------|---|--------------------|------|----|-------------------|------|----|--------------------------|------|----|--------------------------|------|----|---------------|------|----|------------|------|----|-----------|------|----|----------|------|----|----------|------|----|----------|------|----|-------|------|----|-------------------------|------|----|-----|------|----|-----------------------|------|----|-------------|------|----|----------------------|------|
| 316 | Trip Reason | BYTE R0 Array size: 4 Bitfield | Indicates the Trip Reason for the current trip. Each trip type has a bit. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>0</td><td>Under voltage</td><td>5041</td></tr> <tr><td>1</td><td>Over voltage</td><td>5042</td></tr> <tr><td>2</td><td>Reserved</td><td>5043</td></tr> <tr><td>3</td><td>Ground current fault</td><td>5044</td></tr> <tr><td>4</td><td>Current phase loss</td><td>5045</td></tr> <tr><td>5</td><td>Current unbalance</td><td>5046</td></tr> <tr><td>6</td><td>Instantaneous over current</td><td>5047</td></tr> <tr><td>7</td><td>Jam</td><td>5048</td></tr> <tr><td>8</td><td>Power factor deviation</td><td>5049</td></tr> <tr><td>9</td><td>Voltage phase loss</td><td>5050</td></tr> <tr><td>10</td><td>Voltage unbalance</td><td>5051</td></tr> <tr><td>11</td><td>Frequency deviation fast</td><td>5052</td></tr> <tr><td>12</td><td>Frequency deviation slow</td><td>5053</td></tr> <tr><td>13</td><td>Under current</td><td>5054</td></tr> <tr><td>14</td><td>High power</td><td>5055</td></tr> <tr><td>15</td><td>Low power</td><td>5056</td></tr> <tr><td>16</td><td>Reserved</td><td>5057</td></tr> <tr><td>17</td><td>Reserved</td><td>5058</td></tr> <tr><td>18</td><td>Overload</td><td>5059</td></tr> <tr><td>19</td><td>Stall</td><td>5060</td></tr> <tr><td>20</td><td>Phase rotation mismatch</td><td>5061</td></tr> <tr><td>21</td><td>PTC</td><td>5062</td></tr> <tr><td>22</td><td>Under voltage restart</td><td>5063</td></tr> <tr><td>23</td><td>Peak demand</td><td>5064</td></tr> <tr><td>24</td><td>HRGF pulse detection</td><td>5065</td></tr> </tbody> </table> | Bit | Description | Coil | 0 | Under voltage | 5041 | 1 | Over voltage | 5042 | 2 | Reserved | 5043 | 3 | Ground current fault | 5044 | 4 | Current phase loss | 5045 | 5 | Current unbalance | 5046 | 6 | Instantaneous over current | 5047 | 7 | Jam | 5048 | 8 | Power factor deviation | 5049 | 9 | Voltage phase loss | 5050 | 10 | Voltage unbalance | 5051 | 11 | Frequency deviation fast | 5052 | 12 | Frequency deviation slow | 5053 | 13 | Under current | 5054 | 14 | High power | 5055 | 15 | Low power | 5056 | 16 | Reserved | 5057 | 17 | Reserved | 5058 | 18 | Overload | 5059 | 19 | Stall | 5060 | 20 | Phase rotation mismatch | 5061 | 21 | PTC | 5062 | 22 | Under voltage restart | 5063 | 23 | Peak demand | 5064 | 24 | HRGF pulse detection | 5065 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Under voltage | 5041 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Over voltage | 5042 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Reserved | 5043 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Ground current fault | 5044 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Current phase loss | 5045 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Current unbalance | 5046 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Instantaneous over current | 5047 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Jam | 5048 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Power factor deviation | 5049 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Voltage phase loss | 5050 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Voltage unbalance | 5051 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Frequency deviation fast | 5052 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Frequency deviation slow | 5053 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Under current | 5054 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | High power | 5055 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Low power | 5056 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Reserved | 5057 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Reserved | 5058 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Overload | 5059 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Stall | 5060 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Phase rotation mismatch | 5061 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | PTC | 5062 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | Under voltage restart | 5063 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Peak demand | 5064 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | HRGF pulse detection | 5065 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--|--------------------------------------|--|-----|-------------|------|---|---------------|------|---|--------------|------|---|----------|------|---|------------------------|------|---|--------------------|------|---|-------------------|------|---|----------------------------|------|---|-----|------|---|------------------------|------|---|--------------------|------|----|-------------------|------|----|--------------------------|------|----|--------------------------|------|----|---------------|------|----|------------|------|----|-----------|------|----|----------|------|----|-----------------------|------|----|----------|------|----|-------|------|----|-------------------------|------|----|-----|------|----|-----------------------|------|----|-------------|------|----|----------------------|------|
| 318 | Warning Reason | BYTE R0 Array size: 4 Bitfield | Indicates the Reason for a Warning condition. Each Alarm type has a bit. <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>0</td><td>Under voltage</td><td>5073</td></tr> <tr><td>1</td><td>Over voltage</td><td>5074</td></tr> <tr><td>2</td><td>Reserved</td><td>5075</td></tr> <tr><td>3</td><td>Ground current warning</td><td>5076</td></tr> <tr><td>4</td><td>Current phase loss</td><td>5077</td></tr> <tr><td>5</td><td>Current unbalance</td><td>5078</td></tr> <tr><td>6</td><td>Instantaneous over current</td><td>5079</td></tr> <tr><td>7</td><td>Jam</td><td>5080</td></tr> <tr><td>8</td><td>Power factor deviation</td><td>5081</td></tr> <tr><td>9</td><td>Voltage phase loss</td><td>5082</td></tr> <tr><td>10</td><td>Voltage unbalance</td><td>5083</td></tr> <tr><td>11</td><td>Frequency deviation fast</td><td>5084</td></tr> <tr><td>12</td><td>Frequency deviation slow</td><td>5085</td></tr> <tr><td>13</td><td>Under current</td><td>5086</td></tr> <tr><td>14</td><td>High power</td><td>5087</td></tr> <tr><td>15</td><td>Low power</td><td>5088</td></tr> <tr><td>16</td><td>Reserved</td><td>5089</td></tr> <tr><td>17</td><td>Starts limit exceeded</td><td>5090</td></tr> <tr><td>18</td><td>Overload</td><td>5091</td></tr> <tr><td>19</td><td>Stall</td><td>5092</td></tr> <tr><td>20</td><td>Phase rotation mismatch</td><td>5093</td></tr> <tr><td>21</td><td>PTC</td><td>5094</td></tr> <tr><td>22</td><td>Under voltage restart</td><td>5095</td></tr> <tr><td>23</td><td>Peak demand</td><td>5096</td></tr> <tr><td>24</td><td>HRGF pulse detection</td><td>5065</td></tr> </tbody> </table> | Bit | Description | Coil | 0 | Under voltage | 5073 | 1 | Over voltage | 5074 | 2 | Reserved | 5075 | 3 | Ground current warning | 5076 | 4 | Current phase loss | 5077 | 5 | Current unbalance | 5078 | 6 | Instantaneous over current | 5079 | 7 | Jam | 5080 | 8 | Power factor deviation | 5081 | 9 | Voltage phase loss | 5082 | 10 | Voltage unbalance | 5083 | 11 | Frequency deviation fast | 5084 | 12 | Frequency deviation slow | 5085 | 13 | Under current | 5086 | 14 | High power | 5087 | 15 | Low power | 5088 | 16 | Reserved | 5089 | 17 | Starts limit exceeded | 5090 | 18 | Overload | 5091 | 19 | Stall | 5092 | 20 | Phase rotation mismatch | 5093 | 21 | PTC | 5094 | 22 | Under voltage restart | 5095 | 23 | Peak demand | 5096 | 24 | HRGF pulse detection | 5065 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Under voltage | 5073 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Over voltage | 5074 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Reserved | 5075 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Ground current warning | 5076 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Current phase loss | 5077 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Current unbalance | 5078 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Instantaneous over current | 5079 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Jam | 5080 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Power factor deviation | 5081 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Voltage phase loss | 5082 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Voltage unbalance | 5083 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Frequency deviation fast | 5084 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Frequency deviation slow | 5085 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Under current | 5086 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | High power | 5087 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Low power | 5088 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Reserved | 5089 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Starts limit exceeded | 5090 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Overload | 5091 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Stall | 5092 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Phase rotation mismatch | 5093 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | PTC | 5094 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | Under voltage restart | 5095 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Peak demand | 5096 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | HRGF pulse detection | 5065 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 320 | Base Control Module Control Voltage Scaled | UINT16 R0 Units: mV | Base Control Module measured control Voltage scaled in millivolts. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 321 | Voltage L1-L2 (AB) | UINT16 R0 Units: V | Supply Line-to-Line Voltage AB (L1-L2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 322 | Voltage L2-L3 (BC) | UINT16 R0 Units: V | Supply Line-to-Line Voltage BC (L2-L3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 323 | Voltage L3-L1 (CA) | UINT16 R0 Units: V | Supply Line-to-Line Voltage CA (L3-L1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 324 | Average Voltage | UINT16 R0 Units: V | Supply Line-to-Line Voltage, Average of the three phases | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 325 | Voltage Unbalance | UINT8 R0 Units: % | Supply Voltage Unbalance Percentage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | |
|---|---------------------------------------|---|---|-------|-------------|---|---------|---|----------------|---|----------------|---|---------------------------------------|---|---------------------------------------|
| 326 | Phase Order | UINT8 RO Enum | Supply Phase Order. 0: unknown; 1: ABC (L1-L2-L3); 2: ACB (L1-L3-L2); 3: Voltage (L1-L2-L3) Current (L1-L3-L2); 4: Voltage (L1-L3-L2) Current (L1-L2-L3). If a Phase order is set here, a Phase Rotation Fault will occur if the phases detected do not match that order. | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Unknown</td> </tr> <tr> <td>1</td> <td>ABC (L1-L2-L3)</td> </tr> <tr> <td>2</td> <td>ACB (L1-L3-L2)</td> </tr> <tr> <td>3</td> <td>Voltage (L1-L2-L3) Current (L1-L3-L2)</td> </tr> <tr> <td>4</td> <td>Voltage (L1-L3-L2) Current (L1-L2-L3)</td> </tr> </tbody> </table> | | | | Value | Description | 0 | Unknown | 1 | ABC (L1-L2-L3) | 2 | ACB (L1-L3-L2) | 3 | Voltage (L1-L2-L3) Current (L1-L3-L2) | 4 | Voltage (L1-L3-L2) Current (L1-L2-L3) |
| Value | Description | | | | | | | | | | | | | | |
| 0 | Unknown | | | | | | | | | | | | | | |
| 1 | ABC (L1-L2-L3) | | | | | | | | | | | | | | |
| 2 | ACB (L1-L3-L2) | | | | | | | | | | | | | | |
| 3 | Voltage (L1-L2-L3) Current (L1-L3-L2) | | | | | | | | | | | | | | |
| 4 | Voltage (L1-L3-L2) Current (L1-L2-L3) | | | | | | | | | | | | | | |
| 327 | Watts Total | SINT32 RO Units: W | Total Real Power | | | | | | | | | | | | |
| 329 | VA Total | SINT32 RO Units: VA | Total Apparent Power which is the vector sum of Reactive Power and Real Power | | | | | | | | | | | | |
| 331 | VARS Total | SINT32 RO Units: VAR | Total Reactive Power which is the power component that does no work. Reactive power primarily represents the power needed to magnetize the motor. It is stored and discharged by inductive motors. | | | | | | | | | | | | |
| 333 | Power Factor Scaled | SINT16 RO Units: 0.01% | Apparent Power Factor in Percent (scaled 0.01%) | | | | | | | | | | | | |
| 334 | Real Energy Scaled | SINT32 RO Default: 0 Units: 0.1kWh Backup Mem | The total energy used to do work, not resettable (scaled by 0.1). | | | | | | | | | | | | |
| 336 | Reactive Energy Scaled | SINT32 RO Default: 0 Units: 0.1kVARh Backup Mem | The component of Apparent Energy that does no work (scaled by 0.1). The energy used over time to magnetize the motor. Not Resettable | | | | | | | | | | | | |
| 338 | Apparent Energy Scaled | SINT32 RO Default: 0 Units: 0.1kVAh Backup Mem | Total Energy used is the vector sum of Reactive and Real Energy (scaled by 0.1). The total amount of energy used, not resettable. | | | | | | | | | | | | |
| 340 | Real Energy Resettable Scaled | SINT32 RW NV Default: 0 Units: 0.1kWh Admin Lock USB Lock Backup Mem | The total energy used to do work, resettable (scaled by 0.1). Resettable values can be zero-ed out by the user at any time. | | | | | | | | | | | | |
| 342 | Reactive Energy Resettable Scaled | SINT32 RW NV Default: 0 Units: 0.1kVARh Admin Lock USB Lock Backup Mem | The component of Apparent Energy that does no work (scaled by 0.1). The energy used over time to magnetize the motor. Resettable. Resettable values can be zero-ed out by the user at any time. | | | | | | | | | | | | |
| 344 | Apparent Energy Resettable Scaled | SINT32 RW NV Default: 0 Units: 0.1kVAh Admin Lock USB Lock Backup Mem | Apparent Energy, User Resettable (scaled by 0.1). Resettable values can be zero-ed out by the user at any time. | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description |
|----------|---------------------------------|---|---|
| 346 | Run Time Lifetime | UINT32 RO Units: seconds Backup Mem | Total motor run time in seconds |
| 348 | Number Starts Lifetime | UINT32 RO Manufacturing Lock Backup Mem | Total Number of Motor Starts in lifetime, not resettable. |
| 350 | Operating Seconds Lifetime | UINT32 RO Units: seconds Backup Mem | Total number of seconds the C445 is powered. Not Resettable. |
| 352 | Run Time Resettable | UINT32 RW NV Default: 0 Units: seconds Admin Lock USB Lock Backup Mem | Total motor run time in seconds (Resettable). Resettable values can be zero-ed out by the user at any time. |
| 354 | Number Starts Resettable | UINT32 RW NV Default: 0 Admin Lock USB Lock Backup Mem | Total number of motor starts (Resettable). |
| 356 | Operating Seconds Resettable | UINT32 RW NV Default: 0 Units: seconds Backup Mem | Total number of seconds the C445 is powered. Resettable. |
| 358 | Contactorm Operations Last Hour | UINT16 RO Backup Mem | Number of Contactorm Operations During the Last Hour |
| 359 | Last Run Time | UINT32 RO Default: 0 Units: seconds | Duration in Seconds of the Last Start-to-Stop Motor Run Time |
| 361 | Last Starting Time | UINT16 RO Default: 0 Units: seconds | The amount of time the motor took to get up to speed on the last start. |
| 362 | I Average % of FLA | UINT16 RO Units: % | Monitored Average Motor Current as Percentage of FLA (Nominal Current) |
| 363 | Current Demand Value | UINT32 RO Units: W | Latest estimate of the Demand measured over the demand window duration. |
| 365 | Demand (Resettable) | UINT32 RW NV Default: 0 Range: 0 to 0 Units: W Admin Lock USB Lock Backup Mem | Peak Demand, User Resettable. The peak demand is updated if the new demand calculated over the demand window is greater than the previous peak. |
| 367 | Peak Demand Time Stamp | UINT32 RO Default: 0 Units: seconds Admin Lock USB Lock Backup Mem | Peak Demand Time Stamped (in Unix time) |

