SIEMENS

SIMATIC NET

Industrial Ethernet switches SCALANCE XC-100

Operating Instructions

06/2016

C79000-G8976-C415-02

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

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

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.

Siemens AG
Division Process Industries and Drives
Postfach 48 48
90026 NÜRNBERG
GERMANY

C79000-G8976-C415-02
℗ 06/2016 Subject to change

Table of contents

Introduction

1

Purpose of the Operating Instructions

These operating instructions support you when installing and connecting up devices of the SCALANCE XC-100 product group.

Validity of the Operating Instructions

These operating instructions apply to the following devices:

- SCALANCE XC106-2
- SCALANCE XC108
- SCALANCE XC116
- SCALANCE XC124

Unless mentioned otherwise, the descriptions in these operating instructions refer to all devices of the SCALANCE XC-100 product group named above in the section on validity.

Designations used

Classification	Description	Terms used
Product line	The product line includes all devices and variants of all product groups. If information applies to all product groups within the product line, the term SCALANCE X-100 is used.	SCALANCE X-100
Product group	If information applies to all devices and variants of a product group, the term SCALANCE XC-100 is used.	SCALANCE XC-100
Device	If information relates to a specific device, the device name is used.	e.g. SCALANCE XC106-2

Further documentation

In the system manuals "Industrial Ethernet / PROFINET Industrial Ethernet" and "Industrial Ethernet / PROFINET passive network components", you will find information on other SIMATIC NET products that you can operate along with the devices of this product line in an Industrial Ethernet network.

There, you will find among other things optical performance data of the communications partner that you require for the installation.

You will find the system manuals here:

- On the data medium that ships with some products:
  - Product CD / product DVD
  - SIMATIC NET Manual Collection
- On the Internet pages of Siemens Industry Online Support under the following entry IDs:
  - 27069465 (http://support.automation.siemens.com/WW/view/en/27069465)
    Industrial Ethernet / PROFINET Industrial Ethernet System Manual
  - 84922825 (http://support.automation.siemens.com/WW/view/en/84922825)
    Industrial Ethernet / PROFINET - Passive network components System Manual

SIMATIC NET manuals

You will find the SIMATIC NET manuals here:

- On the data medium that ships with some products:
  - Product CD / product DVD
  - SIMATIC NET Manual Collection
- On the Internet pages of Siemens Industry Online Support
  (https://support.industry.siemens.com/cs/ww/en/ps/15247).

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 on the Internet at the following address:

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

Catalogs

You will find the order numbers for the Siemens products of relevance here in the following catalogs:

- SIMATIC NET Industrial Communication / Industrial Identification, catalog IK PI
- SIMATIC Products for Totally Integrated Automation and Micro Automation, catalog ST 70
- Industry Mall - catalog and ordering system for automation and drive technology, Online catalog
  (https://eb.automation.siemens.com/goos/WelcomePage.aspx?regionUrl=/en&language=en)

You can request the catalogs and additional information from your Siemens representative.

Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, solutions, machines, equipment and/or networks. They are important components in a holistic industrial security concept. With this in mind, Siemens' products and solutions undergo continuous development. Siemens recommends strongly that you regularly check for product updates.

For the secure operation of Siemens products and solutions, it is necessary to take suitable preventive action (e.g. cell protection concept) and integrate each component into a holistic, state-of-the-art industrial security concept. Third-party products that may be in use should also be considered. You will find more information about Industrial Security in:
Industrial security (http://www.siemens.com/industrialsecurity)

To stay informed about product updates as they occur, sign up for a product-specific newsletter. You will find more information about this in
Product support (https://support.industry.siemens.com/cs/ww/en/ps/15247/pm)

Trademarks

The following and possibly other names not identified by the registered trademark sign ® are registered trademarks of Siemens AG:

SIMATIC NET, SCALANCE, C-PLUG, OLM

Unpacking and 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
- Damage to the device and other components

Use only undamaged parts.

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

Recycling and disposal

The products are low in pollutants and can be recycled. For environmentally friendly recycling and the disposal of your old device contact a certified disposal company for electronic scrap.

Electrostatic discharge

NOTICE

Electrostatic sensitive devices (ESD)

Electronic modules contain electrostatic sensitive components

These components can easily be destroyed if handled incorrectly.

Note the following instructions to avoid damage.

- Touch electronic modules only when you absolutely need to work on them.
- If electronic modules need to be touched, the body of the person involved must first be electrostatically discharged and grounded.
- Do not bring electronic modules in contact with electrically isolating materials such as plastic film, isolating table top pads or clothing made of synthetic fibers.
- Place the modules only on conductive surfaces.
- Pack, store and transport electronic modules and components only in conductive packaging such as metalized plastic or metal containers, conductive foam or household aluminum foil.

Safety notices

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 the device when the supply voltage is turned on.

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:

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.

Description of the device

3

3.1 Product overview

Article numbers

Device	Description	Article number
SCALANCE XC106-2	6 x 10/100 Mbps RJ-45 ports, 2 x 10/100 Mbps SC ports, multi-mode fiber-optic cable	6GK5 106-2BB00-2AC2
SCALANCE XC108	8 x 10/100 Mbps RJ-45 ports	6GK5 108-0BA00-2AC2
SCALANCE XC116	16 x 10/100 Mbps RJ-45 ports	6GK5 116-0BA00-2AC2
SCALANCE XC124	24 x 10/100 Mbps RJ-45 ports	6GK5 124-0BA00-2AC2

Components of the product

The following components are supplied with a SCALANCE XC-100:

- One IE switch
- A 4-pin terminal block for the power supply (spring-loaded terminal)
- A 2-pin terminal block for the signaling contact (spring-loaded terminal)

Spare parts

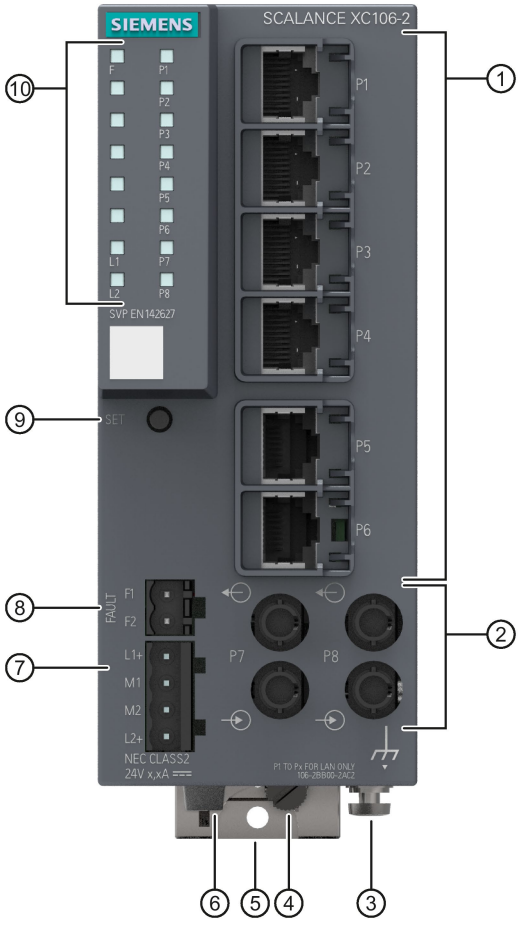
The following spare parts are available for SCALANCE XC-100:

Component	Description	Order number
Spring-loaded terminal block, 4 terminals	4-terminal spring-loaded terminal block to connect the power supply (24 VDC), for SCALANCE X/W/S/M, pack of 5	6GK5 980-1DB10-0AA5
Spring-loaded terminal block, 2 terminals	2-terminal spring-loaded terminal block to connect the signaling contact (24 VDC), for SCALANCE X/W/S/M, pack of 5	6GK5 980-0BB10-0AA5

