PLC, I/O and Communications Products

ELC Series PLCs

XC Series PLCs

XV Series HMI-PLC

XI/ON Series Distributed I/O

Note: For EASY Programmable Relays, see Tab 3 in this volume.

ELC Series Programmable Logic Controllers

Contents

Product Overview

Controllers

There are five controller styles:

ELCB Brick-Style Controllers

The ELCB controllers are the simplest and most affordable members of the ELC portfolio. With ELCB, the focus is on "just enough control" for applications up to 40 I/O points. These controllers pack a lot into a small, low-profile package. Like the ELCM controllers, these controllers are AC powered and provide 24 Vdc sensor power. But unlike the rest of the ELC family, the ELCB controllers do not offer expansion I/O. The ELCB is great as a standalone controller, or is capable of networking with other controllers, operator interfaces, drives, or other Modbus® serial devices.

ELCM Modular Brick-Style Controllers

The next member of the ELC portfolio of controllers is the ELCM. This midrange family comprises "brick-style" controllers, with expansion I/O modules. These all-in-one controllers combine inputs, outputs, logic processing, and an integrated AC power supply into a compact package—but also provide the means to expand as applications change or grow. The controller also provides 24 Vdc power for sensors, eliminating the space, wiring, and expense of an additional power supply. And with three communication ports, the ELCM is able to interface into a local operator interface, connect to other controllers or supervisory computers, and still maintain an open port for programming.

ELC Modular Controllers

The ELC lineup is focused on compact size, powerful features, and affordability. Whether your needs involve discrete standalone control, necessitate distributed control networks, or even a control system, using centralized control with distributed I/O, ELCs provide the solution your application demands.

While the ELCs are perfectly suited for small applications of <40 I/O with a diverse mix of I/O, they can also expand to hundreds of I/O points when needed. These controllers are modular, with a wide range of digital, analog, thermocouple, RTD, and even motion expansion modules. Despite a world-class small footprint—with controllers as small as 1.00-inch wide, these controllers perform like much larger PLCs. With online editing, high-speed processing (basic instructions as fast as 0.24 microseconds), multiple high-speed inputs/outputs (up to 200 kHz), and multiple independent master communication channels, these controllers excel where only the largest PLCs could go only a few years ago.

Electrical/EMC

- ESD Immunity
  - 8 kV air discharge
- EFT Immunity
  - Power Line: 2 kV
  - Digital I/O: 1 kV
  - Analog and Communication I/O: 250V
- Damped-Oscillatory Wave
  - Power Line: 1 kV
  - Digital I/O: 1 kV
- RS Immunity
  - 26 MHz–1 GHz, 10 V/m

Standards and Certifications

- cULus
- CE; C-Tick
- RoHS

c UL us Listed CE RoHS COMPLIANT

Product Selection Guide

ELC Series Programmable Logic Controllers

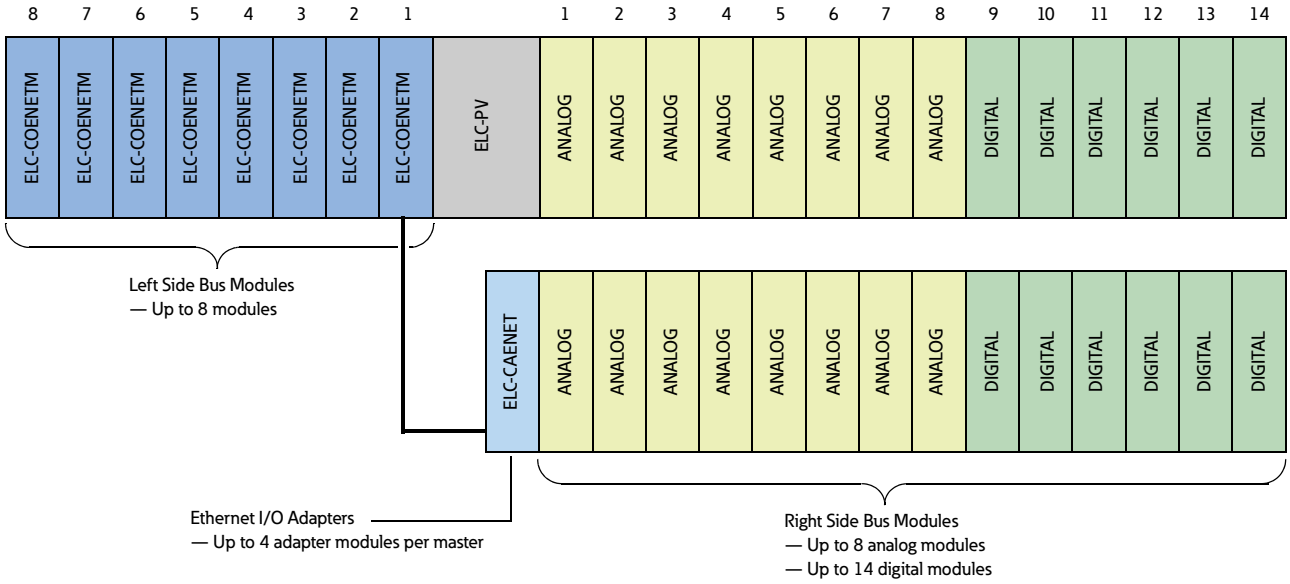
Model	ELCB Brick Style PLCs	ELCM Modular Brick PLCs	ELC Modular PLCs
			
	Page V7-T4-5	**Page V7-T4-6**	**Page V7-T4-8**
Product Description	Compact and economical PLCs • Digital I/O only • 10, 14, 20, 30 or 40 I/O controllers • 24 Vdc inputs • Relay or transistor outputs • Non-expandable I/O • Built-in 110 Vac power supply • On board 400 mA 24 Vdc sensor power • RS-232 programming port • RS-485 Modbus serial port • DIN rail or panel mount	Expandable brick PLCs • Digital, analog, thermocouple and RTD I/O • 16, 20, 24, 32 or 40 I/O base controllers • 8 and 16 digital I/O expansion modules • 2, 4 and 6 analog I/O expansion modules • 24 Vdc inputs • Relay or transistor outputs • Built-in 110 Vac power supply • On board 400 mA 24 Vdc sensor power • RS-232 programming port • Two RS-485 Modbus serial ports • DIN rail or panel mount	Modular and expandable PLCs with distributed I/O capability • Digital, analog, thermocouple and RTD I/O • 10, 12, 14 and 28 I/O base controllers • 6, 8 or 16 digital I/O expansion modules • 2, 4 and 6 analog I/O expansion modules • 24 Vdc and 110 Vac inputs • Relay or transistor outputs • High current relay output module • High speed pulse capture and high speed pulse output up to 200 kHz • Two RS-485 Modbus serial ports • DIN rail mounting only • Distributed I/O adapters for EtherNet/IP, Modbus TCP, DeviceNet, PROFIBUS-DP and RS-485

Features

Input voltage	120 Vac	120 Vac	24 Vdc
Maximum local I/O points	40	264	252
Built-in power supply	Yes	Yes	No
Built-in 24 Vdc sensor power supply	Yes	Yes	No
DC inputs	Yes	Yes	Yes
AC inputs	No	No	Yes
Transistor outputs	Yes	Yes	Yes
Relay outputs	Yes	Yes	Yes
High current relay outputs	No	No	Yes
Clock/calendar	No	No	Yes
Expandable	No	Yes	Yes
Removable terminal blocks	No	Yes	Yes
Built-in display	No	No	Yes
RS232 communication ports	1	1	1
RS485 communication ports	1	2	1
High speed counters	No	Yes	Yes
Analog I/O	No	Yes	Yes
Thermocouple module	No	Yes	Yes
Platinum RTD module	No	Yes	Yes
Single axis motion control module	No	No	Yes
DeviceNet master	No	No	Yes
Ethernet (Modbus TCP) master	No	No	Yes
Distributed I/O adapters	No	No	Yes

System Overview

Configuration and Layout



Product Selection

ELCB Brick Style PLCs

Features

- Basic PLC logic with just enough I/O for simple DC in/relay or transistor out applications
- This non-expandable PLC has a built-in AC power supply and provides up to 400 mA of DC sensor power
- Each controller supports one RS-232 programming port and one RS-485 Modbus serial (master/slave) port

Controllers

ELCB – PB 10 N N D R

Device Types	I/O Count	Analog Inputs	Analog Outputs	Digital Inputs	Digital Outputs
PB = Base model	**xx** = Total number of I/O (10, 14, 20, 30, 40)	**N** = None	**N** = None	**D** = DC	**T** = Transistor **R** = Relay

ELCB-PB10NNDR

Controllers

	Inputs			Outputs			
Description	**AC**	**DC**	**Analog**	**Relay**	**NPN Sinking Transistor**	**Analog**	**Catalog Number**
10 I/O	—	6	—	4	—	—	**ELCB-PB10NNDR**
	—	6	—	—	4	—	**ELCB-PB10NNDT**
14 I/O	—	8	—	6	—	—	**ELCB-PB14NNDR**
	—	8	—	—	6	—	**ELCB-PB14NNDT**
20 I/O	—	12	—	8	—	—	**ELCB-PB20NNDR**
	—	12	—	—	8	—	**ELCB-PB20NNDT**
30 I/O	—	18	—	12	—	—	**ELCB-PB30NNDR**
	—	18	—	—	12	—	**ELCB-PB30NNDT**
40 I/O	—	24	—	16	—	—	**ELCB-PB40NNDR**
	—	24	—	—	16	—	**ELCB-PB40NNDT**

ELCM Modular Brick PLCs

Features

- Midrange brick style controller with digital, analog, thermocouple and RTD expansion capability
- Expansion modules can optionally be used to increase the total number of I/O, to provide a mix of different types of I/O, or both
- These controllers include an embedded AC power supply and provide up to 400 mA of DC sensor power
- Each controller supports two RS-485 Modbus serial (master/node) and one RS-232 programming port

Controllers

ELCM – PA 16 A A D R

Device Types	I/O Count	Analog Inputs	Analog Outputs	Digital Inputs	Digital Outputs
PH = High-speed model **PA** = Analog model **AN** = Analog expansion module **EX** = Digital expansion module **PT** = Platinum rtd expansion module **TC** = Thermocouple expansion module	**xx** = Total number of I/O (16, 24, 32, 40 digital; 20 analog and digital)	**A** = Analog **N** = None	**A** = Analog **N** = None	**A** = AC **D** = DC **N** = None	**T** = Transistor **R** = Relay **N** = None

ELCM-PH16NNDR

Controllers

	Inputs			Outputs			
Description	**AC**	**DC**	**Analog**	**Relay**	**NPN Sinking Transistor**	**Analog**	**Catalog Number**
16 I/O PH model	—	8	—	8	—	—	**ELCM-PH16NNDR**
	—	8	—	—	8	—	**ELCM-PH16NNDT**
24 I/O PH model	—	16	—	8	—	—	**ELCM-PH24NNDR**
	—	16	—	—	8	—	**ELCM-PH24NNDT**
32 I/O PH model	—	16	—	16	—	—	**ELCM-PH32NNDR**
	—	16	—	—	16	—	**ELCM-PH32NNDT**
40 I/O PH model	—	24	—	16	—	—	**ELCM-PH40NNDR**
	—	24	—	—	16	—	**ELCM-PH40NNDT**
20 I/O PA model	—	8	4	6	—	2	**ELCM-PA20AADR**
	—	8	4	—	6	2	**ELCM-PA20AADT**

Right Side Digital Expansion Modules

	Inputs		Outputs		
Description	**AC**	**DC Sink/Source**	**Relay**	**NPN Sinking Transistor**	**Catalog Number**
8 DC input module	—	8	—	—	**ELCM-EX08NNDN**
16 DC input module	—	16	—	—	**ELCM-EX16NNDN**
8 Relay output module	—	—	8	—	**ELCM-EX08NNNR**
16 Relay output module	—	—	16	—	**ELCM-EX16NNNR**
8 Transistor output module	—	—	8	—	**ELCM-EX08NNNT**
16 Transistor output module	—	—	16	—	**ELCM-EX16NNNT**
8 DC input/relay output module	—	4	4	—	**ELCM-EX08NNDR**
16 DC input/relay output module	—	8	8	—	**ELCM-EX16NNDR**
8 DC input/output module	—	4	—	4	**ELCM-EX08NNDT**
16 DC input/output module	—	8	—	8	**ELCM-EX16NNDT**

Right Side Analog and Specialty Modules

Description	**Analog Inputs**	**Analog Outputs**	**Catalog Number**
4 Analog input module	4	—	**ELCM-AN04ANNN**
2 Analog input module	—	2	**ELCM-AN02NANN**
4 Analog input module	—	4	**ELCM-AN04NANN**
6 Analog input/output module	4	2	**ELCM-AN06AANN**
4 Thermocouple input module (J, K, R, S, T)	4	—	**ELCM-TC04ANNN**
4 Platinum RTD input module (PT100)	4	—	**ELCM-PT04ANNN**

ELC Modular PLCs

Features

- **PB Base Model**—
  - 14 I/O (8i/6o)
  - Over 130 instructions
  - Two Modbus (ASCII/RTU) serial ports for master/slave communications
  - RS-485 master port with the ability to communicate to 31 other devices
  - The master port can also be configured to communicate to devices such as ASCII, bar code readers, and so on
  - EEPROM program retention in the event of power loss

Note: This model does not provide a real-time clock

- **PC Clock/Calendar Model**
  - 12 I/O (8i/4o)
  - Same features as the basic model plus clock/calendar
  - Distributed I/O capability with up to 16 devices
  - File area for data storage and retrieval
  - RAM program memory with battery backup
  - Replaceable battery has greater than a 5-year life
  - Two digital potentiometers that vary the data in internal registers
- **PH High-Speed Model**
  - 12 I/O (8i/4o)
  - All the features of the PC model
  - High speed pulse capture up to 100 kHz
  - Single-axis motion control

- **PA Analog Model**
  - 10 I/O (6i/4o)
  - Same features as PC model with a different I/O mix
  - Four digital inputs, two digital outputs, two analog inputs, and two analog outputs
  - Analog channels can be set up for either voltage or current
  - Two 7-segment LEDs that can be used to display unit ID, error codes, process steps, and so on

- **PV Advanced Model**
  - 28 I/O (16i/12o)
  - The PV model has the most extensive features
  - Programs written for the other controllers can be migrated to a PV model controller where greater speed or more I/O is required
  - 10 times increase in processing speed for about 0.24µ seconds/step
  - RAM program storage and backed using a rechargeable lithium-ion battery that charges with normal use
  - Includes 2-axis motion control
  - Additional expansion bus to the left of the controller
  - Add high-speed and specialty modules to the left
  - Left side Ethernet master and DeviceNet master modules are available for use with the PV model controller

Controllers and Modules

ELC - PA 10 A A D R

Device Type
PB = Base model
PC = Clock/calendar model
PH = High-speed model
PA = Analog model
PV = Advanced model
AN = Analog expansion module
EX = Digital expansion module
PT = Platinum RTD expansion module
TC = Thermocouple expansion module

I/O Count
xx = Total number of I/O

Analog Inputs
A = Analog
N = None

Analog Outputs
A = Analog
N = None

Digital Inputs
A = AC
D = DC
S = Switch
N = None

Digital Outputs
T = Transistor
R = Relay
I = High current relay
N = None

ELC-PV_

Controllers (PB, PC, PH, PV, PA)

Description	Inputs	Outputs	Analog	High Speed I/O	Max. Current Consumption (at 24 Vdc)	Catalog Number
ELC-PB model and 14 I/O built-in	(8) 24 Vdc	(6) Relay, 1.5A	—	(2) 20 kHz inputs	150 mA	**ELC-PB14NNDR**
	(8) 24 Vdc	(6) Transistor, 100 mA	—	(2) 20 kHz inputs	150 mA	**ELC-PB14NNDT**
ELC-PC model and 12 I/O built-in	(8) 24 Vdc	(4) Relay, 1.5A	—	(1) 30 kHz inputs	150 mA	**ELC-PC12NNDR**
	(8) 24 Vdc	(4) Transistor, 100 mA	—	(1) 30 kHz inputs	150 mA	**ELC-PC12NNDT**
	(8) 110 Vac	(4) Relay, 1.5A	—	(1) 30 kHz inputs	150 mA	**ELC-PC12NNAR**
ELC-PH model and 12 I/O built-in	(8) 24 Vdc	(4) Transistor, 100 mA	—	(1) 100 kHz inputs	170 mA	**ELC-PH12NNDT**
ELC-PA model and 10 I/O built-in	(4) 24 Vdc	(2) Relay, 1.5A	(2) In and (2) Out	(1) 30 kHz inputs	210 mA	**ELC-PA10AADR**
	(4) 24 Vdc	(2) Relay, 1.5A	(2) In and (2) Out	(1) 30 kHz inputs	210 mA	**ELC-PA10AADT**
ELC-PV model and 28 I/O built-in	(16) 24 Vdc	(12) Relay, 1.5A	—	(2) 200 kHz inputs	220 mA	**ELC-PV28NNDR**
	(16) 24 Vdc	(12) Transistor, 100 mA	—	(2) 200 kHz inputs	220 mA	**ELC-PV28NNDT**

ELC Master Communication Modules

ELC Master Communication Modules

ELC - CO ENETM

Device Type	Module Type
CO = Communication interface module	**DNETM** = DeviceNet master module ① **ENETM** = Ethernet master module ①

Ethernet Master Communication Module (Left Side Bus)

Features

- Ethernet communication module
- Enables the ELC-PV model controller to connect to Modbus TCP networks auto detecting 10/100MB connections
- Enables the uploading and downloading of programs in addition to program monitoring
- Use ELCSoft to search for all the Ethernet modules attached to the network and manage them remotely
- Share data in a peer-to-peer network to reduce long I/O wiring
- Send e-mails for alerts and notifications. For example, advise personnel of alarm condition or send daily production yield summaries
- Keep accurate time with the NTP (Network Time Protocol) feature, which synchronizes your controller with an NTP server
- The Ethernet module will automatically detect and use the type of patch or crossover cable attached
- IP addresses may be filtered to manage module traffic in order to maximize communication performance.

ELC-COENETM

Ethernet Master Communication Module (Left Side Bus)

Description	Inputs Points	Type	Outputs Points	Catalog Number
Ethernet Modbus TCP (master/slave)	N/A	Modbus TCP	N/A	**ELC-COENETM**

DeviceNet Master Communication Module (Left Side Bus)

Features

- DeviceNet master module maps up to 380 bytes of data directly into the PV model controller for quick and easy access
- Use Polled, Bit-Strobe and Change of State/Cyclic DeviceNet commands, or send explicit messages
- Configuration of DeviceNet components in ELCSoft is easy with the drag-and-drop interface
- Use the pre-populated EDS files within ELCSoft and add others to simplify the configuration

ELC-CODNETM

DeviceNet Master Communication Module (Left Side Bus)

Description	Inputs Points	Type	Outputs Points	Catalog Number
DeviceNet Scanner (master/slave)	190 bytes	DeviceNet	190 bytes	**ELC-CODNETM**

Note

① Left side bus communications module—for use with ELC-PV controllers only.

ELC Distributed I/O Adapters

Features

- Combine with ELC expansion modules to create distributed I/O racks for different PLC networks
- Use ELC-CAENET and ELC-COENETM to create distributed I/O racks to the ELC-PV controllers
- Connect cost effective ELC expansion modules to third-party PLCs using standard networks
- EtherNet/IP, Modbus TCP, DeviceNet, PROFIBUS-DP and Modbus serial RS-485 distributed I/O adapters
- Connect up to 8 analog expansion modules or 14 digital expansion modules

ELC Distributed I/O Adapters

ELC – CA ENET

Device Type	Module Type
CA = Distributed I/O adapter	**ENET** = EtherNet/IP or Modbus TCP I/O adapter **DNET** = DeviceNet I/O adapter **RS485** = Modbus serial RS-485 I/O adapter **PBDP** = PROFIBUS-DP I/O adapter

ELC-CAENET

Distributed I/O Adapter Modules

Description	Catalog Number
EtherNet/IP or Modbus TCP I/O adapter	**ELC-CAENET**
Modbus serial RS-485 I/O adapter	**ELC-CARS485**
DeviceNet I/O adapter	**ELC-CADNET**
PROFIBUS-DP I/O adapter	**ELC-CAPBDP**

Digital Expansion Modules (Right Side Bus)

Features

- Digital right side expansion modules can be used with any ELC controller
- They simply snap together to allow the ELC backplane to pass through each connected module
- Add only the amount of I/O you need
- Choose I/O counts as small as 6 points and as large as 14 points per module
- I/O modules are available in a broad selection of AC/DC inputs, relay/transistor and high current outputs that may be used together in any combination
- Maximum of 14 modules per controller

ELC-EX08NNDN

Digital Expansion Modules (Right Side Bus) 1 of 2

Description	Inputs	Outputs	Max. Current Consumption (at 24 Vdc)	Catalog Number
8 DC input module	(8) 24 Vdc	—	50 mA	**ELC-EX08NNDN**
8 AC input module	(8) 110 Vac	—	50 mA	**ELC-EX08NNAN**
8 Transistor output module	—	(8) Transistor (sink), 0.3A	70 mA	**ELC-EX08NNNT**
8 Relay output module	—	(8) Relay, 1.5A	70 mA	**ELC-EX08NNNR**

ELC-EX08NNDT

Digital Expansion Modules (Right Side Bus) 2 of 2

Description	Inputs	Outputs	Max. Current Consumption (at 24 Vdc)	Catalog Number
8 DC input/output module	(4) 24 Vdc	(4) Transistor (sink), 0.3A	70 mA	**ELC-EX08NNDT**
8 DC input/relay output module	(4) 24 Vdc	(4) Relay, 1.5A	70 mA	**ELC-EX08NNDR**
6 High current relay output module	—	(6) Relay, 6A	70 mA	**ELC-EX06NNNI**
16 DC input module	(16) 24 Vdc	—	100 mA	**ELC-EX16NNDN**
16 DC input/output module	(8) 24 Vdc	(8) Transistor (sink), 0.3A	90 mA	**ELC-EX16NNDT**
16 DC input/output module	(8) 24 Vdc	(8) Transistor (source), 0.3A	100 mA	**ELC-EX16NNDP**
16 DC input/relay output module	(8) 24 Vdc	(8) Relay, 1.5A	90 mA	**ELC-EX16NNDR**

ELC-AN04ANNN

Analog Input and Output Modules (Right Side Bus)

Analog input/output modules uses voltage or current mode for any channel—see table for resolution based on type and mode.

Description	Input Points	Resolution	Mode	Output Points	Resolution	Mode	Maximum Current Consumption (at 24 Vdc)	Catalog Number
4 Analog input module	4	V = 12 bit I = 13 bit	±10V ±20 mA	—	—	—	90 mA	**ELC-AN04ANNN**
2 Analog output module	—	—	—	2	12 bit	0–20 mA; 4–20 mA 0–10V; 2–10V	125 mA	**ELC-AN02NANN**
4 Analog output module	—	—	—	2	12 bit	0–20 mA; 4–20 mA 0–10V; 2–10V	170 mA	**ELC-AN04NANN**
6 Analog input/output module	4	V = 12 bit I = 11 bit	±10V ±20 mA	2	12 bit	0–20 mA 0–10V	170 mA	**ELC-AN06AANN**

ELC-PT04ANNN

Temperature Input Modules (Right Side Bus)

Thermocouple and Platinum RTD temperature sensor input modules with 14 bit resolution.

Description	Input Points	Resolution	Sensor Type	Maximum Current Consumption (at 24 Vdc)	Catalog Number
4 Thermocouple input module	4	—	J, K, R, S, T	90 mA	**ELC-TC04ANNN**
4 Platinum RTD input module	4	14 bit	PT100	90 mA	**ELC-PT04ANNN**

ELC-MC01

Motion Control Module (Right Side Bus)

Single axis motion control module—up to 8 modules can be added to controllers.

If used with PH controller, it can provide a second axis since the PH controller has a single axis built-in.

If used with the PV controller, it can provide a third axis since the PV incorporated two axis of motion control and is capable of output pules up to 200 kHz

Description	Input Type	Output Type	Catalog Number
Single axis motion control module	Phase in, start, stop, and so on	Phase, pulse, direction	**ELC-MC01**

ELC-485APTR

RS-485 Adapter Module (Right Side Bus—End Module)

Passive RS-485 connection device module.

RJ12 port for connecting to a drive.

2-pin screw terminal to connect to ELC controller.

Male and female DB9 connectors to connect to other RS-485 devices.

Description	Connector Types	Catalog Number
RS-485 Connect adapter module	RJ12, DB9 (male and female), 2-pin screw terminals	**ELC-485APTR**

ELC-EX08NNSN

Toggle Switch Input Module (Right Side Bus)

8 input switch module for manual switch inputs to the ELC controllers—used for debugging applications or product training demonstrations

Description	Maximum Current Consumption (at 24 Vdc)	Catalog Number
8 Toggle switch input module	20 mA	**ELC-EX08NNSN**

Accessories

Power Supplies

All ELC controllers, analog and specialty expansion modules operate from 24 Vdc.

These power supplies provide a convenient way to provide robust DC voltage for ELC and other products.

4

ELC-PS01

Power Supplies

Description	Input Power	Output Volts	Output Current (A)	Watts	Catalog Number
24 watt, 1 amp power supply	100–240 Vac 50/60 Hz	24 Vdc	1A	24	**ELC-PS01**
48 watt, 2 amp power supply	100–240 Vac 50/60 Hz	24 Vdc	2A	48	**ELC-PS02**

Cables

Use these cables to connect your PC's RS232 serial port to your ELC controller to download, upload and monitor your ELC controllers, or to connect any ELC-GP to an ELC controller. The ELC-CBPCELC1 cable is 1 meter long and has a right angle connector to the ELC controller to help reduce depth when cable is attached. The ELC-CBPCELC3 is 3 meters long with a straight connector.

Cables

Description	Catalog Number
Cable to connect a PC or an ELC-GP unit to ELC, 3 meters (DB 9-pin female to 8-pin DIN)	**ELC-CBPCELC3**
Cable to connect a PC or an ELC-GP unit to ELC, 1 meter with right angle connector (DB 9-pin female to 8-pin DIN)	**ELC-CBPCELC1**

Storage Devices

The ELC-ACPGMXFR module is a multifunction device that provides the ability to back up an application already loaded onto one of the ELC controllers. The transfer module can be used for copying the same application to multiple controllers and to transfer an existing application to a new controller in the event of a failure. It will store system settings, passwords and the application, including the data registers for pre-loaded recipes. Once stored in the module, the application, data registers and settings can be transferred to another ELC controller of the same model number.

Storage Devices

Description	Catalog Number
Program transfer module for ELC controllers	**ELC-ACPGMXFR**

Hand-Held Programmer

ELC-HHP is an easy-to-use, hand-held programming and monitoring tool for ELC controllers when a PC is not available. With ELC-HHP, applications can be programmed directly with the attached keypad. Applications can also be uploaded from an ELC, saved and transferred to a different ELC, or downloaded from a PC and transferred to other ELCs. External power is not required when using the hand-held programmer because it draws its power from either the ELC or the PC through the attached cable.

Hand-Held Programmer

Description	Catalog Number
Hand-held programmer (Includes interface cables)	**ELC-HHP**

Plate Mount

Use the ELC-ACCOVER surface mount stand-alone modules instead of mounting to a DIN rail. This may be used to mount analog, temperature or the RS-485 adapters remotely.

Plate Mount

Description	Catalog Number
Plate mount for specialty modules, qty. 10	**ELC-ACCOVER**

Starter Kit

Starter Kit

Description	Catalog Number
ELC starter kit (includes ELC-PA10AADT, ELC-PS01, ELC-GP04, ELC-CBPCELC3, ELC-CBPCGP3, ELCSoft, ELCSoftGP)	**ELCSTARTKIT1**

Spare Parts

ELC Spare Parts

Description	Quantity	Catalog Number
Kit consists of:		**ELC-SPKIT**
Module to module locking clips (white)	4	
Module DIN rail clip (white)	2	
3-pin power plug and cable assembly (white)	4	
2-pin RS-485 communications connector (green—for latest version PA, PB, PC and PH)	4	
3-pin RS-485 communications connector (green—PV controllers only)	2	
Left side expansion port cover (PV controllers and left side communications modules)	2	
Right side I/O expansion port cover (all controllers and I/O modules)	2	
Battery cover door (for PA, PC and PH controllers)	2	
Metal mounting clips (only for PV controllers)	2	
Kit consists of:		**ELC-IOBLOCK**
9-pin replacement I/O blocks (green)	4	
Kit consists of:		**ELC-BAT**
Battery with pigtail and connector (for PA, PC and PH controllers only)	2	

Programming Software

ELCSoft programming software configures all ELC controllers. With ELCSoft, applications can be created, edited and monitored. Move programs from one controller to another with ease. Program in ladder, sequential function chart or instruction language. ELCSoft is the single program to develop ELC controller applications. ELCSoft is also used to configure the DeviceNet master and Modbus TCP Ethernet modules.

New program simulation capabilities are available in ELCSoft ver. 2.

Requirements

Operating Systems

- Windows® 2000
- Windows XP
- Windows Vista
- Windows 7

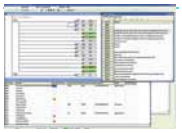
Hard Drive

- At least 100M bytes

RAM

- At least 512M bytes.

ELCSoft Editor



ELC Software

Description	Catalog Number
Programming Software for ELC Controllers	**ELCSOFT**

Technical Data and Specifications

Controllers

Description	ELC-PB14NNDR/DT	ELC-PC12NNAR/DR/DT	ELC-PH12NNDT	ELC-PA10AADR/DT	ELC-PV28NNDR/DT
Dimensions W x H x D (mm)	25.2 x 90 x 60	37.4 x 90 x 60	37.4 x 90 x 60	37.4 x 90 x 60	70 x 90 x 60
I/O type—embedded	14 (8DI/6DO)	12 (8DI/4DO)	12 (8DI/4DO)	10 (4DI/2DO/2AI/2AO)	28 (16DI/12DO)
Maximum additional I/O points	Up to 14 expansion modules (maximum of 8 analog/ specialty modules)	Up to 14 expansion modules (maximum of 8 analog/ specialty modules)	Up to 14 expansion modules (maximum of 8 analog/ specialty modules)	Up to 14 expansion modules (maximum of 8 analog/ specialty modules)	Up to 14 expansion modules (maximum of 8 analog/ specialty modules)
DC in sink/source	Yes	Yes	Yes	Yes	Yes
Execution speed	Basic Instructions— 2 µs minimum	Basic Instructions— 2 µs minimum	Basic Instructions— 2 µs minimum	Basic Instructions— 2 µs minimum	0.24 µs minimum
Program language	Instructions + Ladder Logic + Sequential Function Chart				
Program capacity (steps)	3792	7920	7920	7920	15,872
Data memory capacity (bits)	1280	4096	4096	4096	4096
Data memory capacity (words)	744	5000	5000	5000	10,000
Index registers	2	8	8	8	16
File memory capacity (words)	None	1600 words	1600 words	1600 words	10,000 words
Retentive storage	Yes	Yes	Yes	Yes	Yes
Commands basic/advanced	32/107	32/168	32/168	32/168	32/193
Floating point	Yes	Yes	Yes	Yes	Yes
SFC commands (steps)	128	1024	1024	1024	1024
Timers qty.	128	244 Standard with additional timers for subroutine and retentive applications			
Timers resolution	1–100 ms	1–100 ms	1–100 ms	1–100 ms	1–100 ms
Counters qty.	128	250	250	250	253
High-speed counters (see note)	Up to 4	Up to 6	Up to 8	Up to 6	Up to 8
Max. high-speed counting (see note)	2 at 20 kHz	1 at 30 kHz	1 at 100 kHz	1 at 30 kHz	2 at 200 kHz
Pulse output	2 channels, 10 kHz max.	2 channels, 50 kHz max.	100 kHz	2 channels, 50 kHz max.	200 kHz
PID	Yes	Yes	Yes	Yes	Yes
Master control loop	8 loops	8 loops	8 loops	8 loops	8 loops
Subroutines	64 subroutines	256 subroutines	256 subroutines	256 subroutines	256 subroutines
For/next loops	Yes	Yes	Yes	Yes	Yes
Interrupts	6	15	15	15	22
Real-time clock/calendar	No	Built-in	Built-in	Built-in	Built-in
Password security	Yes	Yes	Yes	Yes	Yes
Diagnostic relays	Yes	Yes	Yes	Yes	Yes
Diagnostic word registers	Yes	Yes	Yes	Yes	Yes
Specialty expansion modules	Up to a maximum of 8 (Analog In/Analog Out/TC/RTD/PT) Modules				
Serial ports	2 Modbus (ASCII/RTU) 1 = Slave (RS-232)/11 = Master-Slave (RS-485)				
Remote I/O	No	With 16 other devices	With 16 other devices	With 16 other devices	With 32 other devices
Runtime editing	No	Yes	Yes	Yes	Yes
Run/stop switch	Yes	Yes	Yes	Yes	Yes
Removable terminal strips	Yes	Yes	Yes	Yes	Yes
Special features	—	2 potentiometers	2 potentiometers	2, 7-segment displays	2 potentiometers high-speed, left side bus

Distributed I/O Adapter Modules

ELC-CANET, refer to **Volume 9—OEM**, CA08100011E, Tab 3, section 3.2.