Appendix D—Modbus Register Map

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | |
|----------|---|---|--|-------|-------------|---|--------------------------------|---|---|---|---|---|----------------|
| 369 | Max Starting Current | FLOAT RW NV Default: 0 Units: A Admin Lock USB Lock | Maximum Motor Starting Current Floating Point Format. This value can be set (typically to 0) before starting the motor. | | | | | | | | | | |
| 371 | Max Starting Current Scaled | UINT16 RW NV Default: 0 Units: scaled A Admin Lock USB Lock | Max Motor Starting Current Scaled. Scaled by parameter "I Scale Factor". This value can be set to any value but is typically reset to 0. | | | | | | | | | | |
| 372 | Motor State (Current Based) | UINT8 RO Enum | Current based motor state. The motor state is determined by using the current presently measured. This state indication runs independent of the actual command being provided. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Motor current indicates a stop</td> </tr> <tr> <td>1</td> <td>Motor current indicates motor is accelerating</td> </tr> <tr> <td>2</td> <td>Motor current indicates a running or at speed condition</td> </tr> </tbody> </table> | Value | Description | 0 | Motor current indicates a stop | 1 | Motor current indicates motor is accelerating | 2 | Motor current indicates a running or at speed condition | | |
| Value | Description | | | | | | | | | | | | |
| 0 | Motor current indicates a stop | | | | | | | | | | | | |
| 1 | Motor current indicates motor is accelerating | | | | | | | | | | | | |
| 2 | Motor current indicates a running or at speed condition | | | | | | | | | | | | |
| 373 | Speed RPM Scaled | UINT16 RO Units: 0.1 RPM | The speed of the motor in scaled RPM (0.1RPM). | | | | | | | | | | |
| 374 | Torque Scaled | SINT16 RO Units: 0.01 Nm | The motor torque in scaled Newton-meters (0.01Nm). | | | | | | | | | | |
| 375 | Efficiency Percent Scaled | UINT16 RO Units: 0.01% | Motor Efficiency in scaled percentage (0.01%) | | | | | | | | | | |
| 376 | PTC Status | UINT8 RO Enum | PTC Status as follows: 0 - No Fault, 1 - Over Temperature fault, 2 - PTC Shorted fault, 3 - PTC Open fault <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>PTC ok - No fault</td> </tr> <tr> <td>1</td> <td>PTC over temperature fault</td> </tr> <tr> <td>2</td> <td>PTC shorted fault</td> </tr> <tr> <td>3</td> <td>PTC open fault</td> </tr> </tbody> </table> | Value | Description | 0 | PTC ok - No fault | 1 | PTC over temperature fault | 2 | PTC shorted fault | 3 | PTC open fault |
| Value | Description | | | | | | | | | | | | |
| 0 | PTC ok - No fault | | | | | | | | | | | | |
| 1 | PTC over temperature fault | | | | | | | | | | | | |
| 2 | PTC shorted fault | | | | | | | | | | | | |
| 3 | PTC open fault | | | | | | | | | | | | |
| 377 | I Phase A (L1) | FLOAT RO Units: A | Monitored Phase A (L1) Motor Current in Floating Point Format | | | | | | | | | | |
| 379 | I Phase B (L2) | FLOAT RO Units: A | Monitored Phase B (L2) Motor Current in Floating Point Format | | | | | | | | | | |
| 381 | I Phase C (L3) | FLOAT RO Units: A | Monitored Phase C (L3) Motor Current in Floating Point Format | | | | | | | | | | |
| 383 | Avg Current | FLOAT RO Units: A | Monitored Average Motor Current in Floating Point Format | | | | | | | | | | |
| 385 | I Positive Sequence Real | SINT16 RO | Monitor Positive Sequence Current, Real Component | | | | | | | | | | |
| 386 | I Positive Sequence Imaginary | SINT16 RO | Monitor Positive Sequence Current, Imaginary Component | | | | | | | | | | |
| 387 | I Negative Sequence Real | SINT16 RO | Monitor Negative Sequence Current, Real Component | | | | | | | | | | |
| 388 | I Negative Sequence Imaginary | SINT16 RO | Monitor Negative Sequence Current, Imaginary Component | | | | | | | | | | |
| 389 | V Positive Sequence Real | SINT16 RO | Monitor Positive Sequence Voltage, Real Component | | | | | | | | | | |
| 390 | V Positive Sequence Imaginary | SINT16 RO | Monitor Positive Sequence Voltage, Imaginary Component | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|---|---|-----|-------------|------|---|---|------|---|---|------|---|---|------|---|------------------------------|------|---|-------------------------|------|---|-------------------------|------|---|-------------------------|------|---|-------------------------|------|---|----------|------|---|--------------------------------|------|
| 391 | V Negative Sequence Real | SINT16 RO | Monitor Negative Sequence Voltage, Real Component | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 392 | V Negative Sequence Imaginary | SINT16 RO | Monitor Negative Sequence Voltage, Imaginary Component | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 393 | Frequency Scaled | UINT16 RO Units: 0.01Hz | Line frequency scaled in 0.01Hz. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 394 | Digital Input Status | BYTE RO Array size: 2 Bitfield | ON/OFF status of digital inputs from both the Base Control Module and the inputs on the optional User Interface (C445UC... versions only). Bits 0-3 are the status for the inputs from the Base Control Module and bits 4-7 are the status of the 4 inputs from the Control User Interface. <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Base Control Module Input I1</td> <td>6289</td> </tr> <tr> <td>1</td> <td>Base Control Module Input I2</td> <td>6290</td> </tr> <tr> <td>2</td> <td>Base Control Module Input I3</td> <td>6291</td> </tr> <tr> <td>3</td> <td>Base Control Module Input I4</td> <td>6292</td> </tr> <tr> <td>4</td> <td>User Interface Input I1</td> <td>6293</td> </tr> <tr> <td>5</td> <td>User Interface Input I2</td> <td>6294</td> </tr> <tr> <td>6</td> <td>User Interface Input I3</td> <td>6295</td> </tr> <tr> <td>7</td> <td>User Interface Input I4</td> <td>6296</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Base Control Module Input I1 | 6289 | 1 | Base Control Module Input I2 | 6290 | 2 | Base Control Module Input I3 | 6291 | 3 | Base Control Module Input I4 | 6292 | 4 | User Interface Input I1 | 6293 | 5 | User Interface Input I2 | 6294 | 6 | User Interface Input I3 | 6295 | 7 | User Interface Input I4 | 6296 | | | | | | |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Base Control Module Input I1 | 6289 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Base Control Module Input I2 | 6290 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Base Control Module Input I3 | 6291 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Base Control Module Input I4 | 6292 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | User Interface Input I1 | 6293 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | User Interface Input I2 | 6294 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | User Interface Input I3 | 6295 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | User Interface Input I4 | 6296 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 395 | Output Status | BYTE RO Default: 0 Bitfield | The status of the output relays on the Base Control Module. <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Q1 state: (0)Open not energized / (1)Closed energized</td> <td>6305</td> </tr> <tr> <td>1</td> <td>Q2 state: (0)Open not energized / (1)Closed energized</td> <td>6306</td> </tr> <tr> <td>2</td> <td>Q3 State: (0)Open (latching: relay reset) / (1)Closed (latching: relay set)</td> <td>6307</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Q1 state: (0)Open not energized / (1)Closed energized | 6305 | 1 | Q2 state: (0)Open not energized / (1)Closed energized | 6306 | 2 | Q3 State: (0)Open (latching: relay reset) / (1)Closed (latching: relay set) | 6307 | | | | | | | | | | | | | | | | | | | | | |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Q1 state: (0)Open not energized / (1)Closed energized | 6305 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Q2 state: (0)Open not energized / (1)Closed energized | 6306 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Q3 State: (0)Open (latching: relay reset) / (1)Closed (latching: relay set) | 6307 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 396 | DIP Switches | WORD RO Bitfield | Base Control Module DIP Switch Settings value. This is the weighted binary value of the DIP switches that are currently set to the ON position. <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Switch 1 (close to connector)</td> <td>6321</td> </tr> <tr> <td>1</td> <td>Switch 2</td> <td>6322</td> </tr> <tr> <td>2</td> <td>Switch 3</td> <td>6323</td> </tr> <tr> <td>3</td> <td>Switch 4</td> <td>6324</td> </tr> <tr> <td>4</td> <td>Switch 5</td> <td>6325</td> </tr> <tr> <td>5</td> <td>Switch 6</td> <td>6326</td> </tr> <tr> <td>6</td> <td>Switch 7</td> <td>6327</td> </tr> <tr> <td>7</td> <td>Switch 8</td> <td>6328</td> </tr> <tr> <td>8</td> <td>Switch 9</td> <td>6329</td> </tr> <tr> <td>9</td> <td>Switch 10 (USB - close to top)</td> <td>6330</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Switch 1 (close to connector) | 6321 | 1 | Switch 2 | 6322 | 2 | Switch 3 | 6323 | 3 | Switch 4 | 6324 | 4 | Switch 5 | 6325 | 5 | Switch 6 | 6326 | 6 | Switch 7 | 6327 | 7 | Switch 8 | 6328 | 8 | Switch 9 | 6329 | 9 | Switch 10 (USB - close to top) | 6330 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Switch 1 (close to connector) | 6321 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Switch 2 | 6322 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Switch 3 | 6323 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Switch 4 | 6324 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Switch 5 | 6325 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Switch 6 | 6326 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Switch 7 | 6327 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Switch 8 | 6328 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Switch 9 | 6329 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Switch 10 (USB - close to top) | 6330 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 397 | Base Control Module Control Bd Amb Temp | SINT16 RO Units: °C | Ambient temperature measured on the PCB of the Base Control Module. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 398 | Base Control Module Max Bd Amb Temp | SINT16 RW NV Default: -40 Units: °C | Base Control Module Maximum ambient temperature for the PCB. This value can be set (typically to -40). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | |
|----------|---|--|--|-------|-------------|---|--|---|---|---|---------------------------------------|---|--|-----|---|
| 400 | Proof Test Status | UIN8 RO Default: 0 Enum | Proof Test Status. 0: Proof test is idle (not triggered), 1: Proof test is running, 2: Proof test passed, 3: Proof test failed. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Proof test is idle (not triggered)</td> </tr> <tr> <td>1</td> <td>Proof test is running</td> </tr> <tr> <td>2</td> <td>Proof test passed</td> </tr> <tr> <td>3</td> <td>Proof test failed</td> </tr> </tbody> </table> | Value | Description | 0 | Proof test is idle (not triggered) | 1 | Proof test is running | 2 | Proof test passed | 3 | Proof test failed | | |
| Value | Description | | | | | | | | | | | | | | |
| 0 | Proof test is idle (not triggered) | | | | | | | | | | | | | | |
| 1 | Proof test is running | | | | | | | | | | | | | | |
| 2 | Proof test passed | | | | | | | | | | | | | | |
| 3 | Proof test failed | | | | | | | | | | | | | | |
| 401 | Ground Fault Current Scale Factor | UIN16 RO Default: 1000 | Ground Fault Current Fractional Scale Factor Divide integer ground current value by this value to convert the value to Amps. | | | | | | | | | | | | |
| 402 | Ground Current Percent | UIN16 RO Units: Scaled Amps | Ground current percent of trip threshold Ground current percent of trip threshold | | | | | | | | | | | | |
| 403 | GFM CT Diagnostic Status | UIN8 RO Enum | CT input connection diagnostic status passed to BCM: Disabled, OK, High-Z, Low-Z. GFM CT connection diagnostic status. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>GFM CT connection diagnostics are disabled</td> </tr> <tr> <td>1</td> <td>GFM CT connection status is good</td> </tr> <tr> <td>2</td> <td>GFM CT connection status is open</td> </tr> <tr> <td>3</td> <td>GFM CT connection status is shorted</td> </tr> <tr> <td>255</td> <td>GFM CT calibration is missing</td> </tr> </tbody> </table> | Value | Description | 0 | GFM CT connection diagnostics are disabled | 1 | GFM CT connection status is good | 2 | GFM CT connection status is open | 3 | GFM CT connection status is shorted | 255 | GFM CT calibration is missing |
| Value | Description | | | | | | | | | | | | | | |
| 0 | GFM CT connection diagnostics are disabled | | | | | | | | | | | | | | |
| 1 | GFM CT connection status is good | | | | | | | | | | | | | | |
| 2 | GFM CT connection status is open | | | | | | | | | | | | | | |
| 3 | GFM CT connection status is shorted | | | | | | | | | | | | | | |
| 255 | GFM CT calibration is missing | | | | | | | | | | | | | | |
| 500 | FLA Active Motor Scaled | UIN16 RO Default: 101 (RW) Range: 1 to 65535 (RW) Units: scaled A | Active Overload FLA (Nominal Current) Scaled is a read only parameter indicating the active FLA. For example, if the application has two windings (and two FLA settings), this parameter will indicate the currently active motor winding setting. Scaled by parameter "I Scale Factor". | | | | | | | | | | | | |
| 501 | Rated Speed RPM Active | UIN16 RO Default: 1750 Range: 300 to 3600 Units: RPM | RPM nameplate rating of the active motor winding. | | | | | | | | | | | | |
| 502 | Rated HP Active Scaled | UIN32 RO Units: HPx100 | HP nameplate rating of the active motor winding. This value is scaled by 0.01. For example if the motor is rated at 123.25 HP then this parameter should contain 12325. | | | | | | | | | | | | |
| 504 | Rated Watts Active | UIN32 RO Default: 14914 Range: 10 to 3728500 Units: W | Watts nameplate rating of the active motor winding. | | | | | | | | | | | | |
| 506 | Active Control Source | UIN8 RO Enum | The control source that is currently active: User Interface, Fieldbus or Fieldwire <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No active control source</td> </tr> <tr> <td>1</td> <td>User Interface is the active control source</td> </tr> <tr> <td>2</td> <td>FieldBus is the active control source</td> </tr> <tr> <td>3</td> <td>FieldWire is the active control source</td> </tr> <tr> <td>4</td> <td>User Logic is the active control source</td> </tr> </tbody> </table> | Value | Description | 0 | No active control source | 1 | User Interface is the active control source | 2 | FieldBus is the active control source | 3 | FieldWire is the active control source | 4 | User Logic is the active control source |
| Value | Description | | | | | | | | | | | | | | |
| 0 | No active control source | | | | | | | | | | | | | | |
| 1 | User Interface is the active control source | | | | | | | | | | | | | | |
| 2 | FieldBus is the active control source | | | | | | | | | | | | | | |
| 3 | FieldWire is the active control source | | | | | | | | | | | | | | |
| 4 | User Logic is the active control source | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|----------------------------------|---------------------------------|--|-----|-------------|------|---|---------------------------|------|---|---------------------------|------|---|---------------------------|------|---|---------------------------|------|---|---------------------------|------|---|---------------------------|------|---|---------------------------|------|---|---------------------------|------|
| 600 | Fieldbus Motor Control | BYTE RW Bitfield USB Lock | Fieldbus Motor Control - Run 1 Command Bit: This bit is Profile dependent. For example, this is the Run bit for a FVNR motor application or the Run FWD bit for a FVR applications. - Run 2 Command Bit: This bit is Profile dependent. For example, this is not used for a FVNR motor application or is the Run REV Run for a FVR applications. - Fault Reset: This resets an active fault if the fault condition is no longer present. - Test Trip: This allows the user to trip the unit for test purposes. Use Fault Reset to reset the test trip condition. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Run1 command bit</td> <td>9585</td> </tr> <tr> <td>1</td> <td>Run2 command bit</td> <td>9586</td> </tr> <tr> <td>2</td> <td>Switch Control To Remote</td> <td>9587</td> </tr> <tr> <td>3</td> <td>Reset fault bit</td> <td>9588</td> </tr> <tr> <td>4</td> <td>Reserved bit</td> <td>9589</td> </tr> <tr> <td>5</td> <td>Test trip the device bit</td> <td>9590</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Run1 command bit | 9585 | 1 | Run2 command bit | 9586 | 2 | Switch Control To Remote | 9587 | 3 | Reset fault bit | 9588 | 4 | Reserved bit | 9589 | 5 | Test trip the device bit | 9590 | | | | | | |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Run1 command bit | 9585 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Run2 command bit | 9586 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Switch Control To Remote | 9587 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Reset fault bit | 9588 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Reserved bit | 9589 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Test trip the device bit | 9590 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 601 | Output Control | BYTE RW Bitfield | ON / OFF Control for Available Base Control Module Field Outputs. The Profile type dictates which of these outputs are available as general purpose outputs. For example, Outputs 2 and 3 are available when the Direct profile is selected, while only Output 3 is available when the Reverser Profile is selected. The bits are assigned to specific physical outputs in the Operation Mode category and the parameters are called Output x Function Select. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Bit 0</td> <td>9601</td> </tr> <tr> <td>1</td> <td>Bit 1</td> <td>9602</td> </tr> <tr> <td>2</td> <td>Bit 2</td> <td>9603</td> </tr> <tr> <td>3</td> <td>Bit 3</td> <td>9604</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Bit 0 | 9601 | 1 | Bit 1 | 9602 | 2 | Bit 2 | 9603 | 3 | Bit 3 | 9604 | | | | | | | | | | | | |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Bit 0 | 9601 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Bit 1 | 9602 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Bit 2 | 9603 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Bit 3 | 9604 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 602 | Remote Feedback Signal Parameter | BYTE RW Bitfield | This parameter only applies if the Operation mode being used includes digital feedback (Solenoid, MCCB Actuation and Contactor Feeder) and the selection for the Feedback Signal Source Select parameter is "Feedback Signals Provided by Network". If both of these conditions are met, then this parameter is a read only parameter that allows monitoring the state of the inputs with this software. Inputs 2 and 3 indicate the following based on the operation mode. Solenoid: Input 2 (bit 1) = Open, Input 3 (bit 2) = Closed Contactor/Feeder: Input 2 (Bit 1) = AUX On MCCB Feeder: Input 2 (Bit 1) = CB On, Input 3 (Bit 2) = CB Alarm | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Network feedback input I1</td> <td>9617</td> </tr> <tr> <td>1</td> <td>Network feedback input I2</td> <td>9618</td> </tr> <tr> <td>2</td> <td>Network feedback input I3</td> <td>9619</td> </tr> <tr> <td>3</td> <td>Network feedback input I4</td> <td>9620</td> </tr> <tr> <td>4</td> <td>Network feedback input I5</td> <td>9621</td> </tr> <tr> <td>5</td> <td>Network feedback input I6</td> <td>9622</td> </tr> <tr> <td>6</td> <td>Network feedback input I7</td> <td>9623</td> </tr> <tr> <td>7</td> <td>Network feedback input I8</td> <td>9624</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Network feedback input I1 | 9617 | 1 | Network feedback input I2 | 9618 | 2 | Network feedback input I3 | 9619 | 3 | Network feedback input I4 | 9620 | 4 | Network feedback input I5 | 9621 | 5 | Network feedback input I6 | 9622 | 6 | Network feedback input I7 | 9623 | 7 | Network feedback input I8 | 9624 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Network feedback input I1 | 9617 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Network feedback input I2 | 9618 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Network feedback input I3 | 9619 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Network feedback input I4 | 9620 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Network feedback input I5 | 9621 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Network feedback input I6 | 9622 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Network feedback input I7 | 9623 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Network feedback input I8 | 9624 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--------------------------------|---|---|-------|-------------|---|-------------------|---|-------------------|---|---------------------|---|------------|---|--------------------------|---|---------------------|---|------------------|---|----------------|---|---------------------|---|------------------|----|--------------------------------|----|----------------------|
| 603 | System Services | UINT8 RW Enum | System services are used to execute device level commands. The command is automatically cleared after being processed. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No Active Service</td> </tr> <tr> <td>1</td> <td>Clear fault queue</td> </tr> <tr> <td>2</td> <td>Clear trip snapshot</td> </tr> <tr> <td>3</td> <td>Test trip</td> </tr> <tr> <td>4</td> <td>Re-pair external modules</td> </tr> <tr> <td>5</td> <td>Factory reset</td> </tr> <tr> <td>6</td> <td>Soft reset</td> </tr> <tr> <td>7</td> <td>Reset Fault</td> </tr> <tr> <td>8</td> <td>Proof Test</td> </tr> </tbody> </table> | | | | Value | Description | 0 | No Active Service | 1 | Clear fault queue | 2 | Clear trip snapshot | 3 | Test trip | 4 | Re-pair external modules | 5 | Factory reset | 6 | Soft reset | 7 | Reset Fault | 8 | Proof Test | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | No Active Service | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Clear fault queue | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Clear trip snapshot | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Test trip | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Re-pair external modules | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Factory reset | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Soft reset | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Reset Fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Proof Test | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 700 | Active Operation Mode | UINT8 RW NV Default: 1 Enum Config CRC Run Lock Admin Lock USB Lock Backup Mem | Active Operation Mode is a read/write parameter used to configure the C445 for the application mode. - Overload Only uses Output 1 as a fault contact. The output is closed when the unit is powered and no fault is present. It opens on a fault. - Direct is FVNR Motor Control and uses Output 1. - Reverser is FVR Motor Control and uses Outputs 1 and 2. - Star/Delta or Wye/Delta applications use all three Base Control Module Outputs. - Two Speed Pole Changing is for Fast/Slow Motor Control applications and uses Outputs 1 and 2. - Two Speed Dahlander is for Slow/Fast Variable Torque Motor Control Applications. All 3 outputs are used. - HMCP/MCCP Actuation is for feeder breakers - Contactor Feeder is for controlling a contactor feeder with Output 1 - Solenoid Valve is for Solenoid Valve Motor Control Applications and uses Output 1. - Auto Transformer is for starting a motor at the voltage reduced by the transformer, with a correspondingly smaller current and uses all 3 Outputs. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Overload only</td> </tr> <tr> <td>1</td> <td>Direct online</td> </tr> <tr> <td>2</td> <td>Reverser</td> </tr> <tr> <td>3</td> <td>Star/Delta</td> </tr> <tr> <td>4</td> <td>Two speed pole changing</td> </tr> <tr> <td>5</td> <td>Two speed Dahlander</td> </tr> <tr> <td>6</td> <td>Auto transformer</td> </tr> <tr> <td>7</td> <td>Solenoid valve</td> </tr> <tr> <td>8</td> <td>HMCP/MCCP actuation</td> </tr> <tr> <td>9</td> <td>Contactor feeder</td> </tr> <tr> <td>10</td> <td>General purpose input / output</td> </tr> <tr> <td>11</td> <td>Standalone GF Module</td> </tr> </tbody> </table> | | | | Value | Description | 0 | Overload only | 1 | Direct online | 2 | Reverser | 3 | Star/Delta | 4 | Two speed pole changing | 5 | Two speed Dahlander | 6 | Auto transformer | 7 | Solenoid valve | 8 | HMCP/MCCP actuation | 9 | Contactor feeder | 10 | General purpose input / output | 11 | Standalone GF Module |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Overload only | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Direct online | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Reverser | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Star/Delta | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Two speed pole changing | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Two speed Dahlander | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Auto transformer | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Solenoid valve | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | HMCP/MCCP actuation | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Contactor feeder | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | General purpose input / output | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Standalone GF Module | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 701 | Contactor Fault Delay | UINT16 RW NV Default: 0 Range: 0 to 2000 Units: 10ms Config CRC Run Lock Admin Lock USB Lock Backup Mem | Delay Before a “Contactor Failure” Fault is Issued after a change of control state. For example, if the user commands C445 to run the motor but no current is seen by the device, it indicates the contactor did not close as commanded. This is meant as a delay in case the Fault clears itself a short time after a change of control state. A value of 0 will disable the contactor failure fault mode and this fault will never occur regardless of whether the current detected matches the state being commanded by C445. | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description |
|----------|----------------------------|--|--|
| 702 | Control Interlocking Time | UINT16 RW NV Default: 10 Range: 0 to 60000 Units: 10ms Config CRC Run Lock Admin Lock USB Lock Backup Mem | Time delay between “forward to reverse” or “reverse to forward” direction change (in 0.1sec). Used in the Reverser operation mode. |
| 703 | Control Switching Time | UINT16 RW NV Default: 10 Range: 0 to 60000 Units: 10ms Config CRC Run Lock Admin Lock USB Lock Backup Mem | Time delay between switching from fast to slow which allows the motor time to slow down. (in 0.1sec). Used in operation modes with two speeds. |
| 704 | Network contactor delay | UINT16 RW NV Default: 5 Range: 0 to 2000 Units: 10ms | Settling time for network contactor before RUN contactor engages (in 10ms). Used with the Star/Delta operation mode. |
| 705 | Max Star Winding Time | UINT16 RW NV Default: 100 Range: 1 to 6000 Units: 100ms Config CRC Run Lock Admin Lock USB Lock Backup Mem | Parameters used in Star/Delta Operation Mode. The time after which the controller will transition to delta wiring when “up to speed” is NOT detected in the star winding |
| 706 | Enable HMCP Actuation | BOOL RW NV Default: 0 Config CRC Run Lock Admin Lock USB Lock Backup Mem | Enable HMCP Actuation Control when using the MCCB Feeder Operation Mode. This allows the C445 Outputs 1 and 2 to turn the Circuit Breaker On and Off. |
| 707 | HMCP Actuation Pulse Width | UINT16 RW NV Default: 500 Range: 100 to 60000 Units: ms Config CRC Run Lock Admin Lock USB Lock Backup Mem | HMCP actuation pulse width or length of on-time to trigger motor operator (in 1.0 ms). |
| 708 | Solenoid Open Delay Time | UINT16 RW NV Default: 0 Units: 10ms Config CRC Admin Lock USB Lock Backup Mem | Delay time for solenoid valve to open (in 10ms). Used in Solenoid Valve operation mode. |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | |
|----------|---|---|---|-------|-------------|---|---|---|---|---|---|---|---|
| 709 | Solenoid Close Delay Time | UINT16 RW NV Default: 0 Units: 10ms Config CRC Admin Lock USB Lock Backup Mem | Delay time for solenoid valve to close (in 10ms). Used in Solenoid Valve operation mode. | | | | | | | | | | |
| 710 | Solenoid Normal State | UINT8 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | Non energized state of solenoid valve. Used in Solenoid Valve operation mode. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Solenoid Valve normally closed - energize to open</td> </tr> <tr> <td>1</td> <td>Solenoid Valve normally open - energize to close</td> </tr> </tbody> </table> | Value | Description | 0 | Solenoid Valve normally closed - energize to open | 1 | Solenoid Valve normally open - energize to close | | | | |
| Value | Description | | | | | | | | | | | | |
| 0 | Solenoid Valve normally closed - energize to open | | | | | | | | | | | | |
| 1 | Solenoid Valve normally open - energize to close | | | | | | | | | | | | |
| 711 | Local Control Source | UINT8 RW NV Default: 0 Enum Config CRC Run Lock Admin Lock USB Lock Backup Mem | Allows the user to select the local source of control. The default if a User Interface is included is "Auto Detect User Interface". Other choices are no local control and fieldwire control. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Auto detect User Interface</td> </tr> <tr> <td>1</td> <td>No local control</td> </tr> <tr> <td>2</td> <td>User Interface local control</td> </tr> <tr> <td>3</td> <td>Fieldwire local control</td> </tr> </tbody> </table> | Value | Description | 0 | Auto detect User Interface | 1 | No local control | 2 | User Interface local control | 3 | Fieldwire local control |
| Value | Description | | | | | | | | | | | | |
| 0 | Auto detect User Interface | | | | | | | | | | | | |
| 1 | No local control | | | | | | | | | | | | |
| 2 | User Interface local control | | | | | | | | | | | | |
| 3 | Fieldwire local control | | | | | | | | | | | | |
| 712 | Remote Control Source | UINT8 RW NV Default: 1 Enum Config CRC Run Lock Admin Lock USB Lock Backup Mem | Remote Control Source Select. Selects the control source when in "Auto" mode. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No remote control source</td> </tr> <tr> <td>1</td> <td>Fieldbus is remote control source</td> </tr> <tr> <td>2</td> <td>Fieldwire is remote control source</td> </tr> <tr> <td>3</td> <td>User Logic is the remote control source</td> </tr> </tbody> </table> | Value | Description | 0 | No remote control source | 1 | Fieldbus is remote control source | 2 | Fieldwire is remote control source | 3 | User Logic is the remote control source |
| Value | Description | | | | | | | | | | | | |
| 0 | No remote control source | | | | | | | | | | | | |
| 1 | Fieldbus is remote control source | | | | | | | | | | | | |
| 2 | Fieldwire is remote control source | | | | | | | | | | | | |
| 3 | User Logic is the remote control source | | | | | | | | | | | | |
| 713 | Feedback Signal Source Select | UINT8 RW NV Default: 0 Enum Config CRC Run Lock Admin Lock USB Lock Backup Mem | Selects the source of the digital inputs used for the feedback signals for certain operation modes. The operation modes that require digital input feedback are: Solenoid, MCCB Actuation and Contactor Feeder. This parameter allows the user to select where the inputs are wired to the C445. To the Base Control Module, the User Interface or to a controller where they are sent to the C445 via a communication network. For all three locations these input feedback signals may be wired, the actual input or bit is pre-defined for each as follows. Solenoid Operation Mode: 1. Base Control Module: Input 2 (open), Input 3 (closed) 3. Input Register 602 from a controller: Bit 1 (open) and Bit 2 (closed) Contactor Feeder Operation Mode: 1. Base Control Module: Input 2 (AUX On) 3. Input Register 602 from a controller: Bit 1 (AUX On) MCCB Feeder Operation Mode: 1. Base Control Module: Input 2 (CB On), Input 3 (CB Alarm) 3. Input Register 602 from a controller: Bit 1 (CB On), Bit 2 (CB Alarm) <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No feedback signals</td> </tr> <tr> <td>1</td> <td>Feedback signals connected to User Interface inputs</td> </tr> <tr> <td>2</td> <td>Feedback signals connected to Base Control Module field wiring inputs</td> </tr> <tr> <td>3</td> <td>Feedback signals provided by network</td> </tr> </tbody> </table> | Value | Description | 0 | No feedback signals | 1 | Feedback signals connected to User Interface inputs | 2 | Feedback signals connected to Base Control Module field wiring inputs | 3 | Feedback signals provided by network |
| Value | Description | | | | | | | | | | | | |
| 0 | No feedback signals | | | | | | | | | | | | |
| 1 | Feedback signals connected to User Interface inputs | | | | | | | | | | | | |
| 2 | Feedback signals connected to Base Control Module field wiring inputs | | | | | | | | | | | | |
| 3 | Feedback signals provided by network | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--|---|---|-------|-------------|---|---|---|--|---|--|---|---|---|---------------------------|---|---|---|-----------------------------|---|--------------------------------|---|----------|---|---------------------------------|----|----------------------------------|----|-------------------------------------|----|--|----|--|----|---|----|--|----|--|----|---------------------------|----|--|----|---|----|--|----|------------------------------------|----|---------------------------------------|----|------------------------------|----|----------------------------------|----|--------------------------------|----|--------------------------------|----|---------------------------------------|----|----------------------------------|----|----------------------------------|
| 714 | Local/Remote PowerUp Behavior | UINT8 RW NV Default: 2 Enum Config CRC Admin Lock USB Lock Backup Mem | Select the Local/Remote mode the Base Control Module will power up in. Selections: 0: Local control is active control on power up, 1: Remote control is active control on power up, 2: Hold last control state on power up. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Local control is active control on power-up</td> </tr> <tr> <td>1</td> <td>Remote control is active control on power-up</td> </tr> <tr> <td>2</td> <td>Hold last control state on power-up</td> </tr> </tbody> </table> | Value | Description | 0 | Local control is active control on power-up | 1 | Remote control is active control on power-up | 2 | Hold last control state on power-up | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Local control is active control on power-up | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Remote control is active control on power-up | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Hold last control state on power-up | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 715 | Q1 Function Select | UINT16 RW NV Default: 54 Enum Config CRC Run Lock Admin Lock USB Lock Backup Mem | Output Function Select for General Purpose Output 1. Available when this output is not used by the Operation Mode. Default = none, If used by the Application Mode = Reserved. A soft reset is required after modifying this parameter. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>None</td> </tr> <tr> <td>1</td> <td>Fault Reason Type - Load fault (Power based)</td> </tr> <tr> <td>2</td> <td>Fault Reason Type - Supply fault (Voltage based)</td> </tr> <tr> <td>3</td> <td>Fault Reason Type - Motor fault (Current based)</td> </tr> <tr> <td>4</td> <td>Tripped Status Bits - PTC</td> </tr> <tr> <td>5</td> <td>Tripped Status Bits - Phase rotation mismatch</td> </tr> <tr> <td>6</td> <td>Tripped Status Bits - Stall</td> </tr> <tr> <td>7</td> <td>Tripped Status Bits - Overload</td> </tr> <tr> <td>8</td> <td>Reserved</td> </tr> <tr> <td>9</td> <td>Tripped Status Bits - Low power</td> </tr> <tr> <td>10</td> <td>Tripped Status Bits - High power</td> </tr> <tr> <td>11</td> <td>Tripped Status Bits - Under current</td> </tr> <tr> <td>12</td> <td>Tripped Status Bits - Frequency deviation slow</td> </tr> <tr> <td>13</td> <td>Tripped Status Bits - Frequency deviation fast</td> </tr> <tr> <td>14</td> <td>Tripped Status Bits - Voltage unbalance</td> </tr> <tr> <td>15</td> <td>Tripped Status Bits - Voltage phase loss</td> </tr> <tr> <td>16</td> <td>Tripped Status Bits - Power factor deviation</td> </tr> <tr> <td>17</td> <td>Tripped Status Bits - Jam</td> </tr> <tr> <td>18</td> <td>Tripped Status Bits - Instantaneous over current</td> </tr> <tr> <td>19</td> <td>Tripped Status Bits - Current unbalance</td> </tr> <tr> <td>20</td> <td>Tripped Status Bits - Current phase loss</td> </tr> <tr> <td>21</td> <td>Tripped Status Bits - Ground fault</td> </tr> <tr> <td>22</td> <td>Motor Control Status - Motor at speed</td> </tr> <tr> <td>23</td> <td>Motor Control Status - Ready</td> </tr> <tr> <td>24</td> <td>Motor Control Status - Inhibited</td> </tr> <tr> <td>25</td> <td>Motor Control Status - Warning</td> </tr> <tr> <td>26</td> <td>Motor Control Status - Faulted</td> </tr> <tr> <td>27</td> <td>Motor Control Status - Remote enabled</td> </tr> <tr> <td>28</td> <td>Motor Control Status - Running 2</td> </tr> <tr> <td>29</td> <td>Motor Control Status - Running 1</td> </tr> </tbody> </table> | Value | Description | 0 | None | 1 | Fault Reason Type - Load fault (Power based) | 2 | Fault Reason Type - Supply fault (Voltage based) | 3 | Fault Reason Type - Motor fault (Current based) | 4 | Tripped Status Bits - PTC | 5 | Tripped Status Bits - Phase rotation mismatch | 6 | Tripped Status Bits - Stall | 7 | Tripped Status Bits - Overload | 8 | Reserved | 9 | Tripped Status Bits - Low power | 10 | Tripped Status Bits - High power | 11 | Tripped Status Bits - Under current | 12 | Tripped Status Bits - Frequency deviation slow | 13 | Tripped Status Bits - Frequency deviation fast | 14 | Tripped Status Bits - Voltage unbalance | 15 | Tripped Status Bits - Voltage phase loss | 16 | Tripped Status Bits - Power factor deviation | 17 | Tripped Status Bits - Jam | 18 | Tripped Status Bits - Instantaneous over current | 19 | Tripped Status Bits - Current unbalance | 20 | Tripped Status Bits - Current phase loss | 21 | Tripped Status Bits - Ground fault | 22 | Motor Control Status - Motor at speed | 23 | Motor Control Status - Ready | 24 | Motor Control Status - Inhibited | 25 | Motor Control Status - Warning | 26 | Motor Control Status - Faulted | 27 | Motor Control Status - Remote enabled | 28 | Motor Control Status - Running 2 | 29 | Motor Control Status - Running 1 |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Fault Reason Type - Load fault (Power based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Fault Reason Type - Supply fault (Voltage based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Fault Reason Type - Motor fault (Current based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Tripped Status Bits - PTC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Tripped Status Bits - Phase rotation mismatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Tripped Status Bits - Stall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Tripped Status Bits - Overload | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Tripped Status Bits - Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Tripped Status Bits - High power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Tripped Status Bits - Under current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Tripped Status Bits - Frequency deviation slow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Tripped Status Bits - Frequency deviation fast | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Tripped Status Bits - Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Tripped Status Bits - Voltage phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Tripped Status Bits - Power factor deviation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Tripped Status Bits - Jam | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Tripped Status Bits - Instantaneous over current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Tripped Status Bits - Current unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Tripped Status Bits - Current phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | Tripped Status Bits - Ground fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | Motor Control Status - Motor at speed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Motor Control Status - Ready | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | Motor Control Status - Inhibited | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | Motor Control Status - Warning | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | Motor Control Status - Faulted | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | Motor Control Status - Remote enabled | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | Motor Control Status - Running 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | Motor Control Status - Running 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|---|--|-------|-------------|----|---------------------------|----|---|----|-----------------------------|----|--------------------------------|----|---|----|---------------------------------|----|----------------------------------|----|-------------------------------------|----|--|----|--|----|---|----|--|----|--|----|---------------------------|----|--|----|---|----|--|----|--------------------------------------|----|--------------------------------|----|------------------------------------|----|-------------------------------------|----|-------------------------------------|----|------------------------------------|----|--------------------------------|----|---|----|---|----|---|----|---|----|---|----|---------------------------------------|----|------------------------------|----|---|----|---|----|---|----|---|----|----------------------------------|-------|----------|
| 715 | Q1 Function Select | UINT16 RW NV Default: 54 Enum Config CRC Run Lock Admin Lock USB Lock Backup Mem | Output Function Select for General Purpose Output 1. Available when this output is not used by the Operation Mode. Default = none, If used by the Application Mode = Reserved. A soft reset is required after modifying this parameter, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>30</td><td>Warning Status Bits - PTC</td></tr> <tr><td>31</td><td>Warning Status Bits - Phase rotation mismatch</td></tr> <tr><td>32</td><td>Warning Status Bits - Stall</td></tr> <tr><td>33</td><td>Warning Status Bits - Overload</td></tr> <tr><td>34</td><td>Warning Status Bits - Starts limit exceeded</td></tr> <tr><td>35</td><td>Warning Status Bits - Low power</td></tr> <tr><td>36</td><td>Warning Status Bits - High power</td></tr> <tr><td>37</td><td>Warning Status Bits - Under current</td></tr> <tr><td>38</td><td>Warning Status Bits - Frequency deviation slow</td></tr> <tr><td>39</td><td>Warning Status Bits - Frequency deviation fast</td></tr> <tr><td>40</td><td>Warning Status Bits - Voltage unbalance</td></tr> <tr><td>41</td><td>Warning Status Bits - Voltage phase loss</td></tr> <tr><td>42</td><td>Warning Status Bits - Power factor deviation</td></tr> <tr><td>43</td><td>Warning Status Bits - Jam</td></tr> <tr><td>44</td><td>Warning Status Bits - Instantaneous over current</td></tr> <tr><td>45</td><td>Warning Status Bits - Current unbalance</td></tr> <tr><td>46</td><td>Warning Status Bits - Current phase loss</td></tr> <tr><td>47</td><td>Warning Status Bits - Ground current</td></tr> <tr><td>48</td><td>Warning Status Bits - Reserved</td></tr> <tr><td>49</td><td>Warning Status Bits - Over voltage</td></tr> <tr><td>50</td><td>Warning Status Bits - Under voltage</td></tr> <tr><td>51</td><td>Tripped Status Bits - Under voltage</td></tr> <tr><td>52</td><td>Tripped Status Bits - Over voltage</td></tr> <tr><td>53</td><td>Tripped Status Bits - Reserved</td></tr> <tr><td>54</td><td>Base Control Module Field Output control word - Bit 0</td></tr> <tr><td>55</td><td>Base Control Module Field Output control word - Bit 1</td></tr> <tr><td>56</td><td>Base Control Module Field Output control word - Bit 2</td></tr> <tr><td>57</td><td>Base Control Module Field Output control word - Bit 3</td></tr> <tr><td>58</td><td>Shunt trip output bit - Shunt trip output bit</td></tr> <tr><td>59</td><td>Warning Reason - HRGF pulse detection</td></tr> <tr><td>60</td><td>Warning Reason - Peak demand</td></tr> <tr><td>61</td><td>Digital Input Status - Base Control Module Input I4</td></tr> <tr><td>62</td><td>Digital Input Status - Base Control Module Input I3</td></tr> <tr><td>63</td><td>Digital Input Status - Base Control Module Input I2</td></tr> <tr><td>64</td><td>Digital Input Status - Base Control Module Input I1</td></tr> <tr><td>65</td><td>Fail Safe - Ground current fault</td></tr> <tr><td>65535</td><td>Reserved</td></tr> </tbody> </table> | Value | Description | 30 | Warning Status Bits - PTC | 31 | Warning Status Bits - Phase rotation mismatch | 32 | Warning Status Bits - Stall | 33 | Warning Status Bits - Overload | 34 | Warning Status Bits - Starts limit exceeded | 35 | Warning Status Bits - Low power | 36 | Warning Status Bits - High power | 37 | Warning Status Bits - Under current | 38 | Warning Status Bits - Frequency deviation slow | 39 | Warning Status Bits - Frequency deviation fast | 40 | Warning Status Bits - Voltage unbalance | 41 | Warning Status Bits - Voltage phase loss | 42 | Warning Status Bits - Power factor deviation | 43 | Warning Status Bits - Jam | 44 | Warning Status Bits - Instantaneous over current | 45 | Warning Status Bits - Current unbalance | 46 | Warning Status Bits - Current phase loss | 47 | Warning Status Bits - Ground current | 48 | Warning Status Bits - Reserved | 49 | Warning Status Bits - Over voltage | 50 | Warning Status Bits - Under voltage | 51 | Tripped Status Bits - Under voltage | 52 | Tripped Status Bits - Over voltage | 53 | Tripped Status Bits - Reserved | 54 | Base Control Module Field Output control word - Bit 0 | 55 | Base Control Module Field Output control word - Bit 1 | 56 | Base Control Module Field Output control word - Bit 2 | 57 | Base Control Module Field Output control word - Bit 3 | 58 | Shunt trip output bit - Shunt trip output bit | 59 | Warning Reason - HRGF pulse detection | 60 | Warning Reason - Peak demand | 61 | Digital Input Status - Base Control Module Input I4 | 62 | Digital Input Status - Base Control Module Input I3 | 63 | Digital Input Status - Base Control Module Input I2 | 64 | Digital Input Status - Base Control Module Input I1 | 65 | Fail Safe - Ground current fault | 65535 | Reserved |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | Warning Status Bits - PTC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | Warning Status Bits - Phase rotation mismatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | Warning Status Bits - Stall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | Warning Status Bits - Overload | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | Warning Status Bits - Starts limit exceeded | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | Warning Status Bits - Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | Warning Status Bits - High power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | Warning Status Bits - Under current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | Warning Status Bits - Frequency deviation slow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | Warning Status Bits - Frequency deviation fast | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | Warning Status Bits - Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | Warning Status Bits - Voltage phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | Warning Status Bits - Power factor deviation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | Warning Status Bits - Jam | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | Warning Status Bits - Instantaneous over current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 | Warning Status Bits - Current unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | Warning Status Bits - Current phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 | Warning Status Bits - Ground current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 48 | Warning Status Bits - Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 49 | Warning Status Bits - Over voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | Warning Status Bits - Under voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | Tripped Status Bits - Under voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 52 | Tripped Status Bits - Over voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 53 | Tripped Status Bits - Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | Base Control Module Field Output control word - Bit 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 55 | Base Control Module Field Output control word - Bit 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 56 | Base Control Module Field Output control word - Bit 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 57 | Base Control Module Field Output control word - Bit 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | Shunt trip output bit - Shunt trip output bit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 59 | Warning Reason - HRGF pulse detection | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | Warning Reason - Peak demand | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 61 | Digital Input Status - Base Control Module Input I4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 62 | Digital Input Status - Base Control Module Input I3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | Digital Input Status - Base Control Module Input I2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 64 | Digital Input Status - Base Control Module Input I1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65 | Fail Safe - Ground current fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65535 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--|---|---|-------|-------------|---|------|---|--|---|--|---|---|---|---------------------------|---|---|---|-----------------------------|---|--------------------------------|---|----------|---|---------------------------------|----|----------------------------------|----|-------------------------------------|----|--|----|--|----|---|----|--|----|--|----|---------------------------|----|--|----|---|----|--|----|--------------------------------------|----|---------------------------------------|----|------------------------------|----|----------------------------------|----|--------------------------------|----|--------------------------------|----|---------------------------------------|----|----------------------------------|----|----------------------------------|----|---------------------------|----|---|----|-----------------------------|----|--------------------------------|----|---|----|---------------------------------|----|----------------------------------|----|-------------------------------------|----|--|----|--|
| 716 | Q2 Function Select | UINT16 RW NV Default: 55 Enum Config CRC Run Lock Admin Lock USB Lock Backup Mem | Output Function Select for General Purpose Output 2. Available when this output is not used by the Operation Mode. Default = none, If used by the Application Mode = Reserved. A soft reset is required after modifying this parameter. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>0</td><td>None</td></tr> <tr><td>1</td><td>Fault Reason Type - Load fault (Power based)</td></tr> <tr><td>2</td><td>Fault Reason Type - Supply fault (Voltage based)</td></tr> <tr><td>3</td><td>Fault Reason Type - Motor fault (Current based)</td></tr> <tr><td>4</td><td>Tripped Status Bits - PTC</td></tr> <tr><td>5</td><td>Tripped Status Bits - Phase rotation mismatch</td></tr> <tr><td>6</td><td>Tripped Status Bits - Stall</td></tr> <tr><td>7</td><td>Tripped Status Bits - Overload</td></tr> <tr><td>8</td><td>Reserved</td></tr> <tr><td>9</td><td>Tripped Status Bits - Low power</td></tr> <tr><td>10</td><td>Tripped Status Bits - High power</td></tr> <tr><td>11</td><td>Tripped Status Bits - Under current</td></tr> <tr><td>12</td><td>Tripped Status Bits - Frequency deviation slow</td></tr> <tr><td>13</td><td>Tripped Status Bits - Frequency deviation fast</td></tr> <tr><td>14</td><td>Tripped Status Bits - Voltage unbalance</td></tr> <tr><td>15</td><td>Tripped Status Bits - Voltage phase loss</td></tr> <tr><td>16</td><td>Tripped Status Bits - Power factor deviation</td></tr> <tr><td>17</td><td>Tripped Status Bits - Jam</td></tr> <tr><td>18</td><td>Tripped Status Bits - Instantaneous over current</td></tr> <tr><td>19</td><td>Tripped Status Bits - Current unbalance</td></tr> <tr><td>20</td><td>Tripped Status Bits - Current phase loss</td></tr> <tr><td>21</td><td>Tripped Status Bits - Ground current</td></tr> <tr><td>22</td><td>Motor Control Status - Motor at speed</td></tr> <tr><td>23</td><td>Motor Control Status - Ready</td></tr> <tr><td>24</td><td>Motor Control Status - Inhibited</td></tr> <tr><td>25</td><td>Motor Control Status - Warning</td></tr> <tr><td>26</td><td>Motor Control Status - Faulted</td></tr> <tr><td>27</td><td>Motor Control Status - Remote enabled</td></tr> <tr><td>28</td><td>Motor Control Status - Running 2</td></tr> <tr><td>29</td><td>Motor Control Status - Running 1</td></tr> <tr><td>30</td><td>Warning Status Bits - PTC</td></tr> <tr><td>31</td><td>Warning Status Bits - Phase rotation mismatch</td></tr> <tr><td>32</td><td>Warning Status Bits - Stall</td></tr> <tr><td>33</td><td>Warning Status Bits - Overload</td></tr> <tr><td>34</td><td>Warning Status Bits - Starts limit exceeded</td></tr> <tr><td>35</td><td>Warning Status Bits - Low power</td></tr> <tr><td>36</td><td>Warning Status Bits - High power</td></tr> <tr><td>37</td><td>Warning Status Bits - Under current</td></tr> <tr><td>38</td><td>Warning Status Bits - Frequency deviation slow</td></tr> <tr><td>39</td><td>Warning Status Bits - Frequency deviation fast</td></tr> </tbody> </table> | Value | Description | 0 | None | 1 | Fault Reason Type - Load fault (Power based) | 2 | Fault Reason Type - Supply fault (Voltage based) | 3 | Fault Reason Type - Motor fault (Current based) | 4 | Tripped Status Bits - PTC | 5 | Tripped Status Bits - Phase rotation mismatch | 6 | Tripped Status Bits - Stall | 7 | Tripped Status Bits - Overload | 8 | Reserved | 9 | Tripped Status Bits - Low power | 10 | Tripped Status Bits - High power | 11 | Tripped Status Bits - Under current | 12 | Tripped Status Bits - Frequency deviation slow | 13 | Tripped Status Bits - Frequency deviation fast | 14 | Tripped Status Bits - Voltage unbalance | 15 | Tripped Status Bits - Voltage phase loss | 16 | Tripped Status Bits - Power factor deviation | 17 | Tripped Status Bits - Jam | 18 | Tripped Status Bits - Instantaneous over current | 19 | Tripped Status Bits - Current unbalance | 20 | Tripped Status Bits - Current phase loss | 21 | Tripped Status Bits - Ground current | 22 | Motor Control Status - Motor at speed | 23 | Motor Control Status - Ready | 24 | Motor Control Status - Inhibited | 25 | Motor Control Status - Warning | 26 | Motor Control Status - Faulted | 27 | Motor Control Status - Remote enabled | 28 | Motor Control Status - Running 2 | 29 | Motor Control Status - Running 1 | 30 | Warning Status Bits - PTC | 31 | Warning Status Bits - Phase rotation mismatch | 32 | Warning Status Bits - Stall | 33 | Warning Status Bits - Overload | 34 | Warning Status Bits - Starts limit exceeded | 35 | Warning Status Bits - Low power | 36 | Warning Status Bits - High power | 37 | Warning Status Bits - Under current | 38 | Warning Status Bits - Frequency deviation slow | 39 | Warning Status Bits - Frequency deviation fast |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Fault Reason Type - Load fault (Power based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Fault Reason Type - Supply fault (Voltage based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Fault Reason Type - Motor fault (Current based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Tripped Status Bits - PTC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Tripped Status Bits - Phase rotation mismatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Tripped Status Bits - Stall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Tripped Status Bits - Overload | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Tripped Status Bits - Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Tripped Status Bits - High power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Tripped Status Bits - Under current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Tripped Status Bits - Frequency deviation slow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Tripped Status Bits - Frequency deviation fast | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Tripped Status Bits - Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Tripped Status Bits - Voltage phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Tripped Status Bits - Power factor deviation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Tripped Status Bits - Jam | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Tripped Status Bits - Instantaneous over current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Tripped Status Bits - Current unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Tripped Status Bits - Current phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | Tripped Status Bits - Ground current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | Motor Control Status - Motor at speed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Motor Control Status - Ready | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | Motor Control Status - Inhibited | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | Motor Control Status - Warning | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | Motor Control Status - Faulted | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | Motor Control Status - Remote enabled | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | Motor Control Status - Running 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | Motor Control Status - Running 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | Warning Status Bits - PTC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | Warning Status Bits - Phase rotation mismatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | Warning Status Bits - Stall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | Warning Status Bits - Overload | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | Warning Status Bits - Starts limit exceeded | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | Warning Status Bits - Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | Warning Status Bits - High power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | Warning Status Bits - Under current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | Warning Status Bits - Frequency deviation slow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | Warning Status Bits - Frequency deviation fast | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|---|--|-------|-------------|----|---|----|--|----|--|----|---------------------------|----|--|----|---|----|--|----|--------------------------------------|----|--------------------------------|----|------------------------------------|----|-------------------------------------|----|-------------------------------------|----|------------------------------------|----|--------------------------------|----|---|----|---|----|---|----|---|----|---|----|---------------------------------------|----|------------------------------|----|---|----|---|----|---|----|---|----|----------------------------------|-------|----------|
| 716 | Q2 Function Select | UINT16 RW NV Default: 55 Enum Config CRC Run Lock Admin Lock USB Lock Backup Mem | Output Function Select for General Purpose Output 2. Available when this output is not used by the Operation Mode. Default = none, If used by the Application Mode = Reserved. A soft reset is required after modifying this parameter, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>40</td><td>Warning Status Bits - Voltage unbalance</td></tr> <tr><td>41</td><td>Warning Status Bits - Voltage phase loss</td></tr> <tr><td>42</td><td>Warning Status Bits - Power factor deviation</td></tr> <tr><td>43</td><td>Warning Status Bits - Jam</td></tr> <tr><td>44</td><td>Warning Status Bits - Instantaneous over current</td></tr> <tr><td>45</td><td>Warning Status Bits - Current unbalance</td></tr> <tr><td>46</td><td>Warning Status Bits - Current phase loss</td></tr> <tr><td>47</td><td>Warning Status Bits - Ground current</td></tr> <tr><td>48</td><td>Warning Status Bits - Reserved</td></tr> <tr><td>49</td><td>Warning Status Bits - Over voltage</td></tr> <tr><td>50</td><td>Warning Status Bits - Under voltage</td></tr> <tr><td>51</td><td>Tripped Status Bits - Under voltage</td></tr> <tr><td>52</td><td>Tripped Status Bits - Over voltage</td></tr> <tr><td>53</td><td>Tripped Status Bits - Reserved</td></tr> <tr><td>54</td><td>Base Control Module Field Output control word - Bit 0</td></tr> <tr><td>55</td><td>Base Control Module Field Output control word - Bit 1</td></tr> <tr><td>56</td><td>Base Control Module Field Output control word - Bit 2</td></tr> <tr><td>57</td><td>Base Control Module Field Output control word - Bit 3</td></tr> <tr><td>58</td><td>Shunt trip output bit - Shunt trip output bit</td></tr> <tr><td>59</td><td>Warning Reason - HRGF pulse detection</td></tr> <tr><td>60</td><td>Warning Reason - Peak demand</td></tr> <tr><td>61</td><td>Digital Input Status - Base Control Module Input I4</td></tr> <tr><td>62</td><td>Digital Input Status - Base Control Module Input I3</td></tr> <tr><td>63</td><td>Digital Input Status - Base Control Module Input I2</td></tr> <tr><td>64</td><td>Digital Input Status - Base Control Module Input I1</td></tr> <tr><td>65</td><td>Fail Safe - Ground current fault</td></tr> <tr><td>65535</td><td>Reserved</td></tr> </tbody> </table> | Value | Description | 40 | Warning Status Bits - Voltage unbalance | 41 | Warning Status Bits - Voltage phase loss | 42 | Warning Status Bits - Power factor deviation | 43 | Warning Status Bits - Jam | 44 | Warning Status Bits - Instantaneous over current | 45 | Warning Status Bits - Current unbalance | 46 | Warning Status Bits - Current phase loss | 47 | Warning Status Bits - Ground current | 48 | Warning Status Bits - Reserved | 49 | Warning Status Bits - Over voltage | 50 | Warning Status Bits - Under voltage | 51 | Tripped Status Bits - Under voltage | 52 | Tripped Status Bits - Over voltage | 53 | Tripped Status Bits - Reserved | 54 | Base Control Module Field Output control word - Bit 0 | 55 | Base Control Module Field Output control word - Bit 1 | 56 | Base Control Module Field Output control word - Bit 2 | 57 | Base Control Module Field Output control word - Bit 3 | 58 | Shunt trip output bit - Shunt trip output bit | 59 | Warning Reason - HRGF pulse detection | 60 | Warning Reason - Peak demand | 61 | Digital Input Status - Base Control Module Input I4 | 62 | Digital Input Status - Base Control Module Input I3 | 63 | Digital Input Status - Base Control Module Input I2 | 64 | Digital Input Status - Base Control Module Input I1 | 65 | Fail Safe - Ground current fault | 65535 | Reserved |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | Warning Status Bits - Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | Warning Status Bits - Voltage phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | Warning Status Bits - Power factor deviation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | Warning Status Bits - Jam | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | Warning Status Bits - Instantaneous over current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 | Warning Status Bits - Current unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | Warning Status Bits - Current phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 | Warning Status Bits - Ground current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 48 | Warning Status Bits - Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 49 | Warning Status Bits - Over voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | Warning Status Bits - Under voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | Tripped Status Bits - Under voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 52 | Tripped Status Bits - Over voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 53 | Tripped Status Bits - Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | Base Control Module Field Output control word - Bit 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 55 | Base Control Module Field Output control word - Bit 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 56 | Base Control Module Field Output control word - Bit 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 57 | Base Control Module Field Output control word - Bit 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | Shunt trip output bit - Shunt trip output bit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 59 | Warning Reason - HRGF pulse detection | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | Warning Reason - Peak demand | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 61 | Digital Input Status - Base Control Module Input I4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 62 | Digital Input Status - Base Control Module Input I3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | Digital Input Status - Base Control Module Input I2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 64 | Digital Input Status - Base Control Module Input I1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65 | Fail Safe - Ground current fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65535 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--|---|---|-------|-------------|---|------|---|--|---|--|---|---|---|---------------------------|---|---|---|-----------------------------|---|--------------------------------|---|----------|---|---------------------------------|----|----------------------------------|----|-------------------------------------|----|--|----|--|----|---|----|--|----|--|----|---------------------------|----|--|----|---|----|--|----|--------------------------------------|----|---------------------------------------|----|------------------------------|----|----------------------------------|----|--------------------------------|----|--------------------------------|----|---------------------------------------|----|----------------------------------|----|----------------------------------|----|---------------------------|----|---|----|-----------------------------|----|--------------------------------|----|---|----|---------------------------------|----|----------------------------------|----|-------------------------------------|----|--|----|--|
| 717 | Q3 Function Select | UINT16 RW NV Default: 56 Enum Config CRC Run Lock Admin Lock USB Lock Backup Mem | Output Function Select for General Purpose Output 3. Available when this output is not used by the Operation Mode. Default = none. If used by the Application Mode = Reserved. (For non-latching relay, 0 = de-energized and 1 = energized. For latching relay, 0 = no change and 1 = set). A soft reset is required after modifying this parameter. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>0</td><td>None</td></tr> <tr><td>1</td><td>Fault Reason Type - Load fault (Power based)</td></tr> <tr><td>2</td><td>Fault Reason Type - Supply fault (Voltage based)</td></tr> <tr><td>3</td><td>Fault Reason Type - Motor fault (Current based)</td></tr> <tr><td>4</td><td>Tripped Status Bits - PTC</td></tr> <tr><td>5</td><td>Tripped Status Bits - Phase rotation mismatch</td></tr> <tr><td>6</td><td>Tripped Status Bits - Stall</td></tr> <tr><td>7</td><td>Tripped Status Bits - Overload</td></tr> <tr><td>8</td><td>Reserved</td></tr> <tr><td>9</td><td>Tripped Status Bits - Low power</td></tr> <tr><td>10</td><td>Tripped Status Bits - High power</td></tr> <tr><td>11</td><td>Tripped Status Bits - Under current</td></tr> <tr><td>12</td><td>Tripped Status Bits - Frequency deviation slow</td></tr> <tr><td>13</td><td>Tripped Status Bits - Frequency deviation fast</td></tr> <tr><td>14</td><td>Tripped Status Bits - Voltage unbalance</td></tr> <tr><td>15</td><td>Tripped Status Bits - Voltage phase loss</td></tr> <tr><td>16</td><td>Tripped Status Bits - Power factor deviation</td></tr> <tr><td>17</td><td>Tripped Status Bits - Jam</td></tr> <tr><td>18</td><td>Tripped Status Bits - Instantaneous over current</td></tr> <tr><td>19</td><td>Tripped Status Bits - Current unbalance</td></tr> <tr><td>20</td><td>Tripped Status Bits - Current phase loss</td></tr> <tr><td>21</td><td>Tripped Status Bits - Ground current</td></tr> <tr><td>22</td><td>Motor Control Status - Motor at speed</td></tr> <tr><td>23</td><td>Motor Control Status - Ready</td></tr> <tr><td>24</td><td>Motor Control Status - Inhibited</td></tr> <tr><td>25</td><td>Motor Control Status - Warning</td></tr> <tr><td>26</td><td>Motor Control Status - Faulted</td></tr> <tr><td>27</td><td>Motor Control Status - Remote enabled</td></tr> <tr><td>28</td><td>Motor Control Status - Running 2</td></tr> <tr><td>29</td><td>Motor Control Status - Running 1</td></tr> <tr><td>30</td><td>Warning Status Bits - PTC</td></tr> <tr><td>31</td><td>Warning Status Bits - Phase rotation mismatch</td></tr> <tr><td>32</td><td>Warning Status Bits - Stall</td></tr> <tr><td>33</td><td>Warning Status Bits - Overload</td></tr> <tr><td>34</td><td>Warning Status Bits - Starts limit exceeded</td></tr> <tr><td>35</td><td>Warning Status Bits - Low power</td></tr> <tr><td>36</td><td>Warning Status Bits - High power</td></tr> <tr><td>37</td><td>Warning Status Bits - Under current</td></tr> <tr><td>38</td><td>Warning Status Bits - Frequency deviation slow</td></tr> <tr><td>39</td><td>Warning Status Bits - Frequency deviation fast</td></tr> </tbody> </table> | Value | Description | 0 | None | 1 | Fault Reason Type - Load fault (Power based) | 2 | Fault Reason Type - Supply fault (Voltage based) | 3 | Fault Reason Type - Motor fault (Current based) | 4 | Tripped Status Bits - PTC | 5 | Tripped Status Bits - Phase rotation mismatch | 6 | Tripped Status Bits - Stall | 7 | Tripped Status Bits - Overload | 8 | Reserved | 9 | Tripped Status Bits - Low power | 10 | Tripped Status Bits - High power | 11 | Tripped Status Bits - Under current | 12 | Tripped Status Bits - Frequency deviation slow | 13 | Tripped Status Bits - Frequency deviation fast | 14 | Tripped Status Bits - Voltage unbalance | 15 | Tripped Status Bits - Voltage phase loss | 16 | Tripped Status Bits - Power factor deviation | 17 | Tripped Status Bits - Jam | 18 | Tripped Status Bits - Instantaneous over current | 19 | Tripped Status Bits - Current unbalance | 20 | Tripped Status Bits - Current phase loss | 21 | Tripped Status Bits - Ground current | 22 | Motor Control Status - Motor at speed | 23 | Motor Control Status - Ready | 24 | Motor Control Status - Inhibited | 25 | Motor Control Status - Warning | 26 | Motor Control Status - Faulted | 27 | Motor Control Status - Remote enabled | 28 | Motor Control Status - Running 2 | 29 | Motor Control Status - Running 1 | 30 | Warning Status Bits - PTC | 31 | Warning Status Bits - Phase rotation mismatch | 32 | Warning Status Bits - Stall | 33 | Warning Status Bits - Overload | 34 | Warning Status Bits - Starts limit exceeded | 35 | Warning Status Bits - Low power | 36 | Warning Status Bits - High power | 37 | Warning Status Bits - Under current | 38 | Warning Status Bits - Frequency deviation slow | 39 | Warning Status Bits - Frequency deviation fast |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Fault Reason Type - Load fault (Power based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Fault Reason Type - Supply fault (Voltage based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Fault Reason Type - Motor fault (Current based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Tripped Status Bits - PTC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Tripped Status Bits - Phase rotation mismatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Tripped Status Bits - Stall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Tripped Status Bits - Overload | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Tripped Status Bits - Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Tripped Status Bits - High power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Tripped Status Bits - Under current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Tripped Status Bits - Frequency deviation slow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Tripped Status Bits - Frequency deviation fast | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Tripped Status Bits - Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Tripped Status Bits - Voltage phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Tripped Status Bits - Power factor deviation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Tripped Status Bits - Jam | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Tripped Status Bits - Instantaneous over current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Tripped Status Bits - Current unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Tripped Status Bits - Current phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | Tripped Status Bits - Ground current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | Motor Control Status - Motor at speed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Motor Control Status - Ready | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | Motor Control Status - Inhibited | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | Motor Control Status - Warning | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | Motor Control Status - Faulted | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | Motor Control Status - Remote enabled | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | Motor Control Status - Running 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | Motor Control Status - Running 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | Warning Status Bits - PTC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | Warning Status Bits - Phase rotation mismatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | Warning Status Bits - Stall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | Warning Status Bits - Overload | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | Warning Status Bits - Starts limit exceeded | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | Warning Status Bits - Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | Warning Status Bits - High power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | Warning Status Bits - Under current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | Warning Status Bits - Frequency deviation slow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | Warning Status Bits - Frequency deviation fast | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|---|--|-------|-------------|----|---|----|--|----|--|----|---------------------------|----|--|----|---|----|--|----|--------------------------------------|----|--------------------------------|----|------------------------------------|----|-------------------------------------|----|-------------------------------------|----|------------------------------------|----|--------------------------------|----|---|----|---|----|---|----|---|----|---|----|---------------------------------------|----|------------------------------|----|---|----|---|----|---|----|---|----|----------------------------------|-------|----------|
| 717 | Q3 Function Select | UINT16 RW NV Default: 56 Enum Config CRC Run Lock Admin Lock USB Lock Backup Mem | Output Function Select for General Purpose Output 3. Available when this output is not used by the Operation Mode. Default = none, If used by the Application Mode = Reserved. (For non-latching relay, 0 = de-energized and 1 = energized. For latching relay, 0 = no change and 1 = set). A soft reset is required after modifying this parameter, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>40</td><td>Warning Status Bits - Voltage unbalance</td></tr> <tr><td>41</td><td>Warning Status Bits - Voltage phase loss</td></tr> <tr><td>42</td><td>Warning Status Bits - Power factor deviation</td></tr> <tr><td>43</td><td>Warning Status Bits - Jam</td></tr> <tr><td>44</td><td>Warning Status Bits - Instantaneous over current</td></tr> <tr><td>45</td><td>Warning Status Bits - Current unbalance</td></tr> <tr><td>46</td><td>Warning Status Bits - Current phase loss</td></tr> <tr><td>47</td><td>Warning Status Bits - Ground current</td></tr> <tr><td>48</td><td>Warning Status Bits - Reserved</td></tr> <tr><td>49</td><td>Warning Status Bits - Over voltage</td></tr> <tr><td>50</td><td>Warning Status Bits - Under voltage</td></tr> <tr><td>51</td><td>Tripped Status Bits - Under voltage</td></tr> <tr><td>52</td><td>Tripped Status Bits - Over voltage</td></tr> <tr><td>53</td><td>Tripped Status Bits - Reserved</td></tr> <tr><td>54</td><td>Base Control Module Field Output control word - Bit 0</td></tr> <tr><td>55</td><td>Base Control Module Field Output control word - Bit 1</td></tr> <tr><td>56</td><td>Base Control Module Field Output control word - Bit 2</td></tr> <tr><td>57</td><td>Base Control Module Field Output control word - Bit 3</td></tr> <tr><td>58</td><td>Shunt trip output bit - Shunt trip output bit</td></tr> <tr><td>59</td><td>Warning Reason - HRGF pulse detection</td></tr> <tr><td>60</td><td>Warning Reason - Peak demand</td></tr> <tr><td>61</td><td>Digital Input Status - Base Control Module Input I4</td></tr> <tr><td>62</td><td>Digital Input Status - Base Control Module Input I3</td></tr> <tr><td>63</td><td>Digital Input Status - Base Control Module Input I2</td></tr> <tr><td>64</td><td>Digital Input Status - Base Control Module Input I1</td></tr> <tr><td>65</td><td>Fail Safe - Ground current fault</td></tr> <tr><td>65535</td><td>Reserved</td></tr> </tbody> </table> | Value | Description | 40 | Warning Status Bits - Voltage unbalance | 41 | Warning Status Bits - Voltage phase loss | 42 | Warning Status Bits - Power factor deviation | 43 | Warning Status Bits - Jam | 44 | Warning Status Bits - Instantaneous over current | 45 | Warning Status Bits - Current unbalance | 46 | Warning Status Bits - Current phase loss | 47 | Warning Status Bits - Ground current | 48 | Warning Status Bits - Reserved | 49 | Warning Status Bits - Over voltage | 50 | Warning Status Bits - Under voltage | 51 | Tripped Status Bits - Under voltage | 52 | Tripped Status Bits - Over voltage | 53 | Tripped Status Bits - Reserved | 54 | Base Control Module Field Output control word - Bit 0 | 55 | Base Control Module Field Output control word - Bit 1 | 56 | Base Control Module Field Output control word - Bit 2 | 57 | Base Control Module Field Output control word - Bit 3 | 58 | Shunt trip output bit - Shunt trip output bit | 59 | Warning Reason - HRGF pulse detection | 60 | Warning Reason - Peak demand | 61 | Digital Input Status - Base Control Module Input I4 | 62 | Digital Input Status - Base Control Module Input I3 | 63 | Digital Input Status - Base Control Module Input I2 | 64 | Digital Input Status - Base Control Module Input I1 | 65 | Fail Safe - Ground current fault | 65535 | Reserved |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | Warning Status Bits - Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | Warning Status Bits - Voltage phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | Warning Status Bits - Power factor deviation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | Warning Status Bits - Jam | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | Warning Status Bits - Instantaneous over current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 | Warning Status Bits - Current unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | Warning Status Bits - Current phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 | Warning Status Bits - Ground current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 48 | Warning Status Bits - Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 49 | Warning Status Bits - Over voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | Warning Status Bits - Under voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | Tripped Status Bits - Under voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 52 | Tripped Status Bits - Over voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 53 | Tripped Status Bits - Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | Base Control Module Field Output control word - Bit 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 55 | Base Control Module Field Output control word - Bit 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 56 | Base Control Module Field Output control word - Bit 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 57 | Base Control Module Field Output control word - Bit 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | Shunt trip output bit - Shunt trip output bit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 59 | Warning Reason - HRGF pulse detection | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | Warning Reason - Peak demand | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 61 | Digital Input Status - Base Control Module Input I4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 62 | Digital Input Status - Base Control Module Input I3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | Digital Input Status - Base Control Module Input I2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 64 | Digital Input Status - Base Control Module Input I1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65 | Fail Safe - Ground current fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65535 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--|---|---|-------|-------------|---|------|---|--|---|--|---|---|---|---------------------------|---|---|---|-----------------------------|---|--------------------------------|---|----------|---|---------------------------------|----|----------------------------------|----|-------------------------------------|----|--|----|--|----|---|----|--|----|--|----|---------------------------|----|--|----|---|----|--|----|--------------------------------------|----|---------------------------------------|----|------------------------------|----|----------------------------------|----|--------------------------------|----|--------------------------------|----|---------------------------------------|----|----------------------------------|----|----------------------------------|----|---------------------------|----|---|----|-----------------------------|----|--------------------------------|----|---|----|---------------------------------|----|----------------------------------|----|-------------------------------------|----|--|----|--|
| 718 | Q3 Latch Reset | UINT16 RW NV Default: 57 Enum Config CRC Run Lock Admin Lock USB Lock Backup Mem | Output Reset Function Select for General Purpose Output 3. Available when this output is not used by the Operation Mode and only when Output 3 is a latching relay. Default = none, If used by the Application Mode = Reserved. (For latching relay, 0 = no change and 1 = reset). A soft reset is required after modifying this parameter. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>0</td><td>None</td></tr> <tr><td>1</td><td>Fault Reason Type - Load fault (Power based)</td></tr> <tr><td>2</td><td>Fault Reason Type - Supply fault (Voltage based)</td></tr> <tr><td>3</td><td>Fault Reason Type - Motor fault (Current based)</td></tr> <tr><td>4</td><td>Tripped Status Bits - PTC</td></tr> <tr><td>5</td><td>Tripped Status Bits - Phase rotation mismatch</td></tr> <tr><td>6</td><td>Tripped Status Bits - Stall</td></tr> <tr><td>7</td><td>Tripped Status Bits - Overload</td></tr> <tr><td>8</td><td>Reserved</td></tr> <tr><td>9</td><td>Tripped Status Bits - Low power</td></tr> <tr><td>10</td><td>Tripped Status Bits - High power</td></tr> <tr><td>11</td><td>Tripped Status Bits - Under current</td></tr> <tr><td>12</td><td>Tripped Status Bits - Frequency deviation slow</td></tr> <tr><td>13</td><td>Tripped Status Bits - Frequency deviation fast</td></tr> <tr><td>14</td><td>Tripped Status Bits - Voltage unbalance</td></tr> <tr><td>15</td><td>Tripped Status Bits - Voltage phase loss</td></tr> <tr><td>16</td><td>Tripped Status Bits - Power factor deviation</td></tr> <tr><td>17</td><td>Tripped Status Bits - Jam</td></tr> <tr><td>18</td><td>Tripped Status Bits - Instantaneous over current</td></tr> <tr><td>19</td><td>Tripped Status Bits - Current unbalance</td></tr> <tr><td>20</td><td>Tripped Status Bits - Current phase loss</td></tr> <tr><td>21</td><td>Tripped Status Bits - Ground current</td></tr> <tr><td>22</td><td>Motor Control Status - Motor at speed</td></tr> <tr><td>23</td><td>Motor Control Status - Ready</td></tr> <tr><td>24</td><td>Motor Control Status - Inhibited</td></tr> <tr><td>25</td><td>Motor Control Status - Warning</td></tr> <tr><td>26</td><td>Motor Control Status - Faulted</td></tr> <tr><td>27</td><td>Motor Control Status - Remote enabled</td></tr> <tr><td>28</td><td>Motor Control Status - Running 2</td></tr> <tr><td>29</td><td>Motor Control Status - Running 1</td></tr> <tr><td>30</td><td>Warning Status Bits - PTC</td></tr> <tr><td>31</td><td>Warning Status Bits - Phase rotation mismatch</td></tr> <tr><td>32</td><td>Warning Status Bits - Stall</td></tr> <tr><td>33</td><td>Warning Status Bits - Overload</td></tr> <tr><td>34</td><td>Warning Status Bits - Starts limit exceeded</td></tr> <tr><td>35</td><td>Warning Status Bits - Low power</td></tr> <tr><td>36</td><td>Warning Status Bits - High power</td></tr> <tr><td>37</td><td>Warning Status Bits - Under current</td></tr> <tr><td>38</td><td>Warning Status Bits - Frequency deviation slow</td></tr> <tr><td>39</td><td>Warning Status Bits - Frequency deviation fast</td></tr> </tbody> </table> | Value | Description | 0 | None | 1 | Fault Reason Type - Load fault (Power based) | 2 | Fault Reason Type - Supply fault (Voltage based) | 3 | Fault Reason Type - Motor fault (Current based) | 4 | Tripped Status Bits - PTC | 5 | Tripped Status Bits - Phase rotation mismatch | 6 | Tripped Status Bits - Stall | 7 | Tripped Status Bits - Overload | 8 | Reserved | 9 | Tripped Status Bits - Low power | 10 | Tripped Status Bits - High power | 11 | Tripped Status Bits - Under current | 12 | Tripped Status Bits - Frequency deviation slow | 13 | Tripped Status Bits - Frequency deviation fast | 14 | Tripped Status Bits - Voltage unbalance | 15 | Tripped Status Bits - Voltage phase loss | 16 | Tripped Status Bits - Power factor deviation | 17 | Tripped Status Bits - Jam | 18 | Tripped Status Bits - Instantaneous over current | 19 | Tripped Status Bits - Current unbalance | 20 | Tripped Status Bits - Current phase loss | 21 | Tripped Status Bits - Ground current | 22 | Motor Control Status - Motor at speed | 23 | Motor Control Status - Ready | 24 | Motor Control Status - Inhibited | 25 | Motor Control Status - Warning | 26 | Motor Control Status - Faulted | 27 | Motor Control Status - Remote enabled | 28 | Motor Control Status - Running 2 | 29 | Motor Control Status - Running 1 | 30 | Warning Status Bits - PTC | 31 | Warning Status Bits - Phase rotation mismatch | 32 | Warning Status Bits - Stall | 33 | Warning Status Bits - Overload | 34 | Warning Status Bits - Starts limit exceeded | 35 | Warning Status Bits - Low power | 36 | Warning Status Bits - High power | 37 | Warning Status Bits - Under current | 38 | Warning Status Bits - Frequency deviation slow | 39 | Warning Status Bits - Frequency deviation fast |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Fault Reason Type - Load fault (Power based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Fault Reason Type - Supply fault (Voltage based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Fault Reason Type - Motor fault (Current based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Tripped Status Bits - PTC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Tripped Status Bits - Phase rotation mismatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Tripped Status Bits - Stall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Tripped Status Bits - Overload | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Tripped Status Bits - Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Tripped Status Bits - High power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Tripped Status Bits - Under current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Tripped Status Bits - Frequency deviation slow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Tripped Status Bits - Frequency deviation fast | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Tripped Status Bits - Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Tripped Status Bits - Voltage phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Tripped Status Bits - Power factor deviation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Tripped Status Bits - Jam | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Tripped Status Bits - Instantaneous over current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Tripped Status Bits - Current unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Tripped Status Bits - Current phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | Tripped Status Bits - Ground current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | Motor Control Status - Motor at speed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Motor Control Status - Ready | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | Motor Control Status - Inhibited | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | Motor Control Status - Warning | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | Motor Control Status - Faulted | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | Motor Control Status - Remote enabled | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | Motor Control Status - Running 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | Motor Control Status - Running 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | Warning Status Bits - PTC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | Warning Status Bits - Phase rotation mismatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | Warning Status Bits - Stall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | Warning Status Bits - Overload | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | Warning Status Bits - Starts limit exceeded | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | Warning Status Bits - Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | Warning Status Bits - High power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | Warning Status Bits - Under current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | Warning Status Bits - Frequency deviation slow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | Warning Status Bits - Frequency deviation fast | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|---|--|---|---|--|---|-------------|--|----------------------------------|---|------------------------------|---|----|---|----|---|----|--|----|--------------------------------------|----|--------------------------------|----|------------------------------------|----|-------------------------------------|----|-------------------------------------|----|------------------------------------|----|--------------------------------|----|---|----|---|----|---|----|---|----|---|----|---------------------------------------|----|------------------------------|----|---|----|---|----|---|----|---|----|----------------------------------|-------|----------|
| 718 | Q3 Latch Reset | UINT16 RW NV Default: 57 Enum Config CRC Run Lock Admin Lock USB Lock Backup Mem | Output Reset Function Select for General Purpose Output 3. Available when this output is not used by the Operation Mode and only when Output 3 is a latching relay. Default = none, If used by the Application Mode = Reserved. (For latching relay, 0 = no change and 1 = reset). A soft reset is required after modifying this parameter, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>40</td><td>Warning Status Bits - Voltage unbalance</td></tr> <tr><td>41</td><td>Warning Status Bits - Voltage phase loss</td></tr> <tr><td>42</td><td>Warning Status Bits - Power factor deviation</td></tr> <tr><td>43</td><td>Warning Status Bits - Jam</td></tr> <tr><td>44</td><td>Warning Status Bits - Instantaneous over current</td></tr> <tr><td>45</td><td>Warning Status Bits - Current unbalance</td></tr> <tr><td>46</td><td>Warning Status Bits - Current phase loss</td></tr> <tr><td>47</td><td>Warning Status Bits - Ground current</td></tr> <tr><td>48</td><td>Warning Status Bits - Reserved</td></tr> <tr><td>49</td><td>Warning Status Bits - Over voltage</td></tr> <tr><td>50</td><td>Warning Status Bits - Under voltage</td></tr> <tr><td>51</td><td>Tripped Status Bits - Under voltage</td></tr> <tr><td>52</td><td>Tripped Status Bits - Over voltage</td></tr> <tr><td>53</td><td>Tripped Status Bits - Reserved</td></tr> <tr><td>54</td><td>Base Control Module Field Output control word - Bit 0</td></tr> <tr><td>55</td><td>Base Control Module Field Output control word - Bit 1</td></tr> <tr><td>56</td><td>Base Control Module Field Output control word - Bit 2</td></tr> <tr><td>57</td><td>Base Control Module Field Output control word - Bit 3</td></tr> <tr><td>58</td><td>Shunt trip output bit - Shunt trip output bit</td></tr> <tr><td>59</td><td>Warning Reason - HRGF pulse detection</td></tr> <tr><td>60</td><td>Warning Reason - Peak demand</td></tr> <tr><td>61</td><td>Digital Input Status - Base Control Module Input I4</td></tr> <tr><td>62</td><td>Digital Input Status - Base Control Module Input I3</td></tr> <tr><td>63</td><td>Digital Input Status - Base Control Module Input I2</td></tr> <tr><td>64</td><td>Digital Input Status - Base Control Module Input I1</td></tr> <tr><td>65</td><td>Fail Safe - Ground current fault</td></tr> <tr><td>65535</td><td>Reserved</td></tr> </tbody> </table> | Value | Description | 40 | Warning Status Bits - Voltage unbalance | 41 | Warning Status Bits - Voltage phase loss | 42 | Warning Status Bits - Power factor deviation | 43 | Warning Status Bits - Jam | 44 | Warning Status Bits - Instantaneous over current | 45 | Warning Status Bits - Current unbalance | 46 | Warning Status Bits - Current phase loss | 47 | Warning Status Bits - Ground current | 48 | Warning Status Bits - Reserved | 49 | Warning Status Bits - Over voltage | 50 | Warning Status Bits - Under voltage | 51 | Tripped Status Bits - Under voltage | 52 | Tripped Status Bits - Over voltage | 53 | Tripped Status Bits - Reserved | 54 | Base Control Module Field Output control word - Bit 0 | 55 | Base Control Module Field Output control word - Bit 1 | 56 | Base Control Module Field Output control word - Bit 2 | 57 | Base Control Module Field Output control word - Bit 3 | 58 | Shunt trip output bit - Shunt trip output bit | 59 | Warning Reason - HRGF pulse detection | 60 | Warning Reason - Peak demand | 61 | Digital Input Status - Base Control Module Input I4 | 62 | Digital Input Status - Base Control Module Input I3 | 63 | Digital Input Status - Base Control Module Input I2 | 64 | Digital Input Status - Base Control Module Input I1 | 65 | Fail Safe - Ground current fault | 65535 | Reserved |
| | | | Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 40 | Warning Status Bits - Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 41 | Warning Status Bits - Voltage phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 42 | Warning Status Bits - Power factor deviation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 43 | Warning Status Bits - Jam | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 44 | Warning Status Bits - Instantaneous over current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 45 | Warning Status Bits - Current unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 46 | Warning Status Bits - Current phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 47 | Warning Status Bits - Ground current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 48 | Warning Status Bits - Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 49 | Warning Status Bits - Over voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 50 | Warning Status Bits - Under voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 51 | Tripped Status Bits - Under voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 52 | Tripped Status Bits - Over voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 53 | Tripped Status Bits - Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 54 | Base Control Module Field Output control word - Bit 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 55 | Base Control Module Field Output control word - Bit 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 56 | Base Control Module Field Output control word - Bit 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 57 | Base Control Module Field Output control word - Bit 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 58 | Shunt trip output bit - Shunt trip output bit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 59 | Warning Reason - HRGF pulse detection | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 60 | Warning Reason - Peak demand | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 61 | Digital Input Status - Base Control Module Input I4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 62 | Digital Input Status - Base Control Module Input I3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 63 | Digital Input Status - Base Control Module Input I2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 64 | Digital Input Status - Base Control Module Input I1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 65 | Fail Safe - Ground current fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 65535 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 719 | Q3 Latch Behavior | UINT8 RW NV Default: 1 Enum Config CRC Admin Lock USB Lock Backup Mem | If the Base Control Module is ordered with a latching relay for Output 3, the behavior of this output may be selected here as either a latching relay or non-latching relay functionality. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>0</td><td>Behave like a non-latching relay</td></tr> <tr><td>1</td><td>Behave like a latching relay</td></tr> </tbody> </table> | Value | Description | 0 | Behave like a non-latching relay | 1 | Behave like a latching relay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Behave like a non-latching relay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Behave like a latching relay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 720 | Communication Loss Behavior | UINT8 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | Defines the behavior of the motor control when communication times out. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>0</td><td>Stop (clear Run1/Run2) on communication loss event - no fault</td></tr> <tr><td>1</td><td>Ignore communication loss and keep present state</td></tr> <tr><td>2</td><td>Set network motor control Run1 on comloss event</td></tr> <tr><td>3</td><td>Set network motor control Run2 on comloss event</td></tr> <tr><td>4</td><td>Stop (clear Run1/Run2) on communication loss event and generate fault</td></tr> </tbody> </table> | Value | Description | 0 | Stop (clear Run1/Run2) on communication loss event - no fault | 1 | Ignore communication loss and keep present state | 2 | Set network motor control Run1 on comloss event | 3 | Set network motor control Run2 on comloss event | 4 | Stop (clear Run1/Run2) on communication loss event and generate fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Stop (clear Run1/Run2) on communication loss event - no fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Ignore communication loss and keep present state | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Set network motor control Run1 on comloss event | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Set network motor control Run2 on comloss event | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Stop (clear Run1/Run2) on communication loss event and generate fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | |
|----------|---|--|---|-------|-------------|------|--------------------|---|------------------------------------|---|---|-------|---------------------------------|---|-------|---|---|-------|
| 721 | Comm Idle Behavior | UINT8 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | Select the state for the motor when the network system controller is in communication idle mode (program mode for most PLCs and DCS controllers). <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Stop on idle event</td> </tr> <tr> <td>1</td> <td>Ignore idle and keep present state</td> </tr> <tr> <td>2</td> <td>Send RUN1 command on idle event</td> </tr> <tr> <td>3</td> <td>Send RUN2 command on idle event</td> </tr> </tbody> </table> | Value | Description | 0 | Stop on idle event | 1 | Ignore idle and keep present state | 2 | Send RUN1 command on idle event | 3 | Send RUN2 command on idle event | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | |
| 0 | Stop on idle event | | | | | | | | | | | | | | | | | |
| 1 | Ignore idle and keep present state | | | | | | | | | | | | | | | | | |
| 2 | Send RUN1 command on idle event | | | | | | | | | | | | | | | | | |
| 3 | Send RUN2 command on idle event | | | | | | | | | | | | | | | | | |
| 722 | Comm Fault Output Action | BYTE RW NV Default: 0 Bitfield Config CRC Admin Lock USB Lock Backup Mem | When a communication fault occurs the relays can execute two types of behavior. The behavior is selected on a per bit basis. Only valid for output relays used as general purpose field outputs. See Communication Loss Behavior parameter to set the behavior of outputs used in the control profile. Each available output is assigned a bit in the Comm Fault Output Action word. If the bit is "0" then the state of the output is determined by the (Comm Fault Output State) Parameter. If the bit is "1" it will hold last state. <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Communication loss action for Field Output Control Word. Bit 0: (0) Use fault state (1) Hold Last</td> <td>11537</td> </tr> <tr> <td>1</td> <td>Communication loss action for Field Output Control Word. Bit 1: (0) Use fault state (1) Hold Last</td> <td>11538</td> </tr> <tr> <td>2</td> <td>Communication loss action for Field Output Control Word. Bit 2: (0) Use fault state (1) Hold Last</td> <td>11539</td> </tr> <tr> <td>3</td> <td>Communication loss action for Field Output Control Word. Bit 3: (0) Use fault state (1) Hold Last</td> <td>11540</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Communication loss action for Field Output Control Word. Bit 0: (0) Use fault state (1) Hold Last | 11537 | 1 | Communication loss action for Field Output Control Word. Bit 1: (0) Use fault state (1) Hold Last | 11538 | 2 | Communication loss action for Field Output Control Word. Bit 2: (0) Use fault state (1) Hold Last | 11539 | 3 | Communication loss action for Field Output Control Word. Bit 3: (0) Use fault state (1) Hold Last | 11540 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | |
| 0 | Communication loss action for Field Output Control Word. Bit 0: (0) Use fault state (1) Hold Last | 11537 | | | | | | | | | | | | | | | | |
| 1 | Communication loss action for Field Output Control Word. Bit 1: (0) Use fault state (1) Hold Last | 11538 | | | | | | | | | | | | | | | | |
| 2 | Communication loss action for Field Output Control Word. Bit 2: (0) Use fault state (1) Hold Last | 11539 | | | | | | | | | | | | | | | | |
| 3 | Communication loss action for Field Output Control Word. Bit 3: (0) Use fault state (1) Hold Last | 11540 | | | | | | | | | | | | | | | | |
| 723 | Comm Fault Output State | BYTE RW NV Default: 0 Bitfield Config CRC Admin Lock USB Lock Backup Mem | This parameters works with the Comm Fault Output Action parameter. Only if that parameter is set to Use Fault State does this parameter apply. This parameter then selects the state of the outputs, On or Off when a communication fault occurs. The behavior is selected on a per bit basis. Only valid for output relays used as general purpose field outputs. <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Communication loss action for Field Output Control Word. Bit 0: (0)Off (1)On</td> <td>11553</td> </tr> <tr> <td>1</td> <td>Communication loss action for Field Output Control Word. Bit 1: (0)Off (1)On</td> <td>11554</td> </tr> <tr> <td>2</td> <td>Communication loss action for Field Output Control Word. Bit 2: (0)Off (1)On</td> <td>11555</td> </tr> <tr> <td>3</td> <td>Communication loss action for Field Output Control Word. Bit 3: (0)Off (1)On</td> <td>11556</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Communication loss action for Field Output Control Word. Bit 0: (0)Off (1)On | 11553 | 1 | Communication loss action for Field Output Control Word. Bit 1: (0)Off (1)On | 11554 | 2 | Communication loss action for Field Output Control Word. Bit 2: (0)Off (1)On | 11555 | 3 | Communication loss action for Field Output Control Word. Bit 3: (0)Off (1)On | 11556 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | |
| 0 | Communication loss action for Field Output Control Word. Bit 0: (0)Off (1)On | 11553 | | | | | | | | | | | | | | | | |
| 1 | Communication loss action for Field Output Control Word. Bit 1: (0)Off (1)On | 11554 | | | | | | | | | | | | | | | | |
| 2 | Communication loss action for Field Output Control Word. Bit 2: (0)Off (1)On | 11555 | | | | | | | | | | | | | | | | |
| 3 | Communication loss action for Field Output Control Word. Bit 3: (0)Off (1)On | 11556 | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | |
|----------|--|---|--|-------|-------------|------|---|--|--|---|--|-------|--------|--|-------|---|--|-------|
| 724 | Comm Idle Output Action | BYTE RW NV Default: 0 Bitfield Config CRC Admin Lock USB Lock Backup Mem | <p>When a communication idle state occurs the relays can execute two types of behavior. Only valid for output relays used as general purpose field outputs. The behavior is selected on a per bit basis. See the Comm Idle Behavior parameter to set the behavior of outputs used in the control profile. Each available output is assigned a bit in the Comm Idle Output Action word. If the bit is “0” then the state of the output is determined by the (Comm Idle Output State) Parameter. If the bit is “1” it will hold last state.</p> <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Communication idle action for Field Output Control Word. Bit 0: (0) Use idle state (1) Hold Last</td> <td>11569</td> </tr> <tr> <td>1</td> <td>Communication idle action for Field Output Control Word. Bit 1: (0) Use idle state (1) Hold Last</td> <td>11570</td> </tr> <tr> <td>2</td> <td>Communication idle action for Field Output Control Word. Bit 2: (0) Use idle state (1) Hold Last</td> <td>11571</td> </tr> <tr> <td>3</td> <td>Communication idle action for Field Output Control Word. Bit 3: (0) Use idle state (1) Hold Last</td> <td>11572</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Communication idle action for Field Output Control Word. Bit 0: (0) Use idle state (1) Hold Last | 11569 | 1 | Communication idle action for Field Output Control Word. Bit 1: (0) Use idle state (1) Hold Last | 11570 | 2 | Communication idle action for Field Output Control Word. Bit 2: (0) Use idle state (1) Hold Last | 11571 | 3 | Communication idle action for Field Output Control Word. Bit 3: (0) Use idle state (1) Hold Last | 11572 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | |
| 0 | Communication idle action for Field Output Control Word. Bit 0: (0) Use idle state (1) Hold Last | 11569 | | | | | | | | | | | | | | | | |
| 1 | Communication idle action for Field Output Control Word. Bit 1: (0) Use idle state (1) Hold Last | 11570 | | | | | | | | | | | | | | | | |
| 2 | Communication idle action for Field Output Control Word. Bit 2: (0) Use idle state (1) Hold Last | 11571 | | | | | | | | | | | | | | | | |
| 3 | Communication idle action for Field Output Control Word. Bit 3: (0) Use idle state (1) Hold Last | 11572 | | | | | | | | | | | | | | | | |
| 725 | Comm Idle Output State | BYTE RW NV Default: 0 Bitfield Config CRC Admin Lock USB Lock Backup Mem | <p>This parameters works with the Comm Idle Output Action parameter. Only if that parameter is set to “Use Idle State” does this parameter apply. This parameter then selects the state of the outputs, On or Off when a communication Idle occurs. The behavior is selected on a per bit basis. Only valid for output relays used as general purpose field outputs.</p> <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Communication idle state for Field Output Control Word. Bit 0: (0) Off (1) On</td> <td>11585</td> </tr> <tr> <td>1</td> <td>Communication idle state for Field Output Control Word. Bit 1: (0) Off (1) On</td> <td>11586</td> </tr> <tr> <td>2</td> <td>Communication idle state for Field Output Control Word. Bit 2: (0) Off (1) On</td> <td>11587</td> </tr> <tr> <td>3</td> <td>Communication idle state for Field Output Control Word. Bit 3: (0) Off (1) On</td> <td>11588</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Communication idle state for Field Output Control Word. Bit 0: (0) Off (1) On | 11585 | 1 | Communication idle state for Field Output Control Word. Bit 1: (0) Off (1) On | 11586 | 2 | Communication idle state for Field Output Control Word. Bit 2: (0) Off (1) On | 11587 | 3 | Communication idle state for Field Output Control Word. Bit 3: (0) Off (1) On | 11588 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | |
| 0 | Communication idle state for Field Output Control Word. Bit 0: (0) Off (1) On | 11585 | | | | | | | | | | | | | | | | |
| 1 | Communication idle state for Field Output Control Word. Bit 1: (0) Off (1) On | 11586 | | | | | | | | | | | | | | | | |
| 2 | Communication idle state for Field Output Control Word. Bit 2: (0) Off (1) On | 11587 | | | | | | | | | | | | | | | | |
| 3 | Communication idle state for Field Output Control Word. Bit 3: (0) Off (1) On | 11588 | | | | | | | | | | | | | | | | |
| 726 | Q3 Latch Behavior Power Down | UINT8 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | <p>Select the behavior of the Latching Relay (Output 3) when power is removed from the C445, provided the Base Control Module was ordered with the latching relay option. Default: Turn Off, emulating a non-latching relay.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Turn off (emulate a non-latching relay [reset]) (default)</td> </tr> <tr> <td>1</td> <td>Turn on (set)</td> </tr> <tr> <td>2</td> <td>Do nothing (maintain present state)</td> </tr> <tr> <td>3</td> <td>Toggle</td> </tr> </tbody> </table> | Value | Description | 0 | Turn off (emulate a non-latching relay [reset]) (default) | 1 | Turn on (set) | 2 | Do nothing (maintain present state) | 3 | Toggle | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | |
| 0 | Turn off (emulate a non-latching relay [reset]) (default) | | | | | | | | | | | | | | | | | |
| 1 | Turn on (set) | | | | | | | | | | | | | | | | | |
| 2 | Do nothing (maintain present state) | | | | | | | | | | | | | | | | | |
| 3 | Toggle | | | | | | | | | | | | | | | | | |
| 727 | Phase Type | UINT8 RW NV Default: 0 Enum Config CRC Run Lock Admin Lock USB Lock Backup Mem | <p>Three-phase configuration is the default and is used for 3-phase motors. The C445 also supports single phase motors by changing this setting to Single Phase.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Three phase wire configuration</td> </tr> <tr> <td>1</td> <td>Single phase wire configuration (two wire)</td> </tr> </tbody> </table> | Value | Description | 0 | Three phase wire configuration | 1 | Single phase wire configuration (two wire) | | | | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | |
| 0 | Three phase wire configuration | | | | | | | | | | | | | | | | | |
| 1 | Single phase wire configuration (two wire) | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | |
|----------|---------------------------------------|---|---|-------|-------------|---|-------------------------------------|---|---------------------------------------|---|--------------------|
| 728 | 2-Wire/3-Wire | UINT8 RW NV Default: 0 Enum Config CRC Run Lock Admin Lock USB Lock Backup Mem | <p>Selects 2 or 3 wire control. When 2-Wire Control is used, the fieldwire inputs are designed to a run signal. If a signal is present at the run input, it will command to run while if no signal is present, it will stop or not run. When 3-Wire control is Used, a second fieldwire input is designated to accept a Run input and a Permissive input. When in fieldwire control, the motor will not be allowed to run if the Permissive signal is not present. Additionally, if the permissive is removed while running, the motor will stop. The Run input in 3-Wire Control can accept a maintained or pulsed run command.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Two wire field wiring configuration</td> </tr> <tr> <td>1</td> <td>Three wire field wiring configuration</td> </tr> </tbody> </table> | Value | Description | 0 | Two wire field wiring configuration | 1 | Three wire field wiring configuration | | |
| Value | Description | | | | | | | | | | |
| 0 | Two wire field wiring configuration | | | | | | | | | | |
| 1 | Three wire field wiring configuration | | | | | | | | | | |
| 729 | Digital Input Debounce | UINT16 RW NV Array size: 4 Default: 20 Range: 5 to 5000 Units: ms Backup Mem | <p>Digital Input Debounce. One 16-bit value for each of the 4 inputs on the Base Control Module. The same value is used for both rising and falling edges. Array of 4 registers</p> | | | | | | | | |
| 733 | LED Brightness Bank 0 | INTERNAL UINT8 RW NV Default: 0 Enum Units: % Backup Mem | <p>LED Brightness Configuration Bank 0</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>High LED brightness</td> </tr> <tr> <td>1</td> <td>Medium LED brightness</td> </tr> <tr> <td>2</td> <td>Low LED brightness</td> </tr> </tbody> </table> | Value | Description | 0 | High LED brightness | 1 | Medium LED brightness | 2 | Low LED brightness |
| Value | Description | | | | | | | | | | |
| 0 | High LED brightness | | | | | | | | | | |
| 1 | Medium LED brightness | | | | | | | | | | |
| 2 | Low LED brightness | | | | | | | | | | |
| 734 | LED Brightness Bank 1 | INTERNAL UINT8 RW NV Default: 0 Enum Units: % Backup Mem | <p>LED Brightness Configuration Bank 1</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>High LED brightness</td> </tr> <tr> <td>1</td> <td>Medium LED brightness</td> </tr> <tr> <td>2</td> <td>Low LED brightness</td> </tr> </tbody> </table> | Value | Description | 0 | High LED brightness | 1 | Medium LED brightness | 2 | Low LED brightness |
| Value | Description | | | | | | | | | | |
| 0 | High LED brightness | | | | | | | | | | |
| 1 | Medium LED brightness | | | | | | | | | | |
| 2 | Low LED brightness | | | | | | | | | | |
| 735 | LED Brightness Bank 2 | INTERNAL UINT8 RW NV Default: 0 Enum Units: % Backup Mem | <p>LED Brightness Configuration Bank 2</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>High LED brightness</td> </tr> <tr> <td>1</td> <td>Medium LED brightness</td> </tr> <tr> <td>2</td> <td>Low LED brightness</td> </tr> </tbody> </table> | Value | Description | 0 | High LED brightness | 1 | Medium LED brightness | 2 | Low LED brightness |
| Value | Description | | | | | | | | | | |
| 0 | High LED brightness | | | | | | | | | | |
| 1 | Medium LED brightness | | | | | | | | | | |
| 2 | Low LED brightness | | | | | | | | | | |
| 736 | LED Brightness Bank 3 | INTERNAL UINT8 RW NV Default: 0 Enum Units: % Backup Mem | <p>LED Brightness Configuration Bank 3</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>High LED brightness</td> </tr> <tr> <td>1</td> <td>Medium LED brightness</td> </tr> <tr> <td>2</td> <td>Low LED brightness</td> </tr> </tbody> </table> | Value | Description | 0 | High LED brightness | 1 | Medium LED brightness | 2 | Low LED brightness |
