SIEMENS

# SIMATIC NET

# Industrial Ethernet switches SCALANCE XR-300M EEC

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 Introduction to the XR-300M EEC

### Purpose of the Operating Instructions (compact)

These operating instructions (compact) contain information with which you will be able to install and connect up a device of the SCALANCE X-300 product line.

### Validity of these Operating Instructions (compact)

These Operating Instructions (compact) are valid for the product group **XR-300M EEC** of the SCALANCE X-300 product line (see product overview).

### 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. | **XR-300M EEC** |
| Device | For a device, only the device name is used. | **XR324-4M EEC** |
| Variant | For a variant of the device, the device name has the appropriate variant added to it in brackets (2x24V). | **XR324-4M EEC** (1 x 24 V DC, cable outlet front) |
| All variants of a device | For all variants of the device, the device name has (all) added to it. | **XR324-4M EEC** (all) |

### Where can I find more detailed information on the product?

A CD is supplied with the IE Switches X-300 on which you will find a detailed description of the products in PDF format in the relevant subfolder.

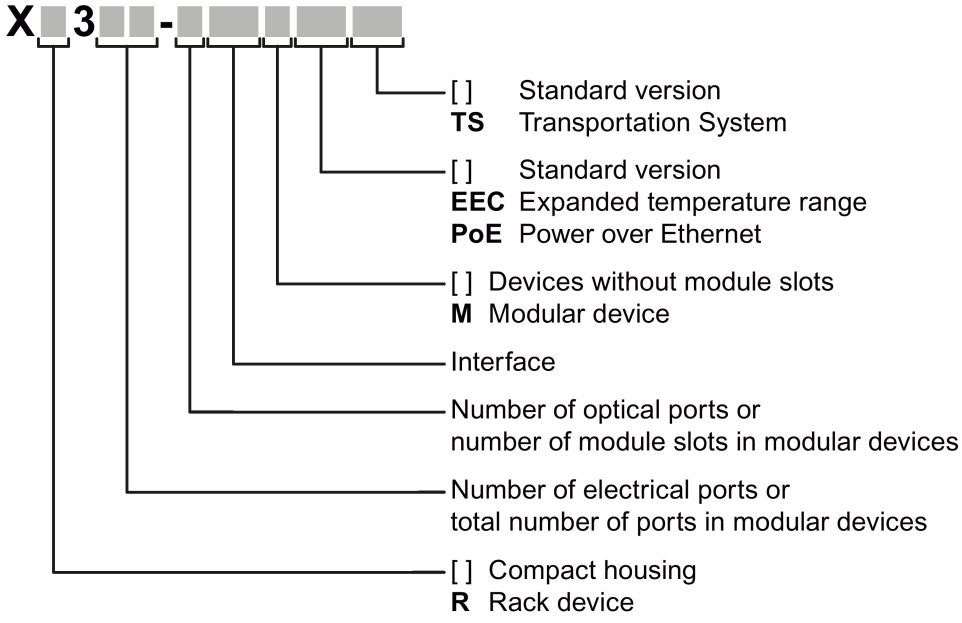
## 1.2 XR-300M EEC product group

| Device | Properties | Order number |
|---|---|---|
| **XR324-4M EEC** | 1 x 24 to 48 VDC<br>LEDs, connector data cable outlet on front<br>Connector power supply and diagnostics port at rear | 6GK5 324-4GG00-1ER2 |
| | 2 x 24 to 48 VDC<br>LEDs, connector data cable outlet on front<br>Connector power supply and diagnostics port at rear | 6GK5 324-4GG00-2ER2 |
| | 1 x 100 to 240 VAC / 60 to 250 VDC<br>LEDs, connector data cable outlet on front<br>Connector power supply and diagnostics port at rear | 6GK5 324-4GG00-3ER2 |
| | 2 x 100 to 240 VAC / 60 to 250 VDC<br>LEDs, connector data cable outlet on front<br>Connector power supply and diagnostics port at rear | 6GK5 324-4GG00-4ER2 |
| | 1 x 24 to 48 VDC<br>LEDs, connector power supply on front<br>Data cable outlet and diagnostics port at rear | 6GK5 324-4GG00-1JR2 |
| | 2 x 24 to 48 VDC<br>LEDs, connector power supply on front<br>Data cable outlet and diagnostics port at rear | 6GK5 324-4GG00-2JR2 |
| | 1 x 100 to 240 VAC / 60 to 250 VDC<br>LEDs, connector power supply on front<br>Data cable outlet and diagnostics port at rear | 6GK5 324-4GG00-3JR2 |
| | 2 x 100 to 240 VAC / 60 to 250 VDC<br>LEDs, connector power supply on front<br>Data cable outlet and diagnostics port at rear | 6GK5 324-4GG00-4JR2 |

# 1.3 Type designations

## 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 and 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

## Safety notices on use in hazardous areas

### General safety notices relating to protection against explosion

### 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<br>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.

## 2.1 Important notes on using the SCALANCE X-300 product family

### 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 does not apply to 100 V...240 V devices.)

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.

## 2.2 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.

## 2.3 Important notes 100 to 240 VAC / 60 to 250 VDC

### Note on devices with power supply 100 to 240 VAC / 60 to 250 VDC

**⚠ DANGER**

**Danger from line voltage**

The supply voltage for the devices listed is 100 to 240 VAC and 60 to 250 VDC.

This device can only function correctly and safely if it is transported, stored, set up, and installed correctly, and operated and maintained as recommended.

Connecting and disconnecting may only be performed by an electrical specialist.

Connect or disconnect power supply cables only when the power is turned off.

**⚠ WARNING**

**Devices with a 100 to 240 VAC power supply do not have an ATEX approval.**

Devices with a 100 to 240 VAC power supply are not approved for use in hazardous areas according to EC-RL-94/9 (ATEX).

**NOTICE**

**Securing cables with dangerous voltage**

Make sure that the connector cannot be released accidentally by pulling on the connecting cable. Lay the cables in cable ducts or cable channels and secure the cables, where necessary, with cable ties.

### Safety requirements for installation

According to the IEC 61131-2 standard and therefore in accordance with the EU directive 2006/95/EC (Low Voltage Directive), the devices are "open equipment" and in accordance with UL/CSA certification, they are an "open type".

To fulfill requirements for safe operation with regard to mechanical stability, flame retardation, stability, and shock-hazard protection, the following alternative types of installation are specified:

- Installation in a suitable cabinet.
- Installation in a suitable enclosure.
- Installation in a suitably equipped, enclosed control room.

## 2.4 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 Unpacking and checking

### Unpacking, checking

**⚠ WARNING**

**Do not use any parts that show evidence of damage**

If you use damaged parts, there is no guarantee that the device will function according to the specification.

If you use damaged parts, this can lead to the following problems:

- Injury to persons
- Loss of the approvals
- Violation of the EMC regulations

Use only undamaged parts.

1. Make sure that the package is complete.
2. Check all the parts for transport damage.

## 3.2 Components of the XR-300M EEC product

**Note**

- When shipped, all devices have a C-PLUG exchangeable medium.
- When shipped, the slots for the media modules have a dummy cover fitted.
- Labels to identify the installed MM900 media modules are supplied with the modular devices.

The consignment of a SCALANCE XR-300M EEC consist of the device itself and the following parts:

- 2 mounting brackets and 8 screws (M3x5 recessed head, drive: Torx) for 19" rack installation
- Connecting cable for the diagnostics port
- Operating Instructions (compact) SCALANCE XR-300 M EEC.

- With devices with power supply 100 to 240 VAC / 60 to 250 VDC:
  - A 3-pin terminal block (or two terminal blocks for redundant power supply) for the signaling contacts.
  - A 3-pin terminal block (or two terminal blocks for redundant power supply) for the power supply.
- With devices with 24 to 48 VDC power supply:
  - A 2-pin terminal block (or two terminal blocks for redundant power supply) for the signaling contacts.
  - A 4-pin terminal block (or two terminal blocks for redundant power supply) for the power supply.

# 3.3 Product characteristics of the SCALANCE XR324-4M EEC

## Connection options with the SCALANCE XR324-4M EEC

The SCALANCE XR324-4M EEC is a partially modular device and has 24 ports.

- **16 fixed ports in the base device:**
  16 RJ-45 jacks for connection of end devices or other network segments.
- **8 modular ports via module slots:**
  4 modules can be combined using slots (S1-S4) depending on the application. End devices and other network segments are connected according to the modules being used.