Environmental Ratings

Description	Specification
Transportation and Storage	
Temperature	–13° to +158°F (–25° to +70°C)
Humidity	5–95%
Operating	
Temperature	32° to 131°F (0° to 55°C)
Humidity	50–95%
Power supply voltage	ELC: 24 Vdc (–15%–20%) (with DC input reverse polarity protection), expansion unit: supplied by the ELC
Power consumption	3–6W
Insulation resistance	>5M ohms at 500 Vdc (between all inputs/outputs and earth)
Grounding	The diameter of grounding wire cannot be smaller than the wire diameter of terminals L and N (All ELC units should be grounded directly to the ground pole)
Vibration / shock resistance	IEC1131-2, IEC 68-2-6 (TEST Fc)/IEC1131-2 and IEC 68-2-27 (TEST Ea)

DC Input Point Electrical Specifications

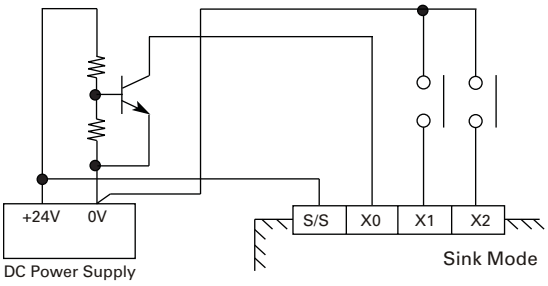
Description	Specification
Input type	DC (SINK or SOURCE)
Input current	24 Vdc 5 mA
Active level	OFF ➔ ON, above 16 Vdc
	ON ➔ OFF, below 14.4 Vdc
Response time	About 10 ms (an adjustment range of 0–10,000 ms could be selected through D1020 and D1021)

Output Point Electrical Specifications

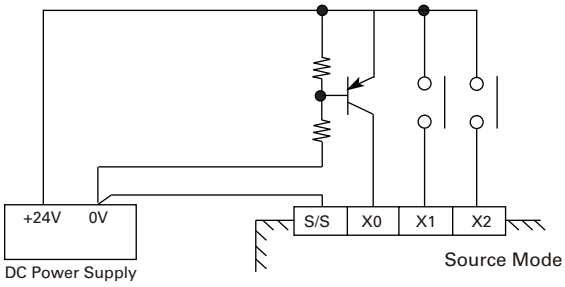
Output Type	Relay–R	Transistor–T
Current specification	1.5A/1 point (5A/COM)	0.3A/1 point @ 40°C; When the output of Y0 and Y1 is high-speed pulse, Y0 and Y1 = 30 mA
Voltage specification	Below 250 Vac, 30 Vdc	30 Vdc
Maximum loading	75 VA (inductive)	9W/1 point When the output of Y0 and Y1 is high-speed pulse, Y0 and Y1 = 0.9W (Y0 = 32 kHz, Y1 = 10 kHz), Y0 can be 50 kHz using D registers
	90W (resistive)	
Response time	Adjustable 0–15 ms, default is 10 ms	OFF ➔ ON 20 µs. Y0 and Y1 are specified points for high-speed pulse
		ON ➔ OFF 30 µs. Y0 and Y1 are specified points for high-speed pulse

Circuit Diagrams

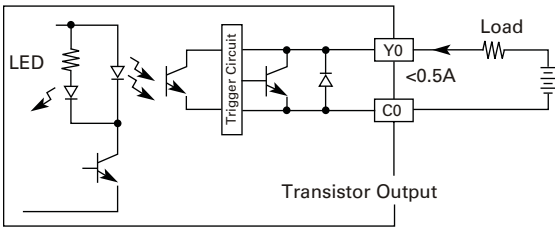
DC Input Sink Mode



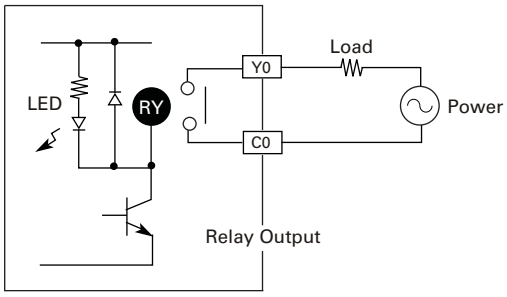
DC Input Source Mode



DC Transistor Sinking Output



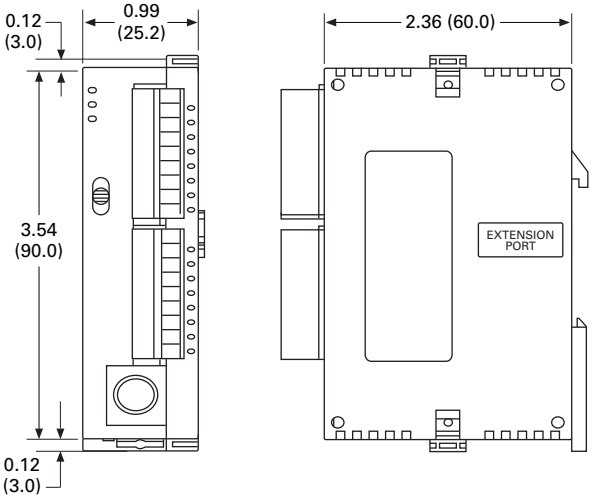
Relay Outputs



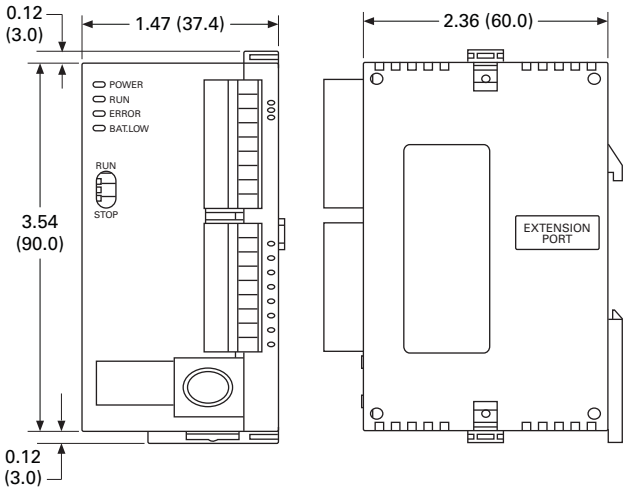
Dimensions

Approximate Dimensions in Inches (mm)

ELC-PB14 Controllers

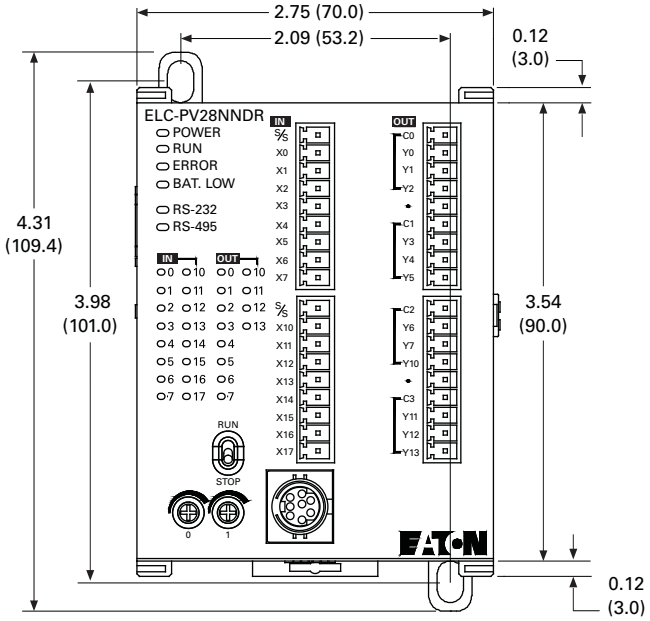


ELC-PC12, ELC-PH12 and ELC-PA10 Controllers

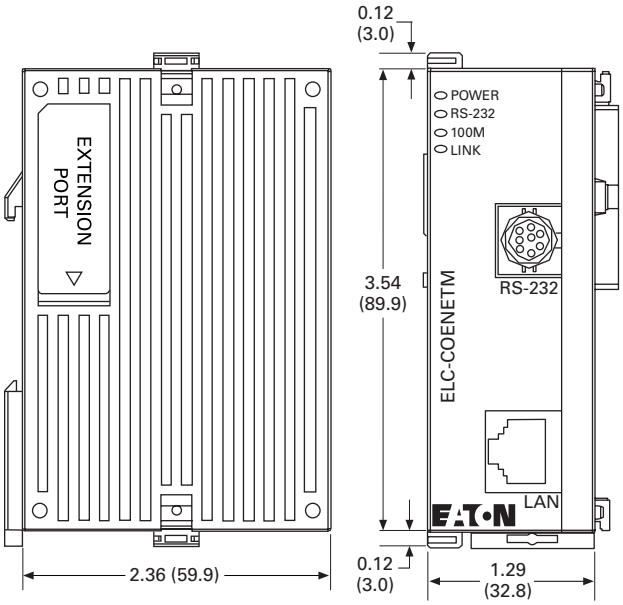


Approximate Dimensions in Inches (mm)

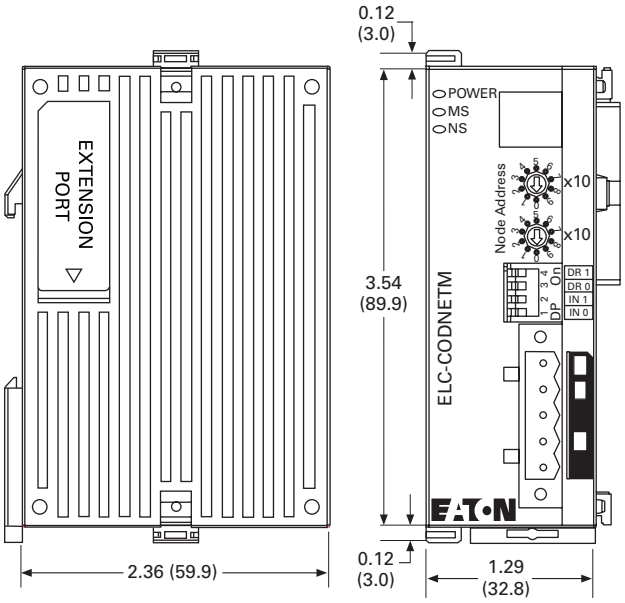
ELC-PV Controller



ELC-COENETM



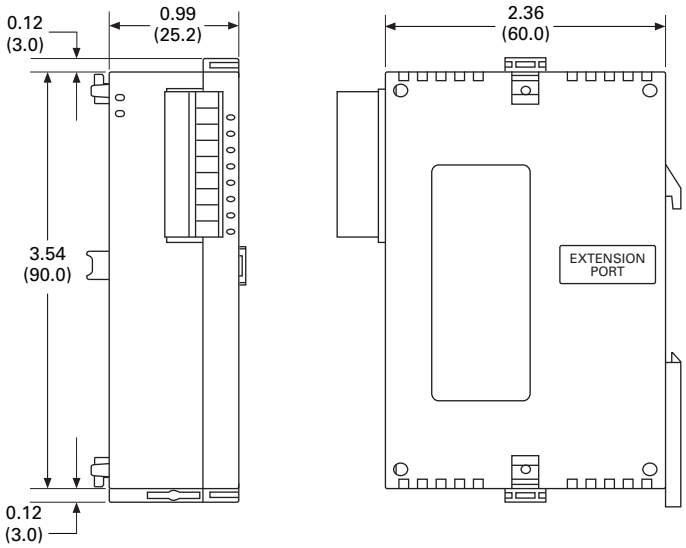
ELC-CODNETM



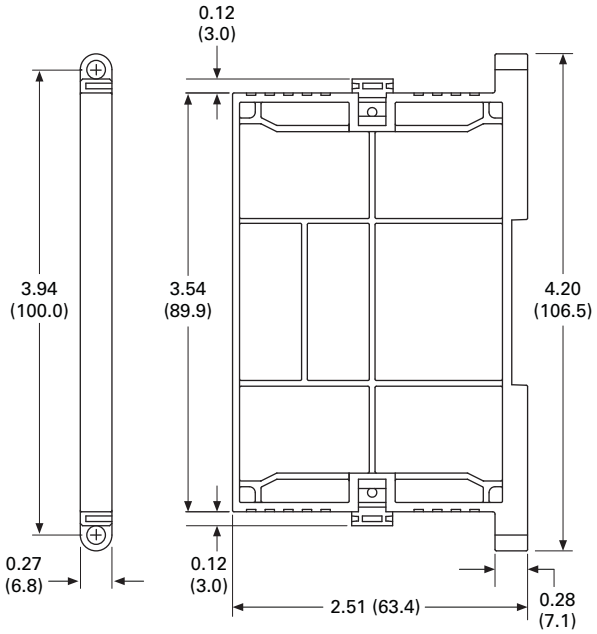
4

Approximate Dimensions in Inches (mm)

Right Side Specialty and Expansion Modules

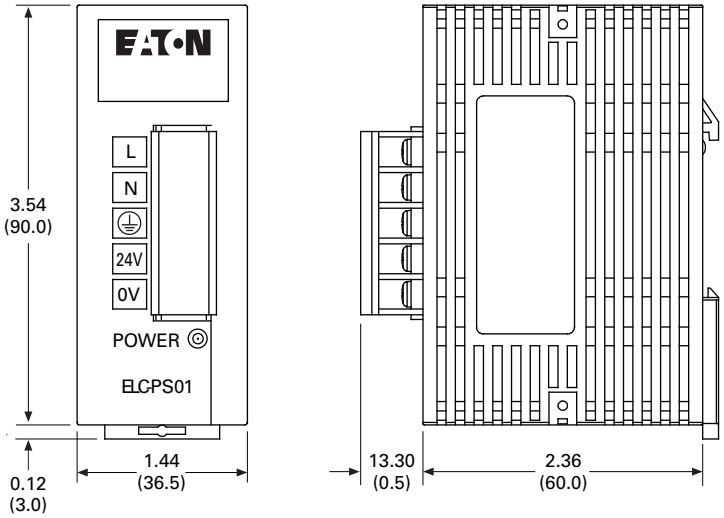


ELC-ACCOVER Plate Mount for Specialty Modules

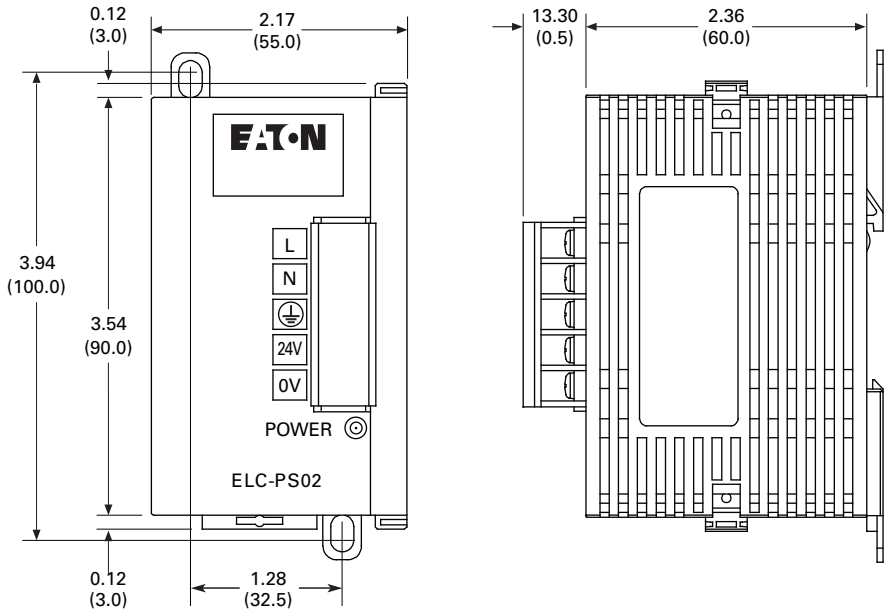


Approximate Dimensions in Inches (mm)

ELC-PS01

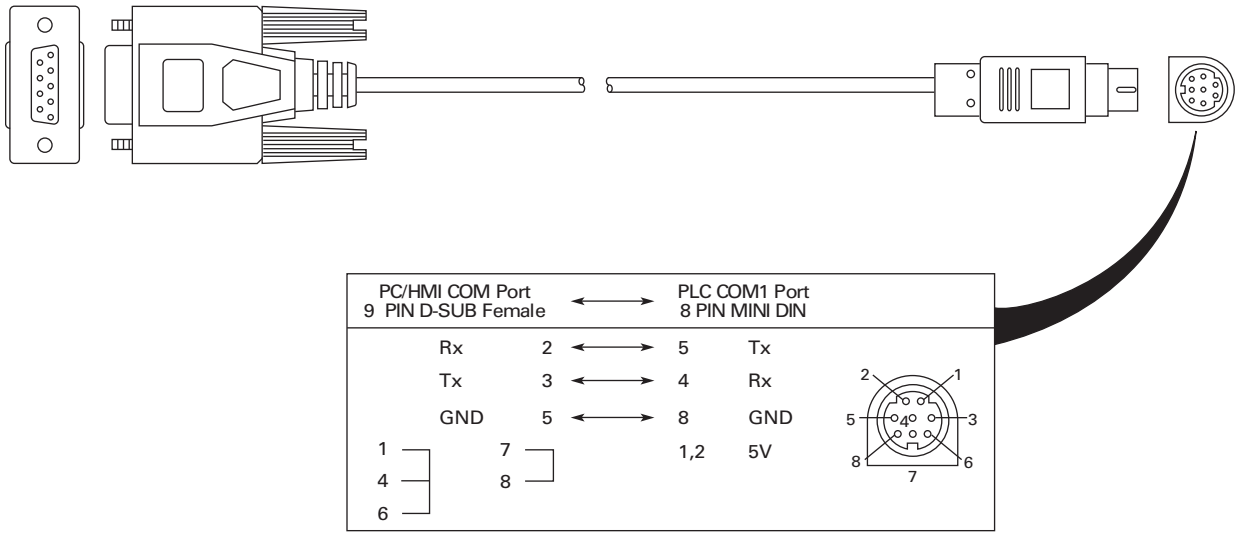


ELC-PS02

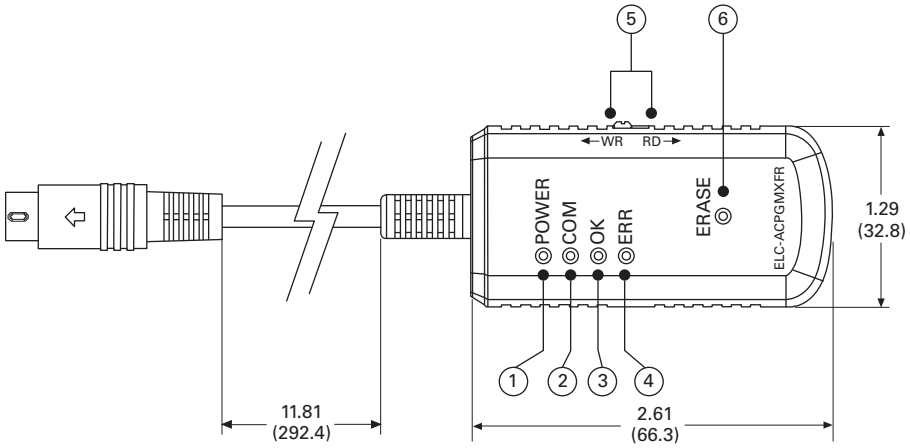


Approximate Dimensions in Inches (mm)

ELC-CBPCELC1 Cable (Right Angle Connector not Shown) and ELC-CBPCELC3 Cable (Straight Connector as Shown)

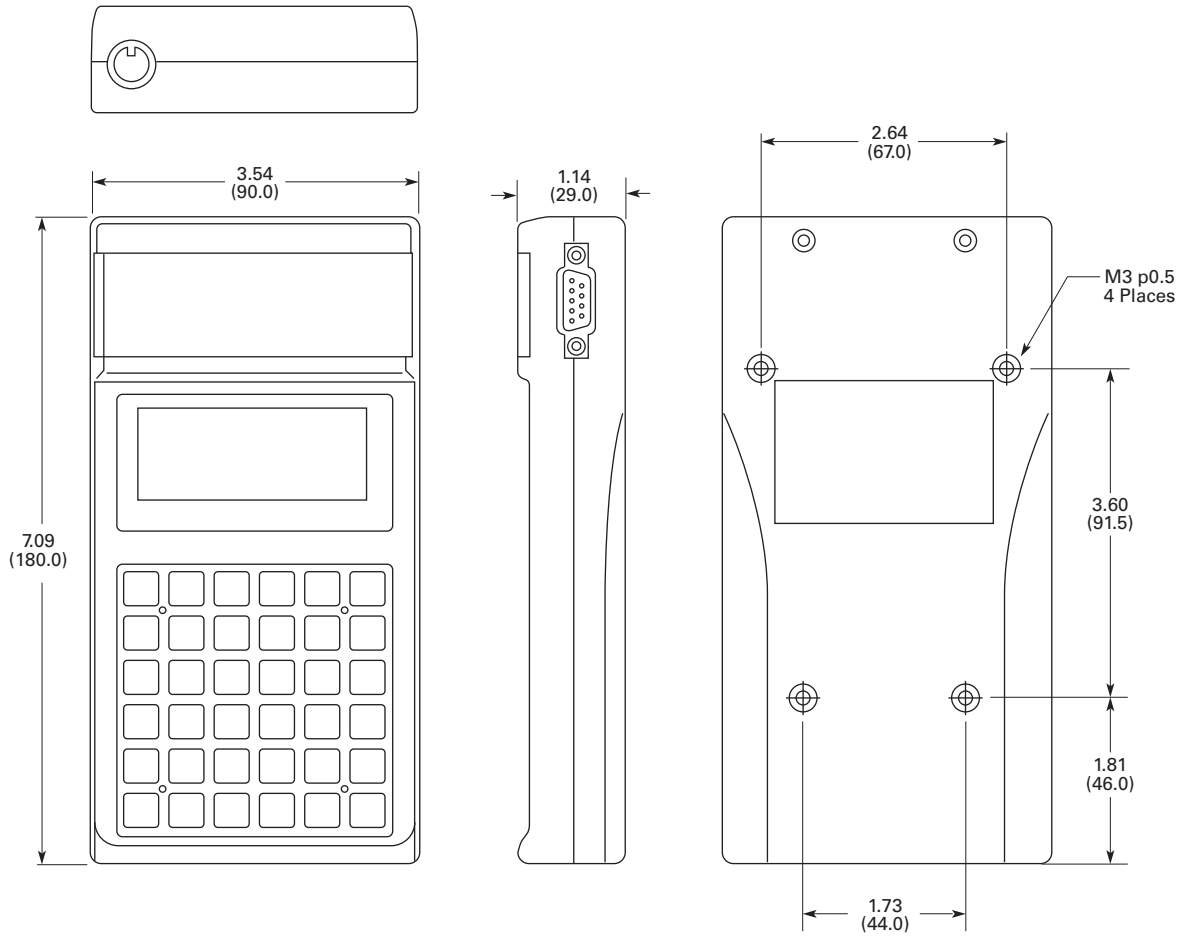


ELC-ACPGMXFER Storage Device



Approximate Dimensions in Inches (mm)

ELC-HHP Hand-Held Programmer



4

XC Series Programmable Logic Controllers

Contents

Product Overview

The XC100 and XC200 series modular PLCs stand out on account of their highly scalable design. Different CPU performance classes and a wide range of expansion modules are available. An important feature is their ability to be integrated in modern communication systems. Innovative solutions can be created thanks to the possibility of exchanging data with OPC clients via the Ethernet interface and the integrated web server.

Features and Benefits

Flexible Range

- Compact and modular CPU versions to suit the needs of the application
- With or without on-board Ethernet and/or built-in web server
- Range of CPU performance
- Integrated CANopen interface for easy integration with XI/ON remote I/O

High Performance

- Parallel backplane bus for faster processing speed
- Fiber optic CANopen interface for environments with severe electromagnetic interference
- High performance XC202 CPU with
  - 10/100 Mbit Ethernet
  - XSoft-CoDeSys programming software

Standards and Certifications

- IEC—UL508; CSA-C22.2 No. 0-M; CSA-C22.2 No. 142-M; CE marking
- UL File No.—E135462
- UL CCN—NRAQ
- CSA File No. 012528
- CSA Class No. 2252-01
- NA Certification—
  - UL Listed
  - CSA certified/cUL
- RoHS

Listed

Product Selection Guide

XC Series Programmable Logic Controllers

XC121 Compact PLC

Page V7-T4-28

This PLC is particularly suitable for applications where space is at premium and with high communication requirements.

- Two serial and two CAN interfaces enable:
  - the coupling of two CAN networks
  - Modbus master/slave coupling (RS232 or RS485)—CAN
  - RS232—CAN coupling
- I/O expansion with 18 digital and 8 analog inputs/outputs
- 6 interrupt inputs
- Expandable with standard XIOC modules

XC101 Modular PLCs

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The modular PLCs of the XC101 series are universal automation devices for small and medium-sized applications.

- Locally expandable with up to 15 XIOC modules
- Data storage on SD card
- CAN interface
- The XC-CPU101-FC has a fiber optic CAN interface
  - particularly suitable for environments with demanding EMC requirements

XC201 Modular PLCs

Page V7-T4-29

The modular PLCs of the XC201 series offer a high CPU performance, a high speed and a wide range of communication options.

- Locally expandable with up to 15 XIOC modules
- Ethernet interface for communication and programming
- CAN interface
- Data storage on SD card or USB stick
- Web server enables visualization via CoDeSys
- Operating system update SD card or USB

XC202 Modular PLCs

Page V7-T4-29

The modular PLCs of the XC202 series offer higher CPU performance and memory than the XC201 PLCs.

- Locally expandable with up to 15 XIOC modules
- Ethernet interface for communication and programming
- CAN interface
- Data storage on SD card or USB stick
- Operating system update via Ethernet, SD card or USB
- Up to three IP addresses can be configured
- 29-bit CAN identifier

Features	XC121	XC101	XC201	XC202
Input voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Maximum local I/O points	506	494	494	494
Memory size	256 kB	64, 128 or 256 kB	256 kB or 2 MB	4 MB
Microprocessor	Infineon CC161	Infineon C164	MIPS RISC	ARM11
Processor speed	36 MHz	24 MHz	131 MHz	532 MHz
Cycle time per 1k instructions	<0.3 ms	<0.5 ms	<0.15 ms	<0.025 ms
SD card slot	Yes	Yes	Yes	Yes
USB interface	No	No	Yes	Yes
Real time clock	Yes	Yes	Yes	Yes
On-board digital inputs	—	8	8	8
On-board digital outputs	—	6	6	6
Interrupt inputs	—	4	2	2
Expandability	XIO-EXT base module + Up to 15 XIOC modules	Up to 15 XIOC modules	Up to 15 XIOC modules	Up to 15 XIOC modules
Removable terminal blocks	Yes	Yes	Yes	Yes
Screw terminal option	No	Yes	Yes	Yes
Spring-cage terminal option	Yes	Yes	Yes	Yes
Serial interface	1, RS-232 1, RS-232/RS-485	1, RS-232	1, RS-232	1, RS-232
Ethernet port	No	No	Yes	Yes
CANopen interface	2	1	1	1
On-board high speed counters	No	No	Yes	Yes
On-board encoder inputs	No	No	Yes	Yes
OPC server	Yes	Yes	Yes	Yes
Integrated web server	No	No	On XV models	Yes
FTP server	No	No	On XV models	Yes
Networks master	CANopen/easyNet/Suconet K	CANopen/PROFIBUS-DP/ easyNet/Suconet K	Ethernet/CANopen/ PROFIBUS-DP/easyNet/ Suconet K	Ethernet/CANopen/ PROFIBUS-DP/easyNet/ Suconet K
Networks node/device	CANopen/PROFIBUS-DP®/ easyNet/Suconet K	CANopen/PROFIBUS-DP/ easyNet/Suconet K	Ethernet/CANopen/ PROFIBUS-DP/easyNet/ Suconet K	Ethernet/CANopen/ PROFIBUS-DP/easyNet/ Suconet K

Catalog Number Selection

Controllers

XC - CPU 201 - EC 512K - 8DI - 6DO - XV

Model Number
101 = Modular (Infineon C164—16 bit at 24 MHz)
121 = Compact (Infineon XC161—16 bit at 36 MHz)
201 = Modular (MIPS RISC—32 bit at 131 MHz)
202 = Modular (ARM 11—32 bit at 532 MHz)

Communication Ports
C = 1 CANopen
2C = 2 CANopen
FC = Fiber Optic CANopen
EC = Ethernet and CANopen

User Memory
64K = 64 kB
128K = 128 kB
256K = 256 kB
512K = 2 MB
4M = 4 MB

Digital Inputs
8DI = 8 inputs

Digital Outputs
6DO = 6 outputs

Visualization Option
XV = Web server

System Overview

System Configuration

① Maximum basic version, ≤7 signal modules.

CPU	1	2	3	4	5	6	7
XIOC-BP-XC	XIOC-BP-2		XIOC-BP-2		XIOC-BP-3		
XIOC-BP-XC1			XIOC-BP-3		XIOC-BP-3		

② Maximum total version, ≤15 signal modules.

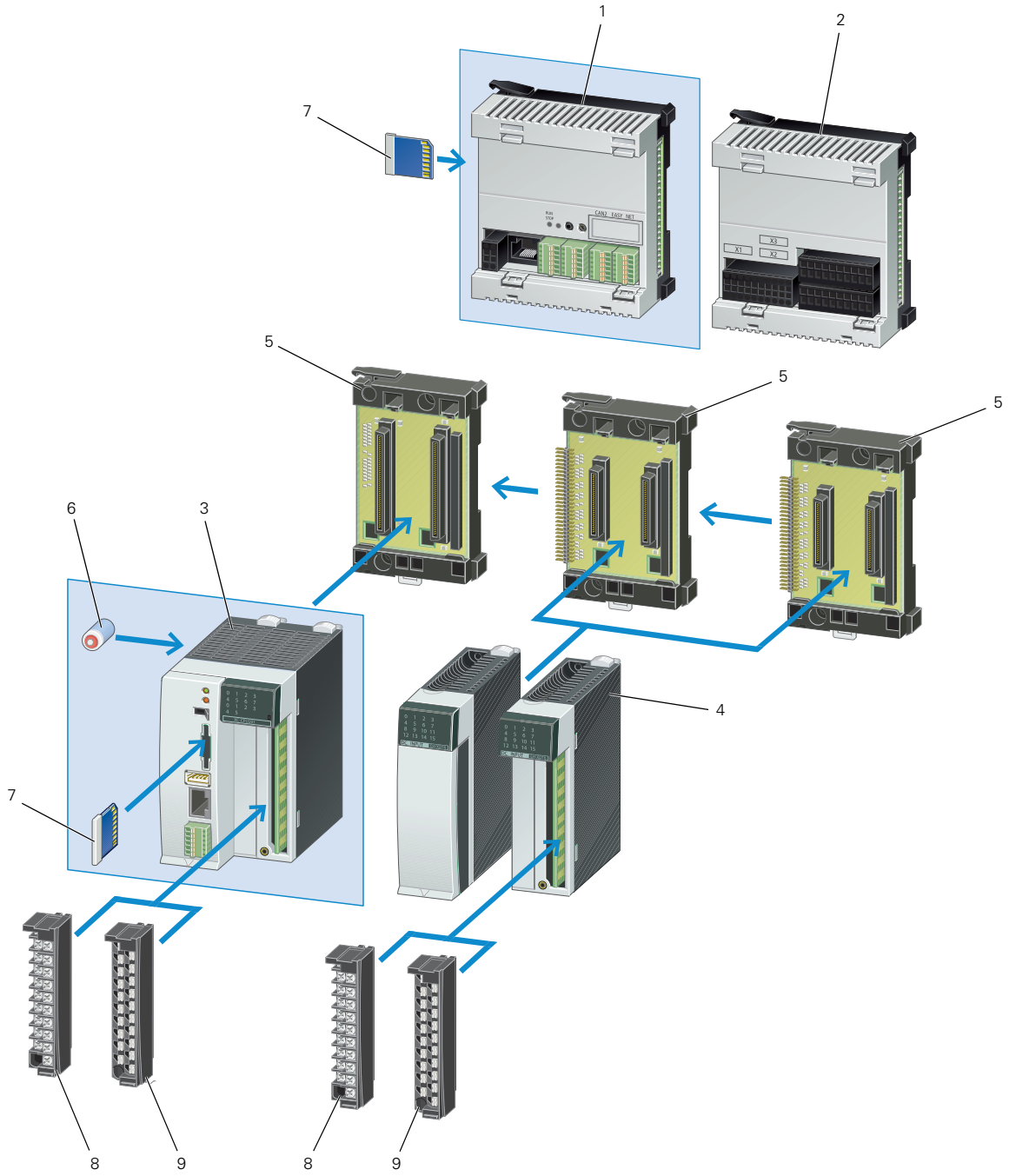
CPU	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
XIOC-BP-XC	XIOC-BP-2		XIOC-BP-3			XIOC-BP-EXT			XIOC-BP-3			XIOC-BP-2		XIOC-BP-2	
XIOC-BP-XC1			XIOC-BP-2		XIOC-BP-2	XIOC-BP-EXT			XIOC-BP-3			XIOC-BP-2		XIOC-BP-2	

Notes

① Maximum basic version, ≤7 signal modules.

② Maximum total version, ≤15 signal modules.

Product Identification



Item Number	Description
1	XC121 Compact PLC CPU
2	XC121 I.O Expansion module
3	XC100/XC200 Modular PLC
4	XIOC I/O modules
5	XIOC Module backplane

Item Number	Description
6	Battery
7	SD Memory card
8	XIOC Terminal block, screw terminals
9	XIOC Terminal block, spring-cage terminals

Product Selection

XC121 Compact PLC CPU

Can be locally expanded with I/O module XIO-EXT-121-1.

- 24 Vdc input supply
- Real time clock
- 2 CANopen interfaces (500 kB)
- RS-232 interface for programming and communication
- Second RS-232/RS-485 interface
- Slot for SD memory card
- Spring-cage terminal blocks
- OPC server
- START/STOP switch

XC121

XC121 Compact PLC

Program Memory Size	Cycle Time ①	Ethernet	CAN	Serial Interface	Web Server	Pkg. Qty.	Style Number ②	Catalog Number ②
256 kB	<0.3 ms	—	2	1, RS-232 1, RS-232/RS-485	—	1	290446	**XC-CPU121-2C256K**

XC121 I/O Expansion Module

Base I/O module for the XC121.

- 10 digital inputs 24 Vdc
- 6 interrupt inputs
- 8 digital inputs/outputs 24 Vdc 0.5A
- 2 analog inputs 0–10V
- 2 analog inputs 0–20 mA
- 2 analog inputs PT100 RTD
- 2 analog outputs 0–10V
- Removable spring-cage terminals
- Expandable with 15 XIOC modules ③

XC121 I/O Module

XC121 I/O Expansion Module

Digital Inputs	Digital Inputs/Outputs	Analog Inputs	Analog Outputs	Pkg. Qty.	Style Number ②	Catalog Number ②
10, 24 Vdc	8, 24 Vdc 0.5A	2, 0–10V 2, 0–20 mA 2, PT100 RTD	2, 0–10V	1	290450	**XIO-EXT121-1**

XC101 Modular PLCs

Order backplane, terminals and battery separately.

- 24 Vdc input supply
- Real time clock
- Expandable with 15 XIOC modules
- 8 digital inputs
- 4 interrupt inputs
- 6 digital outputs
- RS-232 interface for programming and communication
- CANopen interface (500 kB)
- Slot for SD memory card
- RUN/STOP switch and LED indicators

XC101

XC101 Modular PLCs

Program Memory Size	Cycle Time ①	Ethernet	CANOpen	Serial Interface	Web Server	Pkg. Qty.	Style Number ②	Catalog Number ②
64 kB	<0.5 ms	—	1	1, RS-232 typ.	—	1	262152	**XC-CPU101-C64K-8DI-6DO**
128 kB	<0.5 ms	—	1	1, RS-232 typ.	—	1	262146	**XC-CPU101-C128K-8DI-6DO**
256 kB	<0.5 ms	—	1	1, RS-232 typ.	—	1	274399	**XC-CPU101-C256K-8DI-6DO**
128 kB	<0.5 ms	—	1 fiber optic	1, RS-232 typ.	—	1	289169	**XC-CPU101-FC128K-8DI-6DO**

Notes

① Cycle time per 1k of instructions.
② To order XC PLCs, please use the Style Number. This applies to all Catalog Numbers that are longer than 20 characters.
③ Except the XIOC-NET-DP-M module.

