SIEMENS

SIMATIC NET

Industrial Ethernet switches SCALANCE X-300M PoE

Compact Operating Instructions

05/2016

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Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Introduction 1

1.1 Information on the Operating Instructions (compact)

Purpose of the Operating Instructions (compact)

Based on the Operating Instructions (compact), you will be able to install and connect up the SCALANCE X-300M PoE correctly. The configuration and the integration of the device in a network are not described in these instructions.

Validity of these Operating Instructions (compact)

These Operating Instructions (compact) apply to the product group SCALANCE X-300M PoE as of firmware version 3.3.0

Names of the devices in these operating instructions (compact)

Classification	Description	Terms used
Product line	For all devices and variants of all product groups within the SCALANCE X-300 product line, the term IE switches X-300 is used.	IE switches X-300
Product group	For all devices and variants of a product group, only the product group is used.	X-300M PoE
Device	For a device, only the device name is used.	X308-2M PoE
Variant	For a variant of the device, the device name has the appropriate variant added to it in brackets (2x24V).	(-)
All variants of a device	For all variants of the device, the device name has (all) added to it.	(-)

Documentation on the accompanying CD

You will find detailed information on configuration in the configuration manual SCALANCE X300/X400 on the accompanying CD in the file:

PH_SCALANCE-X-300-X-400_76.pdf

Security messages

Note

Siemens offers IT security mechanisms for its automation and drive product portfolio in order to support the safe operation of the plant/machine. Our products are also continuously developed further with regard to IT security. We therefore recommend that you regularly check for updates of our products and that you only use the latest versions. You will find information in:

(http://support.automation.siemens.com/WW/llisapi.dll?func=cslib.csinfo2&aktprim=99&lang=en)

Here, you can register for a product-specific newsletter.

For the safe operation of a plant/machine, however, it is also necessary to integrate the automation components into an overall IT security concept for the entire plant/machine, which corresponds to the state-of-the-art IT technology. You will find information on this in: (http://www.siemens.com/industrialsecurity)

Products from other manufacturers that are being used must also be taken into account.

SIMATIC NET glossary

Explanations of many of the specialist terms used in this documentation can be found in the SIMATIC NET glossary.

You will find the SIMATIC NET glossary here:

- SIMATIC NET Manual Collection or product DVD

  The DVD ships with certain SIMATIC NET products.

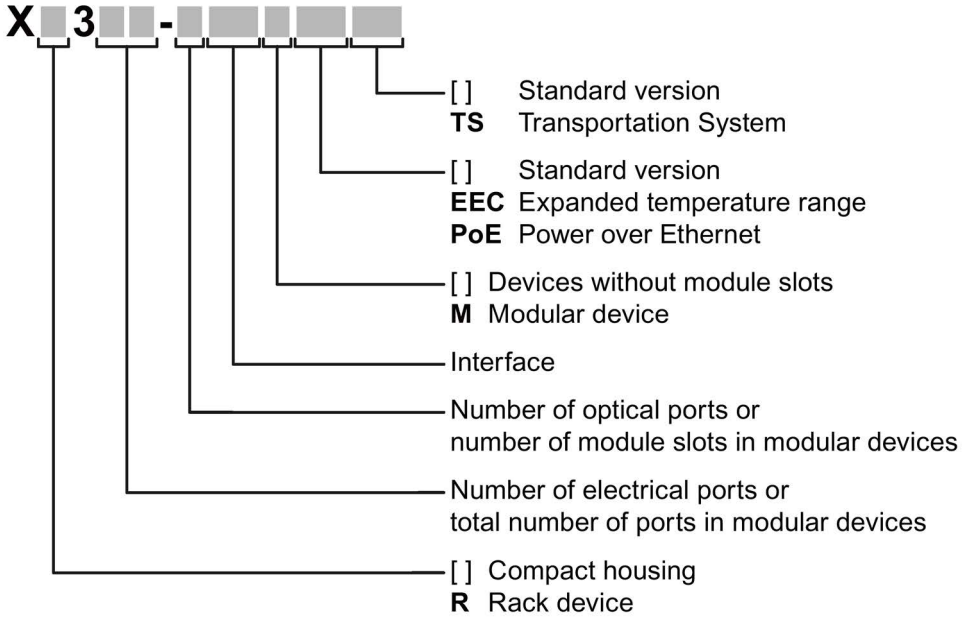
- On the Internet under the following address:

  50305045 (http://support.automation.siemens.com/WW/view/en/50305045)

1.2 Type designation

Structure of the type designation

The type designation of an IE Switch X-300 is made up of several parts that have the following meaning:



Interfaces of devices without optical ports:

Interface	Property
FE	Electrical RJ-45 port for 10/100 Mbps.
[-]	Electrical RJ-45 port for 10/100 Mbps or 10/100/1000 Mbps.

Interfaces of devices with optical ports:

Interface	Property
FE	SC port 100 Mbps multimode FO cable (up to max. 5 km).
LD FE	SC port 100 Mbps single mode FO cable (up to max. 26 km).
[-]	SC port 1000 Mbps multimode FO cable (up to max. 750 m).
LD	SC port 1000 Mbps single mode FO cable (up to max. 10 km).
LH	SC port 1000 Mbps single mode FO cable (up to max. 40 km).
LH+	SC port 1000 Mbps single mode FO cable (up to max. 70 km).

If information applies to all devices, the term "IE Switches X-300" is used. If information applies to only a particular product group, the relevant names will be used without extra information on the type or number of interfaces. Examples: "X-300" stands for non-modular devices with a compact housing, "XR-300" means all rack devices, "X-300M" means all modular devices etc.

Safety notes

2

Read the safety notices

Note the following safety notices. These relate to the entire working life of the device.

You should also read the safety notices relating to handling in the individual sections, particularly in the sections "Installation" and "Connecting up".

Safety notices on use in hazardous areas

General safety notices relating to protection against explosion

⚠ WARNING
EXPLOSION HAZARD
DO NOT OPEN WHEN ENERGIZED.

This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D or non-hazardous locations only.

This equipment is suitable for use in Class I, Zone 2, Group IIC or non-hazardous locations only.

Safety notices on the use of the device

The following safety notices must be adhered to when setting up and operating the device and during all associated work such as installation, connecting up, replacing or opening the device.

General information

⚠ WARNING

Safety extra low voltage

The equipment is designed for operation with Safety Extra-Low Voltage (SELV) by a Limited Power Source (LPS).

This means that only SELV / LPS (Limited Power Source) complying with IEC 60950-1 / EN 60950-1 / VDE 0805-1 must be connected to the power supply terminals. The power supply unit for the equipment power supply must comply with NEC Class 2, as described by the National Electrical Code (r) (ANSI / NFPA 70).

If the equipment is connected to a redundant power supply (two separate power supplies), both must meet these requirements.

A power source that supplies safety extra low voltage combined with a following NEC Class 2 power limiter also meets the requirements according to IEC 60950-1 / EN 60950-1 / VDE 0805-1 or NEC Class 2. A suitable power limiter is for example the redundancy module SITOP PSE202U NEC Class 2 (article number 6EP1962-2BA00).

⚠ WARNING

Opening the device

DO NOT OPEN WHEN ENERGIZED.

General notices about use in hazardous areas

⚠ WARNING

Risk of explosion when connecting or disconnecting the device

EXPLOSION HAZARD

DO NOT CONNECT OR DISCONNECT EQUIPMENT WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.

⚠ WARNING

Replacing components

EXPLOSION HAZARD

SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2 OR ZONE 2.

⚠ WARNING

Requirements for the cabinet/enclosure

When used in hazardous environments corresponding to Class I, Division 2 or Class I, Zone 2, the device must be installed in a cabinet or a suitable enclosure.

Safety notices on use in hazardous areas according to ATEX and IECEx

⚠ WARNING

Requirements for the cabinet/enclosure

To comply with EC Directive 94/9 (ATEX95) or the conditions of IECEx, this enclosure must meet the requirements of at least IP54 in compliance with EN 60529.