Image 3-1 XR324-4M EEC

**⚠ CAUTION**

**Use only approved media modules**

If you use media modules that are not approved by Siemens AG, there is no guarantee that the device will function according to the specification.

If you use unapproved media modules, this can lead to the following problems:

- Damage to the device
- Loss of the approvals
- Violation of the EMC regulations

Use only approved media modules.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Slot number** | | | | | | | | S1 | | S2 | |
| **Port number** | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | P1 | P2 | P1 | P2 |
| **Slot number** | | | | | | | | | S3 | | S4 | |
| **Port number** | P9 | P10 | P11 | P12 | P13 | P14 | P15 | P16 | P1 | P2 | P1 | P2 |

## 3.4 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.

# 3.5 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** |
| 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<br>(no redundant supply). |
| | green | on | Power supplies L1 and L2 higher than 17 V<br>(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. |

| LED color | LED status | Meaning |
|---|---|---|
| yellow | flashes / lit | Receiving data at port.<br>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. |

# 3.6 C-PLUG

## 3.6.1 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.

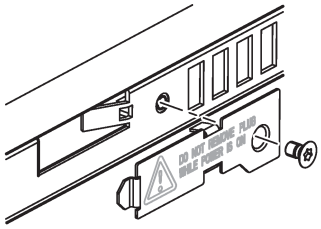
### Response to errors

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).

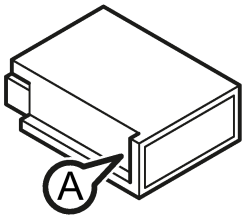
## 3.6.2 Removal and insertion of the C-PLUG (rack devices)

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

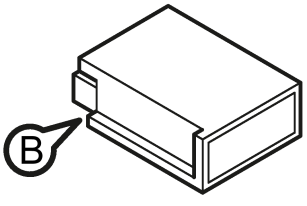
### Position of the C-PLUG with rack devices

| | |
| --- | --- |
|  | With rack devices, the slot is below a cover on the right-hand side of the housing. After undoing the screw (screw head Torx T10), the cover plate can be removed and the slot is accessible. |

### Removing the C-PLUG

| | |
| --- | --- |
|  | 1. Turn off the power to the device.<br>2. Remove the cover plate on the right-hand side of the device.<br>3. Insert a screwdriver between the front edge of the C-PLUG (position A) and the slot and release the C-PLUG.<br>4. Remove the C-PLUG and screw the cover plate firmly in place again. |

### Inserting the C-PLUG

| | |
| --- | --- |
|  | 1. Turn off the power to the device.<br>2. Remove the cover plate on the right-hand side of the device.<br>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.<br>4. Secure the cover plate again with the screws. |

# Assembling

# 4

## 4.1 Safety notices for installation

### Safety notices

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

**⚠ WARNING**

If a device is operated in an ambient temperature of more than 50 °C, the temperature of the device housing may be higher than 70 °C. The device must therefore be installed so that it is only accessible to service personnel or users that are aware of the reason for restricted access and the required safety measures at an ambient temperature higher than 50 °C.

### 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 Suitable cables for temperatures in excess of 70 °C (ATEX)

**⚠ WARNING**

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, only use cables with admitted maximum operating temperature of at least 80 °C.

### Further notes

**⚠ CAUTION**

**Use only approved components**

If you use components and accessories that are not approved for SIMATIC NET devices or their target systems, this may violate the requirements and regulations for safety and electromagnetic compatibility.
Only use components approved for the SIMATIC NET devices.

**NOTICE**

**Warming and premature aging of the IE switch due to direct sunlight**

Direct sunlight can heat up the device and can lead to premature aging of the IE switch and its cabling.

Provide suitable shade to protect the IE switch against direct sunlight.

**Note**

During installation and operation, keep to the installation guidelines and safety notices described in this document and in the system manuals "Industrial Ethernet / PROFINET Industrial Ethernet" and "Industrial Ethernet / PROFINET passive network components".

You will find information on the system manuals in the section "Auto-Hotspot", in "Further documentation".

## 4.4 Notes on installation

**⚠ WARNING**

If a device is operated in an ambient temperature of more than 50 °C, the temperature of the device housing may be higher than 70 °C. The device must therefore be installed so that it is only accessible to service personnel or users that are aware of the reason for restricted access and the required safety measures at an ambient temperature higher than 50 °C.

**NOTICE**

**Use only approved components**

If you use components and accessories that are not approved for SIMATIC NET devices or their target systems, this may violate the requirements and regulations for safety and electromagnetic compatibility.

Use only components that are approved for SIMATIC NET devices.

**⚠ 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, only use cables with admitted maximum operating temperature of at least 80 °C.

**⚠ CAUTION**

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

**Note**

When installing and operating the device, keep to the installation instructions and safety-related notices as described in this document and in the manual SIMATIC NET Industrial Ethernet Twisted Pair and Fiber Optic Networks.

## 4.5 19" rack mounting - XR-300M EEC product group

**⚠ WARNING**

**Danger of injury by falling objects**

If you do not use the supplied mounting brackets for 19"rack installation, it is not possible to install the device correctly.

Use only the supplied mounting brackets.

There are several ways of fixing the mounting brackets depending on the mounting position required.

### Grounding

**⚠ WARNING**

**Danger from line voltage**

Grounding simply via the housing is inadequate.

In this case, connect the functional ground to ensure reliable operation.

With devices with a supply voltage of 100 to 240 VAC / 60 to 250 VDC, you should also connect the protective earth to the grounding bolt.

On the SCALANCE X-300EEC, the grounding bolt is on the bottom of the device.

On the SCALANCE XR-300M EEC, the grounding bolt is on the rear of the housing between the power connectors.

## 19" rack mounting

19" rack mounting is possible for all rack devices identified by (XR).
Refer to the technical specifications, Installation options table for each product group. The rack device is installed using two mounting brackets fitted to the front. After fitting the two mounting brackets, the rack device can then be installed in a 19" cabinet.

| NOTICE |
| --- |
| **Do not cover the ventilation grilles**<br>During installation, select a mounting position so that the ventilation grilles are always free to achieve adequate cooling. With normal orientation, the ventilation grilles are on the top, bottom and sides of the housing.<br>If you install more than one rack device, make sure that the permitted ambient conditions are met for all devices in the rack. |

## Minimum clearances

If you install the IE Switch in rack devices without forced ventilation or cooling, minimum clearances must be maintained to neighboring devices or the wall of the enclosure. By keeping to the minimum clearances, there is then an adequate stream of air for heat dissipation during operation. Keep to the following minimum clearances to neighboring devices.

Table 4- 1 Minimum clearances for installation in rack devices

| | |
| --- | --- |
| Minimum clearance to devices below the switch | 100 mm |
| Minimum clearance to devices above the switch | 100 mm |
| Minimum clearance between two SCALANCE XR-300 EEC at an ambient temperature up to 70 °C without external ventilation | 100 mm |
| Minimum clearance between two SCALANCE XR-300 EEC at an ambient temperature up to 60 °C without external ventilation | 45 mm (1 height unit) |

| NOTICE |
| --- |
| **Four-point mounting**<br>If mechanical load is high, the device should be secured at four points. You will find more detailed information in the section "Mechanical stability in operation". |

## Normal orientation

| Normal orientation of the device | |
|---|---|
| • The LED display is on the left of the front panel of the housing.<br>• The Ethernet ports or the slots for the modules are also on the front of the housing. Slots for the modules are fitted with dummy covers.<br>• The C-PLUG is on the right behind a protective panel secured with screws.<br>(For more detailed information, refer to the section on the C-PLUG in the X-300 operating instructions.)<br>• The ventilation grilles are on the top, bottom and sides of the housing. |  <br>SCALANCE XR324-4M EEC |
| • On the rear of the device, you will find the diagnostics port.<br>• The grounding bolt and the connectors for the signaling contact and power supplies are also on the rear of the device.<br>Note that there are different power supplies (see section "XR-300M EEC product group (Page 6)"). |  <br>SCALANCE XR324-4M EEC |