XC201 Modular PLCs

Order backplane, terminals and battery accessories separately.

- 24 Vdc input supply
- Real time clock
- Expandable with 15 XIOC modules
- 8 digital inputs
- 2 interrupt inputs
- Incremental encoder inputs
- High speed counter (50 kHz) inputs
- 6 digital outputs
- Ethernet and RS-232 interface for programming and communication
- CANopen interface (1 MB)
- Slot for SD memory card
- USB interface
- RUN/STOP switch and LED indicators
- Built-in Web server on XV models

XC201

XC201 Modular PLCs

Program Memory Size	Cycle Time ①	Ethernet	CANOpen	Serial Interface	Web Server	Pkg. Qty.	Style Number ②	Catalog Number ②
256 kB	<0.15 ms	✓	1	1, RS-232	—	1	262155	**XC-CPU201-EC256K-8DI-6DO**
2 MB	<0.15 ms	✓	1	1, RS-232	—	1	262157	**XC-CPU201-EC512K-8DI-6DO**
256 kB Integrated web server	<0.15 ms	✓	1	1, RS-232	✓	1	262156	**XC-CPU201-EC256K-8DI-6DO-XV**
2 MB Integrated web server	<0.15 ms	✓	1	1, RS-232	✓	1	262158	**XC-CPU201-EC512K-8DI-6DO-XV**

XC202 Modular PLCs

Order backplane, terminals and battery accessories separately.

- 24 Vdc input supply
- Real time clock
- Expandable with 15 XIOC modules
- 8 digital inputs
- 2 interrupt inputs
- Incremental encoder inputs
- High speed counter (50 kHz) inputs
- 6 digital outputs
- Ethernet and RS-232 interface for programming and communication
- CANopen interface (1 MB)
- Slot for SD memory card
- USB interface
- RUN/STOP switch and LED indicators
- Built-in Web server

XC202

XC202 Modular PLCs

Program Memory Size	Cycle Time ①	Ethernet	CANOpen	Serial Interface	Web Server	Pkg. Qty.	Style Number ②	Catalog Number ②
4 MB Integrated web server	<0.025 ms	✓	1	1, RS-232	✓	1	134238	**XC-CPU202-EC4M-8DI-6DO-XV** ③

XIOC Expansion Modules

Order screw, spring-cage terminals or 40-pin connector cable for 32 I/O modules separately.

- 8, 16 and 32 input modules
- 8, 16 and 32 output modules
- User configurable input/ output module
- Isolated relay output module

XIOC—Digital

XIOC Digital Expansion Modules

Description	Pkg. Qty.	Style Number ②	Catalog Number ②
8 inputs, 24 Vdc	1	257891	**XIOC-8DI**
16 inputs, 24 Vdc	1	257892	**XIOC-16DI**
32 inputs, 24 Vdc	1	267411	**XIOC-32DI**
8 outputs, 24 Vdc, 0.3A	1	257894	**XIOC-8DO**
16 outputs, 24 Vdc, 0.3A	1	257896	**XIOC-16DO**
16 outputs, 24 Vdc, 0.8A, short-circuit protected	1	257895	**XIOC-16DO-S**
16 terminals, 4 inputs, 12 configurable as inputs/outputs, 24 Vdc—outputs 0.5A	1	262322	**XIOC-16DX**
32 outputs, 24 Vdc, 0.2A	1	267413	**XIOC-32DO**
12 relay outputs, isolated	1	257897	**XIOC-12DO-R**

Notes

① Cycle time per 1k of instructions.
② To order XC PLCs, please use the Style Number. This applies to all Catalog Numbers that are longer than 20 characters.
③ Pending UL certification.

XIOC—Analog

XIOC Analog Modules

Description	Pkg. Qty.	Style Number	Catalog Number
Inputs: 8 inputs 4–20 mA	1	262549	**XIOC-8AI-I2**
Inputs: 8 voltage inputs 0–10V	1	257899	**XIOC-8AI-U1**
Inputs: 8 voltage inputs, ±10V	1	257900	**XIOC-8AI-U2**
Inputs: 4 inputs for temperature monitoring, PT100/1000	1	257901	**XIOC-4T-PT**
Inputs: 4 inputs for thermocouples Type K, J, L, B, N, E, R, S, T	1	289933	**XIOC-4AI-T**
Outputs: 2 outputs, ±10V	1	257904	**XIOC-2AO-U2**
Outputs: 2 outputs 0–10V, 2 outputs 4–20 mA	1	257902	**XIOC-2AO-U1-2AO-I2**
Outputs: 4 outputs 0–10 V	1	257903	**XIOC-4AO-U1**
Combination modules: 2 inputs and 1 output 0–10V/1 ms conversion time	1	262409	**XIOC-2AI-1AO-U1**
Combination modules: 2 inputs and 1 output 0–10V, 0–20 mA/1 ms conversion time, individual changeover	1	281545	**XIOC-2AI-1AO-U1-I1**
Combination modules: 4 inputs and 2 outputs 0–10V/1 ms conversion time	1	262405	**XIOC-4AI-2AO-U1**
Combination modules: 4 inputs and 2 outputs 0–10V, 0–20 mA/1 ms conversion time, individual changeover	1	281544	**XIOC-4AI-2AO-U1-I1**

XIOC—Counter

Counter Modules

Description	Pkg. Qty.	Style Number	Catalog Number
1 input up to 100 kHz, 24 Vdc, 5 Vdc, 2 digital transistor outputs, opto-isolated, 24 Vdc 30-pin connector required for counter module	1	257906	**XIOC-1CNT-100KHZ**
2 inputs up to 100 kHz, (24 Vdc or 5V diff), 4 digital transistor outputs, opto-isolated, 24 Vdc 30-pin connector required for counter module	1	257907	**XIOC-2CNT-100KHZ**
2 incremental encoders up to 400 kHz, 5 Vdc, 2 analog outputs ±10V	1	262417	**XIOC-2CNT-2AO-INC**

XIOC—Communication Card

Communication Modules

Description	Pkg. Qty.	Style Number	Catalog Number
PROFIBUS-DP master module	1	257908	**XIOC-NET-DP-M**
PROFIBUS-DP node module	1	286419	**XIOC-NET-DP-S**
Suconet K master module	1	289982	**XIOC-NET-SK-M**
Serial interfaces: RS232C, RS485, RS422 (for XC101, XC201 and XC202) Modes of operation: Transparent mode, Modbus master/node	1	267191	**XIOC-SER**
Serial interfaces: RS232C, RS485, RS422 (for XC201 and XC202 only) Modes of operation: Transparent mode, Modbus master/node	1	135265	**XIOC-TC1**

Accessories

Terminals

Terminals

One 18 pole terminal plug is required for each digital and analog module.

Description	Pkg. Qty.	Style Number	Catalog Number
18-pin connector with spring-cage terminal for digital or analog I/O	10	258104	**XIOC-TERM-18T**
18-pin connector with screw terminals for digital or analog I/O	10	258102	**XIOC-TERM-18S**
30-pin connector for counter module, with 4 m cable XIOC-1CNT-100KHZ XIOC-2CNT-100KHZ	1	262248	**XIOC-TERM30-CNT4**
40-pin connector for digital module, with 4 m cable XIOC-32DI XIOC-32DO	1	267414	**XIOC-TERM32**

Module Backplane

Backplane

Description	Pkg. Qty.	Style Number	Catalog Number
Basic backplane for mounting XC100/200 on top-hat rail, can be expanded Width: 2 slots for controller	1	260792	**XIOC-BP-XC**
Expansion backplane for mounting XIOC modules on top-hat rail, can be expanded Width: 2 slots for XIOC modules	1	260794	**XIOC-BP-2**

Backplane

Basic backplane for mounting XC100/200 on DIN rail, can be expanded Width: 3 slots for controller and one XIOC module	1	260793	**XIOC-BP-XC1**
Expansion backplane for mounting XIOC modules on DIN rail, can be expanded Width: 3 slots for XIOC modules	1	260795	**XIOC-BP-3**
Expansion backplane for mounting XIOC modules on DIN rail, can be expanded Width: 3 slots for XIOC modules ①	1	274291	**XIOC-BP-EXT**

Memory Card

Memory Card

For storage of programs, data, recipes for XC100, XC121, XC200.

Description	Pkg. Qty.	Style Number	Catalog Number
512 MB	1	138257	**XT-MEM-MM512M**
32 MB	1	262731	**XT-MEM-MM32M**

Note

① Module backplane for expansion with up to 15 modules, must be plugged into the 6th slot.

4

Battery

Battery

Description	Pkg. Qty.	Style Number	Catalog Number
Lithium 1/2 AA 3.6V battery for backup of real-time clock	1	256209	**XT-CPU-BAT1**

Programming Cables

Description	Pkg. Qty.	Style Number	Catalog Number
D-Sub 9-Pin  2m, D-sub 9-pin, serial	1	262186	**XT-SUB-D/RJ45**
Ethernet Cross  2m, Ethernet cross	1	256487	**XT-CAT5-X-2**
5m, Ethernet cross	1	256488	**XT-CAT5-X-5**
Programming  Programming cable for XC through USB interface	1	115735	**EU4A-RJ45-USB-CAB1**

Connection Cables

Connection Cable

Description	Pkg. Qty.	Style Number	Catalog Number
0.3m: Connection cable for XC200 to interface switch	1	256283	**EASY-NT-30**
0.8m: Connection cable for XC200 to interface switch	1	256284	**EASY-NT-80**
1.5m: Connection cable for XC200 to interface switch	1	256285	**EASY-NT-150**

Empty Module

Empty Module

Description	Pkg. Qty.	Style Number	Catalog Number
Empty module to cover open XIOC slots	1	288894	**XIOC-NOP**

Interface Switch

Interface Switch

Description	Pkg. Qty.	Style Number	Catalog Number
Interface adapter to split the combined RS232/Ethernet interface of the XC200 into RJ45 sockets. Connection cable EASY-NT-30/80/150 usable for connection to XC200	1	289170	**XT-RJ45-ETH-RS232**

Filter

Filter

Description	Pkg. Qty.	Style Number	Catalog Number
Interference suppression of the external 24 Vdc supply of the XC100/200. Maximum current consumption: 2.2A	1	285316	**XT-FIL-1**
Power supply interference suppression of I/O modules of XC100/200. Maximum current consumption: 12A	1	118980	**XT-FIL-2**

XSoft-CoDeSys-2 Software

Combined Logic and Visualization Development for XC Series PLCs and XV Series HMI-PLCs

IEC 61131-3 Programming Languages

- Ladder Diagram
- Structured Text
- Sequential function chart
- Function block diagram
- Freely definable function block chart/continuous function chart
- Instruction List

Project Development

- Automatic variable declaration
- On line editing
- Pop-up variable and function search/pick tools
- Automatic formatting and color coding of logic/ declaration text
- Re-usable Visual-Logic Function Blocks

Debugging and commissioning

XSoft-CoDeSys-2 offers you a number of important functions for debugging, testing and commissioning your applications quickly and efficiently.

All these features are available as soon as you log on to the XV HMI-PLC or XC200 PLC (online mode) over an Ethernet connection.

Target Visualization

Integrated design of Operator Interface screens for the XV HMI-PLC series. Visualization and logic developed as part of the same project. Simplifies screen design and always keeps the Logic and visualization in synch.

Web Visualization

Optionally XSoft-CoDeSys-2 can automatically generate XML-based runtime screens to make the screens from the XV HMI-PLC accessible remotely using a web browser with a JavaScript plug-in such as Internet Explorer®, Firefox® and others.

Simulation

Users can also test the application when the XV HMI-PLC is not connected to the process. This is possible thanks to the integrated online simulation feature. Simulation supports both the screens and logic that have been designed using XSoft-CoDeSys.

Advanced Features

- Up to 16 time and/or event driven tasks per project
- Each task can include multiple logic programs or subroutines
- Programs and screen designs can be exported and imported to support reuse
- Powerful, built-in function block libraries
- Ability to create user-defined function blocks
- Fieldbus Configurator for CANopen, PROFIBUS-DP and SmartWire-DT device I/O
- Ethernet and serial communication function blocks (OPC server, UDP, TCP/IP, FTP client/ server, Modbus Master/Node, email, SMS, and more)
- 8 level password protection
- Web access selectable per screen
- System function libraries (OS Storage Card, and more)
- On-line and historical alarms
- On-line and historical trends

System Requirements

Windows XP and Windows 7 32-bit systems

XSoft-CoDeSys-2

XSoft-CoDeSys-2 Software

Description	Catalog Number
Single Seat License	**SW-XSOFT-CODESYS-2-S**
Multiple Seat License (3)	**SW-XSOFT-CODESYS-2-M**

Technical Data and Specifications

XC121 Compact PLC

Description	Unit	XC-CPU121-2C256K
General		
Standards		IEC/EN 61131-2; EN 50178
Ambient temperature	°F (°C)	32° to 131° (0° to 55°)
Storage	°F (°C)	–13° to 158° (–25° to 70°)
Mounting position		Horizontal
Relative humidity, non-condensing (IEC/EN 60068-2-30)	%	10–95
Air pressure (in operation)	hPa	795–1080
Vibration resistance		Frequency 5–9 Hz; 3.5 mm amplitude 9–150 Hz; 1.0 g constant acceleration
Mechanical shock resistance		15g/11 ms
Overvoltage category		II
Pollution degree		2
Degree of protection		IP20
Rated insulation voltage (U_i)	V	500
Emitted interference		EN 61000-6-4
Interference immunity		EN 61000-6-2
Backup time		At least 72 hours
Weight	kg	0.15
Electromagnetic Compatibility (EMC)		Refer to Page **V7-T4-49**
Connections		
Supply voltage		
Connection type		—
Terminal capacity	mm^2	0.14–1 (AWG28-18)
COM1 interface		
Connection type		RJ45
COM2, CAN1, CAN2 interfaces		
Connection type		Spring-loaded terminal block, 6-pole
Terminal capacity	mm^2	0.14–0.5 (AWG28-20)
Power Supply		
Input voltage	Vdc	24
Permissible range	Vdc	20.4–28.8
Input power	W	Max. 1.44
Input current	mA	60
Ripple	%	≤5
Maximum heat dissipation (without local I/O) (P_v)	W	6
Overvoltage protection		Yes
Protection against polarity reversal		Yes
Inrush current	x I_n	No limitation (limited only by upstream 24 Vdc power supply unit)
Supply failure bridging		
Duration of power failure	ms	10
Repetition rate	s	1
External supply filter		Part No.: XT-FIL-1, Refer to **Page V7-T4-32**
Memory		
Program code/program data	kByte	256/244
Marker/input/output/retain data	kByte	16/4/4/8
Cycle time for 1k of instructions (bits, bytes)	ms	<0.3

XC121 Compact PLC, continued

Description	Unit	XC-CPU121-2C256K
Interfaces		
Serial interface (RS232) without handshake lines		
Baud rate	kbit/s	Programming (character format: 8 data bits, No parity, 1 stop bit) 19.2, 38.4 (default), 57.6
Connector type		RJ45
Potential isolation		No
In transparent mode		
Baud rate	kbit/s	0.3, 0.6, 1.2, 2.4, 4.8, 9.6, 19.2, 38.4, 57.6, 115.2
Character formats		8E1, 8O1, 8N1, 8N2, 7E2, 7O2, 7N2, 7E1
Number of send bytes for block		190
Number of receive bytes for block		190
COM2 (RS232/RS485) without handshake lines		
Baud rate	kbit/s	Transparent mode (setting through function blocks) 0.3, 0.6, 1.2, 2.4, 4.8, 9.6, 19.2, 38.4, 57.6
Character formats		8E1, 8O1, 8N1, 8N2, 7E2, 7O2, 7N2, 7E1 (setting through function blocks)
Potential isolation		No
Bus termination		External, for RS485
CAN1/CAN2 interface		
Baud rate	kbit/s	10 – 500
Potential isolation		No
Stations		126
Bus termination		Adjustable for each interface (CAN1/CAN2)
PDO type		Asyn., cyc., acyc.
Power Supply of Local Inputs/Outputs (24 V_Q/0 V_Q)		
Input voltage	Vdc	24
Voltage range	Vdc	19.2–30, observe polarity
Potential isolation		
Between power supply and CPU voltage		Yes
Overvoltage protection		Yes

XC121 Expansion Module

Description	Unit	XIO-EXT121-1
General		
Standards		IEC/EN 61131-2; EN 50178
Ambient temperature	°F (°C)	32° to 131° (0° to 55°)
Storage	°F (°C)	–13° to 158° (–25° to 70°)
Mounting position		Horizontal
Relative humidity, non-condensing (IEC/EN 60068-2-30)	%	10–95
Air pressure (in operation)	hPa	795–1080
Vibration resistance		Frequency 5–9 Hz; 3.5 mm amplitude 9–150 Hz; 1.0g constant acceleration
Mechanical shock resistance		15g/11 ms
Overvoltage category		II
Pollution degree		2
Degree of protection		IP20
Rated insulation voltage (U_i)	V	500
Emitted interference		EN 61000-6-4
Interference immunity		EN 61000-6-2
Backup time		At least 72 hours
Weight	kg	0.15
Electromagnetic Compatibility (EMC)		Refer to Page **V7-T4-49**
Connections		
X1 connector		
Connector type		Spring-loaded terminal block, 20 pole, B2L 3.5
Terminal capacity (solid)	mm^2	0.5–1
X2/X3 connector		
Connector type		Spring-loaded terminal block, 10-pole, BLZF 3.5/180 or BLI/O 3.5/10F with LEDs
Terminal capacity (solid)	mm^2	0.5–1
Power Supply		
Supply failure bridging		
Duration of power failure	ms	10
Repetition rate	s	1
Input voltage	Vdc	24
Permissible range	Vdc	20.4 – 28.8
Input power	W	Max.1.68
Input current	mA	70
Ripple	%	≤5
Overvoltage protection		Yes
Protection against polarity reversal		Yes
Inrush current	x I_n	Max. 1A
Output voltage for signal modules		
Max. field current (I_L)	A	2
Digital Inputs		
Number		X2: 9 with plug BLI/O 3.5/10F or 10 with plug BLZF 3.5/180 X3: 8 (can also be used as outputs)
Rated voltage (U_e)	Vdc	24
At state "0" (U_e)	Vdc	<5
At state "1" (U_e)	Vdc	>15
Rated operational current		
At state "1" (I_e)	mA	3.3
Delay time		
X2: DI0–DI3	µs	20
X2: DI4–DI9	µs	250
X2: DX0–DX7	ms	20
Potential isolation		No

XC121 Expansion Module, continued

Description	Unit	XIO-EXT121-1
Digital Outputs		
Number		At X3: 8 (can also be used as inputs)
Rated voltage		
Rated voltage (U_e)	Vdc	24
Permissible range		20.4–28.8 Vdc
Ripple	%	≤5
Rated operational current		
At state "1" (I_e)	A	0.5 at 24 Vac
Utilization factor (%)	g	1
Maximum duty factor	ms	100%
Lamp load without (R_v)	W	5
Potential isolation		No
Residual current at state "0" per channel	mA	<0.1
Max. output voltage		
At state "0" with external load <10M ohms	V	2.5
At state "1" at I_e = 0.5A	V	U = U_e–1V
Short-circuit tripping current		
Short-circuit tripping current for R_a <10M ohms	A	0.7 ≤ I_e ≤2 for output
Total short-circuit current	A	16
Peak short-circuit current	A	32
Max. operating frequency	ops/h	40,000
Parallel connection capability		Yes
Analog Inputs 0–10V		
Number of channels		2
Primary voltage range	V	0–10
Resolution	bit	10
Conversion time	ms	≤5
Overall accuracy		≤ ± 1% (of full-scale value)
Input resistance	kohm	200
Analog Inputs 0–20 mA		
Number of channels		2
Primary voltage range	mA	0–20
Resolution	bit	10
Conversion time	ms	≤5
Overall accuracy		≤ ± 1% (of full-scale value)
Input resistance	ohm	50
PT100 RTD		
Number of channels		2
Temperature range	°F (°C)	–348° to 392° (–200° to 200°)
Resistance range	ohm	18.5–175.8
Resolution	bit	10
Overall accuracy		≤ ± 2%
Analog Outputs		
Number of channels		2
Secondary voltage range	V	0–10
Resolution	bit	12
Conversion time	ms	≤5
Overall accuracy		≤ ± 1% (of full-scale value)
External load resistance (R)	kohm	10

XC101 Modular PLCs

Description	Unit	XC-CPU101-C64K-8DI-6DO	XC-CPU101-C128K-8DI-6DO	XC-CPU101-FC128K-8DI-6DO	XC-CPU101-C256K-8DI-6DO
General					
Standards		IEC/EN 61131-2; EN 50178	IEC/EN 61131-2; EN 50178	IEC/EN 61131-2; EN 50178	IEC/EN 61131-2; EN 50178
Ambient temperature	°F (°C)	32° to 131° (0° to 55°)	32° to 131° (0° to 55°)	32° to 131° (0° to 55°)	32° to 131° (0° to 55°)
Storage	°F (°C)	–13° to 158° (–25° to 70°)	–13° to 158° (–25° to 70°)	–13° to 158° (–25° to 70°)	–13° to 158° (–25° to 70°)
Mounting position		Horizontal	Horizontal	Horizontal	Horizontal
Relative humidity, non-condensing (IEC/EN 60068-2-30)	%	10–95	10–95	10–95	10–95
Air pressure (in operation)	hPa	795–1080	795–1080	795–1080	795–1080
Vibration resistance		10–57 Hz ±0.075 mm/57–150 Hz ±1.0g			
Mechanical shock resistance		15g/11 ms	15g/11 ms	15g/11 ms	15g/11 ms
Overvoltage category		II	II	II	II
Pollution degree		2	2	2	2
Degree of protection		IP20	IP20	IP20	IP20
Rated insulation voltage (U_i)	V	500	500	500	500
Emitted interference	U_i	EN 61000-6-4, Class A	EN 61000-6-4, Class A	EN 61000-6-4, Class A	EN 61000-6-4, Class A
Interference immunity		EN 61000-6-2	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Battery (lifespan)		Normally 5 years	Normally 5 years	Normally 5 years	Normally 5 years
Weight	kg	0.23	0.23	0.23	0.23
Terminals		Plug-in terminal block	Plug-in terminal block	Plug-in terminal block	Plug-in terminal block
Terminal capacity Screw terminals					
Flexible with ferrule	mm^2	0.5–1.5	0.5–1.5	0.5–1.5	0.5–1.5
Solid	mm^2	0.5–2.5	0.5–2.5	0.5–2.5	0.5–2.5
Spring-cage terminal					
Flexible	mm^2	0.34–1.0	0.34–1.0	0.34–1.0	0.34–1.0
Solid	mm^2	0.14–1.0	0.14–1.0	0.14–1.0	0.14–1.0
Electromagnetic Compatibility (EMC)		Refer to Page **V7-T4-49**			
Power Supply					
Mains failure duration	ms	10	10	10	10
Repetition rate	s	1	1	1	1
Input voltage	Vdc	24	24	24	24
Permissible range	Vdc	20.4–28.8	20.4–28.8	20.4–28.8	20.4–28.8
Input power	W	Max. 26	Max. 26	Max. 26	Max. 26
Ripple	%	≤5	≤5	≤5	≤5
Maximum heat dissipation (without local I/O) (P_v)	W	6	6	6	6
Overvoltage protection		Yes	Yes	Yes	Yes
Protection against polarity reversal		Yes	Yes	Yes	Yes
Mains filter (external)		Yes	Yes	Yes	Yes
Inrush current	x I_n	Not limited, (limiting only by a supply-side 24 Vdc PSU)			
Output voltage for signal modules Rated value	Vdc	5	5	5	5
Output current	A	3.2	3.2	3.2	3.2
Short-circuit rating		Yes	Yes	Yes	Yes
Isolated from supply voltage		No	No	No	No
CPU					
Microprocessor		Infineon C164	Infineon C164	Infineon C164	Infineon C164
Memory					
Program code/program data	kByte	64/64	128/128	128/128	256/256
Marker/retain data	kByte	4/4	8/8	8/8	8/8
Cycle time for 1k of instructions (bits, bytes)	ms	<0.5	<0.5	<0.5	<0.5

XC101 Modular PLCs, continued

Description	Unit	XC-CPU101-C64K-8DI-6DO	XC-CPU101-C128K-8DI-6DO	XC-CPU101-FC128K-8DI-6DO	XC-CPU101- C256K-8DI-6DO
Interfaces					
Serial interface (RS232) without handshake lines					
Baud rate	kbit/s	Max. 57.6	Max. 57.6	Max. 57.6	Max. 57.6
Connections		RJ45	RJ45	RJ45	RJ45
Potential isolation		No	No	No	No
CANopen					
Maximum data transfer rate	bit/s	500,000	500,000	500,000	500,000
Potential isolation		Yes	Yes	Yes	Yes
Device profile		To DS 301 V4	To DS 301 V4	To DS 301 V4	To DS 301 V4
PDO type		Asyn., cyc., acyc.	Asyn., cyc., acyc.	Asyn., cyc., acyc.	Asyn., cyc., acyc.
Connection		Plug-in terminal block	Plug-in terminal block	Optical fiber interface, wavelength 660 mm, plug for example HFBR-4516 Agilent Technologies	Plug-in terminal block
Bus terminating resistors		External	External	External	External
Stations	Number	Max. 126	Max. 126	Max. 126	Max. 126
Watchdog		Yes	Yes	Yes	Yes
RTC (real-time clock)		Yes	Yes	Yes	Yes
Power Supply of Local Inputs/Outputs (24 V_Q/0 V_Q)					
Input voltage	Vdc	24	24	24	24
Voltage range	Vdc	19.2–30, observe polarity	19.2–30, observe polarity	19.2–30, observe polarity	19.2–30, observe polarity
Potential isolation					
Between power supply and CPU voltage		Yes	Yes	Yes	Yes
Overvoltage protection		Yes	Yes	Yes	Yes
Protection against polarity reversal		Yes	Yes	Yes	Yes
Digital Inputs					
Input current for channel at rated voltage	mA	Normally 3.5	Normally 3.5	Normally 3.5	Normally 3.5
Heat dissipation for channel		Normally 85m W	Normally 85m W	Normally 85m W	Normally 85m W
Voltage level to IEC/EN 61131-2					
Limit value type 1		Low <5 Vdc/High >15 Vdc	Low <5 Vdc,/High >15 Vdc	Low <5 Vdc/High >15 Vdc	Low <5 Vdc/High >15 Vdc
Input delay					
OFF ⟶ ON	ms	Normally 0.1	Normally 0.1	Normally 0.1	Normally 0.1
ON ⟶ OFF	ms	Normally 0.1	Normally 0.1	Normally 0.1	Normally 0.1
Inputs	Number	8 (of which 4 interrupt inputs)	8 (of which 4 interrupt inputs)	8 (of which 4 interrupt inputs)	8 (of which 4 interrupt inputs)
Channels with the same reference potential	Number	8	8	8	8
Status indication		LED	LED	LED	LED
Digital outputs					
Channels	Number	6	6	6	6
Heat dissipation for channel	W	0.08	0.08	0.08	0.08
Load circuits	A	0.5	0.5	0.5	0.5
Output delay					
OFF ⟶ ON		Normally 0.1 ms	Normally 0.1 ms	Normally 0.1 ms	Normally 0.1 ms
ON ⟶ OFF		Normally 0.1 ms	Normally 0.1 ms	Normally 0.1 ms	Normally 0.1 ms
Channels with the same reference potential	Number	6	6	6	6
Status indication		LED	LED	LED	LED
Switching capacity		IEC/EN 60947-5-1, utilization category DC-13	IEC/EN 60947-5-1, utilization category DC-13	IEC/EN 60947-5-1, utilization category DC-13	IEC/EN 60947-5-1, utilization category DC-13
Duty factor	% DF	100	100	100	100
Utilization factor	g	1	1	1	1

XC200 Series Modular PLCs

Description	Unit	XC-CPU201-EC256K-8DI-6DO(-XV)	XC-CPU201-EC512K-8DI-6DO(-XV)	XC-CPU202-EC4M-8DI-6DO-XV
General				
Standards		IEC/EN 61131-2; EN 50178	IEC/EN 61131-2; EN 50178	IEC/EN 61131-2; EN 50178
Ambient temperature	°F (°C)	32° to 131° (0° to 55°)	32° to 131° (0° to 55°)	32° to 131° (0° to 55°)
Storage	°F (°C)	–13° to 158° (–25° to 70°)	–13° to 158° (–25° to 70°)	–13° to 158° (–25° to 70°)
Mounting position		Horizontal	Horizontal	Horizontal
Relative humidity, non-condensing (IEC/EN 60068-2-30)	%	10–95	10–95	10–95
Air pressure (in operation)	hPa	795–1080	795–1080	795–1080
Vibration resistance		10–57 Hz ±0.075 mm 57–150 Hz ±1.0g	10–57 Hz ±0.075 mm 57–150 Hz ±1.0g	10–57 Hz ±0.075 mm 57–150 Hz ±1.0g
Mechanical shock resistance		15g/11 ms	15g/11 ms	15g/11 ms
Overvoltage category		II	II	II
Pollution degree		2	2	2
Degree of protection		IP20	IP20	IP20
Rated impulse withstand voltage (U_{imp})	V	850	850	850
Emitted interference		EN 61000-6-4, Class A	EN 61000-6-4, Class A	EN 61000-6-4, Class A
Interference immunity		EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Battery (lifespan)		Normally 5 years	Normally 5 years	Normally 5 years
Weight	kg	0.23	0.23	0.23
Terminals		Plug-in terminal block	Plug-in terminal block	Plug-in terminal block
Terminal capacity Screw terminals				
Flexible with ferrule	mm^2	0.5–1.5	0.5–1.5	0.5–1.5
Solid	mm^2	0.5–2.5	0.5–2.5	0.5–2.5
Spring-cage terminal				
Flexible	mm^2	0.34–1.0	0.34–1.0	0.34–1.0
Solid	mm^2	0.14–1.0	0.14–1.0	0.14–1.0
Electromagnetic Compatibility (EMC)			Refer to Page **V7-T4-49**	
Power Supply				
Duration of mains failure	ms	10	10	10
Repetition rate	s	1	1	1
Input voltage	Vdc	24	24	24
Permissible range	Vdc	20.4–28.8	20.4–28.8	20.4–28.8
Input power	W	Max. 33	Max. 33	Max. 33
Ripple	%	≤5	≤5	≤5
Maximum heat dissipation (P_v)	W	6	6	6
Overvoltage protection		Yes	Yes	Yes
Protection against polarity reversal		Yes	Yes	Yes
Line filter		Yes	Yes	Yes
Inrush current	x I_n		Not limited (limiting only by a supply-side 24 Vdc PSU)	
Output voltage for signal modules Rated value	Vdc	5	5	5
Output current	A	3.2	3.2	3.2
Short-circuit rating		Yes	Yes	Yes
Isolated from supply voltage		No	No	No
CPU				
Microprocessor		NEC VR4181 A MIPS	NEC VR4181 A MIPS	ARM 532 MHz
Memory				
Program code/program data		256 kByte/256 kByte	2 Mbyte/512 kByte	4 Mbyte/512 kByte
Marker/retain data	kByte	16/32	16/32	16/64
Cycle time for 1k of instructions (bits, bytes)	ms	<0.15	<0.15	<0.025

XC200 Series Modular PLCs, continued

Description	Unit	XC-CPU201-EC256K-8DI-6DO(-XV)	XC-CPU201-EC512K-8DI-6DO(-XV)	XC-CPU202-EC4M-8DI-6DO-XV
Interfaces				
Ethernet				
Baud rate	Mbit/s	10/100–Autodetect	10/100–Autodetect	10/100–Autodetect
Connector type		RJ45	RJ45	RJ45
Potential isolation		No	No	No
Serial interface (RS232) without handshake lines				
Baud rate	kbit/s	Max. 115.2	Max. 115.2	Max. 115.2
Connector type		RJ45	RJ45	RJ45
Potential isolation		No	No	No
USB interface		1.0	1.0	2.0
CANopen				
Maximum data transfer rate	Mbit/s	1	1	1
Potential isolation		Yes	Yes	Yes
Device profile		To DS 301 V4	To DS 301 V4	To DS 301 V4
PDO type		Asyn., cyc., acyc.	Asyn., cyc., acyc.	Asyn., cyc., acyc.
Connection		Plug-in terminal block	Plug-in terminal block	Plug-in terminal block
Bus terminating resistors		External	External	Internal
Stations	Number	Max. 126	Max. 126	Max. 126
Watchdog		Yes	Yes	Yes
RTC (real-time clock)		Yes	Yes	Yes
Power Supply of Local Inputs/Outputs (24 V_Q/0 V_Q)				
Input voltage	Vdc	24	24	24
Voltage range	Vdc	19.2–30, observe polarity	19.2–30, observe polarity	19.2–30, observe polarity
Potential isolation				
Between power supply and CPU voltage		Yes	Yes	Yes
Between power supply and inputs/outputs		No	No	No
Status indication		LED	LED	LED
Terminals		Plug-in terminal block	Plug-in terminal block	Plug-in terminal block
Overvoltage protection		Yes	Yes	Yes
Protection against polarity reversal		Yes	Yes	Yes
Digital Inputs				
Input current per channel at rated voltage	mA	Normally 3.5	Normally 3.5	Normally 3.5
Heat dissipation per channel		Normally 85m W	Normally 85m W	Normally 85m W
Voltage level to IEC/EN 61131-2				
Limit value type 1		Low <5 Vdc/High >15 Vdc	Low <5 Vdc/High >15 Vdc	Low <5 Vdc/High >15 Vdc
Input delay				
OFF ⟶ ON	ms	Type 0.1	Type 0.1	Type 0.1
ON ⟶ OFF	ms	Type 0.1	Type 0.1	Type 0.1
Inputs	Number	8, of which parameterizable: 2 counters, 50 kHz, 2 interrupt inputs, 1 incremental input		
Channels with the same reference potential	Number	8	8	8
Status indication		LED	LED	LED
Digital Outputs				
Channels	Number	6	6	6
Heat dissipation per channel	W	0.08	0.08	0.08
Load circuits	A	0.5	0.5	0.5
Output delay				
OFF ⟶ ON		Normally 0.1 ms	Normally 0.1 ms	Normally 0.1 ms
ON ⟶ OFF		Normally 0.1 ms	Normally 0.1 ms	Normally 0.1 ms
Channels with the same reference potential	Number	6	6	6
Status indication		LED	LED	LED
Switching capacity		IEC/EN 60947-5-1, utilization category DC-13		
Duty factor	% DF	100	100	100
Utilization factor	g	1	1	1

