

SIEMENS

SIMATIC NET

Industrial Ethernet switches SCALANCE X-100 media converter




Operating Instructions

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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

All names identified by ® are registered trademarks of Siemens Aktiengesellschaft. 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.

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Introduction

1.1 On the Operating Instructions

Purpose of the Operating Instructions

These operating instructions support you when commissioning networks with the media converters of the SCALANCE X-100.

Validity of the Operating Instructions

These Operating Instructions apply to the following devices:

- SCALANCE X101-1
- SCALANCE X101-1LD

See also

<https://siemens.com/scalance> (<https://siemens.com/scalance>)

SIMATIC NET Industrial TP and Fiber Optic Networks (<https://support.automation.siemens.com/WW/view/en/1172207>)

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:
 - Industrial Ethernet / PROFINET Industrial Ethernet System Manual (<https://support.industry.siemens.com/cs/ww/en/view/27069465>)
 - Industrial Ethernet / PROFINET Passive Network Components System Manual (<https://support.industry.siemens.com/cs/ww/en/view/84922825>)

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 here:

- SIMATIC NET Manual Collection or product DVD
The DVD ships with certain SIMATIC NET products.
- On the Internet under the following address:
50305045 (<https://support.industry.siemens.com/cs/ww/en/view/50305045>)

Cybersecurity notes

1.2 Cybersecurity information

Siemens provides products and solutions with industrial cybersecurity functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial cybersecurity measures that may be implemented, please visit

<https://www.siemens.com/cybersecurity-industry> (<https://www.siemens.com/industrialsecurity>).

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Cybersecurity RSS Feed under <https://new.siemens.com/cert> (<https://www.siemens.com/cert>).

Catalogs

You will find the article 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://mall.industry.siemens.com/goos/WelcomePage.aspx?regionUrl=/en&language=en>)

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

Device defective

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

Recycling and disposal



The products are low in pollutants, can be recycled and meet the requirements of the WEEE directive 2012/19/EU for the disposal of electrical and electronic equipment.

Do not dispose of the products at public disposal sites.

For environmentally friendly recycling and the disposal of your old device contact a certified disposal company for electronic scrap or your Siemens contact (Product return (<https://support.industry.siemens.com/cs/ww/en/view/109479891>)).

Note the different national regulations.

Trademarks

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

SCALANCE, C-PLUG, OLM

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 their product packaging or in a conductive packaging such as metalized plastic or metal containers, conductive foam or household aluminum foil.

Safety notes

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".

 CAUTION
To prevent injury and damage, read the manual before using the device.

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.

Network topologies

3.1 Possible network topologies

Switching technology allows extensive networks to be set up with numerous nodes and simplifies network expansion.

Which topologies can be implemented?

Using the media converters of the SCALANCE X-100 product line, you can implement bus and star topologies. It is also possible to link rings and to use two identical media converters in a ring structure. See also "Cascading two media converters (Page 14)".

Note

Keep to the maximum permitted cable lengths of the devices you are using. You will find the permitted cable lengths in the section "Technical specifications (Page 49)".

