Communication
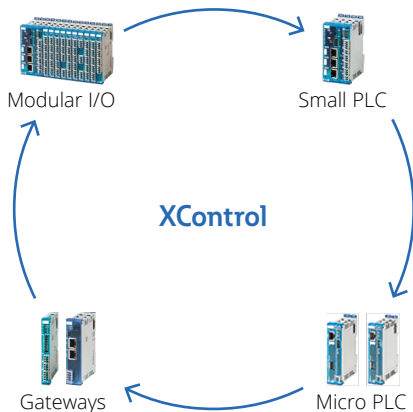# is its strength

F·T·N

Powering Business Worldwide

XControl

The control system for series machine building

Modular I/O

Small PLC

XControl

Gateways

Micro PLC

With the XControl™ system, Eaton offers machine and system builders compact, powerful and flexible PLCs for implementing lean and modern automation concepts—expecially if used in combination with our modular I/O expansions of the XN300 and the innovative touch panels of the XV series. Simple and flexible— these are two words that best describe how well the PLCs and gateways can be expanded with the I/O slice modules of the XN300 system to form a control configuration tailored to your solution. Ethernet interfaces with individual network adapters for connecting networks paired with standard CAN and RS-485 interfaces expand the features of the devices to a universal control and communication point of the networked plant.

A wide variety of functions in a compact unit

Interfaces as required

• Ethernet interfaces with individual adapters for access to different networks

• Standard serial interfaces for setting up CAN and Modbus networks and for the integration of field devices

Ideal for series production

• System and program updates can be carried out via USB and SD memory card

Clearly designed

• Indicator lights under the front ensure touch-safe status display

• Numerous markers provide clear identification

• Switch bank with RUN-STOP switch and switchable terminating resistors

Simple installation

• Tool-free mounting on the mounting rail using locking tabs

• Simple wiring due to the pluggable connection level using push-in technology

Flexible configuration

• Processing of time-critical signals via onboard I/Os

• Expansion of the local I/O level using XN300 I/O modules

The made-to-measure solution

Modular assembly for optimized system design

The local function level of the XControl system PLCs can be expanded to a high degree of flexibility using all components of the XN300 I/O system and can be individually adapted to suit your system requirements. This enables you to produce solutions with a minimum footprint and high connection density. Your solution also leaves the door open for you to expand at the I/O level or switch to a different PLC version, enabling plant versions to be easily adapted and efficiently maintained, even with step-by-step modernization.

Interfaces to suit every requirement

The individual network adapters of the Ethernet interfaces enable the design of segmented machine architectures, simplify integration of the plant into existing factory networks and improve protection against unauthorized access. Safety and performance aspects can be ideally tailored by developing your own networks for cell, machine and SCADA communication.
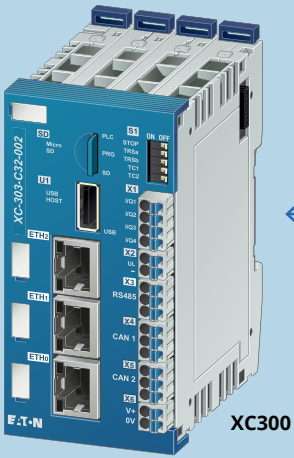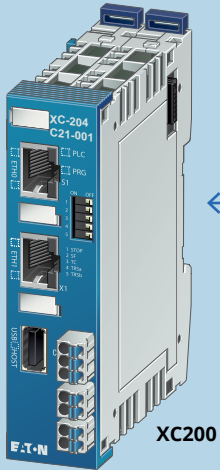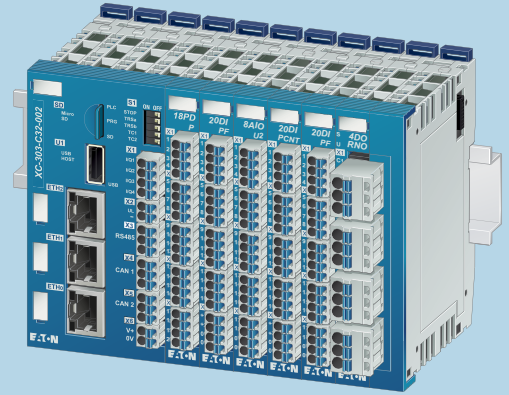
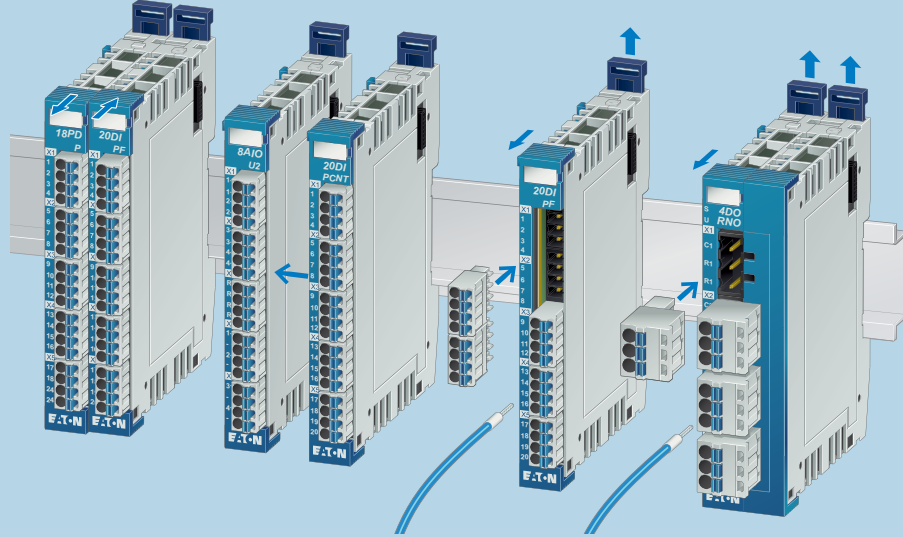**EtherCAT.**