3.2 Device views

3.2.1 Device view of a SCALANCE XC106-2

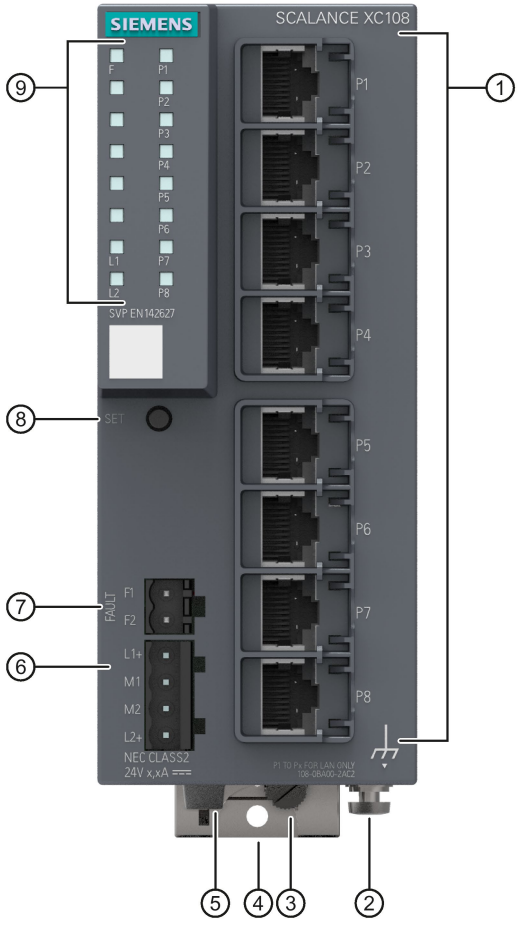
The following figure shows an overview of the components of the SCALANCE XC106-2.



① Electrical ports
② Optical ports
③ Grounding screw
④ Knurled screw
⑤ Securing bar
⑥ Levering aid for moving the securing bar with a screwdriver
⑦ Power supply
⑧ Signaling contact
⑨ "SET" button
⑩ LED display

3.2.2 Device view of a SCALANCE XC108

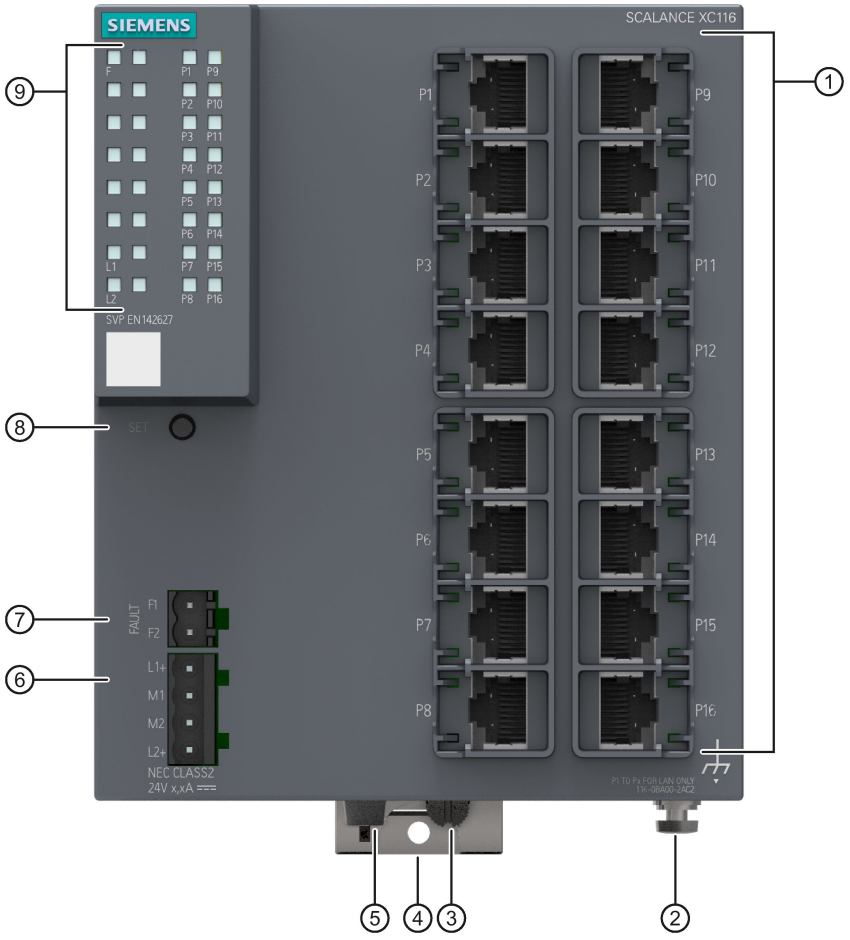
The following figure shows an overview of the components of the SCALANCE XC108.



① Electrical ports
② Grounding screw
③ Knurled screw
④ Securing bar
⑤ Levering aid for moving the securing bar with a screwdriver
⑥ Power supply
⑦ Signaling contact
⑧ "SET" button
⑨ LED display

3.2.3 Device view of a SCALANCE XC116

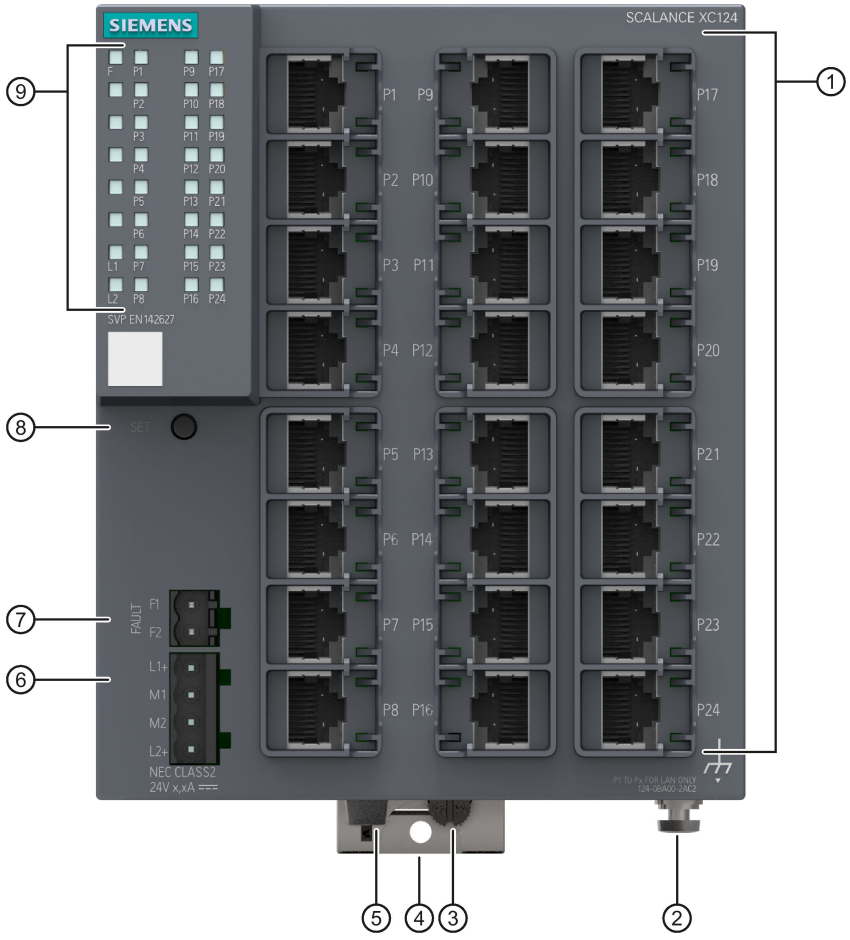
The following figure shows an overview of the components of the SCALANCE XC106-2.