## 19" rack mounting with normal orientation

| 19" rack mounting | | |
|---|---|---|
| 1. | Select the required rack device and the 19" cabinet. | |
| 2. | Fix the two mounting brackets with 4 screws each to the sides of the housing. The maximum tightening torque for these screws is 0.5 Nm. |  |
| | CAUTION: If you install a rack device with components inserted.<br>The locking mechanisms of components installed in the rack device (for example the handles of media modules or the clips on the SFP) must be closed.<br>See also installation of modular devices:<br>- Installing media modules in a slot<br>- Installing an SFP in an SFP media module. |  <br>SCALANCE XR324-4M EEC |
| 3. | Insert the rack device in the 19" cabinet and hold the rack device at the required height. Make sure that nothing is obstructing air from entering the ventilation grilles.<br>Fit the securing screws to the two mounting brackets to secure the rack device in the 19" cabinet. | |
| 4. | Connect the grounding bolts. On the SCALANCE X-300EEC, the PE connector is on the bottom of the device. On the SCALANCE XR-300M EEC, the PE connector is on the rear of the device between the power connectors. | |
| 5. | Fit the connectors for the power supply.<br>Note that the SCALANCE X-300 is available for different power supplies (100 to 240 VAC and 24 VDC variants). | |
| 6. | Fit the remaining connectors, for example the signaling contact. | |

## Removal

| Removing from the rack | |
|---|---|
| 1. | Turn off the power supply for the SCALANCE XR-300M. |
| 2. | Disconnect all cables for data traffic and the connectors for the power supply and the grounding cable. |
| 3. | Undo the screws on the mounting bracket and remove the rack device from the 19" cabinet.<br>If necessary, release the locking mechanisms of components inserted in the rack device (for example handles on the media module or clips on the SFP) to be able to remove the media modules (MM900) or the transceiver (SFP). |

# 4.6 Installation of modular devices

## 4.6.1 Installation and removal of media modules

### Safety notices

**NOTICE**

**Use only approved media modules**

If you use media modules that are not approved by Siemens AG, there is no guarantee that the device will function according to the specification.

If you use unapproved media modules, this can lead to the following problems:

- Damage to the device
- Loss of the approvals
- Violation of the EMC regulations

Use only approved media modules.

**NOTICE**

**Damage due to changing modules while the device is turned on**

Media modules for SCALANCE devices are not capable of hot plugging.

Install or remove media modules only when the power supply of the device is turned off.

**Note**

**Use media modules only in an approved modular device**

Use an MM900 media module only for a device equipped with suitable slots for such modules. Example: X308-2M.

**The names and labeling of the media modules differ**

- Example: The device is called, for example, "MM992-2SFP" [6GK5 992-2AS00-8AA0], the labeling on the device is "9922AS". You will find detailed information on the labeling of the media modules in the "MM900 media modules" compact operating instructions.

**⚠ CAUTION**

**Remember the orientation of media modules.**

On modular devices, there are always two module slots arranged opposite each other. Remember the correct orientation when installing MM900 media modules.
Example:

- Install the first media module in slot 1.
- Install the third media module turned through 180° in slot 2.

On modular devices for rack mounting, pairs of module slots are located one above the other in which modules can be inserted in a specific order:

Example of a rack device:

- Install the first media module in slot 1.
- Install the third media module turned through 180° in slot 3.

Other modules are then installed in slot 2 and 4.

**The permitted operating temperature is decided by the fully equipped device (switch + media module + SFP transceiver).**

With modular devices, it is not only the switch that decides the permitted operating temperature of the overall device but also the temperature ranges of the MM900 media modules and the SFP transceivers. You will find details in the technical specifications of the relevant components.

The following aspects can restrict the maximum permitted operating temperature:

- The orientation of the carrier device.
- The use of SFP transceivers.
- The use of transceivers of the types LH, LH+ or ELH.

**Note**

**SFP transceivers with the SCALANCE XR300M EEC**

In contrast to the information in the product documentation for the SCALANCE MM900, MM992-2SFP media modules can be operated in the SCALANCE XR300M EEC at ambient temperatures up to a maximum of 70 °C if the following requirements are met:

- MM992-2SFP media modules as of hardware product version 02 are suitable. The hardware product version can be found on the device. You can also read out this information with the WBM or the CLI.
- The media modules MM992-2SFP can only be used in conjunction with the media modules MM992-2CUC, MM992-2CU and MM992-2M12.
- Only the following SFP transceivers may be used:
  - SFP991-1
  - SFP991-1LD
  - SFP992-1
  - SFP992-1LD

**Note**

**Slot number**

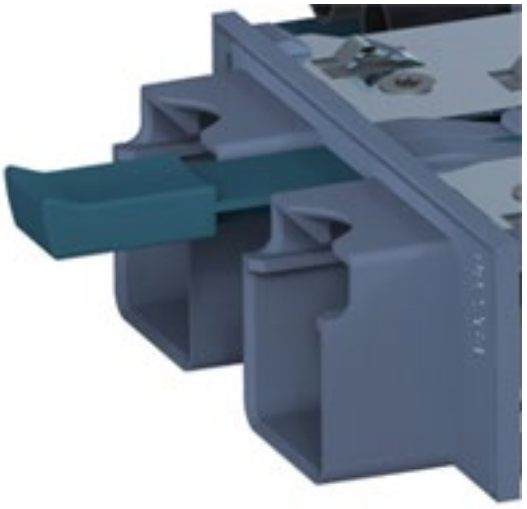
With modular devices, the MM900 media modules must be given a slot number.
The slot number labels are supplied with the modular devices.

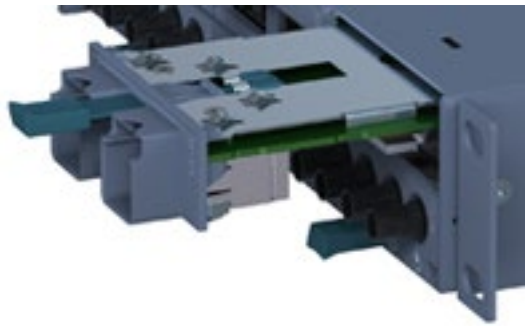
## Installing a media module

The media module is inserted with the handle pulled out. When the handle is inserted, the media module is locked in the device.

**Note**

The figures in the following installation instructions show the installation of a media module in a rack device. The procedure for installation is identical for rack or compact devices.

| | | |
|---|---|---|
| 1. | Select the required slot on the device (for example, X308-2M). Remove the dummy cover. |  |
| 2. | Pull out the handle on the selected media module. |  |

| | | |
|---|---|---|
| 3. | Place the media module in the guide rails of the device slot.<br>The media module is correctly installed when it clips easily into the device. |  |
| 4. | Push the handle back into the media module. This locks the media module in the device. |  |
| 5. | Insert the connectors. |  |

## Removing a media module

**CAUTION**

**Risk of burns due to the high temperature of the module housing**

Turn off the device and allow the device to cool down before you remove a media module.

1. Remove all connectors from the media module.
2. Pull out the handle of the media module and remove the media module from the device slot.
3. Secure the dummy cover.

## 4.6.2 SFP installation in SFP media module

| NOTICE |
| --- |
| **Use only approved SFPs**<br>If you use SFPs that are not approved by Siemens AG, there is no guarantee that the device will function according to the specification.<br>If you use unapproved SFPs, this can lead to the following problems:<br>• Damage to the device<br>• Loss of the approvals<br>• Violation of the EMC regulations<br>Use only approved SFPs. |

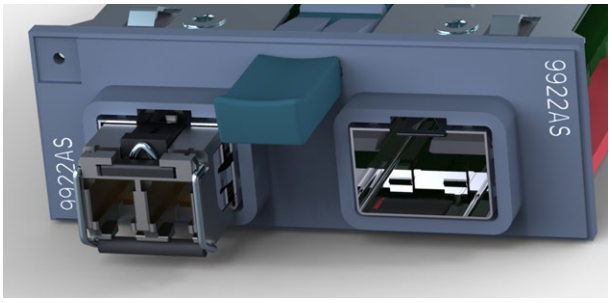
You can insert or remove the SFP during ongoing operation.

### Inserting an SFP

**Note**

Only the media module MM992-2SFP may be fitted with approved SFPs. The SFP media module can be fitted with up to two SFPs.

| Device:<br>Media module | Variant | [Order number]<br>Labeling on the device | Figure |
| --- | --- | --- | --- |
| MM992-2SFP<br>(SFP media module) | 2 x 100/1000 Mbps | [6GK5 992-2AS00-8AA0]<br>9922AS |  |

| | | |
|---|---|---|
| 1. | Select the required SFP media module in the slot of the device. (Example: X-308-2M, slot 2) |  |
| 2. | Insert the SFP with the clip closed in the SFP media module.<br>Notice: Closing the clip after insertion does not lock the device in the rack. |  |
| 3. | The SFP can be heard to lock in place and is therefore firmly secured. |  |
| 4. | Plug the connecting cable into the SFP.<br>The connecting cable can be heard to lock in place and is then firmly secured. | |

## Removing an SFP

1. Remove the cable connected to the SFP.
2. Open the clip on the SFP and remove the SFP from the SFP media module.

   Notice: It must be possible to remove the SFP easy without using force.
3. Fit a blind plug to the SFP.