EtherNet/IP

Modbus

CANopen

Communicative field devices can be integrated into your automation solution via Ethernet, standard CAN or RS-485 interfaces and complement the functions of the devices to form a universal control and communication point.
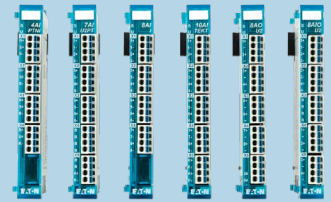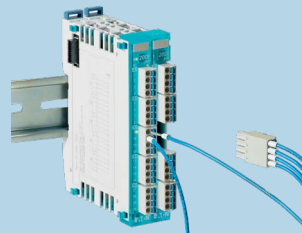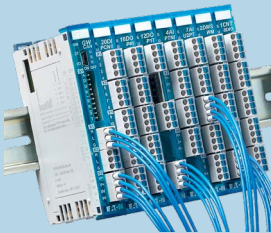
XC300

XC200

XC100

Excellent efficiency, minimum footprint
The components of the XN300 I/O system provide various functions that can be used as either local or remote I/Os.

Quick installation
Pluggable connection level and tool-free mounting allows for easy installation and replacement. This way, you save time and can also pre-assemble the system.

Flexible solution
The I/O level of the XControl PLCs can be built and perfectly adapted to the application using the slice-based modules of the XN300 system with digital, analog and technological functions.

Simple programming
During series production, the device can be programmed using a USB stick or microSD card. In doing so, it automatically copies all relevant data to the internal memory.

Flexible application
The extensive range of control systems means that the system configuration can be designed for efficiency, making adaptations simple to implement.

Networking at field level
The compact design, the broad range of functions and the use of the XN300 system as a local and remote I/O create optimum system solutions with field networking in a minimum footprint.

EtherCAT

CANopen

The XControl product family

The XControl family of PLCs concentrates on application solutions in the field of small and medium-sized series machinery and systems, and offers three performance levels: XC100, XC200 and XC300. The device operating system is based on a Linux® platform and CODESYS 3 is used to program the control and visualization functions.

Modular PLC XC100

Modular PLC XC200

The XC100 is perfect for solving simple automation tasks with Ethernet-based networking. The XN300 system's expansion with up to six snap-on I/O modules enables flexible system configurations. Small PLC and control functions are ideal to implement with the device and networked with higher levels.

- Processor: ARM CORTEX A7 (solo) at 800 MHz

- Internal memory: 256 MB RAM, 4 GB eMMC flash, USB host

- 4k retain data (NVRAM) stored with no power required, capacitive back-up of real-time clock

- 100 MBit/s Ethernet interface for networking

- Locally expandable with up to 6 x XN300 I/O modules

The XC200 PLC versions provide flexible solutions for standard automation tasks. The local I/O level can be configured with the XN300 I/O modules and the separate Ethernet interfaces simplify operation with standard serial interfaces in different networks and the integration of third-party devices.