Bus topology

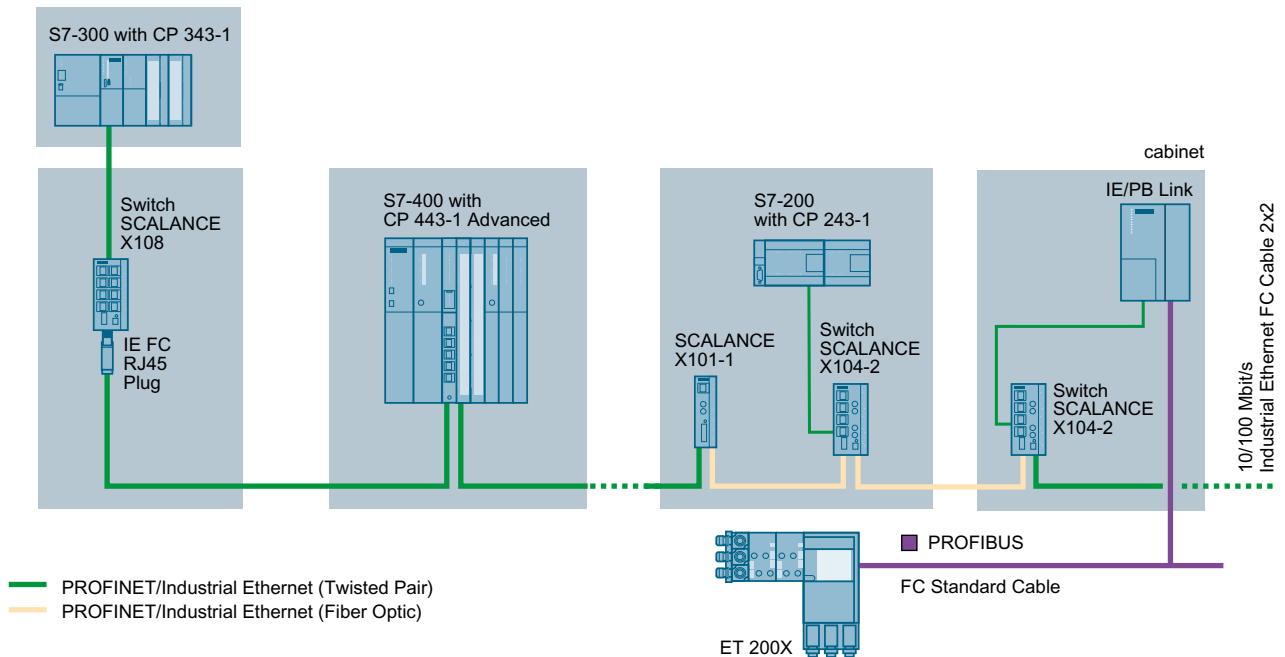
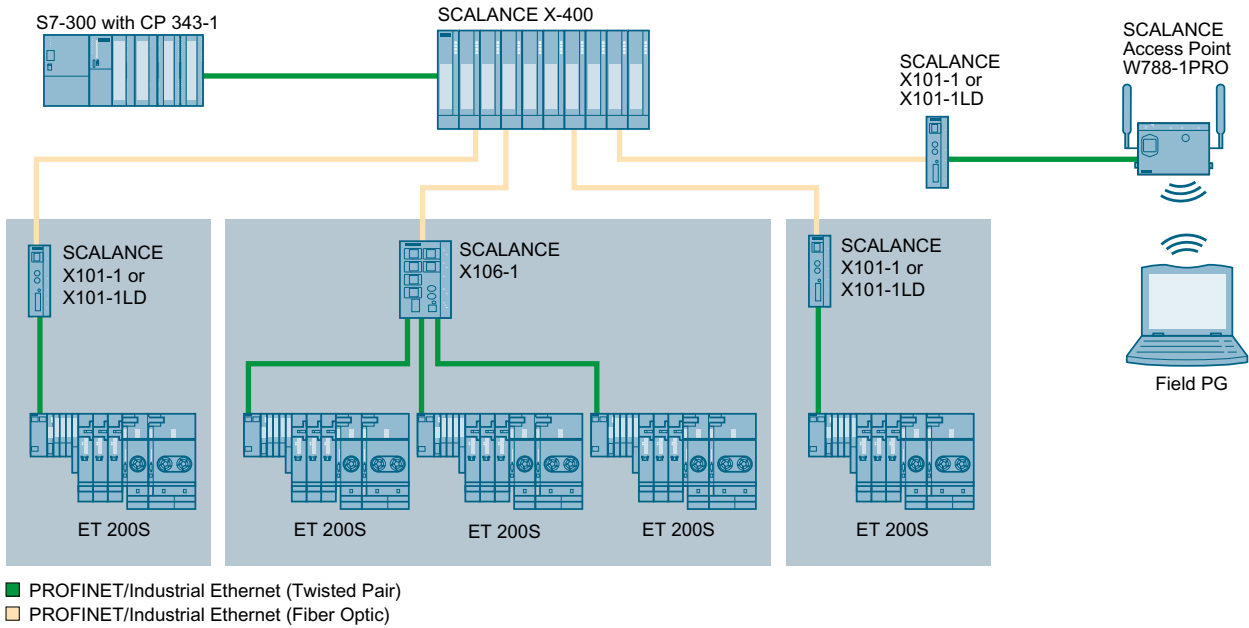