| Value | Description | | | | | | | | | | |
| 0 | High LED brightness | | | | | | | | | | |
| 1 | Medium LED brightness | | | | | | | | | | |
| 2 | Low LED brightness | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | |
|----------|---|--|--|--------------------|
| 737 | Control User Interface Button LED 1 Purpose | UINT16 RW NV Default: 1 Enum Config CRC Admin Lock USB Lock Backup Mem | Configuration parameter for the User Interface button LED 1. Applies only to C445UC... Control Family of User Interfaces. | |
| | | | Value | Description |
| | | | 0 | No LED function |
| | | | 1 | Stop LED function |
| | | | 2 | Auto LED function |
| | | | 3 | Run1 LED function |
| | | | 4 | Run2 LED function |
| | | | 5 | Reset LED function |
| 738 | Control User Interface Button LED 2 Purpose | UINT16 RW NV Default: 2 Enum Config CRC Admin Lock USB Lock Backup Mem | Configuration parameter for the User Interface button LED 2. Applies only to C445UC... Control Family of User Interfaces. | |
| | | | Value | Description |
| | | | 0 | No LED function |
| | | | 1 | Stop LED function |
| | | | 2 | Auto LED function |
| | | | 3 | Run1 LED function |
| | | | 4 | Run2 LED function |
| | | | 5 | Reset LED function |
| 739 | Control User Interface Button LED 3 Purpose | UINT16 RW NV Default: 3 Enum Config CRC Admin Lock USB Lock Backup Mem | Configuration parameter for the User Interface button LED 3. Applies only to C445UC... Control Family of User Interfaces. | |
| | | | Value | Description |
| | | | 0 | No LED function |
| | | | 1 | Stop LED function |
| | | | 2 | Auto LED function |
| | | | 3 | Run1 LED function |
| | | | 4 | Run2 LED function |
| | | | 5 | Reset LED function |
| 740 | Control User Interface Button LED 4 Purpose | UINT16 RW NV Default: 4 Enum Config CRC Admin Lock USB Lock Backup Mem | Configuration parameter for the User Interface button LED 4. Applies only to C445UC... Control Family of User Interfaces. UINT16 RW NV | |
| | | | Value | Description |
| | | | 0 | No LED function |
| | | | 1 | Stop LED function |
| | | | 2 | Auto LED function |
| | | | 3 | Run1 LED function |
| | | | 4 | Run2 LED function |
| | | | 5 | Reset LED function |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | |
|----------|--|--|--|-------|-------------|---|------------------------|---|---------------------------|---|-----------------------------|---|---------------------------|---|---------------------------------|---|------------------------------------|---|----------------------------------|
| 741 | Control User Interface Status LED 1 Purpose | UINT16 RW NV Default: 6 Enum Config CRC Admin Lock USB Lock Backup Mem | Configuration parameter for the User Interface status LED 1. Applies only to C445UC... Control Family of User Interfaces. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No status LED function</td> </tr> <tr> <td>1</td> <td>Fault status LED function</td> </tr> <tr> <td>2</td> <td>Warning status LED function</td> </tr> <tr> <td>3</td> <td>Ready status LED function</td> </tr> <tr> <td>4</td> <td>Up to speed status LED function</td> </tr> <tr> <td>5</td> <td>Overload fault status LED function</td> </tr> <tr> <td>6</td> <td>Ground fault status LED function</td> </tr> </tbody> </table> | Value | Description | 0 | No status LED function | 1 | Fault status LED function | 2 | Warning status LED function | 3 | Ready status LED function | 4 | Up to speed status LED function | 5 | Overload fault status LED function | 6 | Ground fault status LED function |
| Value | Description | | | | | | | | | | | | | | | | | | |
| 0 | No status LED function | | | | | | | | | | | | | | | | | | |
| 1 | Fault status LED function | | | | | | | | | | | | | | | | | | |
| 2 | Warning status LED function | | | | | | | | | | | | | | | | | | |
| 3 | Ready status LED function | | | | | | | | | | | | | | | | | | |
| 4 | Up to speed status LED function | | | | | | | | | | | | | | | | | | |
| 5 | Overload fault status LED function | | | | | | | | | | | | | | | | | | |
| 6 | Ground fault status LED function | | | | | | | | | | | | | | | | | | |
| 742 | Control User Interface Status LED 2 Purpose | UINT16 RW NV Default: 1 Enum Config CRC Admin Lock USB Lock Backup Mem | Configuration parameter for the User Interface status LED 2. Applies only to C445UC... Control Family of User Interfaces. UINT16 RW NV <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No status LED function</td> </tr> <tr> <td>1</td> <td>Fault status LED function</td> </tr> <tr> <td>2</td> <td>Warning status LED function</td> </tr> <tr> <td>3</td> <td>Ready status LED function</td> </tr> <tr> <td>4</td> <td>Up to speed status LED function</td> </tr> <tr> <td>5</td> <td>Overload fault status LED function</td> </tr> <tr> <td>6</td> <td>Ground fault status LED function</td> </tr> </tbody> </table> | Value | Description | 0 | No status LED function | 1 | Fault status LED function | 2 | Warning status LED function | 3 | Ready status LED function | 4 | Up to speed status LED function | 5 | Overload fault status LED function | 6 | Ground fault status LED function |
| Value | Description | | | | | | | | | | | | | | | | | | |
| 0 | No status LED function | | | | | | | | | | | | | | | | | | |
| 1 | Fault status LED function | | | | | | | | | | | | | | | | | | |
| 2 | Warning status LED function | | | | | | | | | | | | | | | | | | |
| 3 | Ready status LED function | | | | | | | | | | | | | | | | | | |
| 4 | Up to speed status LED function | | | | | | | | | | | | | | | | | | |
| 5 | Overload fault status LED function | | | | | | | | | | | | | | | | | | |
| 6 | Ground fault status LED function | | | | | | | | | | | | | | | | | | |
| 743 | Control User Interface Status LED 3 Purpose | UINT16 RW NV Default: 2 Enum Config CRC Admin Lock USB Lock Backup Mem | Configuration parameter for the User Interface status LED 3. Applies only to C445UC... Control Family of User Interfaces. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No status LED function</td> </tr> <tr> <td>1</td> <td>Fault status LED function</td> </tr> <tr> <td>2</td> <td>Warning status LED function</td> </tr> <tr> <td>3</td> <td>Ready status LED function</td> </tr> <tr> <td>4</td> <td>Up to speed status LED function</td> </tr> <tr> <td>5</td> <td>Overload fault status LED function</td> </tr> <tr> <td>6</td> <td>Ground fault status LED function</td> </tr> </tbody> </table> | Value | Description | 0 | No status LED function | 1 | Fault status LED function | 2 | Warning status LED function | 3 | Ready status LED function | 4 | Up to speed status LED function | 5 | Overload fault status LED function | 6 | Ground fault status LED function |
| Value | Description | | | | | | | | | | | | | | | | | | |
| 0 | No status LED function | | | | | | | | | | | | | | | | | | |
| 1 | Fault status LED function | | | | | | | | | | | | | | | | | | |
| 2 | Warning status LED function | | | | | | | | | | | | | | | | | | |
| 3 | Ready status LED function | | | | | | | | | | | | | | | | | | |
| 4 | Up to speed status LED function | | | | | | | | | | | | | | | | | | |
| 5 | Overload fault status LED function | | | | | | | | | | | | | | | | | | |
| 6 | Ground fault status LED function | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--|---|---|-------|-------------|---|------|---|--|---|--|---|---|---|---------------------------|---|---|---|-----------------------------|---|--------------------------------|---|----------|---|---------------------------------|----|----------------------------------|----|-------------------------------------|----|--|----|--|----|---|----|--|----|--|----|---------------------------|----|--|----|---|----|--|----|--------------------------------------|----|---------------------------------------|----|------------------------------|----|----------------------------------|----|--------------------------------|----|--------------------------------|----|---------------------------------------|----|----------------------------------|----|----------------------------------|----|---------------------------|----|---|----|-----------------------------|----|--------------------------------|----|---|----|---------------------------------|----|----------------------------------|----|-------------------------------------|----|--|----|--|
| 744 | Control User Interface User LED 1 Purpose | UINT16 RW NV Default: 2 Enum Config CRC Admin Lock USB Lock Backup Mem | User Interface, User Defined LED 1 Function Selection - Default: Supply Voltage Related Fault. Applies only to C445UC... Control Family of User Interfaces. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>0</td><td>None</td></tr> <tr><td>1</td><td>Fault Reason Type - Load fault (Power based)</td></tr> <tr><td>2</td><td>Fault Reason Type - Supply fault (Voltage based)</td></tr> <tr><td>3</td><td>Fault Reason Type - Motor fault (Current based)</td></tr> <tr><td>4</td><td>Tripped Status Bits - PTC</td></tr> <tr><td>5</td><td>Tripped Status Bits - Phase rotation mismatch</td></tr> <tr><td>6</td><td>Tripped Status Bits - Stall</td></tr> <tr><td>7</td><td>Tripped Status Bits - Overload</td></tr> <tr><td>8</td><td>Reserved</td></tr> <tr><td>9</td><td>Tripped Status Bits - Low power</td></tr> <tr><td>10</td><td>Tripped Status Bits - High power</td></tr> <tr><td>11</td><td>Tripped Status Bits - Under current</td></tr> <tr><td>12</td><td>Tripped Status Bits - Frequency deviation slow</td></tr> <tr><td>13</td><td>Tripped Status Bits - Frequency deviation fast</td></tr> <tr><td>14</td><td>Tripped Status Bits - Voltage unbalance</td></tr> <tr><td>15</td><td>Tripped Status Bits - Voltage phase loss</td></tr> <tr><td>16</td><td>Tripped Status Bits - Power factor deviation</td></tr> <tr><td>17</td><td>Tripped Status Bits - Jam</td></tr> <tr><td>18</td><td>Tripped Status Bits - Instantaneous over current</td></tr> <tr><td>19</td><td>Tripped Status Bits - Current unbalance</td></tr> <tr><td>20</td><td>Tripped Status Bits - Current phase loss</td></tr> <tr><td>21</td><td>Tripped Status Bits - Ground current</td></tr> <tr><td>22</td><td>Motor Control Status - Motor at speed</td></tr> <tr><td>23</td><td>Motor Control Status - Ready</td></tr> <tr><td>24</td><td>Motor Control Status - Inhibited</td></tr> <tr><td>25</td><td>Motor Control Status - Warning</td></tr> <tr><td>26</td><td>Motor Control Status - Faulted</td></tr> <tr><td>27</td><td>Motor Control Status - Remote enabled</td></tr> <tr><td>28</td><td>Motor Control Status - Running 2</td></tr> <tr><td>29</td><td>Motor Control Status - Running 1</td></tr> <tr><td>30</td><td>Warning Status Bits - PTC</td></tr> <tr><td>31</td><td>Warning Status Bits - Phase rotation mismatch</td></tr> <tr><td>32</td><td>Warning Status Bits - Stall</td></tr> <tr><td>33</td><td>Warning Status Bits - Overload</td></tr> <tr><td>34</td><td>Warning Status Bits - Starts limit exceeded</td></tr> <tr><td>35</td><td>Warning Status Bits - Low power</td></tr> <tr><td>36</td><td>Warning Status Bits - High power</td></tr> <tr><td>37</td><td>Warning Status Bits - Under current</td></tr> <tr><td>38</td><td>Warning Status Bits - Frequency deviation slow</td></tr> <tr><td>39</td><td>Warning Status Bits - Frequency deviation fast</td></tr> </tbody> </table> | Value | Description | 0 | None | 1 | Fault Reason Type - Load fault (Power based) | 2 | Fault Reason Type - Supply fault (Voltage based) | 3 | Fault Reason Type - Motor fault (Current based) | 4 | Tripped Status Bits - PTC | 5 | Tripped Status Bits - Phase rotation mismatch | 6 | Tripped Status Bits - Stall | 7 | Tripped Status Bits - Overload | 8 | Reserved | 9 | Tripped Status Bits - Low power | 10 | Tripped Status Bits - High power | 11 | Tripped Status Bits - Under current | 12 | Tripped Status Bits - Frequency deviation slow | 13 | Tripped Status Bits - Frequency deviation fast | 14 | Tripped Status Bits - Voltage unbalance | 15 | Tripped Status Bits - Voltage phase loss | 16 | Tripped Status Bits - Power factor deviation | 17 | Tripped Status Bits - Jam | 18 | Tripped Status Bits - Instantaneous over current | 19 | Tripped Status Bits - Current unbalance | 20 | Tripped Status Bits - Current phase loss | 21 | Tripped Status Bits - Ground current | 22 | Motor Control Status - Motor at speed | 23 | Motor Control Status - Ready | 24 | Motor Control Status - Inhibited | 25 | Motor Control Status - Warning | 26 | Motor Control Status - Faulted | 27 | Motor Control Status - Remote enabled | 28 | Motor Control Status - Running 2 | 29 | Motor Control Status - Running 1 | 30 | Warning Status Bits - PTC | 31 | Warning Status Bits - Phase rotation mismatch | 32 | Warning Status Bits - Stall | 33 | Warning Status Bits - Overload | 34 | Warning Status Bits - Starts limit exceeded | 35 | Warning Status Bits - Low power | 36 | Warning Status Bits - High power | 37 | Warning Status Bits - Under current | 38 | Warning Status Bits - Frequency deviation slow | 39 | Warning Status Bits - Frequency deviation fast |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Fault Reason Type - Load fault (Power based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Fault Reason Type - Supply fault (Voltage based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Fault Reason Type - Motor fault (Current based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Tripped Status Bits - PTC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Tripped Status Bits - Phase rotation mismatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Tripped Status Bits - Stall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Tripped Status Bits - Overload | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Tripped Status Bits - Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Tripped Status Bits - High power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Tripped Status Bits - Under current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Tripped Status Bits - Frequency deviation slow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Tripped Status Bits - Frequency deviation fast | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Tripped Status Bits - Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Tripped Status Bits - Voltage phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Tripped Status Bits - Power factor deviation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Tripped Status Bits - Jam | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Tripped Status Bits - Instantaneous over current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Tripped Status Bits - Current unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Tripped Status Bits - Current phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | Tripped Status Bits - Ground current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | Motor Control Status - Motor at speed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Motor Control Status - Ready | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | Motor Control Status - Inhibited | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | Motor Control Status - Warning | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | Motor Control Status - Faulted | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | Motor Control Status - Remote enabled | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | Motor Control Status - Running 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | Motor Control Status - Running 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | Warning Status Bits - PTC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | Warning Status Bits - Phase rotation mismatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | Warning Status Bits - Stall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | Warning Status Bits - Overload | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | Warning Status Bits - Starts limit exceeded | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | Warning Status Bits - Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | Warning Status Bits - High power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | Warning Status Bits - Under current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | Warning Status Bits - Frequency deviation slow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | Warning Status Bits - Frequency deviation fast | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|--|---|-------|-------------|----|---|----|--|----|--|----|---|----|--|----|---|----|--|----|--------------------------------------|----|--------------------------------|----|------------------------------------|----|-------------------------------------|----|-------------------------------------|----|------------------------------------|----|--------------------------------|----|---|----|---|----|---|----|---|----|---|----|---------------------------------------|----|------------------------------|----|---|----|---|----|---|----|---|----|----------------------------------|-------|----------|
| 744 | Control User Interface User LED 1 Purpose | UINT16 RW NV Default: 2 Enum Config CRC Admin Lock USB Lock Backup Mem | User Interface, User Defined LED 1 Function Selection - Default: Supply Voltage Related Fault. Applies only to C445UC... Control Family of User Interfaces, continued. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>40</td><td>Warning Status Bits - Voltage unbalance</td></tr> <tr><td>41</td><td>Warning Status Bits - Voltage phase loss</td></tr> <tr><td>42</td><td>Warning Status Bits - Power factor deviation</td></tr> <tr><td>43</td><td>Warning Status Bits - Jam</td></tr> <tr><td>44</td><td>Warning Status Bits - Instantaneous over current</td></tr> <tr><td>45</td><td>Warning Status Bits - Current unbalance</td></tr> <tr><td>46</td><td>Warning Status Bits - Current phase loss</td></tr> <tr><td>47</td><td>Warning Status Bits - Ground current</td></tr> <tr><td>48</td><td>Warning Status Bits - Reserved</td></tr> <tr><td>49</td><td>Warning Status Bits - Over voltage</td></tr> <tr><td>50</td><td>Warning Status Bits - Under voltage</td></tr> <tr><td>51</td><td>Tripped Status Bits - Under voltage</td></tr> <tr><td>52</td><td>Tripped Status Bits - Over voltage</td></tr> <tr><td>53</td><td>Tripped Status Bits - Reserved</td></tr> <tr><td>54</td><td>Base Control Module Field Output control word - Bit 0</td></tr> <tr><td>55</td><td>Base Control Module Field Output control word - Bit 1</td></tr> <tr><td>56</td><td>Base Control Module Field Output control word - Bit 2</td></tr> <tr><td>57</td><td>Base Control Module Field Output control word - Bit 3</td></tr> <tr><td>58</td><td>Shunt trip output bit - Shunt trip output bit</td></tr> <tr><td>59</td><td>Warning Reason - HRGF pulse detection</td></tr> <tr><td>60</td><td>Warning Reason - Peak demand</td></tr> <tr><td>61</td><td>Digital Input Status - Base Control Module Input I4</td></tr> <tr><td>62</td><td>Digital Input Status - Base Control Module Input I3</td></tr> <tr><td>63</td><td>Digital Input Status - Base Control Module Input I2</td></tr> <tr><td>64</td><td>Digital Input Status - Base Control Module Input I1</td></tr> <tr><td>65</td><td>Fail Safe - Ground current fault</td></tr> <tr><td>65535</td><td>Reserved</td></tr> </tbody> </table> | Value | Description | 40 | Warning Status Bits - Voltage unbalance | 41 | Warning Status Bits - Voltage phase loss | 42 | Warning Status Bits - Power factor deviation | 43 | Warning Status Bits - Jam | 44 | Warning Status Bits - Instantaneous over current | 45 | Warning Status Bits - Current unbalance | 46 | Warning Status Bits - Current phase loss | 47 | Warning Status Bits - Ground current | 48 | Warning Status Bits - Reserved | 49 | Warning Status Bits - Over voltage | 50 | Warning Status Bits - Under voltage | 51 | Tripped Status Bits - Under voltage | 52 | Tripped Status Bits - Over voltage | 53 | Tripped Status Bits - Reserved | 54 | Base Control Module Field Output control word - Bit 0 | 55 | Base Control Module Field Output control word - Bit 1 | 56 | Base Control Module Field Output control word - Bit 2 | 57 | Base Control Module Field Output control word - Bit 3 | 58 | Shunt trip output bit - Shunt trip output bit | 59 | Warning Reason - HRGF pulse detection | 60 | Warning Reason - Peak demand | 61 | Digital Input Status - Base Control Module Input I4 | 62 | Digital Input Status - Base Control Module Input I3 | 63 | Digital Input Status - Base Control Module Input I2 | 64 | Digital Input Status - Base Control Module Input I1 | 65 | Fail Safe - Ground current fault | 65535 | Reserved |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | Warning Status Bits - Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | Warning Status Bits - Voltage phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | Warning Status Bits - Power factor deviation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | Warning Status Bits - Jam | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | Warning Status Bits - Instantaneous over current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 | Warning Status Bits - Current unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | Warning Status Bits - Current phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 | Warning Status Bits - Ground current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 48 | Warning Status Bits - Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 49 | Warning Status Bits - Over voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | Warning Status Bits - Under voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | Tripped Status Bits - Under voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 52 | Tripped Status Bits - Over voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 53 | Tripped Status Bits - Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | Base Control Module Field Output control word - Bit 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 55 | Base Control Module Field Output control word - Bit 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 56 | Base Control Module Field Output control word - Bit 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 57 | Base Control Module Field Output control word - Bit 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | Shunt trip output bit - Shunt trip output bit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 59 | Warning Reason - HRGF pulse detection | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | Warning Reason - Peak demand | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 61 | Digital Input Status - Base Control Module Input I4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 62 | Digital Input Status - Base Control Module Input I3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | Digital Input Status - Base Control Module Input I2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 64 | Digital Input Status - Base Control Module Input I1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65 | Fail Safe - Ground current fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65535 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 745 | Control User Interface User LED 2 Purpose | UINT16 RW NV Default: 3 Enum Config CRC Admin Lock USB Lock Backup Mem | User Defined LED 2 Function Selection - Default: Motor Current Related Fault. Applies only to C445UC... Control Family of User Interfaces. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>0</td><td>None</td></tr> <tr><td>1</td><td>Fault Reason Type - Load fault (Power based)</td></tr> <tr><td>2</td><td>Fault Reason Type - Supply fault (Voltage based)</td></tr> <tr><td>3</td><td>Fault Reason Type - Motor fault (Current based)</td></tr> <tr><td>4</td><td>Tripped Status Bits - PTC</td></tr> <tr><td>5</td><td>Tripped Status Bits - Phase rotation mismatch</td></tr> <tr><td>6</td><td>Tripped Status Bits - Stall</td></tr> <tr><td>7</td><td>Tripped Status Bits - Overload</td></tr> <tr><td>8</td><td>Reserved</td></tr> <tr><td>9</td><td>Tripped Status Bits - Low power</td></tr> </tbody> </table> | Value | Description | 0 | None | 1 | Fault Reason Type - Load fault (Power based) | 2 | Fault Reason Type - Supply fault (Voltage based) | 3 | Fault Reason Type - Motor fault (Current based) | 4 | Tripped Status Bits - PTC | 5 | Tripped Status Bits - Phase rotation mismatch | 6 | Tripped Status Bits - Stall | 7 | Tripped Status Bits - Overload | 8 | Reserved | 9 | Tripped Status Bits - Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Fault Reason Type - Load fault (Power based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Fault Reason Type - Supply fault (Voltage based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Fault Reason Type - Motor fault (Current based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Tripped Status Bits - PTC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Tripped Status Bits - Phase rotation mismatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Tripped Status Bits - Stall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Tripped Status Bits - Overload | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Tripped Status Bits - Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--|--|---|-------|-------------|----|----------------------------------|----|-------------------------------------|----|--|----|--|----|---|----|--|----|--|----|---------------------------|----|--|----|---|----|--|----|--------------------------------------|----|---------------------------------------|----|------------------------------|----|----------------------------------|----|--------------------------------|----|--------------------------------|----|---------------------------------------|----|----------------------------------|----|----------------------------------|----|---------------------------|----|---|----|-----------------------------|----|--------------------------------|----|---|----|---------------------------------|----|----------------------------------|----|-------------------------------------|----|--|----|--|----|---|----|--|----|--|----|---------------------------|----|--|----|---|----|--|----|--------------------------------------|----|--------------------------------|----|------------------------------------|----|-------------------------------------|----|-------------------------------------|
| 745 | Control User Interface User LED 2 Purpose | UINT16 RW NV Default: 3 Enum Config CRC Admin Lock USB Lock Backup Mem | User Defined LED 2 Function Selection - Default: Motor Current Related Fault. Applies only to C445UC... Control Family of User Interfaces, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>10</td><td>Tripped Status Bits - High power</td></tr> <tr><td>11</td><td>Tripped Status Bits - Under current</td></tr> <tr><td>12</td><td>Tripped Status Bits - Frequency deviation slow</td></tr> <tr><td>13</td><td>Tripped Status Bits - Frequency deviation fast</td></tr> <tr><td>14</td><td>Tripped Status Bits - Voltage unbalance</td></tr> <tr><td>15</td><td>Tripped Status Bits - Voltage phase loss</td></tr> <tr><td>16</td><td>Tripped Status Bits - Power factor deviation</td></tr> <tr><td>17</td><td>Tripped Status Bits - Jam</td></tr> <tr><td>18</td><td>Tripped Status Bits - Instantaneous over current</td></tr> <tr><td>19</td><td>Tripped Status Bits - Current unbalance</td></tr> <tr><td>20</td><td>Tripped Status Bits - Current phase loss</td></tr> <tr><td>21</td><td>Tripped Status Bits - Ground current</td></tr> <tr><td>22</td><td>Motor Control Status - Motor at speed</td></tr> <tr><td>23</td><td>Motor Control Status - Ready</td></tr> <tr><td>24</td><td>Motor Control Status - Inhibited</td></tr> <tr><td>25</td><td>Motor Control Status - Warning</td></tr> <tr><td>26</td><td>Motor Control Status - Faulted</td></tr> <tr><td>27</td><td>Motor Control Status - Remote enabled</td></tr> <tr><td>28</td><td>Motor Control Status - Running 2</td></tr> <tr><td>29</td><td>Motor Control Status - Running 1</td></tr> <tr><td>30</td><td>Warning Status Bits - PTC</td></tr> <tr><td>31</td><td>Warning Status Bits - Phase rotation mismatch</td></tr> <tr><td>32</td><td>Warning Status Bits - Stall</td></tr> <tr><td>33</td><td>Warning Status Bits - Overload</td></tr> <tr><td>34</td><td>Warning Status Bits - Starts limit exceeded</td></tr> <tr><td>35</td><td>Warning Status Bits - Low power</td></tr> <tr><td>36</td><td>Warning Status Bits - High power</td></tr> <tr><td>37</td><td>Warning Status Bits - Under current</td></tr> <tr><td>38</td><td>Warning Status Bits - Frequency deviation slow</td></tr> <tr><td>39</td><td>Warning Status Bits - Frequency deviation fast</td></tr> <tr><td>40</td><td>Warning Status Bits - Voltage unbalance</td></tr> <tr><td>41</td><td>Warning Status Bits - Voltage phase loss</td></tr> <tr><td>42</td><td>Warning Status Bits - Power factor deviation</td></tr> <tr><td>43</td><td>Warning Status Bits - Jam</td></tr> <tr><td>44</td><td>Warning Status Bits - Instantaneous over current</td></tr> <tr><td>45</td><td>Warning Status Bits - Current unbalance</td></tr> <tr><td>46</td><td>Warning Status Bits - Current phase loss</td></tr> <tr><td>47</td><td>Warning Status Bits - Ground current</td></tr> <tr><td>48</td><td>Warning Status Bits - Reserved</td></tr> <tr><td>49</td><td>Warning Status Bits - Over voltage</td></tr> <tr><td>50</td><td>Warning Status Bits - Under voltage</td></tr> <tr><td>51</td><td>Tripped Status Bits - Under voltage</td></tr> </tbody> </table> | Value | Description | 10 | Tripped Status Bits - High power | 11 | Tripped Status Bits - Under current | 12 | Tripped Status Bits - Frequency deviation slow | 13 | Tripped Status Bits - Frequency deviation fast | 14 | Tripped Status Bits - Voltage unbalance | 15 | Tripped Status Bits - Voltage phase loss | 16 | Tripped Status Bits - Power factor deviation | 17 | Tripped Status Bits - Jam | 18 | Tripped Status Bits - Instantaneous over current | 19 | Tripped Status Bits - Current unbalance | 20 | Tripped Status Bits - Current phase loss | 21 | Tripped Status Bits - Ground current | 22 | Motor Control Status - Motor at speed | 23 | Motor Control Status - Ready | 24 | Motor Control Status - Inhibited | 25 | Motor Control Status - Warning | 26 | Motor Control Status - Faulted | 27 | Motor Control Status - Remote enabled | 28 | Motor Control Status - Running 2 | 29 | Motor Control Status - Running 1 | 30 | Warning Status Bits - PTC | 31 | Warning Status Bits - Phase rotation mismatch | 32 | Warning Status Bits - Stall | 33 | Warning Status Bits - Overload | 34 | Warning Status Bits - Starts limit exceeded | 35 | Warning Status Bits - Low power | 36 | Warning Status Bits - High power | 37 | Warning Status Bits - Under current | 38 | Warning Status Bits - Frequency deviation slow | 39 | Warning Status Bits - Frequency deviation fast | 40 | Warning Status Bits - Voltage unbalance | 41 | Warning Status Bits - Voltage phase loss | 42 | Warning Status Bits - Power factor deviation | 43 | Warning Status Bits - Jam | 44 | Warning Status Bits - Instantaneous over current | 45 | Warning Status Bits - Current unbalance | 46 | Warning Status Bits - Current phase loss | 47 | Warning Status Bits - Ground current | 48 | Warning Status Bits - Reserved | 49 | Warning Status Bits - Over voltage | 50 | Warning Status Bits - Under voltage | 51 | Tripped Status Bits - Under voltage |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Tripped Status Bits - High power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Tripped Status Bits - Under current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Tripped Status Bits - Frequency deviation slow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Tripped Status Bits - Frequency deviation fast | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Tripped Status Bits - Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Tripped Status Bits - Voltage phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Tripped Status Bits - Power factor deviation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Tripped Status Bits - Jam | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Tripped Status Bits - Instantaneous over current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Tripped Status Bits - Current unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Tripped Status Bits - Current phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | Tripped Status Bits - Ground current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | Motor Control Status - Motor at speed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Motor Control Status - Ready | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | Motor Control Status - Inhibited | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | Motor Control Status - Warning | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | Motor Control Status - Faulted | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | Motor Control Status - Remote enabled | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | Motor Control Status - Running 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | Motor Control Status - Running 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | Warning Status Bits - PTC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | Warning Status Bits - Phase rotation mismatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | Warning Status Bits - Stall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | Warning Status Bits - Overload | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | Warning Status Bits - Starts limit exceeded | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | Warning Status Bits - Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | Warning Status Bits - High power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | Warning Status Bits - Under current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | Warning Status Bits - Frequency deviation slow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | Warning Status Bits - Frequency deviation fast | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | Warning Status Bits - Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | Warning Status Bits - Voltage phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | Warning Status Bits - Power factor deviation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | Warning Status Bits - Jam | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | Warning Status Bits - Instantaneous over current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 | Warning Status Bits - Current unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | Warning Status Bits - Current phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 | Warning Status Bits - Ground current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 48 | Warning Status Bits - Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 49 | Warning Status Bits - Over voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | Warning Status Bits - Under voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | Tripped Status Bits - Under voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|--|--|-------|-------------|----|------------------------------------|----|--|----|---|----|---|----|---|----|---|----|---|----|---------------------------------------|----|------------------------------|----|---|----|---|----|---|----|---|----|--|-------|---|----|--|----|--|----|---------------------------|----|--|----|---|----|--|----|--------------------------------------|----|---------------------------------------|----|------------------------------|
| 745 | Control User Interface User LED 2 Purpose | UINT16 RW NV Default: 3 Enum Config CRC Admin Lock USB Lock Backup Mem | User Defined LED 2 Function Selection - Default: Motor Current Related Fault. Applies only to C445UC... Control Family of User Interfaces, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>52</td><td>Tripped Status Bits - Over voltage</td></tr> <tr><td>53</td><td>Tripped Status Bits - Reserved</td></tr> <tr><td>54</td><td>Base Control Module Field Output control word - Bit 0</td></tr> <tr><td>55</td><td>Base Control Module Field Output control word - Bit 1</td></tr> <tr><td>56</td><td>Base Control Module Field Output control word - Bit 2</td></tr> <tr><td>57</td><td>Base Control Module Field Output control word - Bit 3</td></tr> <tr><td>58</td><td>Shunt trip output bit - Shunt trip output bit</td></tr> <tr><td>59</td><td>Warning Reason - HRGF pulse detection</td></tr> <tr><td>60</td><td>Warning Reason - Peak demand</td></tr> <tr><td>61</td><td>Digital Input Status - Base Control Module Input I4</td></tr> <tr><td>62</td><td>Digital Input Status - Base Control Module Input I3</td></tr> <tr><td>63</td><td>Digital Input Status - Base Control Module Input I2</td></tr> <tr><td>64</td><td>Digital Input Status - Base Control Module Input I1</td></tr> <tr><td>65</td><td>Fail Safe - Ground current fault</td></tr> <tr><td>65535</td><td>Reserved</td></tr> </tbody> </table> | Value | Description | 52 | Tripped Status Bits - Over voltage | 53 | Tripped Status Bits - Reserved | 54 | Base Control Module Field Output control word - Bit 0 | 55 | Base Control Module Field Output control word - Bit 1 | 56 | Base Control Module Field Output control word - Bit 2 | 57 | Base Control Module Field Output control word - Bit 3 | 58 | Shunt trip output bit - Shunt trip output bit | 59 | Warning Reason - HRGF pulse detection | 60 | Warning Reason - Peak demand | 61 | Digital Input Status - Base Control Module Input I4 | 62 | Digital Input Status - Base Control Module Input I3 | 63 | Digital Input Status - Base Control Module Input I2 | 64 | Digital Input Status - Base Control Module Input I1 | 65 | Fail Safe - Ground current fault | 65535 | Reserved | | | | | | | | | | | | | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 52 | Tripped Status Bits - Over voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 53 | Tripped Status Bits - Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | Base Control Module Field Output control word - Bit 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 55 | Base Control Module Field Output control word - Bit 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 56 | Base Control Module Field Output control word - Bit 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 57 | Base Control Module Field Output control word - Bit 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | Shunt trip output bit - Shunt trip output bit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 59 | Warning Reason - HRGF pulse detection | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | Warning Reason - Peak demand | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 61 | Digital Input Status - Base Control Module Input I4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 62 | Digital Input Status - Base Control Module Input I3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | Digital Input Status - Base Control Module Input I2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 64 | Digital Input Status - Base Control Module Input I1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65 | Fail Safe - Ground current fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65535 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 746 | Control User Interface User LED 3 Purpose | UINT16 RW NV Default: 1 Enum Config CRC Admin Lock USB Lock Backup Mem | User Defined LED 3 Function Selection - Default: Power Related Fault. Applies only to C445UC... Control Family of User Interfaces. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>0</td><td>None</td></tr> <tr><td>1</td><td>Fault Reason Type - Load fault (Power based)</td></tr> <tr><td>2</td><td>Fault Reason Type - Supply fault (Voltage based)</td></tr> <tr><td>3</td><td>Fault Reason Type - Motor fault (Current based)</td></tr> <tr><td>4</td><td>Tripped Status Bits - PTC</td></tr> <tr><td>5</td><td>Tripped Status Bits - Phase rotation mismatch</td></tr> <tr><td>6</td><td>Tripped Status Bits - Stall</td></tr> <tr><td>7</td><td>Tripped Status Bits - Overload</td></tr> <tr><td>8</td><td>Reserved</td></tr> <tr><td>9</td><td>Tripped Status Bits - Low power</td></tr> <tr><td>10</td><td>Tripped Status Bits - High power</td></tr> <tr><td>11</td><td>Tripped Status Bits - Under current</td></tr> <tr><td>12</td><td>Tripped Status Bits - Frequency deviation slow</td></tr> <tr><td>13</td><td>Tripped Status Bits - Frequency deviation fast</td></tr> <tr><td>14</td><td>Tripped Status Bits - Voltage unbalance</td></tr> <tr><td>15</td><td>Tripped Status Bits - Voltage phase loss</td></tr> <tr><td>16</td><td>Tripped Status Bits - Power factor deviation</td></tr> <tr><td>17</td><td>Tripped Status Bits - Jam</td></tr> <tr><td>18</td><td>Tripped Status Bits - Instantaneous over current</td></tr> <tr><td>19</td><td>Tripped Status Bits - Current unbalance</td></tr> <tr><td>20</td><td>Tripped Status Bits - Current phase loss</td></tr> <tr><td>21</td><td>Tripped Status Bits - Ground current</td></tr> <tr><td>22</td><td>Motor Control Status - Motor at speed</td></tr> <tr><td>23</td><td>Motor Control Status - Ready</td></tr> </tbody> </table> | Value | Description | 0 | None | 1 | Fault Reason Type - Load fault (Power based) | 2 | Fault Reason Type - Supply fault (Voltage based) | 3 | Fault Reason Type - Motor fault (Current based) | 4 | Tripped Status Bits - PTC | 5 | Tripped Status Bits - Phase rotation mismatch | 6 | Tripped Status Bits - Stall | 7 | Tripped Status Bits - Overload | 8 | Reserved | 9 | Tripped Status Bits - Low power | 10 | Tripped Status Bits - High power | 11 | Tripped Status Bits - Under current | 12 | Tripped Status Bits - Frequency deviation slow | 13 | Tripped Status Bits - Frequency deviation fast | 14 | Tripped Status Bits - Voltage unbalance | 15 | Tripped Status Bits - Voltage phase loss | 16 | Tripped Status Bits - Power factor deviation | 17 | Tripped Status Bits - Jam | 18 | Tripped Status Bits - Instantaneous over current | 19 | Tripped Status Bits - Current unbalance | 20 | Tripped Status Bits - Current phase loss | 21 | Tripped Status Bits - Ground current | 22 | Motor Control Status - Motor at speed | 23 | Motor Control Status - Ready |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Fault Reason Type - Load fault (Power based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Fault Reason Type - Supply fault (Voltage based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Fault Reason Type - Motor fault (Current based) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Tripped Status Bits - PTC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Tripped Status Bits - Phase rotation mismatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Tripped Status Bits - Stall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Tripped Status Bits - Overload | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Tripped Status Bits - Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Tripped Status Bits - High power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Tripped Status Bits - Under current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Tripped Status Bits - Frequency deviation slow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Tripped Status Bits - Frequency deviation fast | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Tripped Status Bits - Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Tripped Status Bits - Voltage phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Tripped Status Bits - Power factor deviation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Tripped Status Bits - Jam | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Tripped Status Bits - Instantaneous over current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Tripped Status Bits - Current unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Tripped Status Bits - Current phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | Tripped Status Bits - Ground current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | Motor Control Status - Motor at speed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Motor Control Status - Ready | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|---|---|-------|-------------|----|----------------------------------|----|--------------------------------|----|--------------------------------|----|---------------------------------------|----|----------------------------------|----|----------------------------------|----|---------------------------|----|---|----|-----------------------------|----|--------------------------------|----|---|----|---------------------------------|----|----------------------------------|----|-------------------------------------|----|--|----|--|----|---|----|--|----|--|----|---------------------------|----|--|----|---|----|--|----|--------------------------------------|----|--------------------------------|----|------------------------------------|----|-------------------------------------|----|-------------------------------------|----|------------------------------------|----|--------------------------------|----|---|----|---|----|---|----|---|----|---|----|---------------------------------------|----|------------------------------|----|---|----|---|----|---|----|---|----|----------------------------------|-------|----------|
| 746 | Control User Interface User LED 3 Purpose | UINT16 RW NV Default: 1 Enum Config CRC Admin Lock USB Lock Backup Mem | User Defined LED 3 Function Selection - Default: Power Related Fault. Applies only to C445UC... Control Family of User Interfaces, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>24</td><td>Motor Control Status - Inhibited</td></tr> <tr><td>25</td><td>Motor Control Status - Warning</td></tr> <tr><td>26</td><td>Motor Control Status - Faulted</td></tr> <tr><td>27</td><td>Motor Control Status - Remote enabled</td></tr> <tr><td>28</td><td>Motor Control Status - Running 2</td></tr> <tr><td>29</td><td>Motor Control Status - Running 1</td></tr> <tr><td>30</td><td>Warning Status Bits - PTC</td></tr> <tr><td>31</td><td>Warning Status Bits - Phase rotation mismatch</td></tr> <tr><td>32</td><td>Warning Status Bits - Stall</td></tr> <tr><td>33</td><td>Warning Status Bits - Overload</td></tr> <tr><td>34</td><td>Warning Status Bits - Starts limit exceeded</td></tr> <tr><td>35</td><td>Warning Status Bits - Low power</td></tr> <tr><td>36</td><td>Warning Status Bits - High power</td></tr> <tr><td>37</td><td>Warning Status Bits - Under current</td></tr> <tr><td>38</td><td>Warning Status Bits - Frequency deviation slow</td></tr> <tr><td>39</td><td>Warning Status Bits - Frequency deviation fast</td></tr> <tr><td>40</td><td>Warning Status Bits - Voltage unbalance</td></tr> <tr><td>41</td><td>Warning Status Bits - Voltage phase loss</td></tr> <tr><td>42</td><td>Warning Status Bits - Power factor deviation</td></tr> <tr><td>43</td><td>Warning Status Bits - Jam</td></tr> <tr><td>44</td><td>Warning Status Bits - Instantaneous over current</td></tr> <tr><td>45</td><td>Warning Status Bits - Current unbalance</td></tr> <tr><td>46</td><td>Warning Status Bits - Current phase loss</td></tr> <tr><td>47</td><td>Warning Status Bits - Ground current</td></tr> <tr><td>48</td><td>Warning Status Bits - Reserved</td></tr> <tr><td>49</td><td>Warning Status Bits - Over voltage</td></tr> <tr><td>50</td><td>Warning Status Bits - Under voltage</td></tr> <tr><td>51</td><td>Tripped Status Bits - Under voltage</td></tr> <tr><td>52</td><td>Tripped Status Bits - Over voltage</td></tr> <tr><td>53</td><td>Tripped Status Bits - Reserved</td></tr> <tr><td>54</td><td>Base Control Module Field Output control word - Bit 0</td></tr> <tr><td>55</td><td>Base Control Module Field Output control word - Bit 1</td></tr> <tr><td>56</td><td>Base Control Module Field Output control word - Bit 2</td></tr> <tr><td>57</td><td>Base Control Module Field Output control word - Bit 3</td></tr> <tr><td>58</td><td>Shunt trip output bit - Shunt trip output bit</td></tr> <tr><td>59</td><td>Warning Reason - HRGF pulse detection</td></tr> <tr><td>60</td><td>Warning Reason - Peak demand</td></tr> <tr><td>61</td><td>Digital Input Status - Base Control Module Input I4</td></tr> <tr><td>62</td><td>Digital Input Status - Base Control Module Input I3</td></tr> <tr><td>63</td><td>Digital Input Status - Base Control Module Input I2</td></tr> <tr><td>64</td><td>Digital Input Status - Base Control Module Input I1</td></tr> <tr><td>65</td><td>Fail Safe - Ground current fault</td></tr> <tr><td>65535</td><td>Reserved</td></tr> </tbody> </table> | Value | Description | 24 | Motor Control Status - Inhibited | 25 | Motor Control Status - Warning | 26 | Motor Control Status - Faulted | 27 | Motor Control Status - Remote enabled | 28 | Motor Control Status - Running 2 | 29 | Motor Control Status - Running 1 | 30 | Warning Status Bits - PTC | 31 | Warning Status Bits - Phase rotation mismatch | 32 | Warning Status Bits - Stall | 33 | Warning Status Bits - Overload | 34 | Warning Status Bits - Starts limit exceeded | 35 | Warning Status Bits - Low power | 36 | Warning Status Bits - High power | 37 | Warning Status Bits - Under current | 38 | Warning Status Bits - Frequency deviation slow | 39 | Warning Status Bits - Frequency deviation fast | 40 | Warning Status Bits - Voltage unbalance | 41 | Warning Status Bits - Voltage phase loss | 42 | Warning Status Bits - Power factor deviation | 43 | Warning Status Bits - Jam | 44 | Warning Status Bits - Instantaneous over current | 45 | Warning Status Bits - Current unbalance | 46 | Warning Status Bits - Current phase loss | 47 | Warning Status Bits - Ground current | 48 | Warning Status Bits - Reserved | 49 | Warning Status Bits - Over voltage | 50 | Warning Status Bits - Under voltage | 51 | Tripped Status Bits - Under voltage | 52 | Tripped Status Bits - Over voltage | 53 | Tripped Status Bits - Reserved | 54 | Base Control Module Field Output control word - Bit 0 | 55 | Base Control Module Field Output control word - Bit 1 | 56 | Base Control Module Field Output control word - Bit 2 | 57 | Base Control Module Field Output control word - Bit 3 | 58 | Shunt trip output bit - Shunt trip output bit | 59 | Warning Reason - HRGF pulse detection | 60 | Warning Reason - Peak demand | 61 | Digital Input Status - Base Control Module Input I4 | 62 | Digital Input Status - Base Control Module Input I3 | 63 | Digital Input Status - Base Control Module Input I2 | 64 | Digital Input Status - Base Control Module Input I1 | 65 | Fail Safe - Ground current fault | 65535 | Reserved |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | Motor Control Status - Inhibited | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | Motor Control Status - Warning | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | Motor Control Status - Faulted | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | Motor Control Status - Remote enabled | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | Motor Control Status - Running 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | Motor Control Status - Running 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | Warning Status Bits - PTC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | Warning Status Bits - Phase rotation mismatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | Warning Status Bits - Stall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | Warning Status Bits - Overload | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | Warning Status Bits - Starts limit exceeded | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | Warning Status Bits - Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | Warning Status Bits - High power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | Warning Status Bits - Under current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | Warning Status Bits - Frequency deviation slow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | Warning Status Bits - Frequency deviation fast | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | Warning Status Bits - Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | Warning Status Bits - Voltage phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | Warning Status Bits - Power factor deviation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | Warning Status Bits - Jam | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | Warning Status Bits - Instantaneous over current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 | Warning Status Bits - Current unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | Warning Status Bits - Current phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 | Warning Status Bits - Ground current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 48 | Warning Status Bits - Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 49 | Warning Status Bits - Over voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | Warning Status Bits - Under voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | Tripped Status Bits - Under voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 52 | Tripped Status Bits - Over voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 53 | Tripped Status Bits - Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | Base Control Module Field Output control word - Bit 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 55 | Base Control Module Field Output control word - Bit 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 56 | Base Control Module Field Output control word - Bit 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 57 | Base Control Module Field Output control word - Bit 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | Shunt trip output bit - Shunt trip output bit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 59 | Warning Reason - HRGF pulse detection | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | Warning Reason - Peak demand | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 61 | Digital Input Status - Base Control Module Input I4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 62 | Digital Input Status - Base Control Module Input I3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | Digital Input Status - Base Control Module Input I2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 64 | Digital Input Status - Base Control Module Input I1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65 | Fail Safe - Ground current fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65535 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | |
|----------|---|--|---|-------|-------------|---|----------------------------------|---|--|---|--|---|--|---|--|---|---|
| 747 | Control User Interface Button 1 Config | UINT16 RW NV Default: 1 Enum Config CRC Admin Lock USB Lock Backup Mem | Configuration parameter for the User Interface button 1 function. Applies only to C445UC... Control Family of User Interfaces. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No User Interface button present</td> </tr> <tr> <td>1</td> <td>User Interface button configured as STOP</td> </tr> <tr> <td>2</td> <td>User Interface button configured as AUTO</td> </tr> <tr> <td>3</td> <td>User Interface button configured as RUN1</td> </tr> <tr> <td>4</td> <td>User Interface button configured as RUN2</td> </tr> <tr> <td>5</td> <td>User Interface button configured as RESET</td> </tr> </tbody> </table> | Value | Description | 0 | No User Interface button present | 1 | User Interface button configured as STOP | 2 | User Interface button configured as AUTO | 3 | User Interface button configured as RUN1 | 4 | User Interface button configured as RUN2 | 5 | User Interface button configured as RESET |
| Value | Description | | | | | | | | | | | | | | | | |
| 0 | No User Interface button present | | | | | | | | | | | | | | | | |
| 1 | User Interface button configured as STOP | | | | | | | | | | | | | | | | |
| 2 | User Interface button configured as AUTO | | | | | | | | | | | | | | | | |
| 3 | User Interface button configured as RUN1 | | | | | | | | | | | | | | | | |
| 4 | User Interface button configured as RUN2 | | | | | | | | | | | | | | | | |
| 5 | User Interface button configured as RESET | | | | | | | | | | | | | | | | |
| 748 | Control User Interface Button 2 Config | UINT16 RW NV Default: 2 Enum Config CRC Admin Lock USB Lock Backup Mem | Configuration parameter for the User Interface button 2 function. Applies only to C445UC... Control Family of User Interfaces. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No User Interface button present</td> </tr> <tr> <td>1</td> <td>User Interface button configured as STOP</td> </tr> <tr> <td>2</td> <td>User Interface button configured as AUTO</td> </tr> <tr> <td>3</td> <td>User Interface button configured as RUN1</td> </tr> <tr> <td>4</td> <td>User Interface button configured as RUN2</td> </tr> <tr> <td>5</td> <td>User Interface button configured as RESET</td> </tr> </tbody> </table> | Value | Description | 0 | No User Interface button present | 1 | User Interface button configured as STOP | 2 | User Interface button configured as AUTO | 3 | User Interface button configured as RUN1 | 4 | User Interface button configured as RUN2 | 5 | User Interface button configured as RESET |
| Value | Description | | | | | | | | | | | | | | | | |
| 0 | No User Interface button present | | | | | | | | | | | | | | | | |
| 1 | User Interface button configured as STOP | | | | | | | | | | | | | | | | |
| 2 | User Interface button configured as AUTO | | | | | | | | | | | | | | | | |
| 3 | User Interface button configured as RUN1 | | | | | | | | | | | | | | | | |
| 4 | User Interface button configured as RUN2 | | | | | | | | | | | | | | | | |
| 5 | User Interface button configured as RESET | | | | | | | | | | | | | | | | |
| 749 | Control User Interface Button 3 Config | UINT16 RW NV Default: 3 Enum Config CRC Admin Lock USB Lock Backup Mem | Configuration parameter for the User Interface button 3 function. Applies only to C445UC... Control Family of User Interfaces. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No User Interface button present</td> </tr> <tr> <td>1</td> <td>User Interface button configured as STOP</td> </tr> <tr> <td>2</td> <td>User Interface button configured as AUTO</td> </tr> <tr> <td>3</td> <td>User Interface button configured as RUN1</td> </tr> <tr> <td>4</td> <td>User Interface button configured as RUN2</td> </tr> <tr> <td>5</td> <td>User Interface button configured as RESET</td> </tr> </tbody> </table> | Value | Description | 0 | No User Interface button present | 1 | User Interface button configured as STOP | 2 | User Interface button configured as AUTO | 3 | User Interface button configured as RUN1 | 4 | User Interface button configured as RUN2 | 5 | User Interface button configured as RESET |
| Value | Description | | | | | | | | | | | | | | | | |
| 0 | No User Interface button present | | | | | | | | | | | | | | | | |
| 1 | User Interface button configured as STOP | | | | | | | | | | | | | | | | |
| 2 | User Interface button configured as AUTO | | | | | | | | | | | | | | | | |
| 3 | User Interface button configured as RUN1 | | | | | | | | | | | | | | | | |
| 4 | User Interface button configured as RUN2 | | | | | | | | | | | | | | | | |
| 5 | User Interface button configured as RESET | | | | | | | | | | | | | | | | |
| 750 | Control User Interface Button 4 Config | UINT16 RW NV Default: 4 Enum Config CRC Admin Lock USB Lock Backup Mem | Configuration parameter for the User Interface button 4 function. Applies only to C445UC... Control Family of User Interfaces. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No User Interface button present</td> </tr> <tr> <td>1</td> <td>User Interface button configured as STOP</td> </tr> <tr> <td>2</td> <td>User Interface button configured as AUTO</td> </tr> <tr> <td>3</td> <td>User Interface button configured as RUN1</td> </tr> <tr> <td>4</td> <td>User Interface button configured as RUN2</td> </tr> <tr> <td>5</td> <td>User Interface button configured as RESET</td> </tr> </tbody> </table> | Value | Description | 0 | No User Interface button present | 1 | User Interface button configured as STOP | 2 | User Interface button configured as AUTO | 3 | User Interface button configured as RUN1 | 4 | User Interface button configured as RUN2 | 5 | User Interface button configured as RESET |
| Value | Description | | | | | | | | | | | | | | | | |
| 0 | No User Interface button present | | | | | | | | | | | | | | | | |
| 1 | User Interface button configured as STOP | | | | | | | | | | | | | | | | |
| 2 | User Interface button configured as AUTO | | | | | | | | | | | | | | | | |
| 3 | User Interface button configured as RUN1 | | | | | | | | | | | | | | | | |
| 4 | User Interface button configured as RUN2 | | | | | | | | | | | | | | | | |
| 5 | User Interface button configured as RESET | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | |
|----------|---|--|---|-------|-------------|---|----------------------------------|---|--|---|--|---|--|---|--|---|---|
| 751 | Control User Interface Button 5 Config | UINT16 RW NV Default: 5 Enum Config CRC Admin Lock USB Lock Backup Mem | Configuration parameter for the User Interface button 5 function. Applies only to C445UC... Control Family of User Interfaces. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No User Interface button present</td> </tr> <tr> <td>1</td> <td>User Interface button configured as STOP</td> </tr> <tr> <td>2</td> <td>User Interface button configured as AUTO</td> </tr> <tr> <td>3</td> <td>User Interface button configured as RUN1</td> </tr> <tr> <td>4</td> <td>User Interface button configured as RUN2</td> </tr> <tr> <td>5</td> <td>User Interface button configured as RESET</td> </tr> </tbody> </table> | Value | Description | 0 | No User Interface button present | 1 | User Interface button configured as STOP | 2 | User Interface button configured as AUTO | 3 | User Interface button configured as RUN1 | 4 | User Interface button configured as RUN2 | 5 | User Interface button configured as RESET |
| Value | Description | | | | | | | | | | | | | | | | |
| 0 | No User Interface button present | | | | | | | | | | | | | | | | |
| 1 | User Interface button configured as STOP | | | | | | | | | | | | | | | | |
| 2 | User Interface button configured as AUTO | | | | | | | | | | | | | | | | |
| 3 | User Interface button configured as RUN1 | | | | | | | | | | | | | | | | |
| 4 | User Interface button configured as RUN2 | | | | | | | | | | | | | | | | |
| 5 | User Interface button configured as RESET | | | | | | | | | | | | | | | | |
| 752 | Control User Interface LED 1 Color Config | UINT16 RW NV Default: 3 Enum Config CRC Admin Lock USB Lock Backup Mem | User Interface LED 1 Color parameter. Applies only to C445UC... Control Family of User Interfaces. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Sets LED color to green</td> </tr> <tr> <td>1</td> <td>Sets LED color to red</td> </tr> <tr> <td>2</td> <td>Sets LED color to amber</td> </tr> <tr> <td>3</td> <td>Sets LED color to white</td> </tr> </tbody> </table> | Value | Description | 0 | Sets LED color to green | 1 | Sets LED color to red | 2 | Sets LED color to amber | 3 | Sets LED color to white | | | | |
| Value | Description | | | | | | | | | | | | | | | | |
| 0 | Sets LED color to green | | | | | | | | | | | | | | | | |
| 1 | Sets LED color to red | | | | | | | | | | | | | | | | |
| 2 | Sets LED color to amber | | | | | | | | | | | | | | | | |
| 3 | Sets LED color to white | | | | | | | | | | | | | | | | |
| 753 | Control User Interface LED 2 Color Config | UINT16 RW NV Default: 3 Enum Config CRC Admin Lock USB Lock Backup Mem | User Interface LED 2 Color parameter. Applies only to C445UC... Control Family of User Interfaces. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Sets LED color to green</td> </tr> <tr> <td>1</td> <td>Sets LED color to red</td> </tr> <tr> <td>2</td> <td>Sets LED color to amber</td> </tr> <tr> <td>3</td> <td>Sets LED color to white</td> </tr> </tbody> </table> | Value | Description | 0 | Sets LED color to green | 1 | Sets LED color to red | 2 | Sets LED color to amber | 3 | Sets LED color to white | | | | |
| Value | Description | | | | | | | | | | | | | | | | |
| 0 | Sets LED color to green | | | | | | | | | | | | | | | | |
| 1 | Sets LED color to red | | | | | | | | | | | | | | | | |
| 2 | Sets LED color to amber | | | | | | | | | | | | | | | | |
| 3 | Sets LED color to white | | | | | | | | | | | | | | | | |
| 754 | Control User Interface LED 3 Color Config | UINT16 RW NV Default: 3 Enum Config CRC Admin Lock USB Lock Backup Mem | User Interface LED 3 Color parameter. Applies only to C445UC... Control Family of User Interfaces. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Sets LED color to green</td> </tr> <tr> <td>1</td> <td>Sets LED color to red</td> </tr> <tr> <td>2</td> <td>Sets LED color to amber</td> </tr> <tr> <td>3</td> <td>Sets LED color to white</td> </tr> </tbody> </table> | Value | Description | 0 | Sets LED color to green | 1 | Sets LED color to red | 2 | Sets LED color to amber | 3 | Sets LED color to white | | | | |
| Value | Description | | | | | | | | | | | | | | | | |
| 0 | Sets LED color to green | | | | | | | | | | | | | | | | |
| 1 | Sets LED color to red | | | | | | | | | | | | | | | | |
| 2 | Sets LED color to amber | | | | | | | | | | | | | | | | |
| 3 | Sets LED color to white | | | | | | | | | | | | | | | | |
| 755 | Control User Interface LED 4 Color Config | UINT16 RW NV Default: 3 Enum Config CRC Admin Lock USB Lock Backup Mem | User Interface LED 4 Color parameter. Applies only to C445UC... Control Family of User Interfaces. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Sets LED color to green</td> </tr> <tr> <td>1</td> <td>Sets LED color to red</td> </tr> <tr> <td>2</td> <td>Sets LED color to amber</td> </tr> <tr> <td>3</td> <td>Sets LED color to white</td> </tr> </tbody> </table> | Value | Description | 0 | Sets LED color to green | 1 | Sets LED color to red | 2 | Sets LED color to amber | 3 | Sets LED color to white | | | | |
| Value | Description | | | | | | | | | | | | | | | | |
| 0 | Sets LED color to green | | | | | | | | | | | | | | | | |
| 1 | Sets LED color to red | | | | | | | | | | | | | | | | |
| 2 | Sets LED color to amber | | | | | | | | | | | | | | | | |
| 3 | Sets LED color to white | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | |
|----------|--|---|--|-------|-------------|---|-------------------------|---|-----------------------|---|-------------------------|---|-------------------------|
| 756 | Control User Interface LED 5 Color Config | UIN16 RW NV Default: 1 Enum Config CRC Admin Lock USB Lock Backup Mem | User Interface LED 5 Color parameter. Applies only to C445UC... Control Family of User Interfaces. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Sets LED color to green</td> </tr> <tr> <td>1</td> <td>Sets LED color to red</td> </tr> <tr> <td>2</td> <td>Sets LED color to amber</td> </tr> <tr> <td>3</td> <td>Sets LED color to white</td> </tr> </tbody> </table> | Value | Description | 0 | Sets LED color to green | 1 | Sets LED color to red | 2 | Sets LED color to amber | 3 | Sets LED color to white |
| Value | Description | | | | | | | | | | | | |
| 0 | Sets LED color to green | | | | | | | | | | | | |
| 1 | Sets LED color to red | | | | | | | | | | | | |
| 2 | Sets LED color to amber | | | | | | | | | | | | |
| 3 | Sets LED color to white | | | | | | | | | | | | |
| 757 | Control User Interface LED 6 Color Config | UIN16 RW NV Default: 1 Enum Config CRC Admin Lock USB Lock Backup Mem | User Interface LED 6 Color parameter. Applies only to C445UC... Control Family of User Interfaces. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Sets LED color to green</td> </tr> <tr> <td>1</td> <td>Sets LED color to red</td> </tr> <tr> <td>2</td> <td>Sets LED color to amber</td> </tr> </tbody> </table> | Value | Description | 0 | Sets LED color to green | 1 | Sets LED color to red | 2 | Sets LED color to amber | | |
| Value | Description | | | | | | | | | | | | |
| 0 | Sets LED color to green | | | | | | | | | | | | |
| 1 | Sets LED color to red | | | | | | | | | | | | |
| 2 | Sets LED color to amber | | | | | | | | | | | | |
| 758 | Control User Interface LED 7 Color Config | UIN16 RW NV Default: 2 Enum Config CRC Admin Lock USB Lock Backup Mem | User Interface LED 7 Color parameter. Applies only to C445UC... Control Family of User Interfaces. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Sets LED color to green</td> </tr> <tr> <td>1</td> <td>Sets LED color to red</td> </tr> <tr> <td>2</td> <td>Sets LED color to amber</td> </tr> </tbody> </table> | Value | Description | 0 | Sets LED color to green | 1 | Sets LED color to red | 2 | Sets LED color to amber | | |
| Value | Description | | | | | | | | | | | | |
| 0 | Sets LED color to green | | | | | | | | | | | | |
| 1 | Sets LED color to red | | | | | | | | | | | | |
| 2 | Sets LED color to amber | | | | | | | | | | | | |
| 759 | Control User Interface User LED 1 Color Config | UIN16 RW NV Default: 1 Enum | User Defined LED 1 Color Selection, Default Red. Other selections are green and amber. Applies only to C445UC... Control Family of User Interfaces. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Sets LED color to green</td> </tr> <tr> <td>1</td> <td>Sets LED color to red</td> </tr> <tr> <td>2</td> <td>Sets LED color to amber</td> </tr> </tbody> </table> | Value | Description | 0 | Sets LED color to green | 1 | Sets LED color to red | 2 | Sets LED color to amber | | |
| Value | Description | | | | | | | | | | | | |
| 0 | Sets LED color to green | | | | | | | | | | | | |
| 1 | Sets LED color to red | | | | | | | | | | | | |
| 2 | Sets LED color to amber | | | | | | | | | | | | |
| 760 | Control User Interface User LED 2 Color Config | UIN16 RW NV Default: 1 Enum | User Defined LED 2 Color Selection, Default Red. Other selections are green and amber. Applies only to C445UC... Control Family of User Interfaces. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Sets LED color to green</td> </tr> <tr> <td>1</td> <td>Sets LED color to red</td> </tr> <tr> <td>2</td> <td>Sets LED color to amber</td> </tr> </tbody> </table> | Value | Description | 0 | Sets LED color to green | 1 | Sets LED color to red | 2 | Sets LED color to amber | | |
| Value | Description | | | | | | | | | | | | |
| 0 | Sets LED color to green | | | | | | | | | | | | |
| 1 | Sets LED color to red | | | | | | | | | | | | |
| 2 | Sets LED color to amber | | | | | | | | | | | | |
| 761 | Control User Interface User LED 3 Color Config | UIN16 RW NV Default: 1 Enum | User Defined LED 3 Color Selection, Default Red. Other selections are green and amber. Applies only to C445UC... Control Family of User Interfaces. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Sets LED color to green</td> </tr> <tr> <td>1</td> <td>Sets LED color to red</td> </tr> <tr> <td>2</td> <td>Sets LED color to amber</td> </tr> </tbody> </table> | Value | Description | 0 | Sets LED color to green | 1 | Sets LED color to red | 2 | Sets LED color to amber | | |
| Value | Description | | | | | | | | | | | | |
| 0 | Sets LED color to green | | | | | | | | | | | | |
| 1 | Sets LED color to red | | | | | | | | | | | | |
| 2 | Sets LED color to amber | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--------------------------------|---|---|-------|-------------|---|---------------|---|--------------------|---|-------------------|---|--------------------------|---|----------------------|---|----------------|---|----------------|---|----------------|---|--------------------|---|--------------------------|----|----------------------|----|-------|----|-------|----|-------|----|-----------------------|----|-------------------|----|-----------------|----|---------------------|----|--------------------------------|----|---------------------|----|--------------------------|----|------------------|----|--------------------------------|----|-------------------------------|----|--------------------------|----|-------------------------------|----|------------------|----|----------|----|------------------------------|----|------------------------------|----|--------------------------------|----|-----------|
| 762 | Default Measure Param | UINT8 RW NV Default: 0 Enum Config CRC Backup Mem | User selectable default parameter that will be displayed in the Measure run screen at startup. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>0</td><td>Remember Last</td></tr> <tr><td>1</td><td>Avg Current (Iavg)</td></tr> <tr><td>2</td><td>Iavg %FLA (I%FLA)</td></tr> <tr><td>3</td><td>Current Unbalance (IUnb)</td></tr> <tr><td>4</td><td>GF Current RMS (IGF)</td></tr> <tr><td>5</td><td>I Phase A (IA)</td></tr> <tr><td>6</td><td>I Phase B (IB)</td></tr> <tr><td>7</td><td>I Phase C (IC)</td></tr> <tr><td>8</td><td>Avg Voltage (Vavg)</td></tr> <tr><td>9</td><td>Voltage Unbalance (VUnb)</td></tr> <tr><td>10</td><td>Phase Order (Ph Ord)</td></tr> <tr><td>11</td><td>L1-L2</td></tr> <tr><td>12</td><td>L2-L3</td></tr> <tr><td>13</td><td>L3-L1</td></tr> <tr><td>14</td><td>Watts Total (P Watts)</td></tr> <tr><td>15</td><td>Power Factor (PF)</td></tr> <tr><td>16</td><td>VA Total (P VA)</td></tr> <tr><td>17</td><td>VARs Total (P VARs)</td></tr> <tr><td>18</td><td>Real Energy Resettable (P kWh)</td></tr> <tr><td>19</td><td>Thermal Cap % (TC%)</td></tr> <tr><td>20</td><td>Time to Reset (T to Rst)</td></tr> <tr><td>21</td><td>PTC Status (PTC)</td></tr> <tr><td>22</td><td>Run Time Resettable (Run Time)</td></tr> <tr><td>23</td><td># Starts Resettable (#Starts)</td></tr> <tr><td>24</td><td>Max Starting I (MaxStrt)</td></tr> <tr><td>25</td><td>Last Starting Time (LastStrt)</td></tr> <tr><td>26</td><td>Frequency (Freq)</td></tr> <tr><td>27</td><td>RTC Time</td></tr> <tr><td>28</td><td>Present IP Address (IP Addr)</td></tr> <tr><td>29</td><td>Op. Sec Resettable (Op Time)</td></tr> <tr><td>30</td><td>Contactor Ops Lst Hr (Ctr Ops)</td></tr> <tr><td>31</td><td>Speed RPM</td></tr> </tbody> </table> | Value | Description | 0 | Remember Last | 1 | Avg Current (Iavg) | 2 | Iavg %FLA (I%FLA) | 3 | Current Unbalance (IUnb) | 4 | GF Current RMS (IGF) | 5 | I Phase A (IA) | 6 | I Phase B (IB) | 7 | I Phase C (IC) | 8 | Avg Voltage (Vavg) | 9 | Voltage Unbalance (VUnb) | 10 | Phase Order (Ph Ord) | 11 | L1-L2 | 12 | L2-L3 | 13 | L3-L1 | 14 | Watts Total (P Watts) | 15 | Power Factor (PF) | 16 | VA Total (P VA) | 17 | VARs Total (P VARs) | 18 | Real Energy Resettable (P kWh) | 19 | Thermal Cap % (TC%) | 20 | Time to Reset (T to Rst) | 21 | PTC Status (PTC) | 22 | Run Time Resettable (Run Time) | 23 | # Starts Resettable (#Starts) | 24 | Max Starting I (MaxStrt) | 25 | Last Starting Time (LastStrt) | 26 | Frequency (Freq) | 27 | RTC Time | 28 | Present IP Address (IP Addr) | 29 | Op. Sec Resettable (Op Time) | 30 | Contactor Ops Lst Hr (Ctr Ops) | 31 | Speed RPM |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Remember Last | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Avg Current (Iavg) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Iavg %FLA (I%FLA) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Current Unbalance (IUnb) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | GF Current RMS (IGF) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | I Phase A (IA) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | I Phase B (IB) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | I Phase C (IC) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Avg Voltage (Vavg) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Voltage Unbalance (VUnb) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Phase Order (Ph Ord) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | L1-L2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | L2-L3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | L3-L1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Watts Total (P Watts) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Power Factor (PF) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | VA Total (P VA) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | VARs Total (P VARs) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Real Energy Resettable (P kWh) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Thermal Cap % (TC%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Time to Reset (T to Rst) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | PTC Status (PTC) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | Run Time Resettable (Run Time) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | # Starts Resettable (#Starts) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | Max Starting I (MaxStrt) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | Last Starting Time (LastStrt) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | Frequency (Freq) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | RTC Time | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | Present IP Address (IP Addr) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | Op. Sec Resettable (Op Time) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | Contactor Ops Lst Hr (Ctr Ops) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | Speed RPM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 763 | LED Brightness | UINT8 RW NV Default: 50 Range: 0 to 100 Units: % Config CRC Admin Lock USB Lock Backup Mem | LED Brightness | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | |
|----------|------------------------------|--|--|-------|-------------|------|-------|------------------------------|-------|---|-----------------------|-------|-------|--------------|-------|---|--------------|-------|
| 764 | Brightness | UINT8 RW NV Default: 30 Range: 0 to 100 Units: % Config CRC Admin Lock USB Lock Backup Mem | LCD Active Brightness | | | | | | | | | | | | | | | |
| 765 | Idle Brightness | UINT8 RW NV Default: 10 Range: 0 to 100 Units: % Config CRC Admin Lock USB Lock Backup Mem | LCD Idle Brightness | | | | | | | | | | | | | | | |
| 766 | Contrast | UINT8 RW NV Default: 5 Range: 0 to 10 Config CRC Admin Lock USB Lock Backup Mem | LCD Contrast | | | | | | | | | | | | | | | |
| 767 | Inactivity Timeout | UINT16 RW NV Default: 15 Range: 1 to 65535 Units: Min Config CRC Admin Lock USB Lock Backup Mem | MUI Screen Inactive Timeout | | | | | | | | | | | | | | | |
| 768 | Timeout Behavior | BYTE RW NV Default: 1 Bitfield Config CRC Admin Lock USB Lock Backup Mem | MUI Screen Inactive Timeout Behavior <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Set Brightness to Idle Level</td> <td>12273</td> </tr> <tr> <td>1</td> <td>Return to Home Screen</td> <td>12274</td> </tr> <tr> <td>2</td> <td>Local Logout</td> <td>12275</td> </tr> <tr> <td>3</td> <td>Admin Logout</td> <td>12276</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Set Brightness to Idle Level | 12273 | 1 | Return to Home Screen | 12274 | 2 | Local Logout | 12275 | 3 | Admin Logout | 12276 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | |
| 0 | Set Brightness to Idle Level | 12273 | | | | | | | | | | | | | | | | |
| 1 | Return to Home Screen | 12274 | | | | | | | | | | | | | | | | |
| 2 | Local Logout | 12275 | | | | | | | | | | | | | | | | |
| 3 | Admin Logout | 12276 | | | | | | | | | | | | | | | | |
| 769 | Enable Cntrl Buttons | BYTE RW NV Default: 3 Bitfield Config CRC Admin Lock USB Lock Backup Mem | MUI Motor Control Buttons Enable <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Start</td> <td>12289</td> </tr> <tr> <td>1</td> <td>Reset</td> <td>12290</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Start | 12289 | 1 | Reset | 12290 | | | | | | |
| Bit | Description | Coil | | | | | | | | | | | | | | | | |
| 0 | Start | 12289 | | | | | | | | | | | | | | | | |
| 1 | Reset | 12290 | | | | | | | | | | | | | | | | |
| 770 | Start LED Color | UINT8 RW NV Default: 1 Enum Config CRC Admin Lock USB Lock Backup Mem | MUI Start Button LED Color <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Green</td> </tr> <tr> <td>1</td> <td>Red</td> </tr> <tr> <td>2</td> <td>Amber</td> </tr> <tr> <td>3</td> <td>White</td> </tr> <tr> <td>255</td> <td>Off</td> </tr> </tbody> </table> | Value | Description | 0 | Green | 1 | Red | 2 | Amber | 3 | White | 255 | Off | | | |
| Value | Description | | | | | | | | | | | | | | | | | |
| 0 | Green | | | | | | | | | | | | | | | | | |
| 1 | Red | | | | | | | | | | | | | | | | | |
| 2 | Amber | | | | | | | | | | | | | | | | | |
| 3 | White | | | | | | | | | | | | | | | | | |
| 255 | Off | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | |
|----------|-------------------------|---|---|-------|-------------|------|-------|-------------|-------|-----|-------------|-------|-------|-------------|-------|---|-------------|-------|
| 771 | Stop LED Color | UINT8 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | MUI Stop Button LED Color <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Green</td> </tr> <tr> <td>1</td> <td>Red</td> </tr> <tr> <td>2</td> <td>Amber</td> </tr> <tr> <td>3</td> <td>White</td> </tr> <tr> <td>255</td> <td>Off</td> </tr> </tbody> </table> | Value | Description | 0 | Green | 1 | Red | 2 | Amber | 3 | White | 255 | Off | | | |
| Value | Description | | | | | | | | | | | | | | | | | |
| 0 | Green | | | | | | | | | | | | | | | | | |
| 1 | Red | | | | | | | | | | | | | | | | | |
| 2 | Amber | | | | | | | | | | | | | | | | | |
| 3 | White | | | | | | | | | | | | | | | | | |
| 255 | Off | | | | | | | | | | | | | | | | | |
| 772 | Auto LED Color | UINT8 RW NV Default: 2 Enum Config CRC Admin Lock USB Lock Backup Mem | MUI Auto Button LED Color <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Amber</td> </tr> <tr> <td>3</td> <td>White</td> </tr> <tr> <td>255</td> <td>Off</td> </tr> </tbody> </table> | Value | Description | 2 | Amber | 3 | White | 255 | Off | | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | |
| 2 | Amber | | | | | | | | | | | | | | | | | |
| 3 | White | | | | | | | | | | | | | | | | | |
| 255 | Off | | | | | | | | | | | | | | | | | |
| 773 | Start Button Debounce | UINT16 RW NV Default: 50 Units: mSec Config CRC Admin Lock USB Lock Backup Mem | MUI start button debounce time in milliseconds. | | | | | | | | | | | | | | | |
| 774 | Stop Button Debounce | UINT16 RW NV Default: 50 Units: mSec Config CRC Admin Lock USB Lock Backup Mem | MUI stop button debounce time in milliseconds. | | | | | | | | | | | | | | | |
| 775 | Auto Button Debounce | UINT16 RW NV Default: 50 Units: mSec Config CRC Admin Lock USB Lock Backup Mem | MUI auto button debounce time in milliseconds. | | | | | | | | | | | | | | | |
| 776 | Reset Button Debounce | UINT16 RW NV Default: 250 Units: mSec Config CRC Admin Lock USB Lock Backup Mem | MUI reset button debounce time in milliseconds. | | | | | | | | | | | | | | | |
| 777 | Enable Fieldwire Inputs | BYTE RW NV Default: 0x0F Bitfield Config CRC Admin Lock USB Lock Backup Mem | BCM Fieldwire Control Inputs Enable <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Input1 (I1)</td> <td>12417</td> </tr> <tr> <td>1</td> <td>Input1 (I2)</td> <td>12418</td> </tr> <tr> <td>2</td> <td>Input1 (I3)</td> <td>12419</td> </tr> <tr> <td>3</td> <td>Input1 (I4)</td> <td>12420</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Input1 (I1) | 12417 | 1 | Input1 (I2) | 12418 | 2 | Input1 (I3) | 12419 | 3 | Input1 (I4) | 12420 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | |
| 0 | Input1 (I1) | 12417 | | | | | | | | | | | | | | | | |
| 1 | Input1 (I2) | 12418 | | | | | | | | | | | | | | | | |
| 2 | Input1 (I3) | 12419 | | | | | | | | | | | | | | | | |
| 3 | Input1 (I4) | 12420 | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|------------------------------|---|---|-----|-------------|------|---|---------------------|-------|---|---------------------|-------|---|---------------------|-------|---|---------------------|-------|---|------------------------------|-------|---|------------------------------|-------|---|------------------------------|-------|---|------------------------------|-------|----|--------------|-------|----|--------------|-------|----|--------------|-------|----|--------------|-------|----|--------------|-------|----|--------------|-------|----|--------------|-------|----|--------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|
| 778 | Run Interlock inputs | BYTE RW NV Array size: 18 Default: 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 Bitfield Config CRC Run Lock Admin Lock USB Lock Backup Mem | Define which inputs are run interlock inputs, If set, corresponding input must be enabled to run motor. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>0</td><td>C445 field input I1</td><td>12433</td></tr> <tr><td>1</td><td>C445 field input I2</td><td>12434</td></tr> <tr><td>2</td><td>C445 field input I3</td><td>12435</td></tr> <tr><td>3</td><td>C445 field input I4</td><td>12436</td></tr> <tr><td>4</td><td>C445 user interface input I1</td><td>12437</td></tr> <tr><td>5</td><td>C445 user interface input I2</td><td>12438</td></tr> <tr><td>6</td><td>C445 user interface input I3</td><td>12439</td></tr> <tr><td>7</td><td>C445 user interface input I4</td><td>12440</td></tr> <tr><td>16</td><td>ELC input x0</td><td>12449</td></tr> <tr><td>17</td><td>ELC input x1</td><td>12450</td></tr> <tr><td>18</td><td>ELC input x2</td><td>12451</td></tr> <tr><td>19</td><td>ELC input x3</td><td>12452</td></tr> <tr><td>20</td><td>ELC input x4</td><td>12453</td></tr> <tr><td>21</td><td>ELC input x5</td><td>12454</td></tr> <tr><td>22</td><td>ELC input x6</td><td>12455</td></tr> <tr><td>23</td><td>ELC input x7</td><td>12456</td></tr> <tr><td>24</td><td>ELC input x10</td><td>12457</td></tr> <tr><td>25</td><td>ELC input x11</td><td>12458</td></tr> <tr><td>26</td><td>ELC input x12</td><td>12459</td></tr> <tr><td>27</td><td>ELC input x13</td><td>12460</td></tr> <tr><td>28</td><td>ELC input x14</td><td>12461</td></tr> <tr><td>29</td><td>ELC input x15</td><td>12462</td></tr> <tr><td>30</td><td>ELC input x16</td><td>12463</td></tr> <tr><td>31</td><td>ELC input x17</td><td>12464</td></tr> <tr><td>32</td><td>ELC input x20</td><td>12465</td></tr> <tr><td>33</td><td>ELC input x21</td><td>12466</td></tr> <tr><td>34</td><td>ELC input x22</td><td>12467</td></tr> <tr><td>35</td><td>ELC input x23</td><td>12468</td></tr> <tr><td>36</td><td>ELC input x24</td><td>12469</td></tr> <tr><td>37</td><td>ELC input x25</td><td>12470</td></tr> <tr><td>38</td><td>ELC input x26</td><td>12471</td></tr> <tr><td>39</td><td>ELC input x27</td><td>12472</td></tr> <tr><td>40</td><td>ELC input x30</td><td>12473</td></tr> <tr><td>41</td><td>ELC input x31</td><td>12474</td></tr> <tr><td>42</td><td>ELC input x32</td><td>12475</td></tr> <tr><td>43</td><td>ELC input x33</td><td>12476</td></tr> <tr><td>44</td><td>ELC input x34</td><td>12477</td></tr> <tr><td>45</td><td>ELC input x35</td><td>12478</td></tr> <tr><td>46</td><td>ELC input x36</td><td>12479</td></tr> <tr><td>47</td><td>ELC input x37</td><td>12480</td></tr> <tr><td>48</td><td>ELC input x40</td><td>12481</td></tr> <tr><td>49</td><td>ELC input x41</td><td>12482</td></tr> <tr><td>50</td><td>ELC input x42</td><td>12483</td></tr> </tbody> </table> | Bit | Description | Coil | 0 | C445 field input I1 | 12433 | 1 | C445 field input I2 | 12434 | 2 | C445 field input I3 | 12435 | 3 | C445 field input I4 | 12436 | 4 | C445 user interface input I1 | 12437 | 5 | C445 user interface input I2 | 12438 | 6 | C445 user interface input I3 | 12439 | 7 | C445 user interface input I4 | 12440 | 16 | ELC input x0 | 12449 | 17 | ELC input x1 | 12450 | 18 | ELC input x2 | 12451 | 19 | ELC input x3 | 12452 | 20 | ELC input x4 | 12453 | 21 | ELC input x5 | 12454 | 22 | ELC input x6 | 12455 | 23 | ELC input x7 | 12456 | 24 | ELC input x10 | 12457 | 25 | ELC input x11 | 12458 | 26 | ELC input x12 | 12459 | 27 | ELC input x13 | 12460 | 28 | ELC input x14 | 12461 | 29 | ELC input x15 | 12462 | 30 | ELC input x16 | 12463 | 31 | ELC input x17 | 12464 | 32 | ELC input x20 | 12465 | 33 | ELC input x21 | 12466 | 34 | ELC input x22 | 12467 | 35 | ELC input x23 | 12468 | 36 | ELC input x24 | 12469 | 37 | ELC input x25 | 12470 | 38 | ELC input x26 | 12471 | 39 | ELC input x27 | 12472 | 40 | ELC input x30 | 12473 | 41 | ELC input x31 | 12474 | 42 | ELC input x32 | 12475 | 43 | ELC input x33 | 12476 | 44 | ELC input x34 | 12477 | 45 | ELC input x35 | 12478 | 46 | ELC input x36 | 12479 | 47 | ELC input x37 | 12480 | 48 | ELC input x40 | 12481 | 49 | ELC input x41 | 12482 | 50 | ELC input x42 | 12483 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | C445 field input I1 | 12433 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | C445 field input I2 | 12434 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | C445 field input I3 | 12435 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | C445 field input I4 | 12436 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | C445 user interface input I1 | 12437 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | C445 user interface input I2 | 12438 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | C445 user interface input I3 | 12439 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | C445 user interface input I4 | 12440 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | ELC input x0 | 12449 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | ELC input x1 | 12450 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | ELC input x2 | 12451 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | ELC input x3 | 12452 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | ELC input x4 | 12453 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | ELC input x5 | 12454 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | ELC input x6 | 12455 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | ELC input x7 | 12456 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | ELC input x10 | 12457 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | ELC input x11 | 12458 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | ELC input x12 | 12459 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | ELC input x13 | 12460 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | ELC input x14 | 12461 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | ELC input x15 | 12462 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | ELC input x16 | 12463 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | ELC input x17 | 12464 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | ELC input x20 | 12465 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | ELC input x21 | 12466 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | ELC input x22 | 12467 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | ELC input x23 | 12468 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | ELC input x24 | 12469 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | ELC input x25 | 12470 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | ELC input x26 | 12471 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | ELC input x27 | 12472 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | ELC input x30 | 12473 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | ELC input x31 | 12474 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | ELC input x32 | 12475 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | ELC input x33 | 12476 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | ELC input x34 | 12477 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 | ELC input x35 | 12478 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | ELC input x36 | 12479 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 | ELC input x37 | 12480 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 48 | ELC input x40 | 12481 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 49 | ELC input x41 | 12482 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | ELC input x42 | 12483 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|----------------------|---|---|-----|-------------|------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|---------------|-------|----|----------------|-------|----|----------------|-------|----|----------------|-------|----|----------------|-------|----|----------------|-------|----|----------------|-------|----|----------------|-------|----|----------------|-------|----|----------------|-------|----|----------------|-------|----|----------------|-------|----|----------------|-------|----|----------------|-------|----|----------------|-------|
| 778 | Run Interlock inputs | BYTE RW NV Array size: 18 Default: 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 Bitfield Config CRC Run Lock Admin Lock USB Lock Backup Mem | Define which inputs are run interlock inputs, If set, corresponding input must be enabled to run motor, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>51</td><td>ELC input x43</td><td>12484</td></tr> <tr><td>52</td><td>ELC input x44</td><td>12485</td></tr> <tr><td>53</td><td>ELC input x45</td><td>12486</td></tr> <tr><td>54</td><td>ELC input x46</td><td>12487</td></tr> <tr><td>55</td><td>ELC input x47</td><td>12488</td></tr> <tr><td>56</td><td>ELC input x50</td><td>12489</td></tr> <tr><td>57</td><td>ELC input x51</td><td>12490</td></tr> <tr><td>58</td><td>ELC input x52</td><td>12491</td></tr> <tr><td>59</td><td>ELC input x53</td><td>12492</td></tr> <tr><td>60</td><td>ELC input x54</td><td>12493</td></tr> <tr><td>61</td><td>ELC input x55</td><td>12494</td></tr> <tr><td>62</td><td>ELC input x56</td><td>12495</td></tr> <tr><td>63</td><td>ELC input x57</td><td>12496</td></tr> <tr><td>64</td><td>ELC input x60</td><td>12497</td></tr> <tr><td>65</td><td>ELC input x61</td><td>12498</td></tr> <tr><td>66</td><td>ELC input x62</td><td>12499</td></tr> <tr><td>67</td><td>ELC input x63</td><td>12500</td></tr> <tr><td>68</td><td>ELC input x64</td><td>12501</td></tr> <tr><td>69</td><td>ELC input x65</td><td>12502</td></tr> <tr><td>70</td><td>ELC input x66</td><td>12503</td></tr> <tr><td>71</td><td>ELC input x67</td><td>12504</td></tr> <tr><td>72</td><td>ELC input x70</td><td>12505</td></tr> <tr><td>73</td><td>ELC input x71</td><td>12506</td></tr> <tr><td>74</td><td>ELC input x72</td><td>12507</td></tr> <tr><td>75</td><td>ELC input x73</td><td>12508</td></tr> <tr><td>76</td><td>ELC input x74</td><td>12509</td></tr> <tr><td>77</td><td>ELC input x75</td><td>12510</td></tr> <tr><td>78</td><td>ELC input x76</td><td>12511</td></tr> <tr><td>79</td><td>ELC input x77</td><td>12512</td></tr> <tr><td>80</td><td>ELC input x100</td><td>12513</td></tr> <tr><td>81</td><td>ELC input x101</td><td>12514</td></tr> <tr><td>82</td><td>ELC input x102</td><td>12515</td></tr> <tr><td>83</td><td>ELC input x103</td><td>12516</td></tr> <tr><td>84</td><td>ELC input x104</td><td>12517</td></tr> <tr><td>85</td><td>ELC input x105</td><td>12518</td></tr> <tr><td>86</td><td>ELC input x106</td><td>12519</td></tr> <tr><td>87</td><td>ELC input x107</td><td>12520</td></tr> <tr><td>88</td><td>ELC input x110</td><td>12521</td></tr> <tr><td>89</td><td>ELC input x111</td><td>12522</td></tr> <tr><td>90</td><td>ELC input x112</td><td>12523</td></tr> <tr><td>91</td><td>ELC input x113</td><td>12524</td></tr> <tr><td>92</td><td>ELC input x114</td><td>12525</td></tr> <tr><td>93</td><td>ELC input x115</td><td>12526</td></tr> </tbody> </table> | Bit | Description | Coil | 51 | ELC input x43 | 12484 | 52 | ELC input x44 | 12485 | 53 | ELC input x45 | 12486 | 54 | ELC input x46 | 12487 | 55 | ELC input x47 | 12488 | 56 | ELC input x50 | 12489 | 57 | ELC input x51 | 12490 | 58 | ELC input x52 | 12491 | 59 | ELC input x53 | 12492 | 60 | ELC input x54 | 12493 | 61 | ELC input x55 | 12494 | 62 | ELC input x56 | 12495 | 63 | ELC input x57 | 12496 | 64 | ELC input x60 | 12497 | 65 | ELC input x61 | 12498 | 66 | ELC input x62 | 12499 | 67 | ELC input x63 | 12500 | 68 | ELC input x64 | 12501 | 69 | ELC input x65 | 12502 | 70 | ELC input x66 | 12503 | 71 | ELC input x67 | 12504 | 72 | ELC input x70 | 12505 | 73 | ELC input x71 | 12506 | 74 | ELC input x72 | 12507 | 75 | ELC input x73 | 12508 | 76 | ELC input x74 | 12509 | 77 | ELC input x75 | 12510 | 78 | ELC input x76 | 12511 | 79 | ELC input x77 | 12512 | 80 | ELC input x100 | 12513 | 81 | ELC input x101 | 12514 | 82 | ELC input x102 | 12515 | 83 | ELC input x103 | 12516 | 84 | ELC input x104 | 12517 | 85 | ELC input x105 | 12518 | 86 | ELC input x106 | 12519 | 87 | ELC input x107 | 12520 | 88 | ELC input x110 | 12521 | 89 | ELC input x111 | 12522 | 90 | ELC input x112 | 12523 | 91 | ELC input x113 | 12524 | 92 | ELC input x114 | 12525 | 93 | ELC input x115 | 12526 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | ELC input x43 | 12484 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 52 | ELC input x44 | 12485 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 53 | ELC input x45 | 12486 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | ELC input x46 | 12487 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 55 | ELC input x47 | 12488 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 56 | ELC input x50 | 12489 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 57 | ELC input x51 | 12490 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | ELC input x52 | 12491 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 59 | ELC input x53 | 12492 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | ELC input x54 | 12493 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 61 | ELC input x55 | 12494 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 62 | ELC input x56 | 12495 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | ELC input x57 | 12496 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 64 | ELC input x60 | 12497 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65 | ELC input x61 | 12498 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 66 | ELC input x62 | 12499 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 67 | ELC input x63 | 12500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 68 | ELC input x64 | 12501 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 69 | ELC input x65 | 12502 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 70 | ELC input x66 | 12503 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 71 | ELC input x67 | 12504 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 72 | ELC input x70 | 12505 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 73 | ELC input x71 | 12506 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 74 | ELC input x72 | 12507 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 75 | ELC input x73 | 12508 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 76 | ELC input x74 | 12509 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 77 | ELC input x75 | 12510 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 78 | ELC input x76 | 12511 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 79 | ELC input x77 | 12512 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 80 | ELC input x100 | 12513 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 81 | ELC input x101 | 12514 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 82 | ELC input x102 | 12515 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 83 | ELC input x103 | 12516 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 84 | ELC input x104 | 12517 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 85 | ELC input x105 | 12518 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 86 | ELC input x106 | 12519 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 87 | ELC input x107 | 12520 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 88 | ELC input x110 | 12521 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 89 | ELC input x111 | 12522 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 90 | ELC input x112 | 12523 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 91 | ELC input x113 | 12524 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 92 | ELC input x114 | 12525 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 93 | ELC input x115 | 12526 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|----------------------|---|--|-----|-------------|------|----|----------------|-------|----|----------------|-------|----|----------------|-------|----|----------------|-------|----|----------------|-------|----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|
| 778 | Run Interlock inputs | BYTE RW NV Array size: 18 Default: 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 Bitfield Config CRC Run Lock Admin Lock USB Lock Backup Mem | Define which inputs are run interlock inputs, If set, corresponding input must be enabled to run motor, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>94</td><td>ELC input x116</td><td>12527</td></tr> <tr><td>95</td><td>ELC input x117</td><td>12528</td></tr> <tr><td>96</td><td>ELC input x120</td><td>12529</td></tr> <tr><td>97</td><td>ELC input x121</td><td>12530</td></tr> <tr><td>98</td><td>ELC input x122</td><td>12531</td></tr> <tr><td>99</td><td>ELC input x123</td><td>12532</td></tr> <tr><td>100</td><td>ELC input x124</td><td>12533</td></tr> <tr><td>101</td><td>ELC input x125</td><td>12534</td></tr> <tr><td>102</td><td>ELC input x126</td><td>12535</td></tr> <tr><td>103</td><td>ELC input x127</td><td>12536</td></tr> <tr><td>104</td><td>ELC input x130</td><td>12537</td></tr> <tr><td>105</td><td>ELC input x131</td><td>12538</td></tr> <tr><td>106</td><td>ELC input x132</td><td>12539</td></tr> <tr><td>107</td><td>ELC input x133</td><td>12540</td></tr> <tr><td>108</td><td>ELC input x134</td><td>12541</td></tr> <tr><td>109</td><td>ELC input x135</td><td>12542</td></tr> <tr><td>110</td><td>ELC input x136</td><td>12543</td></tr> <tr><td>111</td><td>ELC input x137</td><td>12544</td></tr> <tr><td>112</td><td>ELC input x140</td><td>12545</td></tr> <tr><td>113</td><td>ELC input x141</td><td>12546</td></tr> <tr><td>114</td><td>ELC input x142</td><td>12547</td></tr> <tr><td>115</td><td>ELC input x143</td><td>12548</td></tr> <tr><td>116</td><td>ELC input x144</td><td>12549</td></tr> <tr><td>117</td><td>ELC input x145</td><td>12550</td></tr> <tr><td>118</td><td>ELC input x146</td><td>12551</td></tr> <tr><td>119</td><td>ELC input x147</td><td>12552</td></tr> <tr><td>120</td><td>ELC input x150</td><td>12553</td></tr> <tr><td>121</td><td>ELC input x151</td><td>12554</td></tr> <tr><td>122</td><td>ELC input x152</td><td>12555</td></tr> <tr><td>123</td><td>ELC input x153</td><td>12556</td></tr> <tr><td>124</td><td>ELC input x154</td><td>12557</td></tr> <tr><td>125</td><td>ELC input x155</td><td>12558</td></tr> <tr><td>126</td><td>ELC input x156</td><td>12559</td></tr> <tr><td>127</td><td>ELC input x157</td><td>12560</td></tr> <tr><td>128</td><td>ELC input x160</td><td>12561</td></tr> <tr><td>129</td><td>ELC input x161</td><td>12562</td></tr> <tr><td>130</td><td>ELC input x162</td><td>12563</td></tr> <tr><td>131</td><td>ELC input x163</td><td>12564</td></tr> <tr><td>132</td><td>ELC input x164</td><td>12565</td></tr> <tr><td>133</td><td>ELC input x165</td><td>12566</td></tr> <tr><td>134</td><td>ELC input x166</td><td>12567</td></tr> <tr><td>135</td><td>ELC input x167</td><td>12568</td></tr> </tbody> </table> | Bit | Description | Coil | 94 | ELC input x116 | 12527 | 95 | ELC input x117 | 12528 | 96 | ELC input x120 | 12529 | 97 | ELC input x121 | 12530 | 98 | ELC input x122 | 12531 | 99 | ELC input x123 | 12532 | 100 | ELC input x124 | 12533 | 101 | ELC input x125 | 12534 | 102 | ELC input x126 | 12535 | 103 | ELC input x127 | 12536 | 104 | ELC input x130 | 12537 | 105 | ELC input x131 | 12538 | 106 | ELC input x132 | 12539 | 107 | ELC input x133 | 12540 | 108 | ELC input x134 | 12541 | 109 | ELC input x135 | 12542 | 110 | ELC input x136 | 12543 | 111 | ELC input x137 | 12544 | 112 | ELC input x140 | 12545 | 113 | ELC input x141 | 12546 | 114 | ELC input x142 | 12547 | 115 | ELC input x143 | 12548 | 116 | ELC input x144 | 12549 | 117 | ELC input x145 | 12550 | 118 | ELC input x146 | 12551 | 119 | ELC input x147 | 12552 | 120 | ELC input x150 | 12553 | 121 | ELC input x151 | 12554 | 122 | ELC input x152 | 12555 | 123 | ELC input x153 | 12556 | 124 | ELC input x154 | 12557 | 125 | ELC input x155 | 12558 | 126 | ELC input x156 | 12559 | 127 | ELC input x157 | 12560 | 128 | ELC input x160 | 12561 | 129 | ELC input x161 | 12562 | 130 | ELC input x162 | 12563 | 131 | ELC input x163 | 12564 | 132 | ELC input x164 | 12565 | 133 | ELC input x165 | 12566 | 134 | ELC input x166 | 12567 | 135 | ELC input x167 | 12568 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 94 | ELC input x116 | 12527 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 95 | ELC input x117 | 12528 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 96 | ELC input x120 | 12529 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 97 | ELC input x121 | 12530 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 98 | ELC input x122 | 12531 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 99 | ELC input x123 | 12532 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 | ELC input x124 | 12533 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 101 | ELC input x125 | 12534 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 102 | ELC input x126 | 12535 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 103 | ELC input x127 | 12536 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 104 | ELC input x130 | 12537 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 105 | ELC input x131 | 12538 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 106 | ELC input x132 | 12539 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 107 | ELC input x133 | 12540 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 108 | ELC input x134 | 12541 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 109 | ELC input x135 | 12542 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 110 | ELC input x136 | 12543 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 111 | ELC input x137 | 12544 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 112 | ELC input x140 | 12545 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 113 | ELC input x141 | 12546 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 114 | ELC input x142 | 12547 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 115 | ELC input x143 | 12548 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 116 | ELC input x144 | 12549 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 117 | ELC input x145 | 12550 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 118 | ELC input x146 | 12551 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 119 | ELC input x147 | 12552 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 120 | ELC input x150 | 12553 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 121 | ELC input x151 | 12554 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 122 | ELC input x152 | 12555 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 123 | ELC input x153 | 12556 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 124 | ELC input x154 | 12557 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 125 | ELC input x155 | 12558 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 126 | ELC input x156 | 12559 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 127 | ELC input x157 | 12560 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 128 | ELC input x160 | 12561 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 129 | ELC input x161 | 12562 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 130 | ELC input x162 | 12563 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 131 | ELC input x163 | 12564 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 132 | ELC input x164 | 12565 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 133 | ELC input x165 | 12566 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 134 | ELC input x166 | 12567 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 135 | ELC input x167 | 12568 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|-----------------------------|---|--|-----|-------------|------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|-----|----------------|-------|
| 778 | Run Interlock inputs | BYTE RW NV Array size: 18 Default: 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 Bitfield Config CRC Run Lock Admin Lock USB Lock Backup Mem | Define which inputs are run interlock inputs, If set, corresponding input must be enabled to run motor, continued. <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>136</td> <td>ELC input x170</td> <td>12569</td> </tr> <tr> <td>137</td> <td>ELC input x171</td> <td>12570</td> </tr> <tr> <td>138</td> <td>ELC input x172</td> <td>12571</td> </tr> <tr> <td>139</td> <td>ELC input x173</td> <td>12572</td> </tr> <tr> <td>140</td> <td>ELC input x174</td> <td>12573</td> </tr> <tr> <td>141</td> <td>ELC input x175</td> <td>12574</td> </tr> <tr> <td>142</td> <td>ELC input x176</td> <td>12575</td> </tr> <tr> <td>143</td> <td>ELC input x177</td> <td>12576</td> </tr> </tbody> </table> Define Run Interlock Inputs. | Bit | Description | Coil | 136 | ELC input x170 | 12569 | 137 | ELC input x171 | 12570 | 138 | ELC input x172 | 12571 | 139 | ELC input x173 | 12572 | 140 | ELC input x174 | 12573 | 141 | ELC input x175 | 12574 | 142 | ELC input x176 | 12575 | 143 | ELC input x177 | 12576 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 136 | ELC input x170 | 12569 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 137 | ELC input x171 | 12570 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 138 | ELC input x172 | 12571 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 139 | ELC input x173 | 12572 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 140 | ELC input x174 | 12573 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 141 | ELC input x175 | 12574 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 142 | ELC input x176 | 12575 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 143 | ELC input x177 | 12576 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 787 | Remote Switch from Fieldbus | BOOL RW NV Default: 0 Range: 0 to 1 Config CRC Admin Lock USB Lock Backup Mem | Remote Switch from Fieldbus - when set to true, allows fieldbus to set control mode to remote Remote Switch from Fieldbus. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 788 | Removable MUI Enable | BOOL RW NV Default: 0 Range: 0 to 1 Config CRC Admin Lock USB Lock Backup Mem | When enabled, allows for the MUI to be disconnected from the C445 system without generating a fault if the MUI is not the local source of control. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 900 | FLA Motor1 Scaled | UINT16 RW NV Default: 101 Range: 1 to 65535 (RW) Units: scaled A Config CRC Run Lock Admin Lock USB Lock Backup Mem | Motor1 Overload FLA (Nominal Current) Scaled - Scaled Full Load Amperes for the motor from the motor nameplate. If this is an application with a 2 motor profile, this is the first motor. Scaled by parameter "I Scale Factor". | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 901 | FLA Motor2 Scaled | UINT16 RW NV Default: 101 Range: 1 to 65535 (RW) Units: scaled A Config CRC Run Lock Admin Lock USB Lock Backup Mem | Motor2 Overload FLA (Nominal Current) Scaled - Scaled Full Load Amperes for the motor from the motor nameplate. If this is an application with a 2 motor profile, this is the second motor. Scaled by parameter "I Scale Factor". | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 902 | Rated Service Factor Scaled | UINT8 RW NV Default: 115 Range: 100 to 255 Units: 0.01% Config CRC Run Lock Admin Lock USB Lock Backup Mem | This is the percentage of overloading the motor can handle for short periods of time when operating normally within the correct voltage tolerances. This value is from the motor nameplate. | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description |
|----------|------------------------|---|---|
| 903 | Rated Voltage | UINT16 RW NV Default: 480 Range: 100 to 5000 Units: V Config CRC Run Lock Admin Lock USB Lock Backup Mem | The rated voltage of the motor from the motor nameplate. |
| 904 | Rated Frequency | UINT16 RW NV Default: 60 Range: 50 to 60 Units: Hz Config CRC Run Lock Admin Lock USB Lock Backup Mem | Motor Rated Frequency in Hz from the motor nameplate. |
| 905 | Rated Watts Motor1 | UINT32 RW NV Default: 14914 (RW) Range: 10 to 3728500 Units: W Config CRC Run Lock Admin Lock USB Lock Backup Mem | Watts nameplate rating for motor winding#1 (Used in all control profiles). Motors will either have a Watts or HP rating on the nameplate. When Watts is entered for Motor1 the Motor Rated HP will be calculated and displayed for Motor1. |
| 907 | Rated Watts Motor2 | UINT32 RW NV Default: 14914 (RW) Range: 10 to 3728500 Units: W Config CRC Run Lock Admin Lock USB Lock Backup Mem | Watts nameplate rating for motor winding#2 (Used in star/delta, two speed and dahlander profiles). Motors will either have a Watts or HP rating on the nameplate. When Watts is entered for Motor2 the Motor Rated HP will be calculated and displayed for Motor2. |
| 909 | Rated HP Motor1 Scaled | UINT32 RW NV Default: 2000 (RW) Range: 1 to 500000 Units: HPx100 Config CRC Run Lock Admin Lock USB Lock Backup Mem | HP nameplate rating for motor winding #1 (Used in all control profiles). Motors will either have a Watts or HP rating on the nameplate. When HP is entered for Motor1 the Motor Rated Watts will be calculated and displayed for Motor1. This value is scaled by 0.01. For example if the motor is rated at 123.25 HP then this parameter should contain 12325. |
| 911 | Rated HP Motor2 Scaled | UINT32 RW NV Default: 2000 Range: 1 to 500000 Units: HPx100 Config CRC Run Lock Admin Lock USB Lock Backup Mem | HP nameplate rating for motor winding #2 (used in star/delta, two speed and dahlander profiles). Motors will either have a Watts or HP rating on the nameplate. When HP is entered for Motor2 the Motor Rated Watts will be calculated and displayed for Motor2. This value is scaled by 0.01. For example if the motor is rated at 123.25 HP then this parameter should contain 12325. |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description |
|----------|---|---|--|
| 913 | Rated Power Factor Scaled | SINT16 RW NV Default: 8350 Range: 5000 to 10000 Units: 0.01% Config CRC Run Lock Admin Lock USB Lock Backup Mem | Motor Rated Power Factor in Percent from the motor nameplate. |
| 914 | Rated Speed Motor1 | UINT16 RW NV Default: 1750 (RW) Range: 300 to 3600 (RW) Units: RPM Config CRC Admin Lock USB Lock Backup Mem | RPM nameplate rating for motor winding#1 (Used in all control profiles). |
| 915 | Rated Speed Motor2 | UINT16 RW NV Default: 1750 (RW) Range: 300 to 3600 (RW) Units: RPM Config CRC Admin Lock USB Lock Backup Mem | RPM nameplate rating for motor winding#2 (Used in star/delta, two speed and dahlander profiles). |
| 916 | Rated Efficiency **removed from PCTool** | UINT16 RW NV Default: 8500 Range: 5000 to 10000 Units: 0.01% Config CRC Admin Lock USB Lock Backup Mem | Motor rated efficiency in scaled percent (0.01%). |
| 917 | Rated Stator Resistance Scaled | UINT16 RW NV Default: 280 Units: mOhms Config CRC Admin Lock USB Lock Backup Mem | Motor Rated Stator Resistance from motor nameplate in milliohms. |
| 918 | CT Ratio Primary | UINT16 RW NV Default: 1 Config CRC Run Lock Admin Lock USB Lock Backup Mem | CT Ratio - Primary (Only used with external Current Transformers) |
| 919 | CT Ratio Secondary | UINT16 RW NV Default: 1 Config CRC Run Lock Admin Lock USB Lock Backup Mem | CT Ratio - Secondary (Only used with external Current Transformers) |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description |
|----------|---|--|--|
| 920 | PT Ratio Primary | UINT16 RW NV Default: 1 Run Lock | PT Ratio - Primary (Only used with external Potential Transformers) |
| 921 | PT Ratio Secondary | UINT16 RW NV Default: 1 Run Lock | PT Ratio - Secondary (Only used with external Potential Transformers) |
| 922 | CT Ratio - Primary External Ground Current CT | UINT16 RW NV Default: 500 Range: 1 to 65535 Units: A Config CRC Run Lock Admin Lock USB Lock Backup Mem | CT Ratio - Primary CBCT ratio is adjusted by changing the CT Primary Current Input vs CT Secondary Output Ratings |
| 923 | CT Ratio - Secondary External Ground Current CT | UINT16 RW NV Default: 1 Range: 1 to 65535 Units: A Config CRC Run Lock Admin Lock USB Lock Backup Mem | CT Ratio - Secondary CBCT ratio is adjusted by changing the CT Primary Current Input vs CT Secondary Output Ratings |
| 924 | CT Secondary Multiplier External Ground Current CT | UINT16 RW NV Default: 1 Range: 1 to 65535 Config CRC Run Lock Admin Lock USB Lock Backup Mem | GFM CBCT CT Ratio Interposing Multiplier Multiplier allows support for configurations where effective CT ratio is very high. When using an interposing CT this register would contain the interposing CT ratio. |
| 1000 | Trip Enable | BYTE RW NV Array size: 4 Default: 0x38, 0x00, 0x04, 0x00 Bitfield Config CRC Run Lock Admin Lock USB Lock Backup Mem | Enable protections by selecting the box next to each protection to place a check mark in it. Each protection selected will enable those protections that the C445 will trip on. |