- Processor: ARM CORTEX A7 (solo) at 800 MHz (types ..C10-000, ..C11-003), ARM CORTEX A7 (dual) at 1000 MHz (types ...C21-001, ...C20-002)

- Internal memory: 512 MB RAM, 4 GB eMMC flash, USB host

- Powerless stored 32k retain data (NVRAM), capacitive buffered real-time clock

- 100 Mbit/s Ethernet interfaces with own network adapter for integration into different networks

- Locally expandable with up to 16 x XN300 I/O modules

- Serial standard interfaces (CAN, RS-485) for networking in the CANopen or Modbus RTU network and for the integration of third-party devices

- Two configurable digital inputs/outputs enable the implementation of special, time-critical applications

XSOFT-CODESYS programming software
CODESYS programming is now practically established as standard because of its popular use in open, industrial automation. Existing expertise and created programs can be easily and quickly ported.

Linux operating system
Eaton's embedded Linux platform with real-time expansion and CODESYS run-time form the core of the products' software. The system is particularly reliable and its functions are continuously being developed.

Software XN300-Assist
The XN300-Assist ensures the greatest level of operator convenience in the planning of your system. The online and offline functions of the practical software tool are helpful features for commissioning and installing the devices.

XC300 modular PLC

A wide range of functions and interfaces enables the flexible use of the compact, high-performance control system in modular automation solutions. Ethernet interfaces for connection to different networks, along with the standard CAN and RS-485 interfaces, turn the XC300 device into a universal control and powerful communication point within the networked facility.

- Processor: ARM CORTEX A7 Dual Core at 960 MHz

- Internal memory: 512 MB RAM, 128 MB flash, USB host, SD slot (32 GB)

- Powerless stored 128k retain data (NVRAM), capacitive buffered real-time clock

- 1 Gbit/100 Mbit Ethernet interfaces with individual network adapter for integration into different networks (SCADA, production and machine level)

- Locally expandable with up to 32 x XN300 I/O modules

- Serial interfaces (2xCAN, RS-485) for networking in CANopen and Modbus RTU networks as well as for simple integration of third-party devices

- Four configurable digital inputs/outputs for implementing special, time-critical applications

XN300 I/O system
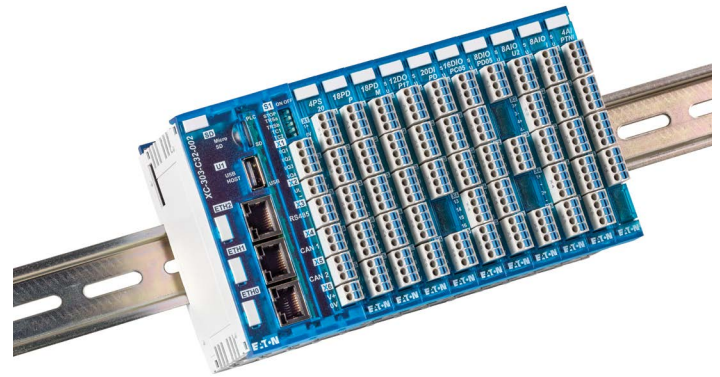
XN300, the ultra-compact, slice-modular I/O system with a pluggable connection level with high connection density complements the HMI/PLC products for a system solution that focuses on your application. The high functional and variant diversity reduce the device costs and enable the optimum system solution in the smallest possible space. At the same time, the XN300 I/O system can be used as a local I/O directly on the PLC and as a decentralized I/O in the CAN or EtherCAT network.

- High connection density: 20 channels on 12.5 x 102 mm front area and 72 mm height

- Tool-less mounting and push-in plug-in connection technology

- Extensive range: Gateways (CAN, EtherCAT), digital and analog I/O modules as well as mixing functions for current, voltage and temperature measurement and for the operation of DC motor, counters and weighing cells