① Electrical ports
② Grounding screw
③ Knurled screw
④ Securing bar
⑤ Levering aid for moving the securing bar with a screwdriver
⑥ Power supply
⑦ Signaling contact
⑧ "SET" button
⑨ LED display

3.2.4 Device view of a SCALANCE XC124

The following figure shows an overview of the components of the SCALANCE XC106-2.



① Electrical ports
② Grounding screw
③ Knurled screw
④ Securing bar
⑤ Levering aid for moving the securing bar with a screwdriver
⑥ Power supply
⑦ Signaling contact
⑧ "SET" button
⑨ LED display

3.3 LED display

Fault LED "F" (red LED)

The fault LED indicates the incorrect functioning of the device.

LED color	LED status	Meaning
Red	Lit	The IE switch detects an error. At the same time, the signaling contact opens. The following faults/errors are detected: 1. Link down event on a monitored port. 2. Loss of the power supply of one of the two redundant power supplies or the power supply drops below 9.6 V. 3. Both power supplies are below approximately 9.6 V (voltage too low).
-	Off	No error detected.

Power LEDs “L1” and “L2” (green LEDs)

The power LEDs show the status of the power supply at connectors L1 and L2.

L1/L2 LEDs		L1/L2 connector
LED color	LED status	
Green	Lit	Power supply L1 or L2 is connected.
-	Off	Power supply L1 and L2 are not connected or L1 and L2 <9.6 V.

Note

If the green LED is not lit, no other signal LED lights up either.

Port LEDs "P" (green/yellow LEDs)

The port LEDs indicate the status of the ports.

LED color	LED status	Meaning
Green	Lit	Link exists, no data reception at port
Yellow	Lit	Link exists, data reception at port
Yellow	Flashing	Setting or display of the fault mask

3.4 SET button

Position

The "SET" button is located on the front of the SCALANCE XC-100.

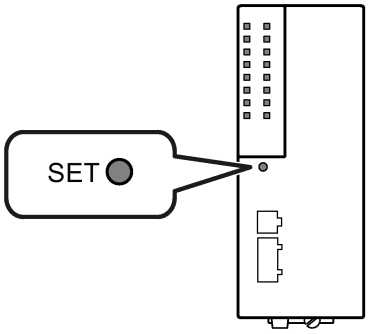


Image 3-1 Position of the "SET" button

Function

With the SET button, you can display and change the set fault mask.

Setting the fault mask

Factory setting

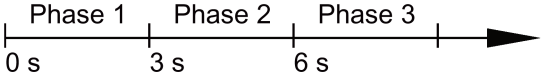
When supplied (factory defaults), the fault mask is set so that the power supply L1+/M1 is monitored. No ports are monitored.

If you connect a power supply to L2+/M2, adapt the fault mask accordingly: Clear the error LED and the signaling contact or set the fault mask to the power supply L2+/M2.

Changing the setting

The changed settings remain after cycling power to the device.

Different settings are made depending on how long you hold down the SET button, as described in the following table:



Time the button is pressed
in seconds

Phase	Description	
1	LEDs flash at 5 Hz	The currently set fault mask is displayed. The LEDs of the monitored ports flash. If no fault mask is set, all port LEDs flash one after the other.
	If you release the button in phase 1, this has no effect.	
2	LEDs flash at 2.5 Hz	The current status is displayed. • The LEDs of the ports at which there is currently a link flash.
	If you release the button in phase 2, this has no effect.	
3	This new status is adopted and stored as the new fault mask in phase 3.	
	LEDs flashing	If you release the SET button while the LEDs are still flashing, storing is aborted.
	LEDs lit	If you release the SET button as soon as the LEDs light up, the current settings will be stored. The stored status is displayed. • The monitored ports are indicated by statically lit LEDs. • The monitored power supply is indicated by statically lit LEDs.

Note

If an empty fault mask is set or needs to be set, the 2 port LEDs flash alternately. If the fault mask is empty, no port is monitored.

Error/fault

If the link is lost at a monitored port or a monitored power supply is lost, this is signaled as follows:

- the red fault LED lights up
- the signaling contact is opened

Mounting

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 60 °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 60 °C.

⚠ WARNING

If the device is installed in a cabinet, the inner temperature of the cabinet corresponds to the ambient temperature of the device.

Safety notices on use in hazardous areas

General safety notices relating to protection against explosion

⚠ WARNING

EXPLOSION HAZARD

Replacing components may impair suitability for Class 1, Division 2 or Zone 2.

⚠ WARNING

The device is suitable only for operation in the interior.

⚠ WARNING

The device may only be operated in an environment with pollution degree 1 or 2 (see IEC 60664-1).

⚠ 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.

⚠ 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 60 °C, only use cables with admitted maximum operating temperature of at least 80 °C.

Further notes

NOTICE

Warming and premature aging of the network component due to direct sunlight

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

Provide suitable shade to protect the network component against direct sunlight.

4.2 Types of installation

Types of installation

The SCALANCE XC-100 can be installed in the following ways:

- DIN rail
- S7-300 standard rail
- S7-1500 standard rail
- Wall mounting

Installation clearance

Keep to the minimum clearances so that the convection ventilation of the device is not blocked.

- Below at least 10 cm
- Above at least 10 cm

4.3 Mounting on DIN rails

Installation

Note

Note the position of the securing bar, see also section “SCALANCE XC-100 dimension drawings (Page 55)“.

When supplied, the securing bar is in the wall mounting position. To change the position of the securing bar, refer to the section “Changing the position of the securing bar (Page 28)“.

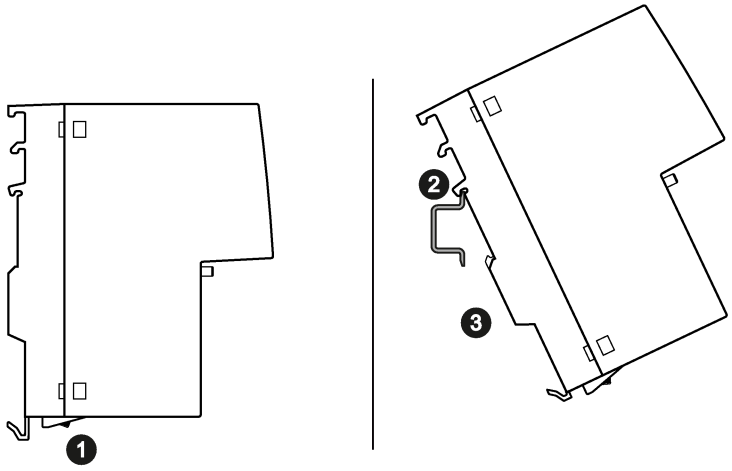


Image 4-1 DIN rail mounting with securing bar in the wall mounting position.

To install the device on a 35 mm DIN rail complying with DIN EN 60715, follow the steps below:

1. Loosen the knurled screw with your hand or a screwdriver.
2. Place the third housing guide of the device on the top edge of the DIN rail.
3. Press the device down against the DIN rail until the spring securing bar locks in place.
4. When you tighten the knurled screw. you cannot release the securing bar (torque 0.5 Nm). The device is additionally fixed.
5. Connect the electrical connecting cables, refer to the section "Connecting up (Page 29)".

Removal

To remove the device from a DIN rail, follow the steps below:

1. Disconnect all connected cables.
2. If necessary, loosen the knurled screw with your hand or a screwdriver.
3. Lever the securing bar down using a screwdriver as far as it will go.
4. Pull the device away from the bottom of the DIN rail with the bar pulled.

4.4 Installation on a standard S7-300 rail

Installing on an S7-300 standard rail

Note

Note the position of the securing bar, see also section “SCALANCE XC-100 dimension drawings (Page 55)“.

When supplied, the securing bar is in the wall mounting position. To change the position of the securing bar, refer to the section “Changing the position of the securing bar (Page 28)“.