# 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.

### 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 Connecting ground (EEC)

### Functional ground

With the devices X-300EEC and XR-300M EEC with a 100 to 240 VAC / 60 to 250 VDC power supply, functional ground must be connected to the grounding bolts or the power supply terminal of every power supply unit. With the devices X-300EEC and XR-300M EEC with 24 to 48 VDC, functional ground must be connected to the grounding bolts or the mounting brackets (XR-300M EEC). On the X-300EEC, the functional ground is on the bottom of the device, on the XR-300M-EEC on the side.

To wire up the functional ground, use a copper cable of category 18-8 AWG or cable with a cross-section of 0.75 to 6 mm².

### Protective ground

When the device is operated with multirange power supply unit 100 to 240 VAC / 60 to 250 VDC, the protective ground is connected in addition to the functional ground.

**⚠ CAUTION**

**Danger from line voltage**

Grounding simply via the housing is inadequate.

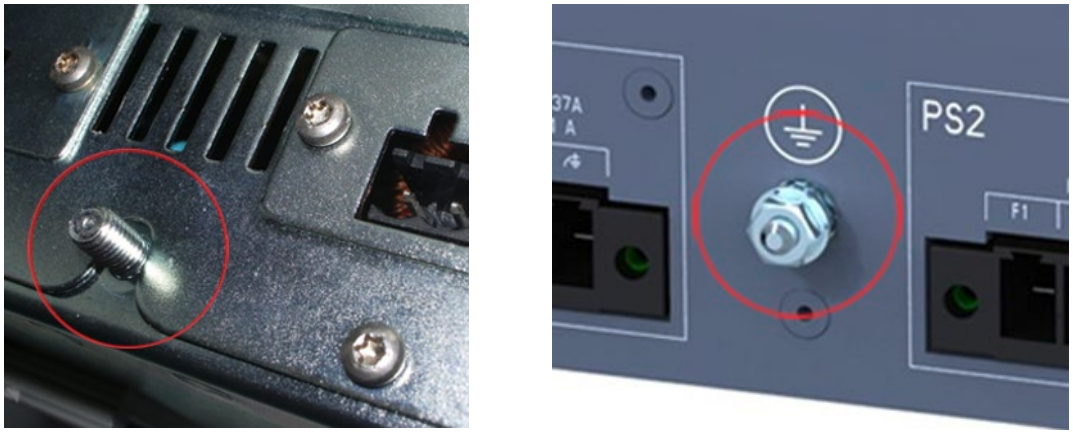
In this case, connect the functional ground to ensure reliable operation.

With devices with a supply voltage of 100 to 240 VAC / 60 to 250 VDC, you should also connect the protective earth to the grounding bolt.

On the SCALANCE X-300EEC, the grounding bolt is on the bottom of the device.

On the SCALANCE XR-300M EEC, the grounding bolt is on the rear of the housing between the power connectors.

To wire up the protective ground, use a copper cable of category 14-8 AWG or cable with a cross-section of 1.5 to 6 mm².




Grounding bolts on the underside of the housing of the X-300EEC or on the rear of the XR-300M-EEC

## 5.3 Signaling contact

The signaling contact (relay contact) is a floating switch with which error/fault states can be signaled by breaking the contact.

### Error indication

- The signaling by the signaling contact is synchronized with the fault LED, in other words, all errors displayed by this LED (freely configurable) are also signaled on the signaling contact.
- If an internal fault occurs, the fault LED lights up and the signaling contact opens.

- The connection or disconnection of a communication node on an unmonitored port does not lead to an error message.
- The signaling contact remains activated until the error/fault is eliminated or until the current status is entered in the fault mask as the new desired status.

## 5.3.1 24 VDC signaling contact (XR-300M EEC)

### 24 VDC signaling contact

- 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 VDC).

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

| Pin number | Assignment (example) |
|---|---|
|  |  |
| Pin 1 | F1 |
| Pin 2 | F2 |

To wire up the signaling contact, use a copper cable of category 18-12 AWG or cable with a cross-section of 0.75 to 2.5 mm².

| NOTICE |
|---|
| **Laying the connecting cables of the signaling contact with the XR-300M EEC**<br>To improve the EMC properties (surge protection), the two connecting cables of the signaling contact should be laid together. |

### 5.3.2 Signaling contact 100 to 240 VAC / 60 to 250 VDC

**⚠ WARNING**

**Danger from line voltage**

The supply voltage for the devices listed is 100 to 240 VAC and 60 to 250 VDC.

This device can only function correctly and safely if it is transported, stored, set up, and installed correctly, and operated and maintained as recommended.

Connecting and disconnecting may only be performed by an electrical specialist.

Connect or disconnect power supply cables only when the power is turned off.

#### Signaling contact 100 to 240 VAC / 60 to 250 VDC

The signaling contact is connected to a 3-pin plug-in terminal block.

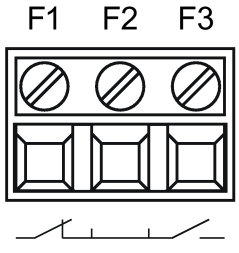
**NOTICE**

**Damage to the device due to incorrectly wiring the terminal blocks**

With devices with a supply voltage of 100 to 240 VAC and 60 to 250 VDC, the terminal blocks for the power supply and signaling contact are plugged in and screwed down in the device. Both terminal blocks have three pins but coding prevents the two terminal blocks being confused.

Make sure that the cables of the power supply and the cables for the signaling contact are connected to the correct terminal block.

Table 5- 2 Pin assignment of the 100 to 240 VAC / 60 to 250 VDC signaling contact

| Pin number | Assignment |
|---|---|
|  | |
| F1 | NC contact |
| F2 | Root |
| F3 | NO contact |

To wire up the signaling contact, use a copper cable of category 18-8 AWG or cable with a cross-section of 0.75 to 6 mm².

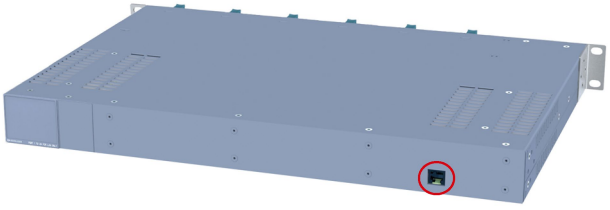
| NOTICE |
| --- |
| **Securing cables with dangerous voltage**<br>Make sure that the connector cannot be released accidentally by pulling on the connecting cable. Lay the cables in cable ducts or cable channels and secure the cables, where necessary, with cable ties. |

# 5.4 Diagnostics port

## 5.4.1 Diagnostics port

### Description

Rack devices have a diagnostics port on the rear of the housing. This port is designed for an RJ-11 plug. A suitable connecting cable with an RJ-11 plug and a 9-pin D sub female connector for connection to the serial port of the PC ships with the SCALANCE XR-300.



Diagnostics port on the rear of the device

## Pin assignment

The following table shows the pin assignment of the RJ-11 plug and the D sub female connector:

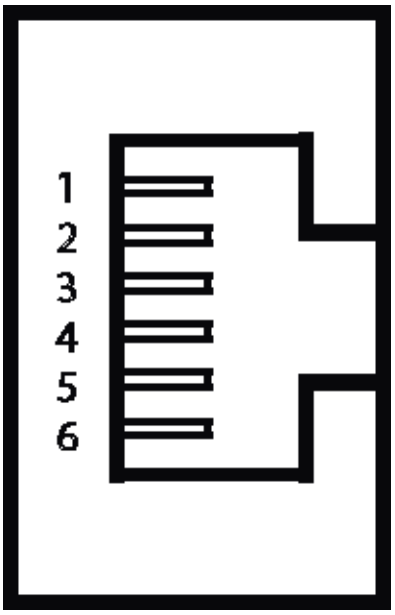



Image 5-1 RJ-11 jack (schematic)

| RJ-11 plug | | D-sub 9-pin, female | |
|---|---|---|---|
| **Pin** | **Assignment** | **Pin** | **Assignment** |
| 1 | n. c. | 1 | n. c. |
| 2 | n. c. | 2 | RD (Receive Data) |
| 3 | TD (Transmit Data) | 3 | TD (Transmit Data) |
| 4 | SG (Signal Ground) | 4 | n. c. |
| 5 | RD (Receive Data) | 5 | SG (Signal Ground) |
| 6 | n. c. | 6 | n. c. |
| | | 7 | n. c. |
| | | 8 | n. c. |
| | | 9 | n. c. |

# 5.5 Power supply

## 5.5.1 Power supply for the X-300EEC / XR-300M EEC

### Power supply of the IE switches X300 EEC / XR300M EEC

**⚠ WARNING**

**Danger to life: 100 ... 240 V / 60 to 250 VDC**

Please note that the IE switches X300EEC / XR300M EEC can have a 100 to 240 VAC / 60 to 250 VDC - or a 24 to 48 VDC power supply.