⚠ WARNING

Suitable cables for temperatures in excess of 70 °C

If the cable or conduit entry point exceeds 70 °C or the branching point of conductors exceeds 80 °C, special precautions must be taken. If the equipment is operated in an air ambient in excess of 50 °C - 70 °C, only use cables with admitted maximum operating temperature of at least 80 °C.

⚠ WARNING

Protection against transient voltage surges

Provisions shall be made to prevent the rated voltage from being exceeded by transient voltage surges of more than 40%. This criterion is fulfilled, if supplies are derived from SELV (Safety Extra-Low Voltage) only.

2.1 Important notes on using the device in hazardous areas

⚠ WARNING

WARNING - EXPLOSION HAZARD -

DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS.

⚠ WARNING

Restricted area of application

This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D or non-hazardous locations only.

⚠ WARNING

Restricted area of application

This equipment is suitable for use in Class I, Zone 2, Group IIC or non-hazardous locations only.

2.2 PELV

Note

Safety extra-low voltage

The supply of the devices by PELV (Protective Extra Low Voltage) according to DIN VDE 0100-410 or IEC 60364-4-41 is permitted when the generated nominal voltage does not exceed the voltage limits 25 VAC or 60 VDC.

Description

3

3.1 Product characteristics of the X308-2M PoE

Interfaces

Type	RJ-45 port electrical 10/100/1000 Mbps	Module slots
X308-2M PoE	4	2

Components of the product

The following parts ship with a SCALANCE X-300M PoE:

- Device with C-PLUG exchangeable medium
- 4-pin terminal block for the power supply
- 2-pin terminal block for the signaling contact
- Product CD with documentation and software

Order numbers

Type	Order number
X308-2M PoE	6GK5 308-2QG00-2AA2

3.2 Power over Ethernet (PoE)

Power over Ethernet (PoE)

With PoE, the power for networked devices is carried via Ethernet. Here, there are two methods of supplying power:

- Alternative A

  Here, the voltage is transferred on the data wires 1, 2, 3 and 6 of the Ethernet cable

  Requirements for the Ethernet cable:

  – For 10Base-T/100Base-TX, a 4-wire cable is adequate for data transmission and power supply.

  – With 1000BASE-T, an 8-wire cable is necessary for data transmission.

- Alternative B

  Power is transferred on the free wires 4, 5, 7 and 8 of the Ethernet cable.

  Requirements for the Ethernet cable: For 10Base-T/100Base-TX/1000BASE-T, an 8-wire cable is needed.

PoE-compliant devices can be divided into the following groups:

- PSE - power sourcing equipment

  These inject power onto the Ethernet cable.

- PD - powered devices

  These are supplied with power via Ethernet.

The PoE ports of the switch

As a PSE, the X308-2M PoE supplies PoE-compliant devices with power over Ethernet. The 48 V power required to supply the powered devices is generated internally on the switch, no extra power supply unit is necessary.

The X308-2M PoE uses the "alternative A" for this. Per RJ-45 port, a maximum of 15.4 W are available for supplying a PoE-compliant device. If a Cat5/Cat5e cable with a maximum length of 100 m is used, the connected device can be supplied with a power of 12.95 W.

Note

The total power provided by the SCALANCE X308-2M PoE on all four PoE ports is a maximum of 30.8 W.

The PoE ports meet the conditions listed in the IEEE 802.3af / IEEE 802.3at standard (type 1) for environment A , in other words power supply over Ethernet within a power supply system. For details of configuring and enabling PoE for individual ports, refer to the configuration manual SCALANCE X-300 / X-400 on the accompanying CD.

Possible attachments

The X308-2M PoE is a partially modular device and has 4 fixed ports and 2 slots for media modules.

- **4 electrical ports**

  4 PoE-compliant RJ-45 jacks with securing collars for connection of end devices or network segments. Non PoE-compliant end devices can also be connected to the PoE-compliant RJ-45 jacks because the X308-2M PoE checks that the end devices are suitable for the PoE function before applying the power.

- **4 modular ports via 2 module slots**

  2 media modules each with 2 ports are combined optically or electrically via the slots S1 and S2 depending on the application.

  End devices and other network segments are connected according to the media modules being used.

3.3 The SET / SELECT button

The SET/SELECT button is located on the top of the housing of devices of the X-300 EEC series. On all other devices, this button is on the front panel of the housing beside the LED display. The SET/SELECT button has several functions that are described below.

Change the display mode

By pressing the button briefly, you change to the display mode of the LED display. For more detailed information on this topic, refer to the section "LED display".

Resetting the device to the factory defaults

If you reset, all the changes you have made will be overwritten by factory defaults. Follow the steps outlined below:

1. Turn on display mode A. Display mode A is active when the "DM" LED is not lit. If this LED is lit or flashing, you will need to press the SET/SELECT briefly (possibly several times) until the "DM" LED goes off. If the SELECT/SET button is not pressed for longer than a minute, the device also turns on display mode A.
2. Hold down the SELECT/SET button for 12 seconds. If you release the button before the 12 seconds have elapsed, the reset is canceled.

Definition of the fault mask

Using the fault mask, you specify an individual "good status" for the connected ports and the power supply. Deviations from this status are then displayed as errors/faults.

1. Turn on display mode A or D. Display mode A is active when the "DM" LED is not lit. Display mode D is active when the "DM" LED flashes yellow/orange. If a different display mode is active, you will need to press the SET/SELECT briefly (possibly several times) until the required display mode is active.
2. Hold down the SET/SELECT button for five seconds. After three seconds, the "DM" LED begins to flash. If you release the button before the five seconds have elapsed, the previous fault mask will be retained.

Enable/disable the redundancy manager

1. Turn on display mode B. Display mode B is active when the "DM" LED is lit green. If a different display mode is active, you will need to press the SET/SELECT briefly (possibly several times) until display mode B is active.
2. Hold down the SET/SELECT button for five seconds. After three seconds, the "DM" LED begins to flash. If you release the button before the five seconds have elapsed, the action is aborted.
3. The result of the action depends on the initial situation:
   - If the redundancy manager and media redundancy were disabled, media redundancy is also enabled after enabling the redundancy manager.
   - If you disable the redundancy manager, media redundancy remains enabled.

3.4 LED display

The "RM" LED for the "redundancy manager" function

The "RM" LED indicates whether or not the device is operating in the role of redundancy manager and whether or not the ring is operating error-free.

LED color	LED status	Meaning
-	off	The device is not operating in the role of "redundancy manager".
green	on	The device is operating in the role of redundancy manager. The ring is working without problems, monitoring is activated.
green	flashes	The device is operating in the role of redundancy manager. An interruption has been detected on the ring and the device has switched through.

The "SB" LED for the standby function

This LED shows the status of the standby function.

LED color	LED status	Meaning
-	off	The standby function is disabled.
green	on	The standby function is enabled. The standby section is passive.
green	flashes	The standby function is enabled. The standby section is active.

The "F" LED for the fault status

The "F" LED (fault) provides information on the error/fault status of the device. While the device is starting up, this LED has the following meaning:

LED color	LED status	Meaning during the device startup
-	off	Device startup completed successfully.
red	on	Device startup not yet completed or a fault/error has occurred.
red	flashes	Bad firmware image.

During normal operation, the "F" LED provides the following information:

LED color	LED status	Meaning during operation
-	off	No operating problems.
red	on	The device has detected an error. The signaling contact opens.

The "DM" LED for the display mode

The "DM" LED (Display Mode) indicates which of the four display modes A, B, C or D is currently active. The meaning of the L1, L2 and P1, P2, ... LEDs depends on the display mode.

LED color	LED status	Meaning
-	off	Display mode **A**
green	on	Display mode **B**
orange	on	Display mode **C**
yellow/orange	flashes	Display mode **D**

Selecting the display mode

Press the SELECT/SET button to set the required display mode. If the SELECT/SET button is not pressed for longer than a minute, the device automatically changes to display mode A.