XIOC Digital Input Modules

Description	Unit	XIOC-8DI	XIOC-16DI	XIOC-32DI
Modules				
Input type		DC input	DC input	DC input
Input voltage	Vdc	24	24	24
Permissible range	Vdc	20.4–28.8	20.4–28.8	20.4–28.8
Input voltage	Vac	—	—	—
Permissible range	Vac	—	—	—
Input resistance		Normally 3.5 kohm	Normally 5.9 kohm	Normally 5.6 kohm
Input current	mA	Normally 6.9	Normally 4.0	Normally 4.3
Voltage level to IEC 61131-2, limit value type 1				
ON	Vdc	≥15	≥15	≥15
OFF	Vdc	≤5	≤5	≤5
Input delay				
OFF ⟶ ON	ms	5 (normally 4)	5 (normally 4)	5 (normally 4)
OFF ⟶ ON	ms	5 (normally 4)	5 (normally 4)	5 (normally 4)
Input channels	Number	8	16	32
Channels with the same reference potential	Number	8	16	32
Potential isolation		With optocouplers	With optocouplers	With optocouplers
Indication		LED (green)	LED (green)	16 LEDs (green), switchable: 0–15, 16–31
Terminals		Plug-in terminal block	Plug-in terminal block	XIOC-TERM32 (connector and cable)
Internal current consumption (5 Vdc)	mA	Normally 26	Normally 51	Normally 100
Weight	kg	0.16	0.16	0.16

XIOC Digital Output Modules

Description	Unit	XIOC-8DO	XIOC-16DO	XIOC-16DO-S	XIOC-32DO
Modules					
Output type		Transistor (source type)	Transistor (source type)	Transistor (source type)	Transistor (source type)
Output voltage	Vdc	24 (–15 to +20%)	24 (–15 to +20%)	24 (–15 to +20%)	24 (–15 to +20%)
Switching current, minimum	mA	1	1	1	1
Leakage current	mA	0.1	0.1	0.1	0.1
Maximum load current					
Per circuit	A	0.3	0.3	0.8	0.2
Per common potential terminal	A	2.4	4	5	3.2
Output delay					
OFF ⟶ ON	ms	≤0.3	≤0.3	≤0.3	≤0.3
OFF ⟶ ON	ms	≤1	≤1	≤1	≤1
Output channels	Number	8	16	16	32
Channels with the same reference potential	Number	8	16	16	32
Overvoltage protection		Diode	Diode	Integrated	Diode
Fuse rating	A	4	8	None	8
Potential isolation		With optocouplers	With optocouplers	With optocouplers	With optocouplers
Indication		LED (green)	LED (green)	LED (green)	16 LEDs (green) switchable: 0–15, 16–31
Terminals		Plug-in terminal block	Plug-in terminal block	Plug-in terminal block	XIOC-TERM32 (connector and cable)
Internal current consumption (5 Vdc)	mA	Normally 30	Normally 50	Normally 50	Normally 250
External voltage for outputs/module (30 mA for module supply) (U_s)	Vdc	24 (–15 to +20%)	24 (–15 to +20%)	24 (–15 to +20%)	24 (–15 to +20%)
Short-circuit protection		—	—	Yes	—
Weight	kg	0.16	0.16	0.16	0.16

XIOC Relay Output Module

Description	Unit	XIOC-12DO-R
Modules		
Output type		Relays
Output voltage	Vdc	24
Output voltage	Vac	100/240
Switching current, minimum	mA	1
Maximum load current		
Per circuit	A	2
Per common potential terminal	A	5
Output delay		
OFF ⟶ ON	ms	≤10
OFF ⟶ ON	ms	≤10
Output channels	Number	12
Channels with the same reference potential	Number	12
Overvoltage protection		External
Fuse rating	A	External
Potential isolation		With optocouplers
Indication		LED (green)
Terminals		Plug-in terminal block
Internal current consumption (5 Vdc)	mA	Normally 40
External voltage for operating the relay		24 Vdc (–15 to +20%, max. 70 mA)
Weight	kg	0.2

XIOC Digital Input/Output Module

Description	Unit	XIOC-16DX
Power Supply		
Supply voltage		24 Vdc (–15 to +20%)
Ripple	%	≤5
Overvoltage protection		Yes
Protection against polarity reversal		Yes
Potential isolation		
Between power supply and I/O bus		Yes
Between power supply and I/O		No
Internal current consumption (5 Vdc)	mA	Normally 80
Channels	Number	16
Terminals		Plug-in terminal block
Status indication		LED
Inputs		
Input type		DC input
Input voltage	Vdc	24
Inputs	Number	4, 12, configurable
Input current	mA	Normally 4
Voltage level to IEC 61131-2, limit value type 1		
ON	Vdc	≥15
OFF	Vdc	≤5
Input delay		
OFF ⟶ ON	ms	Normally 0.1
OFF ⟶ ON	ms	Normally 0.1
Outputs		
Output type		Transistor (source type)
Output voltage	Vdc	12/24 –15 to +20%)
Output current	A	Normally 0.5
Outputs	Number	Max. 12, configurable
Short-circuit tripping current	A	Max. 1.2 over 3 ms for output
Lamp load	W	Max. 3
Drop-out delay (High ⟶ Low)	µs	Normally 100
Switching capacity		IEC/EN 60947-5-1, utilization category DC-13
Short-circuit rating		Yes
Parallel connection of outputs		In groups 0 – 3, 4 – 7, 8 – 11; Actuation of the outputs within a group only in the same program cycle
Number of outputs that can be switched in parallel		Max. 3
Total maximum current	A	2 for group
Weight	kg	0.16

XIOC Analog Modules

Description	Unit	XIOC-8AI-I2	XIOC-8AI-U1	XIOC-8AI-U2	XIOC-4T-PT
Modules					
Input voltage	Vdc	—	0 to 10	–10 to +10	—
Input current	mA	4–20	—	—	—
Resolution, digital	bit	12	12	12	15 bit with sign
Conversion time		≤5 ms	≤5 ms	≤5 ms	—
Total errors	%	≤ ± 1 (of full-scale value)	≤ ± 1 (of full-scale value)	≤ ± 1 (of full-scale value)	≤ ± 1 (of full-scale value)
Input resistance	kohm	—	100	100	—
Potential isolation					
Circuit within each channel		With optocouplers	With optocouplers	With optocouplers	With optocouplers
Between the input channels		No	No	No	No
Input channels	Number	8	8	8	4
Terminals		Plug-in terminal block	Plug-in terminal block	Plug-in terminal block	Plug-in terminal block
External power supply		24 Vdc (–15 to +20%), approx. 150 mA	24 Vdc (–15 to +20%), approx. 150 mA	24 Vdc (–15 to +20%), approx. 150 mA	24 Vdc (–15 to +20%), 100 mA
External resistance (R)	kohm	—	—	—	Max. 0.4, 4 channels
Connection type		2-core shielded cable (≤20m)	2-core shielded cable (≤20m)	2-core shielded cable (≤20m)	Shielded cable
Platinum RTD		—	—	—	PT100 (IEC 751), PT1000
Accuracy					
–20° to 40°C (PT100)	°C	—	—	—	±0.5
–50° to 400°C (PT100)	°C	—	—	—	±3
–50° to 400°C (PT1000)	°C	—	—	—	±6
Temperature measuring range		—	—	—	–20 to 40°/–50 to 400° (uninterrupted current: 2 mA)
Internal current consumption (5 Vdc)	mA	Normally 100	Normally 100	Normally 100	Max. 200
Additional function		—	—	—	Linearization
Fault detection					
–20° to 40°C		—	—	—	≤ –25°C or ≥ +45°C = resistance value 7FFFFhex
–50° to 400°C		—	—	—	≤ –60°C or ≥ +410°C = resistance value 7FFFFhex
Response to cable break or unused inputs		—	—	—	In these cases, the resistance value is 7FFFhex
Weight	kg	0.18	0.18	0.18	0.18

XIOC Thermocouple Module

Description	Unit	XIOC-4AI-T
Channels		
Number		4
Temperature measuring range	°C	Type K: –270 to 1370 Type J: –210 to 1200 Type B: 100 to 1800 Type N: –270 to 1300 Type E: –270 to 1000 Type R: –50 to 1760 Type T: –200 to 400
Voltage measurement	mV	–50 to 50 –100 to 100 –500 to 500 –1000 to 1000
Cold-junction compensation		Yes, built-in
Interference suppression		50 Hz, 60 Hz
Unit		0.1°C, 0.1 F
Resolution	bit	16
Total errors	%	±0.5 of measurement range
Conversion time		<1s
Temperature coefficient		<200 ppm/°C of measurement range

XIOC Analog Modules

Description	Unit	XIOC-2AO-U1-2AO-I2	XIOC-4AO-U1	XIOC-2AO-U2
Modules				
Output voltage	Vdc	0–10	0–10	–10 to 10
Output current	mA	4–20	—	—
Resolution	bit	12	12	12
Conversion time		≤5 ms	≤5 ms	≤5 ms
Total errors	%	≤±1 (of full-scale value)	≤±1 (of full-scale value)	≤±1 (of full-scale value)
External load resistance				
Voltage output		≥10 kohm	≥10 kohm	≥10 kohm
Current output	ohm	0 to 500 ohm	—	—
Potential isolation				
Circuit within each channel		With optocouplers		
Between channels		No	No	No
Number of outputs				
Output voltage		2 (channels 0 and 1)	4	2
Output current		2 (channels 2 and 3)	—	—
Terminals		Plug-in terminal block	Plug-in terminal block	Plug-in terminal block
Internal current consumption (5 Vdc)	mA	Normally 100	Normally 100	Normally 100
External power supply		24 Vdc (–15/+20%), approx. 150 mA	24 Vdc (–15/+20%), approx. 150 mA	24 Vdc (–15/+20%), approx. 150 mA
Connection type		2-core shielded cable (≤20m)	2-core shielded cable (≤20m)	2-core shielded cable (≤20m)

XIOC Analog Modules

Description	Unit	XIOC-2AI-1AO-U1	XIOC-2AI-1AO-U1-I1	XIOC-4AI-2AO-U1	XIOC-4AI-2AO-U1-I1
Inputs					
Input voltage	Vdc	0–10	0–10	0–10	0–10
Input current	mA	—	0–20	—	0–20
Resolution	bit	14	14	14	14
Conversion time		<1 ms	<1 ms	<1 ms	<1 ms
Total errors	%	Normally 0.4	Normally 0.4	Normally 0.4	Normally 0.4
Potential isolation					
Circuit within each channel		No	No	No	No
Between the input channels		No	No	No	No
Between input/output channels		No	No	No	No
Channels	Number	2	2	4	4
Input resistance	kohm	40	40	40	40
Outputs					
Output voltage	Vdc	0–10	0–10	0–10	0–10
Output current	mA	—	0–20	—	0–20
Resolution	bit	12	12	12	12
Errors		Normally 0.4%	Normally 0.4%	Normally 0.4%	Normally 0.4%
Potential isolation					
Circuit within each channel		No	No	No	No
Between the output channels		No	No	No	No
Number of channels		1	1	2	2
External load resistance		≥2 kohm	≥2 kohm	≥2 kohm	≥2 kohm
Short-circuit rating		Yes	Yes	Yes	Yes
Terminal Connection					
Terminals		Plug-in terminal block	Plug-in terminal block	Plug-in terminal block	Plug-in terminal block
Internal current consumption (5 Vdc)	mA	Normally 200	Normally 200	Normally 200	Normally 200
Weight	kg	0.16	0.16	0.16	0.16

XIOC Communication Modules

Description	Unit	XIOC-NET-DP-M	XIOC-NET-DP-S	XIOC-SER	XIOC-TC1
Interfaces					
Interfaces		PROFIBUS-DP, RS485, EN 50170	PROFIBUS-DP, RS485, EN 50170	RS232(C), RS422, RS485	RS232(C), RS422, RS485
Protocol		PROFIBUS-DP master (class 1)	PROFIBUS-DP slave	Transparent mode, Modbus master/slave	Transparent mode, Modbus master/slave, DNP3 protocol
Character formats		—	—	8E1, 8O1, 8N1, 8N2, 7E2, 7O2, 7N2, 7E1	8E1, 8O1, 8N1, 8N2, 7E2, 7O2, 7N2, 7E1
Control and signal cables		—	—	RTS, CTS, DTR, DSR, DCD	RTS, CTS, DTR, DSR, DCD
Transfer rate	kbit/s	9.6 to 12,000	9.6 to 12,000	0.3 –57.6	0.3–57.6
Potential isolation		Yes	Yes	Yes (RS485, RS422)	Yes (RS485, RS422)
Number of slaves		124	—	—	—
Send/receive data		3500 Byte each	Max. 244 Byte	250 Byte per slave 120 Byte per slave	250/500
Bus terminating resistors		Switchable	Switchable	Switchable for RS485, RS422	Switchable for RS485, RS422
Connector type		D-sub 9-pin socket	D-sub 9-pin socket	RS232: D-sub 9-pin RS485, 422: plug-in terminal block	RS232: D-sub 9-pin RS485, 422: plug-in terminal block
Current consumption	mA	<300	<300	<275	<275
Weight	kg	Approx. 0.2	Approx. 0.2	Approx. 0.2	Approx. 0.2
Number of modules		XC100: 1/XC200: 3	XC100: 1/XC200: 3	XC100: 2/XC200: 4	XC200: 4
Slots		1, 2, 3	1, 2, 3	Any	Any

XIOC Counter Modules

Description	Unit	XIOC-1CNT-100KHZ	XIOC-2CNT-100KHZ	XIOC-2CNT-2AO-INC
Inputs				
Counter limits		0–4294967295 (32 bit)	0–4294967295 (32 bit)	0–4294967295 (32 bit)
Internal current consumption	mA	200	200	450
Frequency	kHz	100 (25 with four times resolution)	100 (25 with four times resolution)	400 (100 with four times resolution)
Number of channels		1	2	2
Input voltage	Vdc	12–24	12–24	—
Voltage for ON	Vdc	>10	>10	—
Voltage for OFF	VA/W	<4	<4	—
Input current	mA	≥4	≥4	—
Differential input voltage	Vdc	±5	±5	±5
Voltage for ON	Vdc	2–5	2–5	0.2–5
Voltage for OFF	Vdc	–5 to 8	–5 to 8	–5 to –0.2
Differential input current	mA	35	35	5
Minimum pulse width	µs	ON ≥4/OFF ≥4	ON ≥4/OFF ≥4	—
Potential isolation		With optocouplers	With optocouplers	—
Connection for external cabling		30-pin plug: XIOC-TERM30-CNT4	30-pin plug: XIOC-TERM30-CNT4	Plug-in terminal block
External cabling		Shielded, twisted pair cable	Shielded, twisted pair cable	Shielded, twisted pair cable
Outputs				
Output type		Transistor (open collector)	Transistor (open collector)	Analog
External power supply		12/24 Vdc (30 max.)	12/24 Vdc (30 max.)	—
Minimum load current	mA	1	1	—
Maximum load current (I_e)	mA	20	20	—
Max. leakage current	mA	0.5	0.5	—
Max. voltage drop at ON	V	1.5	1.5	—
Debounce OFF				
OFF ⟶ ON	ms	≤1	≤1	—
OFF ⟶ ON	ms	≤1	≤1	—
Output channels	Number	2	4	2
Potential isolation		With optocouplers	With optocouplers	—
Output voltage	Vdc	—	—	–10 to 10
Resolution	bit	—	—	12
Conversion time		—	—	≤1 ms
Total errors	%	—	—	Normally 0.4
Load resistance		—	—	≥1 kohm
Connection for external cabling		30-pin plug: XIOC-TERM30-CNT4	30-pin plug: XIOC-TERM30-CNT4	Plug-in terminal block
External cabling		Shielded, twisted pair cable	Shielded, twisted pair cable	Shielded 2-core cable
Current per channel	mA	—	—	≤300
Power supply of encoders		—	—	5 Vdc
Current consumption	mA	200	200	Max. 450
Weight	kg	0.16	0.16	0.18

Power Supply Suppression Filters

Description	Unit	XT-FIL-1	XT-FIL-2
General			
Standards		IEC/EN 61131-2; EN 50178	IEC/EN 61131-2; EN 50178
Ambient temperature	°F (°C)	32° to 131° (0° to 55°)	32° to 131° (0° to 55°)
Storage	°F (°C)	–13° to 158° (–25° to 70°)	–13° to 158° (–25° to 70°)
Mounting position		Vertical or horizontal	Vertical or horizontal
Vibration resistance		10–57 Hz ± 0.075 mm 57–150 Hz ± 1.0g	10–57 Hz ± 0.075 mm 57–150 Hz ± 1.0g
Mechanical shock resistance		15g/11 ms	15g/11 ms
Impact strength		500g /50 mm ±25g	500g/50 mm ±25g
Overvoltage category		II	II
Pollution degree		2	2
Protection type		IP20	IP20
Rated impulse withstand voltage (U_{imp})	V	850	850
Interference immunity		EN 61000-6-2	EN 61000-6-2
Weight	kg	0.1	0.1
Dimensions (W x H x D)	mm	35 x 90 x 30	35 x 90 x 57
Terminals		Screw terminals	Screw terminals
Terminal capacity Screw terminals			
Flexible with ferrule	mm^2	0.2–2.5 (AWG22–12)	0.2–2.5 (AWG22–12)
Solid	mm^2	0.2–2.5 (AWG22–12)	0.2–2.5 (AWG22–12)
Power Supply			
Input voltage	Vdc	24	24
Permissible range	Vdc	20.4–28.8	20.4–28.8
Ripple	%	≤5	≤5
Mains overvoltage protection		Yes	Yes
Potential isolation			
Between input voltage and PE		Yes	Yes
Between input voltage and output voltage		No	No
Between output voltage and PE		Yes	Yes
Rated value	Vdc	24	24
Output current	A	2.2	12

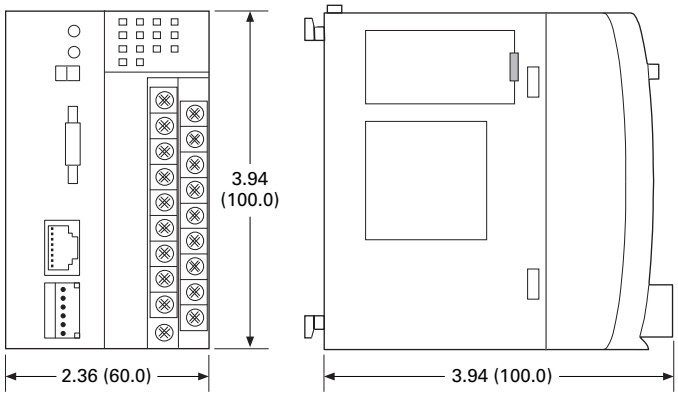
General Information on Electromagnetic Compatibility (EMC) of Automation Systems

Description	Specification			
Emitted interference	EN 55011/22 Class A (VDE 0875, Part 11)			
Interference immunity				
ESD	IEC/EN 61000-4-2	Contact discharge: 4 kV Air discharge 8 kV		
RFI	IEC/EN 61000-4-3	AM (80%)	80–1000 MHz	10V/m
Mobile phones/cellphones	IEC/EN 61000-4-3	PM	800–960 MHz	10V/m
Burst	IEC/EN 61000-4-4	Mains/digital I/O (direct): 2 kV Analog I/O, fieldbus (capacitive coupling): 1 kV		
Surge	IEC/EN 61000-4-5	Digital I/O, asymmetric, analog I/O, asymmetric, connection to shielding: 0.5 kV Mains DC, asymmetric: 1 kV Mains DC, symmetric: 1 kV Mains AC, asymmetric: 0.5 kV Mains AC, symmetric: 2 kV		
Conducted interference, induced by high-frequency fields	IEC/EN 61000-4-6; 2003	AM (80%)	150 kHz–80 MHz	3V

Dimensions

Approximate Dimensions in Inches (mm)

XC-CPU101, XC-CPU201, XC-CPU202



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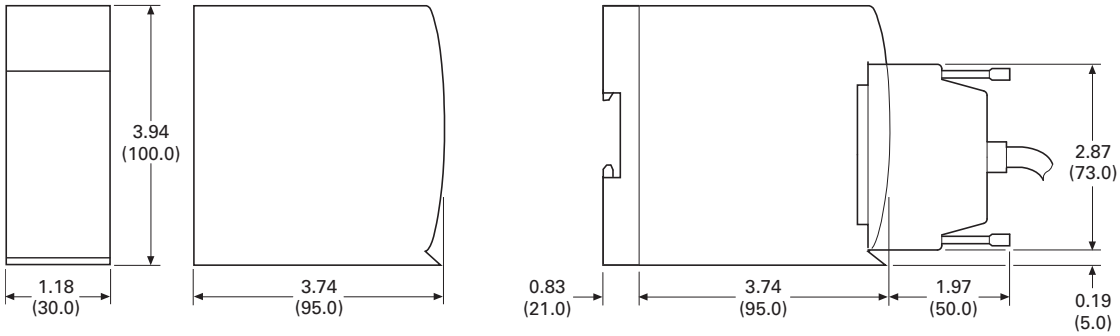
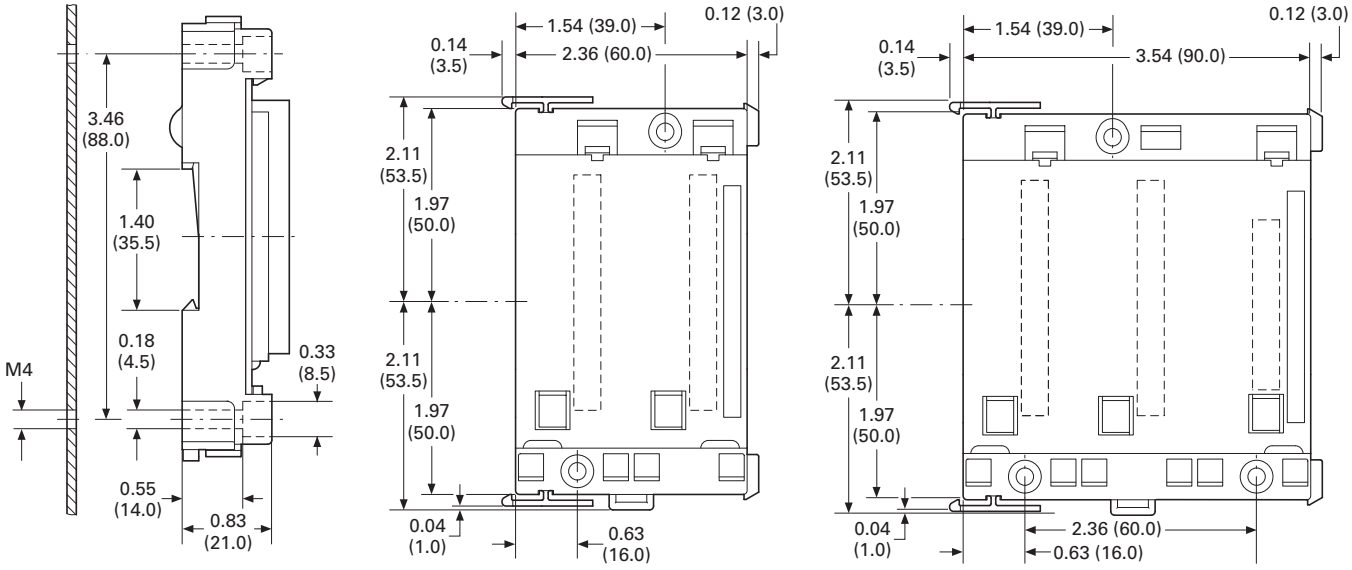


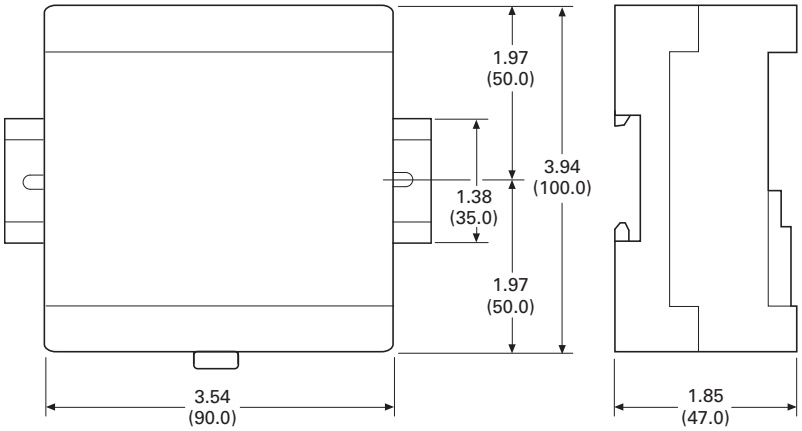
Backplates

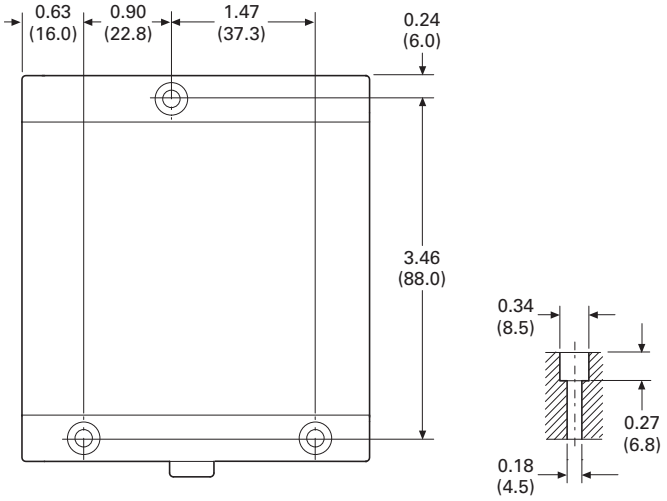
XIOC-BP-2 **XIOC-BP-3** **XIOC-BP-XC1**
XIOC-BP-XC **XIOC-BP-EXT**



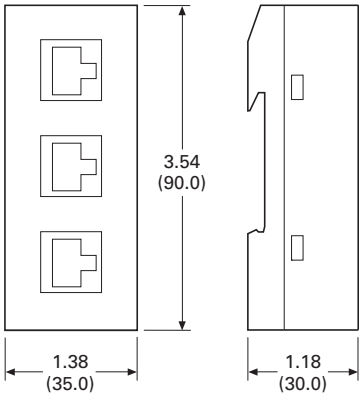
Approximate Dimensions in Inches (mm)

XC-CPU-121_, XIO-EXT121-1

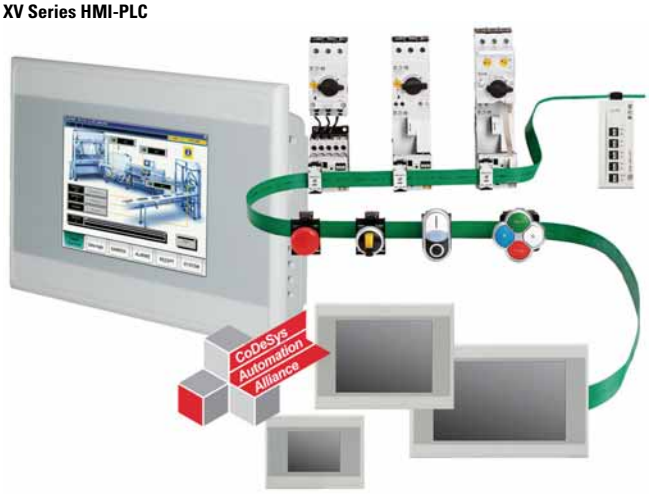




XT-RJ45-ETH-RS232



XV Series HMI-PLC



Contents

Product Description

The XV HMI-PLC is a powerful combination of logic and visualization based on the open CoDeSys programming platform. It is ideal for small to mid-range PLC applications where integrated logic and visualization is advantageous and/or where remote administration is critical.

The XV HMI-PLC is also available with an integrated SmartWire-DT™ master. This combination of visualization, control and SmartWire-DT connectivity is the ultimate lean automation solution.

Features

- Built-in SmartWire-DT master for 99 nodes
- Brilliant image display with 65,536 colors
- High resolution resistive touch TFT displays
- 3.5 in, 5.7 in or 7 in widescreen displays in a robust plastic housings and bezels, or
- 5.7 in, 8.4 in or 10.4 in displays in high-end aluminum front bezels and metal housings
- Ethernet and RS485 serial ports on all models
- PROFIBUS-DP or CANopen master on all models larger than 3.5 in
- Programmable with IEC 61131-3 compliant XSoft-CoDeSys software
- Easy connection direct to motor control components or I/O modules on the SmartWire-DT flat cable

Standards and Certifications

- CE
- UL
- cUL
- RoHS

Catalog Number Selection

XV HMI-PLC

XV – 102 – E6 – 35TQRG – 10

Family
XV = Windows® CE operating system

Housing
102 = Plastic housing
152 = Metal housing

Features Base Unit Variant	Features Additional COMM Options
B = Retentive memory	**6** = 1-CANopen
D = Retentive memory, USB host, RS-232	**8** = 1-PROFIBUS-DP
E = SmartWire-DT, retentive memory, USB host, RS-232	**E** = SmartWire-DT

Display Size	Display Technology	OS Build
35 = 3.5 in	**TQR** = TFT (QVGA) resistive	**C** = XSoft-CoDeSys
57 = 5.7 in	**TVR** = TFT (VGA) resistive	
70 = 7.0 in	**TWR** = TFT (WGA) resistive	
84 = 8.4 in		
10 = 10.4 in		

Bezel
10 = Standard blank front bezel

Product Selection

XV HMI-PLC

XV HMI-PLC

Display Size/Type	Display Resolution	CoDeSys Firmware	Fieldbus Type	RS485	Ethernet	Catalog Number
Plastic Housing						
3.5 in TFT Resistive	QVGA 320x240	Y	CANopen	Y	Y	**XV-102-B6-35TQRC-10**
		Y	PROFIBUS-DP	Y	Y	**XV-102-B8-35TQRC-10**
5.7 in TFT Resistive	VGA 640x480	Y	CANopen	Y	Y	**XV-102-D6-57TVRC-10**
		Y	PROFIBUS-DP	Y	Y	**XV-102-D8-57TVRC-10**
7.0 in TFT Resistive	WGA 800x480	Y	CANopen	Y	Y	**XV-102-D6-70TWRC-10**
		Y	PROFIBUS-DP	Y	Y	**XV-102-D8-70TWRC-10**
Metal Housing						
5.7 in TFT Resistive	VGA 640x480	Y	CANopen	Y	Y	**XV-152-D6-57TVRC-10**
		Y	PROFIBUS-DP	Y	Y	**XV-152-D8-57TVRC-10**
8.4 in TFT Resistive	VGA 640x480	Y	CANopen	Y	Y	**XV-152-D6-84TVRC-10**
		Y	PROFIBUS-DP	Y	Y	**XV-152-D8-84TVRC-10**
10.4 in TFT Resistive	VGA 640x480	Y	CANopen	Y	Y	**XV-152-D6-10TVRC-10**
		Y	PROFIBUS-DP	Y	Y	**XV-152-D8-10TVRC-10**

XV HMI-PLC SmartWire-DT

Display Size/Type	Display Resolution	CoDeSys Firmware	Fieldbus Type	RS485	Ethernet	SmartWire-DT	Catalog Number
Plastic Housing							
3.5 in TFT	QVGA 320x240	Y	None	Y	Y	Y	**XV-102-BE-35TQRC-10**
5.7 in TFT	VGA 640x480	Y	CANopen	Y	Y	Y	**XV-102-E6-57TVRC-10**
		Y	PROFIBUS-DP	Y	Y	Y	**XV-102-E8-57TVRC-10**
7.0 in TFT	WGA 800x480	Y	CANopen	Y	Y	Y	**XV-102-E6-70TWRC-10**
		Y	PROFIBUS-DP	Y	Y	Y	**XV-102-E8-70TWRC-10**
Metal Housing							
5.7 in TFT	VGA 640x480	Y	CANopen	Y	Y	Y	**XV-152-E6-57TVRC-10**
		Y	PROFIBUS-DP	Y	Y	Y	**XV-152-E8-57TVRC-10**
8.4 in TFT	VGA 640x480	Y	CANopen	Y	Y	Y	**XV-152-E6-84TVRC-10**
		Y	PROFIBUS-DP	Y	Y	Y	**XV-152-E8-84TVRC-10**
10.4 in TFT	VGA 640x480	Y	CANopen	Y	Y	Y	**XV-152-E6-10TVRC-10**
		Y	PROFIBUS-DP	Y	Y	Y	**XV-152-E8-10TVRC-10**

Accessories

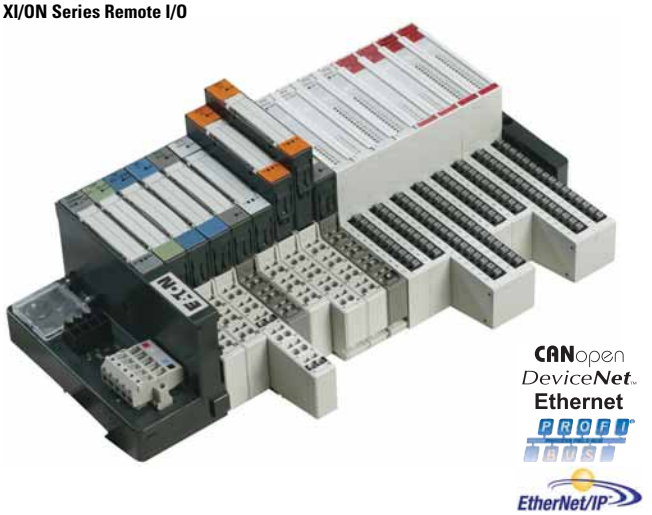
XV HMI-PLC Accessories

Description	Catalog Number
HMI-PLC programming software, single seat license	**SW-XSOFT-CODESYS-2-S** ①
HMI-PLC programming software, multiple seat license	**SW-XSOFT-CODESYS-2-M** ①
SD memory card	**MEMORY-SD-A1-S**
XV-102 parts kit (1 power conductor, 8 mounting brackets, 1 sealing strip, 1 touch pen)	**ACC-TP-57-KG-1**
XV-152 parts kit (1 power conductor, 8 mounting brackets, 1 sealing strip, 1 touch pen)	**ACC-TP-10-12-RES-1**

Note

① For details on SW-XSoft-CoDeSys software, see **Page V7-T4-33**.