| Bit | Description | Coil |
|-----|----------------------------|-------|
| 0 | Under voltage | 15985 |
| 1 | Over voltage | 15986 |
| 2 | Reserved | 15987 |
| 3 | Ground current fault | 15988 |
| 4 | Current phase loss | 15989 |
| 5 | Current unbalance | 15990 |
| 6 | Instantaneous over current | 15991 |
| 7 | Jam | 15992 |
| 8 | Power factor deviation | 15993 |
| 9 | Voltage phase loss | 15994 |
| 10 | Voltage unbalance | 15995 |
| 11 | Frequency deviation fast | 15996 |
| 12 | Frequency deviation slow | 15997 |
| 13 | Under current | 15998 |
| 14 | High power | 15999 |
| 15 | Low power | 16000 |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|----------------------------|---|--|-----|-------------|------|----|---------------|-------|----|-----------------------|-------|----|----------|-------|----|------------------------|-------|----|-------------------------|-------|----|-------------------|-------|----|----------------------------|-------|----|-------------|-------|----|------------------------|-------|---|--------------------|-------|----|-------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|---------------|-------|----|------------|-------|----|-----------|-------|----|----------|-------|----|-----------------------|-------|----|----------|-------|----|-------|-------|----|-------------------------|-------|----|-----|-------|----|-----------------------|-------|----|-------------|-------|----|----------------------|-------|
| 1000 | Trip Enable | BYTE RW NV Array size: 4 Default: 0x38, 0x00, 0x04, 0x00 Bitfield Config CRC Run Lock Admin Lock USB Lock Backup Mem | Enable protections by selecting the box next to each protection to place a check mark in it. Each protection selected will enable those protections that the C445 will trip on, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>16</td> <td>Reserved</td> <td>16001</td> </tr> <tr> <td>17</td> <td>Starts limit exceeded</td> <td>16002</td> </tr> <tr> <td>18</td> <td>Overload</td> <td>16003</td> </tr> <tr> <td>19</td> <td>Stall</td> <td>16004</td> </tr> <tr> <td>20</td> <td>Phase rotation mismatch</td> <td>16005</td> </tr> <tr> <td>21</td> <td>PTC</td> <td>16006</td> </tr> <tr> <td>22</td> <td>Under voltage restart</td> <td>16007</td> </tr> <tr> <td>23</td> <td>Peak demand</td> <td>16008</td> </tr> <tr> <td>24</td> <td>HRGF pulse detection</td> <td>16009</td> </tr> </tbody> </table> | Bit | Description | Coil | 16 | Reserved | 16001 | 17 | Starts limit exceeded | 16002 | 18 | Overload | 16003 | 19 | Stall | 16004 | 20 | Phase rotation mismatch | 16005 | 21 | PTC | 16006 | 22 | Under voltage restart | 16007 | 23 | Peak demand | 16008 | 24 | HRGF pulse detection | 16009 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Reserved | 16001 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Starts limit exceeded | 16002 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Overload | 16003 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Stall | 16004 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Phase rotation mismatch | 16005 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | PTC | 16006 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | Under voltage restart | 16007 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Peak demand | 16008 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | HRGF pulse detection | 16009 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1002 | Warning Enable | BYTE RW NV Array size: 4 Default: 0 Bitfield Config CRC Admin Lock USB Lock Backup Mem | Any Warnings needed for an application may be enabled by selecting the box next to each to place a check mark in it. Each protection selected will enable those protections the C445 will provide a warning for when that condition occurs. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Under voltage</td> <td>16017</td> </tr> <tr> <td>1</td> <td>Over voltage</td> <td>16018</td> </tr> <tr> <td>2</td> <td>Reserved</td> <td>16019</td> </tr> <tr> <td>3</td> <td>Ground current warning</td> <td>16020</td> </tr> <tr> <td>4</td> <td>Current phase loss</td> <td>16021</td> </tr> <tr> <td>5</td> <td>Current unbalance</td> <td>16022</td> </tr> <tr> <td>6</td> <td>Instantaneous over current</td> <td>16023</td> </tr> <tr> <td>7</td> <td>Jam</td> <td>16024</td> </tr> <tr> <td>8</td> <td>Power factor deviation</td> <td>16025</td> </tr> <tr> <td>9</td> <td>Voltage phase loss</td> <td>16026</td> </tr> <tr> <td>10</td> <td>Voltage unbalance</td> <td>16027</td> </tr> <tr> <td>11</td> <td>Frequency deviation fast</td> <td>16028</td> </tr> <tr> <td>12</td> <td>Frequency deviation slow</td> <td>16029</td> </tr> <tr> <td>13</td> <td>Under current</td> <td>16030</td> </tr> <tr> <td>14</td> <td>High power</td> <td>16031</td> </tr> <tr> <td>15</td> <td>Low power</td> <td>16032</td> </tr> <tr> <td>16</td> <td>Reserved</td> <td>16033</td> </tr> <tr> <td>17</td> <td>Starts limit exceeded</td> <td>16034</td> </tr> <tr> <td>18</td> <td>Overload</td> <td>16035</td> </tr> <tr> <td>19</td> <td>Stall</td> <td>16036</td> </tr> <tr> <td>20</td> <td>Phase rotation mismatch</td> <td>16037</td> </tr> <tr> <td>21</td> <td>PTC</td> <td>16038</td> </tr> <tr> <td>22</td> <td>Under voltage restart</td> <td>16039</td> </tr> <tr> <td>23</td> <td>Peak demand</td> <td>16040</td> </tr> <tr> <td>24</td> <td>HRGF pulse detection</td> <td>16041</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Under voltage | 16017 | 1 | Over voltage | 16018 | 2 | Reserved | 16019 | 3 | Ground current warning | 16020 | 4 | Current phase loss | 16021 | 5 | Current unbalance | 16022 | 6 | Instantaneous over current | 16023 | 7 | Jam | 16024 | 8 | Power factor deviation | 16025 | 9 | Voltage phase loss | 16026 | 10 | Voltage unbalance | 16027 | 11 | Frequency deviation fast | 16028 | 12 | Frequency deviation slow | 16029 | 13 | Under current | 16030 | 14 | High power | 16031 | 15 | Low power | 16032 | 16 | Reserved | 16033 | 17 | Starts limit exceeded | 16034 | 18 | Overload | 16035 | 19 | Stall | 16036 | 20 | Phase rotation mismatch | 16037 | 21 | PTC | 16038 | 22 | Under voltage restart | 16039 | 23 | Peak demand | 16040 | 24 | HRGF pulse detection | 16041 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Under voltage | 16017 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Over voltage | 16018 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Reserved | 16019 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Ground current warning | 16020 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Current phase loss | 16021 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Current unbalance | 16022 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Instantaneous over current | 16023 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Jam | 16024 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Power factor deviation | 16025 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Voltage phase loss | 16026 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Voltage unbalance | 16027 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Frequency deviation fast | 16028 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Frequency deviation slow | 16029 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Under current | 16030 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | High power | 16031 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Low power | 16032 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Reserved | 16033 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Starts limit exceeded | 16034 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Overload | 16035 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Stall | 16036 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Phase rotation mismatch | 16037 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | PTC | 16038 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | Under voltage restart | 16039 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Peak demand | 16040 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | HRGF pulse detection | 16041 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description |
|----------|--------------------------|--|---|
| 1004 | Trip Class | UINT8 RW NV Default: 5 Range: 5 to 40 Config CRC Run Lock Admin Lock USB Lock Backup Mem | Trip classes are defined by industry standard and affect the time to trip once an overload condition is realized. This delay is to avoid nuisance tripping, but still properly protect the motor. This is from the motor nameplate. |
| 1005 | Overload Alarm Level | UINT8 RW NV Default: 90 Range: 1 to 100 Units: % Config CRC Admin Lock USB Lock Backup Mem | Overload alarm level, generates a warning when the thermal capacity reaches this percent. |
| 1006 | Overload Reset Threshold | UINT8 RW NV Default: 75 Range: 1 to 99 Units: % Config CRC Run Lock Admin Lock USB Lock Backup Mem | Thermal Overload Reset Threshold. Level where reset is allowed. |
| 1007 | Stall Trip Level | UINT16 RW NV Default: 200 Range: 50 to 400 Units: % Config CRC Admin Lock USB Lock Backup Mem | The Stall protection monitors the average phase current as a percentage of FLA (Nominal Current) of the motor and will trip the motor if the current exceeds the set threshold. The stall protection is only active as the motor transitions from the starting to running states. |
| 1008 | Jam Trip Level | UINT16 RW NV Default: 400 Range: 50 to 400 Units: % Config CRC Admin Lock USB Lock Backup Mem | Jam Trip Level, when exceeded and following the Jam Trip Delay time will generate a trip. |
| 1009 | Jam Alarm Level | UINT16 RW NV Default: 400 Range: 50 to 400 Units: % Config CRC Admin Lock USB Lock Backup Mem | Jam Alarm Level, when exceeded and following the Alarm Delay Time in the Protections/General category, will generate a warning. |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description |
|----------|---------------------------------------|---|--|
| 1010 | Jam Trip Delay | UINT16 RW NV Default: 10 Range: 1 to 60 Units: seconds Config CRC Admin Lock USB Lock Backup Mem | Jam Trip Delay is the time delay following the trip level being exceeded until a trip occurs. |
| 1011 | Allowed Starts/hr | UINT16 RW NV Default: 4 Range: 1 to 60 Config CRC Admin Lock USB Lock Backup Mem | This protection works by limiting the number of starts per hour. Starting the motor frequently can lead to motor windings overheating resulting in a reduced life of the stator insulation. The user can choose a start limit value as well as disabling the fault. Note that the start limit is only verified when a start command is received. |
| 1012 | Instantaneous Overcurrent Trip Level | UINT16 RW NV Default: 400 Range: 50 to 400 Units: % Config CRC Admin Lock USB Lock Backup Mem | Instantaneous Overcurrent Trip Level, when exceeded and following the Instantaneous Overcurrent Trip Delay time will generate a trip. |
| 1013 | Instantaneous Overcurrent Alarm Level | UINT16 RW NV Default: 400 Range: 50 to 400 Units: % Config CRC Admin Lock USB Lock Backup Mem | Instantaneous Overcurrent Alarm Level, when exceeded and following the Alarm Delay Time in the Protections/General category, will generate a warning. |
| 1014 | Instantaneous Overcurrent Start Delay | UINT16 RW NV Default: 0 Range: 0 to 180 Units: seconds Config CRC Admin Lock USB Lock Backup Mem | Instantaneous Overcurrent Start Delay is a delay at power up to inhibit raising this trip condition until this time expires. If the condition is no longer present when this time expires, no trip will occur. |
| 1015 | Instantaneous Overcurrent Trip Delay | UINT16 RW NV Default: 2000 Range: 1 to 2000 Units: ms Config CRC Admin Lock USB Lock Backup Mem | Instantaneous Overcurrent Trip Delay is the time delay following the trip level being exceeded before a trip occurs. |
| 1016 | I Phase Loss Trip Level Percent | INTERNAL UINT8 RO Default: 60 Units: % | I Phase Loss Trip Level Percent |
| 1017 | I Phase Loss Debounce | INTERNAL UINT16 RO Default: 2 Units: seconds | I Phase Loss Debounce |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description |
|----------|-------------------------------|---|--|
| 1018 | Current Unbalance Trip Level | UINT8 RW NV Default: 15 Range: 1 to 60 Units: % Config CRC Admin Lock USB Lock Backup Mem | Current Unbalance Trip Level Percent, when exceeded and following the Current Unbalance Trip Delay time will generate a trip. |
| 1019 | Current Unbalance Alarm Level | UINT8 RW NV Default: 15 Range: 1 to 60 Units: % Config CRC Admin Lock USB Lock Backup Mem | Current Unbalance Alarm Level Percent, when exceeded and after the Alarm Delay Time in the Protections/General category expires will cause a warning to occur. |
| 1020 | Current Unbalance Trip Delay | UINT16 RW NV Default: 15 Range: 1 to 60 Units: seconds Config CRC Admin Lock USB Lock Backup Mem | Current Unbalance Trip Delay is the time delay following the trip level being exceeded before a trip occurs. |
| 1021 | Undercurrent Trip Level | UINT8 RW NV Default: 50 Range: 10 to 90 Units: % Config CRC Admin Lock USB Lock Backup Mem | Undercurrent Trip Level protection monitors the three phase currents and will trip the motor if the measured current drops below the set threshold following the Undercurrent Trip Delay time. |
| 1022 | Undercurrent Alarm Level | UINT8 RW NV Default: 50 Range: 10 to 90 Units: % Config CRC Admin Lock USB Lock Backup Mem | Undercurrent Alarm Level when exceeded and following the Alarm Delay Time in the Protections/General category, will generate a warning. |
| 1023 | Undercurrent Trip Delay | UINT16 RW NV Default: 20 Range: 1 to 60 Units: seconds Config CRC Admin Lock USB Lock Backup Mem | Undercurrent Trip Delay is the time delay following the trip level being exceeded until a trip occurs. |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | |
|----------|----------------------------|---|---|-------|-------------|---|--------------------|---|----------------------------|---|----------------------------|
| 1024 | Phase Order | UINT8 RW NV Default: 0 Enum Config CRC Run Lock Admin Lock USB Lock Backup Mem | By selecting a phase order other than “Ignore Phase Order” will result in a fault if the phase order chosen is incorrect. 0 - No Fault 1 - ABC Rotation 2 - ACB Rotation <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Ignore phase order</td> </tr> <tr> <td>1</td> <td>ABC (L1-L2-L3) phase order</td> </tr> <tr> <td>2</td> <td>ACB (L1-L3-L2) phase order</td> </tr> </tbody> </table> | Value | Description | 0 | Ignore phase order | 1 | ABC (L1-L2-L3) phase order | 2 | ACB (L1-L3-L2) phase order |
| Value | Description | | | | | | | | | | |
| 0 | Ignore phase order | | | | | | | | | | |
| 1 | ABC (L1-L2-L3) phase order | | | | | | | | | | |
| 2 | ACB (L1-L3-L2) phase order | | | | | | | | | | |
| 1025 | Overvoltage Trip Level | UINT16 RW NV Default: 110 Range: 90 to 150 Units: % Config CRC Admin Lock USB Lock Backup Mem | Overvoltage Trip Level, when exceeded and following the Overvoltage Trip Delay time will generate a trip. | | | | | | | | |
| 1026 | Overvoltage Alarm Level | UINT16 RW NV Default: 110 Range: 90 to 150 Units: % Config CRC Admin Lock USB Lock Backup Mem | Overvoltage Alarm Level, when exceeded and following the Alarm Delay Time in the Protections/General category, will generate a warning. | | | | | | | | |
| 1027 | Overvoltage Trip Delay | UINT16 RW NV Default: 20 Range: 1 to 60 Units: seconds Config CRC Admin Lock USB Lock Backup Mem | Overvoltage Trip Delay is the time delay following the trip level being exceeded until a trip occurs. | | | | | | | | |
| 1028 | Undervoltage Trip Level | UINT8 RW NV Default: 90 Range: 10 to 100 Units: % Config CRC Admin Lock USB Lock Backup Mem | Undervoltage Trip Level protection monitors the three phase voltages and will trip the motor if the measured voltage drops below the set threshold following the Undervoltage Trip Delay time. | | | | | | | | |
| 1029 | Undervoltage Alarm Level | UINT8 RW NV Default: 90 Range: 10 to 100 Units: % Config CRC Admin Lock USB Lock Backup Mem | Undervoltage Alarm Level when exceeded and following the Alarm Delay Time in the Protections/General category, will generate a warning. | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description |
|----------|-----------------------------------|--|---|
| 1030 | Undervoltage Start Delay | UINT16 RW NV Default: 20 Range: 0 to 60 Units: seconds Config CRC Admin Lock USB Lock Backup Mem | Undervoltage Start Delay is a delay to prevent this protection, if enabled, from tripping the motor at start up until this time expires. If the Undervoltage condition is still present after this time delay, then a trip would occur following the Undervoltage Trip Delay Time. |
| 1031 | Undervoltage Trip Delay | UINT16 RW NV Default: 20 Range: 1 to 60 Units: seconds Config CRC Admin Lock USB Lock Backup Mem | Undervoltage Trip Delay is the time delay following the trip level being exceeded until a trip occurs. |
| 1032 | Voltage Loss Restart Loss Level | UINT8 RW NV Default: 70 Range: 65 to 90 Units: % Config CRC Run Lock Admin Lock USB Lock Backup Mem | Voltage Loss Restart Loss Level is the level of voltage that C445 will consider a voltage loss to start the time intervals for Voltage Loss Restart Action. |
| 1033 | Voltage Loss Restart Return Level | UINT8 RW NV Default: 90 Range: 80 to 100 Units: % Config CRC Run Lock Admin Lock USB Lock Backup Mem | Voltage Loss Restart Return Level is the voltage level that line voltage must return to for C445 to re-start motors. If the level returns to this point or above within the time intervals specified by the user (VLR Short Time and VLR Long Time), a restart sequence will be initiated according to user settable delays (VLR Short Delay and VLR Long Delay). |
| 1034 | Voltage Loss Restart Auto Time | UINT16 RW NV Default: 200 Range: 100 to 400 Units: ms Config CRC Run Lock Admin Lock USB Lock Backup Mem | Voltage Loss Restart Time Interval for The Auto Time Period. C445 will hold its output relay shut for this time period after voltage loss to automatically pull the contactor back in as soon as voltage returns. If control power is lost, C445 can remain powered for approximately 200ms at 70% control power. |
| 1035 | Voltage Loss Restart Short Delay | UINT32 RW NV Default: 1000 Range: 100 to 500000 Units: ms Config CRC Admin Lock USB Lock Backup Mem | Voltage Loss Restart Short Delay. If voltage returns to the user specified level within the short time period C445 will send a command to re-start the motor after the Short Time Delay. |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description |
|----------|---------------------------------|---|--|
| 1037 | Voltage Loss Restart Short Time | UINT32 RW NV Default: 400 Range: 200 to 500000 Units: ms Config CRC Run Lock Admin Lock USB Lock Backup Mem | Voltage Loss Restart Short Time Interval. If voltage returns to the user specified level within the short time period C445 will send a command to re-start the motor after the Short Time Delay. |
| 1039 | Voltage Loss Restart Long Delay | UINT16 RW NV Default: 10 Range: 1 to 3600 Units: seconds Config CRC Admin Lock USB Lock Backup Mem | Voltage Loss Restart Long Delay. If voltage returns to the user specified level within the long time period C445 will send a command to re-start the motor after the Long Time Delay. |
| 1040 | Voltage Loss Restart Long Time | UINT16 RW NV Default: 4 Range: 0 to 3600 Units: seconds Config CRC Run Lock Admin Lock USB Lock Backup Mem | Voltage Loss Restart Long Time Interval. If voltage returns to the user specified level within the long time period C445 will send a command to re-start the motor after the Long Time Delay. |
| 1041 | V Phase Loss Trip Level | INTERNAL UINT8 RO Default: 80 Units: % | V Phase Loss Trip Level |
| 1042 | V Phase Loss Debounce | INTERNAL UINT16 RO Default: 2 Units: seconds | V Phase Loss Debounce |
| 1043 | Voltage Unbalance Trip Level | UINT8 RW NV Default: 6 Range: 1 to 20 Units: % Config CRC Admin Lock USB Lock Backup Mem | Voltage Unbalance Trip Level protection monitors the three phase voltages and will trip the motor if the measured unbalance percent exceeds this threshold, following the Voltage Unbalance Trip Delay time. |
| 1044 | Voltage Unbalance Alarm Level | UINT8 RW NV Default: 6 Range: 1 to 20 Units: % Config CRC Admin Lock USB Lock Backup Mem | Voltage Unbalance Alarm Level when exceeded and following the Alarm Delay Time in the Protections/General category, will generate a warning. |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description |
|----------|------------------------------|---|---|
| 1045 | Voltage Unbalance Trip Delay | UINT16 RW NV Default: 20 Range: 1 to 60 Units: seconds Config CRC Admin Lock USB Lock Backup Mem | Voltage Unbalance Trip Delay is the time delay following the trip level being exceeded until a trip occurs. |
| 1046 | High Power Trip Level | SINT16 RW NV Default: 110 Range: -200 to 200 Units: % Config CRC Admin Lock USB Lock Backup Mem | High Power Trip Level will trip the motor if the calculated KW Level exceeds this threshold, following the High Power Trip Delay time. |
| 1047 | High Power Alarm Level | SINT16 RW NV Default: 110 Range: -200 to 200 Units: % Config CRC Admin Lock USB Lock Backup Mem | High Power Alarm Level (based on KW) when exceeded and following the Alarm Delay Time in the Protections/General category, will generate a warning. |
| 1048 | High Power Trip Delay | UINT16 RW NV Default: 20 Range: 1 to 60 Units: seconds Config CRC Admin Lock USB Lock Backup Mem | High Power Trip Delay is the time delay following the trip level being exceeded until a trip occurs. |
| 1049 | Low Power Trip Level | SINT16 RW NV Default: 50 Range: -200 to 200 Units: % Config CRC Admin Lock USB Lock Backup Mem | Low Power Trip Level will trip the motor if the calculated KW Level drops below this threshold, following the Low Power Trip Delay time. |
| 1050 | Low Power Alarm Level | SINT16 RW NV Default: 50 Range: -200 to 200 Units: % Config CRC Admin Lock USB Lock Backup Mem | Low Power Alarm Level when exceeded and following the Alarm Delay Time in the Protections/General category, will generate a warning. |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description |
|----------|--|--|--|
| 1051 | Low Power Trip Delay | UINT16 RW NV Default: 20 Range: 1 to 60 Units: seconds Config CRC Admin Lock USB Lock Backup Mem | Low Power Trip Delay is the time delay following the trip level being exceeded until a trip occurs. |
| 1052 | Peak Demand Warning Threshold | UINT32 RW NV Default: 0 Units: W Config CRC Admin Lock USB Lock Backup Mem | Generate an alarm if the peak demand exceeds this threshold. |
| 1054 | Demand Window Duration | UINT16 RW NV Default: 15 Range: 1 to 240 Units: minutes Config CRC Admin Lock USB Lock Backup Mem | The duration over which the Demand is measured. In North America this duration is usually chosen to be 15 minutes. |
| 1055 | Power Factor Deviation Trip Level High Scaled | SINT16 RW NV Default: 10000 Range: -10000 to 10000 Units: 0.01% Config CRC Admin Lock USB Lock Backup Mem | PF Deviation Trip Level High - The Power Factor Deviation protection monitors the PF (supply side) of the load and will trip the motor if the measured deviation from rated exceeds the set threshold. The high power factor protection is active when the motor is in the running state if enabled. |
| 1056 | Power Factor Deviation Trip Level Low Scaled | SINT16 RW NV Default: 0 Range: -10000 to 10000 Units: 0.01% Config CRC Admin Lock USB Lock Backup Mem | PF Deviation Trip Level - The Power Factor Deviation protection monitors the PF (supply side) of the load and will trip the motor if the measured deviation from rated exceeds the set threshold. |
| 1057 | Power Factor Deviation Alarm Level High Scaled | SINT16 RW NV Default: 10000 Range: -10000 to 10000 Units: 0.01% Config CRC Admin Lock USB Lock Backup Mem | Power Factor Deviation Alarm Level High - If the Power Factor rises above this level, following the Alarm Delay Time in the Protections/General category, a warning is generated. |
| 1058 | Power Factor Deviation Alarm Level Low Scaled | SINT16 RW NV Default: 0 Range: -10000 to 10000 Units: 0.01% Config CRC Admin Lock USB Lock Backup Mem | Power Factor Deviation Alarm Level Low - If the Power Factor drops below this level, and following the Alarm Delay Time in the Protections/General category, a warning is generated. |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description |
|----------|-----------------------------------|---|--|
| 1059 | Power Factor Deviation Trip Delay | UINT16 RW NV Default: 20 Range: 1 to 60 Units: seconds Config CRC Admin Lock USB Lock Backup Mem | PF Deviation Trip Delay time is the time delay from when a Power Factor trip condition exists to when the motor is tripped. |
| 1060 | GF Trip Level Scaled | UINT16 RW NV Default: 101 Range: 1 to 65535 (RW) Units: scaled A Config CRC Admin Lock USB Lock Backup Mem | Ground Fault Trip Level is the value that will generate a trip of the motor following the Residual Ground Fault Trip Delay time. Scaled by parameter "I Scale Factor". |
| 1061 | GF Alarm Level Scaled | UINT16 RW NV Default: 101 Range: 1 to 65535 (RW) Units: scaled A Config CRC Admin Lock USB Lock Backup Mem | Ground Fault Alarm Level, if exceeded, will generate a warning following the Alarm Delay Time in the Protections/General category. Scaled by parameter "I Scale Factor". |
| 1062 | GF Protection Start Delay | UINT16 RW NV Default: 0 Range: 0 to 5000 Units: ms Config CRC Admin Lock USB Lock Backup Mem | Ground Fault Protection Start Delay is a delay at power up to inhibit raising a ground fault trip condition until this time expires. If the ground fault trip condition is no longer present when this time expires, no trip will occur. |
| 1063 | GF Trip Debounce | UINT16 RW NV Default: 1000 Range: 0 to 60000 Units: msec Config CRC Admin Lock USB Lock Backup Mem | Ground Fault Trip Delay is the time delay before a trip occurs. |
| 1064 | GF Protection Inhibit Current | BOOL RW NV Default: FALSE Config CRC Admin Lock USB Lock Backup Mem | Ground Fault Protection Inhibit Current, if selected the GF Inhibit Current will be used. |
| 1065 | GF Protection Inhibit % | UINT16 RW NV Default: 50 Range: 25 to 100 Units: % Config CRC Admin Lock USB Lock | This parameter will inhibit a Ground Fault trip if the Ground Fault current exceeds this percentage. The purpose of this is to allow an upstream control to resolve the issue. Note: The External Ground Fault Module does not use this current threshold for inhibit. Instead, the GFM monitors its CT input signal and when saturated, will inhibit the trip. |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description |
|----------|---|--|---|
| 1066 | Hz-Deviation Fast Trip Level Scaled | UINT16 RW NV Default: 10 Range: 2 to 200 Units: 0.01Hz Config CRC Admin Lock USB Lock Backup Mem | Frequency Deviation Fast Trip Level has a small range for the trip level selection with a large time delay to trip range. If the frequency deviation from rated exceeds the set threshold for the duration of the Frequency Deviation Fast Debounce time, it will trip the motor. The frequency deviation protection is active when the motor is in the energized state if enabled. This parameter is scaled in 0.01Hz. |
| 1067 | Frequency Deviation Fast Alarm Level Scaled | UINT16 RW NV Default: 10 Range: 2 to 200 Units: 0.01Hz Config CRC Admin Lock USB Lock Backup Mem | Frequency Deviation Fast Alarm Level has a small range for the alarm level selection and uses the Alarm Delay Time in the Protections/General category for the delay between exceeding the set threshold and generating a warning. The frequency deviation protection is always active if enabled. This parameter is scaled in 0.01Hz. |
| 1068 | Hz-Deviation Fast Trip Delay | UINT16 RW NV Default: 1000 Range: 20 to 2000 Units: ms Config CRC Admin Lock USB Lock Backup Mem | In the motor energized state, the obtained percent deviation is compared against the set trip threshold. If the frequency deviation is higher than the Frequency Deviation Fast Trip Level for the duration of the Frequency Deviation Fast Trip Delay time, the decision to trip the motor is made. This time delay only applies to the trip level. |
| 1069 | Hz-Deviation Slow Trip Level Scaled | UINT16 RW NV Default: 10 Range: 10 to 500 Units: 0.01Hz Config CRC Admin Lock USB Lock Backup Mem | Frequency Deviation Slow Trip Level has a large range for the trip level selection with a short time delay to trip range. If the frequency deviation from rated exceeds the set threshold for the duration of the Frequency Deviation Slow Trip Delay time, it will trip the motor. The frequency deviation protection is active when the motor is in the energized state if enabled. This parameter is scaled in 0.01Hz. |
| 1070 | Hz-Deviation Slow Alarm Level Scaled | UINT16 RW NV Default: 10 Range: 10 to 500 Units: 0.01Hz Config CRC Admin Lock USB Lock Backup Mem | Frequency Deviation Slow Alarm Level has a large range for the trip level selection and uses the Alarm Delay Time in the Protections/General category for the delay between exceeding the set threshold and generating a warning. The frequency deviation protection is always active. This parameter is scaled in 0.01Hz. |
| 1071 | Hz-Deviation Slow Trip Delay | UINT16 RW NV Default: 20 Range: 1 to 60 Units: seconds Config CRC Admin Lock USB Lock Backup Mem | In the motor energized state, the obtained percent deviation is compared against the set trip threshold. If the frequency deviation is higher than the Frequency Deviation Slow Trip Level for the duration of the Frequency Deviation Slow Trip Delay time, it will trip the motor. This debounce time delay only applies to the trip level. |
| 1072 | Auto Reset Enable | BOOL RW NV Default: FALSE Config CRC Run Lock Admin Lock USB Lock Backup Mem | If disabled, no auto reset; if enabled, auto reset occurs for the trip types selected in Auto Reset Types. |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|----------------------------|--|---|-----|-------------|------|---|---------------|-------|---|--------------|-------|---|----------|-------|---|----------------------|-------|---|--------------------|-------|---|-------------------|-------|---|----------------------------|-------|---|-----|-------|---|------------------------|-------|---|--------------------|-------|----|-------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|---------------|-------|----|------------|-------|----|-----------|-------|----|----------|-------|----|----------|-------|----|----------|-------|----|-------|-------|----|-------------------------|-------|----|-----|-------|----|-----------------------|-------|----|-------------|-------|----|----------------------|-------|
| 1073 | Auto Reset Types | BYTE RW NV Array size: 4 Default: 0 Bitfield Config CRC Run Lock Admin Lock USB Lock Backup Mem | Select the protections that are to auto-reset if Auto Reset Enable is enabled. Each protection type is a bit. <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>0</td><td>Under voltage</td><td>17153</td></tr> <tr><td>1</td><td>Over voltage</td><td>17154</td></tr> <tr><td>2</td><td>Reserved</td><td>17155</td></tr> <tr><td>3</td><td>Ground current fault</td><td>17156</td></tr> <tr><td>4</td><td>Current phase loss</td><td>17157</td></tr> <tr><td>5</td><td>Current unbalance</td><td>17158</td></tr> <tr><td>6</td><td>Instantaneous over current</td><td>17159</td></tr> <tr><td>7</td><td>Jam</td><td>17160</td></tr> <tr><td>8</td><td>Power factor deviation</td><td>17161</td></tr> <tr><td>9</td><td>Voltage phase loss</td><td>17162</td></tr> <tr><td>10</td><td>Voltage unbalance</td><td>17163</td></tr> <tr><td>11</td><td>Frequency deviation fast</td><td>17164</td></tr> <tr><td>12</td><td>Frequency deviation slow</td><td>17165</td></tr> <tr><td>13</td><td>Under current</td><td>17166</td></tr> <tr><td>14</td><td>High power</td><td>17167</td></tr> <tr><td>15</td><td>Low power</td><td>17168</td></tr> <tr><td>16</td><td>Reserved</td><td>17169</td></tr> <tr><td>17</td><td>Reserved</td><td>17170</td></tr> <tr><td>18</td><td>Overload</td><td>17171</td></tr> <tr><td>19</td><td>Stall</td><td>17172</td></tr> <tr><td>20</td><td>Phase rotation mismatch</td><td>17173</td></tr> <tr><td>21</td><td>PTC</td><td>17174</td></tr> <tr><td>22</td><td>Under voltage restart</td><td>17175</td></tr> <tr><td>23</td><td>Peak demand</td><td>17176</td></tr> <tr><td>24</td><td>HRGF pulse detection</td><td>17177</td></tr> </tbody> </table> | Bit | Description | Coil | 0 | Under voltage | 17153 | 1 | Over voltage | 17154 | 2 | Reserved | 17155 | 3 | Ground current fault | 17156 | 4 | Current phase loss | 17157 | 5 | Current unbalance | 17158 | 6 | Instantaneous over current | 17159 | 7 | Jam | 17160 | 8 | Power factor deviation | 17161 | 9 | Voltage phase loss | 17162 | 10 | Voltage unbalance | 17163 | 11 | Frequency deviation fast | 17164 | 12 | Frequency deviation slow | 17165 | 13 | Under current | 17166 | 14 | High power | 17167 | 15 | Low power | 17168 | 16 | Reserved | 17169 | 17 | Reserved | 17170 | 18 | Overload | 17171 | 19 | Stall | 17172 | 20 | Phase rotation mismatch | 17173 | 21 | PTC | 17174 | 22 | Under voltage restart | 17175 | 23 | Peak demand | 17176 | 24 | HRGF pulse detection | 17177 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Under voltage | 17153 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Over voltage | 17154 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Reserved | 17155 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Ground current fault | 17156 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Current phase loss | 17157 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Current unbalance | 17158 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Instantaneous over current | 17159 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Jam | 17160 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Power factor deviation | 17161 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Voltage phase loss | 17162 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Voltage unbalance | 17163 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Frequency deviation fast | 17164 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Frequency deviation slow | 17165 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Under current | 17166 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | High power | 17167 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Low power | 17168 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Reserved | 17169 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Reserved | 17170 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Overload | 17171 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Stall | 17172 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Phase rotation mismatch | 17173 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | PTC | 17174 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | Under voltage restart | 17175 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Peak demand | 17176 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | HRGF pulse detection | 17177 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1075 | Auto Reset Delay | UINT16 RW NV Default: 180 Range: 0 to 3600 Units: seconds Config CRC Run Lock Admin Lock USB Lock Backup Mem | The time delay following a fault before attempting to auto-reset that fault condition. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1076 | Reset on Powerup | BOOL RW NV Default: FALSE Config CRC Admin Lock USB Lock Backup Mem | If enabled, perform a fault reset on power up. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description |
|----------|---|--|---|
| 1077 | Backspin Inhibit Time | UINT16 RW NV Default: 0 Range: 0 to 3600 Units: seconds Config CRC Admin Lock USB Lock Backup Mem | Anti-backspin inhibit time before a reset is allowed. |
| 1078 | Run Transition Delay | UINT16 RW NV Default: 10 Range: 2 to 360 Units: seconds Config CRC Run Lock Admin Lock USB Lock Backup Mem | If the motor is instructed to run by the user, but the current thresholds are not reached, the C445 will not fault on Undercurrent if that protection is enabled because it has not realized a run state. If the user wants the unit to fault under these conditions on an enabled protection following the selected debounce time for that protection, a time must be selected for this parameter. |
| 1079 | Alarm Delay | UINT16 RW NV Default: 2000 Range: 200 to 5000 Units: ms Config CRC Admin Lock USB Lock Backup Mem | Alarm Delay Time - applies to all protection function alarms that are enabled. This delay time is to avoid nuisance alarms. The fault condition must be present longer than this time setting. |
| 1080 | Inhibit Start on Voltage Fault | BOOL RW NV Default: 0 Config CRC Run Lock Admin Lock USB Lock Backup Mem | If this parameter is enabled and a voltage supply problem exists when the start command is issued, the C445 will be inhibited from starting the motor. This applies to Over Voltage, Under Voltage and Voltage Imbalance. |
| 1081 | Inhibit Start on Voltage Fault - Undervoltage Level | UINT8 RW NV Default: 90 Range: 10 to 100 Config CRC Admin Lock USB Lock Backup Mem | If Inhibit Start on Voltage Fault is enabled, this Under Voltage threshold value is used to inhibit the motor from being started. |
| 1082 | Inhibit Start on Voltage Fault - Unbalance Level | UINT8 RW NV Default: 6 Range: 1 to 20 Units: % Config CRC Admin Lock USB Lock Backup Mem | If Inhibit Start on Voltage Fault is enabled, this Voltage Unbalance threshold value is used to inhibit the motor from being started. |
| 1083 | Inhibit Start on Voltage Fault - Overvoltage Level | UINT8 RW NV Default: 110 Range: 90 to 150 Units: % Config CRC Admin Lock USB Lock Backup Mem | If Inhibit Start on Voltage Fault is enabled, this Over Voltage threshold value is used to inhibit the motor from being started. |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|------------------------------|--|--|-----|-------------|------|---|---------------|-------|---|--------------|-------|---|-----------------|-------|---|----------------------|-------|---|--------------------|-------|---|-------------------|-------|---|----------------------------|-------|---|-----|-------|---|------------------------|-------|---|--------------------|-------|----|-------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|---------------|-------|----|------------|-------|----|-----------|-------|----|----------|-------|----|-----------------------|-------|----|----------|-------|
| 1084 | Start Threshold Percent | UINT8 RW NV Default: 30 Range: 1 to 100 Units: % Config CRC Run Lock Admin Lock USB Lock Backup Mem | The C445 recognizes a motor Start when it measures motor current exceeding 30% of the FLA setting by default. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1085 | Stop Threshold Percent | UINT8 RW NV Default: 5 Range: 1 to 50 Units: % Config CRC Run Lock Admin Lock USB Lock Backup Mem | A motor Stop is recognized when the current falls below 5% of the FLA setting by default. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1086 | Transition Threshold Percent | UINT8 RW NV Default: 115 Range: 25 to 200 Units: % Config CRC Run Lock Admin Lock USB Lock Backup Mem | Motor Transition to Run Threshold Percent. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1087 | Trip Indication Only Enable | BYTE RW NV Array size: 4 Default: 0x00, 0x00, 0x00, 0x00 Bitfield Config CRC Run Lock Admin Lock USB Lock Backup Mem | Enable trip indication only by selecting the box next to each protection to place a check mark in it. Each protection selected will enable those protections but will not cause the C445 control to drop out when trip occurs. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Under voltage</td> <td>17377</td> </tr> <tr> <td>1</td> <td>Over voltage</td> <td>17378</td> </tr> <tr> <td>2</td> <td>Not Implemented</td> <td>17379</td> </tr> <tr> <td>3</td> <td>Ground current fault</td> <td>17380</td> </tr> <tr> <td>4</td> <td>Current phase loss</td> <td>17381</td> </tr> <tr> <td>5</td> <td>Current unbalance</td> <td>17382</td> </tr> <tr> <td>6</td> <td>Instantaneous over current</td> <td>17383</td> </tr> <tr> <td>7</td> <td>Jam</td> <td>17384</td> </tr> <tr> <td>8</td> <td>Power factor deviation</td> <td>17385</td> </tr> <tr> <td>9</td> <td>Voltage phase loss</td> <td>17386</td> </tr> <tr> <td>10</td> <td>Voltage unbalance</td> <td>17387</td> </tr> <tr> <td>11</td> <td>Frequency deviation fast</td> <td>17388</td> </tr> <tr> <td>12</td> <td>Frequency deviation slow</td> <td>17389</td> </tr> <tr> <td>13</td> <td>Under current</td> <td>17390</td> </tr> <tr> <td>14</td> <td>High power</td> <td>17391</td> </tr> <tr> <td>15</td> <td>Low power</td> <td>17392</td> </tr> <tr> <td>16</td> <td>Reserved</td> <td>17393</td> </tr> <tr> <td>17</td> <td>Starts limit exceeded</td> <td>17394</td> </tr> <tr> <td>18</td> <td>Overload</td> <td>17395</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Under voltage | 17377 | 1 | Over voltage | 17378 | 2 | Not Implemented | 17379 | 3 | Ground current fault | 17380 | 4 | Current phase loss | 17381 | 5 | Current unbalance | 17382 | 6 | Instantaneous over current | 17383 | 7 | Jam | 17384 | 8 | Power factor deviation | 17385 | 9 | Voltage phase loss | 17386 | 10 | Voltage unbalance | 17387 | 11 | Frequency deviation fast | 17388 | 12 | Frequency deviation slow | 17389 | 13 | Under current | 17390 | 14 | High power | 17391 | 15 | Low power | 17392 | 16 | Reserved | 17393 | 17 | Starts limit exceeded | 17394 | 18 | Overload | 17395 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Under voltage | 17377 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Over voltage | 17378 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Not Implemented | 17379 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Ground current fault | 17380 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Current phase loss | 17381 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Current unbalance | 17382 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Instantaneous over current | 17383 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Jam | 17384 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Power factor deviation | 17385 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Voltage phase loss | 17386 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Voltage unbalance | 17387 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Frequency deviation fast | 17388 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Frequency deviation slow | 17389 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Under current | 17390 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | High power | 17391 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Low power | 17392 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Reserved | 17393 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Starts limit exceeded | 17394 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Overload | 17395 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---------------------------------|--|---|-----|-------------|------|----|---------------|-------|----|-------------------------|-------|----|-----------------|-------|----|-----------------------|-------|----|--------------------|-------|----|----------------------|-------|---|----------------------------|-------|---|-----|-------|---|------------------------|-------|---|--------------------|-------|----|-------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|---------------|-------|----|------------|-------|----|-----------|-------|----|----------|-------|----|----------|-------|----|----------|-------|----|-------|-------|----|-------------------------|-------|----|-----|-------|----|-----------------------|-------|----|-------------|-------|----|----------------------|-------|
| 1087 | Trip Indication Only Enable | BYTE RW NV Array size: 4 Default: 0x00, 0x00, 0x00, 0x00 Bitfield Config CRC Run Lock Admin Lock USB Lock Backup Mem | Enable trip indication only by selecting the box next to each protection to place a check mark in it. Each protection selected will enable those protections but will not cause the C445 control to drop out when trip occurs, continued. <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>19</td> <td>Stall</td> <td>17396</td> </tr> <tr> <td>20</td> <td>Phase rotation mismatch</td> <td>17397</td> </tr> <tr> <td>21</td> <td>PTC</td> <td>17398</td> </tr> <tr> <td>22</td> <td>Under voltage restart</td> <td>17399</td> </tr> <tr> <td>23</td> <td>Peak demand</td> <td>17400</td> </tr> <tr> <td>24</td> <td>HRGF pulse detection</td> <td>17401</td> </tr> </tbody> </table> | Bit | Description | Coil | 19 | Stall | 17396 | 20 | Phase rotation mismatch | 17397 | 21 | PTC | 17398 | 22 | Under voltage restart | 17399 | 23 | Peak demand | 17400 | 24 | HRGF pulse detection | 17401 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Stall | 17396 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Phase rotation mismatch | 17397 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | PTC | 17398 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | Under voltage restart | 17399 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Peak demand | 17400 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | HRGF pulse detection | 17401 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1089 | Shunt Trip Output Define | BYTE RW NV Array size: 4 Default: 0x00, 0x00, 0x00, 0x00 Bitfield Config CRC Run Lock Admin Lock USB Lock Backup Mem | Enables the “Shunt Trip” output for selected protections that are configured for “trip” or “trip indication only”. <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Under voltage</td> <td>17409</td> </tr> <tr> <td>1</td> <td>Over voltage</td> <td>17410</td> </tr> <tr> <td>2</td> <td>Not Implemented</td> <td>17411</td> </tr> <tr> <td>3</td> <td>Ground current fault</td> <td>17412</td> </tr> <tr> <td>4</td> <td>Current phase loss</td> <td>17413</td> </tr> <tr> <td>5</td> <td>Current unbalance</td> <td>17414</td> </tr> <tr> <td>6</td> <td>Instantaneous over current</td> <td>17415</td> </tr> <tr> <td>7</td> <td>Jam</td> <td>17416</td> </tr> <tr> <td>8</td> <td>Power factor deviation</td> <td>17417</td> </tr> <tr> <td>9</td> <td>Voltage phase loss</td> <td>17418</td> </tr> <tr> <td>10</td> <td>Voltage unbalance</td> <td>17419</td> </tr> <tr> <td>11</td> <td>Frequency deviation fast</td> <td>17420</td> </tr> <tr> <td>12</td> <td>Frequency deviation slow</td> <td>17421</td> </tr> <tr> <td>13</td> <td>Under current</td> <td>17422</td> </tr> <tr> <td>14</td> <td>High power</td> <td>17423</td> </tr> <tr> <td>15</td> <td>Low power</td> <td>17424</td> </tr> <tr> <td>16</td> <td>Reserved</td> <td>17425</td> </tr> <tr> <td>17</td> <td>Reserved</td> <td>17426</td> </tr> <tr> <td>18</td> <td>Overload</td> <td>17427</td> </tr> <tr> <td>19</td> <td>Stall</td> <td>17428</td> </tr> <tr> <td>20</td> <td>Phase rotation mismatch</td> <td>17429</td> </tr> <tr> <td>21</td> <td>PTC</td> <td>17430</td> </tr> <tr> <td>22</td> <td>Under voltage restart</td> <td>17431</td> </tr> <tr> <td>23</td> <td>Peak demand</td> <td>17432</td> </tr> <tr> <td>24</td> <td>HRGF pulse detection</td> <td>17433</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Under voltage | 17409 | 1 | Over voltage | 17410 | 2 | Not Implemented | 17411 | 3 | Ground current fault | 17412 | 4 | Current phase loss | 17413 | 5 | Current unbalance | 17414 | 6 | Instantaneous over current | 17415 | 7 | Jam | 17416 | 8 | Power factor deviation | 17417 | 9 | Voltage phase loss | 17418 | 10 | Voltage unbalance | 17419 | 11 | Frequency deviation fast | 17420 | 12 | Frequency deviation slow | 17421 | 13 | Under current | 17422 | 14 | High power | 17423 | 15 | Low power | 17424 | 16 | Reserved | 17425 | 17 | Reserved | 17426 | 18 | Overload | 17427 | 19 | Stall | 17428 | 20 | Phase rotation mismatch | 17429 | 21 | PTC | 17430 | 22 | Under voltage restart | 17431 | 23 | Peak demand | 17432 | 24 | HRGF pulse detection | 17433 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Under voltage | 17409 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Over voltage | 17410 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Not Implemented | 17411 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Ground current fault | 17412 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Current phase loss | 17413 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Current unbalance | 17414 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Instantaneous over current | 17415 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Jam | 17416 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Power factor deviation | 17417 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Voltage phase loss | 17418 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Voltage unbalance | 17419 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Frequency deviation fast | 17420 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Frequency deviation slow | 17421 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Under current | 17422 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | High power | 17423 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Low power | 17424 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Reserved | 17425 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Reserved | 17426 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Overload | 17427 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Stall | 17428 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Phase rotation mismatch | 17429 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | PTC | 17430 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | Under voltage restart | 17431 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Peak demand | 17432 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | HRGF pulse detection | 17433 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1091 | Shunt trip pulse duration in ms | UINT16 RW NV Default: 200 Range: 200 to 5000 Units: mSec Config CRC Run Lock Admin Lock USB Lock Backup Mem | Duration of the shunt trip pulse in ms | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---------------------------------|--|---|-------|-------------|---|-----------|---|---------------|---|--------------|---|----------|---|----------------------|---|--------------------|---|-------------------|---|----------------------------|---|-----|---|--------------|----|--------------------|----|-------------------|----|--------------------------|----|--------------------------|----|---------------|----|------------|----|-----------|----|--------------------|----|----------|----|----------|----|-------|----|-------------------------|----|---------------------------------|
| 1092 | CT Prot Response | UINT8 RW NV Default: 1 Range: 0 to 2 Enum Config CRC Run Lock Admin Lock USB Lock Backup Mem | CT protection response: 0-no action; 1-warning; 2-trip <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No Action</td> </tr> <tr> <td>1</td> <td>Warning</td> </tr> <tr> <td>2</td> <td>Trip</td> </tr> </tbody> </table> | Value | Description | 0 | No Action | 1 | Warning | 2 | Trip | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | No Action | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Warning | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Trip | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1093 | Shunt trip pulse duration in ms | UINT16 RW NV Default: 3 Range: 2 to 1000 Units: 10mSec Config CRC Admin Lock USB Lock Backup Mem | Delays the ground current trip, once threshold is exceeded, the delay timer starts and when expired will trip the C445. (In 10ms) Ground Current Trip Delay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1094 | Amplitude of HRG pulse current | UINT16 RW NV Default: 500 Range: 3 to 1000 Units: 10mAmps Config CRC Admin Lock USB Lock Backup Mem | Amplitude of HRG pulse current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1200 | Fault Queue - Event Order | UINT16 RO Array size: 10 Enum | A List of the Last 10 Faults Shown in the Order They Occurred. Duplicates are allowed and the most recent is at the top. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No Faults</td> </tr> <tr> <td>1</td> <td>Under voltage</td> </tr> <tr> <td>2</td> <td>Over voltage</td> </tr> <tr> <td>3</td> <td>Reserved</td> </tr> <tr> <td>4</td> <td>Ground current fault</td> </tr> <tr> <td>5</td> <td>Current phase loss</td> </tr> <tr> <td>6</td> <td>Current unbalance</td> </tr> <tr> <td>7</td> <td>Instantaneous over current</td> </tr> <tr> <td>8</td> <td>Jam</td> </tr> <tr> <td>9</td> <td>PF Deviation</td> </tr> <tr> <td>10</td> <td>Voltage phase loss</td> </tr> <tr> <td>11</td> <td>Voltage unbalance</td> </tr> <tr> <td>12</td> <td>Frequency deviation fast</td> </tr> <tr> <td>13</td> <td>Frequency deviation slow</td> </tr> <tr> <td>14</td> <td>Under current</td> </tr> <tr> <td>15</td> <td>High power</td> </tr> <tr> <td>16</td> <td>Low power</td> </tr> <tr> <td>17</td> <td>Contactore failure</td> </tr> <tr> <td>18</td> <td>Reserved</td> </tr> <tr> <td>19</td> <td>Overload</td> </tr> <tr> <td>20</td> <td>Stall</td> </tr> <tr> <td>21</td> <td>Phase rotation mismatch</td> </tr> <tr> <td>22</td> <td>PTC - See PTC State for details</td> </tr> </tbody> </table> | Value | Description | 0 | No Faults | 1 | Under voltage | 2 | Over voltage | 3 | Reserved | 4 | Ground current fault | 5 | Current phase loss | 6 | Current unbalance | 7 | Instantaneous over current | 8 | Jam | 9 | PF Deviation | 10 | Voltage phase loss | 11 | Voltage unbalance | 12 | Frequency deviation fast | 13 | Frequency deviation slow | 14 | Under current | 15 | High power | 16 | Low power | 17 | Contactore failure | 18 | Reserved | 19 | Overload | 20 | Stall | 21 | Phase rotation mismatch | 22 | PTC - See PTC State for details |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | No Faults | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Under voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Over voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Ground current fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Current phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Current unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Instantaneous over current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Jam | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | PF Deviation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Voltage phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Frequency deviation fast | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Frequency deviation slow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Under current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | High power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Contactore failure | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Overload | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Stall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | Phase rotation mismatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | PTC - See PTC State for details | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--|-------------------------------------|--|-------|-------------|----|-----------------------|----|--------------------------|----|---------------------------------------|----|--|----|--|----|-------------------------|----|---|----|---|----|--|----|--|----|---|----|---|----|---|----|---|----|--|----|--|----|--|----|--|----|---------------------------|----|------------------------------|----|--|----|---------------------------|-----|----------------------|-----|---------------------------|-----|----------------------------|-----|-----------------------------|-----|------------------------------|-----|-----------------------|-----|----------------------------|-----|---------------------------|-----|------------------------|-----|-----------------------|-----|---------------------|-----|---|-----|------------------------------------|-----|-----------------------------|-----|------------------------|
| 1200 | Fault Queue - Event Order | UINT16 RO Array size: 10 Enum | A List of the Last 10 Faults Shown in the Order They Occurred. Duplicates are allowed and the most recent is at the top, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>23</td><td>Under voltage restart</td></tr> <tr><td>24</td><td>Measurement Module fault</td></tr> <tr><td>25</td><td>Communication loss on active fieldbus</td></tr> <tr><td>26</td><td>Measurement Module not available or communication loss with the module</td></tr> <tr><td>27</td><td>User Interface not available or communication loss with the module</td></tr> <tr><td>28</td><td>Test trip was triggered</td></tr> <tr><td>29</td><td>Option Card not available or communication loss with the module</td></tr> <tr><td>30</td><td>RTC / Backup Memory Option Board NV memory fail</td></tr> <tr><td>31</td><td>Currently connected User Interface does not match with what was connected before</td></tr> <tr><td>32</td><td>Currently connected Measurement Module does not match with what was connected before</td></tr> <tr><td>33</td><td>Currently connected Option Card does not match with what was connected before</td></tr> <tr><td>34</td><td>Measurement Module firmware is incompatible</td></tr> <tr><td>35</td><td>User Interface firmware is incompatible</td></tr> <tr><td>36</td><td>Ethernet Option Card firmware is incompatible</td></tr> <tr><td>37</td><td>Profi Option Card firmware is incompatible</td></tr> <tr><td>38</td><td>Ground Fault Module firmware is incompatible</td></tr> <tr><td>39</td><td>External ground fault module not available or communication loss</td></tr> <tr><td>40</td><td>Currently connected Ground Fault Module does not match current configuration</td></tr> <tr><td>41</td><td>GFM CT connection is open</td></tr> <tr><td>42</td><td>GFM CT connection is shorted</td></tr> <tr><td>43</td><td>GFM CT input has no calibration values</td></tr> <tr><td>44</td><td>HRGF pulse detection trip</td></tr> <tr><td>200</td><td>Logic Internal Fault</td></tr> <tr><td>201</td><td>Logic call stack overflow</td></tr> <tr><td>202</td><td>Logic call stack underflow</td></tr> <tr><td>203</td><td>Logic memory read violation</td></tr> <tr><td>204</td><td>Logic memory write violation</td></tr> <tr><td>205</td><td>Logic invalid program</td></tr> <tr><td>206</td><td>Logic incompatible program</td></tr> <tr><td>207</td><td>Logic invalid instruction</td></tr> <tr><td>220</td><td>Logic program underrun</td></tr> <tr><td>221</td><td>Logic program overrun</td></tr> <tr><td>222</td><td>Logic task watchdog</td></tr> <tr><td>223</td><td>Logic instruction invalid instance number</td></tr> <tr><td>224</td><td>Logic instruction invalid argument</td></tr> <tr><td>225</td><td>Logic math - divide by zero</td></tr> <tr><td>226</td><td>Logic math - underflow</td></tr> </tbody> </table> | Value | Description | 23 | Under voltage restart | 24 | Measurement Module fault | 25 | Communication loss on active fieldbus | 26 | Measurement Module not available or communication loss with the module | 27 | User Interface not available or communication loss with the module | 28 | Test trip was triggered | 29 | Option Card not available or communication loss with the module | 30 | RTC / Backup Memory Option Board NV memory fail | 31 | Currently connected User Interface does not match with what was connected before | 32 | Currently connected Measurement Module does not match with what was connected before | 33 | Currently connected Option Card does not match with what was connected before | 34 | Measurement Module firmware is incompatible | 35 | User Interface firmware is incompatible | 36 | Ethernet Option Card firmware is incompatible | 37 | Profi Option Card firmware is incompatible | 38 | Ground Fault Module firmware is incompatible | 39 | External ground fault module not available or communication loss | 40 | Currently connected Ground Fault Module does not match current configuration | 41 | GFM CT connection is open | 42 | GFM CT connection is shorted | 43 | GFM CT input has no calibration values | 44 | HRGF pulse detection trip | 200 | Logic Internal Fault | 201 | Logic call stack overflow | 202 | Logic call stack underflow | 203 | Logic memory read violation | 204 | Logic memory write violation | 205 | Logic invalid program | 206 | Logic incompatible program | 207 | Logic invalid instruction | 220 | Logic program underrun | 221 | Logic program overrun | 222 | Logic task watchdog | 223 | Logic instruction invalid instance number | 224 | Logic instruction invalid argument | 225 | Logic math - divide by zero | 226 | Logic math - underflow |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Under voltage restart | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | Measurement Module fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | Communication loss on active fieldbus | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | Measurement Module not available or communication loss with the module | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | User Interface not available or communication loss with the module | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | Test trip was triggered | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | Option Card not available or communication loss with the module | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | RTC / Backup Memory Option Board NV memory fail | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | Currently connected User Interface does not match with what was connected before | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | Currently connected Measurement Module does not match with what was connected before | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | Currently connected Option Card does not match with what was connected before | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | Measurement Module firmware is incompatible | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | User Interface firmware is incompatible | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | Ethernet Option Card firmware is incompatible | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | Profi Option Card firmware is incompatible | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | Ground Fault Module firmware is incompatible | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | External ground fault module not available or communication loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | Currently connected Ground Fault Module does not match current configuration | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | GFM CT connection is open | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | GFM CT connection is shorted | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | GFM CT input has no calibration values | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | HRGF pulse detection trip | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 200 | Logic Internal Fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 201 | Logic call stack overflow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 202 | Logic call stack underflow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 203 | Logic memory read violation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 204 | Logic memory write violation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 205 | Logic invalid program | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 206 | Logic incompatible program | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 207 | Logic invalid instruction | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 220 | Logic program underrun | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 221 | Logic program overrun | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 222 | Logic task watchdog | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 223 | Logic instruction invalid instance number | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 224 | Logic instruction invalid argument | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 225 | Logic math - divide by zero | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 226 | Logic math - underflow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|-------------------------------------|---|-------|-------------|-----|-----------------------|-----|------------------|-----|--|-----|--------------------------------|-----|---|-----|--|-----|---|-----|--|-----|--|-----|---|-----|---|-----|--|-----|--|-----|---|-----|--|-----|-------------------------------|-----|--|-----|--------------------------------|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|
| 1200 | Fault Queue - Event Order | UINT16 RO Array size: 10 Enum | A List of the Last 10 Faults Shown in the Order They Occurred. Duplicates are allowed and the most recent is at the top, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>227</td><td>Logic math - overflow</td></tr> <tr><td>228</td><td>ELC IO Comm Loss</td></tr> <tr><td>229</td><td>ELC IO is connected but unable to read/write</td></tr> <tr><td>230</td><td>Generic Modbus Slave Comm Loss</td></tr> <tr><td>231</td><td>Generic Modbus slave device is connected but read/write returned an error</td></tr> <tr><td>232</td><td>Logic Program accessing ELC IO but ELC IO not configured</td></tr> <tr><td>500</td><td>Internal - communication loss with Power Supply Board</td></tr> <tr><td>501</td><td>Internal - Power Supply Board is not responding to SPI</td></tr> <tr><td>502</td><td>Internal - Checksums in NV memory (FRAM) didn't match during read (neither pair)</td></tr> <tr><td>503</td><td>Internal - Checksums in NV memory (FRAM) didn't match during write (neither pair)</td></tr> <tr><td>504</td><td>Internal - RTC / Backup Memory Option Card is missing</td></tr> <tr><td>505</td><td>Internal - RTC / Backup Memory Option Card does not match actual</td></tr> <tr><td>506</td><td>Internal - RTC / Backup Memory Option Card has NV Fault.</td></tr> <tr><td>507</td><td>Internal - serial flash memory fault (Attempt Factory Reset first. Return to manufacturer if not cleared)</td></tr> <tr><td>508</td><td>Internal - logic mapping error (Attempt factory reset)</td></tr> <tr><td>509</td><td>Internal - UI NV memory error</td></tr> <tr><td>510</td><td>Internal - Option card NV memory error</td></tr> <tr><td>511</td><td>Internal - GFM NV memory error</td></tr> <tr><td>1000</td><td>Logic User Fault 1</td></tr> <tr><td>1001</td><td>Logic User Fault 2</td></tr> <tr><td>1002</td><td>Logic User Fault 3</td></tr> <tr><td>1003</td><td>Logic User Fault 4</td></tr> <tr><td>1004</td><td>Logic User Fault 5</td></tr> <tr><td>1005</td><td>Logic User Fault 6</td></tr> <tr><td>1006</td><td>Logic User Fault 7</td></tr> <tr><td>1007</td><td>Logic User Fault 8</td></tr> <tr><td>1008</td><td>Logic User Fault 9</td></tr> <tr><td>1009</td><td>Logic User Fault 10</td></tr> <tr><td>1010</td><td>Logic User Fault 11</td></tr> <tr><td>1011</td><td>Logic User Fault 12</td></tr> <tr><td>1012</td><td>Logic User Fault 13</td></tr> <tr><td>1013</td><td>Logic User Fault 14</td></tr> <tr><td>1014</td><td>Logic User Fault 15</td></tr> <tr><td>1015</td><td>Logic User Fault 16</td></tr> <tr><td>1016</td><td>Logic User Fault 17</td></tr> <tr><td>1017</td><td>Logic User Fault 18</td></tr> <tr><td>1018</td><td>Logic User Fault 19</td></tr> <tr><td>1019</td><td>Logic User Fault 20</td></tr> <tr><td>1020</td><td>Logic User Fault 21</td></tr> </tbody> </table> | Value | Description | 227 | Logic math - overflow | 228 | ELC IO Comm Loss | 229 | ELC IO is connected but unable to read/write | 230 | Generic Modbus Slave Comm Loss | 231 | Generic Modbus slave device is connected but read/write returned an error | 232 | Logic Program accessing ELC IO but ELC IO not configured | 500 | Internal - communication loss with Power Supply Board | 501 | Internal - Power Supply Board is not responding to SPI | 502 | Internal - Checksums in NV memory (FRAM) didn't match during read (neither pair) | 503 | Internal - Checksums in NV memory (FRAM) didn't match during write (neither pair) | 504 | Internal - RTC / Backup Memory Option Card is missing | 505 | Internal - RTC / Backup Memory Option Card does not match actual | 506 | Internal - RTC / Backup Memory Option Card has NV Fault. | 507 | Internal - serial flash memory fault (Attempt Factory Reset first. Return to manufacturer if not cleared) | 508 | Internal - logic mapping error (Attempt factory reset) | 509 | Internal - UI NV memory error | 510 | Internal - Option card NV memory error | 511 | Internal - GFM NV memory error | 1000 | Logic User Fault 1 | 1001 | Logic User Fault 2 | 1002 | Logic User Fault 3 | 1003 | Logic User Fault 4 | 1004 | Logic User Fault 5 | 1005 | Logic User Fault 6 | 1006 | Logic User Fault 7 | 1007 | Logic User Fault 8 | 1008 | Logic User Fault 9 | 1009 | Logic User Fault 10 | 1010 | Logic User Fault 11 | 1011 | Logic User Fault 12 | 1012 | Logic User Fault 13 | 1013 | Logic User Fault 14 | 1014 | Logic User Fault 15 | 1015 | Logic User Fault 16 | 1016 | Logic User Fault 17 | 1017 | Logic User Fault 18 | 1018 | Logic User Fault 19 | 1019 | Logic User Fault 20 | 1020 | Logic User Fault 21 |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 227 | Logic math - overflow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 228 | ELC IO Comm Loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 229 | ELC IO is connected but unable to read/write | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 230 | Generic Modbus Slave Comm Loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 231 | Generic Modbus slave device is connected but read/write returned an error | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 232 | Logic Program accessing ELC IO but ELC IO not configured | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 500 | Internal - communication loss with Power Supply Board | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 501 | Internal - Power Supply Board is not responding to SPI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 502 | Internal - Checksums in NV memory (FRAM) didn't match during read (neither pair) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 503 | Internal - Checksums in NV memory (FRAM) didn't match during write (neither pair) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 504 | Internal - RTC / Backup Memory Option Card is missing | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 505 | Internal - RTC / Backup Memory Option Card does not match actual | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 506 | Internal - RTC / Backup Memory Option Card has NV Fault. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 507 | Internal - serial flash memory fault (Attempt Factory Reset first. Return to manufacturer if not cleared) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 508 | Internal - logic mapping error (Attempt factory reset) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 509 | Internal - UI NV memory error | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 510 | Internal - Option card NV memory error | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 511 | Internal - GFM NV memory error | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1000 | Logic User Fault 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1001 | Logic User Fault 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1002 | Logic User Fault 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1003 | Logic User Fault 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1004 | Logic User Fault 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1005 | Logic User Fault 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1006 | Logic User Fault 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1007 | Logic User Fault 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1008 | Logic User Fault 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1009 | Logic User Fault 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1010 | Logic User Fault 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1011 | Logic User Fault 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1012 | Logic User Fault 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1013 | Logic User Fault 14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1014 | Logic User Fault 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1015 | Logic User Fault 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1016 | Logic User Fault 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1017 | Logic User Fault 18 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1018 | Logic User Fault 19 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1019 | Logic User Fault 20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1020 | Logic User Fault 21 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---------------------------|---------------------------------------|---|-------|-------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|
| 1200 | Fault Queue - Event Order | UINT16 RO Array size: 10 Enum | A List of the Last 10 Faults Shown in the Order They Occurred. Duplicates are allowed and the most recent is at the top, continued. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>1021</td><td>Logic User Fault 22</td></tr> <tr><td>1022</td><td>Logic User Fault 23</td></tr> <tr><td>1023</td><td>Logic User Fault 24</td></tr> <tr><td>1024</td><td>Logic User Fault 25</td></tr> <tr><td>1025</td><td>Logic User Fault 26</td></tr> <tr><td>1026</td><td>Logic User Fault 27</td></tr> <tr><td>1027</td><td>Logic User Fault 28</td></tr> <tr><td>1028</td><td>Logic User Fault 29</td></tr> <tr><td>1029</td><td>Logic User Fault 30</td></tr> <tr><td>1030</td><td>Logic User Fault 31</td></tr> <tr><td>1031</td><td>Logic User Fault 32</td></tr> <tr><td>1032</td><td>Logic User Fault 33</td></tr> <tr><td>1033</td><td>Logic User Fault 34</td></tr> <tr><td>1034</td><td>Logic User Fault 35</td></tr> <tr><td>1035</td><td>Logic User Fault 36</td></tr> <tr><td>1036</td><td>Logic User Fault 37</td></tr> <tr><td>1037</td><td>Logic User Fault 38</td></tr> <tr><td>1038</td><td>Logic User Fault 39</td></tr> <tr><td>1039</td><td>Logic User Fault 40</td></tr> <tr><td>1040</td><td>Logic User Fault 41</td></tr> <tr><td>1041</td><td>Logic User Fault 42</td></tr> <tr><td>1042</td><td>Logic User Fault 43</td></tr> <tr><td>1043</td><td>Logic User Fault 44</td></tr> <tr><td>1044</td><td>Logic User Fault 45</td></tr> <tr><td>1045</td><td>Logic User Fault 46</td></tr> <tr><td>1046</td><td>Logic User Fault 47</td></tr> <tr><td>1047</td><td>Logic User Fault 48</td></tr> <tr><td>1048</td><td>Logic User Fault 49</td></tr> <tr><td>1049</td><td>Logic User Fault 50</td></tr> </tbody> </table> | Value | Description | 1021 | Logic User Fault 22 | 1022 | Logic User Fault 23 | 1023 | Logic User Fault 24 | 1024 | Logic User Fault 25 | 1025 | Logic User Fault 26 | 1026 | Logic User Fault 27 | 1027 | Logic User Fault 28 | 1028 | Logic User Fault 29 | 1029 | Logic User Fault 30 | 1030 | Logic User Fault 31 | 1031 | Logic User Fault 32 | 1032 | Logic User Fault 33 | 1033 | Logic User Fault 34 | 1034 | Logic User Fault 35 | 1035 | Logic User Fault 36 | 1036 | Logic User Fault 37 | 1037 | Logic User Fault 38 | 1038 | Logic User Fault 39 | 1039 | Logic User Fault 40 | 1040 | Logic User Fault 41 | 1041 | Logic User Fault 42 | 1042 | Logic User Fault 43 | 1043 | Logic User Fault 44 | 1044 | Logic User Fault 45 | 1045 | Logic User Fault 46 | 1046 | Logic User Fault 47 | 1047 | Logic User Fault 48 | 1048 | Logic User Fault 49 | 1049 | Logic User Fault 50 |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1021 | Logic User Fault 22 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1022 | Logic User Fault 23 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1023 | Logic User Fault 24 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1024 | Logic User Fault 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1025 | Logic User Fault 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1026 | Logic User Fault 27 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1027 | Logic User Fault 28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1028 | Logic User Fault 29 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1029 | Logic User Fault 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1030 | Logic User Fault 31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1031 | Logic User Fault 32 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1032 | Logic User Fault 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1033 | Logic User Fault 34 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1034 | Logic User Fault 35 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1035 | Logic User Fault 36 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1036 | Logic User Fault 37 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1037 | Logic User Fault 38 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1038 | Logic User Fault 39 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1039 | Logic User Fault 40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1040 | Logic User Fault 41 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1041 | Logic User Fault 42 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1042 | Logic User Fault 43 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1043 | Logic User Fault 44 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1044 | Logic User Fault 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1045 | Logic User Fault 46 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1046 | Logic User Fault 47 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1047 | Logic User Fault 48 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1048 | Logic User Fault 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1049 | Logic User Fault 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1300 | Snap Shot Year | UINT16 RO Default: 0 Backup Mem | Fault Snap Shot Log Year. The Year from the time stamp information when the last fault occurred. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1301 | Snap Shot Month | UINT8 RO Default: 0 Backup Mem | Fault Snap Shot Log Month. The Month from the time stamp information when the last fault occurred. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1302 | Snap Shot Day | UINT8 RO Default: 0 Backup Mem | Fault Snap Shot Log Day. The Day from the time stamp information when the last fault occurred. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1303 | Snap Shot Hour | UINT8 RO Default: 0 Backup Mem | Fault Snap Shot Log Hour. The Hour from the time stamp information when the last fault occurred. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1304 | Snap Shot Minute | UINT8 RO Default: 0 Backup Mem | Fault Snap Shot Log Minute. The Minute from the time stamp information when the last fault occurred. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--|---|---|-------|-------------|---|-----------|---|---------------|---|--------------|---|----------|---|----------------------|---|--------------------|---|-------------------|---|----------------------------|---|-----|---|--------------|----|--------------------|----|-------------------|----|--------------------------|----|--------------------------|----|---------------|----|------------|----|-----------|----|--------------------|----|----------|----|----------|----|-------|----|-------------------------|----|---------------------------------|----|-----------------------|----|--------------------------|----|---------------------------------------|----|--|----|--|----|-------------------------|----|---|----|---|----|--|----|--|----|---|----|---|----|---|
| 1305 | Snap Shot Second | UINT8 RO Default: 0 Backup Mem | Fault Snap Shot Log Second. The Seconds from the time stamp information when the last fault occurred. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1306 | Snap Shot Trip Reason | UINT16 RO Default: 0 Enum Backup Mem | The fault that caused the last trip. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>0</td><td>No Faults</td></tr> <tr><td>1</td><td>Under voltage</td></tr> <tr><td>2</td><td>Over voltage</td></tr> <tr><td>3</td><td>Reserved</td></tr> <tr><td>4</td><td>Ground current fault</td></tr> <tr><td>5</td><td>Current phase loss</td></tr> <tr><td>6</td><td>Current unbalance</td></tr> <tr><td>7</td><td>Instantaneous over current</td></tr> <tr><td>8</td><td>Jam</td></tr> <tr><td>9</td><td>PF Deviation</td></tr> <tr><td>10</td><td>Voltage phase loss</td></tr> <tr><td>11</td><td>Voltage unbalance</td></tr> <tr><td>12</td><td>Frequency deviation fast</td></tr> <tr><td>13</td><td>Frequency deviation slow</td></tr> <tr><td>14</td><td>Under current</td></tr> <tr><td>15</td><td>High power</td></tr> <tr><td>16</td><td>Low power</td></tr> <tr><td>17</td><td>Contactors failure</td></tr> <tr><td>18</td><td>Reserved</td></tr> <tr><td>19</td><td>Overload</td></tr> <tr><td>20</td><td>Stall</td></tr> <tr><td>21</td><td>Phase rotation mismatch</td></tr> <tr><td>22</td><td>PTC - See PTC State for details</td></tr> <tr><td>23</td><td>Under voltage restart</td></tr> <tr><td>24</td><td>Measurement Module fault</td></tr> <tr><td>25</td><td>Communication loss on active fieldbus</td></tr> <tr><td>26</td><td>Measurement Module not available or communication loss with the module</td></tr> <tr><td>27</td><td>User Interface not available or communication loss with the module</td></tr> <tr><td>28</td><td>Test trip was triggered</td></tr> <tr><td>29</td><td>Option Card not available or communication loss with the module</td></tr> <tr><td>30</td><td>RTC / Backup Memory Option Board NV memory fail</td></tr> <tr><td>31</td><td>Currently connected User Interface does not match with what was connected before</td></tr> <tr><td>32</td><td>Currently connected Measurement Module does not match with what was connected before</td></tr> <tr><td>33</td><td>Currently connected Option Card does not match with what was connected before</td></tr> <tr><td>34</td><td>Measurement Module firmware is incompatible</td></tr> <tr><td>35</td><td>User Interface firmware is incompatible</td></tr> </tbody> </table> | Value | Description | 0 | No Faults | 1 | Under voltage | 2 | Over voltage | 3 | Reserved | 4 | Ground current fault | 5 | Current phase loss | 6 | Current unbalance | 7 | Instantaneous over current | 8 | Jam | 9 | PF Deviation | 10 | Voltage phase loss | 11 | Voltage unbalance | 12 | Frequency deviation fast | 13 | Frequency deviation slow | 14 | Under current | 15 | High power | 16 | Low power | 17 | Contactors failure | 18 | Reserved | 19 | Overload | 20 | Stall | 21 | Phase rotation mismatch | 22 | PTC - See PTC State for details | 23 | Under voltage restart | 24 | Measurement Module fault | 25 | Communication loss on active fieldbus | 26 | Measurement Module not available or communication loss with the module | 27 | User Interface not available or communication loss with the module | 28 | Test trip was triggered | 29 | Option Card not available or communication loss with the module | 30 | RTC / Backup Memory Option Board NV memory fail | 31 | Currently connected User Interface does not match with what was connected before | 32 | Currently connected Measurement Module does not match with what was connected before | 33 | Currently connected Option Card does not match with what was connected before | 34 | Measurement Module firmware is incompatible | 35 | User Interface firmware is incompatible |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | No Faults | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Under voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Over voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Ground current fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Current phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Current unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Instantaneous over current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Jam | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | PF Deviation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Voltage phase loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Voltage unbalance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Frequency deviation fast | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Frequency deviation slow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Under current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | High power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Low power | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Contactors failure | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Overload | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Stall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | Phase rotation mismatch | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | PTC - See PTC State for details | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Under voltage restart | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | Measurement Module fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | Communication loss on active fieldbus | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | Measurement Module not available or communication loss with the module | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | User Interface not available or communication loss with the module | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | Test trip was triggered | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | Option Card not available or communication loss with the module | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | RTC / Backup Memory Option Board NV memory fail | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | Currently connected User Interface does not match with what was connected before | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | Currently connected Measurement Module does not match with what was connected before | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | Currently connected Option Card does not match with what was connected before | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | Measurement Module firmware is incompatible | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | User Interface firmware is incompatible | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|---|---|-------|-------------|----|---|----|--|----|--|----|--|----|--|----|---------------------------|----|------------------------------|----|--|----|---------------------------|-----|----------------------|-----|---------------------------|-----|----------------------------|-----|-----------------------------|-----|------------------------------|-----|-----------------------|-----|----------------------------|-----|---------------------------|-----|------------------------|-----|-----------------------|-----|---------------------|-----|---|-----|------------------------------------|-----|-----------------------------|-----|------------------------|-----|-----------------------|-----|------------------|-----|--|-----|--------------------------------|-----|---|-----|--|-----|---|-----|--|-----|--|-----|---|-----|---|-----|--|-----|--|-----|---|-----|--|
| 1306 | Snap Shot Trip Reason | UINT16 RO Default: 0 Enum Backup Mem | The fault that caused the last trip, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>36</td><td>Ethernet Option Card firmware is incompatible</td></tr> <tr><td>37</td><td>Profi Option Card firmware is incompatible</td></tr> <tr><td>38</td><td>Ground Fault Module firmware is incompatible</td></tr> <tr><td>39</td><td>External ground fault module not available or communication loss</td></tr> <tr><td>40</td><td>Currently connected Ground Fault Module does not match current configuration</td></tr> <tr><td>41</td><td>GFM CT connection is open</td></tr> <tr><td>42</td><td>GFM CT connection is shorted</td></tr> <tr><td>43</td><td>GFM CT input has no calibration values</td></tr> <tr><td>44</td><td>HRGF pulse detection trip</td></tr> <tr><td>200</td><td>Logic Internal Fault</td></tr> <tr><td>201</td><td>Logic call stack overflow</td></tr> <tr><td>202</td><td>Logic call stack underflow</td></tr> <tr><td>203</td><td>Logic memory read violation</td></tr> <tr><td>204</td><td>Logic memory write violation</td></tr> <tr><td>205</td><td>Logic invalid program</td></tr> <tr><td>206</td><td>Logic incompatible program</td></tr> <tr><td>207</td><td>Logic invalid instruction</td></tr> <tr><td>220</td><td>Logic program underrun</td></tr> <tr><td>221</td><td>Logic program overrun</td></tr> <tr><td>222</td><td>Logic task watchdog</td></tr> <tr><td>223</td><td>Logic instruction invalid instance number</td></tr> <tr><td>224</td><td>Logic instruction invalid argument</td></tr> <tr><td>225</td><td>Logic math - divide by zero</td></tr> <tr><td>226</td><td>Logic math - underflow</td></tr> <tr><td>227</td><td>Logic math - overflow</td></tr> <tr><td>228</td><td>ELC IO Comm Loss</td></tr> <tr><td>229</td><td>ELC IO is connected but unable to read/write</td></tr> <tr><td>230</td><td>Generic Modbus Slave Comm Loss</td></tr> <tr><td>231</td><td>Generic Modbus slave device is connected but read/write returned an error</td></tr> <tr><td>232</td><td>Logic Program accessing ELC IO but ELC IO not configured</td></tr> <tr><td>500</td><td>Internal - communication loss with Power Supply Board</td></tr> <tr><td>501</td><td>Internal - Power Supply Board is not responding to SPI</td></tr> <tr><td>502</td><td>Internal - Checksums in NV memory (FRAM) didn't match during read (neither pair)</td></tr> <tr><td>503</td><td>Internal - Checksums in NV memory (FRAM) didn't match during write (neither pair)</td></tr> <tr><td>504</td><td>Internal - RTC / Backup Memory Option Card is missing</td></tr> <tr><td>505</td><td>Internal - RTC / Backup Memory Option Card does not match actual</td></tr> <tr><td>506</td><td>Internal - RTC / Backup Memory Option Card has NV Fault.</td></tr> <tr><td>507</td><td>Internal - serial flash memory fault (Attempt Factory Reset first. Return to manufacturer if not cleared)</td></tr> <tr><td>508</td><td>Internal - logic mapping error (Attempt factory reset)</td></tr> </tbody> </table> | Value | Description | 36 | Ethernet Option Card firmware is incompatible | 37 | Profi Option Card firmware is incompatible | 38 | Ground Fault Module firmware is incompatible | 39 | External ground fault module not available or communication loss | 40 | Currently connected Ground Fault Module does not match current configuration | 41 | GFM CT connection is open | 42 | GFM CT connection is shorted | 43 | GFM CT input has no calibration values | 44 | HRGF pulse detection trip | 200 | Logic Internal Fault | 201 | Logic call stack overflow | 202 | Logic call stack underflow | 203 | Logic memory read violation | 204 | Logic memory write violation | 205 | Logic invalid program | 206 | Logic incompatible program | 207 | Logic invalid instruction | 220 | Logic program underrun | 221 | Logic program overrun | 222 | Logic task watchdog | 223 | Logic instruction invalid instance number | 224 | Logic instruction invalid argument | 225 | Logic math - divide by zero | 226 | Logic math - underflow | 227 | Logic math - overflow | 228 | ELC IO Comm Loss | 229 | ELC IO is connected but unable to read/write | 230 | Generic Modbus Slave Comm Loss | 231 | Generic Modbus slave device is connected but read/write returned an error | 232 | Logic Program accessing ELC IO but ELC IO not configured | 500 | Internal - communication loss with Power Supply Board | 501 | Internal - Power Supply Board is not responding to SPI | 502 | Internal - Checksums in NV memory (FRAM) didn't match during read (neither pair) | 503 | Internal - Checksums in NV memory (FRAM) didn't match during write (neither pair) | 504 | Internal - RTC / Backup Memory Option Card is missing | 505 | Internal - RTC / Backup Memory Option Card does not match actual | 506 | Internal - RTC / Backup Memory Option Card has NV Fault. | 507 | Internal - serial flash memory fault (Attempt Factory Reset first. Return to manufacturer if not cleared) | 508 | Internal - logic mapping error (Attempt factory reset) |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | Ethernet Option Card firmware is incompatible | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | Profi Option Card firmware is incompatible | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | Ground Fault Module firmware is incompatible | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | External ground fault module not available or communication loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | Currently connected Ground Fault Module does not match current configuration | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | GFM CT connection is open | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | GFM CT connection is shorted | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | GFM CT input has no calibration values | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | HRGF pulse detection trip | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 200 | Logic Internal Fault | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 201 | Logic call stack overflow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 202 | Logic call stack underflow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 203 | Logic memory read violation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 204 | Logic memory write violation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 205 | Logic invalid program | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 206 | Logic incompatible program | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 207 | Logic invalid instruction | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 220 | Logic program underrun | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 221 | Logic program overrun | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 222 | Logic task watchdog | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 223 | Logic instruction invalid instance number | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 224 | Logic instruction invalid argument | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 225 | Logic math - divide by zero | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 226 | Logic math - underflow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 227 | Logic math - overflow | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 228 | ELC IO Comm Loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 229 | ELC IO is connected but unable to read/write | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 230 | Generic Modbus Slave Comm Loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 231 | Generic Modbus slave device is connected but read/write returned an error | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 232 | Logic Program accessing ELC IO but ELC IO not configured | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 500 | Internal - communication loss with Power Supply Board | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 501 | Internal - Power Supply Board is not responding to SPI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 502 | Internal - Checksums in NV memory (FRAM) didn't match during read (neither pair) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 503 | Internal - Checksums in NV memory (FRAM) didn't match during write (neither pair) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 504 | Internal - RTC / Backup Memory Option Card is missing | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 505 | Internal - RTC / Backup Memory Option Card does not match actual | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 506 | Internal - RTC / Backup Memory Option Card has NV Fault. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 507 | Internal - serial flash memory fault (Attempt Factory Reset first. Return to manufacturer if not cleared) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 508 | Internal - logic mapping error (Attempt factory reset) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--|---|---|-------|-------------|-----|-------------------------------|-----|--|-----|--------------------------------|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|------|---------------------|
| 1306 | Snap Shot Trip Reason | UINT16 RO Default: 0 Enum Backup Mem | The fault that caused the last trip, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>509</td><td>Internal - UI NV memory error</td></tr> <tr><td>510</td><td>Internal - Option card NV memory error</td></tr> <tr><td>511</td><td>Internal - GFM NV memory error</td></tr> <tr><td>1000</td><td>Logic User Fault 1</td></tr> <tr><td>1001</td><td>Logic User Fault 2</td></tr> <tr><td>1002</td><td>Logic User Fault 3</td></tr> <tr><td>1003</td><td>Logic User Fault 4</td></tr> <tr><td>1004</td><td>Logic User Fault 5</td></tr> <tr><td>1005</td><td>Logic User Fault 6</td></tr> <tr><td>1006</td><td>Logic User Fault 7</td></tr> <tr><td>1007</td><td>Logic User Fault 8</td></tr> <tr><td>1008</td><td>Logic User Fault 9</td></tr> <tr><td>1009</td><td>Logic User Fault 10</td></tr> <tr><td>1010</td><td>Logic User Fault 11</td></tr> <tr><td>1011</td><td>Logic User Fault 12</td></tr> <tr><td>1012</td><td>Logic User Fault 13</td></tr> <tr><td>1013</td><td>Logic User Fault 14</td></tr> <tr><td>1014</td><td>Logic User Fault 15</td></tr> <tr><td>1015</td><td>Logic User Fault 16</td></tr> <tr><td>1016</td><td>Logic User Fault 17</td></tr> <tr><td>1017</td><td>Logic User Fault 18</td></tr> <tr><td>1018</td><td>Logic User Fault 19</td></tr> <tr><td>1019</td><td>Logic User Fault 20</td></tr> <tr><td>1020</td><td>Logic User Fault 21</td></tr> <tr><td>1021</td><td>Logic User Fault 22</td></tr> <tr><td>1022</td><td>Logic User Fault 23</td></tr> <tr><td>1023</td><td>Logic User Fault 24</td></tr> <tr><td>1024</td><td>Logic User Fault 25</td></tr> <tr><td>1025</td><td>Logic User Fault 26</td></tr> <tr><td>1026</td><td>Logic User Fault 27</td></tr> <tr><td>1027</td><td>Logic User Fault 28</td></tr> <tr><td>1028</td><td>Logic User Fault 29</td></tr> <tr><td>1029</td><td>Logic User Fault 30</td></tr> <tr><td>1030</td><td>Logic User Fault 31</td></tr> <tr><td>1031</td><td>Logic User Fault 32</td></tr> <tr><td>1032</td><td>Logic User Fault 33</td></tr> <tr><td>1033</td><td>Logic User Fault 34</td></tr> <tr><td>1034</td><td>Logic User Fault 35</td></tr> <tr><td>1035</td><td>Logic User Fault 36</td></tr> <tr><td>1036</td><td>Logic User Fault 37</td></tr> <tr><td>1037</td><td>Logic User Fault 38</td></tr> <tr><td>1038</td><td>Logic User Fault 39</td></tr> <tr><td>1039</td><td>Logic User Fault 40</td></tr> </tbody> </table> | Value | Description | 509 | Internal - UI NV memory error | 510 | Internal - Option card NV memory error | 511 | Internal - GFM NV memory error | 1000 | Logic User Fault 1 | 1001 | Logic User Fault 2 | 1002 | Logic User Fault 3 | 1003 | Logic User Fault 4 | 1004 | Logic User Fault 5 | 1005 | Logic User Fault 6 | 1006 | Logic User Fault 7 | 1007 | Logic User Fault 8 | 1008 | Logic User Fault 9 | 1009 | Logic User Fault 10 | 1010 | Logic User Fault 11 | 1011 | Logic User Fault 12 | 1012 | Logic User Fault 13 | 1013 | Logic User Fault 14 | 1014 | Logic User Fault 15 | 1015 | Logic User Fault 16 | 1016 | Logic User Fault 17 | 1017 | Logic User Fault 18 | 1018 | Logic User Fault 19 | 1019 | Logic User Fault 20 | 1020 | Logic User Fault 21 | 1021 | Logic User Fault 22 | 1022 | Logic User Fault 23 | 1023 | Logic User Fault 24 | 1024 | Logic User Fault 25 | 1025 | Logic User Fault 26 | 1026 | Logic User Fault 27 | 1027 | Logic User Fault 28 | 1028 | Logic User Fault 29 | 1029 | Logic User Fault 30 | 1030 | Logic User Fault 31 | 1031 | Logic User Fault 32 | 1032 | Logic User Fault 33 | 1033 | Logic User Fault 34 | 1034 | Logic User Fault 35 | 1035 | Logic User Fault 36 | 1036 | Logic User Fault 37 | 1037 | Logic User Fault 38 | 1038 | Logic User Fault 39 | 1039 | Logic User Fault 40 |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 509 | Internal - UI NV memory error | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 510 | Internal - Option card NV memory error | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 511 | Internal - GFM NV memory error | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1000 | Logic User Fault 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1001 | Logic User Fault 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1002 | Logic User Fault 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1003 | Logic User Fault 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1004 | Logic User Fault 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1005 | Logic User Fault 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1006 | Logic User Fault 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1007 | Logic User Fault 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1008 | Logic User Fault 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1009 | Logic User Fault 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1010 | Logic User Fault 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1011 | Logic User Fault 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1012 | Logic User Fault 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1013 | Logic User Fault 14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1014 | Logic User Fault 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1015 | Logic User Fault 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1016 | Logic User Fault 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1017 | Logic User Fault 18 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1018 | Logic User Fault 19 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1019 | Logic User Fault 20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1020 | Logic User Fault 21 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1021 | Logic User Fault 22 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1022 | Logic User Fault 23 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1023 | Logic User Fault 24 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1024 | Logic User Fault 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1025 | Logic User Fault 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1026 | Logic User Fault 27 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1027 | Logic User Fault 28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1028 | Logic User Fault 29 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1029 | Logic User Fault 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1030 | Logic User Fault 31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1031 | Logic User Fault 32 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1032 | Logic User Fault 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1033 | Logic User Fault 34 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1034 | Logic User Fault 35 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1035 | Logic User Fault 36 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1036 | Logic User Fault 37 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1037 | Logic User Fault 38 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1038 | Logic User Fault 39 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1039 | Logic User Fault 40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | |
|----------|---------------------------------|--|---|---------------------|
| 1306 | Snap Shot Trip Reason | UINT16 RO Default: 0 Enum Backup Mem | The fault that caused the last trip, continued. | |
| | | | Value | Description |
| | | | 1040 | Logic User Fault 41 |
| | | | 1041 | Logic User Fault 42 |
| | | | 1042 | Logic User Fault 43 |
| | | | 1043 | Logic User Fault 44 |
| | | | 1044 | Logic User Fault 45 |
| | | | 1045 | Logic User Fault 46 |
| | | | 1046 | Logic User Fault 47 |
| | | | 1047 | Logic User Fault 48 |
| 1048 | Logic User Fault 49 | | | |
| 1049 | Logic User Fault 50 | | | |
| 1307 | Snap Shot Thermal Capacity | UINT8 RO Default: 0 Backup Mem | Overload Thermal Capacity Percent at time of trip | |
| 1308 | Snap Shot I Phase A (L1) Scaled | UINT16 RO Default: 0 Units: scaled A Backup Mem | Phase A (L1) RMS current at time of trip. Scaled by parameter "I Scale Factor". | |
| 1309 | Snap Shot I Phase B (L2) Scaled | UINT16 RO Default: 0 Units: scaled A Backup Mem | Phase B (L2) RMS current at time of trip. Scaled by parameter "I Scale Factor". | |
| 1310 | Snap Shot I Phase C (L3) Scaled | UINT16 RO Default: 0 Units: scaled A Backup Mem | Phase C (L3) RMS current at time of trip. Scaled by parameter "I Scale Factor". | |
| 1311 | Snap Shot Voltage L1-L2 | UINT16 RO Default: 0 Units: V Backup Mem | Voltage AB (L1-L2) RMS volts at time of trip | |
| 1312 | Snap Shot Voltage L2-L3 | UINT16 RO Default: 0 Units: V Backup Mem | Voltage BC (L2-L3) RMS volts at time of trip | |
| 1313 | Snap Shot Voltage L3-L1 | UINT16 RO Default: 0 Units: V Backup Mem | Voltage CA (L3-L1) RMS volts at time of trip | |
| 1314 | Snap Shot Frequency Scaled | UINT16 RO Default: 0 Units: 0.01Hz Backup Mem | Line Frequency at time of trip. | |
| 1315 | Snap Shot Watts | SINT32 RO Default: 0 Units: W Backup Mem | Real Power at time of trip | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | |
|----------|---|---|---|-------|-------------|---|--------------------------|---|-------------------------|---|-------------------------|---|---------------------------|---|--------------------------|---|-------------------------|
| 1317 | Snap Shot VA | SINT32 RO Default: 0 Units: VA Backup Mem | Apparent Power at time of trip | | | | | | | | | | | | | | |
| 1319 | Snap Shot Power Factor Scaled | SINT16 RO Default: 0 Units: 0.01% Backup Mem | Power Factor at time of trip. | | | | | | | | | | | | | | |
| 1320 | Snap Shot Ground Fault Current RMS Scaled | UINT16 RO Default: 0 Units: scaled A Backup Mem | Ground Fault Current RMS at time of trip. Scaled by parameter "I Scale Factor". | | | | | | | | | | | | | | |
| 2001 | BCM 485 port mode | UINT8 RW NV Default: 0 Enum Config CRC Run Lock Admin Lock USB Lock Backup Mem | BCM 485 port mode. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Modbus Slave</td> </tr> <tr> <td>1</td> <td>ELC IO</td> </tr> <tr> <td>2</td> <td>Generic master</td> </tr> </tbody> </table> | Value | Description | 0 | Modbus Slave | 1 | ELC IO | 2 | Generic master | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | |
| 0 | Modbus Slave | | | | | | | | | | | | | | | | |
| 1 | ELC IO | | | | | | | | | | | | | | | | |
| 2 | Generic master | | | | | | | | | | | | | | | | |
| 2002 | ELC IO Modbus Address | UINT8 RW NV Default: 1 Range: 1 to 247 Config CRC Admin Lock USB Lock Backup Mem | Modbus Address for the communication link between Base Control Module's RS-485 port and the ELC Modbus IO. The address is loaded at startup. A power cycle is required for change in address to take effect. ELC IO Modbus Address | | | | | | | | | | | | | | |
| 2003 | External IO Modbus Baud Rate | UINT8 RW NV Default: 4 Enum Config CRC Admin Lock USB Lock Backup Mem | External IO Modbus Baud Rate. Selects the Modbus Baud Rate for the Base Control Module's RS-485 Modbus port. A power cycle is required for change in baud rate to take effect. 0 = 19200 baud, 1 = 9600 baud, 2 = 38400 baud, 3 = 57600 baud, 4 = 115200 baud. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>19200</td> </tr> <tr> <td>1</td> <td>9600</td> </tr> <tr> <td>2</td> <td>38400</td> </tr> <tr> <td>3</td> <td>57600</td> </tr> <tr> <td>4</td> <td>115200</td> </tr> </tbody> </table> | Value | Description | 0 | 19200 | 1 | 9600 | 2 | 38400 | 3 | 57600 | 4 | 115200 | | |
| Value | Description | | | | | | | | | | | | | | | | |
| 0 | 19200 | | | | | | | | | | | | | | | | |
| 1 | 9600 | | | | | | | | | | | | | | | | |
| 2 | 38400 | | | | | | | | | | | | | | | | |
| 3 | 57600 | | | | | | | | | | | | | | | | |
| 4 | 115200 | | | | | | | | | | | | | | | | |
| 2004 | External IO Modbus Parity and Stop Bits | UINT8 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | External IO Modbus Parity and Stop Bits. Selects the Modbus Parity and Stop Bits for the Base Control Module - ELC IO link. A power cycle is required for change to take effect. Note: No Parity, 1 stop bit is not valid when in MODBUS_ASCII_TX_MODE mode. 0 = Even Parity - 1 stop bit, 1 = Odd Parity - 1 stop bit, 2 = No Parity - 2 stop bits, 3 = Even Parity - 2 stop bits, 4 = Odd Parity - 2 stop bits, 5 = No Parity - 1 stop bit. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Even parity - 1 Stop bit</td> </tr> <tr> <td>1</td> <td>Odd parity - 1 Stop bit</td> </tr> <tr> <td>2</td> <td>No parity - 2 Stop bits</td> </tr> <tr> <td>3</td> <td>Even parity - 2 Stop bits</td> </tr> <tr> <td>4</td> <td>Odd parity - 2 Stop bits</td> </tr> <tr> <td>5</td> <td>No parity - 1 Stop bits</td> </tr> </tbody> </table> | Value | Description | 0 | Even parity - 1 Stop bit | 1 | Odd parity - 1 Stop bit | 2 | No parity - 2 Stop bits | 3 | Even parity - 2 Stop bits | 4 | Odd parity - 2 Stop bits | 5 | No parity - 1 Stop bits |
| Value | Description | | | | | | | | | | | | | | | | |
| 0 | Even parity - 1 Stop bit | | | | | | | | | | | | | | | | |
| 1 | Odd parity - 1 Stop bit | | | | | | | | | | | | | | | | |
| 2 | No parity - 2 Stop bits | | | | | | | | | | | | | | | | |
| 3 | Even parity - 2 Stop bits | | | | | | | | | | | | | | | | |
| 4 | Odd parity - 2 Stop bits | | | | | | | | | | | | | | | | |
| 5 | No parity - 1 Stop bits | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | |
|----------|---|--|--|-------|-------------|---|-----------|----|---------------------|-----|---------------------|-----|---------------------|-----|---------------------|-----|---------------------|-----|---------------------|
| 2005 | ELC IO Number of digital | UINT8 RW NV Default: 0 Range: 0 to 128 Config CRC Admin Lock USB Lock Backup Mem | ELC IO Number of digital inputs ELC IO Number of digital inputs | | | | | | | | | | | | | | | | |
| 2006 | ELC IO Number of digital | UINT8 RW NV Default: 0 Range: 0 to 128 Config CRC Admin Lock USB Lock Backup Mem | ELC IO Number of digital outputs ELC IO Number of digital outputs | | | | | | | | | | | | | | | | |
| 2007 | ELC IO 1st Speciality Module Model Code | UINT16 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | ELC IO 1st Speciality Module Model Code <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No Module</td> </tr> <tr> <td>73</td> <td>(0x49) ELC-AN02NANN</td> </tr> <tr> <td>136</td> <td>(0x88) ELC-AN04ANNN</td> </tr> <tr> <td>137</td> <td>(0x89) ELC-AN04NANN</td> </tr> <tr> <td>138</td> <td>(0x8A) ELC-PT04ANNN</td> </tr> <tr> <td>139</td> <td>(0x8B) ELC-TC04ANNN</td> </tr> <tr> <td>204</td> <td>(0xCC) ELC-AN06AANN</td> </tr> </tbody> </table> | Value | Description | 0 | No Module | 73 | (0x49) ELC-AN02NANN | 136 | (0x88) ELC-AN04ANNN | 137 | (0x89) ELC-AN04NANN | 138 | (0x8A) ELC-PT04ANNN | 139 | (0x8B) ELC-TC04ANNN | 204 | (0xCC) ELC-AN06AANN |
| Value | Description | | | | | | | | | | | | | | | | | | |
| 0 | No Module | | | | | | | | | | | | | | | | | | |
| 73 | (0x49) ELC-AN02NANN | | | | | | | | | | | | | | | | | | |
| 136 | (0x88) ELC-AN04ANNN | | | | | | | | | | | | | | | | | | |
| 137 | (0x89) ELC-AN04NANN | | | | | | | | | | | | | | | | | | |
| 138 | (0x8A) ELC-PT04ANNN | | | | | | | | | | | | | | | | | | |
| 139 | (0x8B) ELC-TC04ANNN | | | | | | | | | | | | | | | | | | |
| 204 | (0xCC) ELC-AN06AANN | | | | | | | | | | | | | | | | | | |
| 2008 | ELC IO 2nd Speciality Module Model Code | UINT16 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | ELC IO 2nd Speciality Module Model Code <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No Module</td> </tr> <tr> <td>73</td> <td>(0x49) ELC-AN02NANN</td> </tr> <tr> <td>136</td> <td>(0x88) ELC-AN04ANNN</td> </tr> <tr> <td>137</td> <td>(0x89) ELC-AN04NANN</td> </tr> <tr> <td>138</td> <td>(0x8A) ELC-PT04ANNN</td> </tr> <tr> <td>139</td> <td>(0x8B) ELC-TC04ANNN</td> </tr> <tr> <td>204</td> <td>(0xCC) ELC-AN06AANN</td> </tr> </tbody> </table> | Value | Description | 0 | No Module | 73 | (0x49) ELC-AN02NANN | 136 | (0x88) ELC-AN04ANNN | 137 | (0x89) ELC-AN04NANN | 138 | (0x8A) ELC-PT04ANNN | 139 | (0x8B) ELC-TC04ANNN | 204 | (0xCC) ELC-AN06AANN |
| Value | Description | | | | | | | | | | | | | | | | | | |
| 0 | No Module | | | | | | | | | | | | | | | | | | |
| 73 | (0x49) ELC-AN02NANN | | | | | | | | | | | | | | | | | | |
| 136 | (0x88) ELC-AN04ANNN | | | | | | | | | | | | | | | | | | |
| 137 | (0x89) ELC-AN04NANN | | | | | | | | | | | | | | | | | | |
| 138 | (0x8A) ELC-PT04ANNN | | | | | | | | | | | | | | | | | | |
| 139 | (0x8B) ELC-TC04ANNN | | | | | | | | | | | | | | | | | | |
| 204 | (0xCC) ELC-AN06AANN | | | | | | | | | | | | | | | | | | |
| 2009 | ELC IO 3rd Speciality Module Model Code | UINT16 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | ELC IO 3rd Speciality Module Model Code <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No Module</td> </tr> <tr> <td>73</td> <td>(0x49) ELC-AN02NANN</td> </tr> <tr> <td>136</td> <td>(0x88) ELC-AN04ANNN</td> </tr> <tr> <td>137</td> <td>(0x89) ELC-AN04NANN</td> </tr> <tr> <td>138</td> <td>(0x8A) ELC-PT04ANNN</td> </tr> <tr> <td>139</td> <td>(0x8B) ELC-TC04ANNN</td> </tr> <tr> <td>204</td> <td>(0xCC) ELC-AN06AANN</td> </tr> </tbody> </table> | Value | Description | 0 | No Module | 73 | (0x49) ELC-AN02NANN | 136 | (0x88) ELC-AN04ANNN | 137 | (0x89) ELC-AN04NANN | 138 | (0x8A) ELC-PT04ANNN | 139 | (0x8B) ELC-TC04ANNN | 204 | (0xCC) ELC-AN06AANN |
| Value | Description | | | | | | | | | | | | | | | | | | |
| 0 | No Module | | | | | | | | | | | | | | | | | | |
| 73 | (0x49) ELC-AN02NANN | | | | | | | | | | | | | | | | | | |
| 136 | (0x88) ELC-AN04ANNN | | | | | | | | | | | | | | | | | | |
| 137 | (0x89) ELC-AN04NANN | | | | | | | | | | | | | | | | | | |
| 138 | (0x8A) ELC-PT04ANNN | | | | | | | | | | | | | | | | | | |
| 139 | (0x8B) ELC-TC04ANNN | | | | | | | | | | | | | | | | | | |
| 204 | (0xCC) ELC-AN06AANN | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | |
|----------|---|--|---|---------------------|
| 2010 | ELC IO 4th Speciality Module Model Code | UINT16 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | ELC IO 4th Speciality Module Model Code | |
| | | | Value | Description |
| | | | 0 | No Module |
| | | | 73 | (0x49) ELC-AN02NANN |
| | | | 136 | (0x88) ELC-AN04ANNN |
| | | | 137 | (0x89) ELC-AN04NANN |
| | | | 138 | (0x8A) ELC-PT04ANNN |
| | | | 139 | (0x8B) ELC-TC04ANNN |
| 204 | (0xCC) ELC-AN06AANN | | | |
| 2011 | ELC IO 5th Speciality Module Model Code | UINT16 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | ELC IO 5th Speciality Module Model Code | |
| | | | Value | Description |
| | | | 0 | No Module |
| | | | 73 | (0x49) ELC-AN02NANN |
| | | | 136 | (0x88) ELC-AN04ANNN |
| | | | 137 | (0x89) ELC-AN04NANN |
| | | | 138 | (0x8A) ELC-PT04ANNN |
| | | | 139 | (0x8B) ELC-TC04ANNN |
| 204 | (0xCC) ELC-AN06AANN | | | |
| 2012 | ELC IO 6th Speciality Module Model Code | UINT16 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | ELC IO 6th Speciality Module Model Code | |
| | | | Value | Description |
| | | | 0 | No Module |
| | | | 73 | (0x49) ELC-AN02NANN |
| | | | 136 | (0x88) ELC-AN04ANNN |
| | | | 137 | (0x89) ELC-AN04NANN |
| | | | 138 | (0x8A) ELC-PT04ANNN |
| | | | 139 | (0x8B) ELC-TC04ANNN |
| 204 | (0xCC) ELC-AN06AANN | | | |
| 2013 | ELC IO 7th Speciality Module Model Code | UINT16 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | ELC IO 7th Speciality Module Model Code | |
| | | | Value | Description |
| | | | 0 | No Module |
| | | | 73 | (0x49) ELC-AN02NANN |
| | | | 136 | (0x88) ELC-AN04ANNN |
| | | | 137 | (0x89) ELC-AN04NANN |
| | | | 138 | (0x8A) ELC-PT04ANNN |
| | | | 139 | (0x8B) ELC-TC04ANNN |
| 204 | (0xCC) ELC-AN06AANN | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|--|---|-------|-------------|------|-----------|------------------------------|---------------------|-----|------------------------------|-------|---------------------|------------------------------|---------------------|-----|------------------------------|-------|---------------------|------------------------------|-------|---|------------------------------|-------|---|------------------------------|-------|
| 2014 | ELC IO 8th Speciality Module Model Code | UINT16 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | ELC IO 8th Speciality Module Model Code <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No Module</td> </tr> <tr> <td>73</td> <td>(0x49) ELC-AN02NANN</td> </tr> <tr> <td>136</td> <td>(0x88) ELC-AN04ANNN</td> </tr> <tr> <td>137</td> <td>(0x89) ELC-AN04NANN</td> </tr> <tr> <td>138</td> <td>(0x8A) ELC-PT04ANNN</td> </tr> <tr> <td>139</td> <td>(0x8B) ELC-TC04ANNN</td> </tr> <tr> <td>204</td> <td>(0xCC) ELC-AN06AANN</td> </tr> </tbody> </table> | Value | Description | 0 | No Module | 73 | (0x49) ELC-AN02NANN | 136 | (0x88) ELC-AN04ANNN | 137 | (0x89) ELC-AN04NANN | 138 | (0x8A) ELC-PT04ANNN | 139 | (0x8B) ELC-TC04ANNN | 204 | (0xCC) ELC-AN06AANN | | | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | No Module | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 73 | (0x49) ELC-AN02NANN | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 136 | (0x88) ELC-AN04ANNN | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 137 | (0x89) ELC-AN04NANN | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 138 | (0x8A) ELC-PT04ANNN | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 139 | (0x8B) ELC-TC04ANNN | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 204 | (0xCC) ELC-AN06AANN | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2015 | ELC IO Passthrough Speciality Module 1 | UINT16 RW NV Array size: 30 Default: 0 Backup Mem | ELC IO Passthrough Speciality Module 1 Array of 30 registers ELC IO Passthrough Speciality Module 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2045 | ELC IO Passthrough Speciality Module 2 | UINT16 RW NV Array size: 30 Default: 0 Backup Mem | ELC IO Passthrough Speciality Module 2 Array of 30 registers ELC IO Passthrough Speciality Module 2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2075 | ELC IO Passthrough Speciality Module 3 | UINT16 RW NV Array size: 30 Default: 0 Backup Mem | ELC IO Passthrough Speciality Module 3 Array of 30 registers ELC IO Passthrough Speciality Module 3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2105 | ELC IO Passthrough Speciality Module 4 | UINT16 RW NV Array size: 30 Default: 0 Backup Mem | ELC IO Passthrough Speciality Module 4 Array of 30 registers ELC IO Passthrough Speciality Module 4 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2135 | ELC IO Passthrough Speciality Module 5 | UINT16 RW NV Array size: 30 Default: 0 Backup Mem | ELC IO Passthrough Speciality Module 5 Array of 30 registers ELC IO Passthrough Speciality Module 5 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2165 | ELC IO Passthrough Speciality Module 6 | UINT16 RW NV Array size: 30 Default: 0 Backup Mem | ELC IO Passthrough Speciality Module 6 Array of 30 registers ELC IO Passthrough Speciality Module 6 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2195 | ELC IO Passthrough Speciality Module 7 | UINT16 RW NV Array size: 30 Default: 0 Backup Mem | ELC IO Passthrough Speciality Module 7 Array of 30 registers ELC IO Passthrough Speciality Module 7 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2225 | ELC IO Passthrough Speciality Module 8 | UINT16 RW NV Array size: 30 Default: 0 Backup Mem | ELC IO Passthrough Speciality Module 8 Array of 30 registers ELC IO Passthrough Speciality Module 8 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2255 | ELC IO Passthrough Digital In | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Passthrough Digital In. <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>ELC Passthrough dig In x0(0)</td> <td>36065</td> </tr> <tr> <td>1</td> <td>ELC Passthrough dig In x1(1)</td> <td>36066</td> </tr> <tr> <td>2</td> <td>ELC Passthrough dig In x2(2)</td> <td>36067</td> </tr> <tr> <td>3</td> <td>ELC Passthrough dig In x3(3)</td> <td>36068</td> </tr> <tr> <td>4</td> <td>ELC Passthrough dig In x4(4)</td> <td>36069</td> </tr> <tr> <td>5</td> <td>ELC Passthrough dig In x5(5)</td> <td>36070</td> </tr> <tr> <td>6</td> <td>ELC Passthrough dig In x6(6)</td> <td>36071</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | ELC Passthrough dig In x0(0) | 36065 | 1 | ELC Passthrough dig In x1(1) | 36066 | 2 | ELC Passthrough dig In x2(2) | 36067 | 3 | ELC Passthrough dig In x3(3) | 36068 | 4 | ELC Passthrough dig In x4(4) | 36069 | 5 | ELC Passthrough dig In x5(5) | 36070 | 6 | ELC Passthrough dig In x6(6) | 36071 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | ELC Passthrough dig In x0(0) | 36065 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | ELC Passthrough dig In x1(1) | 36066 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | ELC Passthrough dig In x2(2) | 36067 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | ELC Passthrough dig In x3(3) | 36068 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | ELC Passthrough dig In x4(4) | 36069 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | ELC Passthrough dig In x5(5) | 36070 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | ELC Passthrough dig In x6(6) | 36071 | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--------------------------------|---|---|-----|-------------|------|---|------------------------------|-------|---|-------------------------------|-------|---|-------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|