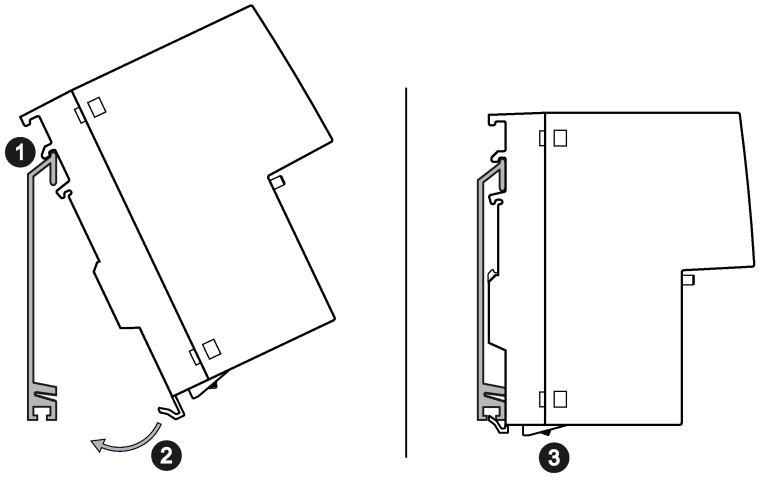


Image 4-2 S7-300 mounting rail installation with the securing bar in the wall mounting position.

Securing bar in the wall mounting position (as supplied).

To install the device on an S7-300 standard rail, follow the steps below:

1. Place the second housing guide of the device on the top edge of the standard rail.
2. Swing the device down towards the back against the mounting rail.
3. Loosen the knurled screw with your hand or a screwdriver. The spring mounted securing bar locks in place.
4. When you tighten the knurled screw. you cannot release the securing bar (torque 0.5 Nm). The device is additionally fixed.
5. Connect the electrical connecting cables, refer to the section "Connecting up (Page 29)".

Removal

To remove the device from a standard rail, follow the steps below:

1. Disconnect all connected cables.
2. If necessary, loosen the knurled screw with your hand or a screwdriver.
3. Lever the securing bar down using a screwdriver as far as it will go.
4. Remove the device from the mounting rail with the bar pulled.

4.5 Installation on a standard S7-1500 rail

Installing on an S7-1500 standard rail

Note

Note the position of the securing bar, see also section “SCALANCE XC-100 dimension drawings (Page 55)“.

When supplied, the securing bar is in the wall mounting position. To change the position of the securing bar, refer to the section “Changing the position of the securing bar (Page 28)“.

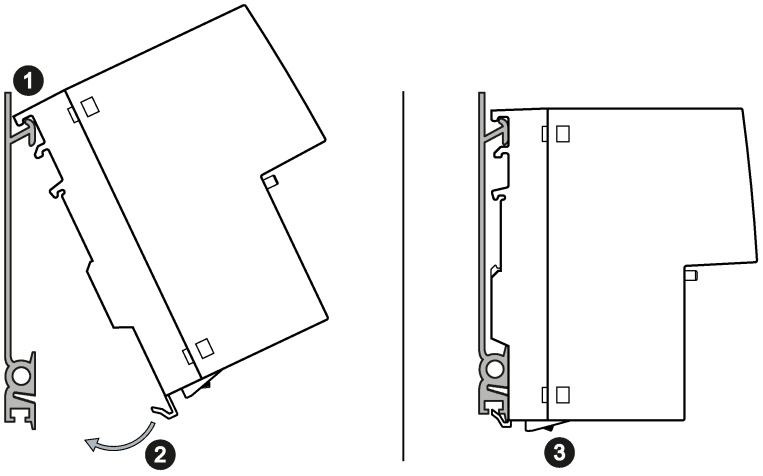


Image 4-3 S7-1500 mounting rail installation with the securing bar in the wall mounting position.

Securing bar in the wall mounting position (as supplied).

To install the device on an S7-1500 standard rail, follow the steps below:

1. Place the first housing guide of the device on the top edge of the standard rail.
2. Swing the device down towards the back against the mounting rail.
3. Loosen the knurled screw with your hand or a screwdriver. The spring mounted securing bar locks in place.
4. When you tighten the knurled screw. you cannot release the securing bar (torque 0.5 Nm). The device is additionally fixed.
5. Connect the electrical connecting cables, refer to the section "Connecting up (Page 29)".

Removal

To remove the device from a standard rail, follow the steps below:

1. Disconnect all connected cables.
2. If necessary, loosen the knurled screw with your hand or a screwdriver.
3. Lever the securing bar down using a screwdriver as far as it will go.
4. Remove the device from the mounting rail with the bar pulled.

4.6 Wall mounting

Preparation

Note the position of the securing bar, see also section “SCALANCE XC-100 dimension drawings (Page 55)“.

When supplied, the securing bar is in the wall mounting position. You do not need to prepare the device any further.

If the securing bar is in the rail mounting position, note the section “Changing the position of the securing bar (Page 28)“.

Tools

To mount the device on a wall, you require the following:

- 2 wall plugs
- 2 fillister head screws

Note

Depending on the mounting surface, use suitable fittings.

Assembly

Note

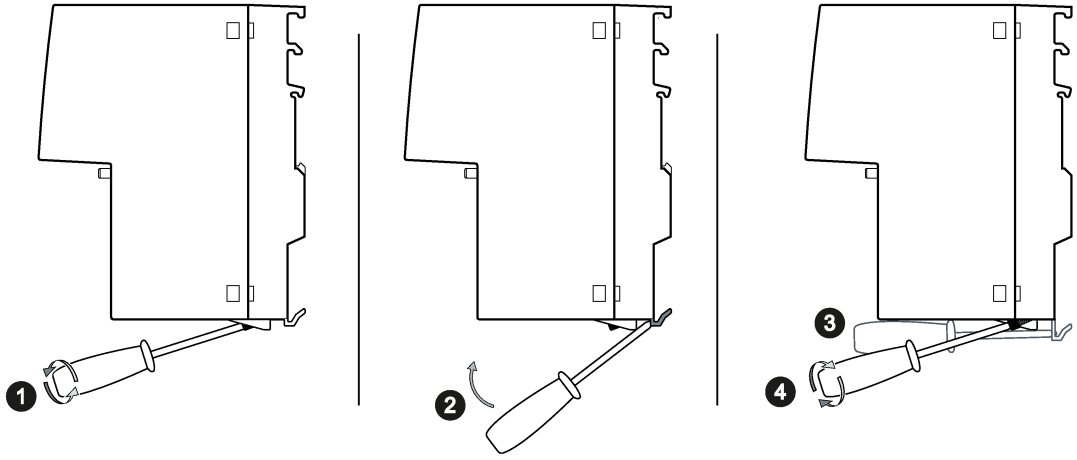
The wall mounting must be capable of supporting at least four times the weight of the device.

To mount the device on a wall, follow the steps below:

1. Prepare the wall mounting with drilled holes and plugs. For the precise dimensions, refer to the section "Dimension drawings (Page 55)".
2. Turn the screw in to the wall so that 10 mm remains jutting out.
3. Hang the device with the keyhole hanging mechanism on the rear on the screw.
4. Fix the device to the wall with the lower screw.
5. Connect the electrical connecting cables, refer to the section "Connecting up (Page 29)".

4.7 Changing the position of the securing bar

Rail mounting position - wall mounting position



To change the securing bar from the rail mounting position to the wall mounting position follow the steps below:

1. If necessary, loosen the knurled screw with your hand or a screwdriver.
2. Move the securing bar down as far as it will go.
   - Use the levering aid and level the securing bar down using a screwdriver into this position.
   - Push the securing bar down using your hand.
3. Hold the securing bar in this position.
   - Hold the securing bar with the screwdriver.
   - Use the gap on the rear of the device and fix the securing bar briefly with a pin.
4. Tighten the knurled screw (torque 0.5 Nm).