Figure 3-1 Example of an electrical/optical bus topology with SCALANCE X101-1

Star topology

The following figure shows an optical star structure with the IE switches X-400 and X106-1. A SCALANCE W access point and SIMATIC NET 200 systems are electrically connected via the media converters SCALANCE X101-1 or SCALANCE X101-1LD.

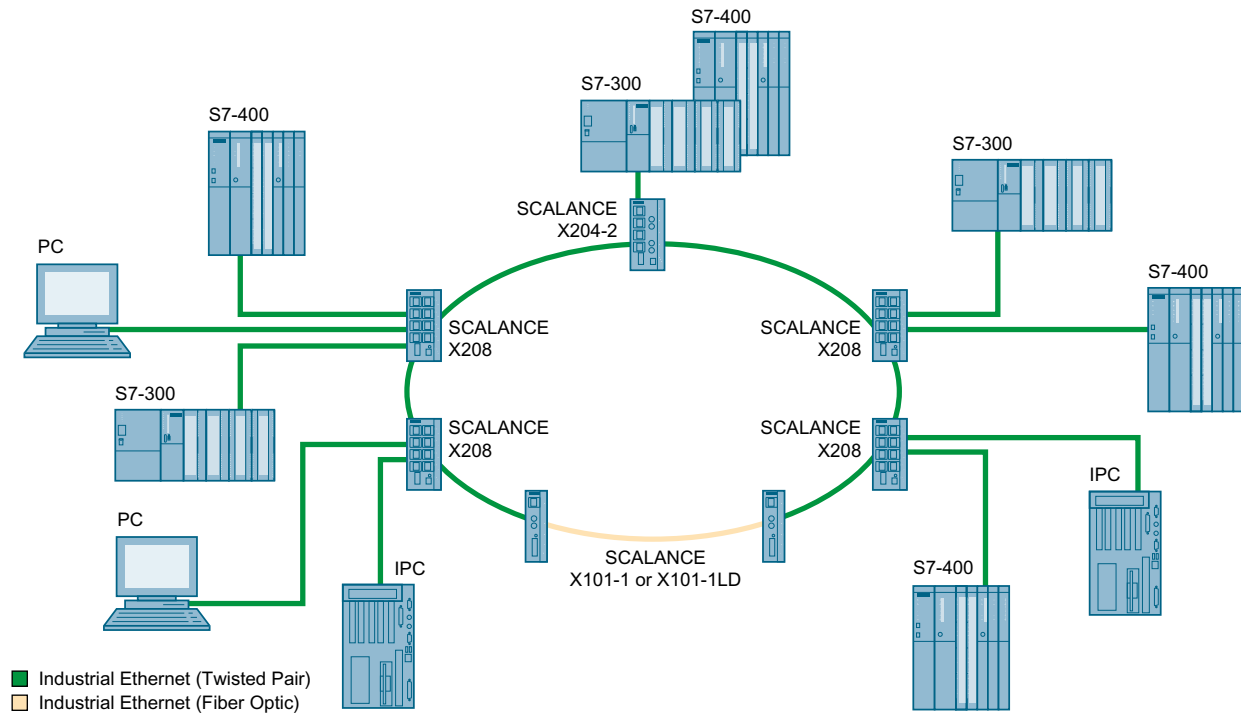


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Figure 3-2 Example of an optical star topology with SCALANCE X101-1 or SCALANCE X101-1LD

Ring topology

The following figure shows an electrical ring with a SCALANCE X204IRT as redundancy manager and SCALANCE X208 IE switches. Using the media converters SCALANCE X101-1 or SCALANCE X101-1LD, there is a conversion to an optical section.