| 2255 | ELC IO Passthrough Digital In | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Passthrough Digital In, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>7</td><td>ELC Passthrough dig In x7(7)</td><td>36072</td></tr> <tr><td>8</td><td>ELC Passthrough dig In x10(8)</td><td>36073</td></tr> <tr><td>9</td><td>ELC Passthrough dig In x11(9)</td><td>36074</td></tr> <tr><td>10</td><td>ELC Passthrough dig In x12(10)</td><td>36075</td></tr> <tr><td>11</td><td>ELC Passthrough dig In x13(11)</td><td>36076</td></tr> <tr><td>12</td><td>ELC Passthrough dig In x14(12)</td><td>36077</td></tr> <tr><td>13</td><td>ELC Passthrough dig In x15(13)</td><td>36078</td></tr> <tr><td>14</td><td>ELC Passthrough dig In x16(14)</td><td>36079</td></tr> <tr><td>15</td><td>ELC Passthrough dig In x17(15)</td><td>36080</td></tr> <tr><td>16</td><td>ELC Passthrough dig In x20(16)</td><td>36081</td></tr> <tr><td>17</td><td>ELC Passthrough dig In x21(17)</td><td>36082</td></tr> <tr><td>18</td><td>ELC Passthrough dig In x22(18)</td><td>36083</td></tr> <tr><td>19</td><td>ELC Passthrough dig In x23(19)</td><td>36084</td></tr> <tr><td>20</td><td>ELC Passthrough dig In x24(20)</td><td>36085</td></tr> <tr><td>21</td><td>ELC Passthrough dig In x25(21)</td><td>36086</td></tr> <tr><td>22</td><td>ELC Passthrough dig In x26(22)</td><td>36087</td></tr> <tr><td>23</td><td>ELC Passthrough dig In x27(23)</td><td>36088</td></tr> <tr><td>24</td><td>ELC Passthrough dig In x30(24)</td><td>36089</td></tr> <tr><td>25</td><td>ELC Passthrough dig In x31(25)</td><td>36090</td></tr> <tr><td>26</td><td>ELC Passthrough dig In x32(26)</td><td>36091</td></tr> <tr><td>27</td><td>ELC Passthrough dig In x33(27)</td><td>36092</td></tr> <tr><td>28</td><td>ELC Passthrough dig In x34(28)</td><td>36093</td></tr> <tr><td>29</td><td>ELC Passthrough dig In x35(29)</td><td>36094</td></tr> <tr><td>30</td><td>ELC Passthrough dig In x36(30)</td><td>36095</td></tr> <tr><td>31</td><td>ELC Passthrough dig In x37(31)</td><td>36096</td></tr> <tr><td>32</td><td>ELC Passthrough dig In x40(32)</td><td>36097</td></tr> <tr><td>33</td><td>ELC Passthrough dig In x41(33)</td><td>36098</td></tr> <tr><td>34</td><td>ELC Passthrough dig In x42(34)</td><td>36099</td></tr> <tr><td>35</td><td>ELC Passthrough dig In x43(35)</td><td>36100</td></tr> <tr><td>36</td><td>ELC Passthrough dig In x44(36)</td><td>36101</td></tr> <tr><td>37</td><td>ELC Passthrough dig In x45(37)</td><td>36102</td></tr> <tr><td>38</td><td>ELC Passthrough dig In x46(38)</td><td>36103</td></tr> <tr><td>39</td><td>ELC Passthrough dig In x47(39)</td><td>36104</td></tr> <tr><td>40</td><td>ELC Passthrough dig In x50(40)</td><td>36105</td></tr> <tr><td>41</td><td>ELC Passthrough dig In x51(41)</td><td>36106</td></tr> <tr><td>42</td><td>ELC Passthrough dig In x52(42)</td><td>36107</td></tr> <tr><td>43</td><td>ELC Passthrough dig In x53(43)</td><td>36108</td></tr> <tr><td>44</td><td>ELC Passthrough dig In x54(44)</td><td>36109</td></tr> <tr><td>45</td><td>ELC Passthrough dig In x55(45)</td><td>36110</td></tr> <tr><td>46</td><td>ELC Passthrough dig In x56(46)</td><td>36111</td></tr> <tr><td>47</td><td>ELC Passthrough dig In x57(47)</td><td>36112</td></tr> <tr><td>48</td><td>ELC Passthrough dig In x60(48)</td><td>36113</td></tr> <tr><td>49</td><td>ELC Passthrough dig In x61(49)</td><td>36114</td></tr> </tbody> </table> | Bit | Description | Coil | 7 | ELC Passthrough dig In x7(7) | 36072 | 8 | ELC Passthrough dig In x10(8) | 36073 | 9 | ELC Passthrough dig In x11(9) | 36074 | 10 | ELC Passthrough dig In x12(10) | 36075 | 11 | ELC Passthrough dig In x13(11) | 36076 | 12 | ELC Passthrough dig In x14(12) | 36077 | 13 | ELC Passthrough dig In x15(13) | 36078 | 14 | ELC Passthrough dig In x16(14) | 36079 | 15 | ELC Passthrough dig In x17(15) | 36080 | 16 | ELC Passthrough dig In x20(16) | 36081 | 17 | ELC Passthrough dig In x21(17) | 36082 | 18 | ELC Passthrough dig In x22(18) | 36083 | 19 | ELC Passthrough dig In x23(19) | 36084 | 20 | ELC Passthrough dig In x24(20) | 36085 | 21 | ELC Passthrough dig In x25(21) | 36086 | 22 | ELC Passthrough dig In x26(22) | 36087 | 23 | ELC Passthrough dig In x27(23) | 36088 | 24 | ELC Passthrough dig In x30(24) | 36089 | 25 | ELC Passthrough dig In x31(25) | 36090 | 26 | ELC Passthrough dig In x32(26) | 36091 | 27 | ELC Passthrough dig In x33(27) | 36092 | 28 | ELC Passthrough dig In x34(28) | 36093 | 29 | ELC Passthrough dig In x35(29) | 36094 | 30 | ELC Passthrough dig In x36(30) | 36095 | 31 | ELC Passthrough dig In x37(31) | 36096 | 32 | ELC Passthrough dig In x40(32) | 36097 | 33 | ELC Passthrough dig In x41(33) | 36098 | 34 | ELC Passthrough dig In x42(34) | 36099 | 35 | ELC Passthrough dig In x43(35) | 36100 | 36 | ELC Passthrough dig In x44(36) | 36101 | 37 | ELC Passthrough dig In x45(37) | 36102 | 38 | ELC Passthrough dig In x46(38) | 36103 | 39 | ELC Passthrough dig In x47(39) | 36104 | 40 | ELC Passthrough dig In x50(40) | 36105 | 41 | ELC Passthrough dig In x51(41) | 36106 | 42 | ELC Passthrough dig In x52(42) | 36107 | 43 | ELC Passthrough dig In x53(43) | 36108 | 44 | ELC Passthrough dig In x54(44) | 36109 | 45 | ELC Passthrough dig In x55(45) | 36110 | 46 | ELC Passthrough dig In x56(46) | 36111 | 47 | ELC Passthrough dig In x57(47) | 36112 | 48 | ELC Passthrough dig In x60(48) | 36113 | 49 | ELC Passthrough dig In x61(49) | 36114 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | ELC Passthrough dig In x7(7) | 36072 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | ELC Passthrough dig In x10(8) | 36073 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | ELC Passthrough dig In x11(9) | 36074 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | ELC Passthrough dig In x12(10) | 36075 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | ELC Passthrough dig In x13(11) | 36076 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | ELC Passthrough dig In x14(12) | 36077 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | ELC Passthrough dig In x15(13) | 36078 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | ELC Passthrough dig In x16(14) | 36079 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | ELC Passthrough dig In x17(15) | 36080 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | ELC Passthrough dig In x20(16) | 36081 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | ELC Passthrough dig In x21(17) | 36082 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | ELC Passthrough dig In x22(18) | 36083 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | ELC Passthrough dig In x23(19) | 36084 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | ELC Passthrough dig In x24(20) | 36085 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | ELC Passthrough dig In x25(21) | 36086 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | ELC Passthrough dig In x26(22) | 36087 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | ELC Passthrough dig In x27(23) | 36088 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | ELC Passthrough dig In x30(24) | 36089 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | ELC Passthrough dig In x31(25) | 36090 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | ELC Passthrough dig In x32(26) | 36091 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | ELC Passthrough dig In x33(27) | 36092 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | ELC Passthrough dig In x34(28) | 36093 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | ELC Passthrough dig In x35(29) | 36094 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | ELC Passthrough dig In x36(30) | 36095 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | ELC Passthrough dig In x37(31) | 36096 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | ELC Passthrough dig In x40(32) | 36097 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | ELC Passthrough dig In x41(33) | 36098 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | ELC Passthrough dig In x42(34) | 36099 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | ELC Passthrough dig In x43(35) | 36100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | ELC Passthrough dig In x44(36) | 36101 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | ELC Passthrough dig In x45(37) | 36102 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | ELC Passthrough dig In x46(38) | 36103 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | ELC Passthrough dig In x47(39) | 36104 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | ELC Passthrough dig In x50(40) | 36105 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | ELC Passthrough dig In x51(41) | 36106 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | ELC Passthrough dig In x52(42) | 36107 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | ELC Passthrough dig In x53(43) | 36108 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | ELC Passthrough dig In x54(44) | 36109 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 | ELC Passthrough dig In x55(45) | 36110 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | ELC Passthrough dig In x56(46) | 36111 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 | ELC Passthrough dig In x57(47) | 36112 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 48 | ELC Passthrough dig In x60(48) | 36113 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 49 | ELC Passthrough dig In x61(49) | 36114 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---------------------------------|---|---|-----|-------------|------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|--------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|
| 2255 | ELC IO Passthrough Digital In | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Passthrough Digital In, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>50</td><td>ELC Passthrough dig In x62(50)</td><td>36115</td></tr> <tr><td>51</td><td>ELC Passthrough dig In x63(51)</td><td>36116</td></tr> <tr><td>52</td><td>ELC Passthrough dig In x64(52)</td><td>36117</td></tr> <tr><td>53</td><td>ELC Passthrough dig In x65(53)</td><td>36118</td></tr> <tr><td>54</td><td>ELC Passthrough dig In x66(54)</td><td>36119</td></tr> <tr><td>55</td><td>ELC Passthrough dig In x67(55)</td><td>36120</td></tr> <tr><td>56</td><td>ELC Passthrough dig In x70(56)</td><td>36121</td></tr> <tr><td>57</td><td>ELC Passthrough dig In x71(57)</td><td>36122</td></tr> <tr><td>58</td><td>ELC Passthrough dig In x72(58)</td><td>36123</td></tr> <tr><td>59</td><td>ELC Passthrough dig In x73(59)</td><td>36124</td></tr> <tr><td>60</td><td>ELC Passthrough dig In x74(60)</td><td>36125</td></tr> <tr><td>61</td><td>ELC Passthrough dig In x75(61)</td><td>36126</td></tr> <tr><td>62</td><td>ELC Passthrough dig In x76(62)</td><td>36127</td></tr> <tr><td>63</td><td>ELC Passthrough dig In x77(63)</td><td>36128</td></tr> <tr><td>64</td><td>ELC Passthrough dig In x100(64)</td><td>36129</td></tr> <tr><td>65</td><td>ELC Passthrough dig In x101(65)</td><td>36130</td></tr> <tr><td>66</td><td>ELC Passthrough dig In x102(66)</td><td>36131</td></tr> <tr><td>67</td><td>ELC Passthrough dig In x103(67)</td><td>36132</td></tr> <tr><td>68</td><td>ELC Passthrough dig In x104(68)</td><td>36133</td></tr> <tr><td>69</td><td>ELC Passthrough dig In x105(69)</td><td>36134</td></tr> <tr><td>70</td><td>ELC Passthrough dig In x106(70)</td><td>36135</td></tr> <tr><td>71</td><td>ELC Passthrough dig In x107(71)</td><td>36136</td></tr> <tr><td>72</td><td>ELC Passthrough dig In x110(72)</td><td>36137</td></tr> <tr><td>73</td><td>ELC Passthrough dig In x111(73)</td><td>36138</td></tr> <tr><td>74</td><td>ELC Passthrough dig In x112(74)</td><td>36139</td></tr> <tr><td>75</td><td>ELC Passthrough dig In x113(75)</td><td>36140</td></tr> <tr><td>76</td><td>ELC Passthrough dig In x114(76)</td><td>36141</td></tr> <tr><td>77</td><td>ELC Passthrough dig In x115(77)</td><td>36142</td></tr> <tr><td>78</td><td>ELC Passthrough dig In x116(78)</td><td>36143</td></tr> <tr><td>79</td><td>ELC Passthrough dig In x117(79)</td><td>36144</td></tr> <tr><td>80</td><td>ELC Passthrough dig In x120(80)</td><td>36145</td></tr> <tr><td>81</td><td>ELC Passthrough dig In x121(81)</td><td>36146</td></tr> <tr><td>82</td><td>ELC Passthrough dig In x122(82)</td><td>36147</td></tr> <tr><td>83</td><td>ELC Passthrough dig In x123(83)</td><td>36148</td></tr> <tr><td>84</td><td>ELC Passthrough dig In x124(84)</td><td>36149</td></tr> <tr><td>85</td><td>ELC Passthrough dig In x125(85)</td><td>36150</td></tr> <tr><td>86</td><td>ELC Passthrough dig In x126(86)</td><td>36151</td></tr> <tr><td>87</td><td>ELC Passthrough dig In x127(87)</td><td>36152</td></tr> <tr><td>88</td><td>ELC Passthrough dig In x130(88)</td><td>36153</td></tr> <tr><td>89</td><td>ELC Passthrough dig In x131(89)</td><td>36154</td></tr> <tr><td>90</td><td>ELC Passthrough dig In x132(90)</td><td>36155</td></tr> <tr><td>91</td><td>ELC Passthrough dig In x133(91)</td><td>36156</td></tr> <tr><td>92</td><td>ELC Passthrough dig In x134(92)</td><td>36157</td></tr> </tbody> </table> | Bit | Description | Coil | 50 | ELC Passthrough dig In x62(50) | 36115 | 51 | ELC Passthrough dig In x63(51) | 36116 | 52 | ELC Passthrough dig In x64(52) | 36117 | 53 | ELC Passthrough dig In x65(53) | 36118 | 54 | ELC Passthrough dig In x66(54) | 36119 | 55 | ELC Passthrough dig In x67(55) | 36120 | 56 | ELC Passthrough dig In x70(56) | 36121 | 57 | ELC Passthrough dig In x71(57) | 36122 | 58 | ELC Passthrough dig In x72(58) | 36123 | 59 | ELC Passthrough dig In x73(59) | 36124 | 60 | ELC Passthrough dig In x74(60) | 36125 | 61 | ELC Passthrough dig In x75(61) | 36126 | 62 | ELC Passthrough dig In x76(62) | 36127 | 63 | ELC Passthrough dig In x77(63) | 36128 | 64 | ELC Passthrough dig In x100(64) | 36129 | 65 | ELC Passthrough dig In x101(65) | 36130 | 66 | ELC Passthrough dig In x102(66) | 36131 | 67 | ELC Passthrough dig In x103(67) | 36132 | 68 | ELC Passthrough dig In x104(68) | 36133 | 69 | ELC Passthrough dig In x105(69) | 36134 | 70 | ELC Passthrough dig In x106(70) | 36135 | 71 | ELC Passthrough dig In x107(71) | 36136 | 72 | ELC Passthrough dig In x110(72) | 36137 | 73 | ELC Passthrough dig In x111(73) | 36138 | 74 | ELC Passthrough dig In x112(74) | 36139 | 75 | ELC Passthrough dig In x113(75) | 36140 | 76 | ELC Passthrough dig In x114(76) | 36141 | 77 | ELC Passthrough dig In x115(77) | 36142 | 78 | ELC Passthrough dig In x116(78) | 36143 | 79 | ELC Passthrough dig In x117(79) | 36144 | 80 | ELC Passthrough dig In x120(80) | 36145 | 81 | ELC Passthrough dig In x121(81) | 36146 | 82 | ELC Passthrough dig In x122(82) | 36147 | 83 | ELC Passthrough dig In x123(83) | 36148 | 84 | ELC Passthrough dig In x124(84) | 36149 | 85 | ELC Passthrough dig In x125(85) | 36150 | 86 | ELC Passthrough dig In x126(86) | 36151 | 87 | ELC Passthrough dig In x127(87) | 36152 | 88 | ELC Passthrough dig In x130(88) | 36153 | 89 | ELC Passthrough dig In x131(89) | 36154 | 90 | ELC Passthrough dig In x132(90) | 36155 | 91 | ELC Passthrough dig In x133(91) | 36156 | 92 | ELC Passthrough dig In x134(92) | 36157 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | ELC Passthrough dig In x62(50) | 36115 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | ELC Passthrough dig In x63(51) | 36116 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 52 | ELC Passthrough dig In x64(52) | 36117 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 53 | ELC Passthrough dig In x65(53) | 36118 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | ELC Passthrough dig In x66(54) | 36119 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 55 | ELC Passthrough dig In x67(55) | 36120 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 56 | ELC Passthrough dig In x70(56) | 36121 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 57 | ELC Passthrough dig In x71(57) | 36122 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | ELC Passthrough dig In x72(58) | 36123 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 59 | ELC Passthrough dig In x73(59) | 36124 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | ELC Passthrough dig In x74(60) | 36125 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 61 | ELC Passthrough dig In x75(61) | 36126 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 62 | ELC Passthrough dig In x76(62) | 36127 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | ELC Passthrough dig In x77(63) | 36128 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 64 | ELC Passthrough dig In x100(64) | 36129 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65 | ELC Passthrough dig In x101(65) | 36130 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 66 | ELC Passthrough dig In x102(66) | 36131 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 67 | ELC Passthrough dig In x103(67) | 36132 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 68 | ELC Passthrough dig In x104(68) | 36133 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 69 | ELC Passthrough dig In x105(69) | 36134 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 70 | ELC Passthrough dig In x106(70) | 36135 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 71 | ELC Passthrough dig In x107(71) | 36136 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 72 | ELC Passthrough dig In x110(72) | 36137 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 73 | ELC Passthrough dig In x111(73) | 36138 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 74 | ELC Passthrough dig In x112(74) | 36139 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 75 | ELC Passthrough dig In x113(75) | 36140 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 76 | ELC Passthrough dig In x114(76) | 36141 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 77 | ELC Passthrough dig In x115(77) | 36142 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 78 | ELC Passthrough dig In x116(78) | 36143 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 79 | ELC Passthrough dig In x117(79) | 36144 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 80 | ELC Passthrough dig In x120(80) | 36145 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 81 | ELC Passthrough dig In x121(81) | 36146 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 82 | ELC Passthrough dig In x122(82) | 36147 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 83 | ELC Passthrough dig In x123(83) | 36148 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 84 | ELC Passthrough dig In x124(84) | 36149 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 85 | ELC Passthrough dig In x125(85) | 36150 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 86 | ELC Passthrough dig In x126(86) | 36151 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 87 | ELC Passthrough dig In x127(87) | 36152 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 88 | ELC Passthrough dig In x130(88) | 36153 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 89 | ELC Passthrough dig In x131(89) | 36154 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 90 | ELC Passthrough dig In x132(90) | 36155 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 91 | ELC Passthrough dig In x133(91) | 36156 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 92 | ELC Passthrough dig In x134(92) | 36157 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|----------------------------------|---|---|-----|-------------|------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|-----|----------------------------------|-------|
| 2255 | ELC IO Passthrough Digital In | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Passthrough Digital In, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>93</td><td>ELC Passthrough dig In x135(93)</td><td>36158</td></tr> <tr><td>94</td><td>ELC Passthrough dig In x136(94)</td><td>36159</td></tr> <tr><td>95</td><td>ELC Passthrough dig In x137(95)</td><td>36160</td></tr> <tr><td>96</td><td>ELC Passthrough dig In x140(96)</td><td>36161</td></tr> <tr><td>97</td><td>ELC Passthrough dig In x141(97)</td><td>36162</td></tr> <tr><td>98</td><td>ELC Passthrough dig In x142(98)</td><td>36163</td></tr> <tr><td>99</td><td>ELC Passthrough dig In x143(99)</td><td>36164</td></tr> <tr><td>100</td><td>ELC Passthrough dig In x144(100)</td><td>36165</td></tr> <tr><td>101</td><td>ELC Passthrough dig In x145(101)</td><td>36166</td></tr> <tr><td>102</td><td>ELC Passthrough dig In x146(102)</td><td>36167</td></tr> <tr><td>103</td><td>ELC Passthrough dig In x147(103)</td><td>36168</td></tr> <tr><td>104</td><td>ELC Passthrough dig In x150(104)</td><td>36169</td></tr> <tr><td>105</td><td>ELC Passthrough dig In x151(105)</td><td>36170</td></tr> <tr><td>106</td><td>ELC Passthrough dig In x152(106)</td><td>36171</td></tr> <tr><td>107</td><td>ELC Passthrough dig In x153(107)</td><td>36172</td></tr> <tr><td>108</td><td>ELC Passthrough dig In x154(108)</td><td>36173</td></tr> <tr><td>109</td><td>ELC Passthrough dig In x155(109)</td><td>36174</td></tr> <tr><td>110</td><td>ELC Passthrough dig In x156(110)</td><td>36175</td></tr> <tr><td>111</td><td>ELC Passthrough dig In x157(111)</td><td>36176</td></tr> <tr><td>112</td><td>ELC Passthrough dig In x160(112)</td><td>36177</td></tr> <tr><td>113</td><td>ELC Passthrough dig In x161(113)</td><td>36178</td></tr> <tr><td>114</td><td>ELC Passthrough dig In x162(114)</td><td>36179</td></tr> <tr><td>115</td><td>ELC Passthrough dig In x163(115)</td><td>36180</td></tr> <tr><td>116</td><td>ELC Passthrough dig In x164(116)</td><td>36181</td></tr> <tr><td>117</td><td>ELC Passthrough dig In x165(117)</td><td>36182</td></tr> <tr><td>118</td><td>ELC Passthrough dig In x166(118)</td><td>36183</td></tr> <tr><td>119</td><td>ELC Passthrough dig In x167(119)</td><td>36184</td></tr> <tr><td>120</td><td>ELC Passthrough dig In x170(120)</td><td>36185</td></tr> <tr><td>121</td><td>ELC Passthrough dig In x171(121)</td><td>36186</td></tr> <tr><td>122</td><td>ELC Passthrough dig In x172(122)</td><td>36187</td></tr> <tr><td>123</td><td>ELC Passthrough dig In x173(123)</td><td>36188</td></tr> <tr><td>124</td><td>ELC Passthrough dig In x174(124)</td><td>36189</td></tr> <tr><td>125</td><td>ELC Passthrough dig In x175(125)</td><td>36190</td></tr> <tr><td>126</td><td>ELC Passthrough dig In x176(126)</td><td>36191</td></tr> <tr><td>127</td><td>ELC Passthrough dig In x177(127)</td><td>36192</td></tr> </tbody> </table> | Bit | Description | Coil | 93 | ELC Passthrough dig In x135(93) | 36158 | 94 | ELC Passthrough dig In x136(94) | 36159 | 95 | ELC Passthrough dig In x137(95) | 36160 | 96 | ELC Passthrough dig In x140(96) | 36161 | 97 | ELC Passthrough dig In x141(97) | 36162 | 98 | ELC Passthrough dig In x142(98) | 36163 | 99 | ELC Passthrough dig In x143(99) | 36164 | 100 | ELC Passthrough dig In x144(100) | 36165 | 101 | ELC Passthrough dig In x145(101) | 36166 | 102 | ELC Passthrough dig In x146(102) | 36167 | 103 | ELC Passthrough dig In x147(103) | 36168 | 104 | ELC Passthrough dig In x150(104) | 36169 | 105 | ELC Passthrough dig In x151(105) | 36170 | 106 | ELC Passthrough dig In x152(106) | 36171 | 107 | ELC Passthrough dig In x153(107) | 36172 | 108 | ELC Passthrough dig In x154(108) | 36173 | 109 | ELC Passthrough dig In x155(109) | 36174 | 110 | ELC Passthrough dig In x156(110) | 36175 | 111 | ELC Passthrough dig In x157(111) | 36176 | 112 | ELC Passthrough dig In x160(112) | 36177 | 113 | ELC Passthrough dig In x161(113) | 36178 | 114 | ELC Passthrough dig In x162(114) | 36179 | 115 | ELC Passthrough dig In x163(115) | 36180 | 116 | ELC Passthrough dig In x164(116) | 36181 | 117 | ELC Passthrough dig In x165(117) | 36182 | 118 | ELC Passthrough dig In x166(118) | 36183 | 119 | ELC Passthrough dig In x167(119) | 36184 | 120 | ELC Passthrough dig In x170(120) | 36185 | 121 | ELC Passthrough dig In x171(121) | 36186 | 122 | ELC Passthrough dig In x172(122) | 36187 | 123 | ELC Passthrough dig In x173(123) | 36188 | 124 | ELC Passthrough dig In x174(124) | 36189 | 125 | ELC Passthrough dig In x175(125) | 36190 | 126 | ELC Passthrough dig In x176(126) | 36191 | 127 | ELC Passthrough dig In x177(127) | 36192 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 93 | ELC Passthrough dig In x135(93) | 36158 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 94 | ELC Passthrough dig In x136(94) | 36159 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 95 | ELC Passthrough dig In x137(95) | 36160 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 96 | ELC Passthrough dig In x140(96) | 36161 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 97 | ELC Passthrough dig In x141(97) | 36162 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 98 | ELC Passthrough dig In x142(98) | 36163 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 99 | ELC Passthrough dig In x143(99) | 36164 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 | ELC Passthrough dig In x144(100) | 36165 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 101 | ELC Passthrough dig In x145(101) | 36166 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 102 | ELC Passthrough dig In x146(102) | 36167 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 103 | ELC Passthrough dig In x147(103) | 36168 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 104 | ELC Passthrough dig In x150(104) | 36169 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 105 | ELC Passthrough dig In x151(105) | 36170 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 106 | ELC Passthrough dig In x152(106) | 36171 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 107 | ELC Passthrough dig In x153(107) | 36172 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 108 | ELC Passthrough dig In x154(108) | 36173 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 109 | ELC Passthrough dig In x155(109) | 36174 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 110 | ELC Passthrough dig In x156(110) | 36175 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 111 | ELC Passthrough dig In x157(111) | 36176 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 112 | ELC Passthrough dig In x160(112) | 36177 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 113 | ELC Passthrough dig In x161(113) | 36178 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 114 | ELC Passthrough dig In x162(114) | 36179 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 115 | ELC Passthrough dig In x163(115) | 36180 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 116 | ELC Passthrough dig In x164(116) | 36181 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 117 | ELC Passthrough dig In x165(117) | 36182 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 118 | ELC Passthrough dig In x166(118) | 36183 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 119 | ELC Passthrough dig In x167(119) | 36184 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 120 | ELC Passthrough dig In x170(120) | 36185 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 121 | ELC Passthrough dig In x171(121) | 36186 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 122 | ELC Passthrough dig In x172(122) | 36187 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 123 | ELC Passthrough dig In x173(123) | 36188 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 124 | ELC Passthrough dig In x174(124) | 36189 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 125 | ELC Passthrough dig In x175(125) | 36190 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 126 | ELC Passthrough dig In x176(126) | 36191 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 127 | ELC Passthrough dig In x177(127) | 36192 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2263 | ELC IO Passthrough Digital Out | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Passthrough Digital Out. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>0</td><td>ELC Passthrough dig Out x0(0)</td><td>36193</td></tr> <tr><td>1</td><td>ELC Passthrough dig Out x1(1)</td><td>36194</td></tr> <tr><td>2</td><td>ELC Passthrough dig Out x2(2)</td><td>36195</td></tr> <tr><td>3</td><td>ELC Passthrough dig Out x3(3)</td><td>36196</td></tr> <tr><td>4</td><td>ELC Passthrough dig Out x4(4)</td><td>36197</td></tr> </tbody> </table> | Bit | Description | Coil | 0 | ELC Passthrough dig Out x0(0) | 36193 | 1 | ELC Passthrough dig Out x1(1) | 36194 | 2 | ELC Passthrough dig Out x2(2) | 36195 | 3 | ELC Passthrough dig Out x3(3) | 36196 | 4 | ELC Passthrough dig Out x4(4) | 36197 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | ELC Passthrough dig Out x0(0) | 36193 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | ELC Passthrough dig Out x1(1) | 36194 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | ELC Passthrough dig Out x2(2) | 36195 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | ELC Passthrough dig Out x3(3) | 36196 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | ELC Passthrough dig Out x4(4) | 36197 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---------------------------------|---|--|-----|-------------|------|---|-------------------------------|-------|---|-------------------------------|-------|---|-------------------------------|-------|---|--------------------------------|-------|---|--------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|
| 2263 | ELC IO Passthrough Digital Out | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Passthrough Digital Out, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>5</td><td>ELC Passthrough dig Out x5(5)</td><td>36198</td></tr> <tr><td>6</td><td>ELC Passthrough dig Out x6(6)</td><td>36199</td></tr> <tr><td>7</td><td>ELC Passthrough dig Out x7(7)</td><td>36200</td></tr> <tr><td>8</td><td>ELC Passthrough dig Out x10(8)</td><td>36201</td></tr> <tr><td>9</td><td>ELC Passthrough dig Out x11(9)</td><td>36202</td></tr> <tr><td>10</td><td>ELC Passthrough dig Out x12(10)</td><td>36203</td></tr> <tr><td>11</td><td>ELC Passthrough dig Out x13(11)</td><td>36204</td></tr> <tr><td>12</td><td>ELC Passthrough dig Out x14(12)</td><td>36205</td></tr> <tr><td>13</td><td>ELC Passthrough dig Out x15(13)</td><td>36206</td></tr> <tr><td>14</td><td>ELC Passthrough dig Out x16(14)</td><td>36207</td></tr> <tr><td>15</td><td>ELC Passthrough dig Out x17(15)</td><td>36208</td></tr> <tr><td>16</td><td>ELC Passthrough dig Out x20(16)</td><td>36209</td></tr> <tr><td>17</td><td>ELC Passthrough dig Out x21(17)</td><td>36210</td></tr> <tr><td>18</td><td>ELC Passthrough dig Out x22(18)</td><td>36211</td></tr> <tr><td>19</td><td>ELC Passthrough dig Out x23(19)</td><td>36212</td></tr> <tr><td>20</td><td>ELC Passthrough dig Out x24(20)</td><td>36213</td></tr> <tr><td>21</td><td>ELC Passthrough dig Out x25(21)</td><td>36214</td></tr> <tr><td>22</td><td>ELC Passthrough dig Out x26(22)</td><td>36215</td></tr> <tr><td>23</td><td>ELC Passthrough dig Out x27(23)</td><td>36216</td></tr> <tr><td>24</td><td>ELC Passthrough dig Out x30(24)</td><td>36217</td></tr> <tr><td>25</td><td>ELC Passthrough dig Out x31(25)</td><td>36218</td></tr> <tr><td>26</td><td>ELC Passthrough dig Out x32(26)</td><td>36219</td></tr> <tr><td>27</td><td>ELC Passthrough dig Out x33(27)</td><td>36220</td></tr> <tr><td>28</td><td>ELC Passthrough dig Out x34(28)</td><td>36221</td></tr> <tr><td>29</td><td>ELC Passthrough dig Out x35(29)</td><td>36222</td></tr> <tr><td>30</td><td>ELC Passthrough dig Out x36(30)</td><td>36223</td></tr> <tr><td>31</td><td>ELC Passthrough dig Out x37(31)</td><td>36224</td></tr> <tr><td>32</td><td>ELC Passthrough dig Out x40(32)</td><td>36225</td></tr> <tr><td>33</td><td>ELC Passthrough dig Out x41(33)</td><td>36226</td></tr> <tr><td>34</td><td>ELC Passthrough dig Out x42(34)</td><td>36227</td></tr> <tr><td>35</td><td>ELC Passthrough dig Out x43(35)</td><td>36228</td></tr> <tr><td>36</td><td>ELC Passthrough dig Out x44(36)</td><td>36229</td></tr> <tr><td>37</td><td>ELC Passthrough dig Out x45(37)</td><td>36230</td></tr> <tr><td>38</td><td>ELC Passthrough dig Out x46(38)</td><td>36231</td></tr> <tr><td>39</td><td>ELC Passthrough dig Out x47(39)</td><td>36232</td></tr> <tr><td>40</td><td>ELC Passthrough dig Out x50(40)</td><td>36233</td></tr> <tr><td>41</td><td>ELC Passthrough dig Out x51(41)</td><td>36234</td></tr> <tr><td>42</td><td>ELC Passthrough dig Out x52(42)</td><td>36235</td></tr> <tr><td>43</td><td>ELC Passthrough dig Out x53(43)</td><td>36236</td></tr> <tr><td>44</td><td>ELC Passthrough dig Out x54(44)</td><td>36237</td></tr> <tr><td>45</td><td>ELC Passthrough dig Out x55(45)</td><td>36238</td></tr> <tr><td>46</td><td>ELC Passthrough dig Out x56(46)</td><td>36239</td></tr> <tr><td>47</td><td>ELC Passthrough dig Out x57(47)</td><td>36240</td></tr> </tbody> </table> | Bit | Description | Coil | 5 | ELC Passthrough dig Out x5(5) | 36198 | 6 | ELC Passthrough dig Out x6(6) | 36199 | 7 | ELC Passthrough dig Out x7(7) | 36200 | 8 | ELC Passthrough dig Out x10(8) | 36201 | 9 | ELC Passthrough dig Out x11(9) | 36202 | 10 | ELC Passthrough dig Out x12(10) | 36203 | 11 | ELC Passthrough dig Out x13(11) | 36204 | 12 | ELC Passthrough dig Out x14(12) | 36205 | 13 | ELC Passthrough dig Out x15(13) | 36206 | 14 | ELC Passthrough dig Out x16(14) | 36207 | 15 | ELC Passthrough dig Out x17(15) | 36208 | 16 | ELC Passthrough dig Out x20(16) | 36209 | 17 | ELC Passthrough dig Out x21(17) | 36210 | 18 | ELC Passthrough dig Out x22(18) | 36211 | 19 | ELC Passthrough dig Out x23(19) | 36212 | 20 | ELC Passthrough dig Out x24(20) | 36213 | 21 | ELC Passthrough dig Out x25(21) | 36214 | 22 | ELC Passthrough dig Out x26(22) | 36215 | 23 | ELC Passthrough dig Out x27(23) | 36216 | 24 | ELC Passthrough dig Out x30(24) | 36217 | 25 | ELC Passthrough dig Out x31(25) | 36218 | 26 | ELC Passthrough dig Out x32(26) | 36219 | 27 | ELC Passthrough dig Out x33(27) | 36220 | 28 | ELC Passthrough dig Out x34(28) | 36221 | 29 | ELC Passthrough dig Out x35(29) | 36222 | 30 | ELC Passthrough dig Out x36(30) | 36223 | 31 | ELC Passthrough dig Out x37(31) | 36224 | 32 | ELC Passthrough dig Out x40(32) | 36225 | 33 | ELC Passthrough dig Out x41(33) | 36226 | 34 | ELC Passthrough dig Out x42(34) | 36227 | 35 | ELC Passthrough dig Out x43(35) | 36228 | 36 | ELC Passthrough dig Out x44(36) | 36229 | 37 | ELC Passthrough dig Out x45(37) | 36230 | 38 | ELC Passthrough dig Out x46(38) | 36231 | 39 | ELC Passthrough dig Out x47(39) | 36232 | 40 | ELC Passthrough dig Out x50(40) | 36233 | 41 | ELC Passthrough dig Out x51(41) | 36234 | 42 | ELC Passthrough dig Out x52(42) | 36235 | 43 | ELC Passthrough dig Out x53(43) | 36236 | 44 | ELC Passthrough dig Out x54(44) | 36237 | 45 | ELC Passthrough dig Out x55(45) | 36238 | 46 | ELC Passthrough dig Out x56(46) | 36239 | 47 | ELC Passthrough dig Out x57(47) | 36240 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | ELC Passthrough dig Out x5(5) | 36198 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | ELC Passthrough dig Out x6(6) | 36199 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | ELC Passthrough dig Out x7(7) | 36200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | ELC Passthrough dig Out x10(8) | 36201 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | ELC Passthrough dig Out x11(9) | 36202 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | ELC Passthrough dig Out x12(10) | 36203 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | ELC Passthrough dig Out x13(11) | 36204 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | ELC Passthrough dig Out x14(12) | 36205 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | ELC Passthrough dig Out x15(13) | 36206 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | ELC Passthrough dig Out x16(14) | 36207 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | ELC Passthrough dig Out x17(15) | 36208 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | ELC Passthrough dig Out x20(16) | 36209 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | ELC Passthrough dig Out x21(17) | 36210 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | ELC Passthrough dig Out x22(18) | 36211 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | ELC Passthrough dig Out x23(19) | 36212 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | ELC Passthrough dig Out x24(20) | 36213 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | ELC Passthrough dig Out x25(21) | 36214 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | ELC Passthrough dig Out x26(22) | 36215 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | ELC Passthrough dig Out x27(23) | 36216 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | ELC Passthrough dig Out x30(24) | 36217 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | ELC Passthrough dig Out x31(25) | 36218 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | ELC Passthrough dig Out x32(26) | 36219 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | ELC Passthrough dig Out x33(27) | 36220 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | ELC Passthrough dig Out x34(28) | 36221 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | ELC Passthrough dig Out x35(29) | 36222 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | ELC Passthrough dig Out x36(30) | 36223 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | ELC Passthrough dig Out x37(31) | 36224 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | ELC Passthrough dig Out x40(32) | 36225 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | ELC Passthrough dig Out x41(33) | 36226 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | ELC Passthrough dig Out x42(34) | 36227 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | ELC Passthrough dig Out x43(35) | 36228 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | ELC Passthrough dig Out x44(36) | 36229 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | ELC Passthrough dig Out x45(37) | 36230 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | ELC Passthrough dig Out x46(38) | 36231 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | ELC Passthrough dig Out x47(39) | 36232 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | ELC Passthrough dig Out x50(40) | 36233 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | ELC Passthrough dig Out x51(41) | 36234 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | ELC Passthrough dig Out x52(42) | 36235 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | ELC Passthrough dig Out x53(43) | 36236 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | ELC Passthrough dig Out x54(44) | 36237 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 | ELC Passthrough dig Out x55(45) | 36238 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | ELC Passthrough dig Out x56(46) | 36239 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 | ELC Passthrough dig Out x57(47) | 36240 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|----------------------------------|---|--|-----|-------------|------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|
| 2263 | ELC IO Passthrough Digital Out | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Passthrough Digital Out, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>48</td><td>ELC Passthrough dig Out x60(48)</td><td>36241</td></tr> <tr><td>49</td><td>ELC Passthrough dig Out x61(49)</td><td>36242</td></tr> <tr><td>50</td><td>ELC Passthrough dig Out x62(50)</td><td>36243</td></tr> <tr><td>51</td><td>ELC Passthrough dig Out x63(51)</td><td>36244</td></tr> <tr><td>52</td><td>ELC Passthrough dig Out x64(52)</td><td>36245</td></tr> <tr><td>53</td><td>ELC Passthrough dig Out x65(53)</td><td>36246</td></tr> <tr><td>54</td><td>ELC Passthrough dig Out x66(54)</td><td>36247</td></tr> <tr><td>55</td><td>ELC Passthrough dig Out x67(55)</td><td>36248</td></tr> <tr><td>56</td><td>ELC Passthrough dig Out x70(56)</td><td>36249</td></tr> <tr><td>57</td><td>ELC Passthrough dig Out x71(57)</td><td>36250</td></tr> <tr><td>58</td><td>ELC Passthrough dig Out x72(58)</td><td>36251</td></tr> <tr><td>59</td><td>ELC Passthrough dig Out x73(59)</td><td>36252</td></tr> <tr><td>60</td><td>ELC Passthrough dig Out x74(60)</td><td>36253</td></tr> <tr><td>61</td><td>ELC Passthrough dig Out x75(61)</td><td>36254</td></tr> <tr><td>62</td><td>ELC Passthrough dig Out x76(62)</td><td>36255</td></tr> <tr><td>63</td><td>ELC Passthrough dig Out x77(63)</td><td>36256</td></tr> <tr><td>64</td><td>ELC Passthrough dig Out x100(64)</td><td>36257</td></tr> <tr><td>65</td><td>ELC Passthrough dig Out x101(65)</td><td>36258</td></tr> <tr><td>66</td><td>ELC Passthrough dig Out x102(66)</td><td>36259</td></tr> <tr><td>67</td><td>ELC Passthrough dig Out x103(67)</td><td>36260</td></tr> <tr><td>68</td><td>ELC Passthrough dig Out x104(68)</td><td>36261</td></tr> <tr><td>69</td><td>ELC Passthrough dig Out x105(69)</td><td>36262</td></tr> <tr><td>70</td><td>ELC Passthrough dig Out x106(70)</td><td>36263</td></tr> <tr><td>71</td><td>ELC Passthrough dig Out x107(71)</td><td>36264</td></tr> <tr><td>72</td><td>ELC Passthrough dig Out x110(72)</td><td>36265</td></tr> <tr><td>73</td><td>ELC Passthrough dig Out x111(73)</td><td>36266</td></tr> <tr><td>74</td><td>ELC Passthrough dig Out x112(74)</td><td>36267</td></tr> <tr><td>75</td><td>ELC Passthrough dig Out x113(75)</td><td>36268</td></tr> <tr><td>76</td><td>ELC Passthrough dig Out x114(76)</td><td>36269</td></tr> <tr><td>77</td><td>ELC Passthrough dig Out x115(77)</td><td>36270</td></tr> <tr><td>78</td><td>ELC Passthrough dig Out x116(78)</td><td>36271</td></tr> <tr><td>79</td><td>ELC Passthrough dig Out x117(79)</td><td>36272</td></tr> <tr><td>80</td><td>ELC Passthrough dig Out x120(80)</td><td>36273</td></tr> <tr><td>81</td><td>ELC Passthrough dig Out x121(81)</td><td>36274</td></tr> <tr><td>82</td><td>ELC Passthrough dig Out x122(82)</td><td>36275</td></tr> <tr><td>83</td><td>ELC Passthrough dig Out x123(83)</td><td>36276</td></tr> <tr><td>84</td><td>ELC Passthrough dig Out x124(84)</td><td>36277</td></tr> <tr><td>85</td><td>ELC Passthrough dig Out x125(85)</td><td>36278</td></tr> <tr><td>86</td><td>ELC Passthrough dig Out x126(86)</td><td>36279</td></tr> <tr><td>87</td><td>ELC Passthrough dig Out x127(87)</td><td>36280</td></tr> <tr><td>88</td><td>ELC Passthrough dig Out x130(88)</td><td>36281</td></tr> <tr><td>89</td><td>ELC Passthrough dig Out x131(89)</td><td>36282</td></tr> <tr><td>90</td><td>ELC Passthrough dig Out x132(90)</td><td>36283</td></tr> </tbody> </table> | Bit | Description | Coil | 48 | ELC Passthrough dig Out x60(48) | 36241 | 49 | ELC Passthrough dig Out x61(49) | 36242 | 50 | ELC Passthrough dig Out x62(50) | 36243 | 51 | ELC Passthrough dig Out x63(51) | 36244 | 52 | ELC Passthrough dig Out x64(52) | 36245 | 53 | ELC Passthrough dig Out x65(53) | 36246 | 54 | ELC Passthrough dig Out x66(54) | 36247 | 55 | ELC Passthrough dig Out x67(55) | 36248 | 56 | ELC Passthrough dig Out x70(56) | 36249 | 57 | ELC Passthrough dig Out x71(57) | 36250 | 58 | ELC Passthrough dig Out x72(58) | 36251 | 59 | ELC Passthrough dig Out x73(59) | 36252 | 60 | ELC Passthrough dig Out x74(60) | 36253 | 61 | ELC Passthrough dig Out x75(61) | 36254 | 62 | ELC Passthrough dig Out x76(62) | 36255 | 63 | ELC Passthrough dig Out x77(63) | 36256 | 64 | ELC Passthrough dig Out x100(64) | 36257 | 65 | ELC Passthrough dig Out x101(65) | 36258 | 66 | ELC Passthrough dig Out x102(66) | 36259 | 67 | ELC Passthrough dig Out x103(67) | 36260 | 68 | ELC Passthrough dig Out x104(68) | 36261 | 69 | ELC Passthrough dig Out x105(69) | 36262 | 70 | ELC Passthrough dig Out x106(70) | 36263 | 71 | ELC Passthrough dig Out x107(71) | 36264 | 72 | ELC Passthrough dig Out x110(72) | 36265 | 73 | ELC Passthrough dig Out x111(73) | 36266 | 74 | ELC Passthrough dig Out x112(74) | 36267 | 75 | ELC Passthrough dig Out x113(75) | 36268 | 76 | ELC Passthrough dig Out x114(76) | 36269 | 77 | ELC Passthrough dig Out x115(77) | 36270 | 78 | ELC Passthrough dig Out x116(78) | 36271 | 79 | ELC Passthrough dig Out x117(79) | 36272 | 80 | ELC Passthrough dig Out x120(80) | 36273 | 81 | ELC Passthrough dig Out x121(81) | 36274 | 82 | ELC Passthrough dig Out x122(82) | 36275 | 83 | ELC Passthrough dig Out x123(83) | 36276 | 84 | ELC Passthrough dig Out x124(84) | 36277 | 85 | ELC Passthrough dig Out x125(85) | 36278 | 86 | ELC Passthrough dig Out x126(86) | 36279 | 87 | ELC Passthrough dig Out x127(87) | 36280 | 88 | ELC Passthrough dig Out x130(88) | 36281 | 89 | ELC Passthrough dig Out x131(89) | 36282 | 90 | ELC Passthrough dig Out x132(90) | 36283 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 48 | ELC Passthrough dig Out x60(48) | 36241 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 49 | ELC Passthrough dig Out x61(49) | 36242 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | ELC Passthrough dig Out x62(50) | 36243 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | ELC Passthrough dig Out x63(51) | 36244 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 52 | ELC Passthrough dig Out x64(52) | 36245 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 53 | ELC Passthrough dig Out x65(53) | 36246 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | ELC Passthrough dig Out x66(54) | 36247 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 55 | ELC Passthrough dig Out x67(55) | 36248 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 56 | ELC Passthrough dig Out x70(56) | 36249 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 57 | ELC Passthrough dig Out x71(57) | 36250 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | ELC Passthrough dig Out x72(58) | 36251 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 59 | ELC Passthrough dig Out x73(59) | 36252 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | ELC Passthrough dig Out x74(60) | 36253 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 61 | ELC Passthrough dig Out x75(61) | 36254 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 62 | ELC Passthrough dig Out x76(62) | 36255 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | ELC Passthrough dig Out x77(63) | 36256 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 64 | ELC Passthrough dig Out x100(64) | 36257 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65 | ELC Passthrough dig Out x101(65) | 36258 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 66 | ELC Passthrough dig Out x102(66) | 36259 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 67 | ELC Passthrough dig Out x103(67) | 36260 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 68 | ELC Passthrough dig Out x104(68) | 36261 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 69 | ELC Passthrough dig Out x105(69) | 36262 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 70 | ELC Passthrough dig Out x106(70) | 36263 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 71 | ELC Passthrough dig Out x107(71) | 36264 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 72 | ELC Passthrough dig Out x110(72) | 36265 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 73 | ELC Passthrough dig Out x111(73) | 36266 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 74 | ELC Passthrough dig Out x112(74) | 36267 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 75 | ELC Passthrough dig Out x113(75) | 36268 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 76 | ELC Passthrough dig Out x114(76) | 36269 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 77 | ELC Passthrough dig Out x115(77) | 36270 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 78 | ELC Passthrough dig Out x116(78) | 36271 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 79 | ELC Passthrough dig Out x117(79) | 36272 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 80 | ELC Passthrough dig Out x120(80) | 36273 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 81 | ELC Passthrough dig Out x121(81) | 36274 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 82 | ELC Passthrough dig Out x122(82) | 36275 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 83 | ELC Passthrough dig Out x123(83) | 36276 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 84 | ELC Passthrough dig Out x124(84) | 36277 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 85 | ELC Passthrough dig Out x125(85) | 36278 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 86 | ELC Passthrough dig Out x126(86) | 36279 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 87 | ELC Passthrough dig Out x127(87) | 36280 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 88 | ELC Passthrough dig Out x130(88) | 36281 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 89 | ELC Passthrough dig Out x131(89) | 36282 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 90 | ELC Passthrough dig Out x132(90) | 36283 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|-----------------------------------|---|--|-----|-------------|------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|
| 2263 | ELC IO Passthrough Digital Out | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Passthrough Digital Out, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>91</td><td>ELC Passthrough dig Out x133(91)</td><td>36284</td></tr> <tr><td>92</td><td>ELC Passthrough dig Out x134(92)</td><td>36285</td></tr> <tr><td>93</td><td>ELC Passthrough dig Out x135(93)</td><td>36286</td></tr> <tr><td>94</td><td>ELC Passthrough dig Out x136(94)</td><td>36287</td></tr> <tr><td>95</td><td>ELC Passthrough dig Out x137(95)</td><td>36288</td></tr> <tr><td>96</td><td>ELC Passthrough dig Out x140(96)</td><td>36289</td></tr> <tr><td>97</td><td>ELC Passthrough dig Out x141(97)</td><td>36290</td></tr> <tr><td>98</td><td>ELC Passthrough dig Out x142(98)</td><td>36291</td></tr> <tr><td>99</td><td>ELC Passthrough dig Out x143(99)</td><td>36292</td></tr> <tr><td>100</td><td>ELC Passthrough dig Out x144(100)</td><td>36293</td></tr> <tr><td>101</td><td>ELC Passthrough dig Out x145(101)</td><td>36294</td></tr> <tr><td>102</td><td>ELC Passthrough dig Out x146(102)</td><td>36295</td></tr> <tr><td>103</td><td>ELC Passthrough dig Out x147(103)</td><td>36296</td></tr> <tr><td>104</td><td>ELC Passthrough dig Out x150(104)</td><td>36297</td></tr> <tr><td>105</td><td>ELC Passthrough dig Out x151(105)</td><td>36298</td></tr> <tr><td>106</td><td>ELC Passthrough dig Out x152(106)</td><td>36299</td></tr> <tr><td>107</td><td>ELC Passthrough dig Out x153(107)</td><td>36300</td></tr> <tr><td>108</td><td>ELC Passthrough dig Out x154(108)</td><td>36301</td></tr> <tr><td>109</td><td>ELC Passthrough dig Out x155(109)</td><td>36302</td></tr> <tr><td>110</td><td>ELC Passthrough dig Out x156(110)</td><td>36303</td></tr> <tr><td>111</td><td>ELC Passthrough dig Out x157(111)</td><td>36304</td></tr> <tr><td>112</td><td>ELC Passthrough dig Out x160(112)</td><td>36305</td></tr> <tr><td>113</td><td>ELC Passthrough dig Out x161(113)</td><td>36306</td></tr> <tr><td>114</td><td>ELC Passthrough dig Out x162(114)</td><td>36307</td></tr> <tr><td>115</td><td>ELC Passthrough dig Out x163(115)</td><td>36308</td></tr> <tr><td>116</td><td>ELC Passthrough dig Out x164(116)</td><td>36309</td></tr> <tr><td>117</td><td>ELC Passthrough dig Out x165(117)</td><td>36310</td></tr> <tr><td>118</td><td>ELC Passthrough dig Out x166(118)</td><td>36311</td></tr> <tr><td>119</td><td>ELC Passthrough dig Out x167(119)</td><td>36312</td></tr> <tr><td>120</td><td>ELC Passthrough dig Out x170(120)</td><td>36313</td></tr> <tr><td>121</td><td>ELC Passthrough dig Out x171(121)</td><td>36314</td></tr> <tr><td>122</td><td>ELC Passthrough dig Out x172(122)</td><td>36315</td></tr> <tr><td>123</td><td>ELC Passthrough dig Out x173(123)</td><td>36316</td></tr> <tr><td>124</td><td>ELC Passthrough dig Out x174(124)</td><td>36317</td></tr> <tr><td>125</td><td>ELC Passthrough dig Out x175(125)</td><td>36318</td></tr> <tr><td>126</td><td>ELC Passthrough dig Out x176(126)</td><td>36319</td></tr> <tr><td>127</td><td>ELC Passthrough dig Out x177(127)</td><td>36320</td></tr> </tbody> </table> | Bit | Description | Coil | 91 | ELC Passthrough dig Out x133(91) | 36284 | 92 | ELC Passthrough dig Out x134(92) | 36285 | 93 | ELC Passthrough dig Out x135(93) | 36286 | 94 | ELC Passthrough dig Out x136(94) | 36287 | 95 | ELC Passthrough dig Out x137(95) | 36288 | 96 | ELC Passthrough dig Out x140(96) | 36289 | 97 | ELC Passthrough dig Out x141(97) | 36290 | 98 | ELC Passthrough dig Out x142(98) | 36291 | 99 | ELC Passthrough dig Out x143(99) | 36292 | 100 | ELC Passthrough dig Out x144(100) | 36293 | 101 | ELC Passthrough dig Out x145(101) | 36294 | 102 | ELC Passthrough dig Out x146(102) | 36295 | 103 | ELC Passthrough dig Out x147(103) | 36296 | 104 | ELC Passthrough dig Out x150(104) | 36297 | 105 | ELC Passthrough dig Out x151(105) | 36298 | 106 | ELC Passthrough dig Out x152(106) | 36299 | 107 | ELC Passthrough dig Out x153(107) | 36300 | 108 | ELC Passthrough dig Out x154(108) | 36301 | 109 | ELC Passthrough dig Out x155(109) | 36302 | 110 | ELC Passthrough dig Out x156(110) | 36303 | 111 | ELC Passthrough dig Out x157(111) | 36304 | 112 | ELC Passthrough dig Out x160(112) | 36305 | 113 | ELC Passthrough dig Out x161(113) | 36306 | 114 | ELC Passthrough dig Out x162(114) | 36307 | 115 | ELC Passthrough dig Out x163(115) | 36308 | 116 | ELC Passthrough dig Out x164(116) | 36309 | 117 | ELC Passthrough dig Out x165(117) | 36310 | 118 | ELC Passthrough dig Out x166(118) | 36311 | 119 | ELC Passthrough dig Out x167(119) | 36312 | 120 | ELC Passthrough dig Out x170(120) | 36313 | 121 | ELC Passthrough dig Out x171(121) | 36314 | 122 | ELC Passthrough dig Out x172(122) | 36315 | 123 | ELC Passthrough dig Out x173(123) | 36316 | 124 | ELC Passthrough dig Out x174(124) | 36317 | 125 | ELC Passthrough dig Out x175(125) | 36318 | 126 | ELC Passthrough dig Out x176(126) | 36319 | 127 | ELC Passthrough dig Out x177(127) | 36320 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 91 | ELC Passthrough dig Out x133(91) | 36284 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 92 | ELC Passthrough dig Out x134(92) | 36285 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 93 | ELC Passthrough dig Out x135(93) | 36286 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 94 | ELC Passthrough dig Out x136(94) | 36287 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 95 | ELC Passthrough dig Out x137(95) | 36288 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 96 | ELC Passthrough dig Out x140(96) | 36289 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 97 | ELC Passthrough dig Out x141(97) | 36290 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 98 | ELC Passthrough dig Out x142(98) | 36291 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 99 | ELC Passthrough dig Out x143(99) | 36292 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 | ELC Passthrough dig Out x144(100) | 36293 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 101 | ELC Passthrough dig Out x145(101) | 36294 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 102 | ELC Passthrough dig Out x146(102) | 36295 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 103 | ELC Passthrough dig Out x147(103) | 36296 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 104 | ELC Passthrough dig Out x150(104) | 36297 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 105 | ELC Passthrough dig Out x151(105) | 36298 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 106 | ELC Passthrough dig Out x152(106) | 36299 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 107 | ELC Passthrough dig Out x153(107) | 36300 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 108 | ELC Passthrough dig Out x154(108) | 36301 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 109 | ELC Passthrough dig Out x155(109) | 36302 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 110 | ELC Passthrough dig Out x156(110) | 36303 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 111 | ELC Passthrough dig Out x157(111) | 36304 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 112 | ELC Passthrough dig Out x160(112) | 36305 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 113 | ELC Passthrough dig Out x161(113) | 36306 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 114 | ELC Passthrough dig Out x162(114) | 36307 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 115 | ELC Passthrough dig Out x163(115) | 36308 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 116 | ELC Passthrough dig Out x164(116) | 36309 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 117 | ELC Passthrough dig Out x165(117) | 36310 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 118 | ELC Passthrough dig Out x166(118) | 36311 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 119 | ELC Passthrough dig Out x167(119) | 36312 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 120 | ELC Passthrough dig Out x170(120) | 36313 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 121 | ELC Passthrough dig Out x171(121) | 36314 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 122 | ELC Passthrough dig Out x172(122) | 36315 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 123 | ELC Passthrough dig Out x173(123) | 36316 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 124 | ELC Passthrough dig Out x174(124) | 36317 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 125 | ELC Passthrough dig Out x175(125) | 36318 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 126 | ELC Passthrough dig Out x176(126) | 36319 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 127 | ELC Passthrough dig Out x177(127) | 36320 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2271 | ELC IO Force Speciality Module 1 | UINT16 RW Array size: 30 Default: 0 | ELC IO Force Speciality Module 1 Array of 30 registers ELC IO Force Speciality Module 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2301 | ELC IO Force Speciality Module 2 | UINT16 RW Array size: 30 Default: 0 | ELC IO Force Speciality Module 2 Array of 30 registers ELC IO Force Speciality Module 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|----------------------------------|---|---|-----|-------------|------|---|------------------------|-------|---|------------------------|-------|---|------------------------|-------|---|------------------------|-------|---|------------------------|-------|---|------------------------|-------|---|------------------------|-------|---|------------------------|-------|---|-------------------------|-------|---|-------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|
| 2331 | ELC IO Force Speciality Module 3 | UINT16 RW Array size: 30 Default: 0 | ELC IO Force Speciality Module 3 Array of 30 registers ELC IO Force Speciality Module 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2361 | ELC IO Force Speciality Module 4 | UINT16 RW Array size: 30 Default: 0 | ELC IO Force Speciality Module 4 Array of 30 registers ELC IO Force Speciality Module 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2391 | ELC IO Force Speciality Module 5 | UINT16 RW Array size: 30 Default: 0 | ELC IO Force Speciality Module 5 Array of 30 registers ELC IO Force Speciality Module 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2421 | ELC IO Force Speciality Module 6 | UINT16 RW Array size: 30 Default: 0 | ELC IO Force Speciality Module 6 Array of 30 registers ELC IO Force Speciality Module 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2451 | ELC IO Force Speciality Module 7 | UINT16 RW Array size: 30 Default: 0 | ELC IO Force Speciality Module 7 Array of 30 registers ELC IO Force Speciality Module 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2481 | ELC IO Force Speciality Module 8 | UINT16 RW Array size: 30 Default: 0 | ELC IO Force Speciality Module 8 Array of 30 registers ELC IO Force Speciality Module 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2511 | ELC IO Force Digital In | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Force Digital In. <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>0</td><td>ELC Force dig In x0(0)</td><td>40161</td></tr> <tr><td>1</td><td>ELC Force dig In x1(1)</td><td>40162</td></tr> <tr><td>2</td><td>ELC Force dig In x2(2)</td><td>40163</td></tr> <tr><td>3</td><td>ELC Force dig In x3(3)</td><td>40164</td></tr> <tr><td>4</td><td>ELC Force dig In x4(4)</td><td>40165</td></tr> <tr><td>5</td><td>ELC Force dig In x5(5)</td><td>40166</td></tr> <tr><td>6</td><td>ELC Force dig In x6(6)</td><td>40167</td></tr> <tr><td>7</td><td>ELC Force dig In x7(7)</td><td>40168</td></tr> <tr><td>8</td><td>ELC Force dig In x10(8)</td><td>40169</td></tr> <tr><td>9</td><td>ELC Force dig In x11(9)</td><td>40170</td></tr> <tr><td>10</td><td>ELC Force dig In x12(10)</td><td>40171</td></tr> <tr><td>11</td><td>ELC Force dig In x13(11)</td><td>40172</td></tr> <tr><td>12</td><td>ELC Force dig In x14(12)</td><td>40173</td></tr> <tr><td>13</td><td>ELC Force dig In x15(13)</td><td>40174</td></tr> <tr><td>14</td><td>ELC Force dig In x16(14)</td><td>40175</td></tr> <tr><td>15</td><td>ELC Force dig In x17(15)</td><td>40176</td></tr> <tr><td>16</td><td>ELC Force dig In x20(16)</td><td>40177</td></tr> <tr><td>17</td><td>ELC Force dig In x21(17)</td><td>40178</td></tr> <tr><td>18</td><td>ELC Force dig In x22(18)</td><td>40179</td></tr> <tr><td>19</td><td>ELC Force dig In x23(19)</td><td>40180</td></tr> <tr><td>20</td><td>ELC Force dig In x24(20)</td><td>40181</td></tr> <tr><td>21</td><td>ELC Force dig In x25(21)</td><td>40182</td></tr> <tr><td>22</td><td>ELC Force dig In x26(22)</td><td>40183</td></tr> </tbody> </table> | Bit | Description | Coil | 0 | ELC Force dig In x0(0) | 40161 | 1 | ELC Force dig In x1(1) | 40162 | 2 | ELC Force dig In x2(2) | 40163 | 3 | ELC Force dig In x3(3) | 40164 | 4 | ELC Force dig In x4(4) | 40165 | 5 | ELC Force dig In x5(5) | 40166 | 6 | ELC Force dig In x6(6) | 40167 | 7 | ELC Force dig In x7(7) | 40168 | 8 | ELC Force dig In x10(8) | 40169 | 9 | ELC Force dig In x11(9) | 40170 | 10 | ELC Force dig In x12(10) | 40171 | 11 | ELC Force dig In x13(11) | 40172 | 12 | ELC Force dig In x14(12) | 40173 | 13 | ELC Force dig In x15(13) | 40174 | 14 | ELC Force dig In x16(14) | 40175 | 15 | ELC Force dig In x17(15) | 40176 | 16 | ELC Force dig In x20(16) | 40177 | 17 | ELC Force dig In x21(17) | 40178 | 18 | ELC Force dig In x22(18) | 40179 | 19 | ELC Force dig In x23(19) | 40180 | 20 | ELC Force dig In x24(20) | 40181 | 21 | ELC Force dig In x25(21) | 40182 | 22 | ELC Force dig In x26(22) | 40183 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | ELC Force dig In x0(0) | 40161 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | ELC Force dig In x1(1) | 40162 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | ELC Force dig In x2(2) | 40163 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | ELC Force dig In x3(3) | 40164 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | ELC Force dig In x4(4) | 40165 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | ELC Force dig In x5(5) | 40166 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | ELC Force dig In x6(6) | 40167 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | ELC Force dig In x7(7) | 40168 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | ELC Force dig In x10(8) | 40169 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | ELC Force dig In x11(9) | 40170 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | ELC Force dig In x12(10) | 40171 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | ELC Force dig In x13(11) | 40172 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | ELC Force dig In x14(12) | 40173 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | ELC Force dig In x15(13) | 40174 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | ELC Force dig In x16(14) | 40175 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | ELC Force dig In x17(15) | 40176 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | ELC Force dig In x20(16) | 40177 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | ELC Force dig In x21(17) | 40178 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | ELC Force dig In x22(18) | 40179 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | ELC Force dig In x23(19) | 40180 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | ELC Force dig In x24(20) | 40181 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | ELC Force dig In x25(21) | 40182 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | ELC Force dig In x26(22) | 40183 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---------------------------|---|--|-----|-------------|------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|
| 2511 | ELC IO Force Digital In | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Force Digital In. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>23</td><td>ELC Force dig In x27(23)</td><td>40184</td></tr> <tr><td>24</td><td>ELC Force dig In x30(24)</td><td>40185</td></tr> <tr><td>25</td><td>ELC Force dig In x31(25)</td><td>40186</td></tr> <tr><td>26</td><td>ELC Force dig In x32(26)</td><td>40187</td></tr> <tr><td>27</td><td>ELC Force dig In x33(27)</td><td>40188</td></tr> <tr><td>28</td><td>ELC Force dig In x34(28)</td><td>40189</td></tr> <tr><td>29</td><td>ELC Force dig In x35(29)</td><td>40190</td></tr> <tr><td>30</td><td>ELC Force dig In x36(30)</td><td>40191</td></tr> <tr><td>31</td><td>ELC Force dig In x37(31)</td><td>40192</td></tr> <tr><td>32</td><td>ELC Force dig In x40(32)</td><td>40193</td></tr> <tr><td>33</td><td>ELC Force dig In x41(33)</td><td>40194</td></tr> <tr><td>34</td><td>ELC Force dig In x42(34)</td><td>40195</td></tr> <tr><td>35</td><td>ELC Force dig In x43(35)</td><td>40196</td></tr> <tr><td>36</td><td>ELC Force dig In x44(36)</td><td>40197</td></tr> <tr><td>37</td><td>ELC Force dig In x45(37)</td><td>40198</td></tr> <tr><td>38</td><td>ELC Force dig In x46(38)</td><td>40199</td></tr> <tr><td>39</td><td>ELC Force dig In x47(39)</td><td>40200</td></tr> <tr><td>40</td><td>ELC Force dig In x50(40)</td><td>40201</td></tr> <tr><td>41</td><td>ELC Force dig In x51(41)</td><td>40202</td></tr> <tr><td>42</td><td>ELC Force dig In x52(42)</td><td>40203</td></tr> <tr><td>43</td><td>ELC Force dig In x53(43)</td><td>40204</td></tr> <tr><td>44</td><td>ELC Force dig In x54(44)</td><td>40205</td></tr> <tr><td>45</td><td>ELC Force dig In x55(45)</td><td>40206</td></tr> <tr><td>46</td><td>ELC Force dig In x56(46)</td><td>40207</td></tr> <tr><td>47</td><td>ELC Force dig In x57(47)</td><td>40208</td></tr> <tr><td>48</td><td>ELC Force dig In x60(48)</td><td>40209</td></tr> <tr><td>49</td><td>ELC Force dig In x61(49)</td><td>40210</td></tr> <tr><td>50</td><td>ELC Force dig In x62(50)</td><td>40211</td></tr> <tr><td>51</td><td>ELC Force dig In x63(51)</td><td>40212</td></tr> <tr><td>52</td><td>ELC Force dig In x64(52)</td><td>40213</td></tr> <tr><td>53</td><td>ELC Force dig In x65(53)</td><td>40214</td></tr> <tr><td>54</td><td>ELC Force dig In x66(54)</td><td>40215</td></tr> <tr><td>55</td><td>ELC Force dig In x67(55)</td><td>40216</td></tr> <tr><td>56</td><td>ELC Force dig In x70(56)</td><td>40217</td></tr> <tr><td>57</td><td>ELC Force dig In x71(57)</td><td>40218</td></tr> <tr><td>58</td><td>ELC Force dig In x72(58)</td><td>40219</td></tr> <tr><td>59</td><td>ELC Force dig In x73(59)</td><td>40220</td></tr> <tr><td>60</td><td>ELC Force dig In x74(60)</td><td>40221</td></tr> <tr><td>61</td><td>ELC Force dig In x75(61)</td><td>40222</td></tr> <tr><td>62</td><td>ELC Force dig In x76(62)</td><td>40223</td></tr> <tr><td>63</td><td>ELC Force dig In x77(63)</td><td>40224</td></tr> <tr><td>64</td><td>ELC Force dig In x100(64)</td><td>40225</td></tr> <tr><td>65</td><td>ELC Force dig In x101(65)</td><td>40226</td></tr> </tbody> </table> | Bit | Description | Coil | 23 | ELC Force dig In x27(23) | 40184 | 24 | ELC Force dig In x30(24) | 40185 | 25 | ELC Force dig In x31(25) | 40186 | 26 | ELC Force dig In x32(26) | 40187 | 27 | ELC Force dig In x33(27) | 40188 | 28 | ELC Force dig In x34(28) | 40189 | 29 | ELC Force dig In x35(29) | 40190 | 30 | ELC Force dig In x36(30) | 40191 | 31 | ELC Force dig In x37(31) | 40192 | 32 | ELC Force dig In x40(32) | 40193 | 33 | ELC Force dig In x41(33) | 40194 | 34 | ELC Force dig In x42(34) | 40195 | 35 | ELC Force dig In x43(35) | 40196 | 36 | ELC Force dig In x44(36) | 40197 | 37 | ELC Force dig In x45(37) | 40198 | 38 | ELC Force dig In x46(38) | 40199 | 39 | ELC Force dig In x47(39) | 40200 | 40 | ELC Force dig In x50(40) | 40201 | 41 | ELC Force dig In x51(41) | 40202 | 42 | ELC Force dig In x52(42) | 40203 | 43 | ELC Force dig In x53(43) | 40204 | 44 | ELC Force dig In x54(44) | 40205 | 45 | ELC Force dig In x55(45) | 40206 | 46 | ELC Force dig In x56(46) | 40207 | 47 | ELC Force dig In x57(47) | 40208 | 48 | ELC Force dig In x60(48) | 40209 | 49 | ELC Force dig In x61(49) | 40210 | 50 | ELC Force dig In x62(50) | 40211 | 51 | ELC Force dig In x63(51) | 40212 | 52 | ELC Force dig In x64(52) | 40213 | 53 | ELC Force dig In x65(53) | 40214 | 54 | ELC Force dig In x66(54) | 40215 | 55 | ELC Force dig In x67(55) | 40216 | 56 | ELC Force dig In x70(56) | 40217 | 57 | ELC Force dig In x71(57) | 40218 | 58 | ELC Force dig In x72(58) | 40219 | 59 | ELC Force dig In x73(59) | 40220 | 60 | ELC Force dig In x74(60) | 40221 | 61 | ELC Force dig In x75(61) | 40222 | 62 | ELC Force dig In x76(62) | 40223 | 63 | ELC Force dig In x77(63) | 40224 | 64 | ELC Force dig In x100(64) | 40225 | 65 | ELC Force dig In x101(65) | 40226 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | ELC Force dig In x27(23) | 40184 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | ELC Force dig In x30(24) | 40185 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | ELC Force dig In x31(25) | 40186 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | ELC Force dig In x32(26) | 40187 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | ELC Force dig In x33(27) | 40188 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | ELC Force dig In x34(28) | 40189 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | ELC Force dig In x35(29) | 40190 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | ELC Force dig In x36(30) | 40191 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | ELC Force dig In x37(31) | 40192 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | ELC Force dig In x40(32) | 40193 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | ELC Force dig In x41(33) | 40194 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | ELC Force dig In x42(34) | 40195 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | ELC Force dig In x43(35) | 40196 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | ELC Force dig In x44(36) | 40197 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | ELC Force dig In x45(37) | 40198 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | ELC Force dig In x46(38) | 40199 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | ELC Force dig In x47(39) | 40200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | ELC Force dig In x50(40) | 40201 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | ELC Force dig In x51(41) | 40202 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | ELC Force dig In x52(42) | 40203 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | ELC Force dig In x53(43) | 40204 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | ELC Force dig In x54(44) | 40205 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 | ELC Force dig In x55(45) | 40206 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | ELC Force dig In x56(46) | 40207 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 | ELC Force dig In x57(47) | 40208 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 48 | ELC Force dig In x60(48) | 40209 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 49 | ELC Force dig In x61(49) | 40210 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | ELC Force dig In x62(50) | 40211 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | ELC Force dig In x63(51) | 40212 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 52 | ELC Force dig In x64(52) | 40213 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 53 | ELC Force dig In x65(53) | 40214 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | ELC Force dig In x66(54) | 40215 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 55 | ELC Force dig In x67(55) | 40216 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 56 | ELC Force dig In x70(56) | 40217 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 57 | ELC Force dig In x71(57) | 40218 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | ELC Force dig In x72(58) | 40219 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 59 | ELC Force dig In x73(59) | 40220 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | ELC Force dig In x74(60) | 40221 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 61 | ELC Force dig In x75(61) | 40222 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 62 | ELC Force dig In x76(62) | 40223 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | ELC Force dig In x77(63) | 40224 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 64 | ELC Force dig In x100(64) | 40225 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65 | ELC Force dig In x101(65) | 40226 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|----------------------------|---|---|-----|-------------|------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|
| 2511 | ELC IO Force Digital In | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Force Digital In. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>66</td><td>ELC Force dig In x102(66)</td><td>40227</td></tr> <tr><td>67</td><td>ELC Force dig In x103(67)</td><td>40228</td></tr> <tr><td>68</td><td>ELC Force dig In x104(68)</td><td>40229</td></tr> <tr><td>69</td><td>ELC Force dig In x105(69)</td><td>40230</td></tr> <tr><td>70</td><td>ELC Force dig In x106(70)</td><td>40231</td></tr> <tr><td>71</td><td>ELC Force dig In x107(71)</td><td>40232</td></tr> <tr><td>72</td><td>ELC Force dig In x110(72)</td><td>40233</td></tr> <tr><td>73</td><td>ELC Force dig In x111(73)</td><td>40234</td></tr> <tr><td>74</td><td>ELC Force dig In x112(74)</td><td>40235</td></tr> <tr><td>75</td><td>ELC Force dig In x113(75)</td><td>40236</td></tr> <tr><td>76</td><td>ELC Force dig In x114(76)</td><td>40237</td></tr> <tr><td>77</td><td>ELC Force dig In x115(77)</td><td>40238</td></tr> <tr><td>78</td><td>ELC Force dig In x116(78)</td><td>40239</td></tr> <tr><td>79</td><td>ELC Force dig In x117(79)</td><td>40240</td></tr> <tr><td>80</td><td>ELC Force dig In x120(80)</td><td>40241</td></tr> <tr><td>81</td><td>ELC Force dig In x121(81)</td><td>40242</td></tr> <tr><td>82</td><td>ELC Force dig In x122(82)</td><td>40243</td></tr> <tr><td>83</td><td>ELC Force dig In x123(83)</td><td>40244</td></tr> <tr><td>84</td><td>ELC Force dig In x124(84)</td><td>40245</td></tr> <tr><td>85</td><td>ELC Force dig In x125(85)</td><td>40246</td></tr> <tr><td>86</td><td>ELC Force dig In x126(86)</td><td>40247</td></tr> <tr><td>87</td><td>ELC Force dig In x127(87)</td><td>40248</td></tr> <tr><td>88</td><td>ELC Force dig In x130(88)</td><td>40249</td></tr> <tr><td>89</td><td>ELC Force dig In x131(89)</td><td>40250</td></tr> <tr><td>90</td><td>ELC Force dig In x132(90)</td><td>40251</td></tr> <tr><td>91</td><td>ELC Force dig In x133(91)</td><td>40252</td></tr> <tr><td>92</td><td>ELC Force dig In x134(92)</td><td>40253</td></tr> <tr><td>93</td><td>ELC Force dig In x135(93)</td><td>40254</td></tr> <tr><td>94</td><td>ELC Force dig In x136(94)</td><td>40255</td></tr> <tr><td>95</td><td>ELC Force dig In x137(95)</td><td>40256</td></tr> <tr><td>96</td><td>ELC Force dig In x140(96)</td><td>40257</td></tr> <tr><td>97</td><td>ELC Force dig In x141(97)</td><td>40258</td></tr> <tr><td>98</td><td>ELC Force dig In x142(98)</td><td>40259</td></tr> <tr><td>99</td><td>ELC Force dig In x143(99)</td><td>40260</td></tr> <tr><td>100</td><td>ELC Force dig In x144(100)</td><td>40261</td></tr> <tr><td>101</td><td>ELC Force dig In x145(101)</td><td>40262</td></tr> <tr><td>102</td><td>ELC Force dig In x146(102)</td><td>40263</td></tr> <tr><td>103</td><td>ELC Force dig In x147(103)</td><td>40264</td></tr> <tr><td>104</td><td>ELC Force dig In x150(104)</td><td>40265</td></tr> <tr><td>105</td><td>ELC Force dig In x151(105)</td><td>40266</td></tr> <tr><td>106</td><td>ELC Force dig In x152(106)</td><td>40267</td></tr> <tr><td>107</td><td>ELC Force dig In x153(107)</td><td>40268</td></tr> <tr><td>108</td><td>ELC Force dig In x154(108)</td><td>40269</td></tr> </tbody> </table> | Bit | Description | Coil | 66 | ELC Force dig In x102(66) | 40227 | 67 | ELC Force dig In x103(67) | 40228 | 68 | ELC Force dig In x104(68) | 40229 | 69 | ELC Force dig In x105(69) | 40230 | 70 | ELC Force dig In x106(70) | 40231 | 71 | ELC Force dig In x107(71) | 40232 | 72 | ELC Force dig In x110(72) | 40233 | 73 | ELC Force dig In x111(73) | 40234 | 74 | ELC Force dig In x112(74) | 40235 | 75 | ELC Force dig In x113(75) | 40236 | 76 | ELC Force dig In x114(76) | 40237 | 77 | ELC Force dig In x115(77) | 40238 | 78 | ELC Force dig In x116(78) | 40239 | 79 | ELC Force dig In x117(79) | 40240 | 80 | ELC Force dig In x120(80) | 40241 | 81 | ELC Force dig In x121(81) | 40242 | 82 | ELC Force dig In x122(82) | 40243 | 83 | ELC Force dig In x123(83) | 40244 | 84 | ELC Force dig In x124(84) | 40245 | 85 | ELC Force dig In x125(85) | 40246 | 86 | ELC Force dig In x126(86) | 40247 | 87 | ELC Force dig In x127(87) | 40248 | 88 | ELC Force dig In x130(88) | 40249 | 89 | ELC Force dig In x131(89) | 40250 | 90 | ELC Force dig In x132(90) | 40251 | 91 | ELC Force dig In x133(91) | 40252 | 92 | ELC Force dig In x134(92) | 40253 | 93 | ELC Force dig In x135(93) | 40254 | 94 | ELC Force dig In x136(94) | 40255 | 95 | ELC Force dig In x137(95) | 40256 | 96 | ELC Force dig In x140(96) | 40257 | 97 | ELC Force dig In x141(97) | 40258 | 98 | ELC Force dig In x142(98) | 40259 | 99 | ELC Force dig In x143(99) | 40260 | 100 | ELC Force dig In x144(100) | 40261 | 101 | ELC Force dig In x145(101) | 40262 | 102 | ELC Force dig In x146(102) | 40263 | 103 | ELC Force dig In x147(103) | 40264 | 104 | ELC Force dig In x150(104) | 40265 | 105 | ELC Force dig In x151(105) | 40266 | 106 | ELC Force dig In x152(106) | 40267 | 107 | ELC Force dig In x153(107) | 40268 | 108 | ELC Force dig In x154(108) | 40269 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 66 | ELC Force dig In x102(66) | 40227 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 67 | ELC Force dig In x103(67) | 40228 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 68 | ELC Force dig In x104(68) | 40229 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 69 | ELC Force dig In x105(69) | 40230 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 70 | ELC Force dig In x106(70) | 40231 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 71 | ELC Force dig In x107(71) | 40232 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 72 | ELC Force dig In x110(72) | 40233 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 73 | ELC Force dig In x111(73) | 40234 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 74 | ELC Force dig In x112(74) | 40235 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 75 | ELC Force dig In x113(75) | 40236 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 76 | ELC Force dig In x114(76) | 40237 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 77 | ELC Force dig In x115(77) | 40238 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 78 | ELC Force dig In x116(78) | 40239 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 79 | ELC Force dig In x117(79) | 40240 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 80 | ELC Force dig In x120(80) | 40241 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 81 | ELC Force dig In x121(81) | 40242 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 82 | ELC Force dig In x122(82) | 40243 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 83 | ELC Force dig In x123(83) | 40244 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 84 | ELC Force dig In x124(84) | 40245 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 85 | ELC Force dig In x125(85) | 40246 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 86 | ELC Force dig In x126(86) | 40247 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 87 | ELC Force dig In x127(87) | 40248 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 88 | ELC Force dig In x130(88) | 40249 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 89 | ELC Force dig In x131(89) | 40250 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 90 | ELC Force dig In x132(90) | 40251 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 91 | ELC Force dig In x133(91) | 40252 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 92 | ELC Force dig In x134(92) | 40253 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 93 | ELC Force dig In x135(93) | 40254 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 94 | ELC Force dig In x136(94) | 40255 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 95 | ELC Force dig In x137(95) | 40256 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 96 | ELC Force dig In x140(96) | 40257 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 97 | ELC Force dig In x141(97) | 40258 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 98 | ELC Force dig In x142(98) | 40259 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 99 | ELC Force dig In x143(99) | 40260 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 | ELC Force dig In x144(100) | 40261 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 101 | ELC Force dig In x145(101) | 40262 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 102 | ELC Force dig In x146(102) | 40263 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 103 | ELC Force dig In x147(103) | 40264 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 104 | ELC Force dig In x150(104) | 40265 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 105 | ELC Force dig In x151(105) | 40266 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 106 | ELC Force dig In x152(106) | 40267 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 107 | ELC Force dig In x153(107) | 40268 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 108 | ELC Force dig In x154(108) | 40269 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|----------------------------|---|--|----------------------------|-------------|------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|
| 2511 | ELC IO Force Digital In | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Force Digital In. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>109</td><td>ELC Force dig In x155(109)</td><td>40270</td></tr> <tr><td>110</td><td>ELC Force dig In x156(110)</td><td>40271</td></tr> <tr><td>111</td><td>ELC Force dig In x157(111)</td><td>40272</td></tr> <tr><td>112</td><td>ELC Force dig In x160(112)</td><td>40273</td></tr> <tr><td>113</td><td>ELC Force dig In x161(113)</td><td>40274</td></tr> <tr><td>114</td><td>ELC Force dig In x162(114)</td><td>40275</td></tr> <tr><td>115</td><td>ELC Force dig In x163(115)</td><td>40276</td></tr> <tr><td>116</td><td>ELC Force dig In x164(116)</td><td>40277</td></tr> <tr><td>117</td><td>ELC Force dig In x165(117)</td><td>40278</td></tr> <tr><td>118</td><td>ELC Force dig In x166(118)</td><td>40279</td></tr> <tr><td>119</td><td>ELC Force dig In x167(119)</td><td>40280</td></tr> <tr><td>120</td><td>ELC Force dig In x170(120)</td><td>40281</td></tr> <tr><td>121</td><td>ELC Force dig In x171(121)</td><td>40282</td></tr> <tr><td>122</td><td>ELC Force dig In x172(122)</td><td>40283</td></tr> <tr><td>123</td><td>ELC Force dig In x173(123)</td><td>40284</td></tr> <tr><td>124</td><td>ELC Force dig In x174(124)</td><td>40285</td></tr> <tr><td>125</td><td>ELC Force dig In x175(125)</td><td>40286</td></tr> <tr><td>126</td><td>ELC Force dig In x176(126)</td><td>40287</td></tr> <tr><td>127</td><td>ELC Force dig In x177(127)</td><td>40288</td></tr> </tbody> </table> | Bit | Description | Coil | 109 | ELC Force dig In x155(109) | 40270 | 110 | ELC Force dig In x156(110) | 40271 | 111 | ELC Force dig In x157(111) | 40272 | 112 | ELC Force dig In x160(112) | 40273 | 113 | ELC Force dig In x161(113) | 40274 | 114 | ELC Force dig In x162(114) | 40275 | 115 | ELC Force dig In x163(115) | 40276 | 116 | ELC Force dig In x164(116) | 40277 | 117 | ELC Force dig In x165(117) | 40278 | 118 | ELC Force dig In x166(118) | 40279 | 119 | ELC Force dig In x167(119) | 40280 | 120 | ELC Force dig In x170(120) | 40281 | 121 | ELC Force dig In x171(121) | 40282 | 122 | ELC Force dig In x172(122) | 40283 | 123 | ELC Force dig In x173(123) | 40284 | 124 | ELC Force dig In x174(124) | 40285 | 125 | ELC Force dig In x175(125) | 40286 | 126 | ELC Force dig In x176(126) | 40287 | 127 | ELC Force dig In x177(127) | 40288 | | | | | | | | | |
| | | | Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 109 | ELC Force dig In x155(109) | 40270 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 110 | ELC Force dig In x156(110) | 40271 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 111 | ELC Force dig In x157(111) | 40272 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 112 | ELC Force dig In x160(112) | 40273 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 113 | ELC Force dig In x161(113) | 40274 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 114 | ELC Force dig In x162(114) | 40275 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 115 | ELC Force dig In x163(115) | 40276 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 116 | ELC Force dig In x164(116) | 40277 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 117 | ELC Force dig In x165(117) | 40278 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 118 | ELC Force dig In x166(118) | 40279 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 119 | ELC Force dig In x167(119) | 40280 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 120 | ELC Force dig In x170(120) | 40281 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 121 | ELC Force dig In x171(121) | 40282 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 122 | ELC Force dig In x172(122) | 40283 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 123 | ELC Force dig In x173(123) | 40284 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 124 | ELC Force dig In x174(124) | 40285 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 125 | ELC Force dig In x175(125) | 40286 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 126 | ELC Force dig In x176(126) | 40287 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 127 | ELC Force dig In x177(127) | 40288 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2519 | ELC IO Force Digital Out | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Force Digital Out. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>0</td><td>ELC Force dig Out x0(0)</td><td>40289</td></tr> <tr><td>1</td><td>ELC Force dig Out x1(1)</td><td>40290</td></tr> <tr><td>2</td><td>ELC Force dig Out x2(2)</td><td>40291</td></tr> <tr><td>3</td><td>ELC Force dig Out x3(3)</td><td>40292</td></tr> <tr><td>4</td><td>ELC Force dig Out x4(4)</td><td>40293</td></tr> <tr><td>5</td><td>ELC Force dig Out x5(5)</td><td>40294</td></tr> <tr><td>6</td><td>ELC Force dig Out x6(6)</td><td>40295</td></tr> <tr><td>7</td><td>ELC Force dig Out x7(7)</td><td>40296</td></tr> <tr><td>8</td><td>ELC Force dig Out x10(8)</td><td>40297</td></tr> <tr><td>9</td><td>ELC Force dig Out x11(9)</td><td>40298</td></tr> <tr><td>10</td><td>ELC Force dig Out x12(10)</td><td>40299</td></tr> <tr><td>11</td><td>ELC Force dig Out x13(11)</td><td>40300</td></tr> <tr><td>12</td><td>ELC Force dig Out x14(12)</td><td>40301</td></tr> <tr><td>13</td><td>ELC Force dig Out x15(13)</td><td>40302</td></tr> <tr><td>14</td><td>ELC Force dig Out x16(14)</td><td>40303</td></tr> <tr><td>15</td><td>ELC Force dig Out x17(15)</td><td>40304</td></tr> <tr><td>16</td><td>ELC Force dig Out x20(16)</td><td>40305</td></tr> <tr><td>17</td><td>ELC Force dig Out x21(17)</td><td>40306</td></tr> <tr><td>18</td><td>ELC Force dig Out x22(18)</td><td>40307</td></tr> <tr><td>19</td><td>ELC Force dig Out x23(19)</td><td>40308</td></tr> <tr><td>20</td><td>ELC Force dig Out x24(20)</td><td>40309</td></tr> <tr><td>21</td><td>ELC Force dig Out x25(21)</td><td>40310</td></tr> </tbody> </table> | Bit | Description | Coil | 0 | ELC Force dig Out x0(0) | 40289 | 1 | ELC Force dig Out x1(1) | 40290 | 2 | ELC Force dig Out x2(2) | 40291 | 3 | ELC Force dig Out x3(3) | 40292 | 4 | ELC Force dig Out x4(4) | 40293 | 5 | ELC Force dig Out x5(5) | 40294 | 6 | ELC Force dig Out x6(6) | 40295 | 7 | ELC Force dig Out x7(7) | 40296 | 8 | ELC Force dig Out x10(8) | 40297 | 9 | ELC Force dig Out x11(9) | 40298 | 10 | ELC Force dig Out x12(10) | 40299 | 11 | ELC Force dig Out x13(11) | 40300 | 12 | ELC Force dig Out x14(12) | 40301 | 13 | ELC Force dig Out x15(13) | 40302 | 14 | ELC Force dig Out x16(14) | 40303 | 15 | ELC Force dig Out x17(15) | 40304 | 16 | ELC Force dig Out x20(16) | 40305 | 17 | ELC Force dig Out x21(17) | 40306 | 18 | ELC Force dig Out x22(18) | 40307 | 19 | ELC Force dig Out x23(19) | 40308 | 20 | ELC Force dig Out x24(20) | 40309 | 21 | ELC Force dig Out x25(21) | 40310 |
| | | | Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0 | ELC Force dig Out x0(0) | 40289 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 | ELC Force dig Out x1(1) | 40290 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 2 | ELC Force dig Out x2(2) | 40291 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 3 | ELC Force dig Out x3(3) | 40292 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 4 | ELC Force dig Out x4(4) | 40293 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 5 | ELC Force dig Out x5(5) | 40294 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 6 | ELC Force dig Out x6(6) | 40295 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 7 | ELC Force dig Out x7(7) | 40296 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 8 | ELC Force dig Out x10(8) | 40297 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 9 | ELC Force dig Out x11(9) | 40298 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 10 | ELC Force dig Out x12(10) | 40299 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 11 | ELC Force dig Out x13(11) | 40300 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 12 | ELC Force dig Out x14(12) | 40301 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 13 | ELC Force dig Out x15(13) | 40302 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 14 | ELC Force dig Out x16(14) | 40303 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 15 | ELC Force dig Out x17(15) | 40304 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 16 | ELC Force dig Out x20(16) | 40305 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 17 | ELC Force dig Out x21(17) | 40306 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 18 | ELC Force dig Out x22(18) | 40307 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | ELC Force dig Out x23(19) | 40308 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | ELC Force dig Out x24(20) | 40309 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | ELC Force dig Out x25(21) | 40310 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|----------------------------|---|--|-----|-------------|------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|----------------------------|-------|
| 2519 | ELC IO Force Digital Out | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Force Digital Out, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>22</td><td>ELC Force dig Out x26(22)</td><td>40311</td></tr> <tr><td>23</td><td>ELC Force dig Out x27(23)</td><td>40312</td></tr> <tr><td>24</td><td>ELC Force dig Out x30(24)</td><td>40313</td></tr> <tr><td>25</td><td>ELC Force dig Out x31(25)</td><td>40314</td></tr> <tr><td>26</td><td>ELC Force dig Out x32(26)</td><td>40315</td></tr> <tr><td>27</td><td>ELC Force dig Out x33(27)</td><td>40316</td></tr> <tr><td>28</td><td>ELC Force dig Out x34(28)</td><td>40317</td></tr> <tr><td>29</td><td>ELC Force dig Out x35(29)</td><td>40318</td></tr> <tr><td>30</td><td>ELC Force dig Out x36(30)</td><td>40319</td></tr> <tr><td>31</td><td>ELC Force dig Out x37(31)</td><td>40320</td></tr> <tr><td>32</td><td>ELC Force dig Out x40(32)</td><td>40321</td></tr> <tr><td>33</td><td>ELC Force dig Out x41(33)</td><td>40322</td></tr> <tr><td>34</td><td>ELC Force dig Out x42(34)</td><td>40323</td></tr> <tr><td>35</td><td>ELC Force dig Out x43(35)</td><td>40324</td></tr> <tr><td>36</td><td>ELC Force dig Out x44(36)</td><td>40325</td></tr> <tr><td>37</td><td>ELC Force dig Out x45(37)</td><td>40326</td></tr> <tr><td>38</td><td>ELC Force dig Out x46(38)</td><td>40327</td></tr> <tr><td>39</td><td>ELC Force dig Out x47(39)</td><td>40328</td></tr> <tr><td>40</td><td>ELC Force dig Out x50(40)</td><td>40329</td></tr> <tr><td>41</td><td>ELC Force dig Out x51(41)</td><td>40330</td></tr> <tr><td>42</td><td>ELC Force dig Out x52(42)</td><td>40331</td></tr> <tr><td>43</td><td>ELC Force dig Out x53(43)</td><td>40332</td></tr> <tr><td>44</td><td>ELC Force dig Out x54(44)</td><td>40333</td></tr> <tr><td>45</td><td>ELC Force dig Out x55(45)</td><td>40334</td></tr> <tr><td>46</td><td>ELC Force dig Out x56(46)</td><td>40335</td></tr> <tr><td>47</td><td>ELC Force dig Out x57(47)</td><td>40336</td></tr> <tr><td>48</td><td>ELC Force dig Out x60(48)</td><td>40337</td></tr> <tr><td>49</td><td>ELC Force dig Out x61(49)</td><td>40338</td></tr> <tr><td>50</td><td>ELC Force dig Out x62(50)</td><td>40339</td></tr> <tr><td>51</td><td>ELC Force dig Out x63(51)</td><td>40340</td></tr> <tr><td>52</td><td>ELC Force dig Out x64(52)</td><td>40341</td></tr> <tr><td>53</td><td>ELC Force dig Out x65(53)</td><td>40342</td></tr> <tr><td>54</td><td>ELC Force dig Out x66(54)</td><td>40343</td></tr> <tr><td>55</td><td>ELC Force dig Out x67(55)</td><td>40344</td></tr> <tr><td>56</td><td>ELC Force dig Out x70(56)</td><td>40345</td></tr> <tr><td>57</td><td>ELC Force dig Out x71(57)</td><td>40346</td></tr> <tr><td>58</td><td>ELC Force dig Out x72(58)</td><td>40347</td></tr> <tr><td>59</td><td>ELC Force dig Out x73(59)</td><td>40348</td></tr> <tr><td>60</td><td>ELC Force dig Out x74(60)</td><td>40349</td></tr> <tr><td>61</td><td>ELC Force dig Out x75(61)</td><td>40350</td></tr> <tr><td>62</td><td>ELC Force dig Out x76(62)</td><td>40351</td></tr> <tr><td>63</td><td>ELC Force dig Out x77(63)</td><td>40352</td></tr> <tr><td>64</td><td>ELC Force dig Out x100(64)</td><td>40353</td></tr> </tbody> </table> | Bit | Description | Coil | 22 | ELC Force dig Out x26(22) | 40311 | 23 | ELC Force dig Out x27(23) | 40312 | 24 | ELC Force dig Out x30(24) | 40313 | 25 | ELC Force dig Out x31(25) | 40314 | 26 | ELC Force dig Out x32(26) | 40315 | 27 | ELC Force dig Out x33(27) | 40316 | 28 | ELC Force dig Out x34(28) | 40317 | 29 | ELC Force dig Out x35(29) | 40318 | 30 | ELC Force dig Out x36(30) | 40319 | 31 | ELC Force dig Out x37(31) | 40320 | 32 | ELC Force dig Out x40(32) | 40321 | 33 | ELC Force dig Out x41(33) | 40322 | 34 | ELC Force dig Out x42(34) | 40323 | 35 | ELC Force dig Out x43(35) | 40324 | 36 | ELC Force dig Out x44(36) | 40325 | 37 | ELC Force dig Out x45(37) | 40326 | 38 | ELC Force dig Out x46(38) | 40327 | 39 | ELC Force dig Out x47(39) | 40328 | 40 | ELC Force dig Out x50(40) | 40329 | 41 | ELC Force dig Out x51(41) | 40330 | 42 | ELC Force dig Out x52(42) | 40331 | 43 | ELC Force dig Out x53(43) | 40332 | 44 | ELC Force dig Out x54(44) | 40333 | 45 | ELC Force dig Out x55(45) | 40334 | 46 | ELC Force dig Out x56(46) | 40335 | 47 | ELC Force dig Out x57(47) | 40336 | 48 | ELC Force dig Out x60(48) | 40337 | 49 | ELC Force dig Out x61(49) | 40338 | 50 | ELC Force dig Out x62(50) | 40339 | 51 | ELC Force dig Out x63(51) | 40340 | 52 | ELC Force dig Out x64(52) | 40341 | 53 | ELC Force dig Out x65(53) | 40342 | 54 | ELC Force dig Out x66(54) | 40343 | 55 | ELC Force dig Out x67(55) | 40344 | 56 | ELC Force dig Out x70(56) | 40345 | 57 | ELC Force dig Out x71(57) | 40346 | 58 | ELC Force dig Out x72(58) | 40347 | 59 | ELC Force dig Out x73(59) | 40348 | 60 | ELC Force dig Out x74(60) | 40349 | 61 | ELC Force dig Out x75(61) | 40350 | 62 | ELC Force dig Out x76(62) | 40351 | 63 | ELC Force dig Out x77(63) | 40352 | 64 | ELC Force dig Out x100(64) | 40353 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | ELC Force dig Out x26(22) | 40311 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | ELC Force dig Out x27(23) | 40312 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | ELC Force dig Out x30(24) | 40313 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | ELC Force dig Out x31(25) | 40314 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | ELC Force dig Out x32(26) | 40315 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | ELC Force dig Out x33(27) | 40316 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | ELC Force dig Out x34(28) | 40317 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | ELC Force dig Out x35(29) | 40318 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | ELC Force dig Out x36(30) | 40319 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | ELC Force dig Out x37(31) | 40320 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | ELC Force dig Out x40(32) | 40321 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | ELC Force dig Out x41(33) | 40322 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | ELC Force dig Out x42(34) | 40323 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | ELC Force dig Out x43(35) | 40324 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | ELC Force dig Out x44(36) | 40325 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | ELC Force dig Out x45(37) | 40326 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | ELC Force dig Out x46(38) | 40327 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | ELC Force dig Out x47(39) | 40328 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | ELC Force dig Out x50(40) | 40329 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | ELC Force dig Out x51(41) | 40330 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | ELC Force dig Out x52(42) | 40331 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | ELC Force dig Out x53(43) | 40332 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | ELC Force dig Out x54(44) | 40333 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 | ELC Force dig Out x55(45) | 40334 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | ELC Force dig Out x56(46) | 40335 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 | ELC Force dig Out x57(47) | 40336 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 48 | ELC Force dig Out x60(48) | 40337 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 49 | ELC Force dig Out x61(49) | 40338 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | ELC Force dig Out x62(50) | 40339 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | ELC Force dig Out x63(51) | 40340 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 52 | ELC Force dig Out x64(52) | 40341 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 53 | ELC Force dig Out x65(53) | 40342 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | ELC Force dig Out x66(54) | 40343 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 55 | ELC Force dig Out x67(55) | 40344 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 56 | ELC Force dig Out x70(56) | 40345 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 57 | ELC Force dig Out x71(57) | 40346 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | ELC Force dig Out x72(58) | 40347 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 59 | ELC Force dig Out x73(59) | 40348 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | ELC Force dig Out x74(60) | 40349 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 61 | ELC Force dig Out x75(61) | 40350 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 62 | ELC Force dig Out x76(62) | 40351 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | ELC Force dig Out x77(63) | 40352 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 64 | ELC Force dig Out x100(64) | 40353 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|-----------------------------|---|--|-----|-------------|------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|----|----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|
| 2519 | ELC IO Force Digital Out | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Force Digital Out, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>65</td><td>ELC Force dig Out x101(65)</td><td>40354</td></tr> <tr><td>66</td><td>ELC Force dig Out x102(66)</td><td>40355</td></tr> <tr><td>67</td><td>ELC Force dig Out x103(67)</td><td>40356</td></tr> <tr><td>68</td><td>ELC Force dig Out x104(68)</td><td>40357</td></tr> <tr><td>69</td><td>ELC Force dig Out x105(69)</td><td>40358</td></tr> <tr><td>70</td><td>ELC Force dig Out x106(70)</td><td>40359</td></tr> <tr><td>71</td><td>ELC Force dig Out x107(71)</td><td>40360</td></tr> <tr><td>72</td><td>ELC Force dig Out x110(72)</td><td>40361</td></tr> <tr><td>73</td><td>ELC Force dig Out x111(73)</td><td>40362</td></tr> <tr><td>74</td><td>ELC Force dig Out x112(74)</td><td>40363</td></tr> <tr><td>75</td><td>ELC Force dig Out x113(75)</td><td>40364</td></tr> <tr><td>76</td><td>ELC Force dig Out x114(76)</td><td>40365</td></tr> <tr><td>77</td><td>ELC Force dig Out x115(77)</td><td>40366</td></tr> <tr><td>78</td><td>ELC Force dig Out x116(78)</td><td>40367</td></tr> <tr><td>79</td><td>ELC Force dig Out x117(79)</td><td>40368</td></tr> <tr><td>80</td><td>ELC Force dig Out x120(80)</td><td>40369</td></tr> <tr><td>81</td><td>ELC Force dig Out x121(81)</td><td>40370</td></tr> <tr><td>82</td><td>ELC Force dig Out x122(82)</td><td>40371</td></tr> <tr><td>83</td><td>ELC Force dig Out x123(83)</td><td>40372</td></tr> <tr><td>84</td><td>ELC Force dig Out x124(84)</td><td>40373</td></tr> <tr><td>85</td><td>ELC Force dig Out x125(85)</td><td>40374</td></tr> <tr><td>86</td><td>ELC Force dig Out x126(86)</td><td>40375</td></tr> <tr><td>87</td><td>ELC Force dig Out x127(87)</td><td>40376</td></tr> <tr><td>88</td><td>ELC Force dig Out x130(88)</td><td>40377</td></tr> <tr><td>89</td><td>ELC Force dig Out x131(89)</td><td>40378</td></tr> <tr><td>90</td><td>ELC Force dig Out x132(90)</td><td>40379</td></tr> <tr><td>91</td><td>ELC Force dig Out x133(91)</td><td>40380</td></tr> <tr><td>92</td><td>ELC Force dig Out x134(92)</td><td>40381</td></tr> <tr><td>93</td><td>ELC Force dig Out x135(93)</td><td>40382</td></tr> <tr><td>94</td><td>ELC Force dig Out x136(94)</td><td>40383</td></tr> <tr><td>95</td><td>ELC Force dig Out x137(95)</td><td>40384</td></tr> <tr><td>96</td><td>ELC Force dig Out x140(96)</td><td>40385</td></tr> <tr><td>97</td><td>ELC Force dig Out x141(97)</td><td>40386</td></tr> <tr><td>98</td><td>ELC Force dig Out x142(98)</td><td>40387</td></tr> <tr><td>99</td><td>ELC Force dig Out x143(99)</td><td>40388</td></tr> <tr><td>100</td><td>ELC Force dig Out x144(100)</td><td>40389</td></tr> <tr><td>101</td><td>ELC Force dig Out x145(101)</td><td>40390</td></tr> <tr><td>102</td><td>ELC Force dig Out x146(102)</td><td>40391</td></tr> <tr><td>103</td><td>ELC Force dig Out x147(103)</td><td>40392</td></tr> <tr><td>104</td><td>ELC Force dig Out x150(104)</td><td>40393</td></tr> <tr><td>105</td><td>ELC Force dig Out x151(105)</td><td>40394</td></tr> <tr><td>106</td><td>ELC Force dig Out x152(106)</td><td>40395</td></tr> <tr><td>107</td><td>ELC Force dig Out x153(107)</td><td>40396</td></tr> </tbody> </table> | Bit | Description | Coil | 65 | ELC Force dig Out x101(65) | 40354 | 66 | ELC Force dig Out x102(66) | 40355 | 67 | ELC Force dig Out x103(67) | 40356 | 68 | ELC Force dig Out x104(68) | 40357 | 69 | ELC Force dig Out x105(69) | 40358 | 70 | ELC Force dig Out x106(70) | 40359 | 71 | ELC Force dig Out x107(71) | 40360 | 72 | ELC Force dig Out x110(72) | 40361 | 73 | ELC Force dig Out x111(73) | 40362 | 74 | ELC Force dig Out x112(74) | 40363 | 75 | ELC Force dig Out x113(75) | 40364 | 76 | ELC Force dig Out x114(76) | 40365 | 77 | ELC Force dig Out x115(77) | 40366 | 78 | ELC Force dig Out x116(78) | 40367 | 79 | ELC Force dig Out x117(79) | 40368 | 80 | ELC Force dig Out x120(80) | 40369 | 81 | ELC Force dig Out x121(81) | 40370 | 82 | ELC Force dig Out x122(82) | 40371 | 83 | ELC Force dig Out x123(83) | 40372 | 84 | ELC Force dig Out x124(84) | 40373 | 85 | ELC Force dig Out x125(85) | 40374 | 86 | ELC Force dig Out x126(86) | 40375 | 87 | ELC Force dig Out x127(87) | 40376 | 88 | ELC Force dig Out x130(88) | 40377 | 89 | ELC Force dig Out x131(89) | 40378 | 90 | ELC Force dig Out x132(90) | 40379 | 91 | ELC Force dig Out x133(91) | 40380 | 92 | ELC Force dig Out x134(92) | 40381 | 93 | ELC Force dig Out x135(93) | 40382 | 94 | ELC Force dig Out x136(94) | 40383 | 95 | ELC Force dig Out x137(95) | 40384 | 96 | ELC Force dig Out x140(96) | 40385 | 97 | ELC Force dig Out x141(97) | 40386 | 98 | ELC Force dig Out x142(98) | 40387 | 99 | ELC Force dig Out x143(99) | 40388 | 100 | ELC Force dig Out x144(100) | 40389 | 101 | ELC Force dig Out x145(101) | 40390 | 102 | ELC Force dig Out x146(102) | 40391 | 103 | ELC Force dig Out x147(103) | 40392 | 104 | ELC Force dig Out x150(104) | 40393 | 105 | ELC Force dig Out x151(105) | 40394 | 106 | ELC Force dig Out x152(106) | 40395 | 107 | ELC Force dig Out x153(107) | 40396 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65 | ELC Force dig Out x101(65) | 40354 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 66 | ELC Force dig Out x102(66) | 40355 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 67 | ELC Force dig Out x103(67) | 40356 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 68 | ELC Force dig Out x104(68) | 40357 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 69 | ELC Force dig Out x105(69) | 40358 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 70 | ELC Force dig Out x106(70) | 40359 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 71 | ELC Force dig Out x107(71) | 40360 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 72 | ELC Force dig Out x110(72) | 40361 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 73 | ELC Force dig Out x111(73) | 40362 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 74 | ELC Force dig Out x112(74) | 40363 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 75 | ELC Force dig Out x113(75) | 40364 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 76 | ELC Force dig Out x114(76) | 40365 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 77 | ELC Force dig Out x115(77) | 40366 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 78 | ELC Force dig Out x116(78) | 40367 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 79 | ELC Force dig Out x117(79) | 40368 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 80 | ELC Force dig Out x120(80) | 40369 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 81 | ELC Force dig Out x121(81) | 40370 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 82 | ELC Force dig Out x122(82) | 40371 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 83 | ELC Force dig Out x123(83) | 40372 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 84 | ELC Force dig Out x124(84) | 40373 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 85 | ELC Force dig Out x125(85) | 40374 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 86 | ELC Force dig Out x126(86) | 40375 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 87 | ELC Force dig Out x127(87) | 40376 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 88 | ELC Force dig Out x130(88) | 40377 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 89 | ELC Force dig Out x131(89) | 40378 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 90 | ELC Force dig Out x132(90) | 40379 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 91 | ELC Force dig Out x133(91) | 40380 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 92 | ELC Force dig Out x134(92) | 40381 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 93 | ELC Force dig Out x135(93) | 40382 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 94 | ELC Force dig Out x136(94) | 40383 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 95 | ELC Force dig Out x137(95) | 40384 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 96 | ELC Force dig Out x140(96) | 40385 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 97 | ELC Force dig Out x141(97) | 40386 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 98 | ELC Force dig Out x142(98) | 40387 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 99 | ELC Force dig Out x143(99) | 40388 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 | ELC Force dig Out x144(100) | 40389 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 101 | ELC Force dig Out x145(101) | 40390 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 102 | ELC Force dig Out x146(102) | 40391 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 103 | ELC Force dig Out x147(103) | 40392 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 104 | ELC Force dig Out x150(104) | 40393 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 105 | ELC Force dig Out x151(105) | 40394 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 106 | ELC Force dig Out x152(106) | 40395 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 107 | ELC Force dig Out x153(107) | 40396 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|---|--|-----------------------------|-------------|------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|-----|-----------------------------|-------|
| 2519 | ELC IO Force Digital Out | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Force Digital Out, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>108</td><td>ELC Force dig Out x154(108)</td><td>40397</td></tr> <tr><td>109</td><td>ELC Force dig Out x155(109)</td><td>40398</td></tr> <tr><td>110</td><td>ELC Force dig Out x156(110)</td><td>40399</td></tr> <tr><td>111</td><td>ELC Force dig Out x157(111)</td><td>40400</td></tr> <tr><td>112</td><td>ELC Force dig Out x160(112)</td><td>40401</td></tr> <tr><td>113</td><td>ELC Force dig Out x161(113)</td><td>40402</td></tr> <tr><td>114</td><td>ELC Force dig Out x162(114)</td><td>40403</td></tr> <tr><td>115</td><td>ELC Force dig Out x163(115)</td><td>40404</td></tr> <tr><td>116</td><td>ELC Force dig Out x164(116)</td><td>40405</td></tr> <tr><td>117</td><td>ELC Force dig Out x165(117)</td><td>40406</td></tr> <tr><td>118</td><td>ELC Force dig Out x166(118)</td><td>40407</td></tr> <tr><td>119</td><td>ELC Force dig Out x167(119)</td><td>40408</td></tr> <tr><td>120</td><td>ELC Force dig Out x170(120)</td><td>40409</td></tr> <tr><td>121</td><td>ELC Force dig Out x171(121)</td><td>40410</td></tr> <tr><td>122</td><td>ELC Force dig Out x172(122)</td><td>40411</td></tr> <tr><td>123</td><td>ELC Force dig Out x173(123)</td><td>40412</td></tr> <tr><td>124</td><td>ELC Force dig Out x174(124)</td><td>40413</td></tr> <tr><td>125</td><td>ELC Force dig Out x175(125)</td><td>40414</td></tr> <tr><td>126</td><td>ELC Force dig Out x176(126)</td><td>40415</td></tr> <tr><td>127</td><td>ELC Force dig Out x177(127)</td><td>40416</td></tr> </tbody> </table> | Bit | Description | Coil | 108 | ELC Force dig Out x154(108) | 40397 | 109 | ELC Force dig Out x155(109) | 40398 | 110 | ELC Force dig Out x156(110) | 40399 | 111 | ELC Force dig Out x157(111) | 40400 | 112 | ELC Force dig Out x160(112) | 40401 | 113 | ELC Force dig Out x161(113) | 40402 | 114 | ELC Force dig Out x162(114) | 40403 | 115 | ELC Force dig Out x163(115) | 40404 | 116 | ELC Force dig Out x164(116) | 40405 | 117 | ELC Force dig Out x165(117) | 40406 | 118 | ELC Force dig Out x166(118) | 40407 | 119 | ELC Force dig Out x167(119) | 40408 | 120 | ELC Force dig Out x170(120) | 40409 | 121 | ELC Force dig Out x171(121) | 40410 | 122 | ELC Force dig Out x172(122) | 40411 | 123 | ELC Force dig Out x173(123) | 40412 | 124 | ELC Force dig Out x174(124) | 40413 | 125 | ELC Force dig Out x175(125) | 40414 | 126 | ELC Force dig Out x176(126) | 40415 | 127 | ELC Force dig Out x177(127) | 40416 |
| | | | Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 108 | ELC Force dig Out x154(108) | 40397 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 109 | ELC Force dig Out x155(109) | 40398 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 110 | ELC Force dig Out x156(110) | 40399 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 111 | ELC Force dig Out x157(111) | 40400 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 112 | ELC Force dig Out x160(112) | 40401 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 113 | ELC Force dig Out x161(113) | 40402 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 114 | ELC Force dig Out x162(114) | 40403 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 115 | ELC Force dig Out x163(115) | 40404 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 116 | ELC Force dig Out x164(116) | 40405 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 117 | ELC Force dig Out x165(117) | 40406 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 118 | ELC Force dig Out x166(118) | 40407 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 119 | ELC Force dig Out x167(119) | 40408 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 120 | ELC Force dig Out x170(120) | 40409 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 121 | ELC Force dig Out x171(121) | 40410 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 122 | ELC Force dig Out x172(122) | 40411 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 123 | ELC Force dig Out x173(123) | 40412 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 124 | ELC Force dig Out x174(124) | 40413 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 125 | ELC Force dig Out x175(125) | 40414 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 126 | ELC Force dig Out x176(126) | 40415 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 127 | ELC Force dig Out x177(127) | 40416 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2527 | ELC IO Force Enable Speciality Module 1 | UINT16 RW Array size: 2 Default: 0 | ELC IO Force Enable Speciality Module 1 Array of 2 registers ELC IO Force Enable Speciality Module 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2529 | ELC IO Force Enable Speciality Module 2 | UINT16 RW Array size: 2 Default: 0 | ELC IO Force Enable Speciality Module 2 Array of 2 registers ELC IO Force Enable Speciality Module 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2531 | ELC IO Force Enable Speciality Module 3 | UINT16 RW Array size: 2 Default: 0 | ELC IO Force Enable Speciality Module 3 Array of 2 registers ELC IO Force Enable Speciality Module 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2533 | ELC IO Force Enable Speciality Module 4 | UINT16 RW Array size: 2 Default: 0 | ELC IO Force Enable Speciality Module 4 Array of 2 registers ELC IO Force Enable Speciality Module 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2535 | ELC IO Force Enable Speciality Module 5 | UINT16 RW Array size: 2 Default: 0 | ELC IO Force Enable Speciality Module 5 Array of 2 registers ELC IO Force Enable Speciality Module 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2537 | ELC IO Force Enable Speciality Module 6 | UINT16 RW Array size: 2 Default: 0 | ELC IO Force Enable Speciality Module 6 Array of 2 registers ELC IO Force Enable Speciality Module 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2539 | ELC IO Force Enable Speciality Module 7 | UINT16 RW Array size: 2 Default: 0 | ELC IO Force Enable Speciality Module 7 Array of 2 registers ELC IO Force Enable Speciality Module 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2541 | ELC IO Force Enable Speciality Module 8 | UINT16 RW Array size: 2 Default: 0 | ELC IO Force Enable Speciality Module 8 Array of 2 registers ELC IO Force Enable Speciality Module 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---------------------------------|---|--|-----|-------------|------|---|-------------------------------|-------|---|-------------------------------|-------|---|-------------------------------|-------|---|-------------------------------|-------|---|-------------------------------|-------|---|-------------------------------|-------|---|-------------------------------|-------|---|-------------------------------|-------|---|--------------------------------|-------|---|--------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|