Pressing the SELECT/SET button starting at display mode A	Status of the "DM" LED	Display mode
-	off	Display mode **A** (default mode)
Press once	lit green	Display mode **B**

Pressing the SELECT/SET button starting at display mode A	Status of the "DM" LED	Display mode
Press twice	lit orange	Display mode **C**
Press 3 times	flashes yellow/orange	Display mode **D**

The "L1" and "L2" or "L" LEDs for the power supply

Whereas on other devices, the "L1" and "L2" LEDs indicate information about the power, on the SCALANCE X306-1LD FE, this is done by the "L" LED. A redundant power supply for this device can be recognized by the color of the LED.

Meaning in display mode A, B or C

LED	Color	Status	Meaning
L1 / L2	_	off	Power supply L1 / L2 lower than 17 V *)
	green	on	Power supply L1 / L2 higher than 17 V *)
L	-	off	Power supplies L1 and L2 less than 17 V or not connected.
	orange	on	Power supply L1 or L2 higher than 17 V (no redundant supply).
	green	on	Power supplies L1 and L2 higher than 17 V (redundant supply).

*) The following applies to the X-300EEC:

- For devices with power supply unit 24 to 48 VDC: Limit voltage = 17 VDC
- For devices with a multiple range power supply unit 100 to 240 VAC / 60 to 250 VDC: Limit voltage = 46.5 VDC or 80 VAC

Meaning in display mode D

LED	Color	Status	Meaning
L1 / L2	_	off	Power supply L1 / L2 is not monitored. If L1 / L2 falls below 17 V *), the signaling contact does not respond.
	green	on	Power supply L1 / L2 is monitored. If L1 / L2 falls below 17 V *), the signaling contact responds.
L	-	off	Power supplies L1 and L2 are not monitored. If L1 or L2 falls below 17 V, the signaling contact does not respond.
	orange	on	Power supply L1 or L2 is monitored. If L1 or L2 falls below 17 V, the signaling contact responds.
	green	on	Power supplies L1 and L2 are monitored. If L1 and L2 fall below 17 V, the signaling contact responds.

*) The following applies to the X-300EEC:

- For devices with power supply unit 24 to 48 VDC: Limit voltage = 17 VDC
- For devices with a multiple range power supply unit 100 to 240 VAC / 60 to 250 VDC: Limit voltage = 46.5 VDC or 80 VAC

Note

Devices of the X-300EEC product group

When using only one power supply unit 24 VDC and two 24 VDC power supplies, the LEDs "L1" and "L2" signal the existence of the power supply L1 and L2.
When using two 24 VDC power supply units, the LEDs "L1" and "L2" signal the existence of the primary voltage and the secondary voltage for both power supply units. If the power supply is intact, a fault occurring on a power supply unit on the secondary side can be recognized.

The P1, P2, ... LEDs for the port status

The P1, P2, ... LEDs show information on the status of their port (transmission speed, mode, port monitoring). The meaning of these LEDs depends on the display mode ("DM" LED).

Meaning in display mode A

LED color	LED status	Meaning
-	off	No valid link to the port (for example station turned off or cable not connected).
green	on	Link exists and port in normal status. In this status, the port can receive and send data.
	flashes once per second	Link exists and port in "blocking" status. In this status, the port only sends and receives management data (no user data).
	flashes 3 times per second	Link exists and port turned off by management. In this status, no data is sent or received via the port.
	flashes 4 times per second	Port exists and is in the "monitor port" status. In this status, the data traffic of another port is mirrored to this port.
yellow	flashes / lit	Receiving data at port. With SCALANCE X-300 devices, both the receipt and the sending of data is indicated for the optical gigabit ports.

Meaning in display mode B

LED color	LED status	Meaning
-	off	Port operating at 10 Mbps.
green	on	Port operating at 100 Mbps.
orange	on	Port operating at 1000 Mbps.

If there is a problem on the connection and the type of transmission is fixed (autonegotiation off), the desired status, in other words the set transmission speed (1000 Mbps, 100 Mbps, 10 Mbps) continues to be displayed. If there is a problem on the connection and autonegotiation is active, the port LED goes off.

Meaning in display mode C

LED color	LED status	Meaning
-	off	Port operating in half duplex.
green	on	Port operating in full duplex.

Meaning in display mode D

LED color	LED status	Meaning
-	off	The port is not monitored; in other words, if a link is not established at the port, this does not trigger the signaling contact.
green	on	The port is monitored, in other words, if no connection was established at the port (for example no cable inserted), this triggers the signaling contact and an error state results.

3.5 C-PLUG

3.5.1 Area of application and function of the C-PLUG

Area of application

The C-PLUG (configuration plug) that ships with the product is an exchangeable memory medium for storing the configuration data of the device. The device can also be operated without a C-PLUG.

This allows fast and uncomplicated replacement of a device. The C-PLUG is taken from the previous device and inserted in the new device. The first time it is started up, the replacement device has the same configuration as the previous device except for the MAC address set by the vendor.

Principle

The data remains stored on the C-PLUG even when power is turned off. In terms of using the C-PLUG, there are two ways of operating the device:

- With unwritten C-PLUG

  If an empty C-PLUG (factory settings or deleted with the Clean function) is inserted, all the configuration data of the device is saved to it automatically when the device starts up. Changes to the configuration during operation are saved without operator intervention on the C-PLUG if this is in the "ACCEPTED" status. This depends on how you configured your SCALANCE device. In this mode, the internal memory is neither read nor written. This mode is active when a C-PLUG is inserted.

- With written C-PLUG

  A device with an accepted C-PLUG inserted uses the configuration data of the C-PLUG automatically when it starts up. Acceptance is possible only when the data was written by a compatible device type.

Response to errors

Inserting a C-PLUG that does not contain the configuration of a compatible device type, accidentally removing the C-PLUG or general malfunctions of the C-PLUG are signaled by the diagnostics mechanisms of the device (LEDs, Web-based management, SNMP, CLI and PROFINET diagnostics).

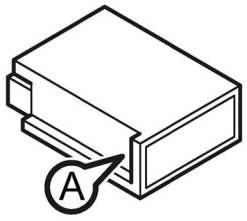
3.5.2 Removing and inserting the C-PLUG (compact housing)

NOTICE
A C-PLUG may only be removed or inserted when the device is turned off.

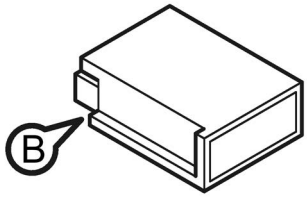
Position of the C-PLUG

	In devices with a compact housing, the C-PLUG is located behind the sealing screw on the rear of the device. To remove the sealing screw, use a coin or a wide blade screwdriver.

Removing the C-PLUG

	1. Turn off the power to the device. 2. Remove the sealing screw on the rear of the device with a coin or a wide blade screwdriver. 3. Insert a screwdriver between the front edge of the C-PLUG (position A) and the slot and release the C-PLUG. 4. Remove the C-PLUG and close the housing again with the sealing screw.

Inserting the C-PLUG

	1. Turn off the power to the device. 2. Remove the sealing screw on the rear of the device with a coin or a wide blade screwdriver. 3. The housing of the C-PLUG has a protruding ridge on the long side (position B). The slot has a groove at this position. Insert the C-PLUG correctly oriented into the slot. 4. Close the housing again with the sealing screw.

Assembling

4

4.1 Safety notices for installation

Safety notices

When installing the device, keep to the safety notices listed below.

Safety notices on use in hazardous areas

General safety notices relating to protection against explosion

⚠ WARNING
EXPLOSION HAZARD The replacement of components may impair suitability for Class 1, Division 2 or zone 2.

⚠ WARNING
When used in hazardous environments corresponding to Class I, Division 2 or Class I, Zone 2, the device must be installed in a cabinet or a suitable enclosure.

Safety notices for use according to ATEX and IECEx

If you use the device under ATEX or IECEx conditions you must also keep to the following safety notices in addition to the general safety notices for protection against explosion:

⚠ WARNING
To comply with EC Directive 2014/34/EU (ATEX 114) or the conditions of IECEx, this enclosure or cabinet must meet the requirements of at least IP54 in compliance with EN 60529.

4.2 Suitable cables for temperatures above 70 °C - cable 50 °C - 70 °C (ATEX)

⚠ WARNING

If the temperature of the cable or housing socket exceeds 70 °C or the branching point of conductors exceeds 80 °C, special precautions must be taken. If the equipment is operated in an air ambient in excess of 50 °C to 70 °C, only use cables with a permitted operating temperature of at least 80 °C.