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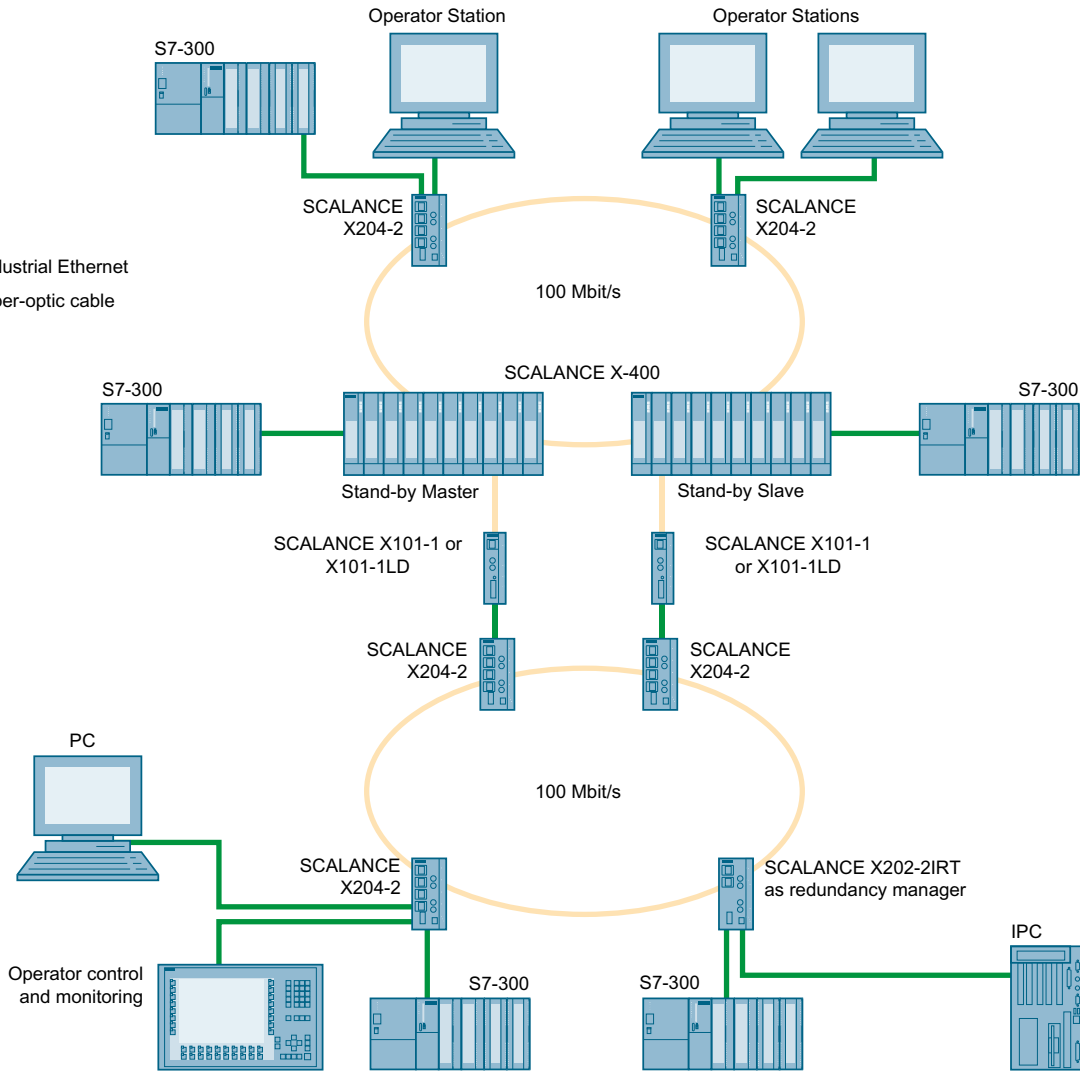
Figure 3-3 Example of an electrical ring with SCALANCE X101-1 or SCALANCE X101-1LD

3.2 Coupling of network segments

The example of a coupling between two ring networks using two SCALANCE X101-1 media converters is only indirectly possible via nodes capable of redundancy (e.g. SCALANCE X-400). This applies to all SCALANCE X-100 media converters.