- Indicator LEDs for communication and signal states

- XN300-Assist with extensive offline and online functions

Designation	No. of XN300 ext. modules	Retain data (kB)	RTC	USB	SD SLOT	EtherNet 1 GB/ 100 MB	Web-Visu	OPC-UA	EtherNet/ IP	Modbus TCP	EtherCAT	CAN	CANopen	RS-485	Modbus RTU
XC100 modular PLC															
XC-104-C10-000	6	4	■	■	—	—/1x	HTML5	Server	Scanner (MS)	Server/Client	—		—	—	—	—
XC200 modular PLC															
XC-204-C10-000	16	32	■	■	—	—/1x	HTML5	Server	Scanner (MS)	Server/Client	—		—	—	—	—
XC-204-C11-003	16	32	■	■	—	—/1x	HTML5	Server	Scanner (MS)	Server/Client	—	1x	MGR/CL	■	MS/DEV
XC-204-C20-002	16	32	■	■	—	—/2x	HTML5	Server	Scanner (MS)	Server/Client	MS	—	—	■	MS/DEV
XC-204-C21-001	16	32	■	■	—	—/2x	HTML5	Server	Scanner (MS)	Server/Client	MS	1x	MGR/CL	—	—
XC300 modular PLC															
XC-303-C11-000	32	128	■	■	■	—/1x	HTML5	Server	Scanner (MS)	Server/Client	MS	1x	MGR/CL	—	—
XC-303-C21-001	32	128	■	■	■	—/2x	HTML5	Server	Scanner (MS)	Server/Client	MS	1x	MGR/CL	■	MS/DEV
XC-303-C32-002	32	128	■	■	■	1x/2x	HTML5	Server	Scanner (MS)	Server/Client	MS	2x	MGR/CL	■	MS/DEV

Digitalizing automation systems
The right solution for your application

Global competition, progressive digitalization and specific customer requirements continually create new challenges for series machine and system manufacturers in the design of their machine concepts. Automation solutions must deliver the hardware and software modularity required to satisfy customer specifications. In addition to component costs, the development, design and product maintenance also need to remain manageable throughout the system's life cycle.

Production machinery

Digital transformation, networked production, Industry 4.0

In modern production, people, machinery and processes are intelligently networked with each other through information and communication technology. Eaton is there to assist you by supplying components and offering support in the development of communicating series machines.

Heating, ventilation and air conditioning technology

Energy-efficient climate control

From the PLC and sensor systems to the electrical drives, Eaton components are ideal for use in efficient climate control to create specified room conditions.
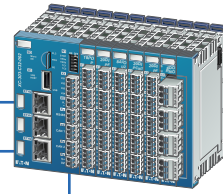

Pumps and compressors
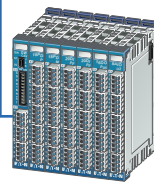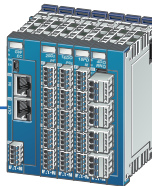
Reliable and efficient system operation

OPC-UA represents a milestone in machine communication, playing a key role in significantly accelerating the digitalization process. Intelligent communication interfaces facilitate the flow of information and simplify the exchange of system components.

Visualization level

PLC level

Field level

Networking systems
Eaton's XControl system comprises a product portfolio of PLCs, gateways and I/O modules. Various interfaces support modern communication concepts and make networking and maintenance of your system even easier.

Enhancing productivity
Optimized system performance through powerful processors with real-time-capable Linux operating system enables short task cycle times and boosts machine productivity.

Visualization in HTML5 standard
The integrated web server offers remote visualization on mobile devices such as PCs, tablets and smartphones. The status of the system is transparent and functions are easy to control from (virtually) anywhere.

Implementing Industry 4.0

The first revolution in industrial production took place with the introduction of mechanical production facilities at the end of the 18th century. This was the foundation for the later implementation of mass production and the subsequent automation of production processes.