   The securing bar is fixed in the wall mounting position.
5. If applicable remove the pin.

Wall mounting position - rail mounting position

To move the securing bar from the wall mounting position to the rail mounting position, loosen the knurled screw.

Connecting up

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

Safety notice for connecting with a LAN ID (Local Area Network)

A LAN or LAN segment with all the interconnected devices should be contained completely in a single low voltage power distribution in a building. The LAN is designed either for “Environment A” according to IEEE802.3 or "Environment 0" according to IEC TR 62102.

Do not connect any electrical connectors directly to the telephone network (telephone network voltage) or a WAN (Wide Area Network).

⚠ WARNING

EXPLOSION HAZARD

Do not press the SELECT/SET button when there is an explosive atmosphere.

5.2 Wiring rules

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

Wiring rules for ...		**Screw/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.

5.3 Power supply

Notes on the power supply

⚠ WARNING

Incorrect power supply

Never operate the device with AC voltage or DC voltage higher than 32 V DC.

⚠ CAUTION

Damage to the device due to overvoltage

The connector of the external power supply is not protected against strong electromagnetic pulses that can, for example, result from lightning strikes or switching large loads.

One of the tests used to attest the immunity of devices of the IE switches SCALANCE XC-100 to electromagnetic interference was 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 number 918 422 or a comparable protective element.

Manufacturer: DEHN+SOEHNE GmbH+Co.KG, Hans-Dehn-Str.1, Postfach 1640, D92306 Neumarkt, Germany

Operate the SCALANCE XC-100 with suitable overvoltage protection.

Note

The device can be disconnected from the power supply with the terminal block.

Information on the power supply

- The power supply is connected using a 4-pin plug-in terminal block (spring-loaded terminal). The terminal block ships with the device and can also be ordered as a spare part.
- The power supply can be connected redundantly. Both inputs are isolated. There is no distribution of load.
- 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.
- Note the wiring rules.

Position and assignment

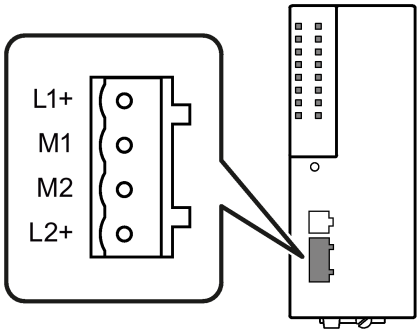


Image 5-1 Position of the power supply on the SCALANCE XC-100 and the assignment of the terminal block

Contact	Assignment
L1+	L1+ DC 12 ... 24 V
M1	Ground
M2	Ground
L2+	L2+ DC 12 ... 24 V

5.4 Signaling contact

Information on the signaling contact

- The signaling contact is a floating switch that signals error statuses by opening the contact.
  The signaling contact must be operated within the range of the operating voltage.
  If an error/fault occurs, the signaling contact opens. In normal operation, the signaling contact is closed.
- The signaling contact is connected using a 2-pin plug-in terminal block (spring-loaded terminal). The terminal block ships with the device and can also be ordered as a spare part.
- Note the wiring rules.

NOTICE
Damage due to voltage being too high The signaling contact can be subjected to a maximum load of 100 mA (safety extra-low voltage SELV, 24 VDC). Higher voltages or currents can damage the device!

Position and assignment

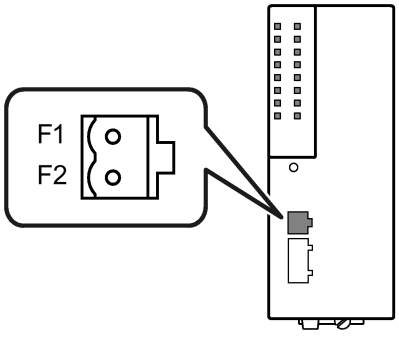


Image 5-2 Position of the signaling contact on the SCALANCE XC-100 and the assignment of the terminal block

Contact	Assignment
F1	Fault contact 1
F2	Fault contact 2

Signaling faults

- The signaling of errors by the signaling contact is synchronized with the fault LED "F", see section "LED display (Page 16)".
  All errors that the fault LED "F" indicates (freely configurable) are also signaled by the signaling contact.
- If an internal fault occurs, the fault LED "F" lights up and the signaling contact opens.
- If you connect a communications node to an unmonitored port or disconnect it, this does not cause an error message.
- The signaling contact remains open until one of the following events occurs:
  - The problem is eliminated.
  - The current status is entered in the fault mask as the new desired status.

5.5 Functional ground

EMC disturbances are diverted to ground via the functional ground. This ensures the immunity of the data transmission.

The functional ground must be implemented with low impedance. The connection of the functional ground must be established directly on the mounting plate or the DIN rail terminal.

The IE switch has a grounding screw (fillister head screw with clamping washer und disk) for functional ground, refer to the section "Device views (Page 12)".

The grounding screw is identified by the following symbol for the functional ground  .

Follow the steps below to connect the functional ground:

1. Loosen the grounding screw).
2. Put the grounding terminal and grounding screw together.
3. Tighten the grounding screw with a maximum torque of 0.75 Nm.

Protective/functional ground

The connection of the reference potential surface with the protective ground system is normally in the cabinet close to the power feed-in. This ground conducts fault currents to ground safely and according DIN/VDE 0100 is a protective ground to protect people, animals and property from too high contact voltages.

Apart from the protective ground, there is functional grounding in the cabinet. According to EN60204-1 (DIN/VDE 0113 T1) electrical circuits must be grounded. The chassis (0 V) is grounded at one defined point. Here, once again the grounding is implemented with the lowest leakage resistance to ground in the vicinity of the power feed-in.

With automation components, functional ground also ensures interference-free operation of a controller. Via the functional ground, interference currents coupled in via the connecting cables are discharged to ground.

Maintenance and troubleshooting

6

Fuses

Some of the Industrial Ethernet switches of the SCALANCE X-100 product line have a resettable fuse / PTC. If the fuse blows, all LEDs are off although the power supply is correctly connected. In this case, disconnect the device from the power supply for approximately 30 minutes before you turn it on again.

Link display on the optical ports

The SCALNCE XC106-2 supports “far end fault” on the optical ports. This function is, however, not used for the corresponding link display. If only the receive direction is plugged in, a “far end fault” is detected and no data is forwarded. The port LED is already lit.

Device defective

If a fault develops, send the device to your SIEMENS service center for repair. Repairs on-site are not possible.

Restoring the factory settings

Follow the steps below to reset the device parameters to the factory settings:

Note

When you reset the device parameters, all previously changed settings are lost.

1. Turn off the power to the device.
2. Press the “SET" button for example with a screwdriver and reconnect the power to the device while holding down the button.
3. Hold down the button until the red fault LED "F" stops flashing after approximately 40 seconds and is permanently lit.
4. Release the button and wait until the fault LED "F" goes off.

   The device starts automatically with the factory settings.

Technical specifications 7

7.1 Technical specifications SCALANCE XC106-2

The following technical specifications apply to the SCALANCE XC106-2.