The following figure shows the standby coupling of two redundant rings using the master/slave concept of the SCALANCE X-400 with SCALANCE X101-1 or SCALANCE X101-1LD media converters.

3.3 Cascading two media converters



G_IPK10_XX_10047

Figure 3-4 Example of a standby coupling of two redundant rings

3.3 Cascading two media converters

You can connect two media converters of the same type in series, i.e. connect them to each other via the FO port. Both media converters must be operated in Transparent Link Mode for the cascade. You enable Transparent Link Mode using the SET button. For more information, refer to "SET button (Page 27)".

In Transparent Link Mode, both media converters communicate via a specific protocol. With this protocol, the media converters initially exchange the link information present at the electrical RJ45 ports between one another. The transmission leads to a certain delay in the behavior for establishing the link at the electrical ports. This can cause a timeout at the

Ethernet interface for devices that are electrically connected and the link is not established. This behavior cannot be influenced and occurs particularly when plants are switched on.

Use the new SCALANCE XCM102 media converters with corresponding SFPs for such applications.

Note the following restrictions:

- A maximum of two media converters can be connected in series.
- Mixed cascading of SCALANCE X-100 media converters and OMC media converters is not possible.
- Mixed operation of SCALANCE X101-1/X101-1LD with SCALANCE XCM102 is not possible.
- Cascading is only permitted via the connection of the FO ports.
- Cascading must be set on both media converters using the SET button (transparent link LED lights up). Otherwise, there may be functional disruptions.
- The setting remains after cycling power.
- When shipped, the standalone mode is enabled; in other words no cascading.

Description of the device

4.1 Purpose

What is possible?

The media converters of the SCALANCE X-100 allow the cost-effective installation of Industrial Ethernet linear (bus) and star structures with transitions from one media to another.

The passive use of two identical SCALANCE X-100 media converters in series (cascaded) within a redundant ring is possible. In this case, the media converters behave "like a section of cable". A simple, passive coupling of two rings is also possible. See also "Coupling of network segments (Page 13)".

Note

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

One of the tests used to attest the immunity of these devices to electromagnetic interference is the "surge immunity test" according to EN 61000-4-5. This test requires overvoltage protection for the power supply lines. A suitable device is, for example, the Dehn Blitzductor BVT AVD 24 V type no. 918 422 or a comparable protective element.

Manufacturer:

DEHN+SÖHNE GmbH+Co.KG Hans Dehn Str.1 Postfach 1640 D-92306 Neumarkt, Germany

4.2 Product overview

Article numbers

Device variant	Description	Article number
SCALANCE X101-1	1x 10/100 Mbps RJ45 port, 1x 100 Mbps multimode BFOC	6GK5101-1BB00-2AA3
SCALANCE X101-1LD	1x 10/100 Mbps RJ45 port, 1x 100 Mbps single-mode BFOC	6GK5101-1BC00-2AA3

4.2.1 Overview of the SCALANCE X-100 media converters


Table 4-1 Overview of the product characteristics

Properties	X101-1	X101-1LD
SIMATIC environment	+	+
Diagnostics LED	+	+
24 VDC	+	+
2 x 24 VDC	+	+
Compact housing 40 mm (securing collar, etc.)	+	+
Signaling contact + on-site operation	+	+
Diagnostics: Web, SNMP, PROFINET	-	-
C-PLUG	-	-
Ring redundancy with RM	-	-
Passive ring redundancy	+	+
Standby redundancy	-	-
IRT capability	-	-
Fast learning	-	-
Passive listening	-	-
Log table	-	-
SNTP + SICLOCK	-	-
Cut Through	+	+

Table 4-2 Overview of the connection options

	X101-1	X101-1LD
TP (RJ-45) Fast Ethernet 10 / 100 Mbps	1	1
Fiber multimode (BFOC) 1300 nm	1	-
Fiber long distance single mode (BFOC) 1310 nm	-	1