You can recognize the type of power supply from the labeling on the device and the labeling of the terminal block for the power supply of the switch.

The 100 to 240 VAC / 60 to 250 VDC and 24 to 48 VDC terminal blocks for the power supply of the X300 EEC / XR300M EEC are coded and cannot be confused when you plug them in.

### Power supply redundancy with the IE switches X300 EEC / XR300M EEC

The IE switches X300 EEC / XR300M EEC provide the following options for redundancy of the 24 to 48 VDC power supply:

- Redundant power supply via one power supply unit (1 x 24 to 48 VDC)
  You can connect a redundant power supply to each 24 V to 48 VDC power supply unit. To do this, use the terminals L1 and L2 of terminal block PS1.
- Redundant power supply units 24 to 48 VDC
  Connect one power supply to a power supply unit.

**NOTICE**

**Connection with redundant 24 to 48 VDC power supply units**

If you connect an X-300EEC with redundant 24 to 48 VDC terminal blocks to two power supplies, you will need to use L1 of the PS1 terminal block and L2 of the PS2 terminal block.

The IE switches X300 EEC / XR300M EEC provide the following options for redundancy of the 100 to 240 VAC / 60 to 250 VDC power supply:

- Redundant terminal blocks

  You can order the switch with redundant terminal blocks for the power supply. Each terminal block has only 1 pin for 1 power supply.
- Redundancy of the power infeed is not possible with this version.

## 5.5.2 Connecting devices with 24 V DC power supply

Table 5- 3 24 to 48 VDC safety extra-low voltage overview

| Device | Device version (power supply) | 24 V safety extra-low voltage (SELV) |
|---|---|---|
| | | can be connected redundantly |
| XR324-4M EEC | 1 x 24 to 48 VDC | • |
| | 2 x 24 to 48 VDC | • |

### 5.5.2.1 Connecting the external 24 VDC power supply

#### 24 V safety extra-low voltage (SELV)

**⚠ WARNING**

- The IE Switch X-300 is designed for operation with safety extra-low voltage (SELV). This means that only SELV complying with IEC 60950-1 / EN 60950-1 / VDE0805 can be connected to the power supply terminals.
- The power supply unit for the IE Switch X-300 power supply must meet NEC Class 2, as described by the National Electrical Code(r) (ANSI/NFPA 70).
- The power of all connected power supply units must total the equivalent of a power source with limited power (LPS limited power source).
- If the device is connected to a redundant power supply (two separate power supplies), both power supplies must meet these requirements.
- The signaling contact can be subjected to a maximum load of 100 mA (safety extra-low voltage (SELV) 24 VDC).
- Never operate the device with AC voltage or DC voltage higher than 58 VDC.

**NOTICE**

**Damage to the device due to overvoltage**

One of the tests used to attest the immunity of devices of the IE Switches X300 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 AVD 24 article no. 918 422 or a comparable protective element.

Manufacturer: DEHN+SÖHNE GmbH+Co.KG, Postfach 1640, D92306 Neumarkt, Germany.

Do not operate the SCALANCE X-300 without suitable overvoltage protection.

### Connecting to the power supply (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- 4 Pinout of the 24 to 48 V safety extra-low voltage (SELV)

| Pin number | Assignment |
|---|---|
| Pin 1 | L1+ (24...48 VDC) |
| Pin 2 | M1 |
| Pin 3 | M2 |
| Pin 4 | L2+ (24...48 VDC) |

To wire up the power connector, use a copper cable of category 18-12 AWG or cable with a cross-section of 0.75 to 2.5 mm².

## 5.5.2.2 Connecting a redundant power supply to the XR300-EEC

### Device variants with 1 or 2 power supply units

There are devices variants with one power supply unit or with two power supply units. With device variants with two power supply units, the 2nd power supply unit is also known as the redundant power supply unit.

The connection is made using a 4-terminal plug-in terminal block to which two power supply units can be connected (connected redundantly).

If two power supply units are connected, this is known as a redundant power supply.

Connect two power supplies as described below to achieve a correlation between the pin assignment and LED display.

#### Connecting a redundant power supply to 1 power supply unit

Use "PS1" to connect the power supply of the terminal block.

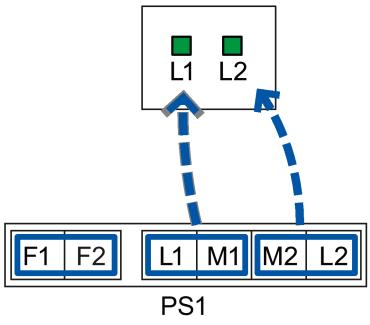



Image 5-2 Assignment of the LED display to the pins for redundant power supply with devices with one power supply unit

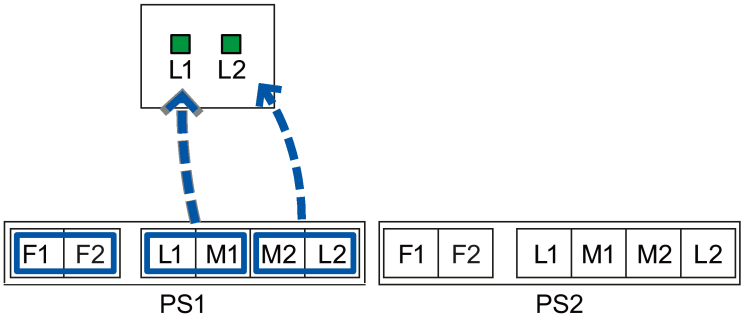



Image 5-3 Assignment of the LED display to the pins for redundant power supply with devices with two power supply units

- If the power supply fails at pins L1/M1, this is indicated by LED L1.
- If the power supply fails at pins L2/M2, this is indicated by LED L2.

### Connecting a redundant power supply to 2 power supply units

To connect the power supplies, use pins L1/M1 of the left terminal block "PS1" and pins L2/M2 of the right terminal block "PS2".

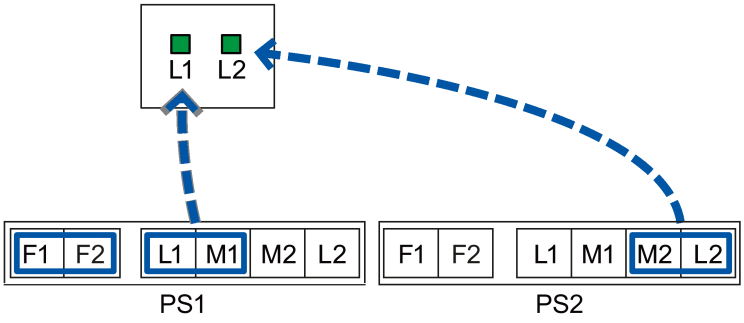



Image 5-4 Assignment of the LED display to the pins for redundant power supply with devices with two power supply units.

- If the power supply fails at pins L1/M1, this is indicated by LED L1.
- If the power supply fails at pins L2/M2, this is indicated by LED L2.

It would also be possible to use the L1/M1 pins of the right terminal block. In this case, however, identification of the terminal block involved from the LED display is not immediately obvious.

## 5.5.3 Connecting devices with 100 to 240 V AC power supply

### 5.5.3.1 100 ... 240 VAC - XR-300M EEC product group

Table 5- 5 100 to 240 VAC power supply overview

| Device | Device version (power supply) | 100 ... 240 V power supply | |
|---|---|---|---|
| | | Redundant | Single |
| XR324-4M EEC | 1 x 100 to 240 VAC / 60 to 250 VDC | - | • |
| | 2 x 100 to 240 VAC / 60 to 250 VDC | • | - |

### 5.5.3.2 Notes on the power supply 100 to 240 VAC

**⚠ WARNING**

**Danger from line voltage**

The supply voltage for the devices listed is 100 to 240 VAC and 60 to 250 VDC.