Industry 4.0 is the fourth industrial revolution. Modern information and communication technologies are now used in production processes and enable communication between humans, machines, industrial plants, logistics and products. This networking helps to optimize the entire value chain.
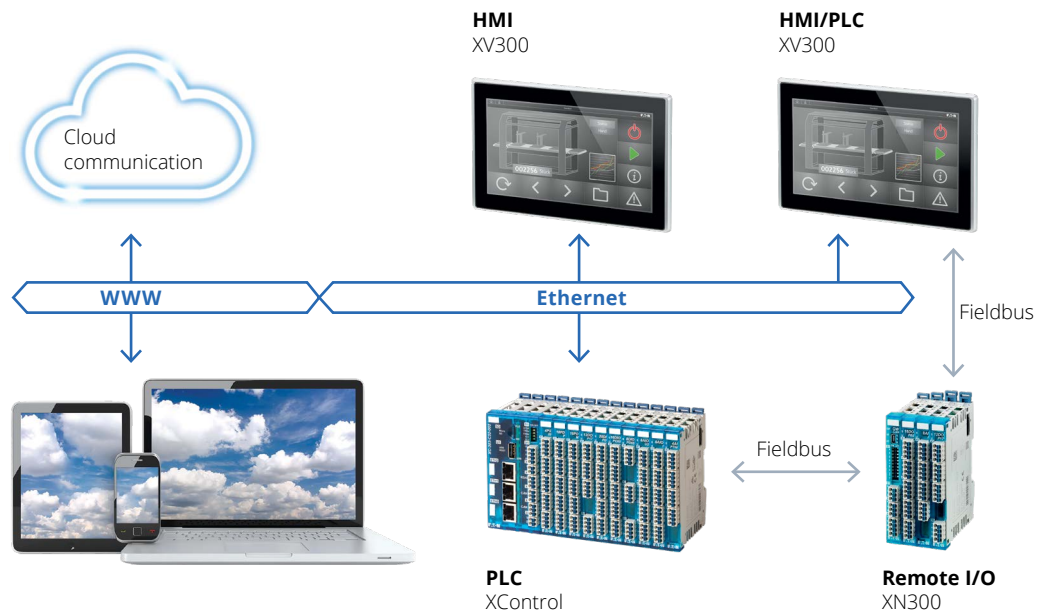
The transition to Industry 4.0 offers a range of advantages for machine and system operators:

- **Process optimization along the value chain**
- **Customized series production**
- **Improvement of machine availability**
- **Maximization of the product life cycle (big data)**

Entering digitalization with XControl

Automation applications are often highly complex. With Eaton PLC and visualization products, it is possible to realize flexible and varied system concepts.

For many users, the integration of Industry 4.0 into their systems is becoming increasingly important. Eaton can support you in this process to help you take a leap into the future. Benefit from a comprehensive portfolio of automation components, relevant software packages and qualified support before, during and after commissioning.

HMI
XV300

HMI/PLC
XV300

Cloud communication

WWW

Ethernet

Fieldbus

Fieldbus

PLC
XControl

Remote I/O
XN300



Standardized data exchange
Data exchange standards ensure that the devices are suitable for universal use. The OPC-UA server guarantees interoperability in machine-to-machine (M2M) communication.
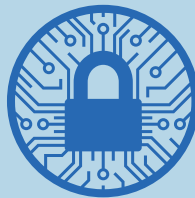
An Eaton secure-by-design solution
Complies with rigorous cybersecurity, process, requirements and testing standards

Cybersecurity
In order to protect machines and systems from unauthorized access, Eaton is committed to complying with the latest standards in communications technology.

SCADA level

Machine level
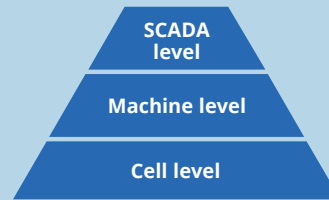
Cell level

Data nodes across all levels
Eaton automation components support various system concepts for the horizontal and vertical networking, control and visualization of your machine.