4.3 Notes on installation

⚠ CAUTION

Risk of burns due to the high temperature of the housing

If a device is operated in an ambient temperature of higher than 50 °C, the temperature of the housing may be higher than 70 °C.

Select the location of the device so that only qualified personnel and trained users have access to it.

Accessories, mounting support, installation guidelines

When installing the SCALANCE X-300, keep the following points in mind:

- Only use approved components (mounting brackets, SFPs, 19 inch inserts etc.) in conjunction with the SCALANCE X-300. Only then can you be sure that the device will operate reliably and problem-free.
- With devices that are suitable for rack mounting, make sure that the required mounting support is created according to the supplied dimension drawings.
- When installing and operating the device, keep to the installation instructions and safety-related notices as described here and in the manual SIMATIC NET Industrial Ethernet Twisted Pair and Fiber Optic Networks.

Note

Provide suitable shade to protect the IE Switch X-300 against direct sunlight. This avoids unnecessary warming of the IE Switch X-300 and prevents premature aging of the IE Switch X-300 and the cabling.

4.4 Installing on an S7-300 standard rail

Procedure

1. Fit the top rear edge of the housing into the S7-300 standard rail.

2. At the bottom, the housing has two holes. Use these holes to screw the housing to the standard rail.
3. Secure the cable for the power supply and the data and any other cables required (for example for the signaling contact) according to the descriptions in the section "Connecting up".

Removing

1. Remove all cables connected to the X-300
2. Release the screws on the bottom of the housing.
3. Remove the X-300 from the S7-300 standard rail.

4.5 Installation on a DIN rail

⚠ WARNING

No DIN rail mounting in shipbuilding and when subject to severe vibration.

The 35 mm DIN rail (DIN EN 60715) does not provide adequate support in shipping or when there is severe vibration (> 10 g). Under such conditions, the device can come out of the mounting and may cause injury.

In such situations, install the device on an S7-300 standard rail.

Procedure

1.	On the rear of the housing, there are two recesses. Place these on the top edge of the DIN rail.	
2.	Then press the housing against the DIN rail until the spring catch of the device locks onto the lower edge of the DIN rail.	
3.	Secure the cable for the power supply and the data and any other cables required (for example for the signaling contact) according to the descriptions in the section "Connecting up".	

Removing

1. Remove all cables connected to the X-300.
2. Use a screwdriver to lever down the spring catch of the device and pull the lower part of the device away from the rail.
3. Remove the device from the upper edge of the DIN rail.

4.6 Wall mounting

Wall mounting

1. For wall mounting, use suitable mounting fittings for the wall
   (for example, for a concrete wall, four plugs 6 mm diameter and 30 mm long, 4 screws 3.5 mm diameter and 40 mm long).
2. Connect the electrical cable connecting cables.

3. Fit the connectors for the signaling contact.
4. Insert the terminal blocks into the sockets on the IE Switch X-300.

Note

For more exact dimensions, please refer to the section "Dimension drawings".

Note

The wall mounting must be capable of supporting at least four times the weight of the IE Switch X-300.

Note

For wall mounting of a rack device (R), use suitable fittings and mount the device as shown in the drawing.

4.7 Fitting and removing media modules and SFPs

NOTICE

Read the Operating Instructions (compact) of the SCALANCE MM900 and SCALANCE SFP.

Before inserting or removing media modules or SFPs, make sure that you have read the information in the Operating Instructions (compact) of the SCALANCE MM900 or the SCALANCE SFP.

You will find the Operating Instructions for both of these on the Cd that ships with the SCALANCE X-300. A printed version of the Operating Instructions (compact) for the SCALANCE MM900 also ships with the media modules.

Connecting

5

5.1 Safety when connecting up

Safety notices

When connecting up the device, keep to the safety notices listed below.

⚠ WARNING

The equipment is designed for operation with Safety Extra-Low Voltage (SELV) by a Limited Power Source (LPS).

This means that only SELV / LPS complying with IEC 60950-1 / EN 60950-1 / VDE 0805-1 must be connected to the power supply terminals. The power supply unit for the equipment power supply must comply with NEC Class 2, as described by the National Electrical Code (r) (ANSI / NFPA 70).

If the equipment is connected to a redundant power supply (two separate power supplies), both must meet these requirements.

NOTICE

Failure of the data traffic due to contamination of optical plug-in connections

Optical sockets and plugs are sensitive to contamination of the end face. Contamination can lead to the failure of the optical transmission network.

Close unused optical sockets and plugs as well as pluggable transceivers and slots with the supplied protective caps.

Remove the protective caps only immediately before you use the plug-in connection.

Note

Wire end ferrules

Use crimp shapes with smooth surfaces, such as provided by square and trapeze shaped crimp cross sections.

Crimp shapes with wave-shaped profile are unsuitable.

Safety notices on use in hazardous areas

General safety notices relating to protection against explosion

⚠ WARNING

EXPLOSION HAZARD

Do not connect or disconnect cables to or from the device when a flammable or combustible atmosphere is present.

Safety notices when using the device according to Hazardous Locations (HazLoc)

If you use the device under HazLoc conditions you must also keep to the following safety notices in addition to the general safety notices for protection against explosion:

⚠ WARNING

EXPLOSION HAZARD

DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS.

Safety notices for use according to ATEX and IECEx

If you use the device under ATEX or IECEx conditions you must also keep to the following safety notices in addition to the general safety notices for protection against explosion:

⚠ WARNING

Take measures to prevent transient voltage surges of more than 40% of the rated voltage. This is the case if you only operate devices with SELV (safety extra-low voltage).

⚠ WARNING

Before connecting up and commissioning the device, read the information in the section Safety notes (Page 9)

5.2 Notes on commissioning

Note

Commissioning devices with redundancy mechanisms

If you use redundancy mechanisms ("HRP" media redundancy or "MRP" and/or redundant coupling of rings over standby coupling), open the redundant path before you insert a new or replacement device in an operational network. A bad configuration or attachment of the Ethernet cables to incorrectly configured ports causes overload in the network and a breakdown in communication.

A device may only be inserted in a network and connected in the following situations:

- HRP/MRP:
  The ring ports of the device being inserted in the ring were configured as ring ports. The required redundancy mode must also be enabled (see "Configuration Manual SCALANCE X-300 / X-400", section "X-300 Ring Configuration"). If the device is intended to operate as the redundancy manager, "Redundancy manager enabled" must also be set.
- Standby coupling:
  "Standby connection" must be "enabled" and the "Standby connection name" must match the name of the partner device. You will also need to configure the port with "Enable Standby Port Monitoring" (see "Configuration Manual SCALANCE X-300 / X-400", section "X-300/X-400 Standby Mask").

5.3 Wiring rules

When wiring use cables with the following AWG categories or cross sections.

Wiring rules for ...		**Screw-type terminals/Spring-loaded terminals**
connectable cable cross sections for flexible cables ...	without wire end ferrule	0.2 - 2.5 mm^2
		AWG: 24 - 13
	with wire end ferrule with plastic ferrule**	0.25 - 2.5 mm^2
		AWG: 24 - 13
	with wire end ferrule without plastic ferrule**	0.25 - 2.5 mm^2
		AWG: 24 - 13
	with TWIN wire end ferrule**	0.5 - 1 mm^2
		AWG: 20 - 17
Stripped length of the cable		8 - 10 mm
Wire end ferrule according to DIN 46228 with plastic ferrule**		8 - 10 mm

* AWG: American Wire Gauge

** See note "Wire end ferrules"

Note

Wire end ferrules

Use crimp shapes with smooth surfaces, such as provided by square and trapeze shaped crimp cross sections.

Crimp shapes with wave-shaped profile are unsuitable.

5.4 Grounding

Mounting the switch on a DIN rail

The switch is grounded over the DIN rail.

Mounting the switch on an S7 standard rail

The switch is grounded over the screw on the rear of the device.

Mounting the switch on a wall

IE Switches X-300 must be grounded with minimum resistance.