This device can only function correctly and safely if it is transported, stored, set up, and installed correctly, and operated and maintained as recommended.

Connecting and disconnecting may only be performed by an electrical specialist.

Connect or disconnect power supply cables only when the power is turned off.

**⚠ WARNING**

**Devices with a 100 to 240 VAC / 60 to 250 VDC power supply do not have an ATEX approval.**

Devices with a 100 to 240 VAC power supply are not approved for use in hazardous areas according to EC-RL-94/9 (ATEX).

**NOTICE**

**Securing cables with dangerous voltage**

Make sure that the connector cannot be released accidentally by pulling on the connecting cable. Lay the cables in cable ducts or cable channels and secure the cables, where necessary, with cable ties.

### 5.5.3.3 Connecting the 100 to 240 VAC power supply

#### Power supply 100 to 240 VAC / 60 to 250 VDC

The switch is available in the following versions for power supply with the multirange power supply unit 100 to 240 VAC / 60 to 250 VDC:

- With single power supply unit (1 x 100 to 240 VAC / 60 to 250 VDC)
- With redundant power supply unit (2 x 100 to 240 VAC / 60 to 250 VDC)

  Each power supply unit PS1 and PS2 has a separate supply connector.

You can recognize the type of power supply from the labeling on the device and the labeling of the terminal block for the power supply of the switch.

On devices with a 100 to 240 VAC power supply, the connectors of the signaling contact and the power supply are identical. To avoid confusion, the two pins have a different coding.

#### Grounding

**⚠ WARNING**

**Danger from line voltage**

Grounding simply via the housing is inadequate.

In this case, connect the functional ground to ensure reliable operation.

With devices with a supply voltage of 100 to 240 VAC / 60 to 250 VDC, you should also connect the protective earth to the grounding bolt.

On the SCALANCE X-300EEC, the grounding bolt is on the bottom of the device.

On the SCALANCE XR-300M EEC, the grounding bolt is on the rear of the housing between the power connectors.

#### Connecting to the power supply

The connection is made via one (or two) 3-pin connector(s) on the terminal block for the power supply.

**NOTICE**

**Damage to the device due to incorrectly wiring the terminal blocks**

With devices with a supply voltage of 100 to 240 VAC and 60 to 250 VDC, the terminal blocks for the power supply and signaling contact are plugged in and screwed down in the device. Both terminal blocks have three pins but coding prevents the two terminal blocks being confused.

Make sure that the cables of the power supply and the cables for the signaling contact are connected to the correct terminal block.

Table 5- 6 Pin assignment at terminal block 100 to 240 VAC / 60 to 250 VDC for the power supply

| Pin number | Assignment |
|---|---|
| Pin 1 | L (100 to 240 V) |
| Pin 2 | N |
| Pin 3 | FE (functional earth) |

To wire up the power connector, use a copper cable of category 18-8 AWG or cable with a cross-section of 0.75 to 6 mm².

DC voltage is connected at the following terminals:

- Plus to "L"
- M to "N"

Secure the firm seat of connectors and the terminal block by tightening the screws (does not apply to X-300EEC).

# Technical data

# 6

## 6.1 Construction, installation and environmental conditions

Table 6- 1 Construction

| Device | Device version (power supply) | Dimensions (W x H x D) | Weight | Degree of protection |
|---|---|---|---|---|
| XR324-4M EEC | 1 x 24 to 48 VDC | 483 × 44 × 305 mm | 6500 g | IP20 |
| | 2 x 24 to 48 VDC | 483 × 44 × 305 mm | 6800 g | IP20 |
| | 1 x 100 to 240 VAC / 60 to 250 VDC | 483 × 44 × 305 mm | 6600 g | IP20 |
| | 2 x 100 to 240 VAC / 60 to 250 VDC | 483 × 44 × 305 mm | 7000 g | IP20 |

Table 6- 2 Installation options

| Device | Installation options |
|---|---|
| XR324-4M EEC | 19" rack [1)] |

[1)] Note: If mechanical load is high, the device should be secured at four points. You will find more detailed information in the section "Mechanical load in operation".

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:<br>-5 °C of the max. operating temperature[1)]<br>3000 m or above:<br>-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 +70 °C |
| | Vertical | -40 °C to +50 °C |
| MM992-2CUC | Horizontal | -40 °C to +70 °C |

| Media module [1] | Installation direction | Operating temperature [2] |
|---|---|---|
| MM992-2CUC (C)<br>MM992-2CU<br>MM992-2M12 (C)<br>MM992-2VD<br>MM991-2<br>MM991-2FM<br>MM991-2LD<br>MM991-2 (SC)<br>MM991-2LD (SC)<br>MM992-2<br>MM992-2 (C)<br>MM992-2LD | Vertical | -40 °C to +50 °C |
| MM991-2LH+ (SC)<br>MM992-2LH<br>MM992-2LH+<br>MM992-2ELH | Horizontal | Maximum 2 modules in slots 3 and 4:<br>-40 °C to +60 °C<br>With more than 2 modules or other slot assignment:<br>-40 °C to +50 °C |
| | Vertical | -40 °C to +50 °C |
| Media module MM992-2SFP with pluggable transceiver<br>SFP991-1<br>SFP991-1LD<br>SFP992-1<br>SFP992-1LD | Horizontal | -40 °C to +70 °C<br>Pluggable transceivers of this group may only be used in conjunction with media modules MM992-2CUC, MM992-2CU and MM992-2M12. When using other modules:<br>-40 °C to +60 °C |
| | Vertical | -40 °C to +50 °C |
| Media module MM992-2SFP with pluggable transceiver<br>SFP991-1LH+<br>SFP992-1LH<br>SFP992-1LH+<br>SFP992-1ELH SFP991-1ELH200 | Horizontal | Max. 2 modules in slots 3 and 4:<br>-40 °C to +60 °C<br>With more than 2 modules or other slot assignment:<br>-40 °C to +50 °C |
| | Vertical | -40 °C to +55 °C |
| MM991-2P | | Maximum 2 modules in slots 3 and 4:<br>The slot above an MM991-2P may be used as follows:<br>• Without media module: - 25 °C to + 50 °C<br>• With media module MM992-2CUC or MM992-2CU: - 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 | 24 ports |
| Electrical | 16 x RJ-45 jacks<br>10/100/1000 Mbps |
| Media module slots | 4 x modular<br>(2 ports per slot) |
| | 12 x modular<br>(2 ports per slot) |
| Transmitter output (optical) and receiver input | The values correspond to those of the permitted MM900 media modules and SFP transceivers. |
| Diagnostics port | RJ-11 jack |

Table 6- 6 Electrical data: Power supply

| **Device version (power supply)** | **Redundant power supply unit** | **Redundant power supply possible** | **Power supply (min./max. range)** |
|---|---|---|---|
| 1 x 24 to 48 VDC | No | Yes | 24 to 48 VDC<br>(19.2 to 57.6 VDC) |
| 2 x 24 to 48 VDC | Yes | Yes | 24 to 48 VDC<br>(19.2 to 57.6 VDC) |
| 1 x 100 to 240 VAC / 60 to 250 VDC | No | No | 100 to 240 VAC<br>(80 to 276 VAC)<br>60 to 250 VDC<br>(48 to 300 VDC) |
| 2 x 100 to 240 VAC / 60 to 250 VDC | Yes | No | 100 to 240 VAC<br>(80 to 276 VAC)<br>60 to 250 VDC<br>(48 to 300 VDC) |

Table 6- 7 Electrical data: Current consumption and power loss

| **Device version (power supply)** | **Current consumption** | **Effective power loss** |
|---|---|---|
| 24 to 48 VDC | 1.6 to 0.75 A | 40 W |
| 100 to 240 VAC / 60 to 250 VDC | 0.6 to 0.37 A (AC)<br>0.7 to 0.17 A (DC) | 42 W (AC)<br>42 W (DC) |