Unpacking and checking

<p> WARNING</p> <p>Do not use any parts that show evidence of damage</p> <p>If you use damaged parts, there is no guarantee that the device will function according to the specification.</p> <p>If you use damaged parts, this can lead to the following problems:</p> <ul style="list-style-type: none"> • Injury to persons • Loss of the approvals • Violation of the EMC regulations • Damage to the device and other components <p>Use only undamaged parts.</p>

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

Scope of delivery

The following components are supplied with a SCALANCE X-100 media converter:

- SCALANCE X-100 media converter
- 2-pin plug-in terminal block (signaling contact)
- 4-terminal plug-in block (power supply)
- Product information

Accessories

Component	Packaging unit	Article number
IE FC Stripping Tool	1	6GK1 901-1GA00
IE FC blade cassettes	1	6GK1 901-1GB00
IE FC TP standard cable GP	1	6XV1 840 2AH10
IE FC TP trailing cable	1	6XV1 840-3AH10
IE FC TP marine cable	1	6XV1 840-4AH10
IE FC TP trailing cable GP	1	6XV1 870-2D
IE FC TP flexible cable GP	1	6XV1 870-2B
IE FC RJ-45 Plug 180	1	6GK1 901-1BB10-2AA0
IE FC RJ-45 Plug 180	10	6GK1 901-1BB10-2AB0
IE FC RJ-45 Plug 180	50	6GK1 901-1BB10-2AE0

4.3 Product properties and device views

4.3.1 SCALANCE X101-1

Possible attachments

The SCALANCE X101-1 media converter has an RJ-45 jack and a BFOC socket for connecting end devices or further network segments.

Note

The BFOC socket (Bayonet Fiber Optic Connector) corresponds to the ST socket.



Figure 4-1 SCALANCE X101-1

4.3.2 SCALANCE X101-1LD

Possible attachments

The SCALANCE X101-1LD media converter has an RJ-45 jack and a BFOC socket for connecting end devices or further network segments.

Note

The BFOC socket (Bayonet Fiber Optic Connector) corresponds to the ST socket.

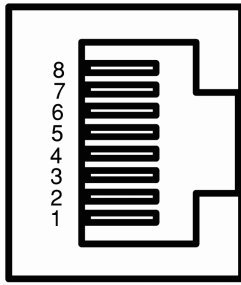


Figure 4-2 SCALANCE X101-1LD

4.4 TP ports (twisted pair)

RJ-45 connector pinout

With SCALANCE X-100 media converters, the twisted-pair port is designed as an RJ-45 jack with the MDI-X pin assignment (Medium Dependent Interface Autocrossover) of a network component.



Pin number	Assignment
Pin 8	n. c.
Pin 7	n. c.
Pin 6	TD-
Pin 5	n. c.
Pin 4	n. c.
Pin 3	TD+
Pin 2	RD-
Pin 1	RD+

Note

Permitted cable lengths

TP cords or TP-XP cords with a maximum length of 10 m can be connected to the TP port with the RJ-45 jack.

With the IE FC cables and IE FC RJ-45 plugs 180, an overall cable length of a maximum of 100 m is permitted between two devices depending on the cable type.

Autonegotiation

With the autonegotiation mechanism, repeaters and end devices can automatically determine the transmission speed and the transmission mode of the partner port. This makes it possible to configure different devices automatically.

Two components connected to a link segment can exchange information about the data transfer and can adapt their settings to each other. The mode with the highest possible speed is set.

Note

Devices not supporting autonegotiation must be set permanently to 100 Mbps half duplex or 10 Mbps half duplex.

Auto polarity exchange

If the pair of receiving cables is connected incorrectly (RD+ and RD- interchanged), the polarity is adapted automatically.

MDI / MDI-X autocrossover function

With the MPI/MDI-X autocrossover function, the send and receive contacts of an Ethernet port are assigned automatically. The assignment depends on the cable with which the communications partner is connected. This means that it does not matter whether the port is connected using a patch cable or crossover cable. This prevents malfunctions resulting from mismatching send and receive lines. This makes installation much easier for the user.