XI/ON Series Remote I/O



Contents

Product Overview

Whether for controlling movements, measuring temperature or speed, or logging currents and voltages, the application ranges for remote I/Os are as extensive as the different applications involved. They are used wherever decentralized signal processing is the essential element of the automation concept.

Thanks to the high modularity of the XI/ON system and the wide range of functions, Eaton is able to offer the right I/O solution for every application. XI/ON: A modular concept with simple handling—adaptable to any application, intelligent and ready for future developments.

Standards and Certifications

- UL File No. E205091
- UL CCN—NRAQ, NRAQ7
- cULus
- CE
- RoHS

c UL us Listed

CE

RoHS COMPLIANT

Product Selection Guide

XI/ON Series Remote I/O

XI/ON

As many as needed, as few as possible—this is the principle on which the XI/ON modular I/O system was built. An extensive range of digital and analog I/Os as well as technology modules are available.

- High level of modularity
- Fieldbuses: CANopen, PROFIBUS-DP, DeviceNet and Ethernet
- Bus-independent, pluggable modules
- Low wiring requirement
- Precise diagnostics
- Space and cost saving with XNE modules
- Programmable CANopen gateway
- Standard and XNE modules can be mixed

XNE Gateways and Integrated Modules

Page V7-T4-62

XI/ON XNE completes the XI/ON I/O system with price and space optimized I/O modules and gateways. The XNE gateways use the EtherNet/IP, Modbus TCP Ethernet, CANopen and PROFIBUS-DP bus systems.

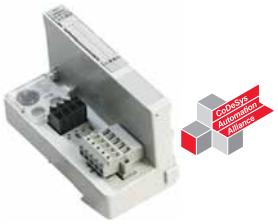
- XNE gateways with integrated bus terminating resistors
- Full compatibility with the standard XI/ON system
- No base module required
- High channel density (up to 16 DI/DO on 12.5 mm width)
- "Push-In" spring-loaded terminals
- Multi-functional slices
- Diagnostics interface

XN Standard Gateways and Plug-in Modules

Page V7-T4-64

The standard gateways use the Modbus TCP, DeviceNet, Ethernet, CANopen and PROFIBUS-DP bus systems.

- The use of pluggable I/O modules is independent on the fieldbus used
- Wiring is implemented on the base module, fixed wiring
- Fast module exchange under power (hot swapping)
- Generation of diagnostics information to higher-level controller
- Up to 74 slice modules can be connected per gateway
- Mechanical coding of modules
- Diagnostics interface

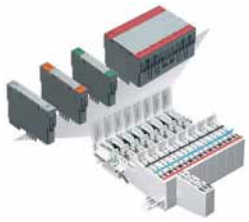


Programmable CANopen Gateway

Page V7-T4-64

The programmable CANopen gateway brings the power of the PLC directly to the fieldbus terminal. The device is ideal for handling decentralized automation tasks and thus for relieving the load of a higher-level PLC.

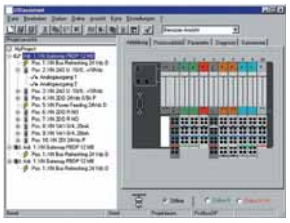
The serial onboard interface is used for local programming access and as an interface for the I/Oassistant configuration and diagnostics tool. Alternatively, this interface can also be used as a free user interface. The gateway is programmed with XSoft-CoDeSys-2.



Base Modules for Every Requirement

Page V7-T4-68

The base modules are used to connect the field wiring for the standard XI/ON modules. They are available for 2-, 3- and 4-wire connections, as block or slice modules, with either spring-loaded terminals or screw terminals—the right format for every application.



I/Oassistant—the Universal Configuration and Diagnostics Tool

The I/Oassistant provides you with a universal tool that offers interactive support with the entire planning and implementation of your XI/ON installation. The I/Oassistant is integrated in XSoft-CoDeSys-2.

A project is first of all created and structured on the screen. For this you choose gateways, electronic and base modules as well as the appropriate accessories. The individual stations are then configured offline or online. Once everything is set to your satisfaction, you simply put your installation into operation. The I/Oassistant also automatically generates a parts list for your order.

I/Oassistant checks the station, reads the process data, outputs values and visualizes the diagnostics data of the channel. This enables you to commission your station without a higher-level PLC and ensure that a section of the system is functioning correctly.

Catalog Number Selection

Gateway Modules

XNE - GWBR - 2ETH - IP

Module Type	Gateway Type	Fieldbus Type
XNE = Integrated I/O Modules **XN** = Plug-in I/O Modules	**GWBR** = Standard Gateway **PLC** = Programmable Gateway	**2ETH-IP** = EtherNet/IP **2ETH-MB** = Modbus TCP/Ethernet **MODBUS-TCP** = Modbus TCP/Ethernet **DVP1** = PROFIBUS-DP (DVP1) **PBDP** = PROFIBUS-DP (DVP0) **CANOPEN** = CANopen **DNET** = DeviceNet

Digital I/O Modules

XNE - 16DO - 24VDC - 0.5A - P

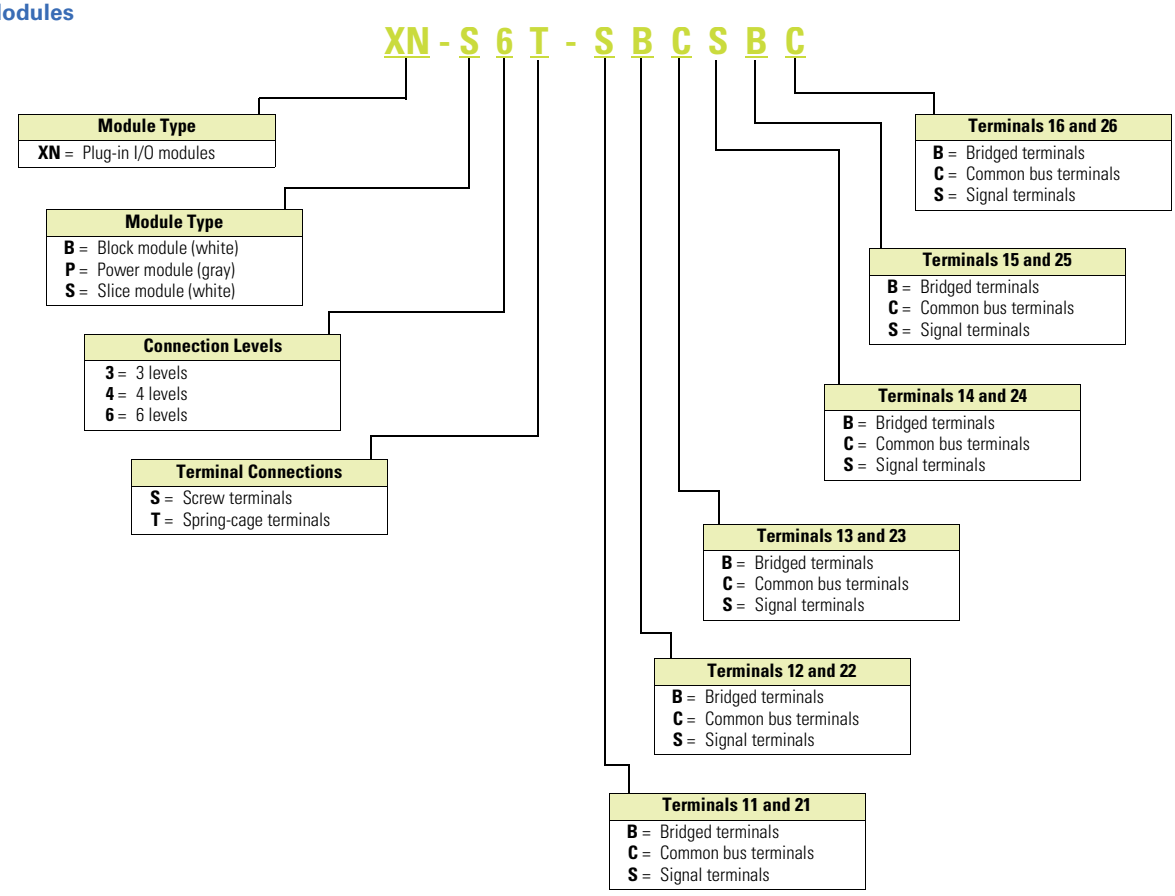
Module Type	Number of Digital I/O	Rated Voltage	Current Rating	Switching
XNE = Integrated I/O Modules **XN** = Plug-in I/O Modules	**DI** = Number of digital inputs **DO** = Number of digital outputs	**VDC** = 24 Vdc **VAC** = 120/230 Vac		**P** = Positive switching **N** = Negative switching

Analog I/O Modules

XN - 2AO - U - (–10/0 … +10 Vdc)

Module Type	Number of Analog I/O	Input/Output Range
XNE = Integrated I/O Modules **XN** = Plug-in I/O Modules	**AI** = Number of analog inputs **AO** = Number of analog outputs	**I** = 0/4 to 20 mA **U** = –10/0 to +10 Vdc **U/I** = 0/4 to 20 mA or –10/0 to +10 Vdc

Base Modules



4

System Overview

System Configuration

XN Module and Base Compatibility Chart

Electronics Modules	Base Modules	XN-S3S-SBB XN-S3T-SBB	XN-S3S-SBC XN-S3T-SBC	XN-S4S-SBBC XN-S4T-SBBC	XN-S4S-SBBS XN-S4T-SBBS	XN-S4S-SBCS XN-S4T-SBCS	XN-S4S-SBBS-CJ XN-S4T-SBBS-CJ	XN-S6S-SBBSBB XN-S6T-SBBSBB	XN-S6S-SBCSBC XN-S6T-SBCSBC	XN-B3S-SBB XN-B3T-SBB	XN-B3S-SBC XN-B3T-SBC	XN-B4S-SBBC XN-B4T-SBBC	XN-B6S-SBBSBB XN-B6T-SBBSBB	XN-B6S-SBCSBC XN-B6T-SBCSBC	XN-P3S-SBB XN-P3T-SBB	XN-P3S-SBB-B XN-P3T.-SBB-B	XN-P4S-SBBC XN-P4T-SBBC	XN-P4S-SBBC-B XN-P4T-SBBC-B
Digital Input Modules																		
XN-2DI-24VDC-P		✓	—	✓	—	—	—	—	—	—	—	—	—	—	—	—	—	—
XN-2DI-24VDC-N		✓	—	✓	—	—	—	—	—	—	—	—	—	—	—	—	—	—
XN-2DI-120/230VAC		✓	—	✓	—	—	—	—	—	—	—	—	—	—	—	—	—	—
XN-4DI-24VDC-P		—	—	—	✓	—	—	✓	—	—	—	—	—	—	—	—	—	—
XN-4DI-24VDC-N		—	—	—	✓	—	—	✓	—	—	—	—	—	—	—	—	—	—
XN-16DI-24VDC-P		—	—	—	—	—	—	—	—	✓	—	✓	—	—	—	—	—	—
XN-32DI-24VDC-P		—	—	—	—	—	—	—	—	—	—	—	✓	—	—	—	—	—
Digital Output Modules																		
XN-2DO-24VDC-0.5A-P		—	✓	—	—	✓	—	—	—	—	—	—	—	—	—	—	—	—
XN-2DO-24VDC-0.5A-N		—	✓	—	—	✓	—	—	—	—	—	—	—	—	—	—	—	—
XN-2DO-24VDC-2A-P		—	✓	—	—	✓	—	—	—	—	—	—	—	—	—	—	—	—
XN-2DO-120/230VAC-0.5A		—	✓	—	—	✓	—	—	—	—	—	—	—	—	—	—	—	—
XN-4DO-24VDC-0.5A-P		—	—	—	—	✓	—	—	✓	—	—	—	—	—	—	—	—	—
XN-16DO-24VDC-0.5A-P		—	—	—	—	—	—	—	—	—	✓	—	—	—	—	—	—	—
XN-32DO-24VDC-0.5A-P		—	—	—	—	—	—	—	—	—	—	—	—	✓	—	—	—	—
Relay Modules																		
XN-2DO-R-NC		—	—	—	✓	✓	—	—	—	—	—	—	—	—	—	—	—	—
XN-2DO-R-NO		—	—	—	✓	✓	—	—	—	—	—	—	—	—	—	—	—	—
XN-2DO-R-CO		—	—	—	✓	—	—	—	—	—	—	—	—	—	—	—	—	—
Analog Input Modules																		
XN-1AI-I(0/4…20MA)		✓	—	—	✓	—	—	—	—	—	—	—	—	—	—	—	—	—
XN-2AI-I(0/4…20MA)		✓	—	—	✓	—	—	—	—	—	—	—	—	—	—	—	—	—
XN-1AI-U(-10/0…+10VDC)		✓	—	—	✓	—	—	—	—	—	—	—	—	—	—	—	—	—
XN-2AI-U(-10/0…+10VDC)		✓	—	—	✓	—	—	—	—	—	—	—	—	—	—	—	—	—
XN-2AI-PT/NI-2/3		✓	—	—	✓	—	—	—	—	—	—	—	—	—	—	—	—	—
XN-2AI-THERMO-PI		—	—	—	—	—	✓	—	—	—	—	—	—	—	—	—	—	—
XN-4AI-U/I		—	—	—	—	—	—	—	✓	—	—	—	—	—	—	—	—	—
Analog Output Modules																		
XN-1AO-I(0/4…20MA)		✓	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
XN-2AO-I(0/4…20MA)		✓	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
XN-2AO-U(-10/0…+10VDC)		✓	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Technology Modules																		
XN-1CNT-24VDC		—	—	—	✓	—	—	—	—	—	—	—	—	—	—	—	—	—
XN-1RS232		—	—	—	✓	—	—	—	—	—	—	—	—	—	—	—	—	—
XN-1RS485/422		—	—	—	✓	—	—	—	—	—	—	—	—	—	—	—	—	—
XN-1SSI		—	—	—	✓	—	—	—	—	—	—	—	—	—	—	—	—	—
Supply Modules																		
XN-BR-24VDC-D		—	—	—	—	—	—	—	—	—	—	—	—	—	✓ ①	✓ ②	✓ ①	✓ ②
XN-PF-24VDC-D		—	—	—	—	—	—	—	—	—	—	—	—	—	✓	—	✓	—
XN-PF-120/230VAC-D		—	—	—	—	—	—	—	—	—	—	—	—	—	✓	—	✓	—

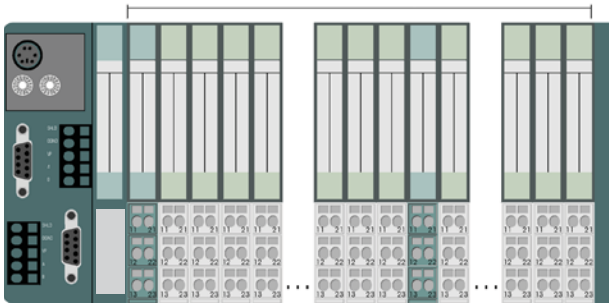
Notes

① Base module for gateway supply.

② Base module for bus refreshing within the station.

Maximum System Configuration

Maximum 74 XI/ON Modules in Slice Design



Plan your XI/ON station with the software "I/Oassistant".

Advantage 1:
Automatically generates a full parts list for your order.

Advantage 2:
Generates an error message as soon as the system limits are exceeded.

IMPORTANT:
When extending your system, make sure that you have a sufficient number of bus refresh or power feed modules.

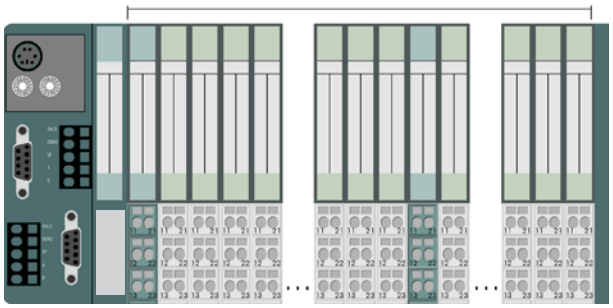
Style Number:	140045		140044		140047		152279	
Catalog Number:	**XNE-GWBR-PBDP**		**XNE-GWBR-CANOPEN**		**XNE-GWBR-2ETH-IP**		**XNE-GWBR-2ETH-MB**	
	Channels	**Modules**	**Channels**	**Modules**	**Channels**	**Modules**	**Channels**	**Modules**
Modules								
XN-4DI-24VDC-P	136	34	244	61	288	72	288	72
XN-4DI-24VDC-N	136	34	244	61	288	72	288	72
XN-16DI-24VDC-P	128	8	128	8	128	8	128	8
XN-32DI-24VDC-P	256	8	256	8	256	8	256	8
XNE-8DI-24VDC-P	384	48	512	64	512	64	512	64
XNE-16DI-24VDC-P	768	48	512	32	512	32	512	32
XN-4DO-24VDC-0.5A-P	132	33	244	61	288	72	288	72
XN-16DO-24VDC-0.5A-P	128	8	128	8	128	8	128	8
XN-32DO-24VDC-0.5A-P	256	8	256	8	256	8	256	8
XNE-8DO-24VDC-0.5A-P	384	48	488	61	512	64	512	64
XNE-16DO-24VDC-0.5A-P	640	40	512	32	512	32	512	32
XN-2DO-R-_	70	35	122	61	144	72	144	72
XN-2AI-I(0/4…20MA)	56	28	100	50	126	63	126	63
XN-2AI-U(-10/0…+10VDC)	56	28	100	50	126	63	126	63
XN-2AI-PT/NI2/3	44	22	98	49	126	63	126	63
XN-2AI-THERMO-PI	44	22	98	49	126	63	126	63
XN-4AI-U/I	64 (132)	16 (33)	108	27	124	31	124	31
XNE-8AI-U/I-4PT/NI	72 (120)	9 (15)	144	18	128	16	128	16
XN-2AO-I(0/4…20MA)	50	25	70	35	126	63	126	63
XN-2AO-U(-10/0…+10VDC)	46	23	70	35	126	63	126	63
XNE-4AO-U/I	64 (76)	16 (19)	108	27	64	16	64	16
XN-1CNT-24VDC	13	13	27	27	31	31	31	31
XN-1RS232	7	7	27	27	31	31	31	31
XN-1RS485/422	16	16	27	27	31	31	31	31
XN-1SSI	20	20	27	27	31	31	31	31

Note

Numeric values in parentheses. Maximum number when diagnostic alarm disabled.
The supply module XN-BR-24VDC-D must be mounted immediately next to the gateway XN-GW-_ to provide power for the gateways.

Maximum System Configuration, continued

Maximum 74 XI/ON Modules in Slice Design



Plan your XI/ON station with the software "I/Oassistant".

Advantage 1:
Automatically generates a full parts list for your order.

Advantage 2:
Generates an error message as soon as the system limits are exceeded.

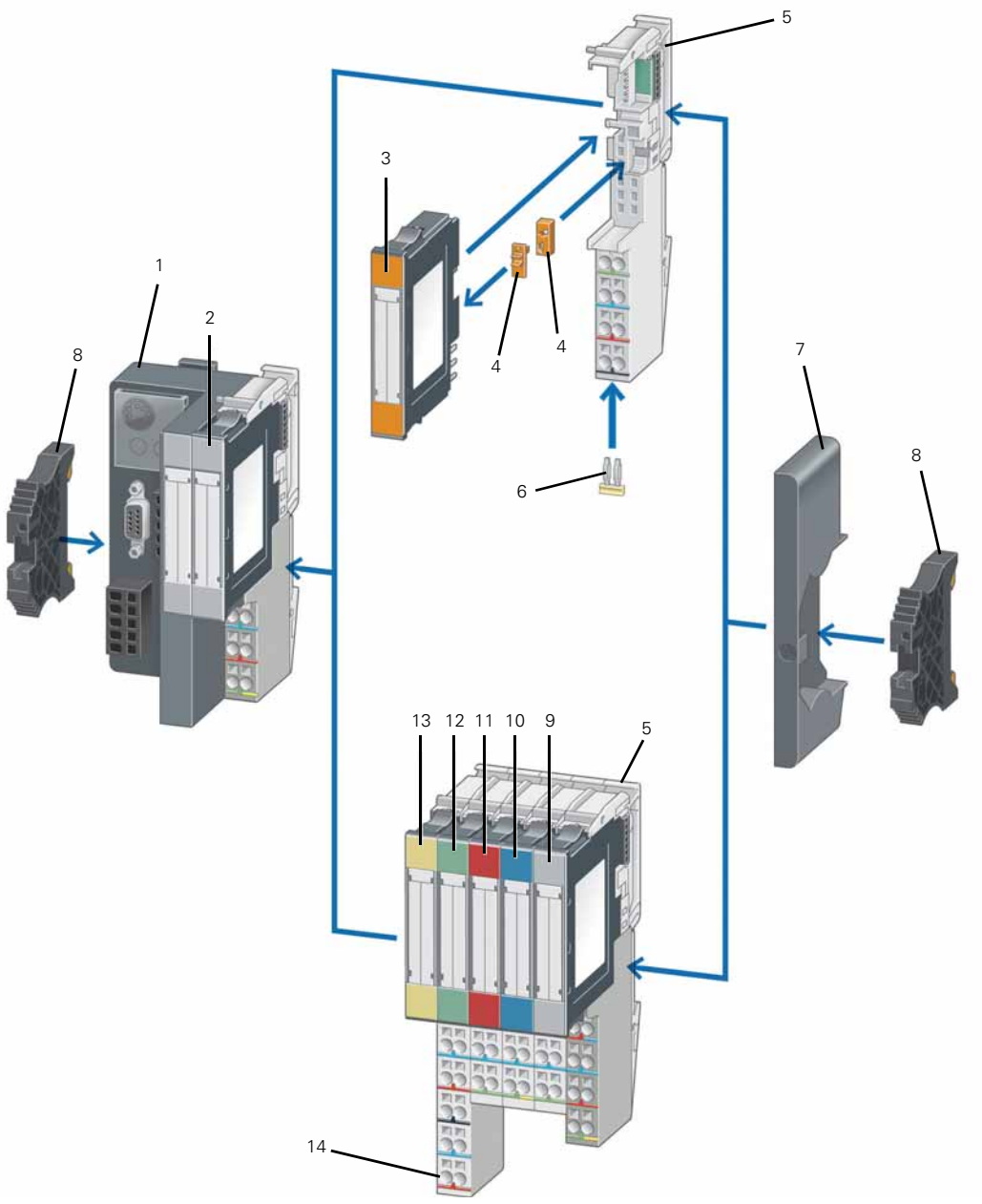
IMPORTANT:
When extending your system, make sure that you have a sufficient number of bus refresh or power feed modules.

Style Number:	140154		140055		140156		140162	
Catalog Number:	**XN-GWBR-PBDP**		**XN-GWBR-CANOPEN**		**XN-GWBR-DNET**		**XN-GWBR-MODBUS-TCP**	
	Channels	**Modules**	**Channels**	**Modules**	**Channels**	**Modules**	**Channels**	**Modules**
Modules								
XN-4DI-24VDC-P	288	72	288	72	288	72	288	72
XN-4DI-24VDC-N	288	72	288	72	288	72	288	72
XN-16DI-24VDC-P	128	8	128	8	128	8	128	8
XN-32DI-24VDC-P	256	8	256	8	256	8	256	8
XNE-8DI-24VDC-P	592	74	512	64	576	72	512	64
XNE-16DI-24VDC-P	1184	74	512	32	1152	72	512	32
XN-4DO-24VDC-0.5A-P	288	72	288	72	128	32	288	72
XN-16DO-24VDC-0.5A-P	128	8	128	8	128	8	128	8
XN-32DO-24VDC-0.5A-P	256	8	256	8	256	8	256	8
XNE-8DO-24VDC-0.5A-P	592	74	512	64	256	32	512	64
XNE-16DO-24VDC-0.5A-P	1168	73	512	32	512	32	512	32
XN-2DO-R-_	144	72	144	72	64	32	144	72
XN-2AI-I(0/4…20MA)	78	39	144	72	32	16	144	72
XN-2AI-U(-10/0…+10VDC)	78	39	144	72	32	16	144	72
XN-2AI-PT/NI-2/3	46	23	144	72	32	16	144	72
XN-2AI-THERMO-PI	58 (76)	29 (38)	144	72	32	16	144	72
XN-4AI-U/I	112	28	144	36	64	16	144	36
XNE-8AI-U/I-4PT/NI	88	11	144	18	128	16	144	18
XN-2AO-I(0/4…20MA)	38	19	144	72	32	16	144	72
XN-2AO-U(-10/0…+10VDC)	38	19	144	72	32	16	144	72
XNE-4AO-U/I	36	9	144	36	64	16	124	31
XN-1CNT-24VDC	7	7	72	72	16	16	72	72
XN-1RS232	22	22	68	68	8	8	68	68
XN-1RS485/422	22	22	72	72	8	8	72	72
XN-1SSI	22	22	72	72	8	8	72	72

Note

Numeric values in parentheses. Maximum number when diagnostic alarm disabled.

System Overview



Item Number	Description
1	Gateway
2	Digital input module
3	Relay module
4	Coding element
5	Base module
6	Relay jumper
7	End plate

Item Number	Description
8	End bracket
9	Power supply module
10	Analog input module
11	Digital output module
12	Analog output module
13	Technology module
14	Marker

Product Selection

XNE Series

The following are included as standard with all gateways:
2 x End bracket XN-WEW-32/2-SW,
1 x End plate XN-ABPL.

4

XNE Gateway with Integrated Supply

	Description	Fieldbus Connection	Terminal Capacity (Fieldbus/Supply Voltage)	Servicing Interface	Transfer Rate	Style Number	Catalog Number
XNE Gateways	**Ethernet**						
	Supports up to 74 disc type modules (XN, XNE) 2xRJ45 socket Address set with decimal rotary coding switches, BootP, DHCP or I/Oassistant Address range: 1–254 (dec.)	Ethernet (EtherNet/IP protocol)	Push-in spring-cage terminals	Mini USB	10/100 MBit/s	140047	**XNE-GWBR-2ETH-IP**
	Supports up to 74 disc type modules (XN, XNE) RJ45 Ethernet switch Address set with decimal rotary coding switches, BootP, DHCP or I/Oassistant Address range: 1–254 (dec.)	Ethernet (Modbus TCP)	Push-in spring-cage terminals	Mini USB	10/100 MBit/s	152279	**XNE-GWBR-2ETH-MB**
	**PROFIBUS-DP**						
	Supports up to 48 slice type modules (XN, XNE) Address setting through DIP switch Address range: 1–125 (dec.)	PROFIBUS-DP (DPV0/DPV1 protocol)	Push-in spring-cage terminals	PS/2 socket	9.6 kbit/s to 12 Mbit/s	140045	**XNE-GWBR-PBDP**
	**CANopen**						
	Supports up to 62 disc type modules (XN, XNE) Address set with DIP switch Address range: 1–63 (dec.)	CANopen	Push-in spring-cage terminals	PS/2 socket	1000 kbit/s 800 kbit/s 500 kbit/s 250 kbit/s 125 kbit/s 50 kbit/s 20 kbit/s	140044	**XNE-GWBR-CANOPEN**

XNE Digital Input

XNE Digital Input Modules

Positive switching.

Channels	Rated Voltage via Power Supply Terminal	Input Delay tRise/tFall	Input Voltage High Signal	Style Number	Catalog Number
8	24 Vdc	<100/<200 µs	11 V-U_L	140035	**XNE-8DI-24VDC-P**
16	24 Vdc	<150/<300 µs	11 V-U_L	140040	**XNE-16DI-24VDC-P**

XNE Digital Output

XNE Digital Output Modules

Resistive inductive and lamp load connectable.

Channels	Rated Voltage via Power Supply Terminal	Switching Frequency with Resistive Load in Hz	Utilization Factor g in %	Style Number	Catalog Number
8	24 Vdc	<100	100	140036	**XNE-8DO-24VDC-0.5A-P**
16	24 Vdc	<100	50%, maximum 4A	140039	**XNE-16DO-24VDC-0.5A-P**

XNE Analog Input

XNE Analog Input and RTD Module

Rated voltage via power supply terminal: 24 Vdc.

Channels	Measured Variables	Measuring Ranges	Value Representation	Limit Frequency in Hz	Style Number	Catalog Number
8 (U/I)/ 4 (PT/NI/R)	Voltage, current temperature (PT, NI), resistance R	–10 to 10 Vdc/0 to 10 Vdc PT100, 200, 500, 1000, NI100, 1000 2-, 3-wire	Standard: 16-bit/12-bit (flush-left) Extended range: 16-bit/12-bit (flush-left) PA (NE43), 16-bit/12-bit (flush-left)	1.5	140037	**XNE-8AI-U/I-4PT/NI**

XNE Analog Output

XNE Analog Output Module

Rated voltage via power supply terminal: 24 Vdc.

Channels	Measured Variables	Output Variables	Value Representation	Style Number	Catalog Number
4	Voltage, current	–10 to 10 Vdc/0 to 10 Vdc 0 to 20 mA 4 to 20 mA	Standard: 16-bit/12-bit (flush-left)	140034	**XNE-4AO-U/I** ①

XNE Counter

XNE Counter Module

Rated voltage via power supply terminal: 24 Vdc.

Signal evaluation A, B: Pulse and direction, rotary encoder single/double/quadruple.

Channels	Operating Modes	Pulse Duration	PWM Module	Resolution	Style Number	Catalog Number
2	Continuous, once only and periodic counting	32-bit/maximum 120s	✓	32-bit	140038	**XNE-2CNT-2PWM**

Note

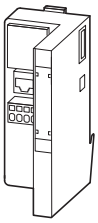
① cUL pending.

XN Series

The following are included as standard with all gateways:
2 x End bracket XN-WEW-32/2-SW,
1 x End plate XN-ABPL.

XN Gateway with Integrated Supply

XN-GWBR-MODBUS_



Description	Fieldbus Connection	Terminal Capacity (Fieldbus/Supply Voltage)	Servicing Interface	Transfer Rate	Style Number	Catalog Number
Ethernet						
Supports up to 74 slice type modules (XN, XNE) 1 x RJ45 socket Address set with decimal rotary coding switches, BootP, DHCP or I/Oassistant Address range: 1–254 (dec.)	Ethernet (Modbus TCP protocol)	Screw terminals	PS/2 socket	10/100 Mbit/s	140162	**XN-GWBR-MODBUS-TCP**

XN-GWBR-D_, XN-GWBR-C_

Description	Fieldbus Connection	Terminal Capacity (Fieldbus/Supply Voltage)	Servicing Interface	Transfer Rate	Style Number	Catalog Number
DeviceNet						
Supports up to 74 disc type modules (XN, XNE) 1 x open-style connector Address set with two decimal rotary coding switches Address range: 1–63 (dec.)	DeviceNet	Screw terminals	PS/2 socket	500 kbit/s 250 kbit/s 125 kbit/s	140156	**XN-GWBR-DNET**
CANopen						
Supports up to 74 disc type modules (XN, XNE) 1 x open-style connector Address set with two decimal rotary coding switches Address range: 1–99 (dec.)	CANopen	Screw terminals	PS/2 socket	1000 kbit/s 800 kbit/s 500 kbit/s 250 kbit/s 125 kbit/s 50 kbit/s 20 kbit/s 10 kbit/s	140155	**XN-GWBR-CANOPEN**

XN-GWBR-DVP1

Description	Fieldbus Connection	Terminal Capacity (Fieldbus/Supply Voltage)	Servicing Interface	Transfer Rate	Style Number	Catalog Number
PROFIBUS-DP						
Supports up to 74 disc type modules (XN, XNE) 1 x D-sub 9-pin socket Address set with decimal rotary coding switches Address range: 1–99 (dec.)	PROFIBUS-DP (DVP1 protocol)	Screw terminals	PS/2 socket	9.6 kbit/s to 12 Mbit/s	148561	**XN-GWBR-DVP1**
Supports up to 74 disc type modules (XN, XNE) 1 x D-sub 9-pin socket Address set with decimal rotary coding switches Address range: 1–99 (dec.)	PROFIBUS-DP (DVP0 protocol)	Screw terminals	PS/2 socket	9.6 kbit/s to 12 Mbit/s	140154	**XN-GWBR-PBDP**

XN-PLC-CANOPEN

XN Programmable Gateway with Integrated Supply

Description	Fieldbus Connection	Terminal Capacity (Fieldbus/Supply Voltage)	Servicing Interface	Transfer Rate	Style Number	Catalog Number
CANopen						
Supports up to 74 disc type modules (XN, XNE to limited extent) 1 x open-style connector Operating mode and address setting with two hexadecimal rotary coding switches Address range: 1–99 (dec.)	CANOpen	Screw terminals	PS/2 socket	Adjustable up to 1 Mbit/s	140157	**XN-PLC-CANOPEN**

XN Power Supply Modules

Slice Module

Number of diagnostic bits: 4.
Ripple <5% (to EN 61131-2).

Operating and Field Voltage	System Power Supply	Rated Current Consumption from Modbus	Maximum System Supply Current	For Use With …	Style Number	Catalog Number
24 Vdc	24 Vdc	—	1.5A	XN-P3T-SBB XN-P3S-SBB XN-P4T-SBBC XN-P4S-SBBC XN-P3T-SBB-B XN-P3S-SBB-B XN-P4T-SBBC-B XN-P4S-SBBC-B	140071	**XN-BR-24VDC-D**
24 Vdc	—	≤28 mA	—	XN-P3T-SBB XN-P3S-SBB XN-P4T-SBBC XN-P4S-SBBC	140070	**XN-PF-24VDC-D**
120/230 Vac	—	≤25 mA	—	XN-P3T-SBB XN-P3S-SBB XN-P4T-SBBC XN-P4S-SBBC	140072	**XN-PF-120/230VAC-D**

XN Digital Input Modules

Base module required.

Channels	Rated Voltage via Power Supply Terminal	Input Delay tRise/tFall	Input Voltage High Signal	For Use With …	Style Number	Catalog Number
Slice Module						
2	24 Vdc	<200/<200 µs	11–30 Vdc	XN-S3T-SBB XN-S3S-SBB XN-S4T-SBBC XN-S4S-SBBC	140056	**XN-2DI-24VDC-P**
			0–5 Vdc		140057	**XN-2DI-24VDC-N**
2	120/230 Vac	<20,000/<20,000 µs	79–265 Vac		140058	**XN-2DI-120/230VAC**
4	24 Vdc	<200/<200 µs	15–30 Vdc	XN-S4T-SBBS XN-S4S-SBBS XN-S6T-SBBSBB XN-S6S-SBBSBB	140052	**XN-4DI-24VDC-P**
			0–5 Vdc		140059	**XN-4DI-24VDC-N**
Block Module						
16	24 Vdc	<200/<200 µs	15–30 Vdc	XN-B3T-SBB XN-B3S-SBB XN-B4T-SBBC XN-B4S-SBBC	140142	**XN-16DI-24VDC-P**
32	24 Vdc	<200/<200 µs	15–30 Vdc	XN-B6T-SBBSBB XN-B6S-SBBSBB	140147	**XN-32DI-24VDC-P**

XN Digital Output Modules

Base module required.