Table 6- 8 Electrical data: Overcurrent protection

| **Device version (power supply)** | **Overcurrent protection of the power supply Non-replaceable fuse** |
|---|---|
| 1 x 24 to 48 VDC | 1 x T2H / 250 V |
| 2 x 24 to 48 VDC | 2 x T2H / 250 V |
| 1 x 100 to 240 VAC / 60 to 250 VDC | 1 x T2H / 250 V (AC)<br>1 x T2H / 300 V (DC) |
| 2 x 100 to 240 VAC / 60 to 250 VDC | 2 x T2H / 250 V (AC)<br>2 x T2H / 300 V (DC) |

Table 6- 9 Electrical data: Signaling contact

| **Device version (power supply)** | **Voltage via signaling contact** | **Switching capacity (resistive load)** |
|---|---|---|
| 24 to 48 VDC | 24 VDC | max. 0.1 A |
| 100 to 240 VAC / 60 to 250 VDC | 240 VAC | max. 5 A |
| | 60 VDC | max. 0.4 A |
| | 125 VDC | max. 0.22 A |
| | 250 VDC | max. 0.11 A |

Table 6- 10 Plug-in terminal block for connectors of the power supply and signaling contact

| **Device version (power supply)** | **Power supply** | **Signaling contact** |
|---|---|---|
| 1 x 24 to 48 VDC | 1 x 4-pin | 1 x 2-pin |
| 2 x 24 to 48 VDC | 2 x 4-pin | 2 x 2-pin |
| 1 x 100 to 240 VAC / 60 to 250 VDC | 1 x 3-pin | 1 x 3-pin |
| 2 x 100 to 240 VAC / 60 to 250 VDC | 2 x 3-pin | 2 x 3-pin |

Table 6- 11 Overvoltage category

| | |
|---|---|
| General | Overvoltage category II |
| In the application range of EN 60255-27 | Overvoltage category III |

# 6.3 Cable lengths

Table 6- 12 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<br>+ 10 m TP cord | 0 to 45 m<br>+ 10 m TP cord |
| | with IE FC RJ-45 Plug 180 | 0 to 55 m |
| IE FC TP Marine Cable<br>IE FC TP Trailing Cable<br>IE FC TP Flexible Cable | with IE FC Outlet RJ-45<br>+ 10 m TP cord | 0 to 75 m<br>+ 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<br>+ 10 m TP cord | 0 to 90 m<br>+ 10 m TP cord |
| | with IE FC RJ-45 Plug 180 | 0 to 100 m |

Table 6- 13 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<br>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<br>+ 10 m TP cord | 0 to 60 m<br>+ 10 m TP cord |
| IE FC Flexible Cable, 4 × 2, 22 AWG | with IE FC Outlet RJ-45<br>+ 10 m TP cord | 0 to 90 m<br>+ 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 Block architecture

## Block architecture with SCALANCE XR-300 devices

The XR324-12M and XR324-4M handle the Ethernet frame traffic of the 24 ports with the aid of three switch blocks.

- The three switch blocks are connected in series (block 1 via block 2 to block 3)
- Gigabit wire speed is possible within a block (max. 8 ports per block).
- Between the blocks there is a bandwidth of 1 gigabit/s available,that must be shared by all ports for frame traffic between the blocks.

When operating solely with Fast Ethernet (100 Mbps), the XR devices support full wire speed via all blocks.

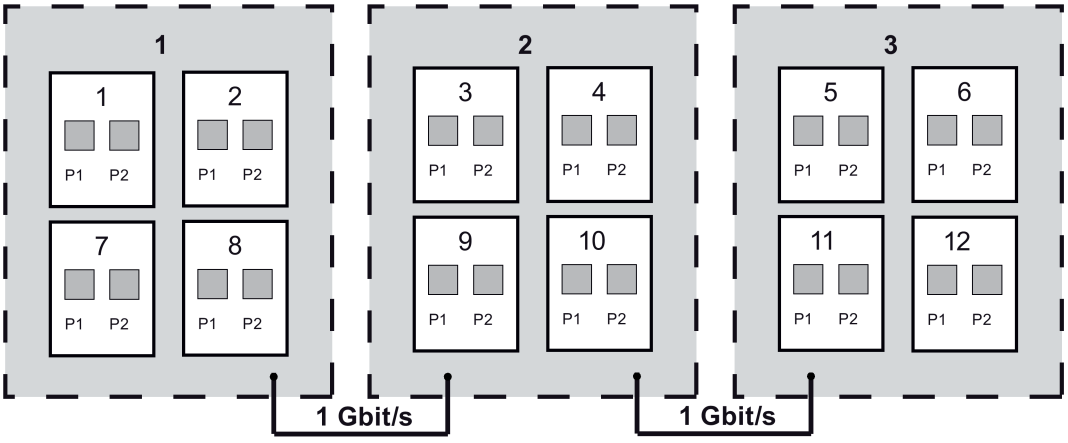



Image 6-1 Block architecture of the XR324-12M

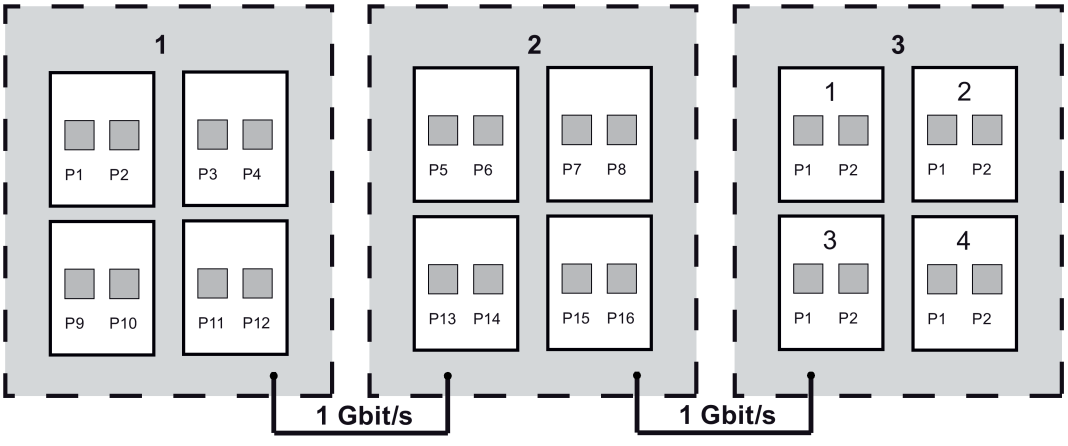



Image 6-2 Block architecture of the XR324-4M

# 6.5 Other properties

Table 6- 14 Switching properties

| | |
|---|---|
| Max. number of learnable addresses | 8000 |
| Aging time | 30 sec |
| Switching technique | Store and forward |
| Latency | 5 µs |

Table 6- 15 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 values in the following table apply to the basic device without media modules.

| **Device version (power supply)** | **MTBF [1)]** |
|---|---|
| 1 x 24 to 48 VDC<br>or<br>1 x 100 to 240 VAC / 60 to 250 VDC | > 15 years |
| 2 x 24 to 48 VDC<br>or<br>2 x 100 to 240 VAC / 60 to 250 VDC | > 15 years [2)] |

1) These values apply at 40 °C.

2) The redundant power supply unit increases the reliability of the system. The MTBF value of the power supply unit is > 20 years.

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.

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

Table 6- 16 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 |

| Number of frames per second | | At a frame length of |
|---|---|---|
| At 100 Mbps | At 1000 Mbps | |
| 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