Technical specifications			
Attachment to Industrial Ethernet			
Electrical connectors	Quantity		6
	Connector		RJ-45 jack
	Properties		Half/full duplex, MDI-X pinning
	Transmission speed		10 / 100 Mbps
Optical connectors	Quantity		2
	Connector		ST(BFOC) socket
	Properties		Full duplex acc. to 100Base-FX
	Transmission speed		100 Mbps
	Cable type		Multimode glass FO cable
	Transmitter output (optical)		
	• Minimum		• -19 dBm
	• Maximum		• -14 dBm
	Receiver input		
	• Sensitivity min.		• -32 dBm
	• Input power max.		• -3 dBm
	Cable cross-section	Cable length	Attenuation
	• 50/125 µm	• 0 ... 5 km	• ≤ 1 dB/km at 1310 nm; 1200 MHz * km
	• 62.5/125 µm	• 0 ... 5 km	• ≤ 1 dB/km at 1310 nm; 1200 MHz * km
Electrical data			
Power supply	Rated voltage		12 to 24 VDC
	Voltage range (incl. tolerance)		9.6 to 31.2 VDC Safe Extra Low Voltage (SELV)
	Design		Terminal block, 4 terminals
	Properties		Implemented redundantly
Current consumption	At 12 VDC		400 mA
	at 24 VDC		200 mA
Effective power loss			4.8 W
Fusing			2.5 A

Technical specifications		
Signaling contact	Quantity	1
	Design	Terminal block, 2 terminals
	Permitted voltage range	24 VDC
	Load capability	max. 100 mA
Permitted ambient conditions		
Ambient temperature	During operation up to 2000 m	-40 °C to +70 °C
	During storage	-40 °C to +85 °C
	During transportation	-40 °C to +85 °C
Relative humidity	During operation at 25 °C	≤ 95 % no condensation
Housing, dimensions and weight		
Design	compact	
Housing material	Polycarbonate (PC-GF10)	
Degree of protection	IP20	
Dimensions (W x H x D)	60 x 147 x 125 mm	
Weight	500 g	
Installation options	• Wall mounting • Installation on a DIN rail • Mounting on an S7-300 standard rail • Mounting on an S7-1500 standard rail	
Mean time between failure (MTBF)		
MTBF (EN/IEC 61709; 40 °C)	> 84.92 years	
Switching properties		
Aging time	45 seconds	
Max. number of learnable MAC addresses	2048	
Response to LLDP frames	Blocking	
Response to spanning tree BPDU frames	Forwarding	
CoS acc. to IEEE 802.1Q	Yes	
QoS priority queues	4	
IEEE 802.1Q tags (VLAN ID, priority) transparent forwarding	Yes	
Maximum frame size	1532 bytes	
Forwarding of PRP frames (Parallel Redundancy Protocol)	Yes	

7.2 Technical specifications of the SCALANCE XC108

The following technical specifications apply to the SCALANCE XC108.

Technical specifications		
Attachment to Industrial Ethernet		
Electrical connectors	Quantity	8
	Connector	RJ-45 jack
	Properties	Half/full duplex, MDI-X pinning
	Transmission speed	10 / 100 Mbps
Electrical data		
Power supply	Rated voltage	12 to 24 VDC
	Voltage range (incl. tolerance)	9.6 to 31.2 VDC Safe Extra Low Voltage (SELV)
	Design	Terminal block, 4 terminals
	Property	Implemented redundantly
Current consumption	At 12 VDC	250 mA
	at 24 VDC	125 mA
Effective power loss		3 W
Fusing		2.5 A
Signaling contact	Quantity	1
	Design	Terminal block, 2 terminals
	Permitted voltage range	24 VDC
	Load capability	max. 100 mA
Permitted ambient conditions		
Ambient temperature	During operation up to 2000 m	-40 °C to +70 °C
	During storage	-40 °C to +85 °C
	During transportation	-40 °C to +85 °C
Relative humidity	During operation at 25 °C	≤ 95 % no condensation
Housing, dimensions and weight		
Design	compact	
Housing material	Polycarbonate (PC-GF10)	
Degree of protection	IP20	
Dimensions (W x H x D)	60 x 147 x 125 mm	
Weight	475 g	
Installation options	• Wall mounting • Installation on a DIN rail • Mounting on an S7-300 standard rail • Mounting on an S7-1500 standard rail	
Mean time between failure (MTBF)		
MTBF (EN/IEC 61709; 40 °C)	> 100.24 years	

Technical specifications	
Switching properties	
Aging time	45 seconds
Max. number of learnable MAC addresses	2048
Response to LLDP frames	Blocking
Response to spanning tree BPDU frames	Forwarding
CoS acc. to IEEE 802.1Q	Yes
QoS priority queues	4
IEEE 802.1Q tags (VLAN ID, priority) transparent forwarding	Yes
Maximum frame size	1532 bytes
Forwarding of PRP frames (Parallel Redundancy Protocol)	Yes

7.3 Technical specifications of the SCALANCE XC116

The following technical specifications apply to the SCALANCE XC116.

Technical specifications		
Attachment to Industrial Ethernet		
Electrical connectors	Quantity	16
	Connector	RJ-45 jack
	Properties	Half/full duplex, MDI-X pinning
	Transmission speed	10 / 100 Mbps
Electrical data		
Power supply	Rated voltage	12 to 24 VDC
	Voltage range (incl. tolerance)	9.6 to 31.2 VDC Safe Extra Low Voltage (SELV)
	Design	Terminal block, 4 terminals
	Properties	Implemented redundantly
Current consumption	At 12 VDC	450 mA
	at 24 VDC	225 mA
Effective power loss		5.4 W
Fusing		2.5 A
Signaling contact	Quantity	1
	Design	Terminal block, 2 terminals
	Permitted voltage range	24 VDC
	Load capability	max. 100 mA
Permitted ambient conditions		
Ambient temperature	During operation up to 2000 m	-40 °C to +70 °C
	During storage	-40 °C to +85 °C
	During transportation	-40 °C to +85 °C
Relative humidity	During operation at 25 °C	≤ 95 % no condensation
Housing, dimensions and weight		
Design	compact	
Housing material	Polycarbonate (PC-GF10)	
Degree of protection	IP20	
Dimensions (W x H x D)	120 x 147 x 125 mm	
Weight	775 g	
Installation options	• Wall mounting • Installation on a DIN rail • Mounting on an S7-300 standard rail • Mounting on an S7-1500 standard rail	
Mean time between failure (MTBF)		
MTBF (EN/IEC 61709; 40 °C)	> 73.69 years	

Technical specifications	
Switching properties	
Aging time	45 seconds
Max. number of learnable MAC addresses	2048
Response to LLDP frames	Blocking
Response to spanning tree BPDU frames	Forwarding
CoS acc. to IEEE 802.1Q	Yes
QoS priority queues	4
IEEE 802.1Q tags (VLAN ID, priority) transparent forwarding	Yes
Maximum frame size	1532 bytes
Forwarding of PRP frames (Parallel Redundancy Protocol)	Yes

7.4 Technical specifications of the SCALANCE XC124

The following technical specifications apply to the SCALANCE XC124.

Technical specifications		
Attachment to Industrial Ethernet		
Electrical connectors	Quantity	24
	Connector	RJ-45 jack
	Properties	Half/full duplex, MDI-X pinning
	Transmission speed	10 / 100 Mbps
Electrical data		
Power supply	Rated voltage	12 to 24 VDC
	Voltage range (incl. tolerance)	9.6 to 31.2 VDC Safe Extra Low Voltage (SELV)
	Design	Terminal block, 4 terminals
	Property	Implemented redundantly
Current consumption	At 12 VDC	650 mA
	at 24 VDC	325 mA
Effective power loss		7.8 W
Fusing		2.5 A
Signaling contact	Quantity	1
	Design	Terminal block, 2 terminals
	Permitted voltage range	24 VDC
	Load capability	max. 100 mA
Permitted ambient conditions		
Ambient temperature	During operation up to 2000 m	-40 °C to +70 °C
	During storage	-40 °C to +85 °C
	During transportation	-40 °C to +85 °C
Relative humidity	During operation at 25 °C	≤ 95 % no condensation
Housing, dimensions and weight		
Design	compact	
Housing material	Polycarbonate (PC-GF10)	
Degree of protection	IP20	
Dimensions (W x H x D)	120 x 147 x 125 mm	
Weight	850 g	
Installation options	• Wall mounting • Installation on a DIN rail • Mounting on an S7-300 standard rail • Mounting on an S7-1500 standard rail	
Mean time between failure (MTBF)		
MTBF (EN/IEC 61709; 40 °C)	> 58.42 years	