Order information

XN300 I/O system

Description	Catalog number		Description	Catalog number
Gateway/interface			**Analog input**	
Gateway to the EtherCAT bus system	**XN-312-GW-EC**		4 inputs, PT/NI/KTY/R, 2/3 core	**XN-322-4AI-PTNI**
Gateway to the CANopen bus system	**XN-312-GW-CAN**		6 inputs, +/-10 V, 1 PT/KTY, Uref	**XN-322-7AI-U2PT**
Digital input			8 inputs, 0/4–20 mA	**XN-322-8AI-I**
8 inputs, P, 24 Vdc, 5.0 ms	**XN-322-8DI-PD**		8 inputs, thermocouple, 2 KTY	**XN-322-10AI-TEKT**
16 inputs, P, 24 Vdc, 5.0 ms	**XN-322-16DI-PD**		8 inputs, PT1000/KTY, 2 cables	**XN-322-8AI-PTKT**
20 inputs, P, 24 Vdc, 5.0 ms	**XN-322-20DI-PD**		**Analog output**	
20 inputs, P, 24 Vdc, 0.5 ms	**XN-322-20DI-PF**		4 outputs, -10/0–10 V, 0/4–20 mA, 16 bit	**XN-322-4AO-UI**
20 inputs, P, 24 Vdc, 2/4 CNT, 25 kHz	**XN-322-20DI-PCNT**		8 outputs, +/-10 V	**XN-322-8AO-U2**
20 inputs, N, 24 Vdc, 5.0 ms	**XN-322-20DI-ND**		**Analog input/output**	
Digital output			2 inputs, 2 outputs, +/-10 V, Uref	**XN-322-4AIO-U2**
8 outputs, P, 24 Vdc, 0.5 A, kf	**XN-322-8DO-P05**		4 inputs, 4 outputs, +/-10 V, Uref	**XN-322-8AIO-U2**
12 outputs, P, 24 Vdc, 1.7 A, kf	**XN-322-12DO-P17**		2 inputs, 2 outputs, 0/4–20 mA	**XN-322-4AIO-I**
16 outputs, P, 24 Vdc, 0.5 A, kf	**XN-322-16DO-P05**		4 inputs, 4 outputs, 0/4–20 mA	**XN-322-8AIO-I**
Digital input/output			**Technology modules**	
4 inputs, 4 outputs, P, 24 Vdc	**XN-322-8DIO-PD05**		Weighing module, 2DMS, 24 bit	**XN-322-2DMS-WM**
8 inputs, 8 outputs, P, 24 Vdc	**XN-322-16DIO-PD05**		DC motor driver, 12–30 V, brush, 3.5 A	**XN-322-1DCD-B35**
8 inputs, 8 outputs, P, 24 Vdc, CNT	**XN-322-16DIO-PC05**		Counter, 1 CNT, 125 kHz, 16 bit, 4 DO, 4 DI	**XN-322-1CNT-8DIO**
6 inputs, 8 outputs, P, 24 Vdc, analog input +/-10 V, analog input 0/4–20 mA	**XN-322-16MIO-DIOAI**		Serial, 2 SSI, RS-422, 32 bit	**XN-322-2SSI**
Relay modules			Serial, RS-232, RS-485	**XN-322-2SI-RS**
4 outputs, relay, NO contacts	**XN-322-4DO-RNO**		PWM, 2 outputs, P, 24 Vdc, 1 A, kf, 20 kHz	**XN-322-2PWM**
5 outputs, relay, CO	**XN-322-5DO-RCO**		**Power supply modules**	
			Energy supply, 4 x 24 Vdc/2 A, kf	**XN-322-4PS-20**
			Passive field potential distributors	
			Power distribution, 18 channels, GND	**XN-322-18PD-M**
			Power distribution, 18 channels, VCC	**XN-322-18PD-P**

XControl PLCs

Description	Catalog number
XC100 modular PLC	
XC-104 modular PLC, CODESYS 3 programmable, USB, 1 x Ethernet	**XC-104-C10-000**
XC200 modular PLCs	
XC-204 modular PLC, CODESYS 3 programmable, USB, 1 x Ethernet	**XC-204-C10-000**
XC-204 modular PLC, CODESYS 3 programmable, USB, 1 x Ethernet, 1 x CAN, 1 x RS-485	**XC-204-C11-003**
XC-204 modular PLC, CODESYS 3 programmable, USB, 2 x Ethernet, 1 x RS-485, 2 digital inputs/outputs	**XC-204-C20-002**
XC-204 modular PLC, CODESYS 3 programmable, USB, 2 x Ethernet, 1 x CAN, 2 digital inputs/outputs	**XC-204-C21-001**
XC300 modular PLCs	
XC-303 modular PLC, CODESYS 3 programmable, SD slot, 1 x Ethernet, 1 x CAN	**XC-303-C11-000**
XC-303 modular PLC, CODESYS 3 programmable, SD slot, USB, 2 x Ethernet, 1 x CAN, 1 x RS-485	**XC-303-C21-001**
XC-303 modular PLC, CODESYS 3 programmable, SD slot, USB, 3 x Ethernet, 2 x CAN, 1 x RS-485, 4 digital inputs/outputs	**XC-303-C32-002**
Starter sets	
1 x XC-104-C10-000, 1 x XN-322-8DIO-PD05, patch cable, CODESYS V3 software license	**XC-104-STARTER-SET**
1 x XC-204-C21-001, 1 x XN-322-8DIO-PD05, patch cable, CODESYS V3 software license	**XC-204-STARTER-SET**

For more information, visit
Eaton.com/xcplc and **Eaton.com/xn300**

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