## 7.1 XR-300M EEC dimension drawings

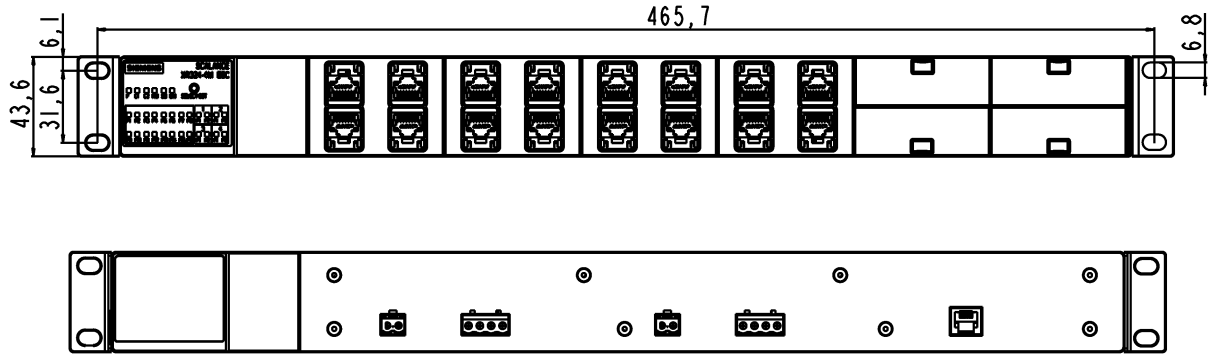



Image 7-1 Housing front and rear

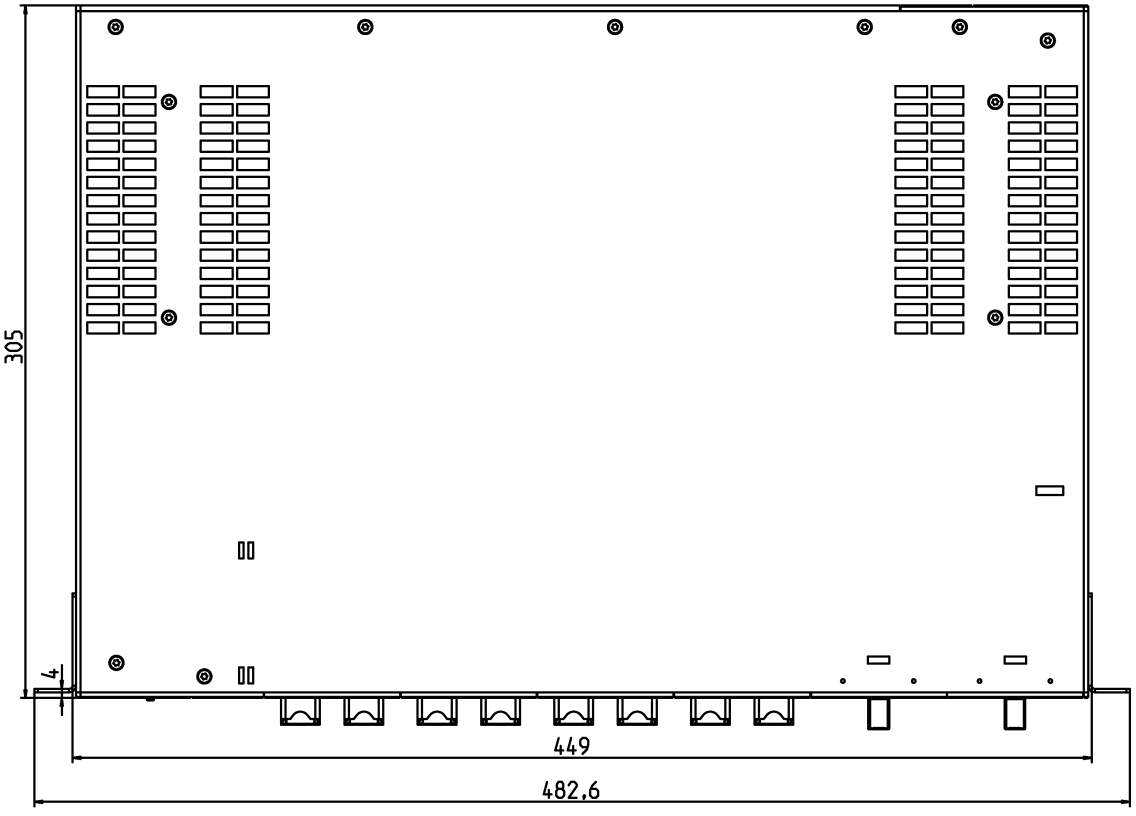



Image 7-2 Top of the housing

# Approvals

# 8

## 8.1 XR-300M EEC 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.

### EC directives

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

### Low voltage equipment directive

Devices supplied with 100 to 240 VAC meet the requirements of the directive 2006/95/EC "Electrical Equipment Designed for Use within Certain Voltage Limits" (Low Voltage Equipment Directive). Conformity attested by compliance with the standard EN 60950-1:2010.

### 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.

## 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 89/392/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)

**Note**

Only variants with 24 VDC power supply meet the requirements of this approval.

## 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)

**Note**

Only variants with 24 VDC power supply meet the requirements of this approval.

### IEC 61850-3 (EN55022 / CISPR22 CLASS A)

The product meets the requirements of the standard IEC 61850-3 (EN55022 / CISPR22 CLASS A).

### IEEE 1613

The product meets the requirements of the standard IEEE 1613 CLASS 1 (electrical ports) or IEEE 1613 CLASS 2 (optical ports).

### FM

The product meets the requirements of the standards:

- Factory Mutual Approval Standard Class Number 3611
- FM Hazardous (Classified) Location Electrical Equipment:
  Non Incendive / Class I / Division 2 / Groups A,B,C,D / T4 and
  Non Incendive / Class I / Zone 2 / Group IIC / T4

**Note**

Only variants with 24 VDC power supply meet the requirements of this approval.

### 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

**Note**

Only variants with 24 VDC power supply meet the requirements of this approval.

### cULus approval for industrial control equipment

cULus Listed IND. CONT. EQ.

Underwriters Laboratories Inc. complying with

- UL 508
- CSA C22.2 No. 142-M1987

Report no. E85972

**Note**

Only variants with 100 to 240 VAC power supply meet the requirements of this approval.

### 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

**Note**

Only variants with 24 VDC power supply meet the requirements of this approval.

## 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 XR-300M EEC approvals

**Note**

The 24 to 48 V variants do not have an E1 approval.

The 100 to 240 V variants have C-Tick and CE approvals, are only UL508 listed, have no UL hazloc, FM or ATEX.

Table 8- 1 Overview of the approvals

| Device | Variant | c-UL-us Inf. Tech. Eq. | c-UL-us for Hazardous Locations [1] | c-UL-us Ind. Cont. Eq. | FM[1] | C-TICK | CE | ATEX95 Zone 2 [1] |
|---|---|---|---|---|---|---|---|---|
| XR324-4M EEC | 1 x 24 to 48 VDC, data cable outlet on front | • | • | - | • | • | • | • |
| | 2 x 24 to 48 VDC, data cable outlet on front | • | • | - | • | • | • | • |
| | 1 x 100 to 240 VAC / 60 to 250 VDC, data cable outlet on front | - | - | • | - | • | • | - |
| | 2 x 100 to 240 VAC / 60 to 250 VDC, data cable outlet on front | - | - | • | - | • | • | - |
| | 1 x 24 to 48 VDC, data cable outlet at rear | • | • | - | • | • | • | • |
| | 2 x 24 to 48 VDC, Data cable outlet at rear | • | • | - | • | • | • | • |
| | 1 x 100 to 240 VAC / 60 to 250 VDC, data cable outlet at rear | - | - | • | - | • | • | - |
| | 2 x 100 to 240 VAC / 60 to 250 VDC, data cable outlet at rear | - | - | • | - | • | • | - |

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

## 8.4 XR-300M EEC mechanical stability (in operation)

The devices of the SCALANCE XR-300M EEC product group meet the following standards (prerequisite: rack mounted with 4 securing points):

- IEC 60068-2-6
  (vibrations during transportation and operation)
  Test parameters:
  5 – 9 Hz: 3.5 mm
  9 – 150 Hz: 1 g
  1 octave/min, 20 sweeps
- IEC 60068-2-27
  (shocks during operation)
  Test parameters:
  15 g , 11 ms duration
  6 shocks per axis
- IEC 60068-2-6
  (vibrations during transportation)
  Test parameters:
  10 – 58 Hz: 0.075 mm
  85 – 150 Hz: 1 g
  1 octave/min, 20 sweeps

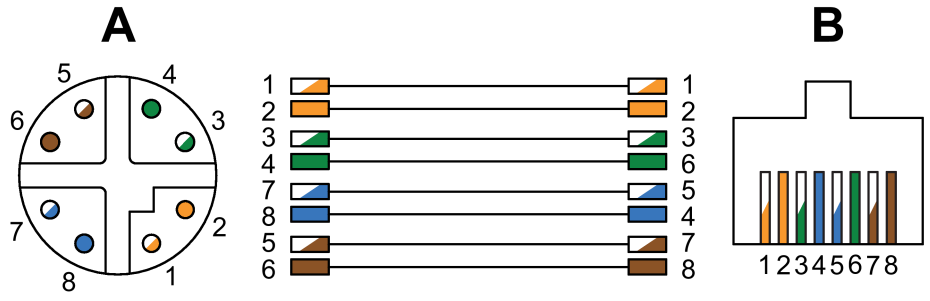
# Appendix A

## 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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## H



## P



## R



## S