Resistive inductive and lamp load connectable.

Slice Module

Block Module

Channels	Rated Voltage via Power Supply Terminal	Switching Frequency with Resistive Load in Hz	Utilization Factor g in %	For Use With …	Style Number	Catalog Number
2	24 Vdc	<5000 (R_{LO} <1 kohm)	100	XN-S3T-SBC XN-S3S-SBC XN-S4T-SBCS XN-S4S-SBCS	140053	**XN-2DO-24VDC-0.5A-P**
		<100 (R_{LO} <1 kohm)			140060	**XN-2DO-24VDC-0.5A-N**
		<5000 (R_{LO} <1 kohm)			140055	**XN-2DO-24VDC-2A-P**
2	120–230 Vac (45–65 Hz)	—	100 (observe derating requirements)		140150	**XN-2DO-120/230VAC-0.5A**
4	24 Vdc	<1000 (R_{LO} <1 kohm)	100	XN-S4T-SBCS XN-S4S-SBCS XN-S6T-SBCSBC XN-S6S-SBCSBC	140148	**XN-4DO-24VDC-0.5A-P**
16	24 Vdc	<100 (R_{LO} <1 kohm)	100	XN-B3T-SBC XN-B3S-SBC	140141	**XN-16DO-24VDC-0.5A-P**
32	24 Vdc	<100 (R_{LO} <1 kohm)	See total module current	XN-B6T-SBCSBC XN-B6S-SBCSBC	140161	**XN-32DO-24VDC-0.5A-P**

XN Relay Modules

Slice Module

Base module required.

Rated voltage via power supply terminal: 24 Vdc.

Resistive inductive and lamp load connectable.

Channels	Contact Type	Rated Load Voltage	Maximum Continuous Current per Channel/ 230 Vac Resistive Load	For Use With …	Style Number	Catalog Number
2	Changeover Contacts	230 Vac, 30 Vdc	5A	XN-S4T-SBBS XN-S4S-SBBS	140054	**XN-2DO-R-CO**
2	NC	230 Vac, 30 Vdc	5A	XN-S4T-SBBS XN-S4S-SBBS XN-S4T-SBCS XN-S4S-SBCS	140061	**XN-2DO-R-NC**
	NO				140062	**XN-2DO-R-NO**

XN Analog Input Modules

Slice Module

Base module required.

Rated voltage via power supply terminal: 24 Vdc.

Channels	Measured Variables	Measuring Range	Value Representation	Limit Frequency in Hz	For Use With …	Style Number	Catalog Number
1	Current	0–20 mA, 4–20 mA	Standard 16-bit/12-bit (flush left)	—	XN-S3T-SBB XN-S3S-SBB XN-S4T-SBBS XN-S4S-SBBS	140063	**XN-1AI-I(0/4…20MA)**
2				—		140144	**XN-2AI-I(0/4…20MA)**
1	Voltage	–10…10 Vdc, 0…10 Vdc		200		140064	**XN-1AI-U(-10/0…+10VDC)**
2				50		140145	**XN-2AI-U(-10/0…+10VDC)**
4	Voltage/Current	–10…10 Vdc, 0…10 Vdc		20	XN-S6T-SBCSBC XN-S6S-SBCSBC	140158	**XN-4AI-U/I**

Slice Module

XN Temperature Modules

Base module required.

Rated voltage via power supply terminal: 24 Vdc.

Channels	Connectable Sensors	Measuring Range (°C)	Value Representation	For Use With …	Style Number	Catalog Number
2	PT100. 200. 500, 1000	Platinum sensors: –200…850/–200…150	Standard 16-bit/12-bit (flush left)	XN-S3T-SBB XN-S3S-SBB XN-S4T-SBBS XN-S4S-SBBS	140067	**XN-2AI-PT/NI-2/3**
	Ni100, Ni1000	Nickel sensors: –60…250/–60…150				
2	Type B, E, J, K, N, R, S, T Thermocouples	See user manual	Standard 16-bit/12-bit (flush left)	XN-S4T-SBBS-CJ XN-S4S-SBBS-CJ	140068	**XN-2AI-THERMO-PI** ①

Slice Module

XN Analog Output Modules

Base module required.

Rated voltage via power supply terminal: 24 Vdc.

Channels	Measured Variables	Output Variables	Value Representation	For Use With …	Style Number	Catalog Number
1	Current	0–20 mA/4–20 mA	Standard 16-bit/12-bit (flush left)	XN-S3T-SBB XN-S3S-SBB	140065	**XN-1AO-I(0/4…20MA)**
2					140146	**XN-2AO-I(0/4…20MA)**
2	Voltage	–10…10 Vdc/0…10 Vdc			140066	**XN-2AO-U(-10/0…+10VDC)**

Slice Module

XN Counter Modules

Base module required.

Rated voltage via power supply terminal: 24 Vdc.

Signal evaluation A, B: Pulse and direction, rotary encoder single/double/quadruple.

Channels	Operating Modes	Pulse Duration	Resolution	For Use With …	Style Number	Catalog Number
1	Continuous, once only and periodic counting	8-bit max. 0.51s	32-bit	XN-S4T-SBBS XN-S4S-SBBS	140069	**XN-1CNT-24VDC**

Slice Module

XN Serial Interfaces

Base module required.

Rated voltage via power supply terminal: 24 Vdc.

Type	Transfer Channels	Bit Transfer Rate	Cable Length	For Use With …	Style Number	Catalog Number
RS-232	RxD, TxD, RTS, CTS	Max. 115,200 bits/s (adjustable)	Max. 15m	XN-S4T-SBBS XN-S4S-SBBS	140151	**XN-1RS232**
RS-485/RS-422	RxD, TxD		Max. 30m		140152	**XN-1RS485/422**
SS1	CL, D	Max. 1 MHz (adjustable)	Max. 30m		140153	**XN-1SSI**

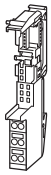
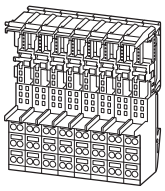
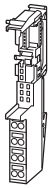
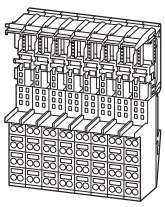
Note

① cUL pending.

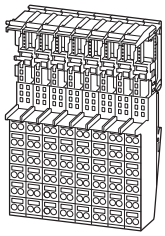
4

Base Modules

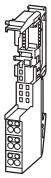
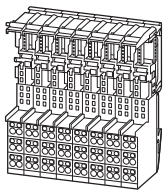
Spring-Cage Terminals

	Description	For Use With …	Style Number	Catalog Number
	Three Connection Levels			
Slice Module 	Base module for field power supply Base module for the gateway supply (with XN-BR-24VDC-D)	XN-BR-24VDC-D XN-PF-24VDC-D XN-PF-120/230VAC-D	140074	**XN-P3T-SBB**
	Base module for bus refresh within the station	XN-BR-24VDC-D	140073	**XN-P3T-SBB-B**
	—	XN-2DI-_ XN-1AI-_ XN-2AI-I(0/4…20MA) XN-2AI-U(-10/0…+10VDC) XN-2AI-PT/NI-2/3 XN-1AO-I(0/4…20MA) XN-2AO-_	140077	**XN-S3T-SBB**
	Connection to C rail	XN-2DO-24VDC-_ XN-2DO-120/230VAC-0.5A	140079	**XN-S3T-SBC**
Block Module 	—	XN-16DI-24VDC-P	140133	**XN-B3T-SBB**
	Connection to C rail	XN-16DO-24VDC-0.5-P	140134	**XN-B3T-SBC**
	Four Connection Levels			
Slice Module 	Base module for field power supply Base module for the gateway supply (with XN-BR-24VDC-D) Connection to C rail	XN-BR-24VDC-D XN-PF-24VDC-D XN-PF-120/230VAC-D	140076	**XN-P4T-SBBC**
	Base module for bus refresh within the station Connection to C rail	XN-BR-24VDC-D	140075	**XN-P4T-SBBC-B**
	Connection to C rail	XN-2DI-24VDC-P XN-2DI-24VDC-N XN-2DI-120/230VAC	140078	**XN-S4T-SBBC**
	Connection to C rail	XN-2DO-24VDC-_ XN-2DO-120/230VAC-0.5A XN-4DO-24VDC-0.5A-P XN-2DO-R-NO XN-2DO-R-NC	140080	**XN-S4T-SBCS**
	—	XN-4DI-_ XN-2DO-R-_ XN-1AI-_ XN-2AI-I(0/4…20MA) XN-2AI-U(-10/0…+10VDC) XN-2AI-PT/NI-2/3 XN-1CNT-24VDC XN-1RS_	140081	**XN-S4T-SBBS**
	Base module with temperature sensors for cold-junction compensation	XN-2AI-THERMO-PI	140084	**XN-S4T-SBBS-CJ**
Block Module 	Connection to C rail	XN-16DI-24VDC-P	140135	**XN-B4T-SBBC**

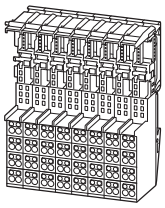
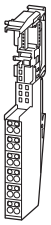
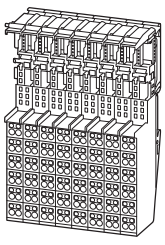
Spring-Cage Terminals, continued

	Description	For Use With …	Style Number	Catalog Number
	Six Connection Levels			
Slice Module	—	XN-4DI-24VDC-P XN-4DI-24VDC-N	140082	**XN-S6T-SBBSBB**
	Connection to C rail	XN-4DO-24VDC-0.5A-P XN-4AI-U/I	140083	**XN-S6T-SBCSBC**
Block Module	—	XN-32DI-24VDC-P	140136	**XN-B6T-SBBSBB**
	Connection to C rail	XN-32DO-24VDC-0.5A-P	140159	**XN-B6T-SBCSBC**

Screw Terminals

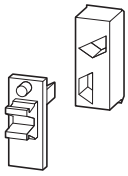
	Description	For Use With …	Style Number	Catalog Number
	Three Connection Levels			
Slice Module	Base module for field power supply Base module for the gateway supply (with XN-BR-24VDC-D)	XN-BR-24VDC-D XN-PF-24VDC-D XN-PF-120/230VAC-D	140085	**XN-P3S-SBB**
	—	XN-2DI-24VDC-P XN-2DI-24VDC-N XN-2DI-120/230VAC XN-1AI-_ XN-2AI-I(0/4…20MA) XN-2AI-U(-10/0…+10VDC) XN-2AI-PT/NI-2/3 XN-1AO-I(0/4…20MA) XN-2AO-_	140088	**XN-S3S-SBB**
	Connection to C rail	XN-2DO-24VDC-_ XN-2DO-120/230VAC-0.5A	140090	**XN-S3S-SBC**
Block Module	—	XN-16DI-24VDC-P	140137	**XN-B3S-SBB**
	Connection to C rail	XN-16DO-24VDC-0.5A-P	140138	**XN-B3S-SBC**

Screw Terminals, continued

Description	For Use With …	Style Number	Catalog Number
Four Connection Levels			
Slice Module 			
Base module for field power supply Base module for the gateway supply (with XN-BR-24VDC-D) Connection to C rail	XN-BR-24VDC-D XN-PF-24VDC-D XN-PF-120/230VAC-D	140087	**XN-P4S-SBBC**
Base module for bus refresh within the station Connection to C rail	XN-BR-24VDC-D	140086	**XN-P4S-SBBC-B**
Connection to C rail	XN-2DI-24VDC-P XN-2DI-24VDC-N XN-2DI-120/230VAC	140089	**XN-S4S-SBBC**
Connection to C rail	XN-2DO-24VDC-_ XN-2DO-120/230VAC-0.5A XN-4DO-24VDC-0.5A-P XN-2DO-R-NO XN-2DO-R-NC	140091	**XN-S4S-SBCS**
—	XN-4DI-_ XN-2DO-R-_ XN-1AI-_ XN-2AI-I(0/4…20MA) XN-2AI-U(-10/0…+10VDC) XN-2AI-PT/NI-2/3 XN-1CNT-24VDC XN-1RS_ XN-1SSI	140092	**XN-S4S-SBBS**
Block Module 			
Base module with temperature sensors for cold-junction compensation	XN-2AI-THERMO-PI	140095	**XN-S4S-SBBS-CJ**
Connection to C rail	XN-16DI-24VDC-P	140139	**XN-B4S-SBBC**
Slice Module 			
Six Connection Levels			
—	XN-4DI-24VDC-P XN-4DI-24VDC-N	140093	**XN-S6S-SBBSBB**
Connection to C rail	XN-4DO-24VDC-0.5A-P XN-4AI-U/I	140094	**XN-S6S-SBCSBC**
Block Module 			
—	XN-32DI-24VDC-P	140140	**XN-B6S-SBBSBB**
Connection to C rail	XN-32DO-24VDC-0.5A-P	140160	**XN-B6S-SBCSBC**

Accessories

Coding Elements



Coding Elements

Description	For Use With …	Style Number	Catalog Number
Included as standard with every electronics module. Prevents incorrect connection of the electronics modules	XN-…DI-24VDC_	140114	**XN-KO/2**
	XN-2DI-120/230VAC	140117	**XN-KO/5**
	XN-xDO-24VDC_	140118	**XN-KO/6**
	XN-2DO-R-NO	140119	**XN-KO/8**
	XN-2DO-R-NC	140120	**XN-KO/9**
	XN-2DO-R-CO	140121	**XN-KO/10**
	XN-1AI-I(0/4…20MA) XN-2AI-I(0/4…20MA)	140122	**XN-KO/11**
	XN-1AI-U(-10/0…+10VDC) XN-2AI-U(-10/0…+10VDC) XN-2AI-PT/NI-2/3 XN-2AI-THERMO-PI XN-4AI-U/I	140123	**XN-KO/12**
	XN-1AO-I(0/4…20MA) XN-2AO-I(0/4…20MA)	140124	**XN-KO/13**
	XN-2AO-U(-10/0…+10VDC)	140125	**XN-KO/14**
	XN-1CNT-24VDC XN-1RS232 XN-1RS485/422 XN-1SSI	140126	**XN-KO/15**
	XN-BR-24VDC-D XN-PF-24VDC-D	140127	**XN-KO/16**
	XN-PF-120/230VAC-D	140128	**XN-KO/17**

Relay Jumper

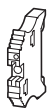
Relay Jumpers

Description	Style Number	Catalog Number
1-grid	140097	**XN-QV/1**
2-grid	140098	**XN-QV/2**
3-grid	140099	**XN-QV/3**
4-grid	140100	**XN-QV/4**
5-grid	140101	**XN-QV/5**
6-grid	140102	**XN-QV/6**
7-grid	140103	**XN-QV/7**
8-grid	140104	**XN-QV/8**

Servicing Cable

Description	Style Number	Catalog Number
Establishes the connection between I/O assistant and the service interface at the gateway	140096	**XN-PS2-CABLE**

End Bracket



End Bracket

Description	Style Number	Catalog Number
For fixing the XI/ON station on the top-hat rail. Two end brackets are supplied as standard with the gateways	140130	**XN-WEW-35/2-SW**

End Cover

End Cover

Description	Style Number	Catalog Number
For covering an XI/ON station. An end cover is supplied with the gateway as standard	140129	**XN-ABPL**

Connection Level Labels

Connection Level Labels

Description	Style Number	Catalog Number
Blue	140105	**XN-ANBZ-BL**
Red	140106	**XN-ANBZ-RT**
Green	140107	**XN-ANBZ-GN**
Black	140108	**XN-ANBZ-SW**
Brown	140109	**XN-ANBZ-BR**
Red/blue	140110	**XN-ANBZ-RT/BL-BED**
Yellow/green	140111	**XN-ANBZ-GN/GE-BED**
White	140112	**XN-ANBZ-WS**

Labels

Description	Style Number	Catalog Number
A5 sheet, perforated, 1 x 57 labels	140131	**XN-LABEL/SCHEIBE**
A5 sheet, perforated, 1 x 6 labels	140132	**XN-LABEL/BLOCK**

Technical Data and Specifications

XI/ON General

Description	Unit	Specification
Standards		EN 61000-6-2, EN 61000-6-4, EN 61131-2
Supported fieldbus systems		PROFIBUS-DP, CANopen, DeviceNet, Modbus TCP, EtherNet/IP (depending on gateway)
Potential isolation		Yes, through optocoupler
Ambient temperature	°F (°C)	32° to 131° (0° to 55°)
Ambient temperature, storage	°F (°C)	–13° to 185° (–25° to 85°)
Relative humidity	%	5–95 (indoor), Level RH-2, non-condensing (for storage at 45°C)
Harmful gases		
SO_2	ppm	10 (relative humidity <75%, non-condensing)
H_2S	ppm	1.0 (relative humidity <75%, non-condensing)
Vibration resistance, operating conditions		According to IEC 60068-2-6
Mechanical shock resistance		According to IEC 60068-2-27
Repetitive shock resistance		According to IEC 60068-2-29
Drop and free fall		According to IEC 60068-2-31, free fall to IEC 60068-2-32
Protection type		IP20
Electromagnetic compatibility (EMC)		
ESD		EN 61000-4-2
Electromagnetic fields		EN 61000-4-3
Burst		EN 61000-4-4
Surge		EN 61000-4-5
HF, asymmetric		EN 61000-4-6
Radiated interference (RFI)		EN 55016-2-3
Voltage fluctuations		EN 61131-2
Type test		To EN 61131-2
Approvals		CE, cUL

Terminals

Description	Unit	XN Gateways and XN Basic Modules	XNE Gateways and Integrated XNE Modules
Dimensional data		To VDE 0611 Part 1/8.92/ IEC/EN 60947-7-1	To VDE 0611 Part 1/8.92/ IEC/EN 60947-7-1
Connection from above		Spring-loaded/screw terminals	Push-in spring-cage terminals
Cable stripped length	mm	8	8
Max. terminal capacity	mm^2	0.5–2.5	0.14–1.5
Connectable conductors			
"e" solid H07V-U	mm^2	0.5–2.5	0.25–1.5
"f" flexible H 07V-K	mm^2	0.5–1.5	0.25–1.5
"f" with ferrule without plastic collar to DIN 46228-1 (ferrules gas-tight)	mm^2	0.5–1.5	0.25–1.5
"f" with ferrule with plastic collar to DIN 46228-1 (ferrules gas-tight)	mm^2	0.5–1.5	0.25–0.75
Gauge pin IEC/EN 60947-1		A1	A1

XNE Gateways

Description	Unit	XNE-GWBR-PBDP	XNE-GWBR-CANOPEN	XNE-GWBR-2ETH-IP
Fieldbus		PROFIBUS-DP	CANopen	Ethernet
Protocol		PROFIBUS-DPV0 and PROFIBUS-DPV1	CANopen	EtherNet/IP
Maximum number of stations		48 modules (XN, XNE) of slice design or max. length of station: 1m	62 modules (XN, XNE) of slice design or max. length of station: 1m	74 modules (XN, XNE) of slice design or max. length of station: 1m
System supply (U_{SYS})	Vdc	24/5	24/5	24/5
Permissible range, 5 Vdc (U_{SYS})	Vdc	4.7–5.3	4.7–5.3	4.7–5.3
Permissible range, 24 Vdc (U_{SYS})	Vdc	18–30	18–30	18–30
Field voltage (U_L)	Vdc	24	24	24
Permissible range (U_L)	Vdc	18–30	18–30	18–30
Ripple	%	<5 (to EN 61131-2)	<5 (to EN 61131-2)	<5 (to EN 61131-2)
Servicing interface		PS/2 socket	PS/2 socket	Mini USB
Fieldbus terminals		Push-in spring-cage terminals	Push-in spring-cage terminals	2x RJ45 socket
Transfer rate	kBit/s	9.6–12,000	20, 50, 125, 250, 500, 800, 1000	10,000, 100,000
Data transfer rate setting		Automatic	Through DIP switch or automatically	Automatic
Address assignment		Through DIP switch	Through DIP switch	Through DIP switch, BootP, DHCP or PGM
Fieldbus termination		Through DIP switch	Through DIP switch	—
Number of parameter bytes		2	—	—
Number of diagnosis bytes		2	—	—
Address range		1–125 decimal	1–63 decimal	1–254 decimal

XN Gateways with Built-In Supply Module

Description	Unit	XN-GWBR-PBDP	XN-GWBR-CANOPEN	XN-GWBR-DNET	XN-GWBR-MODBUS-TCP	XN-PLC-CANOPEN
Fieldbus		PROFIBUS-DP	CANopen	DeviceNet	Ethernet	CANopen
Protocol		PROFIBUS-DPV0	CANopen	DeviceNet	Modbus-TCP	CANopen
Maximum number of stations		74 modules (XN, XNE) of slice design or max. length of station: 1m	74 modules (XN, XNE) of slice design or max. length of station: 1m	74 modules (XN) of slice design or max. length of station: 1m	74 modules (XN, XNE) of slice design or max. length of station: 1m	74 modules (XN, XNE with limitations) of slice design or max. length of station: 1m
System supply (U_{SYS})	Vdc	24/5	24/5	24/5	24/5	24/5
Permissible range, 5 Vdc (U_{SYS})	Vdc	4.7–5.3	4.7–5.3	4.7–5.3	4.7–5.3	4.7–5.3
Permissible range, 24 Vdc (U_{SYS})	Vdc	18–30	18–30	18–30	18–30	18–30
Field voltage (U_L)		24	24	24	24	24
Permissible range (U_L)	Vdc	18–30	18–30	18–30	18–30	18–30
Ripple	%	<5 (to EN 61131-2)	<5 (to EN 61131-2)	<5 (to EN 61131-2)	<5 (to EN 61131-2)	<5 (to EN 61131-2)
Servicing interface		PS/2 socket	PS/2 socket	PS/2 socket	PS/2 socket	PS/2 socket
Fieldbus terminals		1 x D-sub 9-pin socket	Open style connector	Open style connector	RJ45 bus	Open style connector
Transfer rate	kBit/s	9.6–12,000	10, 20, 50, 125, 250, 500, 800, 1000	125, 250, 500	10,000, 100,000	10, 20, 50, 125, 250, 500, 800, 1000
Data transfer rate setting		—	Through DIP switch	Through DIP switch	Automatic	Software
Address assignment		2 decimal rotary coding switches	2 decimal rotary coding switches	2 decimal rotary coding switches	Decimal rotary coding switch, BootP, DHCP or I/Oassistant	Software
Fieldbus termination		External	External	External	—	External
Number of parameter bytes		5	—	—	—	—
Number of diagnosis bytes		3	—	—	—	—
Address range		1–99 decimal	1–99 decimal	1–63 decimal	1–254 decimal	1–127 decimal
Program data	kByte	—	—	—	—	128
Program code	kByte	—	—	—	—	128
Cycle time for 1k of instructions (bits, bytes)	ms	—	—	—	—	0.5
Real-time clock		—	—	—	—	Yes

Supply Modules

Description	Unit	XN-BR-24VDC-D	XN-PF-24VDC-D	XN-PF-120/230VAC-D
Operating voltage		24 Vdc	24 Vdc	120/230 Vac
System supply (U_{SYS})	Vdc	24	—	—
Permissible range, 24 Vdc (U_{SYS})	Vdc	18–30 ①	—	—
Permissible range, 5 Vdc (U_{MB} [built into system])	Vdc	4.7–5.3	—	—
Field voltage (U_L)		24 Vdc	24 Vdc	120/230 Vac
Permissible range (U_L)		18–30 Vdc	18–30 Vdc ②	102–132 Vac (120 Vac) 195.5–253 Vac (230 Vac) ③
Rated current drawn from module bus (I_{MB})	mA	—	≤28	≤25
Insulation test (U_i)	Vac	500	500	1500
Ripple	%	<5 (to EN 61131-2)	<5 (to EN 61131-2)	<5 (to EN 61131-2)
Maximum operating current (I_L)	A	10	10	10
Maximum system supply current (I_{MB})	A	1.5	—	—
Number of diagnostic bits		4	4	4
Base module without gateway power supply				
Without C connection		XN-P3…-SBB/XN-P3…-SBB-B	XN-P3…-SBB	XN-P3…-SBB
With C connection		XN-P4…-SBBC/XN-P4…-SBBC-B	XN-P4…-SBBC	XN-P4…-SBBC

Digital Input Modules

Description	Unit	XN-2DI-24VDC-P	XN-2DI-24VDC-N	XN-2DI-120/230VAC	XN-4DI-24VDC-P	XN-4DI-24VDC-N
Channels	Number	2	2	2	4	4
Rated voltage at supply terminal (U_L)		24 Vdc	24 Vdc	120/230 Vac	24 Vdc	24 Vdc
Rated current drawn from supply terminal (I_L) ④⑤	mA	≤20	≤20	≤20	≤40	≤40
Rated current drawn from module bus (I_{MB}) ⑤	mA	≤28	≤28	≤28	≤29	≤28
Insulation test (U_i)	Vac	500	500	1500	500	500
Heat dissipation	W	0.7	0.7	1	1	1
Input voltage						
Input voltage, rated value		24 Vdc	24 Vdc	120/230 Vac	24 Vdc	24 Vdc
Low level		–30V to 5V	30V (U_L–11V)	0–20 Vac	–30V to 5V	30V (U_L–11V)
High level		11–30V	0–5V	79 Vac–265 Vac ⑥	15 V–30V	0–5V
Frequency range	Hz	—	—	48–63	—	—
Input current						
Low level/active level		0 mA–1.5 mA	0 mA–1.7 mA	0 mA–1 mA	0 mA–1.5 mA	0 mA–1.2 mA
High level/active level		2 mA–10 mA	1.8 mA–10 mA	3 mA–10 mA	2 mA–10 mA	1.3 mA–6 mA
Input delay						
$t_{rising\ edge}$	µs	<200	<200	<20,000	<200	<200
$t_{falling\ edge}$	µs	<200	<200	<20,000	<200	<200
Basic modules						
Without C connection		XN-S3…-SBB 2-conductor proximity switches (Bero®) can be connected, with a permissible quiescent current of up to 1.5 mA		XN-S3…-SBB	XN-S4…-SBBS XN-S6…-SBBSBB	XN-S4…-SBBS XN-S6…-SBBSBB
With C connection		XN-S4…-SBBC	XN-S4…-SBBC	XN-S4…-SBBC	—	—

Notes

① Permissible range for system supply: for U_{SYS} = 24 Vdc: 18 to 30 Vdc (to EN 61131-2).
② Permissible range for field voltage U_L: to EN 61131-2 (18 to 30 Vdc).
③ Permissible range for rated voltage and field voltage U_L: to EN 61131-2.
④ The supply terminal (U_L) provides power for the module electronics and for the sensors at the inputs. The total current required for each module consists of the sum of all partial currents.
⑤ Part of the XI/ON module's electronics is supplied with module bus voltage (5 Vdc), the other part through the supply terminal (U_L).
⑥ Maximum permissible capacity: 141 nF at 79 Vac/50 Hz; 23 nF at 265 Vac/50 Hz.

Digital Input Modules, continued

Description	Unit	XN-16DI-24VDC-P	XN-32DI-24VDC-P	XNE-8DI-24VDC-P	XNE-16DI-24VDC-P
Channels	Number	16	32	8	16
Rated voltage at supply terminal (U_L)	Vdc	24	24	24	24
Rated current drawn from supply terminal (I_L) ①②	mA	≤40	≤30	≤1.5	≤3
Rated current drawn from module bus (I_{MB}) ②	mA	≤45	≤30	≤15	≤15
Insulation test (U_i)	Vac	500	500	500	500
Heat dissipation	W	2.5	4.2	<1.5	<2.5
Input voltage					
Input voltage, rated value	Vdc	24	24	24	24
Low level		–30V to 5V	–30V to 5V	$-U_L$ to 5V	$-U_L$ to 5V
High level		15V–30V	15V–30V	11V–U_L	11V–U_L
Frequency range	Hz	—	—	—	—
Input current					
Low level/active level		0 mA–1.5 mA	0 mA–1.5 mA	–1 mA–1.5 mA	–1 mA–1.5 mA
High level/active level		2 mA–10 mA	2 mA–10 mA	2 mA–5 mA	2 mA–5 mA
Input delay					
$t_{rising\ edge}$	µs	<200	<200	<100	<150
$t_{falling\ edge}$	µs	<200	<200	<200	<300
Basic modules					
Without C connection		XN-B3…-SBB	XN-B6…-SBBSBB	Already built in	Already built in
With C connection		XN-B4…-SBBC	—	—	—

Notes

① The supply terminal (U_L) provides power for the module electronics and for the sensors at the inputs. The total current required for each module consists of the sum of all partial currents.

② Part of the XI/ON module's electronics is supplied with module bus voltage (5 Vdc), the other part through the supply terminal (U_L).

Digital Output Modules

Description	Unit	XN-2DO-24VDC-0.5A-P	XN-2DO-24VDC-0.5A-N	XN-2DO-120/230VAC-0.5A	XN-2DO-24VDC-2A-P	XN-4DO-24VDC-0.5A-P
Channels	Number	2	2	2	2	4
Rated voltage at supply terminal (U_L)		24 Vdc	24 Vdc	120/230 Vac (45–65 Hz)	24 Vdc	24 Vdc
Rated current drawn from supply terminal (for 0 mA load current) (I_L) ①	mA	≤20	≤20	≤20	≤50	≤25
Rated current drawn from module bus (I_{MB}) ②	mA	≤32	≤32	≤35	≤33	≤30
Insulation test (U_i)	Vac	500	500	1500	500	500
Heat dissipation	W	Normally 1	Normally 1	Normally 1	Normally 1	Normally 1
Output voltage						
High level		>U_L–1 Vdc	<GND_L +1 Vdc	>U_L–2 Vac, (zero-point switching triac)	>U_L–1 Vdc	>U_L–1 Vdc
Output current						
High level (rated)	A	0.5	0.5	0.5 ③	2	0.5
High level (permissible range)	A	<0.6	<0.6	0.02–0.5	<2.4	<0.6
Low level	mA	—	—	<1.5	—	—
Back-up fuse		—	—	500 mA FF	—	—
Surge current (I_S)	A	—	—	8 (1 period at 60 Hz)	—	—
Number of parallel-switchable outputs (maximum)		—	—	—	—	4
Total module current	A	1	1	1	4	2
Delay for signal changeover, resistive load						
From Low to High level	µs	<100	<100	<T/2 +1 ms	<100	<250
From High to Low level	µs	<100	<100	<T/2 +1 ms	<100	<250
Load resistance range		>48 ohm	>48 ohm	At 120 Vac: 240 ohm to 6 kohm At 230 Vac: 460 ohm to 11.5 kohm	<12 ohm	>48 ohm
Utilization factor (%)	g	100	100	100 (observe derating)	100	100
The following can be connected:				Resistive loads/Inductive loads/Lamp loads		
Resistive load	ohm	>48	>48	—	>12	>48
Inductive load	H	<1.2	<1.2	—	<1.2	<1.2
Lamp load (R_{LL})	W	<3	<12	—	<6	<6
Switching frequency						
For resistive load (f)	Hz	<5000 (R_{LO} <1 kohm)	<100 (R_{LO} <1 kohm)	—	<5000 (R_{LO} <1 kohm)	<1000 (R_{LO} <1 kohm)
For inductive load	Hz	<2	<2	—	<2	<2
For lamps	Hz	<10	<10	—	<10	<10
Number of diagnostic bits		2	2	—	2	1
Diagnostics		Yes	Yes	No	Yes	Yes
Outputs to EN 61131-1		Protected	Protected	—	Protected	Short-circuit proof
Retriggering after elimination of short circuit (I_i)		Self-acting	Self-acting	—	Self-acting	Self-acting
Basic modules						
With C connection		XN-S3…-SBC XN-S4…-SBCS	XN-S3…-SBC XN-S4…-SBCS	XN-S3…-SBC XN-S4…-SBCS	XN-S3…-SBC XN-S4…-SBCS	XN-S4…-SBCS XN-S4…-SBCSBC

Notes

① The supply terminal (U_L) provides power for the module electronics and for the consumers at the outputs. The total current required for each module consists of the sum of all partial currents.

② Part of the XI/ON module's electronics is supplied with module bus voltage (5 Vdc), the other part through the supply terminal (U_L).

③ To increase the maximum output current to up to 1A, two outputs can be connected in parallel.

Digital Output Modules, continued

Description	Unit	XN-16DO-24VDC-0.5A-P	XN-32DO-24VDC-0.5A-P	XNE-8DO-24VDC-0.5A-P	XNE-16DO-24VDC-0.5A-P
Channels	Number	16	32	8	16
Rated voltage at supply terminal (U_L)	Vdc	24	24	24	24
Rated current drawn from supply terminal (for 0 mA load current) (I_L) ①	mA	≤30	≤50	≤3 (all outputs OFF)	≤3 (all outputs OFF)
Rated current drawn from module bus (I_{MB}) ②	mA	≤120	≤30	≤15	≤25
Insulation test (U_i)	Vac	500	500	500	500
Heat dissipation	W	Normally 4	Normally 5	Normally 1.5	Normally 2.5
Output voltage					
High level	Vdc	>U_L–1	>U_L–1	>U_L–1	>U_L–1
Output current					
High level (rated)	A	0.5	0.5	0.5 ③	0.5 ③
High level (permissible range)	A	<0.6	<1.0	<1.0	<1.0
Low level	mA	—	—	—	—
Back-up fuse		—	—	—	—
Surge current (I_S)	A	—	—	—	—
Number of parallel-switchable outputs (maximum)		—	2	—	—
Total module current	A	8	10	4	4
Delay for signal changeover, resistive load					
From Low to High level	µs	<100	<300	<300	<300
From High to Low level	µs	<100	<300	<300	<300
Load resistance range		>48 ohm	>48 ohm	>48 ohm	>48 ohm
Utilization factor (%)	g	100	See total module current	100	50%, max. 4A
The following can be connected:			Resistive loads/Inductive loads/Lamp loads		
Resistive load	ohm	>48	>48	>48	>48
Inductive load	H	<1.2	<1.2	As for DC13 to IEC 60947-5-1	As for DC13 to IEC 60947-5-1
Lamp load (R_{LL})	W	<3	<6	<6	<6
Switching frequency					
For resistive load (f)	Hz	<100 (R_{LO} <1 kohm)	<100 (R_{LO} <1 kohm)	<100	<100
For inductive load	Hz	—	—	As for DC13 to IEC 60947-5-1	As for DC13 to IEC 60947-5-1
For lamps	Hz	—	—	<10	<10
Number of diagnostic bits		4	8	—	—
Diagnostics		Yes	Yes	—	—
Outputs to EN 61131-1		Short-circuit proof	Short-circuit proof	Short-circuit proof	Short-circuit proof
Retriggering after elimination of short circuit (I_i)		Self-acting	Self-acting	Self-acting	Self-acting
Basic modules					
With C connection		XN-B3…-SBC	XN-B6…-SBCSBC	Already built in	Already built in

Notes

① The supply terminal (U_L) provides power for the module electronics and for the consumers at the outputs. The total current required for each module consists of the sum of all partial currents.