| 2543 | ELC IO Force Enable Digital In | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Force Enable Digital In. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>0</td><td>ELC Force Enable dig In x0(0)</td><td>40673</td></tr> <tr><td>1</td><td>ELC Force Enable dig In x1(1)</td><td>40674</td></tr> <tr><td>2</td><td>ELC Force Enable dig In x2(2)</td><td>40675</td></tr> <tr><td>3</td><td>ELC Force Enable dig In x3(3)</td><td>40676</td></tr> <tr><td>4</td><td>ELC Force Enable dig In x4(4)</td><td>40677</td></tr> <tr><td>5</td><td>ELC Force Enable dig In x5(5)</td><td>40678</td></tr> <tr><td>6</td><td>ELC Force Enable dig In x6(6)</td><td>40679</td></tr> <tr><td>7</td><td>ELC Force Enable dig In x7(7)</td><td>40680</td></tr> <tr><td>8</td><td>ELC Force Enable dig In x10(8)</td><td>40681</td></tr> <tr><td>9</td><td>ELC Force Enable dig In x11(9)</td><td>40682</td></tr> <tr><td>10</td><td>ELC Force Enable dig In x12(10)</td><td>40683</td></tr> <tr><td>11</td><td>ELC Force Enable dig In x13(11)</td><td>40684</td></tr> <tr><td>12</td><td>ELC Force Enable dig In x14(12)</td><td>40685</td></tr> <tr><td>13</td><td>ELC Force Enable dig In x15(13)</td><td>40686</td></tr> <tr><td>14</td><td>ELC Force Enable dig In x16(14)</td><td>40687</td></tr> <tr><td>15</td><td>ELC Force Enable dig In x17(15)</td><td>40688</td></tr> <tr><td>16</td><td>ELC Force Enable dig In x20(16)</td><td>40689</td></tr> <tr><td>17</td><td>ELC Force Enable dig In x21(17)</td><td>40690</td></tr> <tr><td>18</td><td>ELC Force Enable dig In x22(18)</td><td>40691</td></tr> <tr><td>19</td><td>ELC Force Enable dig In x23(19)</td><td>40692</td></tr> <tr><td>20</td><td>ELC Force Enable dig In x24(20)</td><td>40693</td></tr> <tr><td>21</td><td>ELC Force Enable dig In x25(21)</td><td>40694</td></tr> <tr><td>22</td><td>ELC Force Enable dig In x26(22)</td><td>40695</td></tr> <tr><td>23</td><td>ELC Force Enable dig In x27(23)</td><td>40696</td></tr> <tr><td>24</td><td>ELC Force Enable dig In x30(24)</td><td>40697</td></tr> <tr><td>25</td><td>ELC Force Enable dig In x31(25)</td><td>40698</td></tr> <tr><td>26</td><td>ELC Force Enable dig In x32(26)</td><td>40699</td></tr> <tr><td>27</td><td>ELC Force Enable dig In x33(27)</td><td>40700</td></tr> <tr><td>28</td><td>ELC Force Enable dig In x34(28)</td><td>40701</td></tr> <tr><td>29</td><td>ELC Force Enable dig In x35(29)</td><td>40702</td></tr> <tr><td>30</td><td>ELC Force Enable dig In x36(30)</td><td>40703</td></tr> <tr><td>31</td><td>ELC Force Enable dig In x37(31)</td><td>40704</td></tr> <tr><td>32</td><td>ELC Force Enable dig In x40(32)</td><td>40705</td></tr> <tr><td>33</td><td>ELC Force Enable dig In x41(33)</td><td>40706</td></tr> <tr><td>34</td><td>ELC Force Enable dig In x42(34)</td><td>40707</td></tr> <tr><td>35</td><td>ELC Force Enable dig In x43(35)</td><td>40708</td></tr> <tr><td>36</td><td>ELC Force Enable dig In x44(36)</td><td>40709</td></tr> <tr><td>37</td><td>ELC Force Enable dig In x45(37)</td><td>40710</td></tr> <tr><td>38</td><td>ELC Force Enable dig In x46(38)</td><td>40711</td></tr> <tr><td>39</td><td>ELC Force Enable dig In x47(39)</td><td>40712</td></tr> </tbody> </table> | Bit | Description | Coil | 0 | ELC Force Enable dig In x0(0) | 40673 | 1 | ELC Force Enable dig In x1(1) | 40674 | 2 | ELC Force Enable dig In x2(2) | 40675 | 3 | ELC Force Enable dig In x3(3) | 40676 | 4 | ELC Force Enable dig In x4(4) | 40677 | 5 | ELC Force Enable dig In x5(5) | 40678 | 6 | ELC Force Enable dig In x6(6) | 40679 | 7 | ELC Force Enable dig In x7(7) | 40680 | 8 | ELC Force Enable dig In x10(8) | 40681 | 9 | ELC Force Enable dig In x11(9) | 40682 | 10 | ELC Force Enable dig In x12(10) | 40683 | 11 | ELC Force Enable dig In x13(11) | 40684 | 12 | ELC Force Enable dig In x14(12) | 40685 | 13 | ELC Force Enable dig In x15(13) | 40686 | 14 | ELC Force Enable dig In x16(14) | 40687 | 15 | ELC Force Enable dig In x17(15) | 40688 | 16 | ELC Force Enable dig In x20(16) | 40689 | 17 | ELC Force Enable dig In x21(17) | 40690 | 18 | ELC Force Enable dig In x22(18) | 40691 | 19 | ELC Force Enable dig In x23(19) | 40692 | 20 | ELC Force Enable dig In x24(20) | 40693 | 21 | ELC Force Enable dig In x25(21) | 40694 | 22 | ELC Force Enable dig In x26(22) | 40695 | 23 | ELC Force Enable dig In x27(23) | 40696 | 24 | ELC Force Enable dig In x30(24) | 40697 | 25 | ELC Force Enable dig In x31(25) | 40698 | 26 | ELC Force Enable dig In x32(26) | 40699 | 27 | ELC Force Enable dig In x33(27) | 40700 | 28 | ELC Force Enable dig In x34(28) | 40701 | 29 | ELC Force Enable dig In x35(29) | 40702 | 30 | ELC Force Enable dig In x36(30) | 40703 | 31 | ELC Force Enable dig In x37(31) | 40704 | 32 | ELC Force Enable dig In x40(32) | 40705 | 33 | ELC Force Enable dig In x41(33) | 40706 | 34 | ELC Force Enable dig In x42(34) | 40707 | 35 | ELC Force Enable dig In x43(35) | 40708 | 36 | ELC Force Enable dig In x44(36) | 40709 | 37 | ELC Force Enable dig In x45(37) | 40710 | 38 | ELC Force Enable dig In x46(38) | 40711 | 39 | ELC Force Enable dig In x47(39) | 40712 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | ELC Force Enable dig In x0(0) | 40673 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | ELC Force Enable dig In x1(1) | 40674 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | ELC Force Enable dig In x2(2) | 40675 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | ELC Force Enable dig In x3(3) | 40676 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | ELC Force Enable dig In x4(4) | 40677 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | ELC Force Enable dig In x5(5) | 40678 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | ELC Force Enable dig In x6(6) | 40679 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | ELC Force Enable dig In x7(7) | 40680 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | ELC Force Enable dig In x10(8) | 40681 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | ELC Force Enable dig In x11(9) | 40682 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | ELC Force Enable dig In x12(10) | 40683 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | ELC Force Enable dig In x13(11) | 40684 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | ELC Force Enable dig In x14(12) | 40685 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | ELC Force Enable dig In x15(13) | 40686 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | ELC Force Enable dig In x16(14) | 40687 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | ELC Force Enable dig In x17(15) | 40688 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | ELC Force Enable dig In x20(16) | 40689 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | ELC Force Enable dig In x21(17) | 40690 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | ELC Force Enable dig In x22(18) | 40691 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | ELC Force Enable dig In x23(19) | 40692 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | ELC Force Enable dig In x24(20) | 40693 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | ELC Force Enable dig In x25(21) | 40694 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | ELC Force Enable dig In x26(22) | 40695 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | ELC Force Enable dig In x27(23) | 40696 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | ELC Force Enable dig In x30(24) | 40697 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | ELC Force Enable dig In x31(25) | 40698 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | ELC Force Enable dig In x32(26) | 40699 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | ELC Force Enable dig In x33(27) | 40700 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | ELC Force Enable dig In x34(28) | 40701 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | ELC Force Enable dig In x35(29) | 40702 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | ELC Force Enable dig In x36(30) | 40703 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | ELC Force Enable dig In x37(31) | 40704 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | ELC Force Enable dig In x40(32) | 40705 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | ELC Force Enable dig In x41(33) | 40706 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | ELC Force Enable dig In x42(34) | 40707 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | ELC Force Enable dig In x43(35) | 40708 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | ELC Force Enable dig In x44(36) | 40709 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | ELC Force Enable dig In x45(37) | 40710 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | ELC Force Enable dig In x46(38) | 40711 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | ELC Force Enable dig In x47(39) | 40712 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|----------------------------------|---|--|-----|-------------|------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|---------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|
| 2543 | ELC IO Force Enable Digital In | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Force Enable Digital In, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>40</td><td>ELC Force Enable dig In x50(40)</td><td>40713</td></tr> <tr><td>41</td><td>ELC Force Enable dig In x51(41)</td><td>40714</td></tr> <tr><td>42</td><td>ELC Force Enable dig In x52(42)</td><td>40715</td></tr> <tr><td>43</td><td>ELC Force Enable dig In x53(43)</td><td>40716</td></tr> <tr><td>44</td><td>ELC Force Enable dig In x54(44)</td><td>40717</td></tr> <tr><td>45</td><td>ELC Force Enable dig In x55(45)</td><td>40718</td></tr> <tr><td>46</td><td>ELC Force Enable dig In x56(46)</td><td>40719</td></tr> <tr><td>47</td><td>ELC Force Enable dig In x57(47)</td><td>40720</td></tr> <tr><td>48</td><td>ELC Force Enable dig In x60(48)</td><td>40721</td></tr> <tr><td>49</td><td>ELC Force Enable dig In x61(49)</td><td>40722</td></tr> <tr><td>50</td><td>ELC Force Enable dig In x62(50)</td><td>40723</td></tr> <tr><td>51</td><td>ELC Force Enable dig In x63(51)</td><td>40724</td></tr> <tr><td>52</td><td>ELC Force Enable dig In x64(52)</td><td>40725</td></tr> <tr><td>53</td><td>ELC Force Enable dig In x65(53)</td><td>40726</td></tr> <tr><td>54</td><td>ELC Force Enable dig In x66(54)</td><td>40727</td></tr> <tr><td>55</td><td>ELC Force Enable dig In x67(55)</td><td>40728</td></tr> <tr><td>56</td><td>ELC Force Enable dig In x70(56)</td><td>40729</td></tr> <tr><td>57</td><td>ELC Force Enable dig In x71(57)</td><td>40730</td></tr> <tr><td>58</td><td>ELC Force Enable dig In x72(58)</td><td>40731</td></tr> <tr><td>59</td><td>ELC Force Enable dig In x73(59)</td><td>40732</td></tr> <tr><td>60</td><td>ELC Force Enable dig In x74(60)</td><td>40733</td></tr> <tr><td>61</td><td>ELC Force Enable dig In x75(61)</td><td>40734</td></tr> <tr><td>62</td><td>ELC Force Enable dig In x76(62)</td><td>40735</td></tr> <tr><td>63</td><td>ELC Force Enable dig In x77(63)</td><td>40736</td></tr> <tr><td>64</td><td>ELC Force Enable dig In x100(64)</td><td>40737</td></tr> <tr><td>65</td><td>ELC Force Enable dig In x101(65)</td><td>40738</td></tr> <tr><td>66</td><td>ELC Force Enable dig In x102(66)</td><td>40739</td></tr> <tr><td>67</td><td>ELC Force Enable dig In x103(67)</td><td>40740</td></tr> <tr><td>68</td><td>ELC Force Enable dig In x104(68)</td><td>40741</td></tr> <tr><td>69</td><td>ELC Force Enable dig In x105(69)</td><td>40742</td></tr> <tr><td>70</td><td>ELC Force Enable dig In x106(70)</td><td>40743</td></tr> <tr><td>71</td><td>ELC Force Enable dig In x107(71)</td><td>40744</td></tr> <tr><td>72</td><td>ELC Force Enable dig In x110(72)</td><td>40745</td></tr> <tr><td>73</td><td>ELC Force Enable dig In x111(73)</td><td>40746</td></tr> <tr><td>74</td><td>ELC Force Enable dig In x112(74)</td><td>40747</td></tr> <tr><td>75</td><td>ELC Force Enable dig In x113(75)</td><td>40748</td></tr> <tr><td>76</td><td>ELC Force Enable dig In x114(76)</td><td>40749</td></tr> <tr><td>77</td><td>ELC Force Enable dig In x115(77)</td><td>40750</td></tr> <tr><td>78</td><td>ELC Force Enable dig In x116(78)</td><td>40751</td></tr> <tr><td>79</td><td>ELC Force Enable dig In x117(79)</td><td>40752</td></tr> <tr><td>80</td><td>ELC Force Enable dig In x120(80)</td><td>40753</td></tr> <tr><td>81</td><td>ELC Force Enable dig In x121(81)</td><td>40754</td></tr> <tr><td>82</td><td>ELC Force Enable dig In x122(82)</td><td>40755</td></tr> <tr><td>83</td><td>ELC Force Enable dig In x123(83)</td><td>40756</td></tr> </tbody> </table> | Bit | Description | Coil | 40 | ELC Force Enable dig In x50(40) | 40713 | 41 | ELC Force Enable dig In x51(41) | 40714 | 42 | ELC Force Enable dig In x52(42) | 40715 | 43 | ELC Force Enable dig In x53(43) | 40716 | 44 | ELC Force Enable dig In x54(44) | 40717 | 45 | ELC Force Enable dig In x55(45) | 40718 | 46 | ELC Force Enable dig In x56(46) | 40719 | 47 | ELC Force Enable dig In x57(47) | 40720 | 48 | ELC Force Enable dig In x60(48) | 40721 | 49 | ELC Force Enable dig In x61(49) | 40722 | 50 | ELC Force Enable dig In x62(50) | 40723 | 51 | ELC Force Enable dig In x63(51) | 40724 | 52 | ELC Force Enable dig In x64(52) | 40725 | 53 | ELC Force Enable dig In x65(53) | 40726 | 54 | ELC Force Enable dig In x66(54) | 40727 | 55 | ELC Force Enable dig In x67(55) | 40728 | 56 | ELC Force Enable dig In x70(56) | 40729 | 57 | ELC Force Enable dig In x71(57) | 40730 | 58 | ELC Force Enable dig In x72(58) | 40731 | 59 | ELC Force Enable dig In x73(59) | 40732 | 60 | ELC Force Enable dig In x74(60) | 40733 | 61 | ELC Force Enable dig In x75(61) | 40734 | 62 | ELC Force Enable dig In x76(62) | 40735 | 63 | ELC Force Enable dig In x77(63) | 40736 | 64 | ELC Force Enable dig In x100(64) | 40737 | 65 | ELC Force Enable dig In x101(65) | 40738 | 66 | ELC Force Enable dig In x102(66) | 40739 | 67 | ELC Force Enable dig In x103(67) | 40740 | 68 | ELC Force Enable dig In x104(68) | 40741 | 69 | ELC Force Enable dig In x105(69) | 40742 | 70 | ELC Force Enable dig In x106(70) | 40743 | 71 | ELC Force Enable dig In x107(71) | 40744 | 72 | ELC Force Enable dig In x110(72) | 40745 | 73 | ELC Force Enable dig In x111(73) | 40746 | 74 | ELC Force Enable dig In x112(74) | 40747 | 75 | ELC Force Enable dig In x113(75) | 40748 | 76 | ELC Force Enable dig In x114(76) | 40749 | 77 | ELC Force Enable dig In x115(77) | 40750 | 78 | ELC Force Enable dig In x116(78) | 40751 | 79 | ELC Force Enable dig In x117(79) | 40752 | 80 | ELC Force Enable dig In x120(80) | 40753 | 81 | ELC Force Enable dig In x121(81) | 40754 | 82 | ELC Force Enable dig In x122(82) | 40755 | 83 | ELC Force Enable dig In x123(83) | 40756 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | ELC Force Enable dig In x50(40) | 40713 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | ELC Force Enable dig In x51(41) | 40714 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | ELC Force Enable dig In x52(42) | 40715 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | ELC Force Enable dig In x53(43) | 40716 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | ELC Force Enable dig In x54(44) | 40717 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 | ELC Force Enable dig In x55(45) | 40718 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | ELC Force Enable dig In x56(46) | 40719 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 | ELC Force Enable dig In x57(47) | 40720 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 48 | ELC Force Enable dig In x60(48) | 40721 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 49 | ELC Force Enable dig In x61(49) | 40722 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | ELC Force Enable dig In x62(50) | 40723 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | ELC Force Enable dig In x63(51) | 40724 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 52 | ELC Force Enable dig In x64(52) | 40725 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 53 | ELC Force Enable dig In x65(53) | 40726 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | ELC Force Enable dig In x66(54) | 40727 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 55 | ELC Force Enable dig In x67(55) | 40728 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 56 | ELC Force Enable dig In x70(56) | 40729 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 57 | ELC Force Enable dig In x71(57) | 40730 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | ELC Force Enable dig In x72(58) | 40731 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 59 | ELC Force Enable dig In x73(59) | 40732 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | ELC Force Enable dig In x74(60) | 40733 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 61 | ELC Force Enable dig In x75(61) | 40734 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 62 | ELC Force Enable dig In x76(62) | 40735 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | ELC Force Enable dig In x77(63) | 40736 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 64 | ELC Force Enable dig In x100(64) | 40737 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65 | ELC Force Enable dig In x101(65) | 40738 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 66 | ELC Force Enable dig In x102(66) | 40739 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 67 | ELC Force Enable dig In x103(67) | 40740 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 68 | ELC Force Enable dig In x104(68) | 40741 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 69 | ELC Force Enable dig In x105(69) | 40742 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 70 | ELC Force Enable dig In x106(70) | 40743 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 71 | ELC Force Enable dig In x107(71) | 40744 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 72 | ELC Force Enable dig In x110(72) | 40745 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 73 | ELC Force Enable dig In x111(73) | 40746 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 74 | ELC Force Enable dig In x112(74) | 40747 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 75 | ELC Force Enable dig In x113(75) | 40748 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 76 | ELC Force Enable dig In x114(76) | 40749 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 77 | ELC Force Enable dig In x115(77) | 40750 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 78 | ELC Force Enable dig In x116(78) | 40751 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 79 | ELC Force Enable dig In x117(79) | 40752 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 80 | ELC Force Enable dig In x120(80) | 40753 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 81 | ELC Force Enable dig In x121(81) | 40754 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 82 | ELC Force Enable dig In x122(82) | 40755 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 83 | ELC Force Enable dig In x123(83) | 40756 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|-----------------------------------|---|--|-----|-------------|------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|-----|-----------------------------------|-------|
| 2543 | ELC IO Force Enable Digital In | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Force Enable Digital In, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>84</td><td>ELC Force Enable dig In x124(84)</td><td>40757</td></tr> <tr><td>85</td><td>ELC Force Enable dig In x125(85)</td><td>40758</td></tr> <tr><td>86</td><td>ELC Force Enable dig In x126(86)</td><td>40759</td></tr> <tr><td>87</td><td>ELC Force Enable dig In x127(87)</td><td>40760</td></tr> <tr><td>88</td><td>ELC Force Enable dig In x130(88)</td><td>40761</td></tr> <tr><td>89</td><td>ELC Force Enable dig In x131(89)</td><td>40762</td></tr> <tr><td>90</td><td>ELC Force Enable dig In x132(90)</td><td>40763</td></tr> <tr><td>91</td><td>ELC Force Enable dig In x133(91)</td><td>40764</td></tr> <tr><td>92</td><td>ELC Force Enable dig In x134(92)</td><td>40765</td></tr> <tr><td>93</td><td>ELC Force Enable dig In x135(93)</td><td>40766</td></tr> <tr><td>94</td><td>ELC Force Enable dig In x136(94)</td><td>40767</td></tr> <tr><td>95</td><td>ELC Force Enable dig In x137(95)</td><td>40768</td></tr> <tr><td>96</td><td>ELC Force Enable dig In x140(96)</td><td>40769</td></tr> <tr><td>97</td><td>ELC Force Enable dig In x141(97)</td><td>40770</td></tr> <tr><td>98</td><td>ELC Force Enable dig In x142(98)</td><td>40771</td></tr> <tr><td>99</td><td>ELC Force Enable dig In x143(99)</td><td>40772</td></tr> <tr><td>100</td><td>ELC Force Enable dig In x144(100)</td><td>40773</td></tr> <tr><td>101</td><td>ELC Force Enable dig In x145(101)</td><td>40774</td></tr> <tr><td>102</td><td>ELC Force Enable dig In x146(102)</td><td>40775</td></tr> <tr><td>103</td><td>ELC Force Enable dig In x147(103)</td><td>40776</td></tr> <tr><td>104</td><td>ELC Force Enable dig In x150(104)</td><td>40777</td></tr> <tr><td>105</td><td>ELC Force Enable dig In x151(105)</td><td>40778</td></tr> <tr><td>106</td><td>ELC Force Enable dig In x152(106)</td><td>40779</td></tr> <tr><td>107</td><td>ELC Force Enable dig In x153(107)</td><td>40780</td></tr> <tr><td>108</td><td>ELC Force Enable dig In x154(108)</td><td>40781</td></tr> <tr><td>109</td><td>ELC Force Enable dig In x155(109)</td><td>40782</td></tr> <tr><td>110</td><td>ELC Force Enable dig In x156(110)</td><td>40783</td></tr> <tr><td>111</td><td>ELC Force Enable dig In x157(111)</td><td>40784</td></tr> <tr><td>112</td><td>ELC Force Enable dig In x160(112)</td><td>40785</td></tr> <tr><td>113</td><td>ELC Force Enable dig In x161(113)</td><td>40786</td></tr> <tr><td>114</td><td>ELC Force Enable dig In x162(114)</td><td>40787</td></tr> <tr><td>115</td><td>ELC Force Enable dig In x163(115)</td><td>40788</td></tr> <tr><td>116</td><td>ELC Force Enable dig In x164(116)</td><td>40789</td></tr> <tr><td>117</td><td>ELC Force Enable dig In x165(117)</td><td>40790</td></tr> <tr><td>118</td><td>ELC Force Enable dig In x166(118)</td><td>40791</td></tr> <tr><td>119</td><td>ELC Force Enable dig In x167(119)</td><td>40792</td></tr> <tr><td>120</td><td>ELC Force Enable dig In x170(120)</td><td>40793</td></tr> <tr><td>121</td><td>ELC Force Enable dig In x171(121)</td><td>40794</td></tr> <tr><td>122</td><td>ELC Force Enable dig In x172(122)</td><td>40795</td></tr> <tr><td>123</td><td>ELC Force Enable dig In x173(123)</td><td>40796</td></tr> <tr><td>124</td><td>ELC Force Enable dig In x174(124)</td><td>40797</td></tr> <tr><td>125</td><td>ELC Force Enable dig In x175(125)</td><td>40798</td></tr> <tr><td>126</td><td>ELC Force Enable dig In x176(126)</td><td>40799</td></tr> <tr><td>127</td><td>ELC Force Enable dig In x177(127)</td><td>40800</td></tr> </tbody> </table> | Bit | Description | Coil | 84 | ELC Force Enable dig In x124(84) | 40757 | 85 | ELC Force Enable dig In x125(85) | 40758 | 86 | ELC Force Enable dig In x126(86) | 40759 | 87 | ELC Force Enable dig In x127(87) | 40760 | 88 | ELC Force Enable dig In x130(88) | 40761 | 89 | ELC Force Enable dig In x131(89) | 40762 | 90 | ELC Force Enable dig In x132(90) | 40763 | 91 | ELC Force Enable dig In x133(91) | 40764 | 92 | ELC Force Enable dig In x134(92) | 40765 | 93 | ELC Force Enable dig In x135(93) | 40766 | 94 | ELC Force Enable dig In x136(94) | 40767 | 95 | ELC Force Enable dig In x137(95) | 40768 | 96 | ELC Force Enable dig In x140(96) | 40769 | 97 | ELC Force Enable dig In x141(97) | 40770 | 98 | ELC Force Enable dig In x142(98) | 40771 | 99 | ELC Force Enable dig In x143(99) | 40772 | 100 | ELC Force Enable dig In x144(100) | 40773 | 101 | ELC Force Enable dig In x145(101) | 40774 | 102 | ELC Force Enable dig In x146(102) | 40775 | 103 | ELC Force Enable dig In x147(103) | 40776 | 104 | ELC Force Enable dig In x150(104) | 40777 | 105 | ELC Force Enable dig In x151(105) | 40778 | 106 | ELC Force Enable dig In x152(106) | 40779 | 107 | ELC Force Enable dig In x153(107) | 40780 | 108 | ELC Force Enable dig In x154(108) | 40781 | 109 | ELC Force Enable dig In x155(109) | 40782 | 110 | ELC Force Enable dig In x156(110) | 40783 | 111 | ELC Force Enable dig In x157(111) | 40784 | 112 | ELC Force Enable dig In x160(112) | 40785 | 113 | ELC Force Enable dig In x161(113) | 40786 | 114 | ELC Force Enable dig In x162(114) | 40787 | 115 | ELC Force Enable dig In x163(115) | 40788 | 116 | ELC Force Enable dig In x164(116) | 40789 | 117 | ELC Force Enable dig In x165(117) | 40790 | 118 | ELC Force Enable dig In x166(118) | 40791 | 119 | ELC Force Enable dig In x167(119) | 40792 | 120 | ELC Force Enable dig In x170(120) | 40793 | 121 | ELC Force Enable dig In x171(121) | 40794 | 122 | ELC Force Enable dig In x172(122) | 40795 | 123 | ELC Force Enable dig In x173(123) | 40796 | 124 | ELC Force Enable dig In x174(124) | 40797 | 125 | ELC Force Enable dig In x175(125) | 40798 | 126 | ELC Force Enable dig In x176(126) | 40799 | 127 | ELC Force Enable dig In x177(127) | 40800 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 84 | ELC Force Enable dig In x124(84) | 40757 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 85 | ELC Force Enable dig In x125(85) | 40758 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 86 | ELC Force Enable dig In x126(86) | 40759 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 87 | ELC Force Enable dig In x127(87) | 40760 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 88 | ELC Force Enable dig In x130(88) | 40761 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 89 | ELC Force Enable dig In x131(89) | 40762 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 90 | ELC Force Enable dig In x132(90) | 40763 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 91 | ELC Force Enable dig In x133(91) | 40764 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 92 | ELC Force Enable dig In x134(92) | 40765 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 93 | ELC Force Enable dig In x135(93) | 40766 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 94 | ELC Force Enable dig In x136(94) | 40767 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 95 | ELC Force Enable dig In x137(95) | 40768 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 96 | ELC Force Enable dig In x140(96) | 40769 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 97 | ELC Force Enable dig In x141(97) | 40770 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 98 | ELC Force Enable dig In x142(98) | 40771 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 99 | ELC Force Enable dig In x143(99) | 40772 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 | ELC Force Enable dig In x144(100) | 40773 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 101 | ELC Force Enable dig In x145(101) | 40774 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 102 | ELC Force Enable dig In x146(102) | 40775 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 103 | ELC Force Enable dig In x147(103) | 40776 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 104 | ELC Force Enable dig In x150(104) | 40777 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 105 | ELC Force Enable dig In x151(105) | 40778 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 106 | ELC Force Enable dig In x152(106) | 40779 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 107 | ELC Force Enable dig In x153(107) | 40780 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 108 | ELC Force Enable dig In x154(108) | 40781 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 109 | ELC Force Enable dig In x155(109) | 40782 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 110 | ELC Force Enable dig In x156(110) | 40783 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 111 | ELC Force Enable dig In x157(111) | 40784 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 112 | ELC Force Enable dig In x160(112) | 40785 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 113 | ELC Force Enable dig In x161(113) | 40786 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 114 | ELC Force Enable dig In x162(114) | 40787 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 115 | ELC Force Enable dig In x163(115) | 40788 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 116 | ELC Force Enable dig In x164(116) | 40789 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 117 | ELC Force Enable dig In x165(117) | 40790 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 118 | ELC Force Enable dig In x166(118) | 40791 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 119 | ELC Force Enable dig In x167(119) | 40792 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 120 | ELC Force Enable dig In x170(120) | 40793 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 121 | ELC Force Enable dig In x171(121) | 40794 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 122 | ELC Force Enable dig In x172(122) | 40795 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 123 | ELC Force Enable dig In x173(123) | 40796 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 124 | ELC Force Enable dig In x174(124) | 40797 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 125 | ELC Force Enable dig In x175(125) | 40798 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 126 | ELC Force Enable dig In x176(126) | 40799 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 127 | ELC Force Enable dig In x177(127) | 40800 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|----------------------------------|---|--|-----|-------------|------|---|--------------------------------|-------|---|--------------------------------|-------|---|--------------------------------|-------|---|--------------------------------|-------|---|--------------------------------|-------|---|--------------------------------|-------|---|--------------------------------|-------|---|--------------------------------|-------|---|---------------------------------|-------|---|---------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|
| 2551 | ELC IO Force Enable Digital Out | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Force Enable Digital Out. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>0</td><td>ELC Force Enable dig Out x0(0)</td><td>40801</td></tr> <tr><td>1</td><td>ELC Force Enable dig Out x1(1)</td><td>40802</td></tr> <tr><td>2</td><td>ELC Force Enable dig Out x2(2)</td><td>40803</td></tr> <tr><td>3</td><td>ELC Force Enable dig Out x3(3)</td><td>40804</td></tr> <tr><td>4</td><td>ELC Force Enable dig Out x4(4)</td><td>40805</td></tr> <tr><td>5</td><td>ELC Force Enable dig Out x5(5)</td><td>40806</td></tr> <tr><td>6</td><td>ELC Force Enable dig Out x6(6)</td><td>40807</td></tr> <tr><td>7</td><td>ELC Force Enable dig Out x7(7)</td><td>40808</td></tr> <tr><td>8</td><td>ELC Force Enable dig Out x10(8)</td><td>40809</td></tr> <tr><td>9</td><td>ELC Force Enable dig Out x11(9)</td><td>40810</td></tr> <tr><td>10</td><td>ELC Force Enable dig Out x12(10)</td><td>40811</td></tr> <tr><td>11</td><td>ELC Force Enable dig Out x13(11)</td><td>40812</td></tr> <tr><td>12</td><td>ELC Force Enable dig Out x14(12)</td><td>40813</td></tr> <tr><td>13</td><td>ELC Force Enable dig Out x15(13)</td><td>40814</td></tr> <tr><td>14</td><td>ELC Force Enable dig Out x16(14)</td><td>40815</td></tr> <tr><td>15</td><td>ELC Force Enable dig Out x17(15)</td><td>40816</td></tr> <tr><td>16</td><td>ELC Force Enable dig Out x20(16)</td><td>40817</td></tr> <tr><td>17</td><td>ELC Force Enable dig Out x21(17)</td><td>40818</td></tr> <tr><td>18</td><td>ELC Force Enable dig Out x22(18)</td><td>40819</td></tr> <tr><td>19</td><td>ELC Force Enable dig Out x23(19)</td><td>40820</td></tr> <tr><td>20</td><td>ELC Force Enable dig Out x24(20)</td><td>40821</td></tr> <tr><td>21</td><td>ELC Force Enable dig Out x25(21)</td><td>40822</td></tr> <tr><td>22</td><td>ELC Force Enable dig Out x26(22)</td><td>40823</td></tr> <tr><td>23</td><td>ELC Force Enable dig Out x27(23)</td><td>40824</td></tr> <tr><td>24</td><td>ELC Force Enable dig Out x30(24)</td><td>40825</td></tr> <tr><td>25</td><td>ELC Force Enable dig Out x31(25)</td><td>40826</td></tr> <tr><td>26</td><td>ELC Force Enable dig Out x32(26)</td><td>40827</td></tr> <tr><td>27</td><td>ELC Force Enable dig Out x33(27)</td><td>40828</td></tr> <tr><td>28</td><td>ELC Force Enable dig Out x34(28)</td><td>40829</td></tr> <tr><td>29</td><td>ELC Force Enable dig Out x35(29)</td><td>40830</td></tr> <tr><td>30</td><td>ELC Force Enable dig Out x36(30)</td><td>40831</td></tr> <tr><td>31</td><td>ELC Force Enable dig Out x37(31)</td><td>40832</td></tr> <tr><td>32</td><td>ELC Force Enable dig Out x40(32)</td><td>40833</td></tr> <tr><td>33</td><td>ELC Force Enable dig Out x41(33)</td><td>40834</td></tr> <tr><td>34</td><td>ELC Force Enable dig Out x42(34)</td><td>40835</td></tr> <tr><td>35</td><td>ELC Force Enable dig Out x43(35)</td><td>40836</td></tr> <tr><td>36</td><td>ELC Force Enable dig Out x44(36)</td><td>40837</td></tr> <tr><td>37</td><td>ELC Force Enable dig Out x45(37)</td><td>40838</td></tr> <tr><td>38</td><td>ELC Force Enable dig Out x46(38)</td><td>40839</td></tr> <tr><td>39</td><td>ELC Force Enable dig Out x47(39)</td><td>40840</td></tr> <tr><td>40</td><td>ELC Force Enable dig Out x50(40)</td><td>40841</td></tr> <tr><td>41</td><td>ELC Force Enable dig Out x51(41)</td><td>40842</td></tr> <tr><td>42</td><td>ELC Force Enable dig Out x52(42)</td><td>40843</td></tr> <tr><td>43</td><td>ELC Force Enable dig Out x53(43)</td><td>40844</td></tr> </tbody> </table> | Bit | Description | Coil | 0 | ELC Force Enable dig Out x0(0) | 40801 | 1 | ELC Force Enable dig Out x1(1) | 40802 | 2 | ELC Force Enable dig Out x2(2) | 40803 | 3 | ELC Force Enable dig Out x3(3) | 40804 | 4 | ELC Force Enable dig Out x4(4) | 40805 | 5 | ELC Force Enable dig Out x5(5) | 40806 | 6 | ELC Force Enable dig Out x6(6) | 40807 | 7 | ELC Force Enable dig Out x7(7) | 40808 | 8 | ELC Force Enable dig Out x10(8) | 40809 | 9 | ELC Force Enable dig Out x11(9) | 40810 | 10 | ELC Force Enable dig Out x12(10) | 40811 | 11 | ELC Force Enable dig Out x13(11) | 40812 | 12 | ELC Force Enable dig Out x14(12) | 40813 | 13 | ELC Force Enable dig Out x15(13) | 40814 | 14 | ELC Force Enable dig Out x16(14) | 40815 | 15 | ELC Force Enable dig Out x17(15) | 40816 | 16 | ELC Force Enable dig Out x20(16) | 40817 | 17 | ELC Force Enable dig Out x21(17) | 40818 | 18 | ELC Force Enable dig Out x22(18) | 40819 | 19 | ELC Force Enable dig Out x23(19) | 40820 | 20 | ELC Force Enable dig Out x24(20) | 40821 | 21 | ELC Force Enable dig Out x25(21) | 40822 | 22 | ELC Force Enable dig Out x26(22) | 40823 | 23 | ELC Force Enable dig Out x27(23) | 40824 | 24 | ELC Force Enable dig Out x30(24) | 40825 | 25 | ELC Force Enable dig Out x31(25) | 40826 | 26 | ELC Force Enable dig Out x32(26) | 40827 | 27 | ELC Force Enable dig Out x33(27) | 40828 | 28 | ELC Force Enable dig Out x34(28) | 40829 | 29 | ELC Force Enable dig Out x35(29) | 40830 | 30 | ELC Force Enable dig Out x36(30) | 40831 | 31 | ELC Force Enable dig Out x37(31) | 40832 | 32 | ELC Force Enable dig Out x40(32) | 40833 | 33 | ELC Force Enable dig Out x41(33) | 40834 | 34 | ELC Force Enable dig Out x42(34) | 40835 | 35 | ELC Force Enable dig Out x43(35) | 40836 | 36 | ELC Force Enable dig Out x44(36) | 40837 | 37 | ELC Force Enable dig Out x45(37) | 40838 | 38 | ELC Force Enable dig Out x46(38) | 40839 | 39 | ELC Force Enable dig Out x47(39) | 40840 | 40 | ELC Force Enable dig Out x50(40) | 40841 | 41 | ELC Force Enable dig Out x51(41) | 40842 | 42 | ELC Force Enable dig Out x52(42) | 40843 | 43 | ELC Force Enable dig Out x53(43) | 40844 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | ELC Force Enable dig Out x0(0) | 40801 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | ELC Force Enable dig Out x1(1) | 40802 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | ELC Force Enable dig Out x2(2) | 40803 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | ELC Force Enable dig Out x3(3) | 40804 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | ELC Force Enable dig Out x4(4) | 40805 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | ELC Force Enable dig Out x5(5) | 40806 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | ELC Force Enable dig Out x6(6) | 40807 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | ELC Force Enable dig Out x7(7) | 40808 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | ELC Force Enable dig Out x10(8) | 40809 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | ELC Force Enable dig Out x11(9) | 40810 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | ELC Force Enable dig Out x12(10) | 40811 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | ELC Force Enable dig Out x13(11) | 40812 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | ELC Force Enable dig Out x14(12) | 40813 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | ELC Force Enable dig Out x15(13) | 40814 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | ELC Force Enable dig Out x16(14) | 40815 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | ELC Force Enable dig Out x17(15) | 40816 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | ELC Force Enable dig Out x20(16) | 40817 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | ELC Force Enable dig Out x21(17) | 40818 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | ELC Force Enable dig Out x22(18) | 40819 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | ELC Force Enable dig Out x23(19) | 40820 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | ELC Force Enable dig Out x24(20) | 40821 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | ELC Force Enable dig Out x25(21) | 40822 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | ELC Force Enable dig Out x26(22) | 40823 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | ELC Force Enable dig Out x27(23) | 40824 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | ELC Force Enable dig Out x30(24) | 40825 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | ELC Force Enable dig Out x31(25) | 40826 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | ELC Force Enable dig Out x32(26) | 40827 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | ELC Force Enable dig Out x33(27) | 40828 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | ELC Force Enable dig Out x34(28) | 40829 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | ELC Force Enable dig Out x35(29) | 40830 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | ELC Force Enable dig Out x36(30) | 40831 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | ELC Force Enable dig Out x37(31) | 40832 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | ELC Force Enable dig Out x40(32) | 40833 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | ELC Force Enable dig Out x41(33) | 40834 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | ELC Force Enable dig Out x42(34) | 40835 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | ELC Force Enable dig Out x43(35) | 40836 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | ELC Force Enable dig Out x44(36) | 40837 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | ELC Force Enable dig Out x45(37) | 40838 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | ELC Force Enable dig Out x46(38) | 40839 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | ELC Force Enable dig Out x47(39) | 40840 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | ELC Force Enable dig Out x50(40) | 40841 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | ELC Force Enable dig Out x51(41) | 40842 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | ELC Force Enable dig Out x52(42) | 40843 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | ELC Force Enable dig Out x53(43) | 40844 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|-----------------------------------|---|--|-----|-------------|------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|
| 2551 | ELC IO Force Enable Digital Out | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Force Enable Digital Out, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>44</td><td>ELC Force Enable dig Out x54(44)</td><td>40845</td></tr> <tr><td>45</td><td>ELC Force Enable dig Out x55(45)</td><td>40846</td></tr> <tr><td>46</td><td>ELC Force Enable dig Out x56(46)</td><td>40847</td></tr> <tr><td>47</td><td>ELC Force Enable dig Out x57(47)</td><td>40848</td></tr> <tr><td>48</td><td>ELC Force Enable dig Out x60(48)</td><td>40849</td></tr> <tr><td>49</td><td>ELC Force Enable dig Out x61(49)</td><td>40850</td></tr> <tr><td>50</td><td>ELC Force Enable dig Out x62(50)</td><td>40851</td></tr> <tr><td>51</td><td>ELC Force Enable dig Out x63(51)</td><td>40852</td></tr> <tr><td>52</td><td>ELC Force Enable dig Out x64(52)</td><td>40853</td></tr> <tr><td>53</td><td>ELC Force Enable dig Out x65(53)</td><td>40854</td></tr> <tr><td>54</td><td>ELC Force Enable dig Out x66(54)</td><td>40855</td></tr> <tr><td>55</td><td>ELC Force Enable dig Out x67(55)</td><td>40856</td></tr> <tr><td>56</td><td>ELC Force Enable dig Out x70(56)</td><td>40857</td></tr> <tr><td>57</td><td>ELC Force Enable dig Out x71(57)</td><td>40858</td></tr> <tr><td>58</td><td>ELC Force Enable dig Out x72(58)</td><td>40859</td></tr> <tr><td>59</td><td>ELC Force Enable dig Out x73(59)</td><td>40860</td></tr> <tr><td>60</td><td>ELC Force Enable dig Out x74(60)</td><td>40861</td></tr> <tr><td>61</td><td>ELC Force Enable dig Out x75(61)</td><td>40862</td></tr> <tr><td>62</td><td>ELC Force Enable dig Out x76(62)</td><td>40863</td></tr> <tr><td>63</td><td>ELC Force Enable dig Out x77(63)</td><td>40864</td></tr> <tr><td>64</td><td>ELC Force Enable dig Out x100(64)</td><td>40865</td></tr> <tr><td>65</td><td>ELC Force Enable dig Out x101(65)</td><td>40866</td></tr> <tr><td>66</td><td>ELC Force Enable dig Out x102(66)</td><td>40867</td></tr> <tr><td>67</td><td>ELC Force Enable dig Out x103(67)</td><td>40868</td></tr> <tr><td>68</td><td>ELC Force Enable dig Out x104(68)</td><td>40869</td></tr> <tr><td>69</td><td>ELC Force Enable dig Out x105(69)</td><td>40870</td></tr> <tr><td>70</td><td>ELC Force Enable dig Out x106(70)</td><td>40871</td></tr> <tr><td>71</td><td>ELC Force Enable dig Out x107(71)</td><td>40872</td></tr> <tr><td>72</td><td>ELC Force Enable dig Out x110(72)</td><td>40873</td></tr> <tr><td>73</td><td>ELC Force Enable dig Out x111(73)</td><td>40874</td></tr> <tr><td>74</td><td>ELC Force Enable dig Out x112(74)</td><td>40875</td></tr> <tr><td>75</td><td>ELC Force Enable dig Out x113(75)</td><td>40876</td></tr> <tr><td>76</td><td>ELC Force Enable dig Out x114(76)</td><td>40877</td></tr> <tr><td>77</td><td>ELC Force Enable dig Out x115(77)</td><td>40878</td></tr> <tr><td>78</td><td>ELC Force Enable dig Out x116(78)</td><td>40879</td></tr> <tr><td>79</td><td>ELC Force Enable dig Out x117(79)</td><td>40880</td></tr> <tr><td>80</td><td>ELC Force Enable dig Out x120(80)</td><td>40881</td></tr> <tr><td>81</td><td>ELC Force Enable dig Out x121(81)</td><td>40882</td></tr> <tr><td>82</td><td>ELC Force Enable dig Out x122(82)</td><td>40883</td></tr> <tr><td>83</td><td>ELC Force Enable dig Out x123(83)</td><td>40884</td></tr> <tr><td>84</td><td>ELC Force Enable dig Out x124(84)</td><td>40885</td></tr> <tr><td>85</td><td>ELC Force Enable dig Out x125(85)</td><td>40886</td></tr> <tr><td>86</td><td>ELC Force Enable dig Out x126(86)</td><td>40887</td></tr> <tr><td>87</td><td>ELC Force Enable dig Out x127(87)</td><td>40888</td></tr> </tbody> </table> | Bit | Description | Coil | 44 | ELC Force Enable dig Out x54(44) | 40845 | 45 | ELC Force Enable dig Out x55(45) | 40846 | 46 | ELC Force Enable dig Out x56(46) | 40847 | 47 | ELC Force Enable dig Out x57(47) | 40848 | 48 | ELC Force Enable dig Out x60(48) | 40849 | 49 | ELC Force Enable dig Out x61(49) | 40850 | 50 | ELC Force Enable dig Out x62(50) | 40851 | 51 | ELC Force Enable dig Out x63(51) | 40852 | 52 | ELC Force Enable dig Out x64(52) | 40853 | 53 | ELC Force Enable dig Out x65(53) | 40854 | 54 | ELC Force Enable dig Out x66(54) | 40855 | 55 | ELC Force Enable dig Out x67(55) | 40856 | 56 | ELC Force Enable dig Out x70(56) | 40857 | 57 | ELC Force Enable dig Out x71(57) | 40858 | 58 | ELC Force Enable dig Out x72(58) | 40859 | 59 | ELC Force Enable dig Out x73(59) | 40860 | 60 | ELC Force Enable dig Out x74(60) | 40861 | 61 | ELC Force Enable dig Out x75(61) | 40862 | 62 | ELC Force Enable dig Out x76(62) | 40863 | 63 | ELC Force Enable dig Out x77(63) | 40864 | 64 | ELC Force Enable dig Out x100(64) | 40865 | 65 | ELC Force Enable dig Out x101(65) | 40866 | 66 | ELC Force Enable dig Out x102(66) | 40867 | 67 | ELC Force Enable dig Out x103(67) | 40868 | 68 | ELC Force Enable dig Out x104(68) | 40869 | 69 | ELC Force Enable dig Out x105(69) | 40870 | 70 | ELC Force Enable dig Out x106(70) | 40871 | 71 | ELC Force Enable dig Out x107(71) | 40872 | 72 | ELC Force Enable dig Out x110(72) | 40873 | 73 | ELC Force Enable dig Out x111(73) | 40874 | 74 | ELC Force Enable dig Out x112(74) | 40875 | 75 | ELC Force Enable dig Out x113(75) | 40876 | 76 | ELC Force Enable dig Out x114(76) | 40877 | 77 | ELC Force Enable dig Out x115(77) | 40878 | 78 | ELC Force Enable dig Out x116(78) | 40879 | 79 | ELC Force Enable dig Out x117(79) | 40880 | 80 | ELC Force Enable dig Out x120(80) | 40881 | 81 | ELC Force Enable dig Out x121(81) | 40882 | 82 | ELC Force Enable dig Out x122(82) | 40883 | 83 | ELC Force Enable dig Out x123(83) | 40884 | 84 | ELC Force Enable dig Out x124(84) | 40885 | 85 | ELC Force Enable dig Out x125(85) | 40886 | 86 | ELC Force Enable dig Out x126(86) | 40887 | 87 | ELC Force Enable dig Out x127(87) | 40888 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | ELC Force Enable dig Out x54(44) | 40845 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 | ELC Force Enable dig Out x55(45) | 40846 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | ELC Force Enable dig Out x56(46) | 40847 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 | ELC Force Enable dig Out x57(47) | 40848 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 48 | ELC Force Enable dig Out x60(48) | 40849 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 49 | ELC Force Enable dig Out x61(49) | 40850 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | ELC Force Enable dig Out x62(50) | 40851 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | ELC Force Enable dig Out x63(51) | 40852 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 52 | ELC Force Enable dig Out x64(52) | 40853 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 53 | ELC Force Enable dig Out x65(53) | 40854 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | ELC Force Enable dig Out x66(54) | 40855 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 55 | ELC Force Enable dig Out x67(55) | 40856 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 56 | ELC Force Enable dig Out x70(56) | 40857 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 57 | ELC Force Enable dig Out x71(57) | 40858 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | ELC Force Enable dig Out x72(58) | 40859 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 59 | ELC Force Enable dig Out x73(59) | 40860 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | ELC Force Enable dig Out x74(60) | 40861 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 61 | ELC Force Enable dig Out x75(61) | 40862 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 62 | ELC Force Enable dig Out x76(62) | 40863 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | ELC Force Enable dig Out x77(63) | 40864 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 64 | ELC Force Enable dig Out x100(64) | 40865 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65 | ELC Force Enable dig Out x101(65) | 40866 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 66 | ELC Force Enable dig Out x102(66) | 40867 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 67 | ELC Force Enable dig Out x103(67) | 40868 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 68 | ELC Force Enable dig Out x104(68) | 40869 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 69 | ELC Force Enable dig Out x105(69) | 40870 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 70 | ELC Force Enable dig Out x106(70) | 40871 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 71 | ELC Force Enable dig Out x107(71) | 40872 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 72 | ELC Force Enable dig Out x110(72) | 40873 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 73 | ELC Force Enable dig Out x111(73) | 40874 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 74 | ELC Force Enable dig Out x112(74) | 40875 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 75 | ELC Force Enable dig Out x113(75) | 40876 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 76 | ELC Force Enable dig Out x114(76) | 40877 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 77 | ELC Force Enable dig Out x115(77) | 40878 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 78 | ELC Force Enable dig Out x116(78) | 40879 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 79 | ELC Force Enable dig Out x117(79) | 40880 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 80 | ELC Force Enable dig Out x120(80) | 40881 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 81 | ELC Force Enable dig Out x121(81) | 40882 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 82 | ELC Force Enable dig Out x122(82) | 40883 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 83 | ELC Force Enable dig Out x123(83) | 40884 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 84 | ELC Force Enable dig Out x124(84) | 40885 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 85 | ELC Force Enable dig Out x125(85) | 40886 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 86 | ELC Force Enable dig Out x126(86) | 40887 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 87 | ELC Force Enable dig Out x127(87) | 40888 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|------------------------------------|---|--|-----|-------------|------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|----|-----------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|-----|------------------------------------|-------|
| 2551 | ELC IO Force Enable Digital Out | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Force Enable Digital Out, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>88</td><td>ELC Force Enable dig Out x130(88)</td><td>40889</td></tr> <tr><td>89</td><td>ELC Force Enable dig Out x131(89)</td><td>40890</td></tr> <tr><td>90</td><td>ELC Force Enable dig Out x132(90)</td><td>40891</td></tr> <tr><td>91</td><td>ELC Force Enable dig Out x133(91)</td><td>40892</td></tr> <tr><td>92</td><td>ELC Force Enable dig Out x134(92)</td><td>40893</td></tr> <tr><td>93</td><td>ELC Force Enable dig Out x135(93)</td><td>40894</td></tr> <tr><td>94</td><td>ELC Force Enable dig Out x136(94)</td><td>40895</td></tr> <tr><td>95</td><td>ELC Force Enable dig Out x137(95)</td><td>40896</td></tr> <tr><td>96</td><td>ELC Force Enable dig Out x140(96)</td><td>40897</td></tr> <tr><td>97</td><td>ELC Force Enable dig Out x141(97)</td><td>40898</td></tr> <tr><td>98</td><td>ELC Force Enable dig Out x142(98)</td><td>40899</td></tr> <tr><td>99</td><td>ELC Force Enable dig Out x143(99)</td><td>40900</td></tr> <tr><td>100</td><td>ELC Force Enable dig Out x144(100)</td><td>40901</td></tr> <tr><td>101</td><td>ELC Force Enable dig Out x145(101)</td><td>40902</td></tr> <tr><td>102</td><td>ELC Force Enable dig Out x146(102)</td><td>40903</td></tr> <tr><td>103</td><td>ELC Force Enable dig Out x147(103)</td><td>40904</td></tr> <tr><td>104</td><td>ELC Force Enable dig Out x150(104)</td><td>40905</td></tr> <tr><td>105</td><td>ELC Force Enable dig Out x151(105)</td><td>40906</td></tr> <tr><td>106</td><td>ELC Force Enable dig Out x152(106)</td><td>40907</td></tr> <tr><td>107</td><td>ELC Force Enable dig Out x153(107)</td><td>40908</td></tr> <tr><td>108</td><td>ELC Force Enable dig Out x154(108)</td><td>40909</td></tr> <tr><td>109</td><td>ELC Force Enable dig Out x155(109)</td><td>40910</td></tr> <tr><td>110</td><td>ELC Force Enable dig Out x156(110)</td><td>40911</td></tr> <tr><td>111</td><td>ELC Force Enable dig Out x157(111)</td><td>40912</td></tr> <tr><td>112</td><td>ELC Force Enable dig Out x160(112)</td><td>40913</td></tr> <tr><td>113</td><td>ELC Force Enable dig Out x161(113)</td><td>40914</td></tr> <tr><td>114</td><td>ELC Force Enable dig Out x162(114)</td><td>40915</td></tr> <tr><td>115</td><td>ELC Force Enable dig Out x163(115)</td><td>40916</td></tr> <tr><td>116</td><td>ELC Force Enable dig Out x164(116)</td><td>40917</td></tr> <tr><td>117</td><td>ELC Force Enable dig Out x165(117)</td><td>40918</td></tr> <tr><td>118</td><td>ELC Force Enable dig Out x166(118)</td><td>40919</td></tr> <tr><td>119</td><td>ELC Force Enable dig Out x167(119)</td><td>40920</td></tr> <tr><td>120</td><td>ELC Force Enable dig Out x170(120)</td><td>40921</td></tr> <tr><td>121</td><td>ELC Force Enable dig Out x171(121)</td><td>40922</td></tr> <tr><td>122</td><td>ELC Force Enable dig Out x172(122)</td><td>40923</td></tr> <tr><td>123</td><td>ELC Force Enable dig Out x173(123)</td><td>40924</td></tr> <tr><td>124</td><td>ELC Force Enable dig Out x174(124)</td><td>40925</td></tr> <tr><td>125</td><td>ELC Force Enable dig Out x175(125)</td><td>40926</td></tr> <tr><td>126</td><td>ELC Force Enable dig Out x176(126)</td><td>40927</td></tr> <tr><td>127</td><td>ELC Force Enable dig Out x177(127)</td><td>40928</td></tr> </tbody> </table> | Bit | Description | Coil | 88 | ELC Force Enable dig Out x130(88) | 40889 | 89 | ELC Force Enable dig Out x131(89) | 40890 | 90 | ELC Force Enable dig Out x132(90) | 40891 | 91 | ELC Force Enable dig Out x133(91) | 40892 | 92 | ELC Force Enable dig Out x134(92) | 40893 | 93 | ELC Force Enable dig Out x135(93) | 40894 | 94 | ELC Force Enable dig Out x136(94) | 40895 | 95 | ELC Force Enable dig Out x137(95) | 40896 | 96 | ELC Force Enable dig Out x140(96) | 40897 | 97 | ELC Force Enable dig Out x141(97) | 40898 | 98 | ELC Force Enable dig Out x142(98) | 40899 | 99 | ELC Force Enable dig Out x143(99) | 40900 | 100 | ELC Force Enable dig Out x144(100) | 40901 | 101 | ELC Force Enable dig Out x145(101) | 40902 | 102 | ELC Force Enable dig Out x146(102) | 40903 | 103 | ELC Force Enable dig Out x147(103) | 40904 | 104 | ELC Force Enable dig Out x150(104) | 40905 | 105 | ELC Force Enable dig Out x151(105) | 40906 | 106 | ELC Force Enable dig Out x152(106) | 40907 | 107 | ELC Force Enable dig Out x153(107) | 40908 | 108 | ELC Force Enable dig Out x154(108) | 40909 | 109 | ELC Force Enable dig Out x155(109) | 40910 | 110 | ELC Force Enable dig Out x156(110) | 40911 | 111 | ELC Force Enable dig Out x157(111) | 40912 | 112 | ELC Force Enable dig Out x160(112) | 40913 | 113 | ELC Force Enable dig Out x161(113) | 40914 | 114 | ELC Force Enable dig Out x162(114) | 40915 | 115 | ELC Force Enable dig Out x163(115) | 40916 | 116 | ELC Force Enable dig Out x164(116) | 40917 | 117 | ELC Force Enable dig Out x165(117) | 40918 | 118 | ELC Force Enable dig Out x166(118) | 40919 | 119 | ELC Force Enable dig Out x167(119) | 40920 | 120 | ELC Force Enable dig Out x170(120) | 40921 | 121 | ELC Force Enable dig Out x171(121) | 40922 | 122 | ELC Force Enable dig Out x172(122) | 40923 | 123 | ELC Force Enable dig Out x173(123) | 40924 | 124 | ELC Force Enable dig Out x174(124) | 40925 | 125 | ELC Force Enable dig Out x175(125) | 40926 | 126 | ELC Force Enable dig Out x176(126) | 40927 | 127 | ELC Force Enable dig Out x177(127) | 40928 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 88 | ELC Force Enable dig Out x130(88) | 40889 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 89 | ELC Force Enable dig Out x131(89) | 40890 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 90 | ELC Force Enable dig Out x132(90) | 40891 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 91 | ELC Force Enable dig Out x133(91) | 40892 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 92 | ELC Force Enable dig Out x134(92) | 40893 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 93 | ELC Force Enable dig Out x135(93) | 40894 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 94 | ELC Force Enable dig Out x136(94) | 40895 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 95 | ELC Force Enable dig Out x137(95) | 40896 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 96 | ELC Force Enable dig Out x140(96) | 40897 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 97 | ELC Force Enable dig Out x141(97) | 40898 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 98 | ELC Force Enable dig Out x142(98) | 40899 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 99 | ELC Force Enable dig Out x143(99) | 40900 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 | ELC Force Enable dig Out x144(100) | 40901 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 101 | ELC Force Enable dig Out x145(101) | 40902 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 102 | ELC Force Enable dig Out x146(102) | 40903 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 103 | ELC Force Enable dig Out x147(103) | 40904 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 104 | ELC Force Enable dig Out x150(104) | 40905 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 105 | ELC Force Enable dig Out x151(105) | 40906 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 106 | ELC Force Enable dig Out x152(106) | 40907 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 107 | ELC Force Enable dig Out x153(107) | 40908 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 108 | ELC Force Enable dig Out x154(108) | 40909 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 109 | ELC Force Enable dig Out x155(109) | 40910 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 110 | ELC Force Enable dig Out x156(110) | 40911 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 111 | ELC Force Enable dig Out x157(111) | 40912 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 112 | ELC Force Enable dig Out x160(112) | 40913 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 113 | ELC Force Enable dig Out x161(113) | 40914 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 114 | ELC Force Enable dig Out x162(114) | 40915 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 115 | ELC Force Enable dig Out x163(115) | 40916 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 116 | ELC Force Enable dig Out x164(116) | 40917 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 117 | ELC Force Enable dig Out x165(117) | 40918 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 118 | ELC Force Enable dig Out x166(118) | 40919 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 119 | ELC Force Enable dig Out x167(119) | 40920 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 120 | ELC Force Enable dig Out x170(120) | 40921 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 121 | ELC Force Enable dig Out x171(121) | 40922 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 122 | ELC Force Enable dig Out x172(122) | 40923 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 123 | ELC Force Enable dig Out x173(123) | 40924 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 124 | ELC Force Enable dig Out x174(124) | 40925 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 125 | ELC Force Enable dig Out x175(125) | 40926 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 126 | ELC Force Enable dig Out x176(126) | 40927 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 127 | ELC Force Enable dig Out x177(127) | 40928 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--|---|---|---|-------------|------|---|------------------------|-------|---|-----------------------|-------|---|---------------------|-------|---|---|-------|---|------------------------------------|-------|---|-----------------------------|-------|---|------------------------|-------|---|-----------------------|-------|---|------------------|-------|---|-------------------|-------|----|--------------------------------|-------|----|---------------------------------|-------|----|--|-------|
| 2559 | Fault/Warning configuration | BYTE RW NV Array size: 4 Default: 0 Bitfield Config CRC Admin Lock USB Lock Backup Mem | Fault/Warning configuration - When a bit is set to 0, a fault is thrown, when set to 1, a warning is thrown. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Logic program underrun</td> <td>40929</td> </tr> <tr> <td>1</td> <td>Logic program overrun</td> <td>40930</td> </tr> <tr> <td>2</td> <td>Logic task watchdog</td> <td>40931</td> </tr> <tr> <td>3</td> <td>Logic instruction invalid instance number</td> <td>40932</td> </tr> <tr> <td>4</td> <td>Logic instruction invalid argument</td> <td>40933</td> </tr> <tr> <td>5</td> <td>Logic math - divide by zero</td> <td>40934</td> </tr> <tr> <td>6</td> <td>Logic math - underflow</td> <td>40935</td> </tr> <tr> <td>7</td> <td>Logic math - overflow</td> <td>40936</td> </tr> <tr> <td>8</td> <td>ELC IO Comm loss</td> <td>40937</td> </tr> <tr> <td>9</td> <td>ELC IO Comm error</td> <td>40938</td> </tr> <tr> <td>10</td> <td>Generic Modbus slave comm loss</td> <td>40939</td> </tr> <tr> <td>11</td> <td>Generic Modbus slave comm error</td> <td>40940</td> </tr> <tr> <td>12</td> <td>Logic Program accessing ELC IO but ELC IO not configured</td> <td>40941</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Logic program underrun | 40929 | 1 | Logic program overrun | 40930 | 2 | Logic task watchdog | 40931 | 3 | Logic instruction invalid instance number | 40932 | 4 | Logic instruction invalid argument | 40933 | 5 | Logic math - divide by zero | 40934 | 6 | Logic math - underflow | 40935 | 7 | Logic math - overflow | 40936 | 8 | ELC IO Comm loss | 40937 | 9 | ELC IO Comm error | 40938 | 10 | Generic Modbus slave comm loss | 40939 | 11 | Generic Modbus slave comm error | 40940 | 12 | Logic Program accessing ELC IO but ELC IO not configured | 40941 |
| | | | Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0 | Logic program underrun | 40929 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 | Logic program overrun | 40930 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 2 | Logic task watchdog | 40931 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 3 | Logic instruction invalid instance number | 40932 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 4 | Logic instruction invalid argument | 40933 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 5 | Logic math - divide by zero | 40934 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 6 | Logic math - underflow | 40935 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 7 | Logic math - overflow | 40936 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 8 | ELC IO Comm loss | 40937 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 9 | ELC IO Comm error | 40938 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Generic Modbus slave comm loss | 40939 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Generic Modbus slave comm error | 40940 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Logic Program accessing ELC IO but ELC IO not configured | 40941 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2561 | Logic error info - Program Id | UINT16 RO Default: 0 | Logic error info - Program Id Logic error info - Program Id | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2562 | Logic error info - Program Counter | UINT32 RO Default: 0 | Logic error info - Program Counter Logic error info - Program Counter | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2564 | Logic error info - Error Data | UINT32 RO Default: 0 | Logic error info - Error Data Logic error info - Error Data | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2566 | Logic Run Control | BYTE RW NV Default: 0 Bitfield Config CRC Admin Lock USB Lock Backup Mem | Logic Run Control | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Run</td> <td>41041</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Run | 41041 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Run | 41041 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2567 | Logic Run Status | BYTE RO Default: 0 Bitfield | Logic Run Status | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Logic Running</td> <td>41057</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Logic Running | 41057 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Logic Running | 41057 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2568 | ELC IO Speciality Module config location | UINT8 RW NV Default: 0 Enum Admin Lock Backup Mem | ELC IO Speciality Module config location | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>C445</td> <td>ELC10</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | C445 | ELC10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | C445 | ELC10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | |
|----------|-----------------------------------|---|---|------------------------------------|-------------|
| 2569 | ELC IO Status | BYTE R0 Array size: 4 Bitfield | ELC IO Status. | | |
| | | | Bit | Description | Coil |
| | | | 0 | 485 port not configured for ELC IO | 41089 |
| | | | 1 | Syncing configuration | 41090 |
| | | | 2 | Running | 41091 |
| | | | 3 | Comm Loss | 41092 |
| | | | 4 | Comm Error | 41093 |
| | | | 5 | Invalid number of digital inputs | 41094 |
| | | | 6 | Invalid number of digital outputs | 41095 |
| | | | 7 | Invalid specialty module 1 code | 41096 |
| | | | 8 | Invalid specialty module 2 code | 41097 |
| | | | 9 | Invalid specialty module 3 code | 41098 |
| | | | 10 | Invalid specialty module 4 code | 41099 |
| | | | 11 | Invalid specialty module 5 code | 41100 |
| | | | 12 | Invalid specialty module 6 code | 41101 |
| 13 | Invalid specialty module 7 code | 41102 | | | |
| 14 | Invalid specialty module 8 code | 41103 | | | |
| 2571 | ELC IO Analog Update interval | UINT16 R0 Units: mSec | ELC IO Analog Update interval ELC IO Analog Update interval | | |
| 2572 | ELC IO Digital Update interval | UINT16 R0 Units: mSec | ELC IO Digital Update interval ELC IO Digital Update interval | | |
| 2573 | ELC IO Actual Speciality Module 1 | UINT16 RW Array size: 30 Default: 0 | ELC IO Actual Speciality Module 1 Array of 30 registers ELC IO Actual Speciality Module 1 | | |
| 2603 | ELC IO Actual Speciality Module 2 | UINT16 RW Array size: 30 Default: 0 | ELC IO Actual Speciality Module 2 Array of 30 registers ELC IO Actual Speciality Module 2 | | |
| 2633 | ELC IO Actual Speciality Module 3 | UINT16 RW Array size: 30 Default: 0 | ELC IO Actual Speciality Module 3 Array of 30 registers ELC IO Actual Speciality Module 3 | | |
| 2663 | ELC IO Actual Speciality Module 4 | UINT16 RW Array size: 30 Default: 0 | ELC IO Actual Speciality Module 4 Array of 30 registers ELC IO Actual Speciality Module 4 | | |
| 2693 | ELC IO Actual Speciality Module 5 | UINT16 RW Array size: 30 Default: 0 | ELC IO Actual Speciality Module 5 Array of 30 registers ELC IO Actual Speciality Module 5 | | |
| 2723 | ELC IO Actual Speciality Module 6 | UINT16 RW Array size: 30 Default: 0 | ELC IO Actual Speciality Module 6 Array of 30 registers ELC IO Actual Speciality Module 6 | | |
| 2753 | ELC IO Actual Speciality Module 7 | UINT16 RW Array size: 30 Default: 0 | ELC IO Actual Speciality Module 7 Array of 30 registers ELC IO Actual Speciality Module 7 | | |
| 2783 | ELC IO Actual Speciality Module 8 | UINT16 RW Array size: 30 Default: 0 | ELC IO Actual Speciality Module 8 Array of 30 registers ELC IO Actual Speciality Module 8 | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--------------------------|---|--|-----|-------------|------|---|------------------------|-------|---|------------------------|-------|---|------------------------|-------|---|------------------------|-------|---|------------------------|-------|---|------------------------|-------|---|------------------------|-------|---|------------------------|-------|---|-------------------------|-------|---|-------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|
| 2813 | ELC IO Actual Digital In | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Actual Digital In | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>0</td><td>ELC Force dig In x0(0)</td><td>44993</td></tr> <tr><td>1</td><td>ELC Force dig In x1(1)</td><td>44994</td></tr> <tr><td>2</td><td>ELC Force dig In x2(2)</td><td>44995</td></tr> <tr><td>3</td><td>ELC Force dig In x3(3)</td><td>44996</td></tr> <tr><td>4</td><td>ELC Force dig In x4(4)</td><td>44997</td></tr> <tr><td>5</td><td>ELC Force dig In x5(5)</td><td>44998</td></tr> <tr><td>6</td><td>ELC Force dig In x6(6)</td><td>44999</td></tr> <tr><td>7</td><td>ELC Force dig In x7(7)</td><td>45000</td></tr> <tr><td>8</td><td>ELC Force dig In x10(8)</td><td>45001</td></tr> <tr><td>9</td><td>ELC Force dig In x11(9)</td><td>45002</td></tr> <tr><td>10</td><td>ELC Force dig In x12(10)</td><td>45003</td></tr> <tr><td>11</td><td>ELC Force dig In x13(11)</td><td>45004</td></tr> <tr><td>12</td><td>ELC Force dig In x14(12)</td><td>45005</td></tr> <tr><td>13</td><td>ELC Force dig In x15(13)</td><td>45006</td></tr> <tr><td>14</td><td>ELC Force dig In x16(14)</td><td>45007</td></tr> <tr><td>15</td><td>ELC Force dig In x17(15)</td><td>45008</td></tr> <tr><td>16</td><td>ELC Force dig In x20(16)</td><td>45009</td></tr> <tr><td>17</td><td>ELC Force dig In x21(17)</td><td>45010</td></tr> <tr><td>18</td><td>ELC Force dig In x22(18)</td><td>45011</td></tr> <tr><td>19</td><td>ELC Force dig In x23(19)</td><td>45012</td></tr> <tr><td>20</td><td>ELC Force dig In x24(20)</td><td>45013</td></tr> <tr><td>21</td><td>ELC Force dig In x25(21)</td><td>45014</td></tr> <tr><td>22</td><td>ELC Force dig In x26(22)</td><td>45015</td></tr> <tr><td>23</td><td>ELC Force dig In x27(23)</td><td>45016</td></tr> <tr><td>24</td><td>ELC Force dig In x30(24)</td><td>45017</td></tr> <tr><td>25</td><td>ELC Force dig In x31(25)</td><td>45018</td></tr> <tr><td>26</td><td>ELC Force dig In x32(26)</td><td>45019</td></tr> <tr><td>27</td><td>ELC Force dig In x33(27)</td><td>45020</td></tr> <tr><td>28</td><td>ELC Force dig In x34(28)</td><td>45021</td></tr> <tr><td>29</td><td>ELC Force dig In x35(29)</td><td>45022</td></tr> <tr><td>30</td><td>ELC Force dig In x36(30)</td><td>45023</td></tr> <tr><td>31</td><td>ELC Force dig In x37(31)</td><td>45024</td></tr> <tr><td>32</td><td>ELC Force dig In x40(32)</td><td>45025</td></tr> <tr><td>33</td><td>ELC Force dig In x41(33)</td><td>45026</td></tr> <tr><td>34</td><td>ELC Force dig In x42(34)</td><td>45027</td></tr> <tr><td>35</td><td>ELC Force dig In x43(35)</td><td>45028</td></tr> <tr><td>36</td><td>ELC Force dig In x44(36)</td><td>45029</td></tr> <tr><td>37</td><td>ELC Force dig In x45(37)</td><td>45030</td></tr> <tr><td>38</td><td>ELC Force dig In x46(38)</td><td>45031</td></tr> <tr><td>39</td><td>ELC Force dig In x47(39)</td><td>45032</td></tr> <tr><td>40</td><td>ELC Force dig In x50(40)</td><td>45033</td></tr> </tbody> </table> | Bit | Description | Coil | 0 | ELC Force dig In x0(0) | 44993 | 1 | ELC Force dig In x1(1) | 44994 | 2 | ELC Force dig In x2(2) | 44995 | 3 | ELC Force dig In x3(3) | 44996 | 4 | ELC Force dig In x4(4) | 44997 | 5 | ELC Force dig In x5(5) | 44998 | 6 | ELC Force dig In x6(6) | 44999 | 7 | ELC Force dig In x7(7) | 45000 | 8 | ELC Force dig In x10(8) | 45001 | 9 | ELC Force dig In x11(9) | 45002 | 10 | ELC Force dig In x12(10) | 45003 | 11 | ELC Force dig In x13(11) | 45004 | 12 | ELC Force dig In x14(12) | 45005 | 13 | ELC Force dig In x15(13) | 45006 | 14 | ELC Force dig In x16(14) | 45007 | 15 | ELC Force dig In x17(15) | 45008 | 16 | ELC Force dig In x20(16) | 45009 | 17 | ELC Force dig In x21(17) | 45010 | 18 | ELC Force dig In x22(18) | 45011 | 19 | ELC Force dig In x23(19) | 45012 | 20 | ELC Force dig In x24(20) | 45013 | 21 | ELC Force dig In x25(21) | 45014 | 22 | ELC Force dig In x26(22) | 45015 | 23 | ELC Force dig In x27(23) | 45016 | 24 | ELC Force dig In x30(24) | 45017 | 25 | ELC Force dig In x31(25) | 45018 | 26 | ELC Force dig In x32(26) | 45019 | 27 | ELC Force dig In x33(27) | 45020 | 28 | ELC Force dig In x34(28) | 45021 | 29 | ELC Force dig In x35(29) | 45022 | 30 | ELC Force dig In x36(30) | 45023 | 31 | ELC Force dig In x37(31) | 45024 | 32 | ELC Force dig In x40(32) | 45025 | 33 | ELC Force dig In x41(33) | 45026 | 34 | ELC Force dig In x42(34) | 45027 | 35 | ELC Force dig In x43(35) | 45028 | 36 | ELC Force dig In x44(36) | 45029 | 37 | ELC Force dig In x45(37) | 45030 | 38 | ELC Force dig In x46(38) | 45031 | 39 | ELC Force dig In x47(39) | 45032 | 40 | ELC Force dig In x50(40) | 45033 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | ELC Force dig In x0(0) | 44993 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | ELC Force dig In x1(1) | 44994 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | ELC Force dig In x2(2) | 44995 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | ELC Force dig In x3(3) | 44996 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | ELC Force dig In x4(4) | 44997 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | ELC Force dig In x5(5) | 44998 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | ELC Force dig In x6(6) | 44999 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | ELC Force dig In x7(7) | 45000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | ELC Force dig In x10(8) | 45001 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | ELC Force dig In x11(9) | 45002 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | ELC Force dig In x12(10) | 45003 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | ELC Force dig In x13(11) | 45004 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | ELC Force dig In x14(12) | 45005 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | ELC Force dig In x15(13) | 45006 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | ELC Force dig In x16(14) | 45007 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | ELC Force dig In x17(15) | 45008 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | ELC Force dig In x20(16) | 45009 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | ELC Force dig In x21(17) | 45010 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | ELC Force dig In x22(18) | 45011 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | ELC Force dig In x23(19) | 45012 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | ELC Force dig In x24(20) | 45013 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | ELC Force dig In x25(21) | 45014 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | ELC Force dig In x26(22) | 45015 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | ELC Force dig In x27(23) | 45016 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | ELC Force dig In x30(24) | 45017 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | ELC Force dig In x31(25) | 45018 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | ELC Force dig In x32(26) | 45019 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | ELC Force dig In x33(27) | 45020 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | ELC Force dig In x34(28) | 45021 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | ELC Force dig In x35(29) | 45022 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | ELC Force dig In x36(30) | 45023 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | ELC Force dig In x37(31) | 45024 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | ELC Force dig In x40(32) | 45025 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | ELC Force dig In x41(33) | 45026 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | ELC Force dig In x42(34) | 45027 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | ELC Force dig In x43(35) | 45028 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | ELC Force dig In x44(36) | 45029 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | ELC Force dig In x45(37) | 45030 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | ELC Force dig In x46(38) | 45031 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | ELC Force dig In x47(39) | 45032 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | ELC Force dig In x50(40) | 45033 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---------------------------|---|---|-----|-------------|------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|
| 2813 | ELC IO Actual Digital In | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Actual Digital In, continued | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>41</td><td>ELC Force dig In x51(41)</td><td>45034</td></tr> <tr><td>42</td><td>ELC Force dig In x52(42)</td><td>45035</td></tr> <tr><td>43</td><td>ELC Force dig In x53(43)</td><td>45036</td></tr> <tr><td>44</td><td>ELC Force dig In x54(44)</td><td>45037</td></tr> <tr><td>45</td><td>ELC Force dig In x55(45)</td><td>45038</td></tr> <tr><td>46</td><td>ELC Force dig In x56(46)</td><td>45039</td></tr> <tr><td>47</td><td>ELC Force dig In x57(47)</td><td>45040</td></tr> <tr><td>48</td><td>ELC Force dig In x60(48)</td><td>45041</td></tr> <tr><td>49</td><td>ELC Force dig In x61(49)</td><td>45042</td></tr> <tr><td>50</td><td>ELC Force dig In x62(50)</td><td>45043</td></tr> <tr><td>51</td><td>ELC Force dig In x63(51)</td><td>45044</td></tr> <tr><td>52</td><td>ELC Force dig In x64(52)</td><td>45045</td></tr> <tr><td>53</td><td>ELC Force dig In x65(53)</td><td>45046</td></tr> <tr><td>54</td><td>ELC Force dig In x66(54)</td><td>45047</td></tr> <tr><td>55</td><td>ELC Force dig In x67(55)</td><td>45048</td></tr> <tr><td>56</td><td>ELC Force dig In x70(56)</td><td>45049</td></tr> <tr><td>57</td><td>ELC Force dig In x71(57)</td><td>45050</td></tr> <tr><td>58</td><td>ELC Force dig In x72(58)</td><td>45051</td></tr> <tr><td>59</td><td>ELC Force dig In x73(59)</td><td>45052</td></tr> <tr><td>60</td><td>ELC Force dig In x74(60)</td><td>45053</td></tr> <tr><td>61</td><td>ELC Force dig In x75(61)</td><td>45054</td></tr> <tr><td>62</td><td>ELC Force dig In x76(62)</td><td>45055</td></tr> <tr><td>63</td><td>ELC Force dig In x77(63)</td><td>45056</td></tr> <tr><td>64</td><td>ELC Force dig In x100(64)</td><td>45057</td></tr> <tr><td>65</td><td>ELC Force dig In x101(65)</td><td>45058</td></tr> <tr><td>66</td><td>ELC Force dig In x102(66)</td><td>45059</td></tr> <tr><td>67</td><td>ELC Force dig In x103(67)</td><td>45060</td></tr> <tr><td>68</td><td>ELC Force dig In x104(68)</td><td>45061</td></tr> <tr><td>69</td><td>ELC Force dig In x105(69)</td><td>45062</td></tr> <tr><td>70</td><td>ELC Force dig In x106(70)</td><td>45063</td></tr> <tr><td>71</td><td>ELC Force dig In x107(71)</td><td>45064</td></tr> <tr><td>72</td><td>ELC Force dig In x110(72)</td><td>45065</td></tr> <tr><td>73</td><td>ELC Force dig In x111(73)</td><td>45066</td></tr> <tr><td>74</td><td>ELC Force dig In x112(74)</td><td>45067</td></tr> <tr><td>75</td><td>ELC Force dig In x113(75)</td><td>45068</td></tr> <tr><td>76</td><td>ELC Force dig In x114(76)</td><td>45069</td></tr> <tr><td>77</td><td>ELC Force dig In x115(77)</td><td>45070</td></tr> <tr><td>78</td><td>ELC Force dig In x116(78)</td><td>45071</td></tr> <tr><td>79</td><td>ELC Force dig In x117(79)</td><td>45072</td></tr> <tr><td>80</td><td>ELC Force dig In x120(80)</td><td>45073</td></tr> <tr><td>81</td><td>ELC Force dig In x121(81)</td><td>45074</td></tr> <tr><td>82</td><td>ELC Force dig In x122(82)</td><td>45075</td></tr> <tr><td>83</td><td>ELC Force dig In x123(83)</td><td>45076</td></tr> <tr><td>84</td><td>ELC Force dig In x124(84)</td><td>45077</td></tr> </tbody> </table> | Bit | Description | Coil | 41 | ELC Force dig In x51(41) | 45034 | 42 | ELC Force dig In x52(42) | 45035 | 43 | ELC Force dig In x53(43) | 45036 | 44 | ELC Force dig In x54(44) | 45037 | 45 | ELC Force dig In x55(45) | 45038 | 46 | ELC Force dig In x56(46) | 45039 | 47 | ELC Force dig In x57(47) | 45040 | 48 | ELC Force dig In x60(48) | 45041 | 49 | ELC Force dig In x61(49) | 45042 | 50 | ELC Force dig In x62(50) | 45043 | 51 | ELC Force dig In x63(51) | 45044 | 52 | ELC Force dig In x64(52) | 45045 | 53 | ELC Force dig In x65(53) | 45046 | 54 | ELC Force dig In x66(54) | 45047 | 55 | ELC Force dig In x67(55) | 45048 | 56 | ELC Force dig In x70(56) | 45049 | 57 | ELC Force dig In x71(57) | 45050 | 58 | ELC Force dig In x72(58) | 45051 | 59 | ELC Force dig In x73(59) | 45052 | 60 | ELC Force dig In x74(60) | 45053 | 61 | ELC Force dig In x75(61) | 45054 | 62 | ELC Force dig In x76(62) | 45055 | 63 | ELC Force dig In x77(63) | 45056 | 64 | ELC Force dig In x100(64) | 45057 | 65 | ELC Force dig In x101(65) | 45058 | 66 | ELC Force dig In x102(66) | 45059 | 67 | ELC Force dig In x103(67) | 45060 | 68 | ELC Force dig In x104(68) | 45061 | 69 | ELC Force dig In x105(69) | 45062 | 70 | ELC Force dig In x106(70) | 45063 | 71 | ELC Force dig In x107(71) | 45064 | 72 | ELC Force dig In x110(72) | 45065 | 73 | ELC Force dig In x111(73) | 45066 | 74 | ELC Force dig In x112(74) | 45067 | 75 | ELC Force dig In x113(75) | 45068 | 76 | ELC Force dig In x114(76) | 45069 | 77 | ELC Force dig In x115(77) | 45070 | 78 | ELC Force dig In x116(78) | 45071 | 79 | ELC Force dig In x117(79) | 45072 | 80 | ELC Force dig In x120(80) | 45073 | 81 | ELC Force dig In x121(81) | 45074 | 82 | ELC Force dig In x122(82) | 45075 | 83 | ELC Force dig In x123(83) | 45076 | 84 | ELC Force dig In x124(84) | 45077 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | ELC Force dig In x51(41) | 45034 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | ELC Force dig In x52(42) | 45035 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | ELC Force dig In x53(43) | 45036 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | ELC Force dig In x54(44) | 45037 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 | ELC Force dig In x55(45) | 45038 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | ELC Force dig In x56(46) | 45039 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 | ELC Force dig In x57(47) | 45040 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 48 | ELC Force dig In x60(48) | 45041 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 49 | ELC Force dig In x61(49) | 45042 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | ELC Force dig In x62(50) | 45043 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | ELC Force dig In x63(51) | 45044 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 52 | ELC Force dig In x64(52) | 45045 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 53 | ELC Force dig In x65(53) | 45046 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | ELC Force dig In x66(54) | 45047 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 55 | ELC Force dig In x67(55) | 45048 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 56 | ELC Force dig In x70(56) | 45049 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 57 | ELC Force dig In x71(57) | 45050 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | ELC Force dig In x72(58) | 45051 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 59 | ELC Force dig In x73(59) | 45052 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | ELC Force dig In x74(60) | 45053 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 61 | ELC Force dig In x75(61) | 45054 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 62 | ELC Force dig In x76(62) | 45055 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | ELC Force dig In x77(63) | 45056 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 64 | ELC Force dig In x100(64) | 45057 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65 | ELC Force dig In x101(65) | 45058 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 66 | ELC Force dig In x102(66) | 45059 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 67 | ELC Force dig In x103(67) | 45060 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 68 | ELC Force dig In x104(68) | 45061 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 69 | ELC Force dig In x105(69) | 45062 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 70 | ELC Force dig In x106(70) | 45063 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 71 | ELC Force dig In x107(71) | 45064 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 72 | ELC Force dig In x110(72) | 45065 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 73 | ELC Force dig In x111(73) | 45066 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 74 | ELC Force dig In x112(74) | 45067 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 75 | ELC Force dig In x113(75) | 45068 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 76 | ELC Force dig In x114(76) | 45069 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 77 | ELC Force dig In x115(77) | 45070 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 78 | ELC Force dig In x116(78) | 45071 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 79 | ELC Force dig In x117(79) | 45072 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 80 | ELC Force dig In x120(80) | 45073 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 81 | ELC Force dig In x121(81) | 45074 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 82 | ELC Force dig In x122(82) | 45075 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 83 | ELC Force dig In x123(83) | 45076 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 84 | ELC Force dig In x124(84) | 45077 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|----------------------------|---|---|-----|-------------|------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|
| 2813 | ELC IO Actual Digital In | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Actual Digital In, continued | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>85</td><td>ELC Force dig In x125(85)</td><td>45078</td></tr> <tr><td>86</td><td>ELC Force dig In x126(86)</td><td>45079</td></tr> <tr><td>87</td><td>ELC Force dig In x127(87)</td><td>45080</td></tr> <tr><td>88</td><td>ELC Force dig In x130(88)</td><td>45081</td></tr> <tr><td>89</td><td>ELC Force dig In x131(89)</td><td>45082</td></tr> <tr><td>90</td><td>ELC Force dig In x132(90)</td><td>45083</td></tr> <tr><td>91</td><td>ELC Force dig In x133(91)</td><td>45084</td></tr> <tr><td>92</td><td>ELC Force dig In x134(92)</td><td>45085</td></tr> <tr><td>93</td><td>ELC Force dig In x135(93)</td><td>45086</td></tr> <tr><td>94</td><td>ELC Force dig In x136(94)</td><td>45087</td></tr> <tr><td>95</td><td>ELC Force dig In x137(95)</td><td>45088</td></tr> <tr><td>96</td><td>ELC Force dig In x140(96)</td><td>45089</td></tr> <tr><td>97</td><td>ELC Force dig In x141(97)</td><td>45090</td></tr> <tr><td>98</td><td>ELC Force dig In x142(98)</td><td>45091</td></tr> <tr><td>99</td><td>ELC Force dig In x143(99)</td><td>45092</td></tr> <tr><td>100</td><td>ELC Force dig In x144(100)</td><td>45093</td></tr> <tr><td>101</td><td>ELC Force dig In x145(101)</td><td>45094</td></tr> <tr><td>102</td><td>ELC Force dig In x146(102)</td><td>45095</td></tr> <tr><td>103</td><td>ELC Force dig In x147(103)</td><td>45096</td></tr> <tr><td>104</td><td>ELC Force dig In x150(104)</td><td>45097</td></tr> <tr><td>105</td><td>ELC Force dig In x151(105)</td><td>45098</td></tr> <tr><td>106</td><td>ELC Force dig In x152(106)</td><td>45099</td></tr> <tr><td>107</td><td>ELC Force dig In x153(107)</td><td>45100</td></tr> <tr><td>108</td><td>ELC Force dig In x154(108)</td><td>45101</td></tr> <tr><td>109</td><td>ELC Force dig In x155(109)</td><td>45102</td></tr> <tr><td>110</td><td>ELC Force dig In x156(110)</td><td>45103</td></tr> <tr><td>111</td><td>ELC Force dig In x157(111)</td><td>45104</td></tr> <tr><td>112</td><td>ELC Force dig In x160(112)</td><td>45105</td></tr> <tr><td>113</td><td>ELC Force dig In x161(113)</td><td>45106</td></tr> <tr><td>114</td><td>ELC Force dig In x162(114)</td><td>45107</td></tr> <tr><td>115</td><td>ELC Force dig In x163(115)</td><td>45108</td></tr> <tr><td>116</td><td>ELC Force dig In x164(116)</td><td>45109</td></tr> <tr><td>117</td><td>ELC Force dig In x165(117)</td><td>45110</td></tr> <tr><td>118</td><td>ELC Force dig In x166(118)</td><td>45111</td></tr> <tr><td>119</td><td>ELC Force dig In x167(119)</td><td>45112</td></tr> <tr><td>120</td><td>ELC Force dig In x170(120)</td><td>45113</td></tr> <tr><td>121</td><td>ELC Force dig In x171(121)</td><td>45114</td></tr> <tr><td>122</td><td>ELC Force dig In x172(122)</td><td>45115</td></tr> <tr><td>123</td><td>ELC Force dig In x173(123)</td><td>45116</td></tr> <tr><td>124</td><td>ELC Force dig In x174(124)</td><td>45117</td></tr> <tr><td>125</td><td>ELC Force dig In x175(125)</td><td>45118</td></tr> <tr><td>126</td><td>ELC Force dig In x176(126)</td><td>45119</td></tr> <tr><td>127</td><td>ELC Force dig In x177(127)</td><td>45120</td></tr> </tbody> </table> | Bit | Description | Coil | 85 | ELC Force dig In x125(85) | 45078 | 86 | ELC Force dig In x126(86) | 45079 | 87 | ELC Force dig In x127(87) | 45080 | 88 | ELC Force dig In x130(88) | 45081 | 89 | ELC Force dig In x131(89) | 45082 | 90 | ELC Force dig In x132(90) | 45083 | 91 | ELC Force dig In x133(91) | 45084 | 92 | ELC Force dig In x134(92) | 45085 | 93 | ELC Force dig In x135(93) | 45086 | 94 | ELC Force dig In x136(94) | 45087 | 95 | ELC Force dig In x137(95) | 45088 | 96 | ELC Force dig In x140(96) | 45089 | 97 | ELC Force dig In x141(97) | 45090 | 98 | ELC Force dig In x142(98) | 45091 | 99 | ELC Force dig In x143(99) | 45092 | 100 | ELC Force dig In x144(100) | 45093 | 101 | ELC Force dig In x145(101) | 45094 | 102 | ELC Force dig In x146(102) | 45095 | 103 | ELC Force dig In x147(103) | 45096 | 104 | ELC Force dig In x150(104) | 45097 | 105 | ELC Force dig In x151(105) | 45098 | 106 | ELC Force dig In x152(106) | 45099 | 107 | ELC Force dig In x153(107) | 45100 | 108 | ELC Force dig In x154(108) | 45101 | 109 | ELC Force dig In x155(109) | 45102 | 110 | ELC Force dig In x156(110) | 45103 | 111 | ELC Force dig In x157(111) | 45104 | 112 | ELC Force dig In x160(112) | 45105 | 113 | ELC Force dig In x161(113) | 45106 | 114 | ELC Force dig In x162(114) | 45107 | 115 | ELC Force dig In x163(115) | 45108 | 116 | ELC Force dig In x164(116) | 45109 | 117 | ELC Force dig In x165(117) | 45110 | 118 | ELC Force dig In x166(118) | 45111 | 119 | ELC Force dig In x167(119) | 45112 | 120 | ELC Force dig In x170(120) | 45113 | 121 | ELC Force dig In x171(121) | 45114 | 122 | ELC Force dig In x172(122) | 45115 | 123 | ELC Force dig In x173(123) | 45116 | 124 | ELC Force dig In x174(124) | 45117 | 125 | ELC Force dig In x175(125) | 45118 | 126 | ELC Force dig In x176(126) | 45119 | 127 | ELC Force dig In x177(127) | 45120 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 85 | ELC Force dig In x125(85) | 45078 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 86 | ELC Force dig In x126(86) | 45079 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 87 | ELC Force dig In x127(87) | 45080 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 88 | ELC Force dig In x130(88) | 45081 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 89 | ELC Force dig In x131(89) | 45082 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 90 | ELC Force dig In x132(90) | 45083 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 91 | ELC Force dig In x133(91) | 45084 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 92 | ELC Force dig In x134(92) | 45085 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 93 | ELC Force dig In x135(93) | 45086 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 94 | ELC Force dig In x136(94) | 45087 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 95 | ELC Force dig In x137(95) | 45088 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 96 | ELC Force dig In x140(96) | 45089 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 97 | ELC Force dig In x141(97) | 45090 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 98 | ELC Force dig In x142(98) | 45091 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 99 | ELC Force dig In x143(99) | 45092 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 | ELC Force dig In x144(100) | 45093 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 101 | ELC Force dig In x145(101) | 45094 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 102 | ELC Force dig In x146(102) | 45095 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 103 | ELC Force dig In x147(103) | 45096 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 104 | ELC Force dig In x150(104) | 45097 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 105 | ELC Force dig In x151(105) | 45098 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 106 | ELC Force dig In x152(106) | 45099 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 107 | ELC Force dig In x153(107) | 45100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 108 | ELC Force dig In x154(108) | 45101 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 109 | ELC Force dig In x155(109) | 45102 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 110 | ELC Force dig In x156(110) | 45103 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 111 | ELC Force dig In x157(111) | 45104 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 112 | ELC Force dig In x160(112) | 45105 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 113 | ELC Force dig In x161(113) | 45106 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 114 | ELC Force dig In x162(114) | 45107 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 115 | ELC Force dig In x163(115) | 45108 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 116 | ELC Force dig In x164(116) | 45109 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 117 | ELC Force dig In x165(117) | 45110 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 118 | ELC Force dig In x166(118) | 45111 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 119 | ELC Force dig In x167(119) | 45112 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 120 | ELC Force dig In x170(120) | 45113 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 121 | ELC Force dig In x171(121) | 45114 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 122 | ELC Force dig In x172(122) | 45115 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 123 | ELC Force dig In x173(123) | 45116 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 124 | ELC Force dig In x174(124) | 45117 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 125 | ELC Force dig In x175(125) | 45118 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 126 | ELC Force dig In x176(126) | 45119 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 127 | ELC Force dig In x177(127) | 45120 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---------------------------|---|--|-----|-------------|------|---|------------------------|-------|---|------------------------|-------|---|------------------------|-------|---|------------------------|-------|---|------------------------|-------|---|------------------------|-------|---|------------------------|-------|---|------------------------|-------|---|-------------------------|-------|---|-------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|
| 2821 | ELC IO Actual Digital Out | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Actual Digital Out. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>0</td><td>ELC Force dig In x0(0)</td><td>45121</td></tr> <tr><td>1</td><td>ELC Force dig In x1(1)</td><td>45122</td></tr> <tr><td>2</td><td>ELC Force dig In x2(2)</td><td>45123</td></tr> <tr><td>3</td><td>ELC Force dig In x3(3)</td><td>45124</td></tr> <tr><td>4</td><td>ELC Force dig In x4(4)</td><td>45125</td></tr> <tr><td>5</td><td>ELC Force dig In x5(5)</td><td>45126</td></tr> <tr><td>6</td><td>ELC Force dig In x6(6)</td><td>45127</td></tr> <tr><td>7</td><td>ELC Force dig In x7(7)</td><td>45128</td></tr> <tr><td>8</td><td>ELC Force dig In x10(8)</td><td>45129</td></tr> <tr><td>9</td><td>ELC Force dig In x11(9)</td><td>45130</td></tr> <tr><td>10</td><td>ELC Force dig In x12(10)</td><td>45131</td></tr> <tr><td>11</td><td>ELC Force dig In x13(11)</td><td>45132</td></tr> <tr><td>12</td><td>ELC Force dig In x14(12)</td><td>45133</td></tr> <tr><td>13</td><td>ELC Force dig In x15(13)</td><td>45134</td></tr> <tr><td>14</td><td>ELC Force dig In x16(14)</td><td>45135</td></tr> <tr><td>15</td><td>ELC Force dig In x17(15)</td><td>45136</td></tr> <tr><td>16</td><td>ELC Force dig In x20(16)</td><td>45137</td></tr> <tr><td>17</td><td>ELC Force dig In x21(17)</td><td>45138</td></tr> <tr><td>18</td><td>ELC Force dig In x22(18)</td><td>45139</td></tr> <tr><td>19</td><td>ELC Force dig In x23(19)</td><td>45140</td></tr> <tr><td>20</td><td>ELC Force dig In x24(20)</td><td>45141</td></tr> <tr><td>21</td><td>ELC Force dig In x25(21)</td><td>45142</td></tr> <tr><td>22</td><td>ELC Force dig In x26(22)</td><td>45143</td></tr> <tr><td>23</td><td>ELC Force dig In x27(23)</td><td>45144</td></tr> <tr><td>24</td><td>ELC Force dig In x30(24)</td><td>45145</td></tr> <tr><td>25</td><td>ELC Force dig In x31(25)</td><td>45146</td></tr> <tr><td>26</td><td>ELC Force dig In x32(26)</td><td>45147</td></tr> <tr><td>27</td><td>ELC Force dig In x33(27)</td><td>45148</td></tr> <tr><td>28</td><td>ELC Force dig In x34(28)</td><td>45149</td></tr> <tr><td>29</td><td>ELC Force dig In x35(29)</td><td>45150</td></tr> <tr><td>30</td><td>ELC Force dig In x36(30)</td><td>45151</td></tr> <tr><td>31</td><td>ELC Force dig In x37(31)</td><td>45152</td></tr> <tr><td>32</td><td>ELC Force dig In x40(32)</td><td>45153</td></tr> <tr><td>33</td><td>ELC Force dig In x41(33)</td><td>45154</td></tr> <tr><td>34</td><td>ELC Force dig In x42(34)</td><td>45155</td></tr> <tr><td>35</td><td>ELC Force dig In x43(35)</td><td>45156</td></tr> <tr><td>36</td><td>ELC Force dig In x44(36)</td><td>45157</td></tr> <tr><td>37</td><td>ELC Force dig In x45(37)</td><td>45158</td></tr> <tr><td>38</td><td>ELC Force dig In x46(38)</td><td>45159</td></tr> <tr><td>39</td><td>ELC Force dig In x47(39)</td><td>45160</td></tr> <tr><td>40</td><td>ELC Force dig In x50(40)</td><td>45161</td></tr> <tr><td>41</td><td>ELC Force dig In x51(41)</td><td>45162</td></tr> <tr><td>42</td><td>ELC Force dig In x52(42)</td><td>45163</td></tr> <tr><td>43</td><td>ELC Force dig In x53(43)</td><td>45164</td></tr> </tbody> </table> | Bit | Description | Coil | 0 | ELC Force dig In x0(0) | 45121 | 1 | ELC Force dig In x1(1) | 45122 | 2 | ELC Force dig In x2(2) | 45123 | 3 | ELC Force dig In x3(3) | 45124 | 4 | ELC Force dig In x4(4) | 45125 | 5 | ELC Force dig In x5(5) | 45126 | 6 | ELC Force dig In x6(6) | 45127 | 7 | ELC Force dig In x7(7) | 45128 | 8 | ELC Force dig In x10(8) | 45129 | 9 | ELC Force dig In x11(9) | 45130 | 10 | ELC Force dig In x12(10) | 45131 | 11 | ELC Force dig In x13(11) | 45132 | 12 | ELC Force dig In x14(12) | 45133 | 13 | ELC Force dig In x15(13) | 45134 | 14 | ELC Force dig In x16(14) | 45135 | 15 | ELC Force dig In x17(15) | 45136 | 16 | ELC Force dig In x20(16) | 45137 | 17 | ELC Force dig In x21(17) | 45138 | 18 | ELC Force dig In x22(18) | 45139 | 19 | ELC Force dig In x23(19) | 45140 | 20 | ELC Force dig In x24(20) | 45141 | 21 | ELC Force dig In x25(21) | 45142 | 22 | ELC Force dig In x26(22) | 45143 | 23 | ELC Force dig In x27(23) | 45144 | 24 | ELC Force dig In x30(24) | 45145 | 25 | ELC Force dig In x31(25) | 45146 | 26 | ELC Force dig In x32(26) | 45147 | 27 | ELC Force dig In x33(27) | 45148 | 28 | ELC Force dig In x34(28) | 45149 | 29 | ELC Force dig In x35(29) | 45150 | 30 | ELC Force dig In x36(30) | 45151 | 31 | ELC Force dig In x37(31) | 45152 | 32 | ELC Force dig In x40(32) | 45153 | 33 | ELC Force dig In x41(33) | 45154 | 34 | ELC Force dig In x42(34) | 45155 | 35 | ELC Force dig In x43(35) | 45156 | 36 | ELC Force dig In x44(36) | 45157 | 37 | ELC Force dig In x45(37) | 45158 | 38 | ELC Force dig In x46(38) | 45159 | 39 | ELC Force dig In x47(39) | 45160 | 40 | ELC Force dig In x50(40) | 45161 | 41 | ELC Force dig In x51(41) | 45162 | 42 | ELC Force dig In x52(42) | 45163 | 43 | ELC Force dig In x53(43) | 45164 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | ELC Force dig In x0(0) | 45121 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | ELC Force dig In x1(1) | 45122 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | ELC Force dig In x2(2) | 45123 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | ELC Force dig In x3(3) | 45124 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | ELC Force dig In x4(4) | 45125 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | ELC Force dig In x5(5) | 45126 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | ELC Force dig In x6(6) | 45127 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | ELC Force dig In x7(7) | 45128 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | ELC Force dig In x10(8) | 45129 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | ELC Force dig In x11(9) | 45130 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | ELC Force dig In x12(10) | 45131 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | ELC Force dig In x13(11) | 45132 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | ELC Force dig In x14(12) | 45133 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | ELC Force dig In x15(13) | 45134 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | ELC Force dig In x16(14) | 45135 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | ELC Force dig In x17(15) | 45136 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | ELC Force dig In x20(16) | 45137 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | ELC Force dig In x21(17) | 45138 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | ELC Force dig In x22(18) | 45139 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | ELC Force dig In x23(19) | 45140 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | ELC Force dig In x24(20) | 45141 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | ELC Force dig In x25(21) | 45142 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | ELC Force dig In x26(22) | 45143 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | ELC Force dig In x27(23) | 45144 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | ELC Force dig In x30(24) | 45145 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | ELC Force dig In x31(25) | 45146 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | ELC Force dig In x32(26) | 45147 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | ELC Force dig In x33(27) | 45148 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | ELC Force dig In x34(28) | 45149 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | ELC Force dig In x35(29) | 45150 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | ELC Force dig In x36(30) | 45151 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | ELC Force dig In x37(31) | 45152 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | ELC Force dig In x40(32) | 45153 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | ELC Force dig In x41(33) | 45154 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | ELC Force dig In x42(34) | 45155 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | ELC Force dig In x43(35) | 45156 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | ELC Force dig In x44(36) | 45157 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | ELC Force dig In x45(37) | 45158 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | ELC Force dig In x46(38) | 45159 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | ELC Force dig In x47(39) | 45160 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | ELC Force dig In x50(40) | 45161 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | ELC Force dig In x51(41) | 45162 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | ELC Force dig In x52(42) | 45163 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | ELC Force dig In x53(43) | 45164 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---------------------------|---|--|-----|-------------|------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|--------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|
| 2821 | ELC IO Actual Digital Out | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Actual Digital Out, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>44</td><td>ELC Force dig In x54(44)</td><td>45165</td></tr> <tr><td>45</td><td>ELC Force dig In x55(45)</td><td>45166</td></tr> <tr><td>46</td><td>ELC Force dig In x56(46)</td><td>45167</td></tr> <tr><td>47</td><td>ELC Force dig In x57(47)</td><td>45168</td></tr> <tr><td>48</td><td>ELC Force dig In x60(48)</td><td>45169</td></tr> <tr><td>49</td><td>ELC Force dig In x61(49)</td><td>45170</td></tr> <tr><td>50</td><td>ELC Force dig In x62(50)</td><td>45171</td></tr> <tr><td>51</td><td>ELC Force dig In x63(51)</td><td>45172</td></tr> <tr><td>52</td><td>ELC Force dig In x64(52)</td><td>45173</td></tr> <tr><td>53</td><td>ELC Force dig In x65(53)</td><td>45174</td></tr> <tr><td>54</td><td>ELC Force dig In x66(54)</td><td>45175</td></tr> <tr><td>55</td><td>ELC Force dig In x67(55)</td><td>45176</td></tr> <tr><td>56</td><td>ELC Force dig In x70(56)</td><td>45177</td></tr> <tr><td>57</td><td>ELC Force dig In x71(57)</td><td>45178</td></tr> <tr><td>58</td><td>ELC Force dig In x72(58)</td><td>45179</td></tr> <tr><td>59</td><td>ELC Force dig In x73(59)</td><td>45180</td></tr> <tr><td>60</td><td>ELC Force dig In x74(60)</td><td>45181</td></tr> <tr><td>61</td><td>ELC Force dig In x75(61)</td><td>45182</td></tr> <tr><td>62</td><td>ELC Force dig In x76(62)</td><td>45183</td></tr> <tr><td>63</td><td>ELC Force dig In x77(63)</td><td>45184</td></tr> <tr><td>64</td><td>ELC Force dig In x100(64)</td><td>45185</td></tr> <tr><td>65</td><td>ELC Force dig In x101(65)</td><td>45186</td></tr> <tr><td>66</td><td>ELC Force dig In x102(66)</td><td>45187</td></tr> <tr><td>67</td><td>ELC Force dig In x103(67)</td><td>45188</td></tr> <tr><td>68</td><td>ELC Force dig In x104(68)</td><td>45189</td></tr> <tr><td>69</td><td>ELC Force dig In x105(69)</td><td>45190</td></tr> <tr><td>70</td><td>ELC Force dig In x106(70)</td><td>45191</td></tr> <tr><td>71</td><td>ELC Force dig In x107(71)</td><td>45192</td></tr> <tr><td>72</td><td>ELC Force dig In x110(72)</td><td>45193</td></tr> <tr><td>73</td><td>ELC Force dig In x111(73)</td><td>45194</td></tr> <tr><td>74</td><td>ELC Force dig In x112(74)</td><td>45195</td></tr> <tr><td>75</td><td>ELC Force dig In x113(75)</td><td>45196</td></tr> <tr><td>76</td><td>ELC Force dig In x114(76)</td><td>45197</td></tr> <tr><td>77</td><td>ELC Force dig In x115(77)</td><td>45198</td></tr> <tr><td>78</td><td>ELC Force dig In x116(78)</td><td>45199</td></tr> <tr><td>79</td><td>ELC Force dig In x117(79)</td><td>45200</td></tr> <tr><td>80</td><td>ELC Force dig In x120(80)</td><td>45201</td></tr> <tr><td>81</td><td>ELC Force dig In x121(81)</td><td>45202</td></tr> <tr><td>82</td><td>ELC Force dig In x122(82)</td><td>45203</td></tr> <tr><td>83</td><td>ELC Force dig In x123(83)</td><td>45204</td></tr> <tr><td>84</td><td>ELC Force dig In x124(84)</td><td>45205</td></tr> <tr><td>85</td><td>ELC Force dig In x125(85)</td><td>45206</td></tr> <tr><td>86</td><td>ELC Force dig In x126(86)</td><td>45207</td></tr> <tr><td>87</td><td>ELC Force dig In x127(87)</td><td>45208</td></tr> </tbody> </table> | Bit | Description | Coil | 44 | ELC Force dig In x54(44) | 45165 | 45 | ELC Force dig In x55(45) | 45166 | 46 | ELC Force dig In x56(46) | 45167 | 47 | ELC Force dig In x57(47) | 45168 | 48 | ELC Force dig In x60(48) | 45169 | 49 | ELC Force dig In x61(49) | 45170 | 50 | ELC Force dig In x62(50) | 45171 | 51 | ELC Force dig In x63(51) | 45172 | 52 | ELC Force dig In x64(52) | 45173 | 53 | ELC Force dig In x65(53) | 45174 | 54 | ELC Force dig In x66(54) | 45175 | 55 | ELC Force dig In x67(55) | 45176 | 56 | ELC Force dig In x70(56) | 45177 | 57 | ELC Force dig In x71(57) | 45178 | 58 | ELC Force dig In x72(58) | 45179 | 59 | ELC Force dig In x73(59) | 45180 | 60 | ELC Force dig In x74(60) | 45181 | 61 | ELC Force dig In x75(61) | 45182 | 62 | ELC Force dig In x76(62) | 45183 | 63 | ELC Force dig In x77(63) | 45184 | 64 | ELC Force dig In x100(64) | 45185 | 65 | ELC Force dig In x101(65) | 45186 | 66 | ELC Force dig In x102(66) | 45187 | 67 | ELC Force dig In x103(67) | 45188 | 68 | ELC Force dig In x104(68) | 45189 | 69 | ELC Force dig In x105(69) | 45190 | 70 | ELC Force dig In x106(70) | 45191 | 71 | ELC Force dig In x107(71) | 45192 | 72 | ELC Force dig In x110(72) | 45193 | 73 | ELC Force dig In x111(73) | 45194 | 74 | ELC Force dig In x112(74) | 45195 | 75 | ELC Force dig In x113(75) | 45196 | 76 | ELC Force dig In x114(76) | 45197 | 77 | ELC Force dig In x115(77) | 45198 | 78 | ELC Force dig In x116(78) | 45199 | 79 | ELC Force dig In x117(79) | 45200 | 80 | ELC Force dig In x120(80) | 45201 | 81 | ELC Force dig In x121(81) | 45202 | 82 | ELC Force dig In x122(82) | 45203 | 83 | ELC Force dig In x123(83) | 45204 | 84 | ELC Force dig In x124(84) | 45205 | 85 | ELC Force dig In x125(85) | 45206 | 86 | ELC Force dig In x126(86) | 45207 | 87 | ELC Force dig In x127(87) | 45208 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | ELC Force dig In x54(44) | 45165 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 | ELC Force dig In x55(45) | 45166 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | ELC Force dig In x56(46) | 45167 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 | ELC Force dig In x57(47) | 45168 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 48 | ELC Force dig In x60(48) | 45169 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 49 | ELC Force dig In x61(49) | 45170 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | ELC Force dig In x62(50) | 45171 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | ELC Force dig In x63(51) | 45172 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 52 | ELC Force dig In x64(52) | 45173 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 53 | ELC Force dig In x65(53) | 45174 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 54 | ELC Force dig In x66(54) | 45175 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 55 | ELC Force dig In x67(55) | 45176 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 56 | ELC Force dig In x70(56) | 45177 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 57 | ELC Force dig In x71(57) | 45178 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | ELC Force dig In x72(58) | 45179 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 59 | ELC Force dig In x73(59) | 45180 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | ELC Force dig In x74(60) | 45181 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 61 | ELC Force dig In x75(61) | 45182 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 62 | ELC Force dig In x76(62) | 45183 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | ELC Force dig In x77(63) | 45184 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 64 | ELC Force dig In x100(64) | 45185 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65 | ELC Force dig In x101(65) | 45186 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 66 | ELC Force dig In x102(66) | 45187 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 67 | ELC Force dig In x103(67) | 45188 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 68 | ELC Force dig In x104(68) | 45189 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 69 | ELC Force dig In x105(69) | 45190 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 70 | ELC Force dig In x106(70) | 45191 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 71 | ELC Force dig In x107(71) | 45192 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 72 | ELC Force dig In x110(72) | 45193 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 73 | ELC Force dig In x111(73) | 45194 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 74 | ELC Force dig In x112(74) | 45195 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 75 | ELC Force dig In x113(75) | 45196 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 76 | ELC Force dig In x114(76) | 45197 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 77 | ELC Force dig In x115(77) | 45198 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 78 | ELC Force dig In x116(78) | 45199 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 79 | ELC Force dig In x117(79) | 45200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 80 | ELC Force dig In x120(80) | 45201 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 81 | ELC Force dig In x121(81) | 45202 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 82 | ELC Force dig In x122(82) | 45203 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 83 | ELC Force dig In x123(83) | 45204 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 84 | ELC Force dig In x124(84) | 45205 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 85 | ELC Force dig In x125(85) | 45206 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 86 | ELC Force dig In x126(86) | 45207 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 87 | ELC Force dig In x127(87) | 45208 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|----------------------------|---|--|-----|-------------|------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|----|---------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|-----|----------------------------|-------|
| 2821 | ELC IO Actual Digital Out | BYTE RW Array size: 16 Default: 0 Bitfield | ELC IO Actual Digital Out, continued. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>88</td><td>ELC Force dig In x130(88)</td><td>45209</td></tr> <tr><td>89</td><td>ELC Force dig In x131(89)</td><td>45210</td></tr> <tr><td>90</td><td>ELC Force dig In x132(90)</td><td>45211</td></tr> <tr><td>91</td><td>ELC Force dig In x133(91)</td><td>45212</td></tr> <tr><td>92</td><td>ELC Force dig In x134(92)</td><td>45213</td></tr> <tr><td>93</td><td>ELC Force dig In x135(93)</td><td>45214</td></tr> <tr><td>94</td><td>ELC Force dig In x136(94)</td><td>45215</td></tr> <tr><td>95</td><td>ELC Force dig In x137(95)</td><td>45216</td></tr> <tr><td>96</td><td>ELC Force dig In x140(96)</td><td>45217</td></tr> <tr><td>97</td><td>ELC Force dig In x141(97)</td><td>45218</td></tr> <tr><td>98</td><td>ELC Force dig In x142(98)</td><td>45219</td></tr> <tr><td>99</td><td>ELC Force dig In x143(99)</td><td>45220</td></tr> <tr><td>100</td><td>ELC Force dig In x144(100)</td><td>45221</td></tr> <tr><td>101</td><td>ELC Force dig In x145(101)</td><td>45222</td></tr> <tr><td>102</td><td>ELC Force dig In x146(102)</td><td>45223</td></tr> <tr><td>103</td><td>ELC Force dig In x147(103)</td><td>45224</td></tr> <tr><td>104</td><td>ELC Force dig In x150(104)</td><td>45225</td></tr> <tr><td>105</td><td>ELC Force dig In x151(105)</td><td>45226</td></tr> <tr><td>106</td><td>ELC Force dig In x152(106)</td><td>45227</td></tr> <tr><td>107</td><td>ELC Force dig In x153(107)</td><td>45228</td></tr> <tr><td>108</td><td>ELC Force dig In x154(108)</td><td>45229</td></tr> <tr><td>109</td><td>ELC Force dig In x155(109)</td><td>45230</td></tr> <tr><td>110</td><td>ELC Force dig In x156(110)</td><td>45231</td></tr> <tr><td>111</td><td>ELC Force dig In x157(111)</td><td>45232</td></tr> <tr><td>112</td><td>ELC Force dig In x160(112)</td><td>45233</td></tr> <tr><td>113</td><td>ELC Force dig In x161(113)</td><td>45234</td></tr> <tr><td>114</td><td>ELC Force dig In x162(114)</td><td>45235</td></tr> <tr><td>115</td><td>ELC Force dig In x163(115)</td><td>45236</td></tr> <tr><td>116</td><td>ELC Force dig In x164(116)</td><td>45237</td></tr> <tr><td>117</td><td>ELC Force dig In x165(117)</td><td>45238</td></tr> <tr><td>118</td><td>ELC Force dig In x166(118)</td><td>45239</td></tr> <tr><td>119</td><td>ELC Force dig In x167(119)</td><td>45240</td></tr> <tr><td>120</td><td>ELC Force dig In x170(120)</td><td>45241</td></tr> <tr><td>121</td><td>ELC Force dig In x171(121)</td><td>45242</td></tr> <tr><td>122</td><td>ELC Force dig In x172(122)</td><td>45243</td></tr> <tr><td>123</td><td>ELC Force dig In x173(123)</td><td>45244</td></tr> <tr><td>124</td><td>ELC Force dig In x174(124)</td><td>45245</td></tr> <tr><td>125</td><td>ELC Force dig In x175(125)</td><td>45246</td></tr> <tr><td>126</td><td>ELC Force dig In x176(126)</td><td>45247</td></tr> <tr><td>127</td><td>ELC Force dig In x177(127)</td><td>45248</td></tr> </tbody> </table> | Bit | Description | Coil | 88 | ELC Force dig In x130(88) | 45209 | 89 | ELC Force dig In x131(89) | 45210 | 90 | ELC Force dig In x132(90) | 45211 | 91 | ELC Force dig In x133(91) | 45212 | 92 | ELC Force dig In x134(92) | 45213 | 93 | ELC Force dig In x135(93) | 45214 | 94 | ELC Force dig In x136(94) | 45215 | 95 | ELC Force dig In x137(95) | 45216 | 96 | ELC Force dig In x140(96) | 45217 | 97 | ELC Force dig In x141(97) | 45218 | 98 | ELC Force dig In x142(98) | 45219 | 99 | ELC Force dig In x143(99) | 45220 | 100 | ELC Force dig In x144(100) | 45221 | 101 | ELC Force dig In x145(101) | 45222 | 102 | ELC Force dig In x146(102) | 45223 | 103 | ELC Force dig In x147(103) | 45224 | 104 | ELC Force dig In x150(104) | 45225 | 105 | ELC Force dig In x151(105) | 45226 | 106 | ELC Force dig In x152(106) | 45227 | 107 | ELC Force dig In x153(107) | 45228 | 108 | ELC Force dig In x154(108) | 45229 | 109 | ELC Force dig In x155(109) | 45230 | 110 | ELC Force dig In x156(110) | 45231 | 111 | ELC Force dig In x157(111) | 45232 | 112 | ELC Force dig In x160(112) | 45233 | 113 | ELC Force dig In x161(113) | 45234 | 114 | ELC Force dig In x162(114) | 45235 | 115 | ELC Force dig In x163(115) | 45236 | 116 | ELC Force dig In x164(116) | 45237 | 117 | ELC Force dig In x165(117) | 45238 | 118 | ELC Force dig In x166(118) | 45239 | 119 | ELC Force dig In x167(119) | 45240 | 120 | ELC Force dig In x170(120) | 45241 | 121 | ELC Force dig In x171(121) | 45242 | 122 | ELC Force dig In x172(122) | 45243 | 123 | ELC Force dig In x173(123) | 45244 | 124 | ELC Force dig In x174(124) | 45245 | 125 | ELC Force dig In x175(125) | 45246 | 126 | ELC Force dig In x176(126) | 45247 | 127 | ELC Force dig In x177(127) | 45248 |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 88 | ELC Force dig In x130(88) | 45209 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 89 | ELC Force dig In x131(89) | 45210 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 90 | ELC Force dig In x132(90) | 45211 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 91 | ELC Force dig In x133(91) | 45212 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 92 | ELC Force dig In x134(92) | 45213 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 93 | ELC Force dig In x135(93) | 45214 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 94 | ELC Force dig In x136(94) | 45215 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 95 | ELC Force dig In x137(95) | 45216 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 96 | ELC Force dig In x140(96) | 45217 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 97 | ELC Force dig In x141(97) | 45218 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 98 | ELC Force dig In x142(98) | 45219 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 99 | ELC Force dig In x143(99) | 45220 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 | ELC Force dig In x144(100) | 45221 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 101 | ELC Force dig In x145(101) | 45222 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 102 | ELC Force dig In x146(102) | 45223 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 103 | ELC Force dig In x147(103) | 45224 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 104 | ELC Force dig In x150(104) | 45225 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 105 | ELC Force dig In x151(105) | 45226 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 106 | ELC Force dig In x152(106) | 45227 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 107 | ELC Force dig In x153(107) | 45228 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 108 | ELC Force dig In x154(108) | 45229 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 109 | ELC Force dig In x155(109) | 45230 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 110 | ELC Force dig In x156(110) | 45231 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 111 | ELC Force dig In x157(111) | 45232 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 112 | ELC Force dig In x160(112) | 45233 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 113 | ELC Force dig In x161(113) | 45234 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 114 | ELC Force dig In x162(114) | 45235 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 115 | ELC Force dig In x163(115) | 45236 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 116 | ELC Force dig In x164(116) | 45237 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 117 | ELC Force dig In x165(117) | 45238 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 118 | ELC Force dig In x166(118) | 45239 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 119 | ELC Force dig In x167(119) | 45240 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 120 | ELC Force dig In x170(120) | 45241 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 121 | ELC Force dig In x171(121) | 45242 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 122 | ELC Force dig In x172(122) | 45243 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 123 | ELC Force dig In x173(123) | 45244 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 124 | ELC Force dig In x174(124) | 45245 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 125 | ELC Force dig In x175(125) | 45246 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 126 | ELC Force dig In x176(126) | 45247 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 127 | ELC Force dig In x177(127) | 45248 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3000 | Modbus Scan Data | UINT16 RW Array size: 32 | Data used for Modbus Scan List. The actual data for each register selected with the Modbus Scan List parameter will be displayed in this parameter for Modbus read data and data can be entered into this parameter for Modbus writes. Array of 32 registers | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Appendix D—Modbus Register Map