The switch is grounded via the unpainted holes in the housing of the switch and the securing screws.

If the switch is mounted on a non-conductive base, you will need to use the grounding cable. The grounding cable is not supplied with the device. Connect the paint-free surface of the switch to the nearest grounding point using the grounding cable.

5.5 24 VDC signaling contact

24 V DC signaling contact

Note

Supply voltage at signaling contact for XR-300M and XR-300M-PoE

At the signaling contact, there is always a voltage of 24 VDC even if the device can be operated with 100 to 240 VAC.

- The signaling contact is connected to a 2-pin plug-in terminal block.

  The signaling contact can be subjected to a maximum load of 100 mA (safety extra-low voltage SELV, 24 V DC).

Table 5- 1 Pin assignment of the 24 VDC signaling contact

Pin number	Assignment
	
Pin 1	F1
Pin 2	F2

5.6 Connecting the external 24 VDC power supply

Safety extra-low voltage and measures for protecting against overvoltage

⚠ WARNING

The equipment is designed for operation with Safety Extra-Low Voltage (SELV) by a Limited Power Source (LPS).

This means that only SELV / LPS (Limited Power Source) complying with IEC 60950-1 / EN 60950-1 / VDE 0805-1 must be connected to the power supply terminals. The power supply unit for the equipment power supply must comply with NEC Class 2, as described by the National Electrical Code (r) (ANSI / NFPA 70).

If the equipment is connected to a redundant power supply (two separate power supplies), both must meet these requirements.

⚠ CAUTION

If IE Switches X-300 are supplied over long 24 V power supply lines or networks, measures are necessary to prevent interference by strong electromagnetic pulses on the supply lines. These can result, for example, due to lightning or switching of large inductive loads.

One of the tests used to attest the immunity of devices of the IE Switches X-300 to electromagnetic interference is the "surge immunity test" according to EN61000-4-5. This test requires overvoltage protection for the power supply lines. A suitable device is, for example, the Dehn Blitzductor BVT ALD 36, order number 918 408 or comparable protective element.

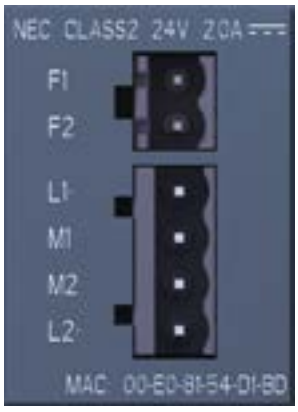
Vendor: DEHN+SÖHNE GmbH+Co.KG, Postfach 1640, D-92306 Neumarkt, Germany

Connecting to the supply voltage (SELV)

- The power supply is connected using a 4-pin plug-in terminal block.
- The power supply can be connected redundantly. Both inputs are isolated. There is no distribution of load. When a redundant power supply is used, the power supply unit with the higher output voltage supplies the IE Switch X-300 alone.
- The power supply is connected over a high resistance with the enclosure to allow an ungrounded set up. The two power inputs are non-floating.

Terminal block assignment (4-pin)

Table 5- 2 Pinout of the 24 V safety extra-low voltage (SELV)

Pin number	Assignment	Labeling (example)
Pin 1	L1+ (24 VDC)	
Pin 2	M1	
Pin 3	M2	
Pin 4	L2+ (24 VDC)	

Technical data

6

Note

Validity of the technical specifications

All the technical specifications described in this section that is not assigned to a specific device variant, version or a media module, apply to all device variants/versions of the product group.

6.1 Construction, installation and environmental conditions

Table 6- 1 Construction

Dimensions (W x H x D)	120 × 125 × 124 mm
Weight	1150 g
Degree of protection	IP20

Table 6- 2 Installation options

Installation options	• DIN rail [1)] • S7-300 standard rail • Wall

1) Note: When used in shipbuilding, installation on a 35 mm DIN rail is not permitted. In ships, the 35 mm DIN rail does not provide adequate support.

Table 6- 3 Permitted ambient conditions

Storage/transport temperature	-40 °C to +85 °C
Max. relative humidity in operation at 25 °C	<= 95% (no condensation)
Max. ambient temperature at operating altitude	2000 m or above: -5 °C of the max. operating temperature[1)] 3000 m or above: -10 °C of the max. operating temperature[1)]

1) See table: "Operating temperature depending on the media modules used"

Table 6- 4 Operating temperature depending on the media modules used

Media module [1]	Installation direction	Operating temperature [2]
Without media module	Horizontal	-40 °C to +60 °C
	Vertical	-40 °C to +45 °C
MM992-2CUC MM992-2CUC (C) MM992-2CU MM992-2M12 (C) MM992-2VD MM991-2 MM991-2FM MM991-2LD MM991-2 (SC) MM991-2LD (SC) MM992-2 MM992-2 (C) MM992-2LD	Horizontal	-40 °C to +60 °C
	Vertical	-40 °C to +45 °C
MM991-2LH+ (SC) MM992-2LH MM992-2LH+ MM992-2ELH	Horizontal	-40 °C to +50 °C
	Vertical	-40 °C to +45 °C
Media module MM992-2SFP with pluggable transceiver SFP991-1 SFP991-1LD SFP992-1 SFP992-1LD	Horizontal	-40 °C to +60 °C
	Vertical	-40 °C to +45 °C
Media module MM992-2SFP with pluggable transceiver SFP991-1LH+ SFP992-1LH SFP992-1LH+ SFP992-1ELH SFP991-1ELH200	Horizontal	-40 °C to +50 °C
	Vertical	-40 °C to +45 °C
MM991-2P		- 25 °C to + 40 °C

1) Only hardware product version 02 of the media modules is permitted.
The hardware product version is shown on the product. You can also read out this information from the device with the WBM or the CLI.

2) The permitted operating temperature depends on how the mounting device was installed. The installation is horizontal if the device labeling is from left to right. With a vertical installation, the device labeling is rotated through 90°.

6.2 Connectors and electrical data

Table 6- 5 Connection for end devices or network components

Max. number	8 ports
Electrical	4 x RJ-45 jacks, MDI-X pinning, 10/100/1000 Mbps (half/full duplex) power supply for connected devices (PDs) using Power over Ethernet (PoE) according to IEEE 802.3af / 802.3at (type 1)
Media module slots	2 x modular (2 ports per slot)
Transmitter output (optical) and receiver input	The values correspond to those of the permitted MM900 media modules and SFP transceivers.

Table 6- 6 Electrical data: Power supply

Rated voltage	**Voltage range**	**Permitted voltage range including total ripple**
24 VDC	19.2 VDC - 28.8 VDC	18.5 VDC - 30.2 VDC

Table 6- 7 Electrical data: Power consumption and redundancy

Current consumption	2 A
Max. power consumption (incl. PoE power supply of the connected PoE devices (PDs))	48 W
Power loss at 24 VDC	17 W
Overcurrent protection of the power supply Non-replaceable fuse	3 A / 32 V and 5 A / 125 V (PoE)
Redundant power supply unit	No
Redundant power supply possible	Yes

Table 6- 8 Electrical data: Signaling contact

Voltage via signaling contact	24 VDC
Switching capacity (resistive load)	max. 100 mA

Table 6- 9 Plug-in terminal block for connectors of the power supply and signaling contact

Power supply	1 x 4-pin male connector
Signaling contact	1 x 2-pin male connector

Table 6- 10 Power over Ethernet at port P1, P2, P3, P4

PoE function within a power supply system	According to IEEE 802.3af / 802.3at (type 1) for environment A
Method of PoE power feed	Alternative A (refer to the following table for the pin assignment)
Reserved power per port	15.4 W at port, of which the following can be used by the PD: 12.95 W
Overall power on all 4 ports	Max. 30.8 W

Table 6- 11 Electrical isolation

Between the ports	No
Between ports and ground	Yes
Between ports and 24 VDC power input	Yes

Table 6- 12 Pin assignment of the Ethernet ports of the SCALANCE PoE switch

Pin number / wire [1)]	**Assignment for data transmission**	**Assignment for power transfer (PoE). Alternative A (MDI-X)**
Pin 1	RX+	V-
Pin 2	RX-	V-
Pin 3	TX+	V+
Pin 4	-	-
Pin 5	-	-
Pin 6	TX-	V+
Pin 7	-	-
Pin 8	-	-

1) with 4-wire industrial twisted-pair cables, the wires are connected to pins 1, 2, 3 and 6.