Technical specifications	
Switching properties	
Aging time	45 seconds
Max. number of learnable MAC addresses	2048
Response to LLDP frames	Blocking
Response to spanning tree BPDU frames	Forwarding
CoS acc. to IEEE 802.1Q	Yes
QoS priority queues	4
IEEE 802.1Q tags (VLAN ID, priority) transparent forwarding	Yes
Maximum frame size	1532 bytes
Forwarding of PRP frames (Parallel Redundancy Protocol)	Yes

7.5 Mechanical stability (in operation)

Mechanical stability (in operation)

Device	IEC 60068-2-27 shock	IEC 60068-2-6 vibration
	15 g, 11 ms duration 6 shocks per axis	10 - 58 Hz: 0.075 mm 85 - 150 Hz: 1 g 1 octave/min, 20 sweeps
SCALANCE XC106-2	●	●
SCALANCE XC108	●	●
SCALANCE XC116	●	●
SCALANCE XC124	●	●

Certifications and approvals

8

The SIMATIC NET products described in these Operating Instructions have the approvals listed below.

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.

Current approvals on the Internet

You will find the current approvals for the product on the Internet pages of Siemens Industry Online Support (https://support.industry.siemens.com/cs/ww/en/ps/15273/cert).
→ Entry type "Certificates"

Notes for the manufacturers of machines

The devices are not machines in the sense of the EC Machinery Directive. There is therefore no declaration of conformity relating to the EC Machinery Directive 2006/42/EC for these devices.

If the devices are part of the equipment of a machine, they must be included in the declaration of conformity procedure by the manufacturer of the machine.

See also

SIMATIC NET Industrial Ethernet TP and Fiber Optic Networks
(http://support.automation.siemens.com/WW/view/en/8763736)

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.

- "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 "Auto-Hotspot", in "Further documentation".
- "EMC Installation Guidelines" configuration manual

  60612658 (http://support.automation.siemens.com/WW/view/en/60612658)

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.

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.

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.

The SIMATIC NET products meet the requirements of the EC directive 94/9/EC "Equipment and Protective Devices for Use in Potentially Explosive Atmospheres". and as of 20.04.2016 the EC directive 2014/34/EU.

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

You will find the current versions of the standards in the currently valid ATEX certificates.

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

You will find the current versions of the standards in the currently valid IECEx certificates.

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

cULus approval for industrial control equipment

cULus Listed IND. CONT. EQ.

Underwriters Laboratories Inc. complying with

- UL 61010-2-201
- CAN/CSA-IEC 61010-2-201

Report no. E85972

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

E1

The device meets the requirements of the ECE R10 directive.

Test number 10 R - 057876

Note

This approval exists only for the IE switch SCALANCE XC108.

RCM

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

Marking for the customs union

EAC (Eurasian Conformity)

Customs union of Russia, Belarus and Kazakhstan

Declaration of the conformity according to the technical regulations of the customs union (TR CU)

MSIP 요구사항 - For Korea only

A급 기기(업무용 방송통신기자재)

이 기기는 업무용(A급) 전자파 적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정 외의 지역에서 사용하는것을 목적으로 합니다.

FDA and IEC marks

The following devices meet the FDA and IEC requirements listed below:

Device	CLASS 1 LASER Product	CLASS 1 LED Product
SCALANCE XC106-2	-	●
SCALANCE XC108	-	-
SCALANCE XC116	-	-
SCALANCE XC124	-	-

Image 8-1 FDA and IEC approvals

⚠ CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

8.1 EU declaration of conformity

The EC Declaration of Conformity is available for all responsible authorities at:

Siemens Aktiengesellschaft
Process Industries and Drives Division,
Process Automation
DE-76181 Karlsruhe
Germany

You will find the EC declaration of conformity for these products on the Internet pages of Siemens Industry Online Support (https://support.industry.siemens.com/cs/ww/en/ps/15273/cert).

The SIMATIC NET products described in these Operating Instructions meet the requirements of the following EC directives:

- 94/9/EC (ATEX, until 19.04.2016)

  ATEX directive of the European Parliament and the Council of 23 March 1994 on the approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres

- 2014/34/EC (ATEX, as of 20.04.2016)

  ATEX directive of the European Parliament and the Council of 26 February 2014 on the approximation of the laws of the member states concerning equipment and protective systems intended for use in potentially explosive atmospheres.

- 2004/108/EC (EMC up to 19.04.2016)

  EMC directive of the European Parliament and of the Council of December 15, 2004 on the approximation of the laws of the member states relating to electromagnetic compatibility.

- 2014/30/EC (EMC, as of 20.04.2016)

  EMC directive of the European Parliament and of the Council of February 26, 2014 on the harmonization of the laws of the member states relating to electromagnetic compatibility.

- 2011/65/EU (RoHS)

  RoHS directive of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Which of the described standards apply to the product can be found in Products (Page 54).

The current versions of the standards can be seen in the EC Declaration of Conformity.

8.1.1 ATEX

ATEX directive (correct usage in potentially explosive atmospheres)

The SIMATIC NET product meets the requirements of the EC directive:94/9/EC (until 19.04.2016) and 2014/34/EU (as of 20.04.2016) "Equipment and Protective Devices for Use in Potentially Explosive Atmospheres" according to the standards listed in the section Products (Page 54):

Applied standard:

1. EN 60079-0
   Hazardous areas - Part 0: Equipment - General requirements
2. EN 60079-15
   Explosive atmospheres - Part 15: Equipment protection by type of protection "n"

8.1.2 EMC

EMC directive (electromagnetic compatibility)

The SIMATIC NET products described in these operating instructions meet the requirements of EC directive 2004/108/EC (until 19.04.2016) and 2014/30/EU (as of 20.04.2016) "Electromagnetic Compatibility" for the following areas of application according to the standards listed in the section Products (Page 54):

3. EN 61000-6-1
   Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
4. EN 61000-6-2
   Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments.
5. EN 61000-6-3
   Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments.
6. EN 61000-6-4
   Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments.

8.1.3 RoHS

RoHS directive (restriction of the use of certain hazardous substances)

The SIMATIC NET products described in these operating instructions meet the requirements of the EC directive 2011/65/EC for the restriction of the use of certain hazardous substances in electrical and electronic equipment:

Applied standard:

7 EN 50581

Technical documentation for the assessment electrical and electronic products with respect to restriction of hazardous substances

8.1.4 Products

Product designation and standards

The standards that apply to the product are described in EMC (Page 53) and RoHS (Page 54).