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--|--|--|-------|-------------|---|-----------------------|---|-------------------|---|-------|---|-------|---|-----|---|------|---|------|---|--------|---|-----------|----|---------|----|----------|----|----------|
| 3032 | Modbus Scan List | UINT16 RW NV Array size: 32 Default: 0 Config CRC Admin Lock USB Lock Backup Mem | The Modbus scan registers can be used to create a custom Modbus data block. This allows various non-contiguous Register Numbers to be entered in this list and be read or written with a single Modbus command. The Modbus addresses for this block of data are entered here and the actual data for each register will be displayed in the Modbus Scan Data parameter for Modbus read data and data can be entered into the Modbus Scan Data parameter for Modbus writes. The Modbus register numbers for all parameters can be found in the C445 User Manual, Appendix D. The starting Modbus address to read or write this custom data block is register 3000. Array of 32 registers | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3064 | Logic Process Data In DCI_LOGIC_PROCESS_DATA_IN | UINT32 RW Array size:30 Default: 0 | Logic Process Data In Array of 60 registers Logic Process Data In | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3124 | Logic Process Data Out DCI_LOGIC_PROCESS_DATA_OUT | UINT32 RW Array size:30 Default: 0 | Logic Process Data Out Array of 60 registers Logic Process Data Out | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4000 | RTC Time | UINT8 RO Array size: 3 | Real Time Clock Time in hh:mm:ss format (24 hour format) Array of 2 registers | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4002 | RTC Year | UINT16 RW Range: 2000 to 2099 | Real Time Clock - year | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4003 | RTC Month | UINT8 RW Enum | Real Time Clock Month <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>1</td><td>January</td></tr> <tr><td>2</td><td>February</td></tr> <tr><td>3</td><td>March</td></tr> <tr><td>4</td><td>April</td></tr> <tr><td>5</td><td>May</td></tr> <tr><td>6</td><td>June</td></tr> <tr><td>7</td><td>July</td></tr> <tr><td>8</td><td>August</td></tr> <tr><td>9</td><td>September</td></tr> <tr><td>10</td><td>October</td></tr> <tr><td>11</td><td>November</td></tr> <tr><td>12</td><td>December</td></tr> </tbody> </table> | Value | Description | 1 | January | 2 | February | 3 | March | 4 | April | 5 | May | 6 | June | 7 | July | 8 | August | 9 | September | 10 | October | 11 | November | 12 | December |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | January | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | February | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | March | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | April | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | May | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | June | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | July | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | August | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | September | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | October | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | November | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | December | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4004 | RTC Day of Month | UINT8 RW | Real Time Clock Day of Month | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4005 | RTC Time Hours | UINT8 RW | Real Time Clock Time hours | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4006 | RTC Time Minutes | UINT8 RW | Real Time Clock Time minutes | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4007 | RTC Time Seconds | UINT8 RW | Real Time Clock Time seconds | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4008 | RTC Time (milliseconds) | UINT16 RO | Real Time Clock Time milliseconds | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4009 | RTC Power Interrupted | UINT8 RO Default: 0 Enum Backup Mem | Real Time Clock backup power has been interrupted: 0 = Power Not Interrupted, 1 = Power Interrupted. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>0</td><td>Power not interrupted</td></tr> <tr><td>1</td><td>Power interrupted</td></tr> </tbody> </table> | Value | Description | 0 | Power not interrupted | 1 | Power interrupted | | | | | | | | | | | | | | | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Power not interrupted | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Power interrupted | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4010 | RTC Time In UNIX format | UINT32 RO Units: seconds | Real Time Clock time in seconds from UNIX epoch | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | |
|----------|----------------------------------|---|---|-------|-------------|---|--------------------------|---|--------------------------------|---|-----------------------------|---|--------------------------|---|-------------------------|---|----------------|---|-------------|---|---------------------------|
| 4012 | RTC Status | UINT8 RO Enum | Real Time Clock Status: 0 = Running, 1 = Initializing, 2 = Real Time Clock not present, 3 = internal error. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Running</td> </tr> <tr> <td>1</td> <td>Initializing</td> </tr> <tr> <td>2</td> <td>Real time clock not present</td> </tr> <tr> <td>3</td> <td>Internal error</td> </tr> </tbody> </table> | Value | Description | 0 | Running | 1 | Initializing | 2 | Real time clock not present | 3 | Internal error | | | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | | | | |
| 0 | Running | | | | | | | | | | | | | | | | | | | | |
| 1 | Initializing | | | | | | | | | | | | | | | | | | | | |
| 2 | Real time clock not present | | | | | | | | | | | | | | | | | | | | |
| 3 | Internal error | | | | | | | | | | | | | | | | | | | | |
| 4013 | RTC Time Set Status | UINT8 RO Enum | Real Time Clock Time Set Status: 0 = Initial Value, 1 = Successful, 2 = In Progress, 3 = Wrong Input, 4 = Conversion out of range, 5 = Internal Error <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Initial value</td> </tr> <tr> <td>1</td> <td>Successful</td> </tr> <tr> <td>2</td> <td>Set in progress</td> </tr> <tr> <td>3</td> <td>Wrong data</td> </tr> <tr> <td>4</td> <td>Conversion out of range</td> </tr> <tr> <td>5</td> <td>Internal error</td> </tr> </tbody> </table> | Value | Description | 0 | Initial value | 1 | Successful | 2 | Set in progress | 3 | Wrong data | 4 | Conversion out of range | 5 | Internal error | | | | |
| Value | Description | | | | | | | | | | | | | | | | | | | | |
| 0 | Initial value | | | | | | | | | | | | | | | | | | | | |
| 1 | Successful | | | | | | | | | | | | | | | | | | | | |
| 2 | Set in progress | | | | | | | | | | | | | | | | | | | | |
| 3 | Wrong data | | | | | | | | | | | | | | | | | | | | |
| 4 | Conversion out of range | | | | | | | | | | | | | | | | | | | | |
| 5 | Internal error | | | | | | | | | | | | | | | | | | | | |
| 4014 | RTC Time Zone DST Setting Status | UINT8 RO Enum Config CRC Admin Lock USB Lock | Real Time Clock Time Zone DST Setting Status: 0 = Okay, 1 = Manual Rule error, 2 = Time Zone error, 3 = Conversion out of range, 4 = Internal error. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Okay</td> </tr> <tr> <td>1</td> <td>Manual rule error</td> </tr> <tr> <td>2</td> <td>Time zone error</td> </tr> <tr> <td>3</td> <td>Conversion out of range</td> </tr> <tr> <td>4</td> <td>Internal error</td> </tr> </tbody> </table> | Value | Description | 0 | Okay | 1 | Manual rule error | 2 | Time zone error | 3 | Conversion out of range | 4 | Internal error | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | | | | |
| 0 | Okay | | | | | | | | | | | | | | | | | | | | |
| 1 | Manual rule error | | | | | | | | | | | | | | | | | | | | |
| 2 | Time zone error | | | | | | | | | | | | | | | | | | | | |
| 3 | Conversion out of range | | | | | | | | | | | | | | | | | | | | |
| 4 | Internal error | | | | | | | | | | | | | | | | | | | | |
| 4015 | RTC DST Rule | UINT8 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | Real Time Clock DST Rule Selection: 0 = No daylight savings time, 1 = Manually set DST start and end, 2 = Europe, 3 = United States of America, 4 = Australia, 5 = Brazil, 6 = New Zealand, 7 = United States before 2007. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No daylight savings time</td> </tr> <tr> <td>1</td> <td>Manually set DST start and end</td> </tr> <tr> <td>2</td> <td>Europe</td> </tr> <tr> <td>3</td> <td>United States of America</td> </tr> <tr> <td>4</td> <td>Australia</td> </tr> <tr> <td>5</td> <td>Brazil</td> </tr> <tr> <td>6</td> <td>New Zealand</td> </tr> <tr> <td>7</td> <td>United States before 2007</td> </tr> </tbody> </table> | Value | Description | 0 | No daylight savings time | 1 | Manually set DST start and end | 2 | Europe | 3 | United States of America | 4 | Australia | 5 | Brazil | 6 | New Zealand | 7 | United States before 2007 |
| Value | Description | | | | | | | | | | | | | | | | | | | | |
| 0 | No daylight savings time | | | | | | | | | | | | | | | | | | | | |
| 1 | Manually set DST start and end | | | | | | | | | | | | | | | | | | | | |
| 2 | Europe | | | | | | | | | | | | | | | | | | | | |
| 3 | United States of America | | | | | | | | | | | | | | | | | | | | |
| 4 | Australia | | | | | | | | | | | | | | | | | | | | |
| 5 | Brazil | | | | | | | | | | | | | | | | | | | | |
| 6 | New Zealand | | | | | | | | | | | | | | | | | | | | |
| 7 | United States before 2007 | | | | | | | | | | | | | | | | | | | | |
| 4016 | RTC DST End | UINT8 RW NV Array size: 5 Default: 11, 1, 7, 2, 0 Config CRC Admin Lock USB Lock Backup Mem | Real Time Clock Manual Daylight Savings Time Rule End date/time (Element 0 = month, Element 1 = week, Element 2 = weekday, Element 3 = hour, Element 4 = minute). Array of 3 registers | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | |
|----------|-------------------------------------|--|--|-------|-------------|---|--------------|---|--------------|
| 4019 | RTC DST Start | UINT8 RW NV Array size: 5 Default: 3, 2, 7, 2, 0 Config CRC Admin Lock USB Lock Backup Mem | Real Time Clock Manual Daylight Savings Time Rule Start date/time (Element 0 = month, Element 1 = week, Element 2 = weekday, Element 3 = hour, Element 4 = minute). Array of 3 registers | | | | | | |
| 4022 | RTC Month and Date | UINT8 RO Array size: 2 | Real Time Clock Month and Date Array of 1 registers | | | | | | |
| 4023 | RTC Time Zone Ahead of UTC | UINT8 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | Real Time Clock calculation for Time Zone ahead of UTC. If true, UTC+hh:mm; otherwise UTC-hh:mm | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>UTC - hh: mm</td> </tr> <tr> <td>1</td> <td>UTC + hh: mm</td> </tr> </tbody> </table> | Value | Description | 0 | UTC - hh: mm | 1 | UTC + hh: mm |
| Value | Description | | | | | | | | |
| 0 | UTC - hh: mm | | | | | | | | |
| 1 | UTC + hh: mm | | | | | | | | |
| 4024 | RTC Time Zone hh mm | UINT8 RW NV Array size: 2 Default: 0 Config CRC Admin Lock USB Lock Backup Mem | Time zone assignment (UTC+/-hh:mm). Where 0xhhmm. Element [0] = Minutes Element [1] = Hours Array of 1 register | | | | | | |
| 5000 | Admin Password | UINT32 RW Default: 0x00000000 Config CRC Admin Lock USB Lock Backup Mem | Set administrator password (0x00000000 means no password) | | | | | | |
| 5002 | Admin Login | UINT32 RW | Log in with administrator password | | | | | | |
| 5004 | USB Password | UINT32 RW Default: 0x00000000 Config CRC Admin Lock USB Lock Backup Mem | Set USB port password (0x00000000 means no password) | | | | | | |
| 5006 | USB Login | UINT32 RW | Log in with USB Port administrator password | | | | | | |
| 5008 | Run Lock Override | BOOL RW NV Default: 0 Config CRC Admin Lock USB Lock Backup Mem | When the motor is either running or is being commanded to run, certain protection and control parameters are locked. To disable this lock and allow parameters to be adjusted during motor run time, check this box. To restrict access during run time, uncheck this box. It is not recommended to change configuration parameters while running. | | | | | | |
| 5009 | Motor Running Parameter Access Lock | INTERNAL UINT8 RO | Indicates whether the Motor Running Parameter Access Lock is currently locked. If this parameter is high then the lock is active and the run lock parameters will be in a read only state. | | | | | | |
| 5010 | Param Lock | INTERNAL UINT8 RO | Indicates whether the Admin Password Parameter Access Lock is currently locked. If this parameter is high then the lock is active and the admin lock parameters will be in a read only state. | | | | | | |
| 5011 | USB Param Lock State | INTERNAL UINT8 RO | When this bit is high the USB Parameter Access lock is enabled. Parameters covered by the USB Param lock will be read only during this time. | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | |
|----------|--|--|--|-------|-------------|---|---------------------------|---|-----------------------------|---|-------------------------|---|---------------------------|---|--------------------------|---|-------------------------|
| 6000 | Modbus Address | UINT8 RW NV Default: 1 Range: 1 to 247 Config CRC Admin Lock USB Lock Backup Mem | Modbus Address for the Base Control Module's RS-485 port. The address is loaded at startup. A power cycle is required for change in address to take effect. | | | | | | | | | | | | | | |
| 6001 | Modbus Baud Rate | UINT8 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | <p>Selects the Modbus Baud Rate for the Base Control Module's RS-485 Modbus port. A power cycle is required for change in baud rate to take effect. 0 = 19200 baud, 1 = 9600 baud, 2 = 38400 baud, 3 = 57600 baud, 4 = 115200 baud.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>19200</td> </tr> <tr> <td>1</td> <td>9600</td> </tr> <tr> <td>2</td> <td>38400</td> </tr> <tr> <td>3</td> <td>57600</td> </tr> <tr> <td>4</td> <td>115200</td> </tr> </tbody> </table> | Value | Description | 0 | 19200 | 1 | 9600 | 2 | 38400 | 3 | 57600 | 4 | 115200 | | |
| Value | Description | | | | | | | | | | | | | | | | |
| 0 | 19200 | | | | | | | | | | | | | | | | |
| 1 | 9600 | | | | | | | | | | | | | | | | |
| 2 | 38400 | | | | | | | | | | | | | | | | |
| 3 | 57600 | | | | | | | | | | | | | | | | |
| 4 | 115200 | | | | | | | | | | | | | | | | |
| 6002 | Modbus Parity and Stop Bits | UINT8 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | <p>Selects the Modbus Parity and Stop Bits for the Base Control Module's Modbus port. A power cycle is required for change to take effect. Note: No Parity, 1 stop bit is not valid when in MODBUS_ASCII_TX_MODE mode. 0 = Even Parity - 1 stop bit, 1 = Odd Parity - 1 stop bit, 2 = No Parity - 2 stop bits, 3 = Even Parity - 2 stop bits, 4 = Odd Parity - 2 stop bits, 5 = No Parity - 1 stop bit.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Even parity - 1 Stop bit</td> </tr> <tr> <td>1</td> <td>Odd parity - 1 Stop bit</td> </tr> <tr> <td>2</td> <td>No parity - 2 Stop bits</td> </tr> <tr> <td>3</td> <td>Even parity - 2 Stop bits</td> </tr> <tr> <td>4</td> <td>Odd parity - 2 Stop bits</td> </tr> <tr> <td>5</td> <td>No parity - 1 Stop bits</td> </tr> </tbody> </table> | Value | Description | 0 | Even parity - 1 Stop bit | 1 | Odd parity - 1 Stop bit | 2 | No parity - 2 Stop bits | 3 | Even parity - 2 Stop bits | 4 | Odd parity - 2 Stop bits | 5 | No parity - 1 Stop bits |
| Value | Description | | | | | | | | | | | | | | | | |
| 0 | Even parity - 1 Stop bit | | | | | | | | | | | | | | | | |
| 1 | Odd parity - 1 Stop bit | | | | | | | | | | | | | | | | |
| 2 | No parity - 2 Stop bits | | | | | | | | | | | | | | | | |
| 3 | Even parity - 2 Stop bits | | | | | | | | | | | | | | | | |
| 4 | Odd parity - 2 Stop bits | | | | | | | | | | | | | | | | |
| 5 | No parity - 1 Stop bits | | | | | | | | | | | | | | | | |
| 6003 | Modbus Port TX More | UINT8 RW NV Default: 0 Enum Config CRC Admin Lock USB Lock Backup Mem | <p>Selects the RTU/ASCII Modbus Mode for the Base Control Module's Modbus port. 0 = RTU Tx Mode (8 Data Bits), 1 = ASCII Tx Mode (7 Data Bits).</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>RTU Tx Mode (8 data bits)</td> </tr> <tr> <td>1</td> <td>ASCII Tx Mode (7 data bits)</td> </tr> </tbody> </table> | Value | Description | 0 | RTU Tx Mode (8 data bits) | 1 | ASCII Tx Mode (7 data bits) | | | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | |
| 0 | RTU Tx Mode (8 data bits) | | | | | | | | | | | | | | | | |
| 1 | ASCII Tx Mode (7 data bits) | | | | | | | | | | | | | | | | |
| 6004 | Modbus Timeout | UINT16 RW NV Default: 0 Units: ms Config CRC Admin Lock USB Lock Backup Mem | The time before Modbus communications are considered lost. Every valid message received will reset this timer. The timeout is in milliseconds. When this timer expires, communication loss behavior will be triggered. A value of zero (0) will disable the communication timeout. | | | | | | | | | | | | | | |
| 6005 | Base Control Module USB Modbus Timeout | UINT16 RW NV Default: 10000 Config CRC Admin Lock USB Lock Backup Mem | The time before Modbus communications are considered lost. Every valid message received will reset this timer. The timeout is in milliseconds. When this timer expires, communication loss behavior will be triggered. A value of zero (0) will disable the communication timeout. | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | |
|----------|-----------------------------------|---|--|-------|-------------|----|---------|-----|----------|
| 6006 | User Interface USB Modbus Timeout | UINT16 RW NV Default: 0 Units: ms Backup Mem | The time before Modbus communications are considered lost. Every valid message received will reset this timer. The timeout is in milliseconds. When this timer expires, communication loss behavior will be triggered. A value of zero (0) will disable the communication timeout. | | | | | | |
| 6007 | Modbus TCP Timeout | UINT16 RW NV Default: 0 Units: ms Config CRC Admin Lock USB Lock | The time before Modbus TCP communications are considered lost. Every valid message received will reset this timer. The timeout is in milliseconds. When this timer expires, communication loss behavior will be triggered. A value of zero (0) will disable the communication timeout. | | | | | | |
| 6010 | Present IP Address | UINT8 RO Array size: 4 | The Active IP Address being used on the Network. Array of 2 registers | | | | | | |
| 6012 | Present Subnet Mask | UINT8 RO Array size: 4 | The Active Subnet Mask IP Address being used on the Network. Array of 2 registers | | | | | | |
| 6014 | Present Gateway | UINT8 RO Array size: 4 | The Active Default Gateway IP Address being used on the Network. Array of 2 registers | | | | | | |
| 6016 | Stored IP Address | UINT8 RW NV Array size: 4 Default: 0xFE, 0x01, 0xA8, 0xC0 Config CRC Admin Lock USB Lock | The IP address used in the NV address select configuration. The DIP switch settings on the Base Control Module determine if a static IP address of 192.168.1.x, where x= the value on the DIP switch settings is used, or if DHCP is used or if the IP address stored at this parameter is used. To use this IP address, enter an IP address for this parameter, power down the C445, set the DIP switches for the NVMEM selection and when the unit is powered again, the C445 Ethernet module will be using this IP address. Array of 2 registers | | | | | | |
| 6018 | Stored Subnet Mask | UINT8 RW NV Array size: 4 Default: 0x00, 0xFF, 0xFF, 0xFF Config CRC Admin Lock USB Lock | The IP subnet mask used in the NV address select configuration. If the DIP switches on the Base Control Module are set for NVMEM, this IP subnet mask will take effect following a power cycle. Array of 2 registers | | | | | | |
| 6020 | Stored Gateway | UINT8 RW NV Array size: 4 Default: 0x01, 0x01, 0xA8, 0xC0 Config CRC Admin Lock USB Lock | The IP default gateway used in the NV address select configuration. Array of 2 registers | | | | | | |
| 6022 | Ethernet Port 1 Speed Select | UINT16 RW NV Default: 100 Enum Units: Mbs Config CRC Admin Lock USB Lock | Select the Ethernet link speed. Only used when Auto-Negotiate is disabled. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>10 Mbps</td> </tr> <tr> <td>100</td> <td>100 Mbps</td> </tr> </tbody> </table> | Value | Description | 10 | 10 Mbps | 100 | 100 Mbps |
| Value | Description | | | | | | | | |
| 10 | 10 Mbps | | | | | | | | |
| 100 | 100 Mbps | | | | | | | | |
| 6023 | Ethernet Port 1 Speed Actual | UINT16 RO Enum Units: Mbs | Actual Ethernet link speed. This parameter is used to verify the data rate being used on the Ethernet network. It is read only. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>10 Mbps</td> </tr> <tr> <td>100</td> <td>100 Mbps</td> </tr> </tbody> </table> | Value | Description | 10 | 10 Mbps | 100 | 100 Mbps |
| Value | Description | | | | | | | | |
| 10 | 10 Mbps | | | | | | | | |
| 100 | 100 Mbps | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | |
|----------|--|--|---|-------|-------------|----|---------------|-----|------------------------------|---|-------------------------|---|--|---|--------------------------|---|---------------------------|---|---------------|
| 6024 | Ethernet Port 1 Full Duplex Enable | BOOL RW NV Default: 1 Config CRC Admin Lock USB Lock | Selects the duplex mode. Only used when Auto-Negotiate is disabled. True = Full Duplex False = Half Duplex | | | | | | | | | | | | | | | | |
| 6025 | Ethernet Port 1 Full Duplex Enabled | BOOL RO | Actual duplex mode. This is a read only parameter, indicating the actual duplex mode on the Ethernet network. True = Full Duplex False = Half Duplex | | | | | | | | | | | | | | | | |
| 6026 | Ethernet Port 1 Autonegotiate Enable | BOOL RW NV Default: 1 Config CRC Admin Lock USB Lock | Selects Auto-Negotiation of link speed and duplex. False = Disabled True = Enabled | | | | | | | | | | | | | | | | |
| 6027 | Ethernet Port 1 Autonegotiate State | UINT8 RO Enum | Active state of the Auto-Negotiation behavior. This parameter indicates the status of auto negotiate on the Ethernet network. This is read only. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Link inactive</td> </tr> <tr> <td>1</td> <td>Auto negotiation in progress</td> </tr> <tr> <td>2</td> <td>Auto negotiation failed</td> </tr> <tr> <td>3</td> <td>Auto negotiation of duplex failed (speed ok)</td> </tr> <tr> <td>4</td> <td>Auto negotiation success</td> </tr> <tr> <td>5</td> <td>Auto negotiation disabled</td> </tr> <tr> <td>6</td> <td>Port disabled</td> </tr> </tbody> </table> | Value | Description | 0 | Link inactive | 1 | Auto negotiation in progress | 2 | Auto negotiation failed | 3 | Auto negotiation of duplex failed (speed ok) | 4 | Auto negotiation success | 5 | Auto negotiation disabled | 6 | Port disabled |
| Value | Description | | | | | | | | | | | | | | | | | | |
| 0 | Link inactive | | | | | | | | | | | | | | | | | | |
| 1 | Auto negotiation in progress | | | | | | | | | | | | | | | | | | |
| 2 | Auto negotiation failed | | | | | | | | | | | | | | | | | | |
| 3 | Auto negotiation of duplex failed (speed ok) | | | | | | | | | | | | | | | | | | |
| 4 | Auto negotiation success | | | | | | | | | | | | | | | | | | |
| 5 | Auto negotiation disabled | | | | | | | | | | | | | | | | | | |
| 6 | Port disabled | | | | | | | | | | | | | | | | | | |
| 6028 | Ethernet Port 1 Enable | BOOL RW NV Default: 1 Config CRC Admin Lock USB Lock | This parameter is used to disable the Ethernet port. True = Enable Port False = Disable Port | | | | | | | | | | | | | | | | |
| 6029 | Ethernet Port 2 Speed Select | UINT16 RW NV Default: 100 Enum Units: Mbs Config CRC Admin Lock USB Lock | Select the Ethernet link speed. Only used when Auto-Negotiate is disabled. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>10 Mbps</td> </tr> <tr> <td>100</td> <td>100 Mbps</td> </tr> </tbody> </table> | Value | Description | 10 | 10 Mbps | 100 | 100 Mbps | | | | | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | | |
| 10 | 10 Mbps | | | | | | | | | | | | | | | | | | |
| 100 | 100 Mbps | | | | | | | | | | | | | | | | | | |
| 6030 | Ethernet Port 2 Speed Actual | UINT16 RO Enum Units: Mbs | Actual Ethernet link speed. This is a read only parameter. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>10 Mbps</td> </tr> <tr> <td>100</td> <td>100 Mbps</td> </tr> </tbody> </table> | Value | Description | 10 | 10 Mbps | 100 | 100 Mbps | | | | | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | | |
| 10 | 10 Mbps | | | | | | | | | | | | | | | | | | |
| 100 | 100 Mbps | | | | | | | | | | | | | | | | | | |
| 6031 | Ethernet Port 2 Full Duplex Enable | BOOL RW NV Default: 1 Config CRC Admin Lock USB Lock | Selects the duplex mode. Only used when Auto-Negotiate is disabled. True = Full Duplex False = Half Duplex | | | | | | | | | | | | | | | | |
| 6032 | Ethernet Port 2 Full Duplex Enabled | BOOL RO | Actual duplex mode. This is a read only parameter. True = Full Duplex False = Half Duplex | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | |
|----------|--|--|---|-------|-------------|---|----------------------|---|-------------------------------|---|-------------------------------|---|--|---|--------------------------|---|---------------------------|---|---------------|
| 6033 | Ethernet Port 2 Autonegotiate Enabled | BOOL RW NV Default: 1 Config CRC Admin Lock USB Lock | Selects Auto-Negotiation of link speed and duplex. False = Disabled True = Enabled (default) | | | | | | | | | | | | | | | | |
| 6034 | Ethernet Port 2 Autonegotiate State | UINT8 RO Enum | Active state of the Auto-Negotiation behavior. This is read only. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Link inactive</td> </tr> <tr> <td>1</td> <td>Auto negotiation in progress</td> </tr> <tr> <td>2</td> <td>Auto negotiation failed</td> </tr> <tr> <td>3</td> <td>Auto negotiation of duplex failed (speed ok)</td> </tr> <tr> <td>4</td> <td>Auto negotiation success</td> </tr> <tr> <td>5</td> <td>Auto negotiation disabled</td> </tr> <tr> <td>6</td> <td>Port disabled</td> </tr> </tbody> </table> | Value | Description | 0 | Link inactive | 1 | Auto negotiation in progress | 2 | Auto negotiation failed | 3 | Auto negotiation of duplex failed (speed ok) | 4 | Auto negotiation success | 5 | Auto negotiation disabled | 6 | Port disabled |
| Value | Description | | | | | | | | | | | | | | | | | | |
| 0 | Link inactive | | | | | | | | | | | | | | | | | | |
| 1 | Auto negotiation in progress | | | | | | | | | | | | | | | | | | |
| 2 | Auto negotiation failed | | | | | | | | | | | | | | | | | | |
| 3 | Auto negotiation of duplex failed (speed ok) | | | | | | | | | | | | | | | | | | |
| 4 | Auto negotiation success | | | | | | | | | | | | | | | | | | |
| 5 | Auto negotiation disabled | | | | | | | | | | | | | | | | | | |
| 6 | Port disabled | | | | | | | | | | | | | | | | | | |
| 6035 | Ethernet Port 2 Enable | BOOL RW NV Default: 1 Config CRC Admin Lock USB Lock | This parameter is used to disable the Ethernet port. True = Enable Port False = Disable Port | | | | | | | | | | | | | | | | |
| 6036 | IP Conflict Detection Enable | BOOL RW NV Default: 1 Config CRC Admin Lock USB Lock | Address Conflict Detection enable. ACD provides protection from duplicate IP addresses on the network. 0 = Disable ACD, 1 = Enable ACD. | | | | | | | | | | | | | | | | |
| 6037 | IP Conflict Detection Status | UINT8 RO Enum | Address Conflict Detection State. This is read only. 0 = no conflict detected, 1 = conflict detected - defending, 2 = conflict detected - retreated. <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No conflict detected</td> </tr> <tr> <td>1</td> <td>Conflict detected - defending</td> </tr> <tr> <td>2</td> <td>Conflict detected - retreated</td> </tr> </tbody> </table> | Value | Description | 0 | No conflict detected | 1 | Conflict detected - defending | 2 | Conflict detected - retreated | | | | | | | | |
| Value | Description | | | | | | | | | | | | | | | | | | |
| 0 | No conflict detected | | | | | | | | | | | | | | | | | | |
| 1 | Conflict detected - defending | | | | | | | | | | | | | | | | | | |
| 2 | Conflict detected - retreated | | | | | | | | | | | | | | | | | | |
| 6038 | IP Conflict Detection Conflicted Status | UINT8 RW NV Default: 0 Range: 0 to 0 | Address Conflict Detection Status. The state of ACD activity when the last conflict was detected. | | | | | | | | | | | | | | | | |
| 6039 | IP Conflict Detection Conflicted MAC | UINT8 RW NV Array size: 6 Default: 0 Range: 0 to 0 | Address Conflict Detection conflicted device MAC address. The source MAC address from the header of the received Ethernet packet which was sent by a device reporting a conflict. All Ethernet devices have a unique MAC address so by reporting the MAC address of the device containing the duplicate IP address allows the issue to be resolved in a timely manner. Array of 3 registers | | | | | | | | | | | | | | | | |
| 6048 | Ethernet MAC Address | UINT8 RO Array size: 6 | Unique MAC Address assigned to this device. Array of 3 registers | | | | | | | | | | | | | | | | |
| 6052 | Profibus Modbus Timeout | UINT16 RW NV Default: 2000 Units: ms Backup Mem | The time before Modbus communications are considered lost. Every valid message received will reset this timer. The timeout is based on milliseconds. When this timer expires, communication loss behavior will be triggered. A value of zero (0) will disable the communication timeout. | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|--|--|-------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|---|----|--|----|--|----|--|----|--|----|--|----|--|----|--|----|--|----|--|----|--|----|---------------|-----|---|
| 6053 | Set UI Local Password | UINT32 RW Default: 0x00000000 Range: 0 to 9999 Admin Lock USB Lock Backup Mem | Set UI local password (0x00000000 means no password) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6055 | UI Local Login | UINT32 RW Range: 0 to 9999 | Log in with UI local password | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6058 | TCP socket timeout | INTERNALUINT32 RW NV Default: 300000 Range: 10 to 600000 Units: mSec Backup Mem | TCP socket inactivity timeout; if no activity for set time, socket is closed TCP Socket Timeout | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7000 | Minimum FLA (Nominal Current) Scaled | UINT16 RO Default: 1 Units: scaled A | Minimum Setting allowed for Full Load Amperes, Scaled (Nominal Current). The minimum range is based on the measurement module used. Scaled by parameter "I Scale Factor". | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7001 | Maximum FLA (Nominal Current) Scaled | UINT16 RO Default: 65535 Units: scaled A | Maximum Setting allowed for Full Load Amperes, Scaled (Nominal Current). The max range is based on the Measurement Module used. Scaled by parameter "I Scale Factor". | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7002 | Overlay type | UINT8 RO Default: 255 Enum | The Overlay type for the User Interface - Applies to C445UC... models only. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>0</td><td>No predefined User Interface overlay selected</td></tr> <tr><td>1</td><td>30-46625-101 IEC User Interface Overlay</td></tr> <tr><td>2</td><td>30-46625-102 IEC User Interface Overlay</td></tr> <tr><td>3</td><td>30-46625-103 IEC User Interface Overlay</td></tr> <tr><td>4</td><td>30-46625-104 IEC User Interface Overlay</td></tr> <tr><td>5</td><td>30-46625-105 IEC User Interface Overlay</td></tr> <tr><td>6</td><td>30-46625-106 IEC User Interface Overlay</td></tr> <tr><td>7</td><td>30-46625-107 IEC User Interface Overlay</td></tr> <tr><td>8</td><td>30-46625-108 IEC User Interface Overlay</td></tr> <tr><td>9</td><td>30-46625-109 IEC User Interface Overlay</td></tr> <tr><td>10</td><td>30-46625-110 IEC User Interface Overlay</td></tr> <tr><td>11</td><td>30-46625-201 NEMA User Interface Overlay</td></tr> <tr><td>12</td><td>30-46625-202 NEMA User Interface Overlay</td></tr> <tr><td>13</td><td>30-46625-203 NEMA User Interface Overlay</td></tr> <tr><td>14</td><td>30-46625-204 NEMA User Interface Overlay</td></tr> <tr><td>15</td><td>30-46625-205 NEMA User Interface Overlay</td></tr> <tr><td>16</td><td>30-46625-206 NEMA User Interface Overlay</td></tr> <tr><td>17</td><td>30-46625-207 NEMA User Interface Overlay</td></tr> <tr><td>18</td><td>30-46625-208 NEMA User Interface Overlay</td></tr> <tr><td>19</td><td>30-46625-209 NEMA User Interface Overlay</td></tr> <tr><td>20</td><td>30-46625-210 NEMA User Interface Overlay</td></tr> <tr><td>21</td><td>MUI connected</td></tr> <tr><td>255</td><td>Out of box or factory reset state. No User Interface was ever connected</td></tr> </tbody> </table> | Value | Description | 0 | No predefined User Interface overlay selected | 1 | 30-46625-101 IEC User Interface Overlay | 2 | 30-46625-102 IEC User Interface Overlay | 3 | 30-46625-103 IEC User Interface Overlay | 4 | 30-46625-104 IEC User Interface Overlay | 5 | 30-46625-105 IEC User Interface Overlay | 6 | 30-46625-106 IEC User Interface Overlay | 7 | 30-46625-107 IEC User Interface Overlay | 8 | 30-46625-108 IEC User Interface Overlay | 9 | 30-46625-109 IEC User Interface Overlay | 10 | 30-46625-110 IEC User Interface Overlay | 11 | 30-46625-201 NEMA User Interface Overlay | 12 | 30-46625-202 NEMA User Interface Overlay | 13 | 30-46625-203 NEMA User Interface Overlay | 14 | 30-46625-204 NEMA User Interface Overlay | 15 | 30-46625-205 NEMA User Interface Overlay | 16 | 30-46625-206 NEMA User Interface Overlay | 17 | 30-46625-207 NEMA User Interface Overlay | 18 | 30-46625-208 NEMA User Interface Overlay | 19 | 30-46625-209 NEMA User Interface Overlay | 20 | 30-46625-210 NEMA User Interface Overlay | 21 | MUI connected | 255 | Out of box or factory reset state. No User Interface was ever connected |
| Value | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | No predefined User Interface overlay selected | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 30-46625-101 IEC User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 30-46625-102 IEC User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 30-46625-103 IEC User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 30-46625-104 IEC User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 30-46625-105 IEC User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 30-46625-106 IEC User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 30-46625-107 IEC User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 30-46625-108 IEC User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | 30-46625-109 IEC User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 30-46625-110 IEC User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | 30-46625-201 NEMA User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | 30-46625-202 NEMA User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | 30-46625-203 NEMA User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 30-46625-204 NEMA User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | 30-46625-205 NEMA User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | 30-46625-206 NEMA User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | 30-46625-207 NEMA User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | 30-46625-208 NEMA User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | 30-46625-209 NEMA User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | 30-46625-210 NEMA User Interface Overlay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | MUI connected | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255 | Out of box or factory reset state. No User Interface was ever connected | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Write-protected by manufacturing lock service. Preserved on WipeNV.