6.3 Cable lengths

Table 6- 13 Permitted cable lengths (copper cable - Fast Ethernet)

Cable type	Accessory (plug, outlet, TP cord)	Permitted cable length
IE TP torsion cable	with IE FC Outlet RJ-45 + 10 m TP cord	0 to 45 m + 10 m TP cord
	with IE FC RJ-45 Plug 180	0 to 55 m
IE FC TP Marine Cable IE FC TP Trailing Cable IE FC TP Flexible Cable	with IE FC Outlet RJ-45 + 10 m TP cord	0 to 75 m + 10 m TP cord
	with IE FC RJ-45 Plug 180	0 to 85 m
IE FC TP standard cable	with IE FC Outlet RJ-45 + 10 m TP cord	0 to 90 m + 10 m TP cord
	with IE FC RJ-45 Plug 180	0 to 100 m

Table 6- 14 Permitted cable lengths (copper cable - gigabit Ethernet)

Cable type	Accessory (plug, outlet, TP cord)	Permitted cable length
IE FC Standard Cable, 4 × 2, 24 AWG IE FC Flexible Cable, 4 × 2, 24 AWG	with IE FC RJ-45 Plug 180, 4 × 2	0 to 90 m
IE FC Standard Cable, 4 × 2, 22 AWG	with IE FC Outlet RJ-45 + 10 m TP cord	0 to 60 m + 10 m TP cord
IE FC Flexible Cable, 4 × 2, 22 AWG	with IE FC Outlet RJ-45 + 10 m TP cord	0 to 90 m + 10 m TP cord

Note

Permitted cable lengths (fiber-optic cable - Fast Ethernet or gigabit)

The values correspond to those of the permitted MM900 media modules and SFP transceivers.

6.4 Other properties

Table 6- 15 Switching properties

Max. number of learnable addresses	8000
Aging time	30 sec

Switching technique	Store and forward
Latency	5 µs

Table 6- 16 Reconfiguration times for redundancy mechanisms

Redundancy mechanism	Reconfiguration times
HRP	300 ms
Standby link	300 ms
MRP	200 ms

Mean time between failure (MTBF)

The value in the following table applies to the basic device without media modules.

MTBF	> 30 years [1]

[1] This value applies at 40 °C.

In the calculation of the MTBF of a modular switch, the standard parts count applies; in other words, the reciprocals of all component failure rates are added.

The reciprocal of this total id the MTBF of the entire assembly.

$$MTBF_{total} = \frac{1}{\left(\frac{1}{MTBF_{basic\ device}} + \frac{1}{MTBF_{module\ 1}} + \ldots + \frac{1}{MTBF_{module\ n}}\right)}$$

Note

The IE Switches X-300 support "full wire speed switching" complying with IEEE 802.3 on all ports. The number of packets therefore depends on the packet length.

Table 6- 17 Full wire speed switching

Number of frames per second		At a frame length of
At 100 Mbps	At 1000 Mbps	
148810	1488095	64 bytes
84459	844595	128 bytes
45290	452899	256 bytes
23496	234962	512 bytes
11973	119732	1024 bytes
9615	96154	1280 bytes
8127	81274	1518 bytes

Note

The following applies to IE Switches X-300:

The number of IE Switches X-300 connected in a line influences the frame delay time. When a frame passes through the switch, this is delayed by the Store&Forward function of the IE Switch X-300 by the following values:

- at 64 bytes frame length: Delay of approx. 10 microseconds (at 100 Mbps)
- at 1500 bytes frame length: Delay of approx. 130 microseconds (at 100 Mbps)

This means, the more IE Switches X-300 a frame runs through, the higher the frame delay.

Dimension drawings

7

All dimensions in the drawings are in millimeters.