② Part of the XI/ON module's electronics is supplied with module bus voltage (5 Vdc), the other part through the supply terminal (U_L).

③ To increase the maximum output current to up to 1A, two outputs can be connected in parallel.

Analog Input Modules

Description	Unit	XN-1AI-I(0/4…20MA)	XN-2AI-I(0/4…20MA)	XN-1AI-U(-10/0…+10VDC)	XN-2AI-U(-10/0…+10VDC)
Measured variables		Current	Current	Voltage	Voltage
Channels	Number	1	2	1	2
Rated voltage at supply terminal (U_L)	Vdc	24	24	24	24
Rated current drawn from supply terminal (I_L) ①②	mA	≤50	≤12	≤50	≤12
Rated current drawn from module bus (I_{MB}) ②	mA	≤41	≤35	≤41	≤35
Heat dissipation	W	<1	<1	<1	<1
Sensor/transmitter supply		Bridged with U_L and GND_L of incoming unit; not protected	≤250 mA; bridged with U_L and GND_L of incoming unit; not protected	Bridged with U_L and GND_L of incoming unit; not protected	≤250 mA; bridged with U_L and GND_L of incoming unit; not protected
Voltage measurement					
Measurement ranges		—	—	–10 to 10 Vdc/0 to 10 Vdc	–10 to 10 Vdc/0 to 10 Vdc
Value representation		—	—	Standard, 16-bit/12-bit left-aligned	Standard, 16-bit/12-bit left-aligned
The following can be connected:		—	—	2-/3-/4-conductor + shield	2-/3-conductor + shield
Maximum input voltage ($U_{max.}$)	Vdc	—	—	35	35
Input resistance (R_L)	kohm	—	—	≥98.5	≥98.5
Limiting frequency (f_G)	Hz	—	—	200	50
Basic error limit at 23°C	%	—	—	<0.2	<0.2
Temperature coefficient		—	—	≤300 ppm/°C of full-scale value	≤150 ppm/°C of full-scale value
Current measurement					
Measurement ranges	mA	0–20/4–20	0–20/4–20	—	—
Value representation		Standard, 16-bit/12-bit (left-aligned)	Standard, 16-bit/12-bit (left-aligned)	—	—
The following can be connected:		2-/3-/4-conductor + shield	2-/3-conductor + shield	—	—
Maximum input current ($I_{max.}$)	mA	50	50	—	—
Input resistance (R_L)	ohm	<125 ohm	<125 ohm	—	—
Limiting frequency (f_G)	Hz	200	50	—	—
Basic error limit at 23°C	%	<0.2	<0.2	—	—
Temperature coefficient		≤300 ppm/°C of full-scale value	≤300 ppm/°C of full-scale value	—	—
Temperature measurement					
Connectable sensors		—	—	—	—
Measurement ranges		—	—	—	—
Value representation		—	—	—	—
The following can be connected:		—	—	—	—
Measuring current (I_{mess})		—	—	—	—
Destruction limit ($U_{max.}$)	Vdc	—	—	—	—
Basic error limit at 23°C	%	—	—	—	—
Temperature coefficient		—	—	—	—
R (resistance measurement)					
Measurement ranges		—	—	—	—
Value representation		—	—	—	—
The following can be connected:		—	—	—	—
Destruction limit ($U_{max.}$)	Vdc	—	—	—	—
Limiting frequency (f_G)	Hz	—	—	—	—
Basic error limit at 23°C	%	—	—	—	—
Temperature coefficient		—	—	—	—
Basic modules					
Without C connection		XN-S3…-SBB	XN-S3…-SBB	XN-S3…-SBB	XN-S3…-SBB
Without C connection, for sensor supply		XN-S4…-SBBS	XN-S4…-SBBS	XN-S4…-SBBS	XN-S4…-SBBS

Notes

① The supply terminal (U_L) provides power for the module electronics and for the analog transmitters at the inputs. The total current required for each module consists of the sum of all partial currents.
② Part of the XI/ON module's electronics is supplied with module bus voltage (5 Vdc), the other part through the supply terminal (U_L).

Analog Input Modules, continued

Description	Unit	XN-4AI-U/I	XN-2AI-THERMO-PI	XN-2AI-PT/NI-2/3	XNE-8AI-U/I-4PT/NI
Measured variables		Voltage, current	Temperature (thermocouples)	Temperature PT, NI resistance R	Voltage, current, temperature PT, NI resistance R
Channels	Number	4	2	2	8 (U/I)/4 (PT/NI/R)
Rated voltage at supply terminal (U_L)	Vdc	24	24	24	24
Rated current drawn from supply terminal (I_L) ①②	mA	≤20	≤30	≤30	Normally 35
Rated current drawn from module bus (I_{MB}) ②	mA	≤50	≤45	≤45	≤30
Heat dissipation	W	<1	<1	<1	<1.5
Sensor/transmitter supply		—	—	—	—
Voltage measurement					
Measurement ranges		–10 to 10 Vdc/0 to 10 Vdc	–50 to 50 mV, –100 to 100 mV –500 to 500 mV, –1,000 to 1,000 mV	—	–10 to 10 Vdc/0 to 10 Vdc
Value representation		Standard, 16-bit/12-bit (left-aligned)	Standard, 16-bit/12-bit (left-aligned)	—	Standard, 16-bit/12-bit (left-aligned) Extended range, 16-bit/12-bit (left-aligned) PA (NE43), 16-bit/12-bit (left-aligned)
The following can be connected:		2-conductor + shield	2-conductor	—	2-conductor
Maximum input voltage ($U_{max.}$)	Vdc	30	10	—	±20
Input resistance (R_L)	kohm	≥98.5	—	—	≥200
Limiting frequency (f_G)	Hz	20	—	—	1.5
Basic error limit at 23°C	%	<0.3	<0.2 (normally)	—	<0.2
Temperature coefficient		≤300 ppm/°C of full-scale value	≤300 ppm/°C of full-scale value	—	≤200 ppm/°C of full-scale value
Current measurement					
Measurement ranges	mA	0–20/4–20	—	—	0–20/4–20
Value representation		Standard, 16-bit/12-bit (left-aligned)	—	—	Standard, 16-bit/12-bit (left-aligned) Extended range, 16-bit/12-bit (left-aligned) PA (NE43), 16-bit/12-bit (left-aligned)
The following can be connected:		2-conductor + shield	—	—	2-conductor
Maximum input current ($I_{max.}$)	mA	50	—	—	40 (Max. input voltage: <17V)
Input resistance (R_L)	ohm	<62	—	—	<52
Limiting frequency (f_G)	Hz	20	—	—	1.5
Basic error limit at 23°C	%	<0.3	—	—	<0.2
Temperature coefficient		≤300 ppm/°C of full-scale value	—	—	≤200 ppm/°C of full-scale value
Temperature measurement					
Connectable sensors		—	Thermocouple type B, E, J, K, N, R, S, T to IEC 584, Class 1, 2, 3	PT100 RTD, PT200, PT500, PT100 RTD0 (EN 60751) NI100, NI1000 (DIN 43760)	PT100 RTD, PT200, PT500, PT100 RTD0 (all: EN 60751) NI100, NI1000 (DIN 43760), NI1000TK5000
Measurement ranges		—	Type B: 100 to 1820 °C Type E: –270 to 1000 °C Type J: –210 to 1200 °C Type K: –270 to 1370 °C Type N: –270 to 1300 °C Type R: –50 to 1760 °C Type S: –50 to 1540 °C Type T: –270 to 400 °C	Platinum RTDs: –200 to 850°C/–200 to 150°C Nickel RTDs: –60 to 250°C/–60 to 150°C	Platinum RTDs: –200 to 850°C/–200 to 150°C Nickel RTDs: –60 to 250°C/–60 to 150°C

Notes

① The supply terminal (U_L) provides power for the module electronics and for the analog transmitters at the inputs. The total current required for each module consists of the sum of all partial currents.
② Part of the XI/ON module's electronics is supplied with module bus voltage (5 Vdc), the other part through the supply terminal (U_L).

Analog Input Modules, continued

Description	Unit	XN-4AI-U/I	XN-2AI-THERMO-PI	XN-2AI-PT/NI-2/3	XNE-8AI-U/I-4PT/NI
Temperature measurement, continued					
Value representation		—		Standard, 16-bit/12-bit left-aligned	
The following can be connected:		—	2-conductor (cold-junction compensation in base module)	2-conductor/3-conductor	2-conductor/3-conductor
Measuring current (I_{mess})		—	—	<1 mA	<0.5 mA
Destruction limit ($U_{max.}$)	Vdc	—	—	>30	>30
Basic error limit at 23°C	%	—	<0.2 (type T, –200 to 0°C: 0.6%)	<0.2	PT100 RTD, NI100: 0.35%, PT200, PT500, PT100 RTD0, NI1000, NI1000TK5000: 0.2%
Temperature coefficient		—	≤300 ppm/°C of full-scale value	≤300 ppm/°C of full-scale value	≤200 ppm/°C of full-scale value
R (resistance measurement)					
Measurement ranges		—	—	0–100 ohm, 0–200 ohm, 0–400 ohm, 0–1000 ohm	0–250 ohm, 0–400 ohm, 0–800 ohm, 0–2000 ohm, 0–4000 ohm
Value representation		—	—	Standard, 16-bit/ 12-bit left-aligned	Standard, 16-bit/ 12-bit left-aligned
The following can be connected:		—	—	2-conductor/3-conductor	2-conductor/3-conductor
Destruction limit ($U_{max.}$)	Vdc	—	—	>30	>30
Limiting frequency (f_G)	Hz	—	—	—	1.5
Basic error limit at 23°C	%	—	—	<0.2	<0.2
Temperature coefficient		—	—	≤300 ppm/°C of full-scale value	≤200 ppm/°C of full-scale value
Basic modules					
Without C connection		XN-S6…-SBCSBC	—	XN-S3…-SBB	Already built in
Without C connection, for sensor supply		—	With integrated cold-junction compensation XN-S4…-SBBS-CJ	XN-S4…-SBBS	—

Analog Output Modules

Description	Unit	XN-1AO-I(0/4…20MA)	XN-2AO-I(0/4…20MA)	XN-2AO-U(-10/0…+10VDC)	XNE-4AO-U/I
Measured variables		Current	Current	Voltage	Voltage, current
Channels	Number	1	2	2	4
Rated voltage at supply terminal (U_L)	Vdc	24	24	24	24
Rated current drawn from supply terminal (I_L) ①	mA	≤50	≤50	≤50	≤150
Rated current drawn from module bus (I_{MB}) ①	mA	≤39	≤40	≤43	≤40
Heat dissipation	W	Normally 1	Normally 1	Normally 1	<3
Output Value, Voltage					
Output voltage	Vdc	—	—	–10 to 10 Vdc/0 to 10 Vdc	–10 to 10 Vdc/0 to 10 Vdc
Value representation		—	—	Standard, 16-bit/12-bit (left-aligned)	Standard, 16-bit/12-bit (left-aligned) Extended range, 16-bit/12-bit (left-aligned) PA (NE43), 16-bit/12-bit (left-aligned)
The following can be connected:		—	—	2-conductor + shield	2-conductor
Load resistor					
Resistive load	ohm	—	—	>1000	>1000
Capacitive load	µF	—	—	<1	<1
Transfer frequency	Hz	—	—	<100	<20
Recovery time		—	—		
Resistive load	ms	—	—	<0.1	<1
Inductive load	ms	—	—	<0.5	<2
Capacitive load	ms	—	—	<0.5	<2
Short-circuit current	mA	—	—	≤40	≤40
Basic error limit at 23°C	%	—	—	<0.2	<0.2
Temperature coefficient		—	—	≤300 ppm/°C of full-scale value	≤200 ppm/°C of full-scale value
Output Value, Current					
Output current	mA	0–20/4–20	0–20/4–20	—	0–20/4–20
Value representation		Standard, 16-bit/12-bit (left-aligned)	Standard, 16-bit/12-bit (left-aligned)	—	Standard, 16-bit/12-bit (left-aligned) Extended range, 16-bit/12-bit (left-aligned) PA (NE43), 16-bit/12-bit (left-aligned)
The following can be connected:		2-conductor + shield	2-conductor + shield	—	2-conductor
Load resistor					
Resistive load	ohm	<550	<450	—	<450
Inductive load	µH	<1	<1	—	<1
Transfer frequency	Hz	<200	<200	—	<20
Recovery time					
Resistive load	ms	<0.1	<2	—	<1
Inductive load	ms	<0.5	<2	—	<2
Capacitive load	ms	<0.5	—	—	<2
Short-circuit current	mA	—	—	—	≤40
Basic error limit at 23°C	%	<0.2	<0.2	—	<0.2
Temperature coefficient		≤300 ppm/°C of full-scale value	≤300 ppm/°C of full-scale value	—	≤200 ppm/°C of full-scale value
Basic modules					
Without C connection		XN-S3…-SBB	XN-S3…-SBB	XN-S3…-SBB	Already built in

Note

① Part of the XI/ON module's electronics is supplied with module bus voltage (5 Vdc), the other part through the supply terminal (U_L).

Relay Modules

Description	Unit	XN-2DO-R-NC	XN-2DO-R-NO	XN-2DO-R-CO
Contact type		2 NC	2 N/O	2 change-over contacts
Rated voltage at supply terminal (U_L)	Vdc	24	24	24
Rated current drawn from supply terminal (I_L)	mA	≤20	≤20	≤20
Rated current drawn from module bus (I_{MB})	mA	≤28	≤28	≤28
Insulation test (U_i)	Vac	1500, 500	1500, 500	1500, 500
Heat dissipation	W	Normally 1	Normally 1	Normally 1
The following can be connected:			Resistive loads/Inductive loads/Lamp loads	
Nominal load voltage		230 Vac, 30 Vdc	230 Vac, 30 Vdc	230 Vac, 30 Vdc
Output current for channel/230 Vac				
Maximum continuous current	A	2	2	2
Maximum continuous current, resistive load		5A, load-dependent	5A, load-dependent	5A, load-dependent
Minimum load current	mA	100 at 12 Vdc	100 at 12 Vdc	100 at 12 Vdc
Output current for DC voltage (resistive)			Load limit curve, see **Page V7-T4-95**	
Utilization factor (g)	%	100	100	100
Lifespan at 230 Vac				
At 5A (Operations)	x 10^6	>0.1	>0.1	>0.1
At 0.5A (Operations)	x 10^6	>1	>1	>1
Basic modules				
Without C connection		XN-S4…-SBBS	XN-S4…-SBBS	XN-S4…-SBBS
With C connection		XN-S4…-SBCS	XN-S4…-SBCS	—

Technology Modules

Description	Unit	XN-1CNT-24VDC	XNE-2CNT-2PWM
Rated voltage at supply terminal (U_L)	Vdc	24	24
Rated current drawn from supply terminal (I_L)	mA	≤50 ①	≤20
Rated current drawn from module bus (I_{MB})	mA	≤40	≤50
Heat dissipation	W	<1.3	<3
Power supply of encoders		Output voltage U_L (–0.8V) Output current ≤0.5A, short-circuit proof	Output voltage U_L, GND_L Output current 0.5A, not protected
Digital Inputs			
Input voltage			
Input voltage, rated value	Vdc	24	24
Low level	Vdc	–30 to 5	–30 to 5
High level	Vdc	11 to 30	11 to 30
Input current			
Low level	mA	–8 to 1.5	–1 to 1.5
High level	mA	2 to 10	2 to 10
Minimum pulse width	µs	Filter on: >25 (20 kHz) Filter off: <2.5 (200 kHz)	Filter on: >25 (20 kHz) Filter off: <2.5 (200 kHz)
Counter Modules			
Channels	Number	1	2
Resolution	bit	32	32
Measurement Ranges			
Frequency		0.1 Hz–200 kHz	0.01 Hz–200 kHz (scaleable)
Rotational speed		1–25,000 rpm	Scaleable
Period duration		5 ms to 120s	5 ms to 120s (scaleable)
Counter Modes			
Signal evaluation A, B		Pulse and direction, rotary encoder: single/double/quadruple	Pulse and direction, rotary encoder: single/double/quadruple
Operating mode		Endless count, count once, count periodically	Endless count, count once, count periodically
Hysteresis	bit	8	32
Pulse duration		8-bit/max. 0.51s	32-bit/max. 120s
Synchronization		Once/periodic	Once/periodic
Counter limits		Upper count limit: 0–7FFF FFFF Lower count limit: 8000 0000–FFFF FFFF	Upper count limit: 0–7FFF FFFF Lower count limit: 8000 0000–FFFF FFFF
Measurement Modes			
Signal evaluation A, B		Pulse and direction, single rotary encoder	Pulse and direction, single rotary encoder
Digital Outputs			
Output voltage			
Output voltage, nominal value	Vdc	24	24
Low level	Vdc	≤3	≤3
High level		≥U_L (–1V)	≥U_L (–1V)
Output current			
High level (permissible range)		5 mA to 2A	5 mA to 0.6A
High level (nominal)		≤0.5A (55°C)	0.5A (55°C)
Switching frequency			
For resistive load	Hz	100	20,000/100
For inductive load	Hz	2	—
For lamps	Hz	≤10	—
Lamp load (R_{LL})	W	≤10	—
Output delay	µs	100 (resistive load)	25 (resistive load)
Short-circuit rating		Yes	Yes

Note

① The figures for rated operational current from the supply terminal apply for load current = 0 mA.

Technology Modules, continued

Description	Unit	XN-1CNT-24VDC	XNE-2CNT-2PWM
PWM Module			
Channels	Number	—	2
PWM		—	0.01Hz–20 kHz
Period duration/duty cycle		—	32-bit at 41.6 ns/bit
Pulse duration		—	32-bit at 41.6 ns/bit
Pause time		—	32-bit at 41.6 ns/bit
Output, number of pulses		—	32-bit counter
Pulse output modes		—	Once, endless
General Data			
Diagnostics		1 bit	4 Byte
Parameters		15 bit	16 Byte
Basic Modules			
No C-connection for sensor/transmitter supply		XN-S4…-SBBS	Already built in

Interfaces

Description	Unit	XN-1RS232	XN-1RS485/422	XN-1SSI
Type		RS232	RS485/RS422	SSI
Rated voltage at supply terminal (U_L)	Vdc	24	24	24
Rated current drawn from supply terminal (I_L)	mA	0	≤25	≤25 ①
Rated current drawn from module bus (I_{MB})	mA	≤140	≤60	≤50
Heat dissipation	W	Normally 1	Normally 1	Normally 1
Transfer channels		RxD, TxD, RTS, CTS	RxD, TxD	CL, D
Data buffer				
Receive	Byte	128	128	—
Send	Byte	64	64	—
Connection type				
RS 232		Full-duplex	—	—
RS 485		—	2-wire, half-duplex	—
RS 422		—	2-conductor, half-duplex or 4-conductor, full-duplex	4-conductor, full-duplex (clock output/signal input)
Bit transfer rate		Max. 115200 bits/s (parameterizable), Standard: 9600 bits/s, 7 data bits, odd parity and 2 stop bits	Max. 115200 bits/s (parameterizable), Standard: 9600 bits/s, 7 data bits, odd parity and 2 stop bits	Max. 1 MHz (parameterizable), default settings: 500 kBit/s
Insulation test (U_i)				
Between interface and module bus/ system voltage	V_{eff}	500	500	500
Between interface and field voltage	V_{eff}	500	500	500
Common-mode range	Vdc	–7 to 12	—	—
Cable impedance	ohm	—	120	120
Bus termination	ohm	—	120 (external)	Internal
Cable length	m	Max. 15	Max. 30	Max. 30
Number of diagnosis bytes		1	1	1
Number of parameter bytes		4	4	4
Basic modules				
No C-connection for sensor/transmitter supply		XN-S4…-SBBS	XN-S4…-SBBS	XN-S4…-SBBS

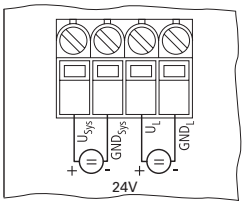
Note

① The figures for rated operational current from the supply terminal apply when there is no sensor/transmitter current.

Connection Diagrams

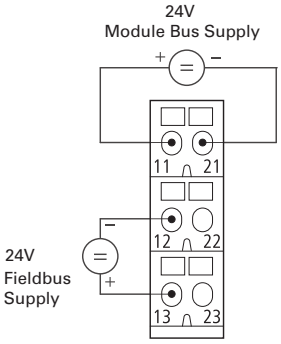
Gateway XN…GWBR_

24V Supply from Gateway (U_L) and System Bus (U_{sys})

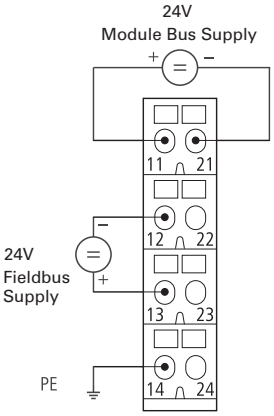


Bus Refreshing Modules

XN-P3x-SBB with Gateway Power Supply
XN-P3…-SBB-B without Gateway Power Supply

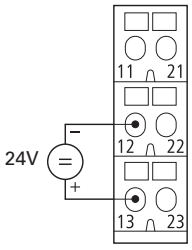


XN-P4…-SBBC with Gateway Power Supply
XN-P4…-SBBC-B without Gateway Power Supply

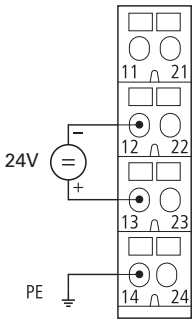


Power Feeding Modules

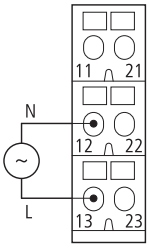
XN-P3…-SBB for XN-PF-24VDC-D



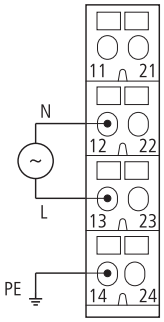
XN-P4…-SBBC for XN-PF-24VDC-D



XN-P3…-SBB for XN-PF-120/230VAC-D

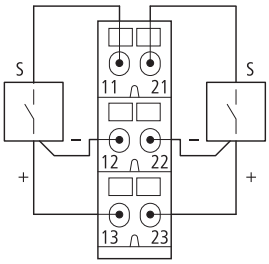


XN-P4…-SBB for XN-PF-120/230VAC-D

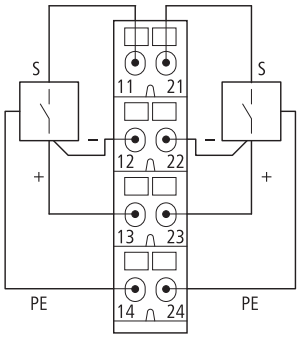


Digital Input Modules

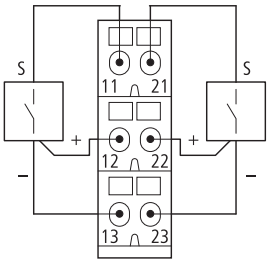
XN-S3...-SBB for XN-2DI-24VDC-P



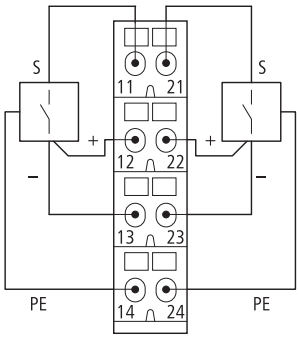
XN-S4...-SBBC for XN-2DI-24VDC-P



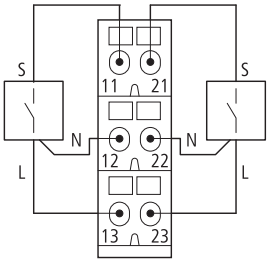
XN-S3...-SBB for XN-2DI-24VDC-N



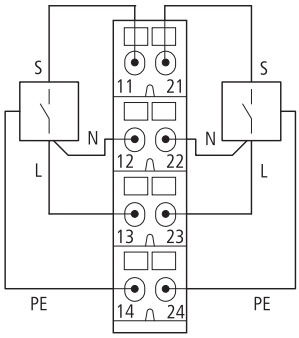
XN-S4...-SBBC for XN-2DI-24VDC-N



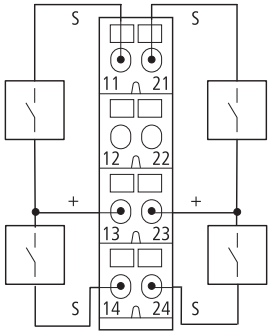
XN-S3...-SBB for XN-2DI-120/230VAC



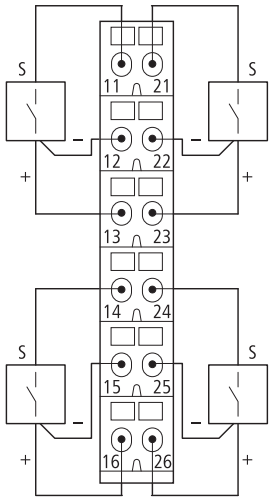
XN-S4...-SBBC for XN-2DI-120/230VAC



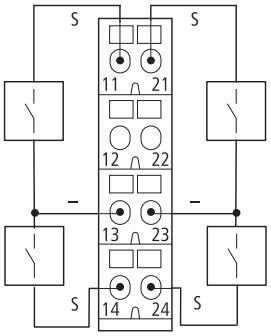
XN-S4...-SBBS for XN-4DI-24VDC-P



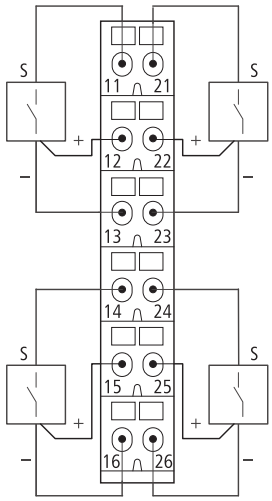
XN-S6...-SBBSBB for XN-4DI-24VDC-P



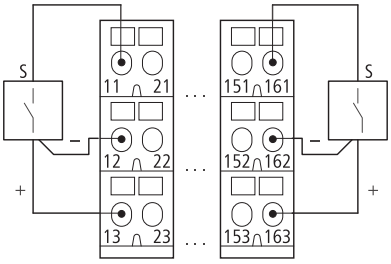
XN-S4...-SBBS for XN-4DI-24VDC-N



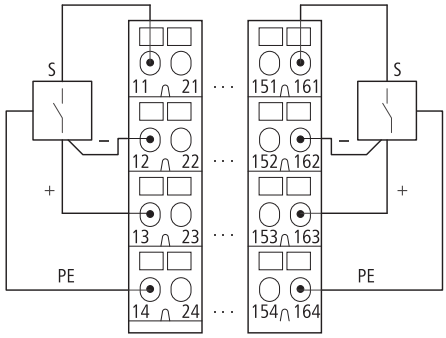
XN-S6...-SBBSBB for XN-4DI-24VDC-N



XN-B3...-SBB for XN-16DI-24VDC-P

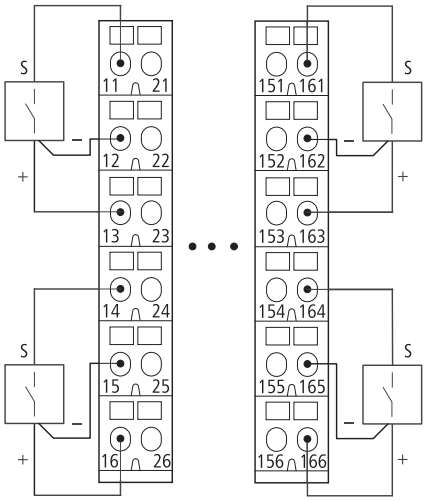


XN-B4...-SBBC for XN-16DI-24VDC-P

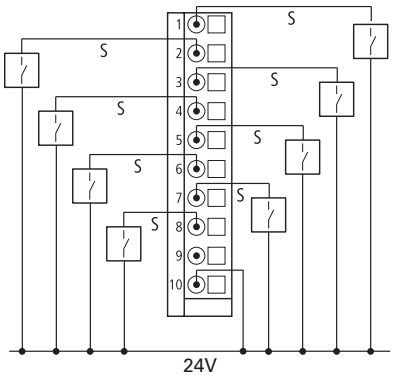


4

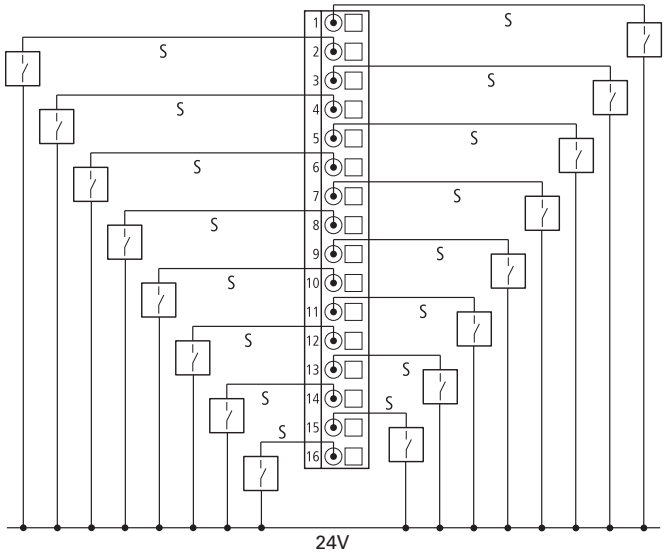
XN-B6...-SBBSBB for XN-32DI-24VDC-P



XNE-8DI-24VDC-P

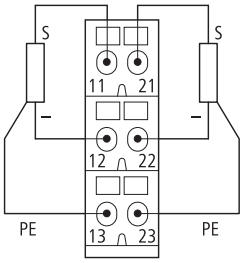


XNE-16DI-24VDC-P

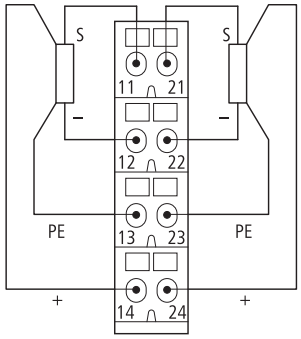


Digital Output Modules

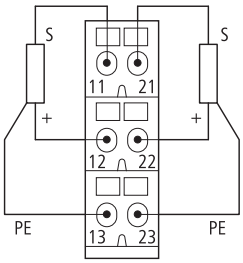
XN-S3...-SBC for XN-2DO-24VDC-0.5A-P and XN-2DO-24VDC-2A-P



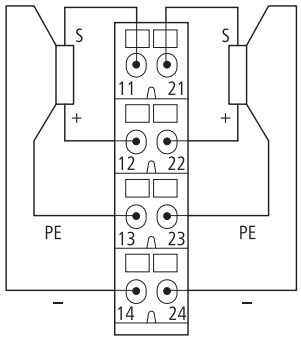
XN-S4...-SBCS for XN-2DO-24VDC-0.5A-P and XN-2DO-24VDC-2A-P



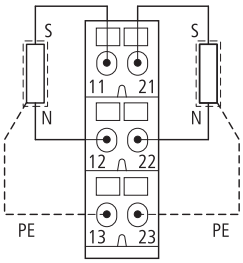
XN-S3...-SBC for XN-2DO-24VDC-0.5A-N



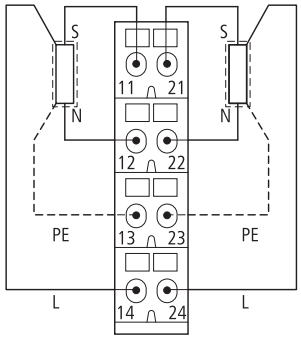
XN-S4...-SBCS for XN-2DO-24VDC-0.5A-N



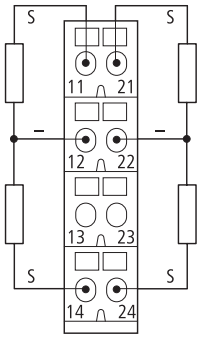
XN-S3...-SBC for XN-2DO-120/230VAC-0.5A



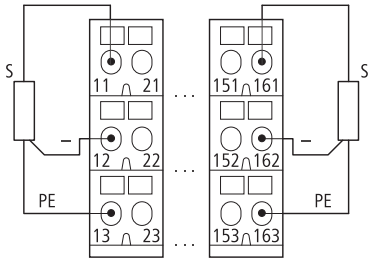
XN-S4...-SBCS for XN-2DO-120/230VAC-0.5A