Appendix D—Modbus Register Map

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | |
|----------|--|--|---|-----|-------------|------|---|--|-----|---|--|-----|
| 7003 | Base Control Module Product Name | STRING8 RO Array size: 32 | Base Control Module Product Name, short description of the Product Code Array of 16 registers | | | | | | | | | |
| 7025 | Base Control Module Assigned Name | STRING8 RW NV Array size: 32 Default: "Power Xpert C445" Config CRC Admin Lock USB Lock Backup Mem | Base Control Module User Assigned Name. The default is "Power Xpert C445", but optionally may be changed. Array of 16 registers | | | | | | | | | |
| 7041 | Base Control Module Serial Number | UINT32 RO | Base Control Module Serial Number (32 bit format). Write-protected by manufacturing lock service. Preserved on WipeNV. | | | | | | | | | |
| 7043 | Base Control Module Product Code | UINT16 RO | Base Control Module Product Code (numerical format) | | | | | | | | | |
| 7044 | Base Control Module Product Sub Code | UINT16 RO | Base Control Module Product Sub Code Write-protected by manufacturing lock service. Preserved on WipeNV. | | | | | | | | | |
| 7045 | Base Control Module Firmware Version | UINT16 RO Array size: 2 | Base Control Module Firmware Version Array of 2 registers | | | | | | | | | |
| 7048 | Base Control Module Hardware Version | UINT16 RO | Base Control Module Product Hardware Version (numerical format). Write-protected by manufacturing lock service. Preserved on WipeNV. | | | | | | | | | |
| 7049 | Base Control Module Config CRC | UINT16 RO | The configuration CRC is a calculated hash of configuration parameters (see appendix for list of covered parameters). After a configuration parameter is changed the configuration CRC is recalculated. While the CRC is being calculated the returned value will be 65535 (0xFFFF). | | | | | | | | | |
| 7050 | Base Control Module Bootloader Version | UINT16 RO Array size: 2 | Base Control Module Bootloader Version Array of 2 registers | | | | | | | | | |
| 7053 | Measurement Module Serial Number | UINT32 RO | Measurement Module Product Serial Number | | | | | | | | | |
| 7055 | Measurement Module Product Code | UINT16 RO | Measurement Module Product Code | | | | | | | | | |
| 7056 | Measurement Module Product Sub Code | UINT16 RO Default: 65535 | Measurement Module Product Sub Code | | | | | | | | | |
| 7057 | Measurement Module Firmware Version | UINT16 RO Array size: 2 | Measurement Module Product Firmware Version Array of 2 registers | | | | | | | | | |
| 7060 | Measurement Module Hardware Version | UINT16 RO | Measurement Module Product Hardware Version | | | | | | | | | |
| 7061 | Measurement Module Option Board Type | BYTE RO Bitfield | Measurement Module board type. 0: Voltage option board present, 1: PTC option board present. <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Voltage option board present in Measurement Module</td> <td>n/a</td> </tr> <tr> <td>1</td> <td>PTC option board present in Measurement Module</td> <td>n/a</td> </tr> </tbody> </table> | Bit | Description | Coil | 0 | Voltage option board present in Measurement Module | n/a | 1 | PTC option board present in Measurement Module | n/a |
| Bit | Description | Coil | | | | | | | | | | |
| 0 | Voltage option board present in Measurement Module | n/a | | | | | | | | | | |
| 1 | PTC option board present in Measurement Module | n/a | | | | | | | | | | |
| 7062 | Measurement Module Bootloader Version | UINT16 RO Array size: 2 | Measurement Module Bootloader Version Array of 2 registers | | | | | | | | | |
| 7065 | User Interface Serial Number | UINT32 RO | User Interface Module Device Serial Number (32 bit format). | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description |
|----------|--------------------------------------|---|--|
| 7067 | User Interface Product Code | UINT16 RO | User Interface Module Product code (numerical format). |
| 7068 | User Interface Product Sub Code | UINT16 RO | User Interface Product Sub Code |
| 7069 | User Interface Firmware Version | UINT16 RO Array size: 2 | User Interface Module Firmware version (numerical format). Array of 2 registers |
| 7072 | User Interface Hardware Version | UINT16 RO | User Interface Module Product hardware version (numerical format). |
| 7073 | User Interface Bootloader Version | UINT16 RO Array size: 2 | User Interface Bootloader Version Array of 2 registers |
| 7076 | Option Card Serial Number | UINT32 RO | Option Card Serial Number (32 bit format). |
| 7078 | Option Card Product Code | UINT16 RO Default: 0 | Option Card Product Code |
| 7079 | Option Card Product Sub Code | UINT16 RO | Option Card Product Sub Code |
| 7080 | Option Card Product Firmware Version | UINT16 RO Array size: 2 | Option Card Product Firmware Version Array of 2 registers |
| 7083 | Option Card Hardware Version | UINT16 RO | Option Card Product Hardware Version |
| 7084 | Option Card Bootloader Version | UINT16 RO Array size: 2 | Option Card Bootloader Version Array of 2 registers |
| 7087 | Power Board Serial Number | UINT32 RO | Power Board Serial Number (32 bit format). |
| 7089 | Power Board Firmware Version | UINT16 RO Array size: 2 | The Firmware version of the power board processor. Array of 2 registers |
| 7092 | Power Board Hardware Version | UINT16 RO | Power Board Product hardware version (numerical format). |
| 7093 | GFM Serial Number | UINT32 RO | Ground Fault Module Product Serial Number Write-protected by manufacturing lock service. Preserved on WipeNV. |
| 7095 | GFM Product Code | UINT16 RO | Ground Fault Module Product Code Numerical |
| 7096 | GFM Product Sub Code | UINT16 RO Default: 0 | GFM Product Sub Code Write-protected by manufacturing lock service. Preserved on WipeNV. |
| 7097 | GFM Firmware Version | UINT16 RO Array size: 2 | Ground Fault Module Firmware Version Array of 2 registers |
| 7099 | GFM Firmware CRC | UINT16 RO | Ground Fault Module Firmware CRC |
| 7100 | GFM Bootloader Version | UINT16 RO Array size: 2 | GFM Bootloader Firmware Version Array of 2 registers |
| 7102 | GFM Bootloader CRC | UINT16 RO | GFM Bootloader Firmware CRC |
| 7103 | GFM Hardware Version | UINT16 RO | Configuration register used to flag functional hardware version Write-protected by manufacturing lock service. Preserved on WipeNV. |
| 7104 | GFM PCB Configuration | UINT8 RO | PCBA Configuration |
| 7105 | Stored FW Image Revisions | UINT32 RO Array size: 10 | Identifies revisions (via array of 4 bytes values) of firmware images stored in BCM Serial Flash. |
| 7125 | C445 Image CRC Values | UINT16 RO Array size: 10 Default: 0 | Identifies CRC values (via array of 4 byte CRC values) of firmware images stored in BCM Serial Flash. |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|---|---|-----|-------------|------|---|-------------------------------------|-----|---|------------------------------------|-----|---|-------------------------------------|-----|---|---|-----|---|---|-----|---|-------------------------------------|-----|---|-------------------------------------|-----|---|-------------------------------------|-----|----|--|-----|----|--|-----|----|--|-----|----|---|-----|
| 7135 | C445 Valid Image Flags | WORD RO Default: 0 Bitfield | Indicates which module firmware images in BCM serial flash are valid images. <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>0</td><td>BCM firmware image is valid</td><td>n/a</td></tr> <tr><td>1</td><td>MM firmware image is valid</td><td>n/a</td></tr> <tr><td>2</td><td>GFM firmware image is valid</td><td>n/a</td></tr> <tr><td>3</td><td>EDC 407 firmware image is valid</td><td>n/a</td></tr> <tr><td>4</td><td>EDC 765 firmware image is valid</td><td>n/a</td></tr> <tr><td>5</td><td>MUI firmware image is valid</td><td>n/a</td></tr> <tr><td>6</td><td>PDC firmware image is valid</td><td>n/a</td></tr> <tr><td>7</td><td>CUI firmware image is valid</td><td>n/a</td></tr> </tbody> </table> | Bit | Description | Coil | 0 | BCM firmware image is valid | n/a | 1 | MM firmware image is valid | n/a | 2 | GFM firmware image is valid | n/a | 3 | EDC 407 firmware image is valid | n/a | 4 | EDC 765 firmware image is valid | n/a | 5 | MUI firmware image is valid | n/a | 6 | PDC firmware image is valid | n/a | 7 | CUI firmware image is valid | n/a | | | | | | | | | | | | |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | BCM firmware image is valid | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | MM firmware image is valid | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | GFM firmware image is valid | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | EDC 407 firmware image is valid | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | EDC 765 firmware image is valid | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | MUI firmware image is valid | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | PDC firmware image is valid | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | CUI firmware image is valid | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7136 | C445 New Image Flags | WORD RO Default: 0 Bitfield | Indicates which module firmware images in BCM serial flash have been updated. <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>0</td><td>New BCM firmware image is available</td><td>n/a</td></tr> <tr><td>1</td><td>New MM firmware image is available</td><td>n/a</td></tr> <tr><td>2</td><td>New GFM firmware image is available</td><td>n/a</td></tr> <tr><td>3</td><td>New EDC 407 firmware image is available</td><td>n/a</td></tr> <tr><td>4</td><td>New EDC 765 firmware image is available</td><td>n/a</td></tr> <tr><td>5</td><td>New MUI firmware image is available</td><td>n/a</td></tr> <tr><td>6</td><td>New PDC firmware image is available</td><td>n/a</td></tr> <tr><td>7</td><td>New CUI firmware image is available</td><td>n/a</td></tr> </tbody> </table> | Bit | Description | Coil | 0 | New BCM firmware image is available | n/a | 1 | New MM firmware image is available | n/a | 2 | New GFM firmware image is available | n/a | 3 | New EDC 407 firmware image is available | n/a | 4 | New EDC 765 firmware image is available | n/a | 5 | New MUI firmware image is available | n/a | 6 | New PDC firmware image is available | n/a | 7 | New CUI firmware image is available | n/a | | | | | | | | | | | | |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | New BCM firmware image is available | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | New MM firmware image is available | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | New GFM firmware image is available | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | New EDC 407 firmware image is available | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | New EDC 765 firmware image is available | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | New MUI firmware image is available | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | New PDC firmware image is available | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | New CUI firmware image is available | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7137 | C445 Modules FW Upgrade Required | WORD RO Default: 0 Bitfield | Indicates which of the connected modules and security keys in the C445 system require a firmware upgrade. <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr><td>0</td><td>Connected BCM requires FW upgrade</td><td>n/a</td></tr> <tr><td>1</td><td>Connected MM requires FW upgrade</td><td>n/a</td></tr> <tr><td>2</td><td>Connected GFM requires FW upgrade</td><td>n/a</td></tr> <tr><td>3</td><td>Connected EDC requires FW upgrade</td><td>n/a</td></tr> <tr><td>4</td><td>Connected EDC requires FW upgrade</td><td>n/a</td></tr> <tr><td>5</td><td>Connected MUI requires FW upgrade</td><td>n/a</td></tr> <tr><td>6</td><td>Connected PDC requires FW upgrade</td><td>n/a</td></tr> <tr><td>7</td><td>Connected CUI requires FW upgrade</td><td>n/a</td></tr> <tr><td>12</td><td>New FVK key - update FVK in certstore required</td><td>n/a</td></tr> <tr><td>13</td><td>New IVK key - update IVK in certstore required</td><td>n/a</td></tr> <tr><td>14</td><td>New RVK key - update RVK in certstore required</td><td>n/a</td></tr> <tr><td>15</td><td>Bootloader sets bit when it could not clear a tombstone</td><td>n/a</td></tr> </tbody> </table> | Bit | Description | Coil | 0 | Connected BCM requires FW upgrade | n/a | 1 | Connected MM requires FW upgrade | n/a | 2 | Connected GFM requires FW upgrade | n/a | 3 | Connected EDC requires FW upgrade | n/a | 4 | Connected EDC requires FW upgrade | n/a | 5 | Connected MUI requires FW upgrade | n/a | 6 | Connected PDC requires FW upgrade | n/a | 7 | Connected CUI requires FW upgrade | n/a | 12 | New FVK key - update FVK in certstore required | n/a | 13 | New IVK key - update IVK in certstore required | n/a | 14 | New RVK key - update RVK in certstore required | n/a | 15 | Bootloader sets bit when it could not clear a tombstone | n/a |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Connected BCM requires FW upgrade | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Connected MM requires FW upgrade | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Connected GFM requires FW upgrade | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Connected EDC requires FW upgrade | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Connected EDC requires FW upgrade | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Connected MUI requires FW upgrade | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Connected PDC requires FW upgrade | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Connected CUI requires FW upgrade | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | New FVK key - update FVK in certstore required | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | New IVK key - update IVK in certstore required | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | New RVK key - update RVK in certstore required | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Bootloader sets bit when it could not clear a tombstone | n/a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7138 | Connected module FW Image Revisions | UINT32 RO Array size: 10 Default: 0,0,0,0,0,0,0,0,0 | Identifies firmware image revisions (via array of 4 bytes values) of all modules currently connected in C445 system. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | |
|----------|---------------------------|--|---|-------|-------------|---|-------------|---|-----------------------|---|-----------------------|---|-----------------------|
| 7201 | SNTP Active Server Status | UINT8 RO Range: 0 to 3 Enum Config CRC Admin Lock USB Lock Backup Mem | SNTP Active Server Status <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Unconnected</td> </tr> <tr> <td>1</td> <td>Connected_To_Server_1</td> </tr> <tr> <td>2</td> <td>Connected_To_Server_2</td> </tr> <tr> <td>3</td> <td>Connected_To_Server_3</td> </tr> </tbody> </table> | Value | Description | 0 | Unconnected | 1 | Connected_To_Server_1 | 2 | Connected_To_Server_2 | 3 | Connected_To_Server_3 |
| Value | Description | | | | | | | | | | | | |
| 0 | Unconnected | | | | | | | | | | | | |
| 1 | Connected_To_Server_1 | | | | | | | | | | | | |
| 2 | Connected_To_Server_2 | | | | | | | | | | | | |
| 3 | Connected_To_Server_3 | | | | | | | | | | | | |
| 7202 | SNTP Operation Enable | UINT8 RW NV Default: 0 Range: 0 to 1 Enum Config CRC Admin Lock USB Lock Backup Mem | SNTP Operation Enable <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Disable</td> </tr> <tr> <td>1</td> <td>Manual IP Entry</td> </tr> </tbody> </table> | Value | Description | 0 | Disable | 1 | Manual IP Entry | | | | |
| Value | Description | | | | | | | | | | | | |
| 0 | Disable | | | | | | | | | | | | |
| 1 | Manual IP Entry | | | | | | | | | | | | |
| 7203 | SNTP Server 1 | STRING8 RW NV Array size: 40 Default: "151.110.232.100" Config CRC Admin Lock USB Lock Backup Mem | The SNTP Server 1 IP address or Domain Name Array of 20 registers | | | | | | | | | | |
| 7223 | SNTP Server 2 | STRING8 RW NV Array size: 40 Default: "151.110.232.100" Config CRC Admin Lock USB Lock Backup Mem | The SNTP Server 2 IP address or Domain Name Array of 20 registers | | | | | | | | | | |
| 7243 | SNTP Server 3 | STRING8 RW NV Array size: 40 Default: "151.110.232.100" Config CRC Admin Lock USB Lock Backup Mem | The SNTP Server 3 IP address or Domain Name Array of 20 registers | | | | | | | | | | |
| 7263 | SNTP Update Time | UINT32 RW NV Default: 86400000 Range: 15000 to 86400000 Units: mSec Config CRC Admin Lock USB Lock Backup Mem | SNTP Update Time is the interval between attempts to synchronize time with the configured SNTP server(s). | | | | | | | | | | |
| 7265 | SNTP Retry Time | UINT16 RW NV Default: 3000 Range: 3000 to 20000 Units: mSec Config CRC Admin Lock USB Lock Backup Mem | SNTP Retry time is the time the system will attempt another time sync request following a failure. It will be doubled when no server is responding and will be increased up to 10 times the configured retry time. | | | | | | | | | | |

Table 130. C445 Modbus Register Map, continued

| Register | Name | Attribute | Description | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|-----|-------------|------|---|--------------|-----|---|--------------|-----|---|----------|-----|---|-------------|-----|---|---|-----|---|----------------------|-----|
| 8004 | Control User Interface Input Debounce | UINT16 RW NV Array size: 4 Default: 20 Range: 5 to 5000 Units: ms Config CRC Admin Lock USB Lock Backup Mem | Array of debounce values for the Control User Interface digital inputs (C445UC... versions only). A debounce value exists for each input. The debounce applies to both rising and falling edge. Array of 4 registers | | | | | | | | | | | | | | | | | | | | | |
| 8027 | Measurement Module Board Ambient Temp | SINT16 RO Units: °C | Measurement Module Ambient temperature measured on the PCB. | | | | | | | | | | | | | | | | | | | | | |
| 8028 | Measurement Module Max Board Ambient Temp | SINT16 RW NV Default: -40 Units: °C | Measurement Module Maximum ambient temperature measured on the PCB. This value can be set (typically to -40). | | | | | | | | | | | | | | | | | | | | | |
| 8145 | Supply Voltage Low Flag | BOOL RO | Flag indicates the power supply voltage is too low to pull in the output relays | | | | | | | | | | | | | | | | | | | | | |
| 8502 | Control Word with NetCtrl bit | BYTE RW Bitfield | Network Control Word with NetCtrl bit Bit 0: Run1 Bit 1: Run2 Bit 2: Reserved Bit 3: Fault Reset Bit 4: NetCtrl Bit 5: Test Trip Bit 6: Reserved Bit 7: Reserved | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>Bit</th> <th>Description</th> <th>Coil</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Run1 command</td> <td>n/a</td> </tr> <tr> <td>1</td> <td>Run2 command</td> <td>n/a</td> </tr> <tr> <td>2</td> <td>Reserved</td> <td>n/a</td> </tr> <tr> <td>3</td> <td>Reset fault</td> <td>n/a</td> </tr> <tr> <td>4</td> <td>Remote control enable (Allow control commands from this control word)</td> <td>n/a</td> </tr> <tr> <td>5</td> <td>Test trip the device</td> <td>n/a</td> </tr> </tbody> </table> | | | | Bit | Description | Coil | 0 | Run1 command | n/a | 1 | Run2 command | n/a | 2 | Reserved | n/a | 3 | Reset fault | n/a | 4 | Remote control enable (Allow control commands from this control word) | n/a | 5 | Test trip the device | n/a |
| Bit | Description | Coil | | | | | | | | | | | | | | | | | | | | | | |
| 0 | Run1 command | n/a | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Run2 command | n/a | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Reserved | n/a | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Reset fault | n/a | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Remote control enable (Allow control commands from this control word) | n/a | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Test trip the device | n/a | | | | | | | | | | | | | | | | | | | | | | |

Appendix E—Firmware Upgrades

There are two different C445 systems. One system was available prior to 2023 and the new system was released in 2023. These two systems can be uniquely identified by the firmware version of the C445 Base Control Module (BCM).

The firmware version of the C445 Base Control Module released prior to 2023 is 2.1.3 or earlier.

The firmware version of the C445 Base Control Module released in 2023 is 3.0 or later.

The firmware version of a C445 Base Control Module can be viewed with one of the following methods:

1. Using the Power Xpert *inControl* commissioning software. You must be connected to the C445 and viewing Online parameters. The firmware version is under: System View / Base Control Module.
2. Using the Monitoring User Interface module: PRG / 10. System View / 1. Base Control Module / 5. Firmware Ver.

The Style Number of the Base Control Module corresponding with firmware versions 2.1.3 and 3.0 are also different, per the following. These Style Numbers are printed on the label of each BCM.

Style Number for BCMs with firmware 2.1.3 or earlier: 3-4104-xxxC

Style Number for BCMs with firmware 3.0 or later: 3-4104-xxxD

Note: There are many options when selecting a BCM, so the style numbers vary with the options selected. That's what the xxx represents in the style numbers above. The important distinction between the two style numbers is the suffix letter, C or D.

Upgrade process for Base Control Modules with Firmware version 2.1.3 or earlier (Style number 3-4104-xxxC)

Note: During this firmware upgrade process, the C445 will be out of service until the process is complete.

To upgrade the firmware for this version of the Base Control Module (BCM), one of the following cables is required.

1. USB / RS485 cable. Any such cable will work. If the Eaton cable is used (part number C445XS-USBLEADS), the USB driver for this cable is installed with the Power Xpert One Installer software. This is the preferred cable provided the BCM has the RS485 port.
2. USB / RJ12 cable. This cable must be used if the BCM does not have an RS-485 port. The Eaton cable part number is C445XS-USBRJ12. When using this cable, upgrading the C445 modules must be done in 2 parts, because the RJ12 ports are used for the upgrade. These same ports are where the Measurement Module and User Interface are connected to the BCM. One of these modules must be disconnected to upgrade all remaining modules, then the device that was disconnected must be reconnected to get it upgraded and the other module connected to the other RJ12 port must be disconnected to upgrade the remaining module. If an optional C445XG-MOD GF module is also connected, it must also be upgraded in this 2-step process.

Appendix E—Firmware Upgrades

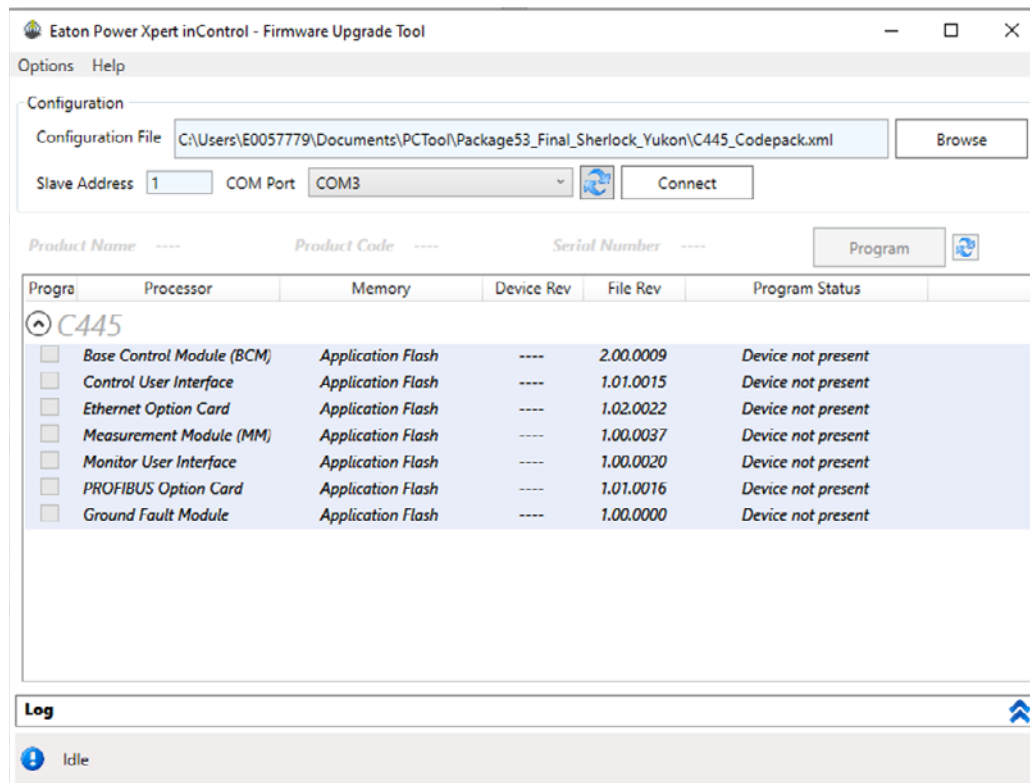
This example shows how to upgrade the C445 using the RS485 port using the C445XS-USBLEADS cable.

1. Connect the C445XS-USBLEADS cable to a USB port on the computer that will be running the Firmware Upgrade Tool (FUT).
2. Connect the open leads end of this cable to the RS-485 port on the bottom of the BCM. If the C445XS-USBLEADS cable is used, follow the wiring instructions on the label provided on the cable. If a third-party cable is used, wire per below:

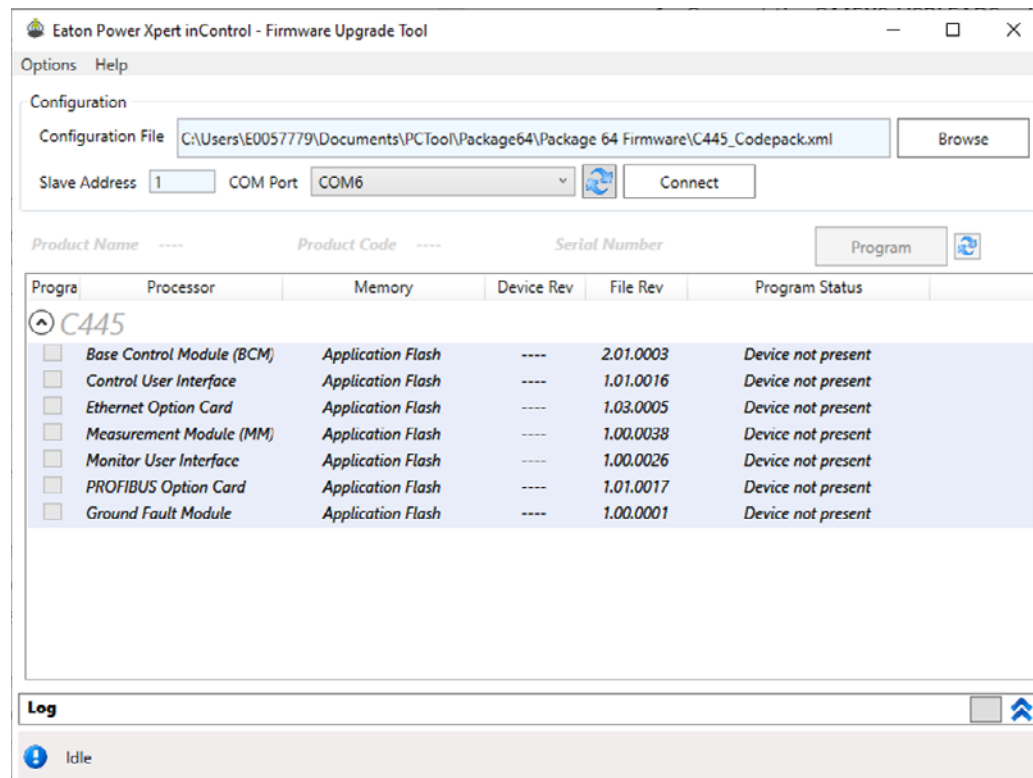
| C445 | Connector |
|---------|-----------|
| D0----- | - |
| D1----- | + |
| C----- | C |

Note: If the D0/D1 terminals are connected one way and it does not work, swap them.

3. Start the Firmware Upgrade Tool software. This software can be found under: Start/eaton on your computer, provided the One Installer software was previously installed. If not, install it at this time. It can be found on the C445 website: www.eaton.com/C445, select “Resources” and find the software under the “Software, firmware, and applications” category. Once started, it will look like the following:

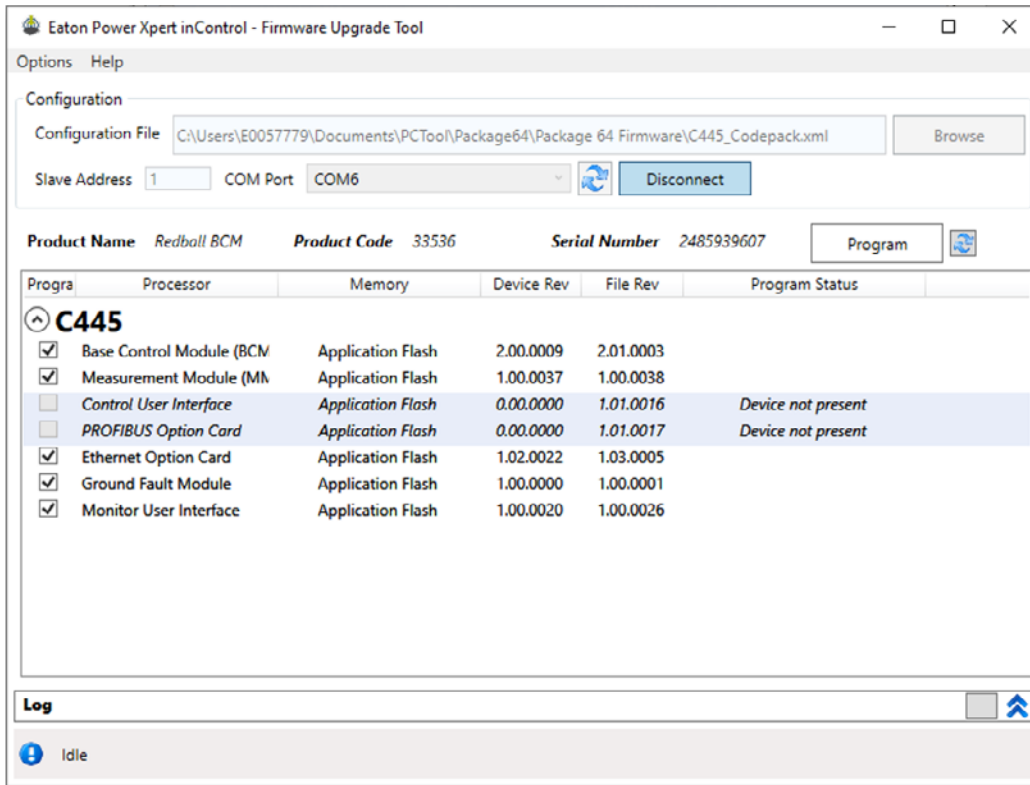


4. For this example, a C445 with Package 53 firmware is being upgraded to Package 64 (only the latest firmware will be available on the C445 website for BCMs with Style Number 3-4104-xxxC).
5. Select and enter the following:
 - a. Browse for the firmware (Package 64 / C445_Codepack) on your hard drive.
 - b. The default Slave Address is 1.
 - c. Select the virtual COM Port assigned to the USB cable (use Device Manager if needed to confirm the COM port number).
6. The Firmware Upgrade Tool (FUT) screen should now look like the following:



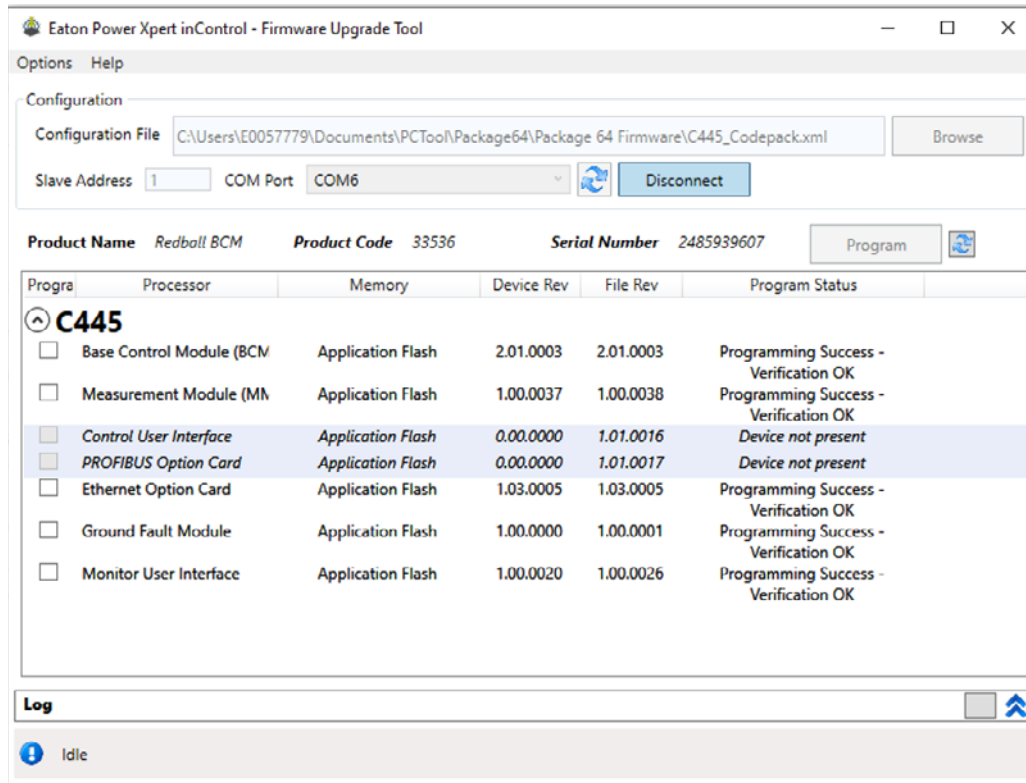
Appendix E—Firmware Upgrades

Select Connect and Agree to the license agreement and the FUT screen should look like the following. All the C445 modules will now be flashing their status LEDs and the user interface will display: “Firmware Upgrade in Process”.



Note that the Device Rev column shows the actual firmware versions for each module connected to the C445 and the File Rev column displays the firmware versions for each module in the firmware file selected.

Select “Program” to begin downloading the Package 64 firmware files to each connected module. Do not interrupt the process until all connected modules have been updated and verified. If the verification fails for a module, let the entire process complete, then Disconnect and Reconnect and start the upgrade process again for any modules that did not complete successfully. When all connected modules have been upgraded and verified (see below), select Disconnect. The C445 modules will perform a soft reset and will then be ready to operate with the new, updated firmware.



Note: A firmware upgrade does not change any configuration parameters in the C445. Following the process, the configuration of the C445 will be as it was prior to the upgrade.

Firmware Upgrade Process for a C445 with a Base Control Module Firmware 3.0 or later (Style Number 3-4104-xxxD)

The latest version of the Base Control Module (BCM) provides a more efficient method of upgrading the firmware in a C445 system. Rather than downloading and verifying each C445 module one at a time, this process allows the firmware for all modules to be downloaded to the BCM while the C445 continues normal operation. When the download process is complete, the BCM will upgrade its own firmware and the firmware for all the other attached C445 modules following the next power cycle or soft reset. This allows the user to plan a time for the upgrade when the process is not in operation. During this part of the process, the C445 will not be available for normal service. This upgrade process takes just under 5 minutes for a C445 system consisting of a Base Control Module, Measurement Module, User Interface, Ground Fault module and an Ethernet card for example.

The download process depends on the port used (see below) and takes place while the C445 is in service so the download time is less critical. The actual firmware upgrade can then be performed when the system is not needed and is a relatively short process as noted above. This 2-step process is summarized below:

1. The firmware download process is performed while the C445 is in operation. The firmware for all C445 modules is downloaded to the BCM.
2. The firmware upgrade process is performed following the firmware download process after the C445 is power cycled or a soft reset is performed. The BCM performs the firmware upgrade and the total time is just under 5 minutes for all C445 modules.

Note: New Base Control modules with firmware version 3.0 or later come with the latest firmware in them for all C445 modules. If a new Base Control Module replaces an older Base Control Module in an older C445 system, the firmware upgrade process to the other C445 modules will not begin until the 'next' power cycle or soft reset, following the installation of the new BCM. And since the new Base Control Module is compatible with older C445 modules, this upgrade process will not occur until the C445 is power cycled or a soft reset is performed. That allows this to be performed when the C445 can be out of operation for approximately 5 minutes.

The new firmware download process can be performed on any of the following communication ports on a C445 system.

1. The optional RS-485 port on the C445 Base Control Module. The C445XS-USBLEADS cable should be used. But any USB/RS485 cable can be used.
2. The Micro USB port on the side of the Monitoring User Interface. The C445XS-USBMICRO cable should be used. But any USB/Micro USB cable can be used.
3. The Micro USB port on the front of the Base Control Module. The C445XS-USBMICRO should be used. But any USB/Micro USB cable can be used.
4. If a C445XC-E Ethernet card is connected into the Base Control Module, it can be used to download the firmware via the Web Page interface and an Ethernet cable.

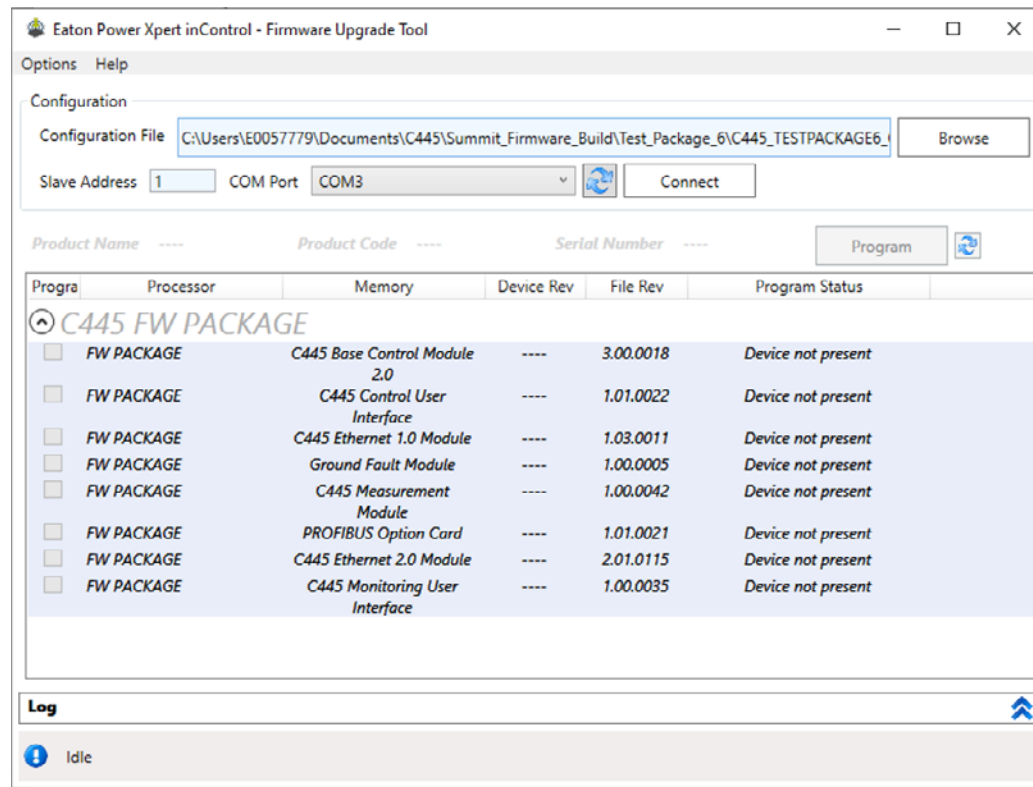
Options 1–3 above all use the Firmware Upgrade Tool (FUT) and download the firmware files in the same way. This is described below.

Option 4 above does not use the Firmware Upgrade Tool, but uses the Web Page interface. This will also be described below.

Note: When using the firmware Upgrade Tool for Base Control Modules with firmware version 3.0 or later (Style Number 3-4104-xxxD), the One Installer software must be version 2.25 or later. The One Installer software is a free download from the C445 website (www.eaton.com/c445, then select "Resources" and find the software in the "Software, firmware, and applications" category).

Downloading Firmware to a C445 via the RS485 port or a Micro USB port

1. Connect the USB cable to the computer and to the C445.
2. Start the Firmware Upgrade Tool (FUT). If the One Installer version 2.25 or later software is installed, the FUT can be found under: Start/eaton/Firmware Upgrade Tool. The software will look like the following:

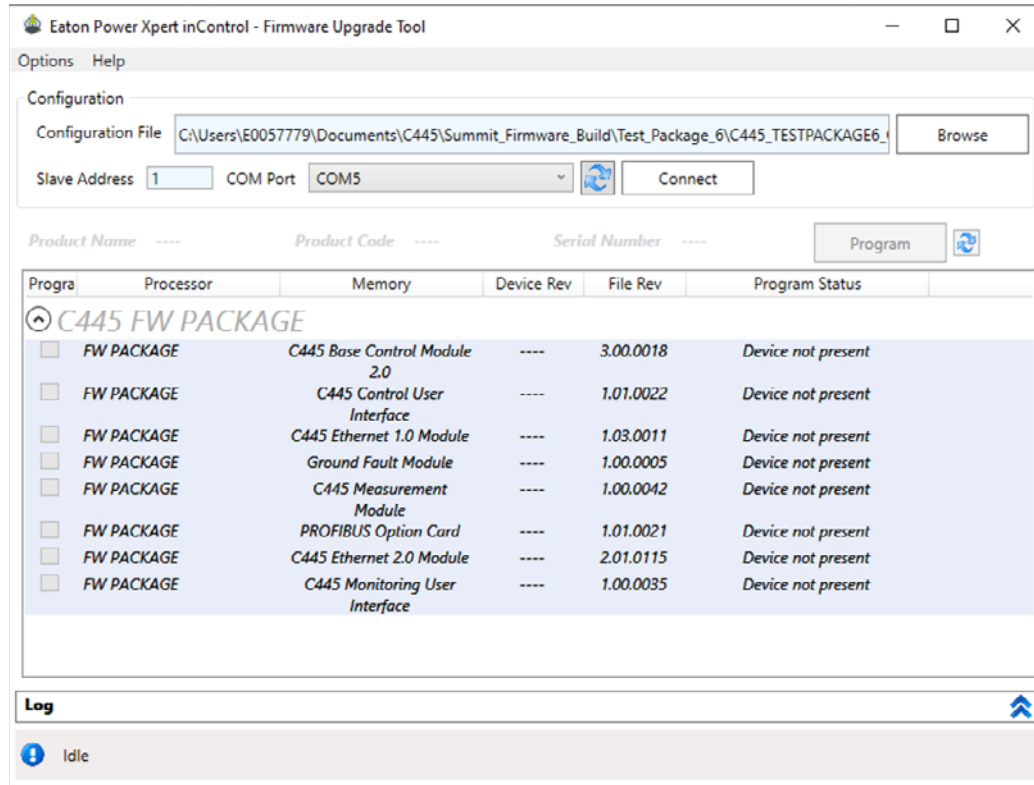


Note: Disregard the firmware versions shown in this example. The latest firmware version can be found on the C445 website: www.eaton.com/c445. Select "Resources". The latest firmware will be version 3.0 or later.

3. Set the parameters on the screen as follows.
 - a. Select the Virtual Com Port assigned to the USB cable. This can be verified with Device Manager.
 - b. The Slave address for the USB/Micro USB cable is always 1. The default address for the USB/RS485 cable is also 1, but could be something else if it was previously changed by the user.
 - c. Select the Browse button and find the firmware stored on the hard drive.

Appendix E—Firmware Upgrades

The upgrade tool should now look similar to the following:

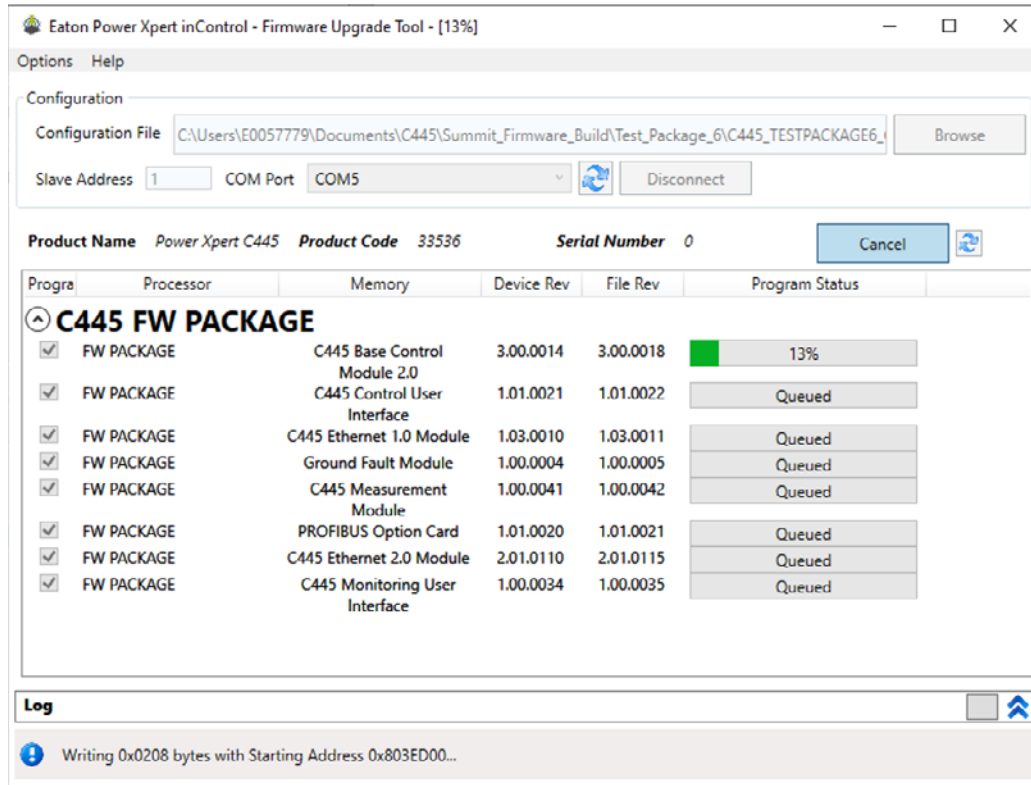


4. Select the Connect button, followed by the Program button to begin downloading the firmware for all C445 modules to the Base Control Module. During this download process, the C445 can continue normal operation, controlling and protecting a motor.
5. The C445 User Interface module (if one is connected) will display the following:

“FW Download in Progress
Press MODE/BACK to
Clr Msg”

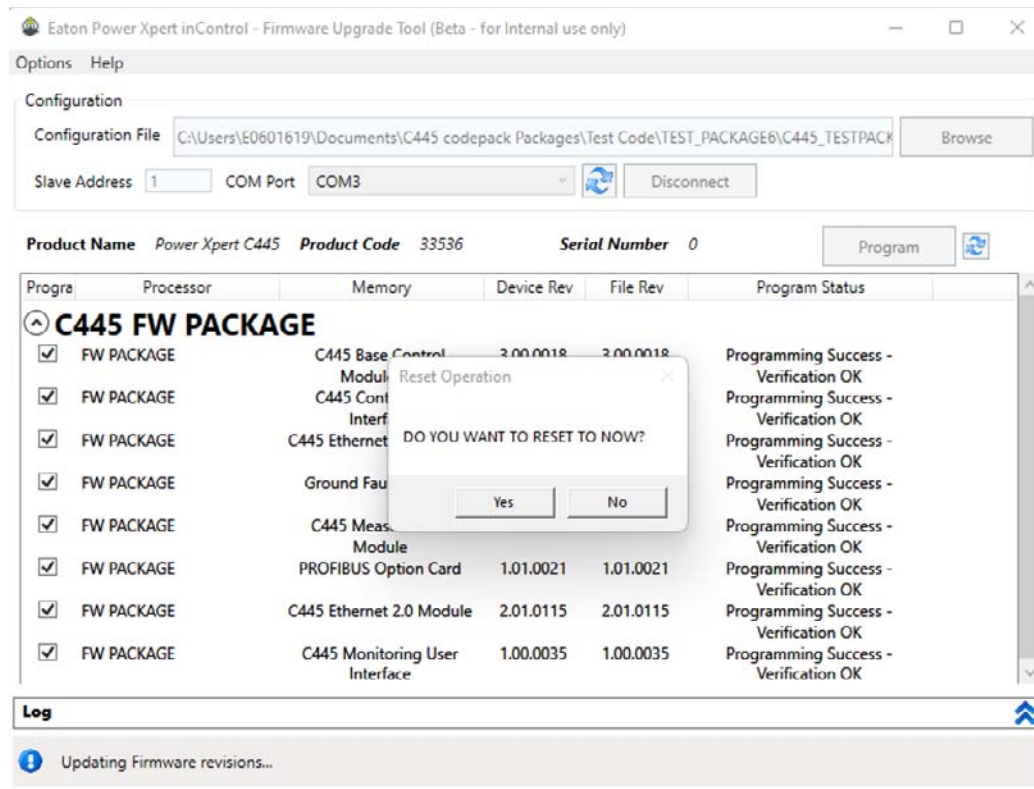
Press the Mode/Back button if you wish to use the user interface during the download process for control, monitoring or configuration as usual. The C445 continues normal operation during the firmware download process.

6. Per below, during the firmware download process, the FUT shows the progress of the download for each C445 module, even modules not connected. It also shows the revision of firmware for each module before the download (Device Rev column) and the firmware being downloaded for each module (File Rev column). There is also a check mark for each module that can be de-selected before starting the “Program/Download” process for any modules that are not in the system. It is recommended to download all firmware files in case a module is connected at a later time.



Appendix E—Firmware Upgrades

- When the download process is complete, the FUT screen will look like the following with an option to reset the C445 system immediately.



Selecting Yes at this prompt will cause the C445 system to reset, triggering a Firmware Upgrade of the BCM and all connected modules that require it. Selecting No will clear the prompt.

If an immediate upgrade is not desired, Press No and select the Disconnect button. The following message will be displayed on the User Interface screen:

```
"FW Upgrade Next Pwr  
Cycle Press  
MODE/BACK to Clr"
```

Press the Mode/Back button if you wish to use the user interface until a Power Cycle or Soft Reset is performed. The C445 continues normal operation until the Power Cycle/Soft Reset occurs.

At the next power cycle or soft reset of the C445, the Base Control Module will upgrade its own firmware and the firmware of each C445 module connected to it. During the upgrade process, the C445 will not be available for normal operation. Do not power cycle the C445 (or select the Reset Now option via the Firmware Upgrade Tool) until it can be out of service for approximately 5 minutes. The firmware upgrade process does not affect the configuration of the C445.

During the upgrade process, the user interface will display the following message:

```
"Firmware Upgrade  
In Progress"
```

```
Warning – Do Not Power  
Off The Device"
```

Notes:

1. If a USB/Micro USB cable is used for the download and is connected to the Base Control Module (BCM), disconnect it before cycling power to perform the upgrade. Power from the computer over the USB cable may provide enough power to the BCM to keep it from resetting.
2. The session timeout period is 2 minutes. After connecting to the C445 with the Firmware Upgrade Tool, if there is no activity for 2 minutes, the session will time out and will need to be restarted.
3. During the firmware download process, do not access the C445 with the Power Xpert Logic Engine software tool. Do not attempt to download or upload a logic program or the firmware download process could fail and would need to be restarted.

Downloading Firmware to a C445 via Ethernet and the Web Browser

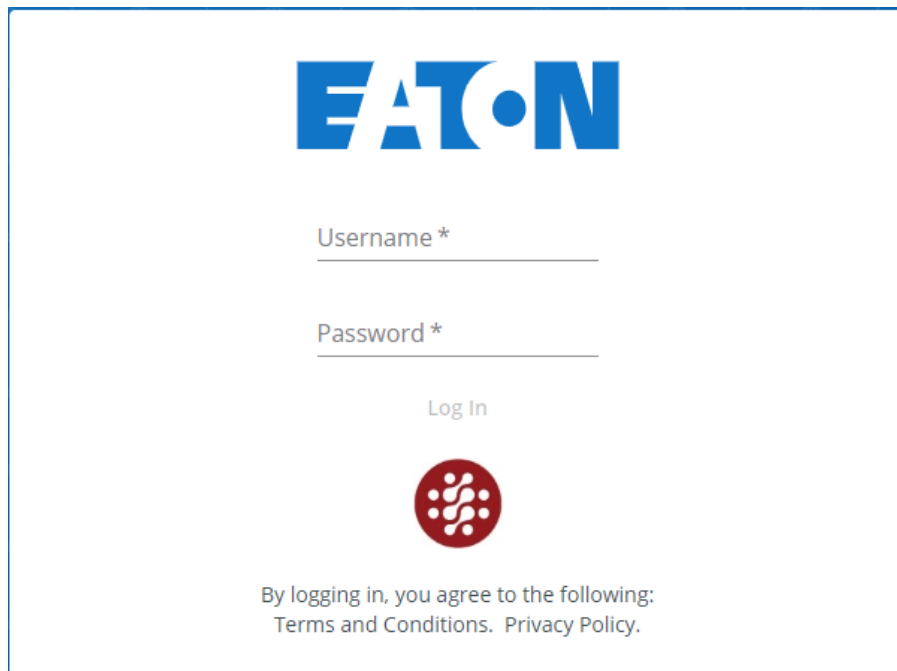
The following firmware versions for the Base Control Module (BCM) and the C445XC-E Ethernet module are needed to support this firmware download/upgrade process.

BCM firmware version 3.0 or later (style number 3-4104-xxxD)

C445XC-E firmware version 2.0 or later (style number 3-4106-001C)

It should be noted that the Firmware Download process does not affect normal operation of the C445. The files for all C445 modules are downloaded to the Base Control Module while the C445 continues normal operation. Once the download process is complete, the firmware Upgrade process will not be performed until the C445 is power cycled or a Soft Reset is performed. During the firmware upgrade process, the C445 will not be available for normal operation until this process completes. This process takes approximately 5 minutes.

1. Connect an Ethernet cable to the computer and to the C445.
2. Open the web browser (Google Chrome or Microsoft Edge).
3. Enter the IP Address of the C445 on the browser address bar and press enter.
4. When the following screen is displayed, enter the Username and password.



EATON

Username *

Password *

Log In

By logging in, you agree to the following:
Terms and Conditions. Privacy Policy.

Appendix E—Firmware Upgrades

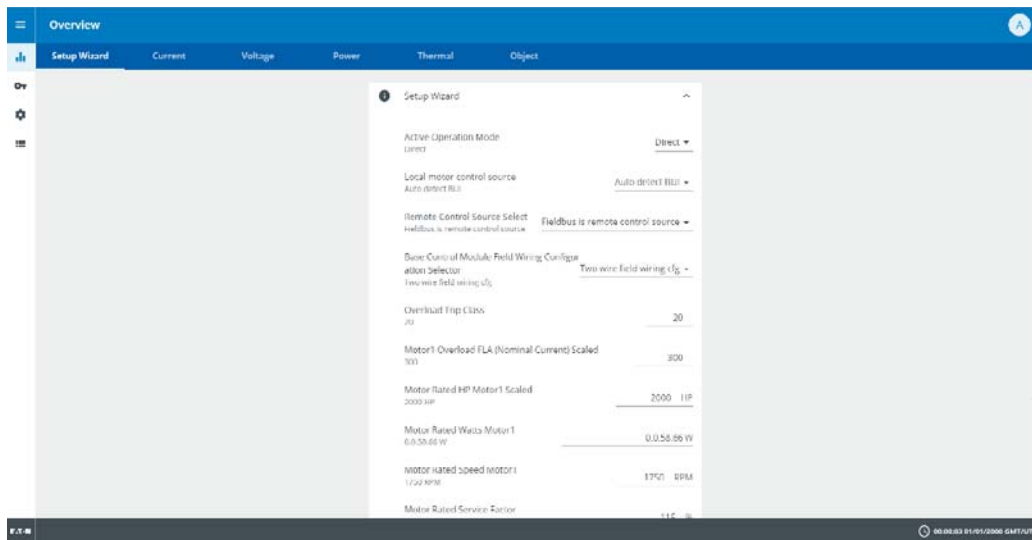
Note: When entering the web pages for the first time, enter the default username and password below:

Username: admin

Password: Admin*1

You will then be prompted to change the default password. Once you have done this, you will need to login again with the new password.

5. After logging into the web pages, you will see the following screen.



6. To access the Firmware Download screen, select the “gear” on the left which is Settings. Then select the Firmware category at the top of the screen. The following screen will be displayed:

Firmware Upgrade
^

Open Codepack

Firmware Version
^

Serial Number

0 0

Vendor Name

Eaton Corp.

Product Code

33546

Vendor URL

www.eaton.com

Model Name

RTK

Assigned Name

RTOS TOOL KIT RTOS TOOL KIT

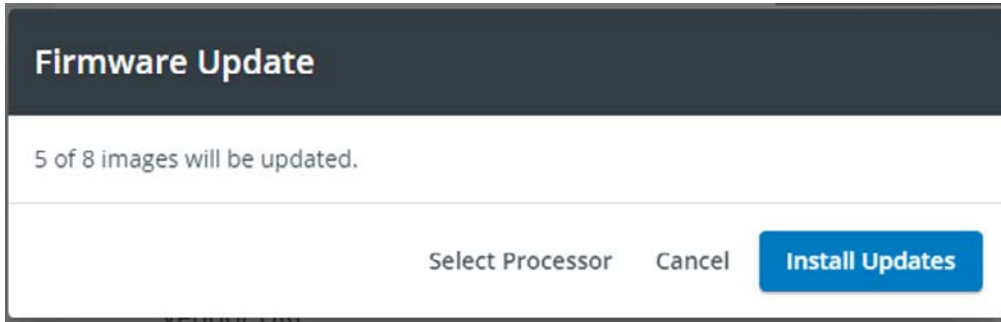
App Fw Upgrade Enable

Upgrade to any version allowed Upgrade to any version allowed ▼

7. Select the “Open Codepack” button and find and open the firmware file to download to the C445. This file needs to be the web-based firmware file.

Appendix E—Firmware Upgrades

8. The following window will be displayed.

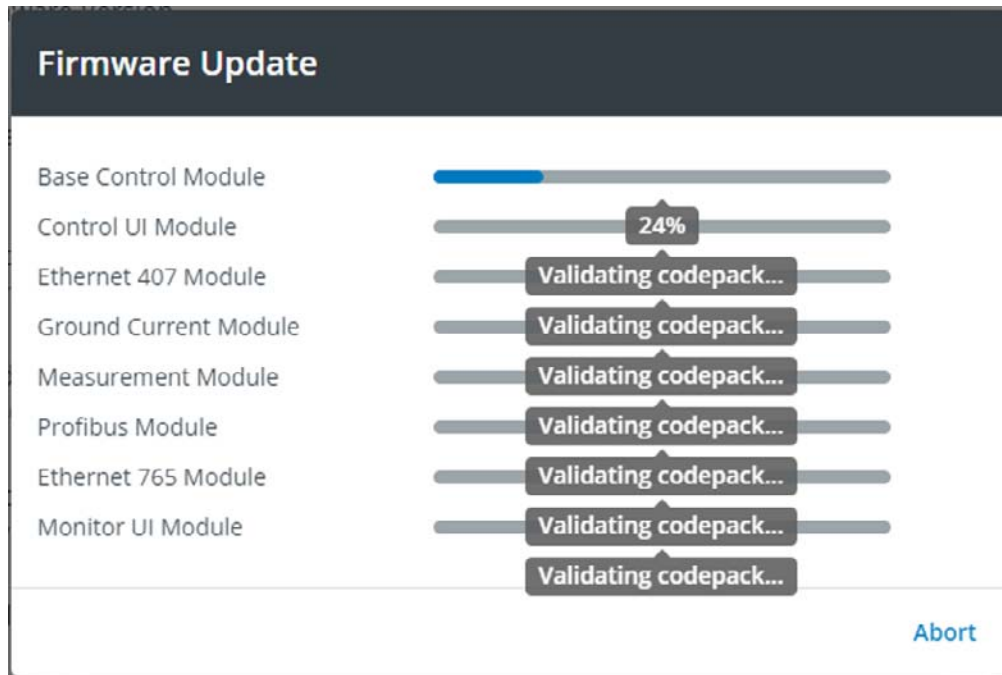


At this point, you can select the “Install Updates” button or the “Select Processor” button. By selecting “Install Updates,” the download process will begin. If you select “Select Processor” the following will be displayed.

| Firmware / Code Pack Evaluation | | | | | | | |
|-------------------------------------|-----------------|-----------------------|------------|--------------|---------------|--------|---------------------|
| Processor | Image | File Ver | Device Ver | Hardware Ver | Compatibility | Status | |
| <input checked="" type="checkbox"/> | C445 FW Package | Base Control Module | 3.00.0018 | 3.0.14 | 0.0.0 | 0 | Update Recommended. |
| <input checked="" type="checkbox"/> | C445 FW Package | Control UI Module | 1.01.0030 | 1.1.20 | 0.0.0 | 0 | Update Recommended. |
| <input checked="" type="checkbox"/> | C445 FW Package | Ethernet 617 Module | 1.05.0011 | 1.5.10 | 0.0.0 | 0 | Update Recommended. |
| <input checked="" type="checkbox"/> | C445 FW Package | Ground Current Module | 1.00.0006 | 1.0.4 | 0.0.0 | 0 | Update Recommended. |
| <input checked="" type="checkbox"/> | C445 FW Package | Measurement Module | 1.00.0042 | 1.0.41 | 0.0.0 | 0 | Update Recommended. |
| <input checked="" type="checkbox"/> | C445 FW Package | Profibus Module | 1.01.0021 | 1.1.20 | 0.0.0 | 0 | Update Recommended. |
| <input checked="" type="checkbox"/> | C445 FW Package | Ethernet 765 Module | 2.01.0015 | 2.1.110 | 0.0.0 | 0 | Update Recommended. |
| <input checked="" type="checkbox"/> | C445 FW Package | Monitor UI Module | 1.00.0035 | 1.0.31 | 0.0.0 | 0 | Update Recommended. |

Only the firmware files for the C445 modules that require updating in the Base Control Module (BCM) will be checked. Select OK to continue. Then, select “Install Updates.”

9. The firmware download process will begin and will look like the following.



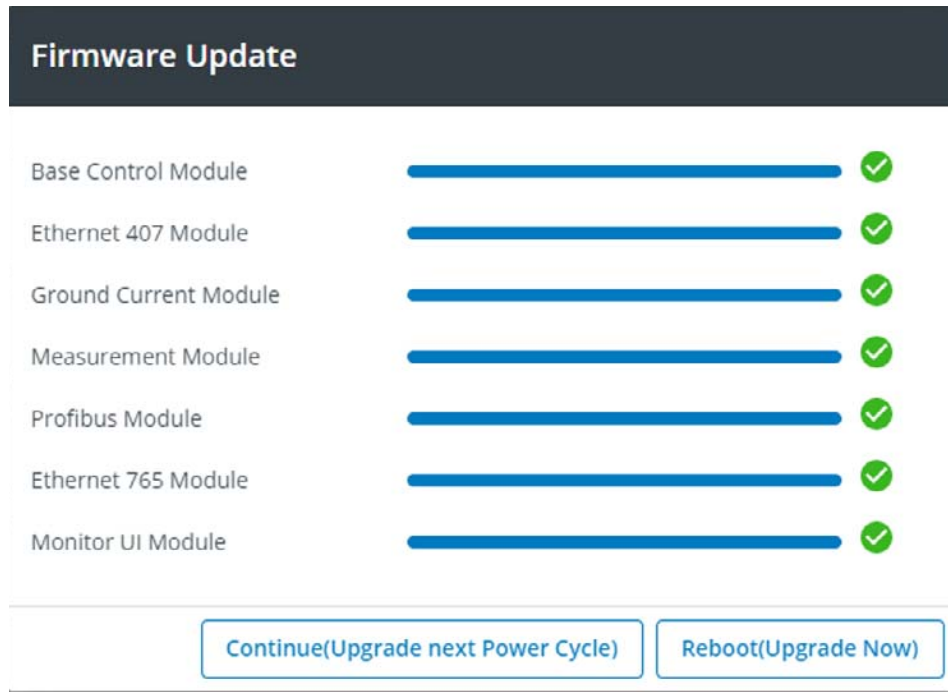
10. The User Interface will display the following message and it will not affect normal operation of the C445.

```
FW Download in Progress
Press Mode/Back to
Clr Msg
```

Press the Mode/Back button if you wish to use the user interface during the download process for control, monitoring or configuration as usual. The C445 continues normal operation during the firmware download process.

Appendix E—Firmware Upgrades

11. After each file for each C445 module has been downloaded and verified, the Firmware Update screen will look like the following:



Select "Continue (Upgrade next Power Cycle)" to exit and the upgrade will not be performed until the next power cycle of the C445.

Select "Reboot (Upgrade Now)" to soft reset the C445 which will result in the firmware upgrade taking place immediately. This should only be done if the C445 can be out of service for up to 5 minutes.

If option 1 is selected above, the User Interface will display the following message:

```
"FW Upgrade Next Pwr  
Cycle Press  
MODE/BACK to Clr"
```

12. The C445 can be used to continue normal operation until the next power cycle or Soft Reset is performed. This should not be performed until the C445 is no longer needed for normal operation. The entire firmware upgrade process for all C445 modules will begin following the next power cycle or Soft Reset and will be completed in approximately 5 minutes. Then the C445 will be ready for normal operation again with the new firmware. The firmware upgrade process does not affect the configuration of the C445.

During the upgrade process, the user interface will display the following"

```
"Firmware Upgrade  
In Progress  
Warning – Do Not Power  
Off The Device"
```

Notes:

1. The session timeout period is 2 minutes. After connecting to the Web Interface Tool, if there is no activity for 2 minutes, the session will time out and will need to be restarted.
2. During the firmware download process, do not access the C445 with the Power Xpert Logic Engine software tool. Do not attempt to download or upload a logic program or the firmware download process could fail and would need to be restarted.

Appendix F—Licenses

This product includes embedded software that incorporates or interfaces with the following third party software:

lwIP is licensed under the BSD license:
Copyright© 2001–2004 Swedish Institute of Computer Science.
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. The name of the author may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDER "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

www.FreeRTOS.org

ANTLR BSD license link → <http://www.antlr.org/license.html>

Copyright© 2012 Terence Parr and Sam Harwell. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- Neither the name of the author nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

We make what matters work.*

* At Eaton, we believe that power is a fundamental part of just about everything people do. Technology, transportation, energy and infrastructure—these are things the world relies on every day. That's why Eaton is dedicated to helping our customers find new ways to manage electrical, hydraulic and mechanical power more efficiently, safely and sustainably. To improve people's lives, the communities where we live and work, and the planet our future generations depend upon. Because that's what really matters. And we're here to make sure it works.

See more at [Eaton.com/whatmatters](https://www.eaton.com/whatmatters)