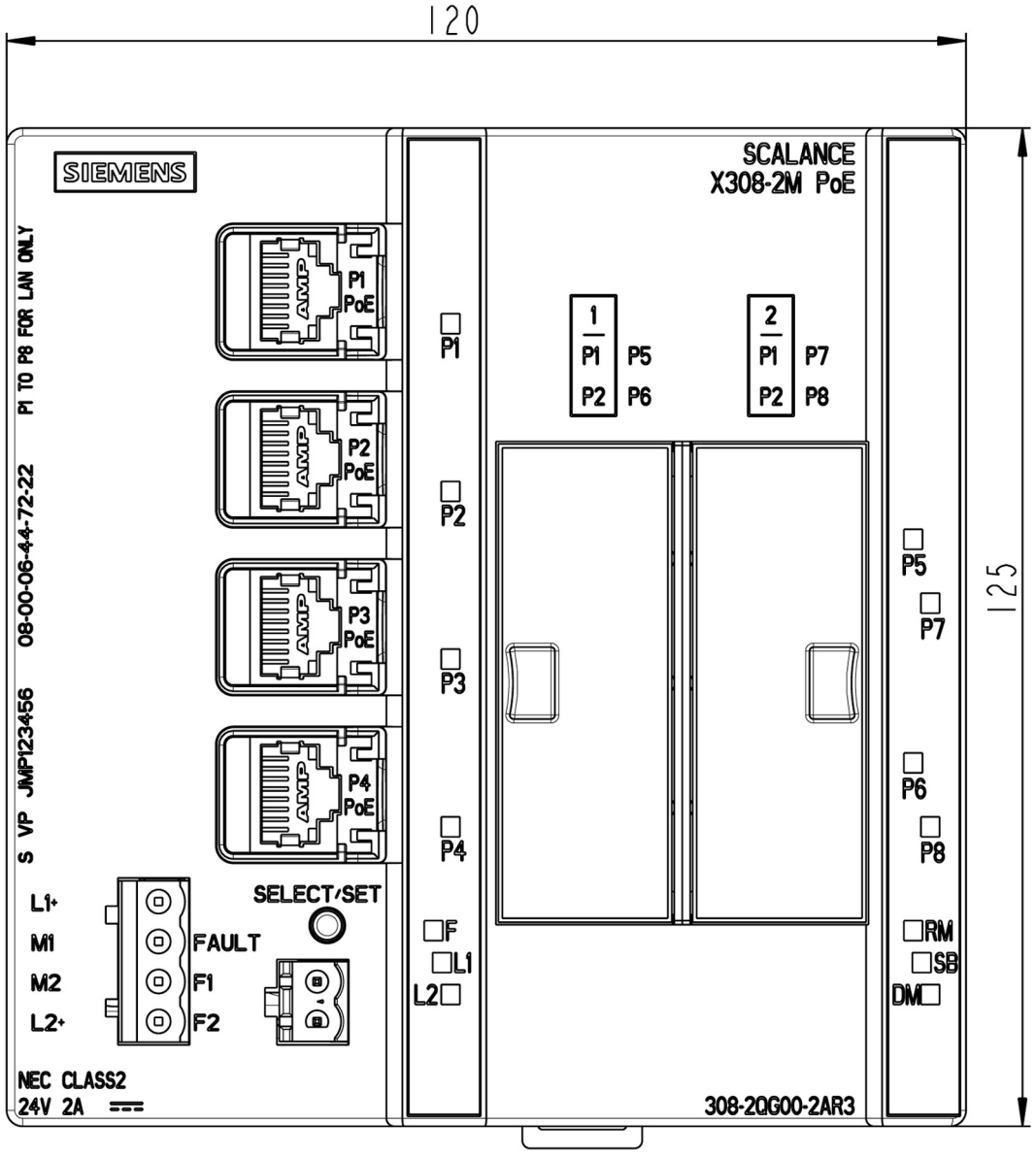


Image 7-1 X308-2M PoE: Front view

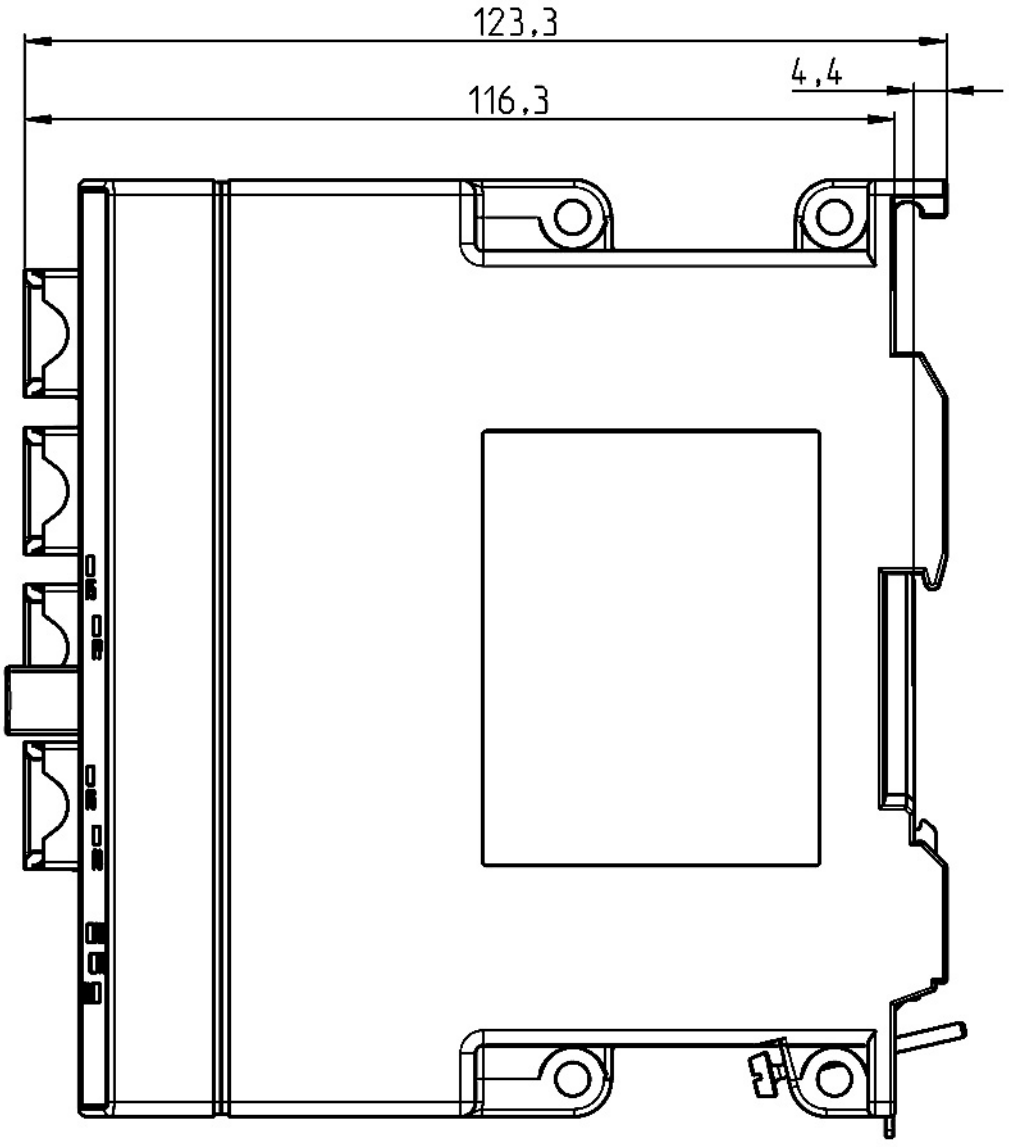


Image 7-2 X308-2M PoE: Side view

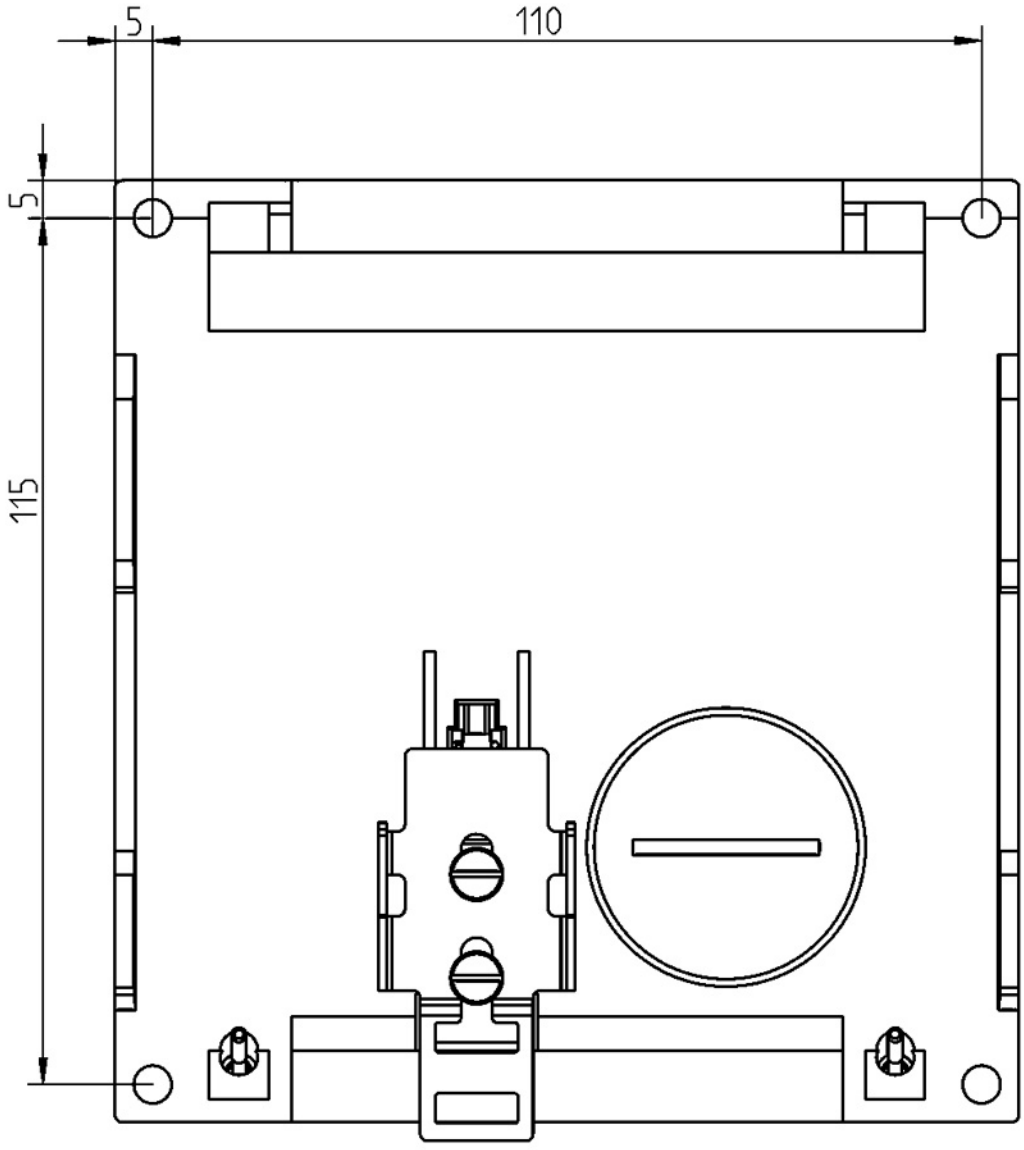


Image 7-3 X308-2M PoE: Drilling template

Approvals

8

8.1 X-300M PoE approvals, certificates

Approvals issued

Note

Issued approvals on the type plate of the device

The specified approvals apply only when the corresponding mark is printed on the product. You can check which of the following approvals have been granted for your product by the markings on the type plate.

Approvals for shipbuilding are not printed on the device type plate.

Note

Shipbuilding approval

You will find shipbuilding approvals on the Internet on the pages of Siemens Industry Automation Customer Support under the following entry ID:

33118441 (http://support.automation.siemens.com/WW/view/en/33118441)
"Entry list" tab > entry type "Certificates"

EC directives

SIMATIC NET products meet the requirements and aims of the following EC directives.