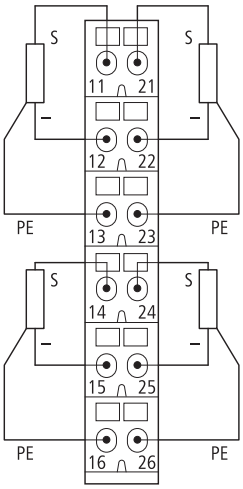
XN-S4...-SBCS for XN-4DO-24VDC-0.5A-P



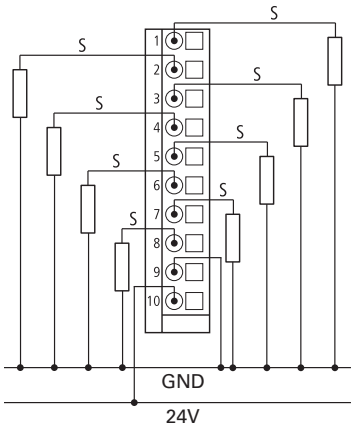
XN-B3...-SBC for XN-16DO-24VDC-0.5A-P



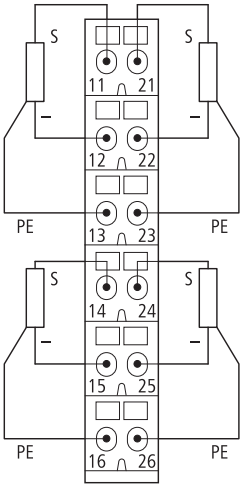
XN-S6...-SBCSBC for XN-4DO-24VDC-0.5A-P



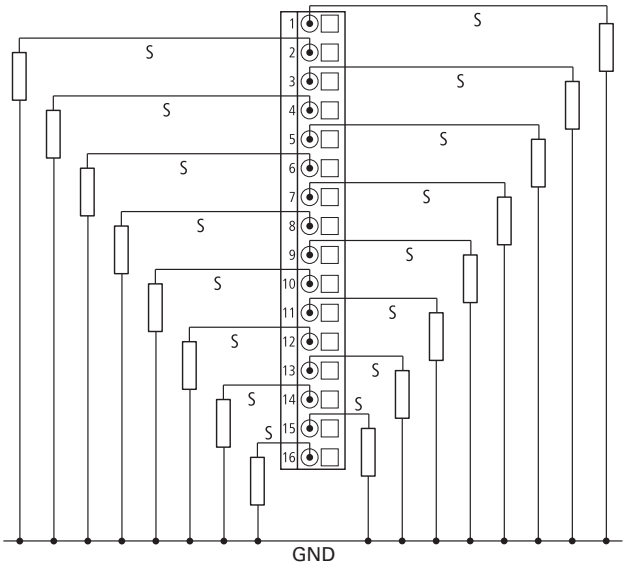
XNE-8DO-24VDC-0.5A-P



XN-B6...-SBCSBC for XN-32DO-24VDC-0.5A-P

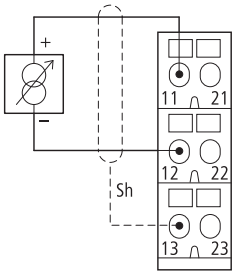


XNE-16DO-24VDC-0.5A-P

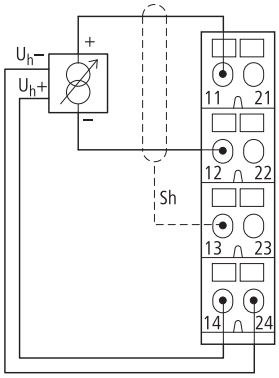


Analog Input Modules

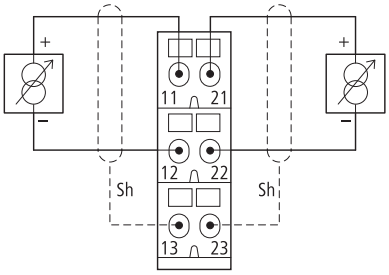
XN-S3...-SBB for XN-1AI-I(0/4...20MA)
XN-S3...-SBB for XN-1AI-U(-10/0...+10VDC)
Analog Sensor/Transmitter, without Transmitter Supply



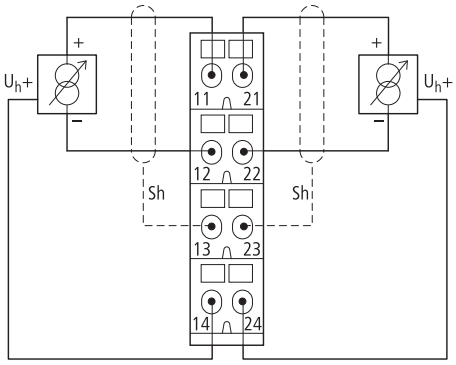
XN-S4...-SBBS for XN-1AI-I(0/4...20MA)
XN-S4...-SBBS for XN-1AI-U(-10/0...+10VDC)
Analog Transmitter with Non-Isolated Transmitter Supply



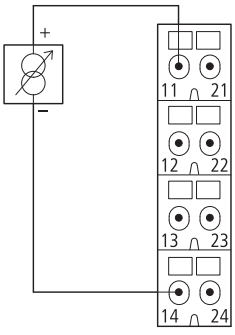
XN-S3...-SBB for XN-2AI-I(0/4...20MA),
XN-2AI-U(-10/0...+10VDC)
Analog Sensor/Transmitter, without Transmitter Supply



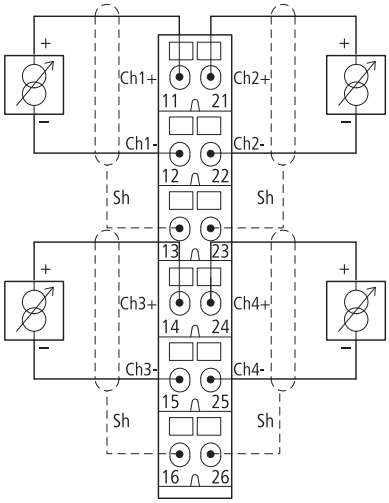
XN-S4...-SBBS for XN-2AI-I(0/4...20MA),
XN-2AI-U(-10/0...+10VDC)
Analog Transmitter with Non-Isolated Transmitter Supply



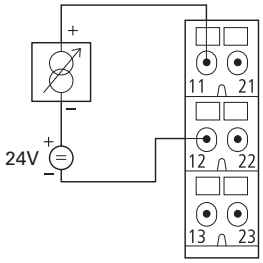
XN-S4...-SBBS for XN-2AI-I(0/4...20MA)
Two-Conductor Connection without
External Transmitter Supply



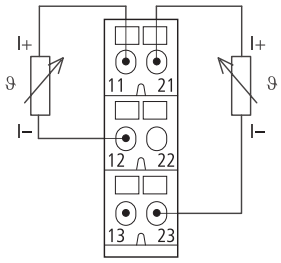
XN-S6...-SBCSBC for XN-4AI-U/I Analog Sensor/Transmitter, without Transmitter Supply



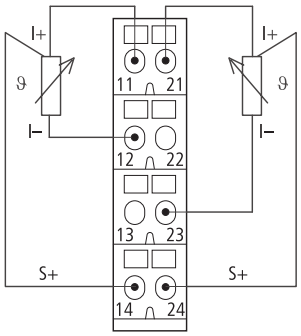
XN-S3...-SSB for XN-AI-U/I Two-Conductor Connection without External Transmitter Supply



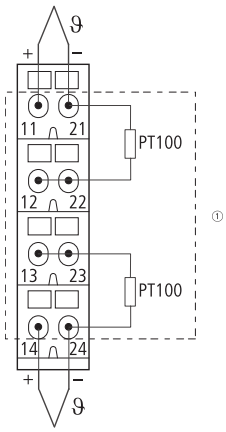
XN-S3...-SBB for XN-2AI-PT/NI-2/3 Two-Conductor Connection



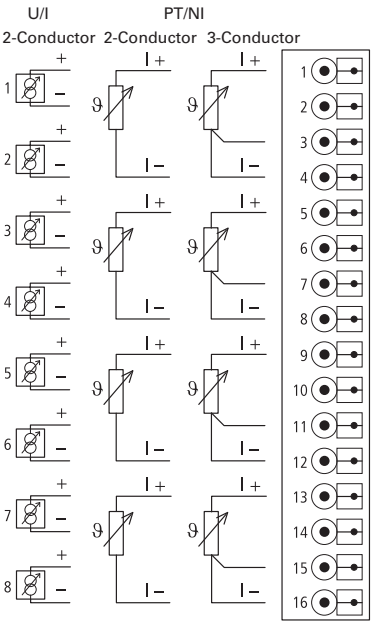
XN-S4...-SBBS for XN-2AI-PT/NI-2/3 Three-Conductor Connection



XN-S4...-SBBS-CJ for XN-2AI-THERMO-PI



XNE-8AI-U/I-4PT/NI

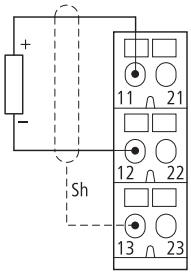


Note

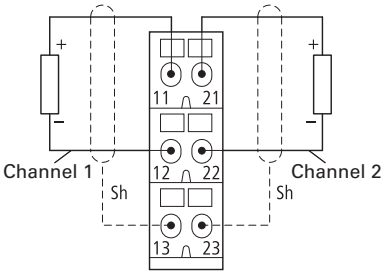
① Cold-junction compensation in base module.

Analog Output Modules

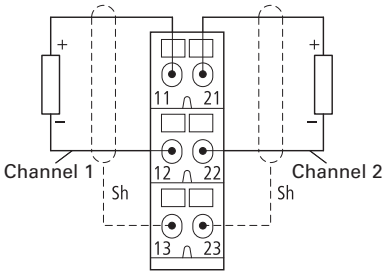
XN-S3...-SSB for XN-1AO-I(0/4...20MA)



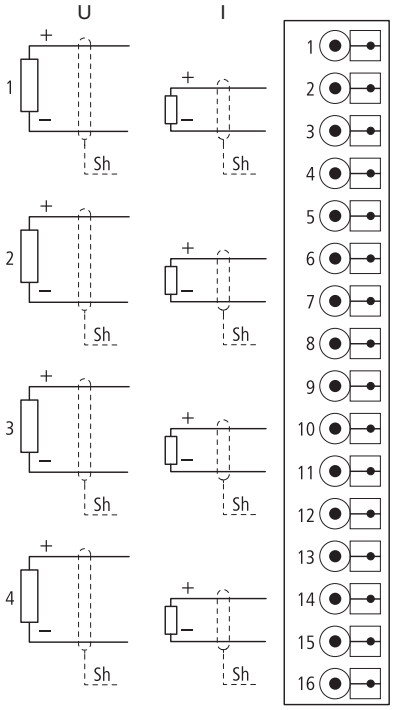
XN-S3...-SBB for XN-2AO-I(0/4...20MA)



XN-S3...-SBB for XN-2AO-U(-10/0...+10VDC)



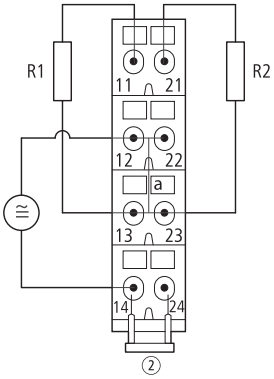
XNE-4AO-U/I



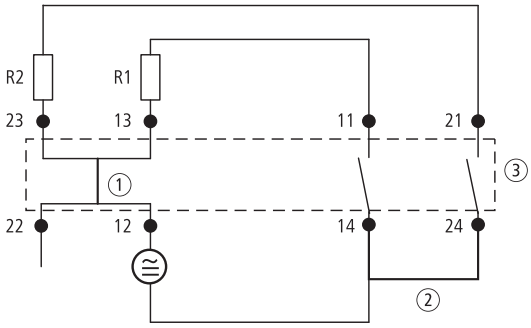
4

Relay Modules

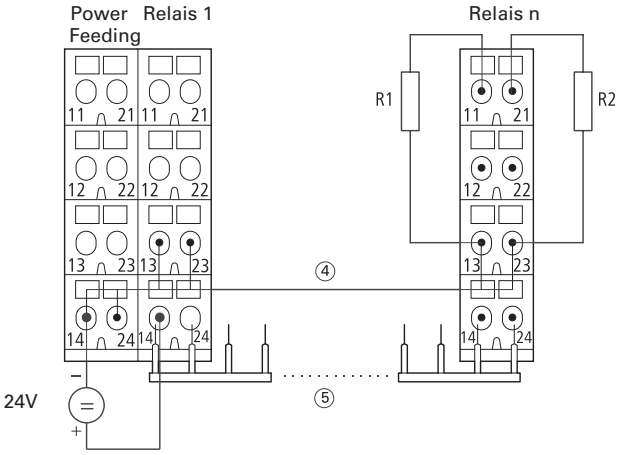
XN-S4x...-SBBS with Externally Applied Supply and Common Potential Link for XN-2DO-R-NC



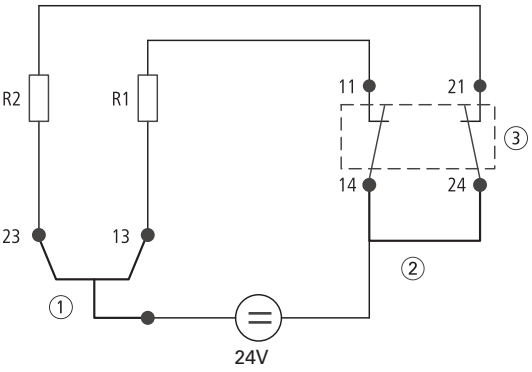
Module Circuit XN-S4x...SBBS for XN-2DO-R-NC



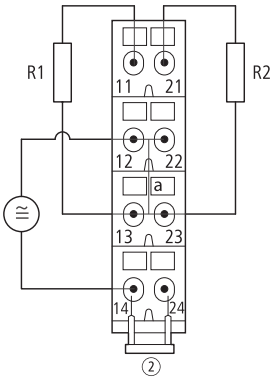
XN-S4x...-SBCS Supply via C-Rail and Common Potential Link for XN-2DO-R-NC



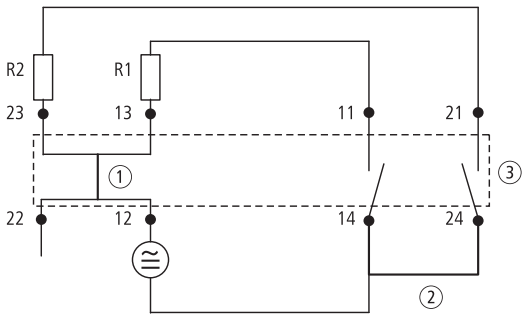
Module Circuit XN-S4x...-SBCS for XN-2DO-R-NC



XN-S4x...-SBBS with Externally Applied Supply and Common Potential Link for XN-2DO-R-NO



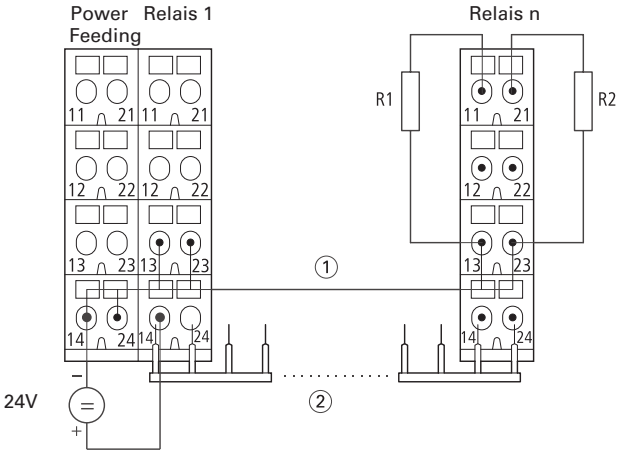
Module Circuit XN-S4x...-SBBS for XN-2DO-R-NO



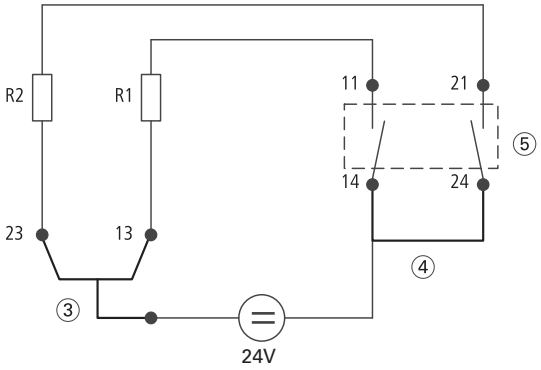
Notes

① Linked in the electronics.
② Cross-link via QVR in the base module.
③ Electronics module.
④ Supply via C-rail.
⑤ Maximum eight relay modules.

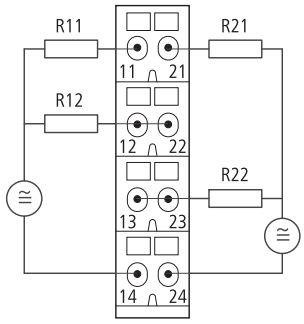
XN-S4x...-SBCS Supply via C-rail and Common Potential Link for XN-2DO-R-NO



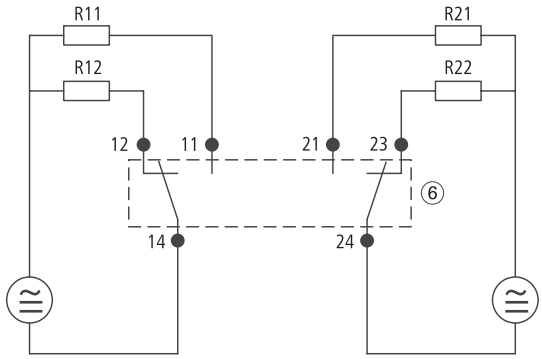
Module Circuit XN-S4x...SBCS for XN-2DO-R-NO



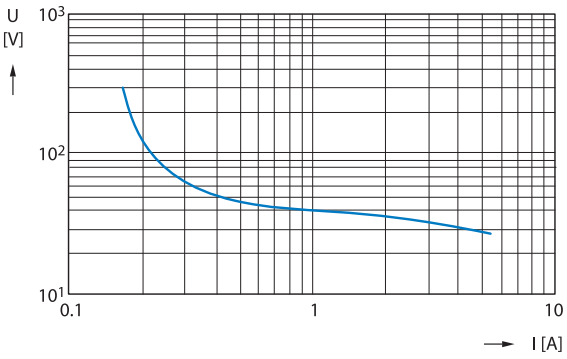
XN-S4x...-SBBS for XN-2DO-R-CO



Module Circuit XN-S4x...-SBBS for XN-2DO-R-CO



Load Limit Curve



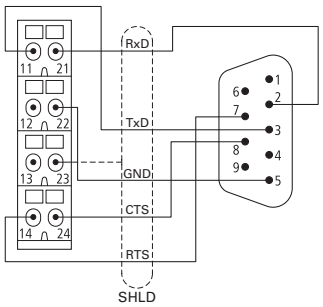
Notes

① Supply via C-rail.
② Maximum eight relay modules.
③ Top-hat rail.
④ Cross-link via QVR in the base module.
⑤ Electronics module.
⑥ Electronics module—
Definition: At 1000 operations, no arc with a duration >10 ms must occur.

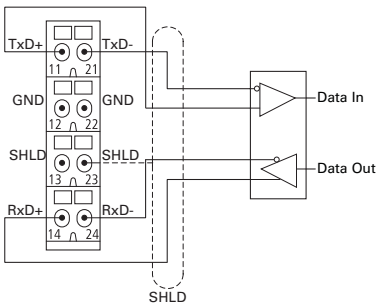
4

Serial Interfaces

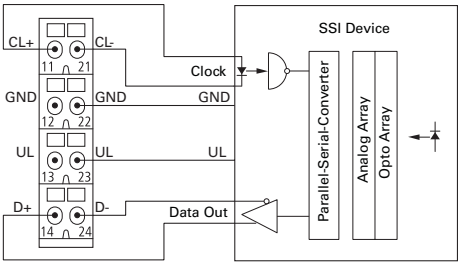
XN-S4x...-SBBS for XN-1RS232 and D-Sub Plug



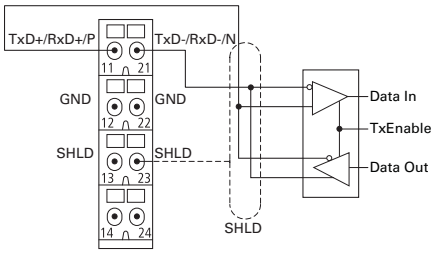
XN-S4x...SBBS for XN-1RS485/422 in RS422 Mode



XN-S4x...-SBBS for XN-1SSI on an SSI Rotary Encoder

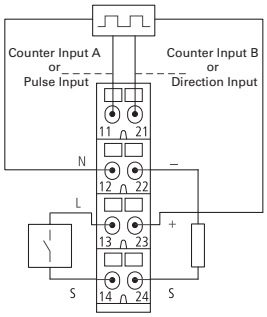


XN-S4...-SBBS for XN-1RS485/422 in RS485 Mode

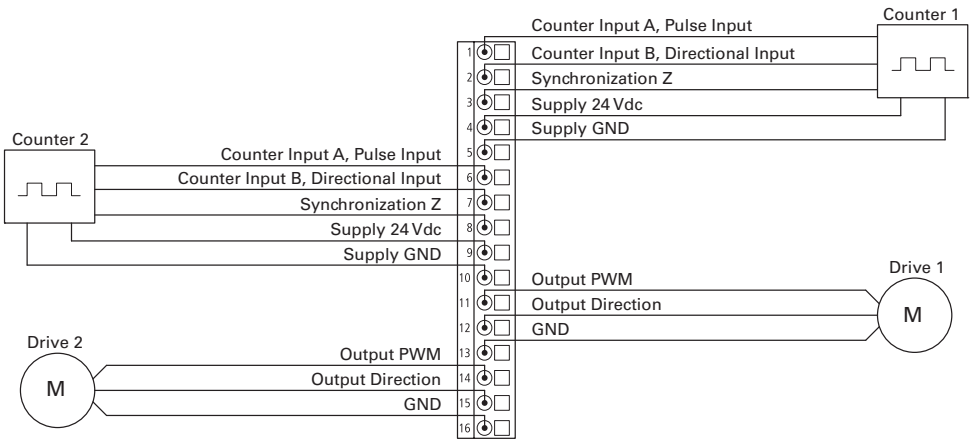


Technology Modules/Counter

XN-S4...-SBBS for XN-1CNT-24VDC



XNE-2CNT-2PWM

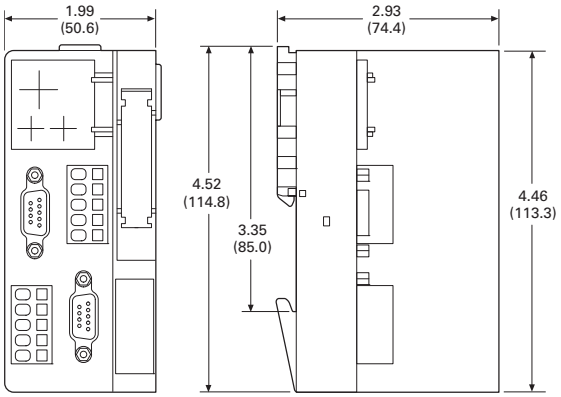


Dimensions

Approximate Dimensions in Inches (mm)

XN Gateways

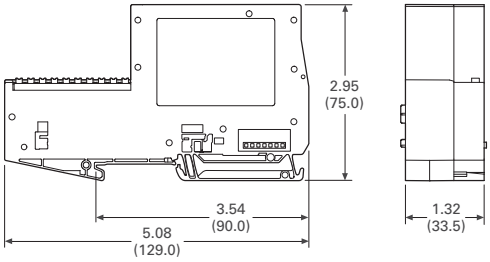
XN-GWBR-PBDP
XN-GWBR-CANOPEN
XN-GWBR-DNET
XN-GWBR-MODBUS-TCP
XN-PLC-CANOPEN



Note: The plugs/connectors used depends on the version.

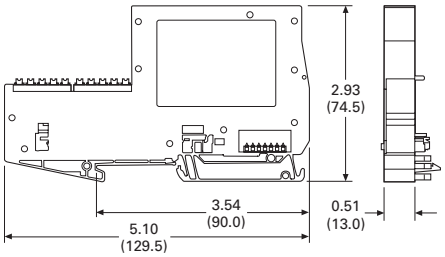
XNE Gateways

XNE-GWBR-PBDP
XNE-GWBR-CANOPEN
XNE-GWBR-2ETH-IP

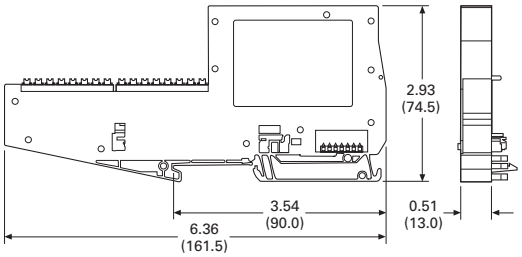


XNE Electronics Modules

XNE-8DO-24VDC-0.5A-P
XNE-8DI-24VDC-P

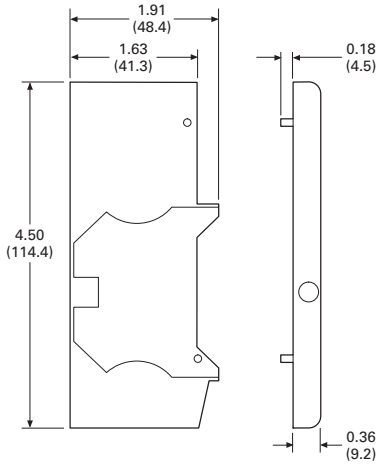


XNE-16DI-24VDC-P
XNE-16DO-24VDC-0.5A-P
XNE-8AI-U/I/4PT/NI
XNE-4AO-U/I
XNE-2CNT-2PWM



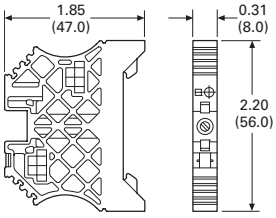
End Cover

XN-ABPL



End Bracket

XN-WEW-35/2-SW



Approximate Dimensions in Inches (mm)

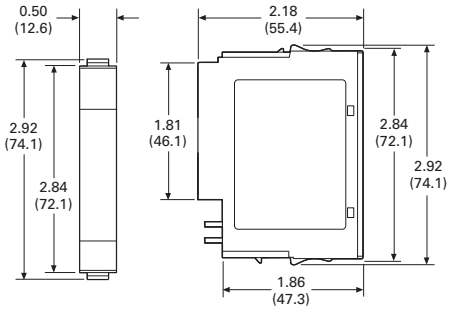
XN Electronics Modules in Slice Design

XN-BR-24VDC-D
XN-PF-24VDC-D
XN-PF-120/230VAC-D

XN-2DI-24VDC-P
XN-2DI-24VDC-N
XN-2DI-120/230VAC
XN-4DI-24VDC-P
XN-4DI-24VDC-N
XN-2DO-24VDC-2A-P
XN-2DO-24VDC-0.5A-P
XN-2DO-24VDC-0.5A-N
XN-2DO-120/230VAC-0.5A
XN-4DO-24VDC-0.5A-P
XN-2DO-R-CO
XN-2DO-R-NC
XN-2DO-R-NO

XN-1AI-I(0/4...20MA)
XN-2AI-I(0/4...20MA)
XN-1AI-U(-10/0...+10VDC)
XN-2AI-U(-10/0...+10VDC)
XN-2AI-PT/NI-2/3
XN-2AI-THERMO-PI
XN-4AI-U/I
XN-1AO-I(0/4...20MA)
XN-2AO-I(0/4...20MA)
XN-2AO-U(-10/0...+10VDC)

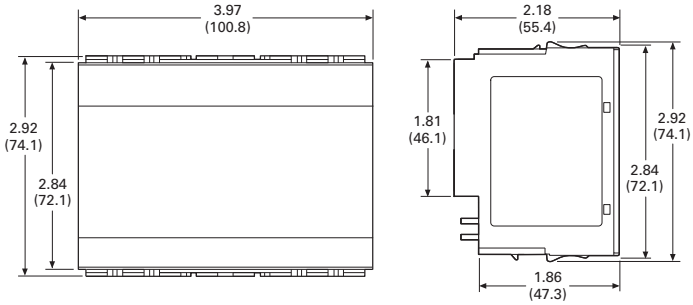
XN-1CNT-24VDC
XN-1RS232
XN-1RS485/422
XN-1SSI



XN Electronics Modules in Block Design

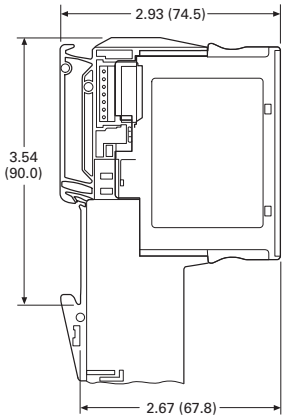
XN-16DI-24VDC-P
XN-32DI-24VDC-P

XN-16DO-24VDC-0.5A-P
XN-32DO-24VDC-0.5A-P



XN Electronics Modules Completed with Base Module

All Types



Approximate Dimensions in Inches (mm)

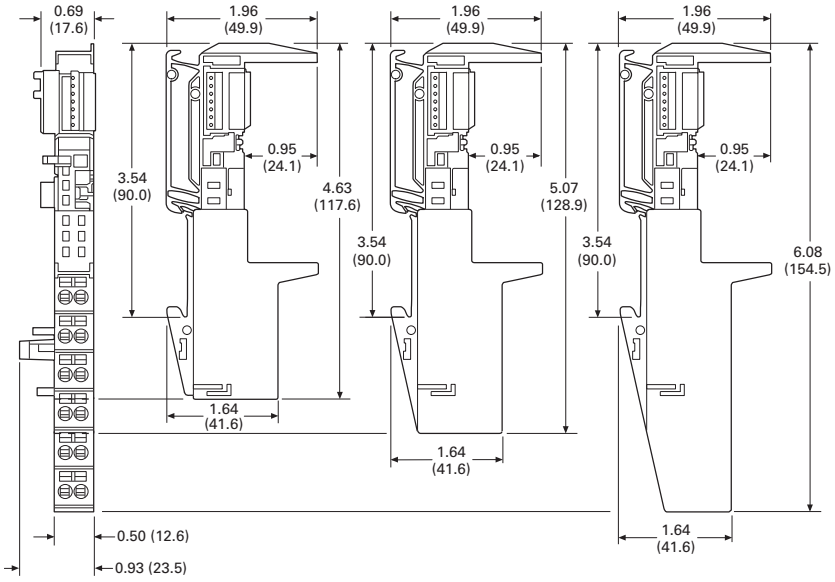
Base Modules in Slice Design

Spring-Cage Terminals

3 Connection Levels
XN-S3T-SBB
XN-S3T-SBC
XN-P3T-SBB
XN-P3T-SBB-B

4 Connection Levels
XN-S4T-SBBC
XN-S4T-SBBS
XN-S4T-SBBS-CJ
XN-S4T-SBCS
XN-P4T-SBBC
XN-P4T-SBBC-B

6 Connection Levels
XN-S6T-SBBSBB
XN-S6T-SBCSBC

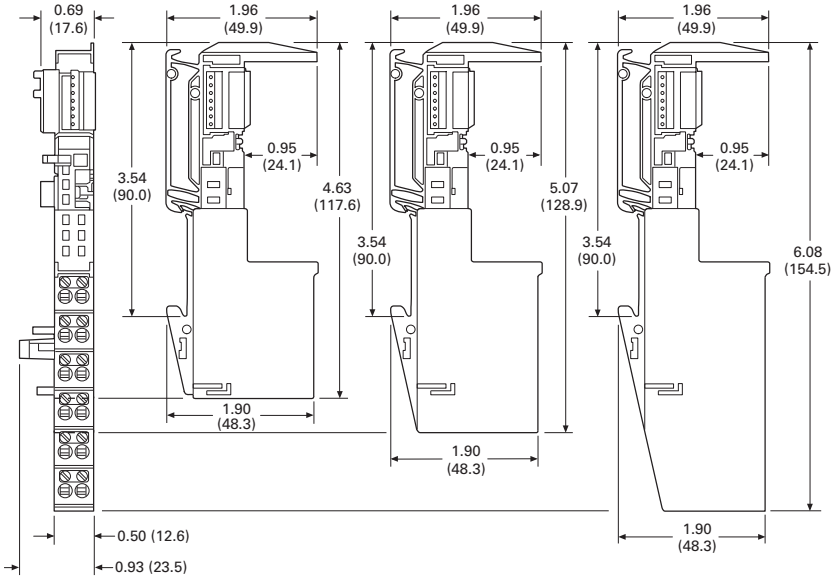


Screw Terminals

3 Connection Levels
XN-S3S-SBB
XN-S3S-SBC
XN-P3S-SBB
XN-P3S-SBB-B

4 Connection Levels
XN-S4S-SBBC
XN-S4S-SBBS
XN-S4S-SBBS-CJ
XN-S4S-SBCS
XN-P4S-SBBC
XN-P4S-SBBC-B

6 Connection Levels
XN-S6S-SBBSBB
XN-S6S-SBCSBC



Approximate Dimensions in Inches (mm)

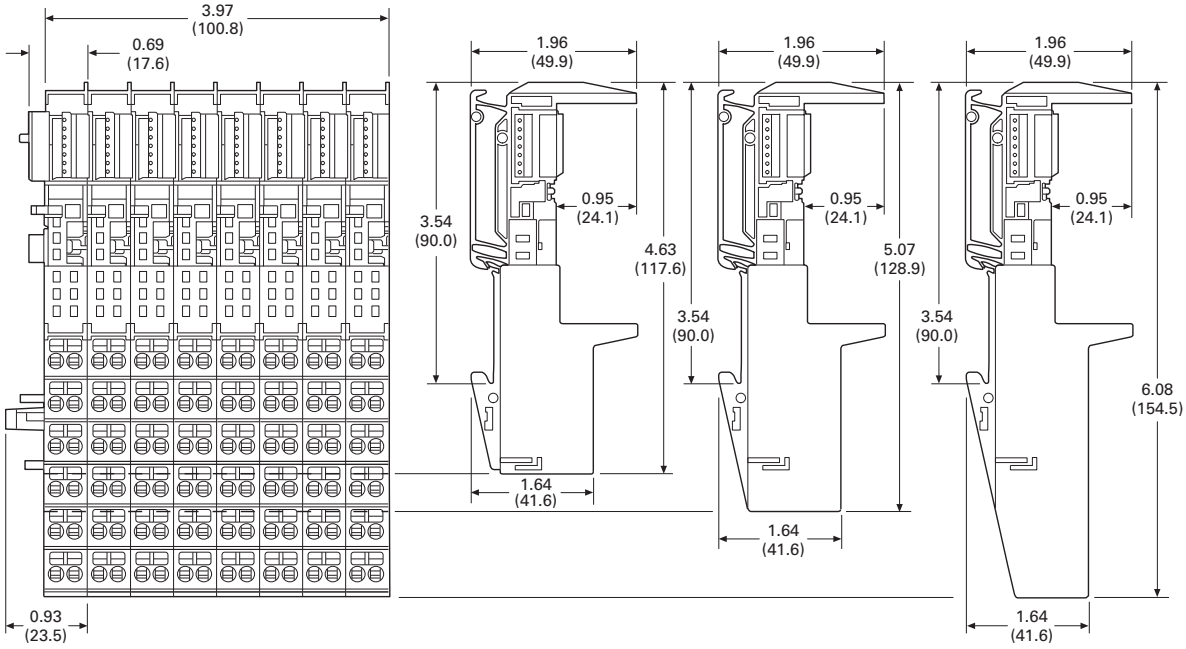
Base Modules in Block Design

Spring-Cage Terminals

3 Connection Levels
XN-B3T-SBB
XN-B3T-SBC

4 Connection Levels
XN-B4T-SBBC

6 Connection Levels
XN-B6T-SBBSBB
XN-B6T-SBCSBC



Screw Terminals

3 Connection Levels
XN-B3S-SBB
XN-B3S-SBC

4 Connection Levels
XN-B4S-SBBC

6 Connection Levels
XN-B6S-SBBSBB
XN-B6S-SBCSBC