Product name	Standards
SCALANCE XC106-2	1, 2, 4, 6, 7
SCALANCE XC108	1, 2, 4, 6, 7
SCALANCE XC116	1, 2, 4, 6, 7
SCALANCE XC124	1, 2, 4, 6, 7

Dimension drawings

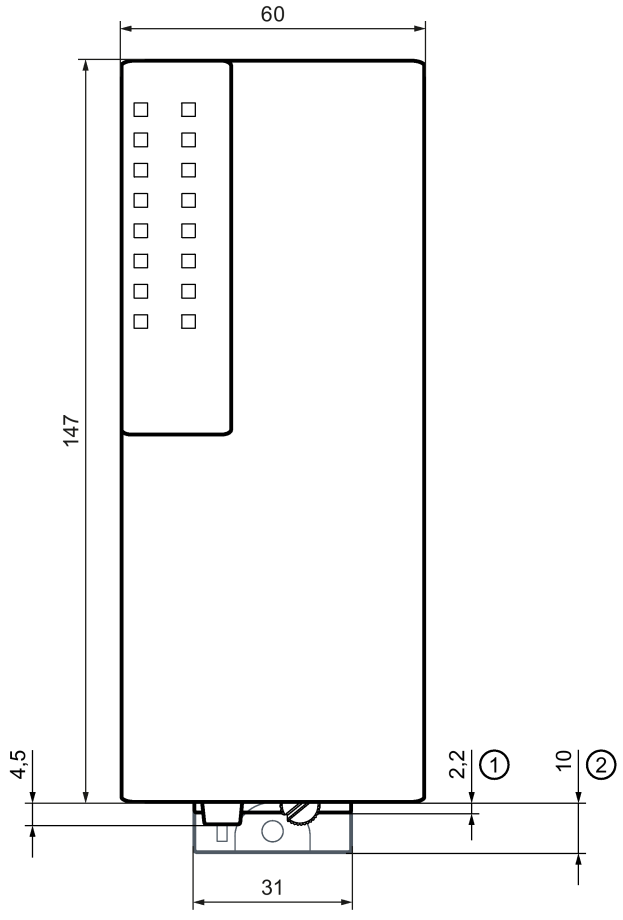
9

9.1 SCALANCE XC-100 dimension drawings

Note

Dimensions are specified in mm.

Front view of the SCALANCE XC106-2, SCALANCE XC108

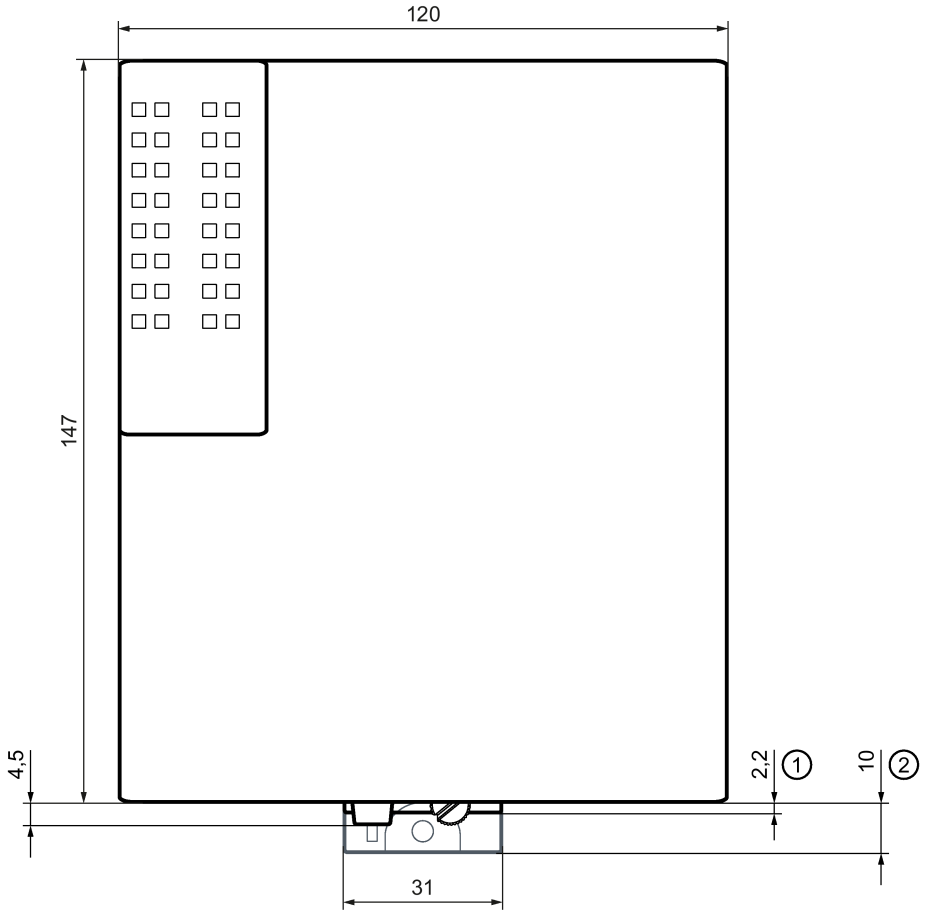


① Securing bar in the rail mounting position

② Securing bar in the wall mounting position (as supplied).

Image 9-1 Width and height

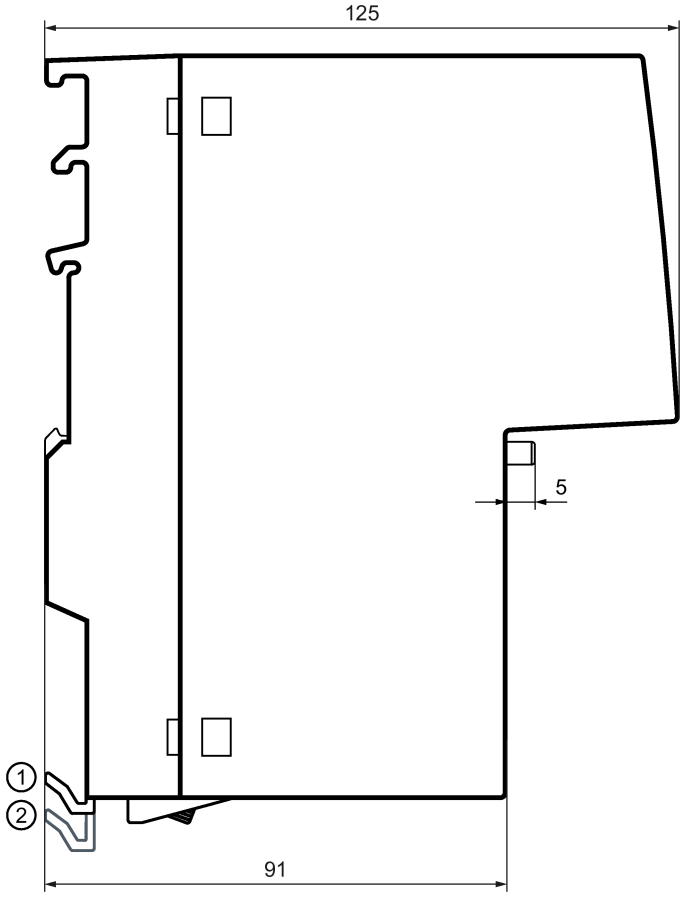
Front view of the SCALANCE XC116, SCALANCE XC124



① Securing bar in the rail mounting position
② Securing bar in the wall mounting position (as supplied).

Image 9-2 Width and height

Side view of the SCALANCE XC-100



① Securing bar in the rail mounting position
② Securing bar in the wall mounting position (as supplied).

Image 9-3 Depth

Drilling template for wall mounting

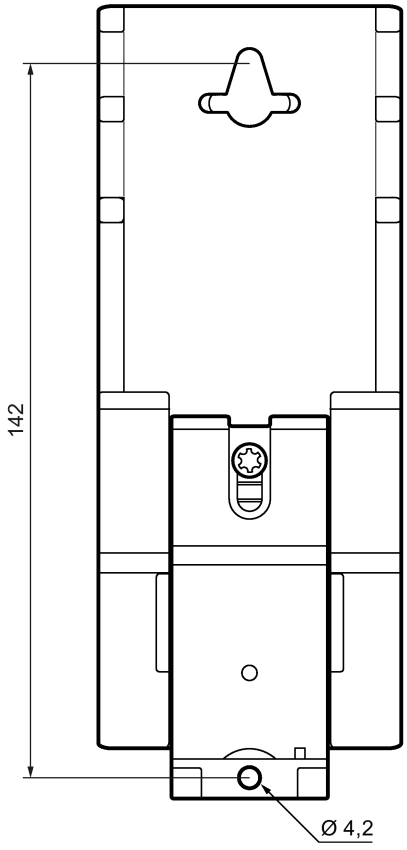


Image 9-4 Drilling template

Index

W