EMC directive (electromagnetic compatibility)

The SIMATIC NET products described in these operating instructions meet the requirements of EC directive 2004/108/EC "Electromagnetic Compatibility" for the following areas of application:

Field of application	Requirements	
	Emission	Immunity to interference
Industry	EN 61000-6-4 : 2007	EN 61000-6-2 : 2005

⚠ WARNING

Personal injury and property damage can occur

The installation of expansions that are not approved for SIMATIC NET products or their target systems may violate the requirements and regulations for safety and electromagnetic compatibility.

Only use expansions that are approved for the system.

- **Keep to the installation guidelines**
  The devices meet the requirements if you adhere to the installation and safety instructions contained in this documentation and in the following documentation when installing and operating the devices.
- **You can always find the latest documentation on the Internet**
  The current descriptions of the currently available products can always be found on the Internet under the specified entry IDs/Internet pages:
  - "Industrial Ethernet / PROFINET Industrial Ethernet" System Manual
  - "Industrial Ethernet / PROFINET - Passive network components" System Manual

    You will find information on the system manuals in the section "ID = 27069465 (http://support.automation.siemens.com/WW/view/en/27069465)", in "Further documentation".
  - "EMC Installation Guidelines" configuration manual

    ID = 60612658 (http://support.automation.siemens.com/WW/view/en/60612658)
- **Working on the device**
  To protect the device from electrostatic discharge, personnel must first discharge any electrostatic charge from their body before touching the device.

Note

The test was performed with a device and a connected communications partner that also meets the requirements of the standards listed above.

When operating the device with a communications partner that does not comply with these standards, adherence to the corresponding values cannot be guaranteed.

Machinery directive

The product is a component in compliance with the EC Machinery Directive 2006/42//EEC. According to the machinery directive, we are obliged to point out that the product described is intended solely for installation in a machine.

Before the final product can be put into operation, it must be tested to ensure that it conforms with the directive 2006/42/EEC.

Note

Note for the manufacturers of machines

This product is not a machine in the sense of the EC Machinery Directive. There is therefore no declaration of conformity relating to the EC Machinery Directive 2006/42/EEC for this product.

ATEX (explosion protection directive)

⚠ WARNING

When using SIMATIC NET products in hazardous area zone 2, make absolutely sure that the associated conditions in the following document are adhered to:

"SIMATIC NET Product Information Use of subasseblies/modules in a Zone 2 Hazardous Area".

You will find this document

- on the data medium that ships with some devices.
- on the Internet pages of Siemens Industry Online Support (http://support.automation.siemens.com/WW/view/en).

Enter the document identification number C234 as the search term.

SIMATIC NET products meet the requirements of the EC directive:94/9/EC "Equipment and Protective Devices for Use in Potentially Explosive Atmospheres".

ATEX classification:

II 3 G Ex nA IIC T4 Gc

KEMA 07ATEX0145 X

The products meet the requirements of the following standards:

- EN 60079-15: 2010 (electrical apparatus for potentially explosive atmospheres; Type of protection "n")
- EN 60079-0: 2009 (Explosive atmospheres - Part 0: Equipment - General requirements)

IECEx

The SIMATIC NET products meet the requirements of explosion protection according to IECEx.

IECEx classification:

Ex nA IIC T4 Gc

DEK 14.0025X

The products meet the requirements of the following standards:

- IEC 60079-15 : 2010 (Explosive atmospheres - Part 15: Equipment protection by type of protection "n"
- IEC 60079-0 : 2011 (Explosive atmospheres - Part 0: Equipment - General requirements)

FM

The product meets the requirement of the standard:

- Factory Mutual Approval Standard Class Number 3611

C-Tick

The product meets the requirements of the AS/NZS 2064 standard (Class A).

cULus Approval for Information Technology Equipment

cULus Listed I. T. E.

Underwriters Laboratories Inc. complying with

- UL 60950-1 (Information Technology Equipment)
- CSA C22.2 No. 60950-1-03

Report no. E115352

cULus Approval Hazardous Location

cULus Listed I. T. E. FOR HAZ. LOC.

Underwriters Laboratories Inc. complying with

- UL 60950-1 (Information Technology Equipment)
- ANSI/ISA 12.12.01-2007
- CSA C22.2 No. 213-M1987

Approved for use in
Cl. 1, Div. 2, GP A, B, C, D T4
Cl. 1, Zone 2, GP IIC T4

Report no. E240480

8.2 SCALANCE X-300 declaration of conformity

You will find the EC Declaration of Conformity for these products on the Internet at the following address:

SCALANCE X-300 declaration of conformity
(https://support.industry.siemens.com/cs/ww/en/ps/15296/cert)

1. Click on the entry "SCALANCE X-300 managed" in the navigation panel at the top edge of the window and from the drop-down list that opens, select the entry for your product group.
2. Select the entry "Certificate" from the "Entry type"drop-down list.

Result: A list of the available certificates is displayed.

8.3 Overview of the approvals

Table 8- 1 Overview of the approvals

Device	c-UL-us Inf. Tech. Eq.	c-UL-us for Hazardous Locations [1)]	FM[1)]	C-TICK	CE	ATEX95 Zone 2 [1)]
X308-2M PoE	•	•	•	•	•	•

1 For temperature information "T.." or the maximum ambient temperature "Ta:...", refer to the type plate.

Note

Shipbuilding approval

You will find shipbuilding approvals on the Internet on the pages of Siemens Industry Automation Customer Support under the following entry ID:

33118441 (http://support.automation.siemens.com/WW/view/en/33118441)
"Entry list" tab > entry type "Certificates"

8.4 Mechanical stability in operation

The switch meets the following requirements for mechanical stability:

IEC 60068-2-6 (vibration)

- Securing on a DIN rail

  5 – 9 Hz: 3.5 mm
  9 – 150 Hz: 1 g
  1 octave/min, 20 sweeps

IEC 60068-2-27 (shock)

- Securing on a DIN rail

  15 g, 11 ms duration, 6 shocks per axis

Appendix

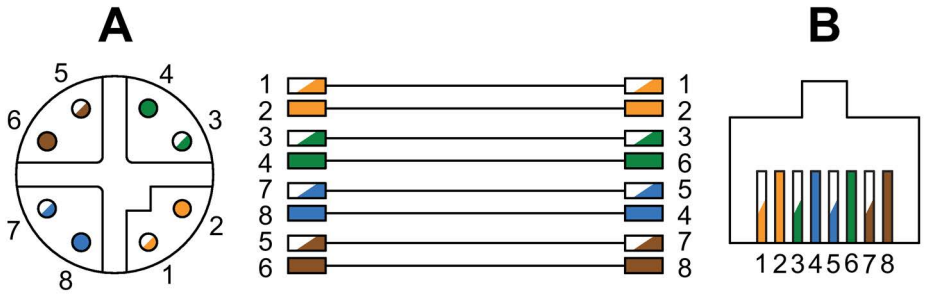
A

A.1 The connector system M12/X coded according to IEC 61076-2-109

Description

M12 connectors with X coding are also suitable for transmission rates up to 210 Gbps (Cat6A) because the shields of the wire pairs can be led into the connectors. A further advantage is the availability of connectors with degree of protection IP67 with which the equipped devices are also suitable for adverse environmental conditions (dust, dampness). Due to the locking technology standardized for the M12 connectors a high resistance to vibration is achieved. Numerous SCALANCE devices therefore provide connection options for X coded M12 connectors.

Pin assignment



A Front view of M12 connector, X coded according to IEC61076-2-109

B Front view of RJ-45 connector, latching nose at the top, with pin assignment according to EIA/TIA 568B

Pin	M12/X coded		RJ-45 according to EIA/TIA 568B	
	Wire color	Signal	Wire color	Signal
1	White / orange	TX+	White / orange	TX+
2	Orange	TX-	Orange	TX-
3	White / green	RX+	White / green	RX+
4	Green	RX-	Blue	
5	White / brown		White / blue	
6	Brown		Green	RX-
7	White / blue		White / brown	
8	Blue		Brown	

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G

S