The SCALANCE X-100 media converters all support the MDI / MDI-X autocrossover function.

4.5 FO port (fiber optic)

NOTICE
<p>Failure of the data traffic due to contamination of optical plug-in connections</p> <p>Optical sockets and plugs are sensitive to contamination of the end face. Contamination can lead to the failure of the optical transmission network. Take the following precautions to avoid functional impairments:</p> <ul style="list-style-type: none">• Clean the end face of field-assembled connectors carefully before connecting. No residues of processing may remain on the connector.• Only remove the dust caps of optical transceivers and pre-configured cables shortly before connecting the cables.• Close unused optical sockets and plugs as well as pluggable transceivers and slots with the supplied protective caps.

NOTICE

No link building with active plug-in transceivers

If you connect a SCALANCE X101-1 or SCALANCE X101-1LD media converter to the port of a partner device in which an active plug-in transceiver is plugged in, the media converter does not establish a link.

The SCALANCE X101-1 and SCALANCE X101-1LD media converters are not compatible with the following plug-in transceivers:

- SFP991-1A (6GK5991-1AD00-8GA0)
- SFP991-1LD A (6GK5991-1AF00-8GA0)

NOTICE

No link building with partner device

If you connect a SCALANCE X101-1 or SCALANCE X101-1LD media converter to one of the following partner devices, the media converter does not establish a link.

The SCALANCE X101-1 and SCALANCE X101-1LD media converters are not compatible with the following partner devices:

- SCALANCE XB108-2(SC) (6GK5108-2BD00-2AB2)
- SCALANCE XB108-2(ST) (6GK5108-2BB00-2AB2)

4.5.1 SCALANCE X101-1

Transmission speed

The transmission speed of the optical Fast Ethernet port is 100 Mbps.

Transmission mode

The transmission mode for 100Base-FX is specified in the IEEE 802.3 standard.

Since the full duplex mode and the transmission speed cannot be modified for optical transmission, autonegotiation cannot be used.

Transmission medium

Data transmission is via multimode fiber-optic cable (FO cable). The transceiver wavelength is 1300 nm.

Multimode FO cable is used with a core diameter of 50 or 62.5 µm. The light source is an LED.

The outer diameter of the FO cable is 125 µm.

Range

The maximum transmission range (segment length) is as follows:

- with 62.5/125 μm fiber multimode SIMATIC NET cable: 4 km
- with 50.0/125 μm fiber multimode SIMATIC NET cable: 5 km

Connectors

The cables are connected using BFOC sockets.

4.5.2 SCALANCE X101-1LD

Transmission speed

The transmission speed of the optical Fast Ethernet port is 100 Mbps.

Transmission mode

The transmission mode for 100Base-LX is specified in the IEEE 802.3 standard.

Since the full duplex mode and the transmission speed cannot be modified for optical transmission, autonegotiation cannot be used.

Transmission medium

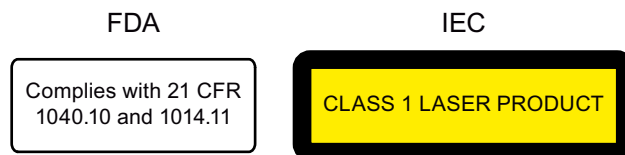
Data transmission is over single-mode fiber-optic cable (FO cable). The transceiver wavelength is 1310 nm.

Single-mode fiber-optic cable with a core diameter of 10 μm is used.

The outer diameter of the FO cable is 125 μm .

Sender

The light source is an "eye safe" class 1 laser with a wavelength of 1310 nm.



Range

The maximum transmission range (segment length) is 26 km with a signal attenuation of the fiber-optic cable of ≤ 0.5 dB/km.

4.6 LEDs

Connectors

The cables are connected using BFOC sockets.

GI-PCF

For segment lengths longer than 100 m, you can use GI-PCF cables. Note the information of the manufacturer.

4.6 LEDs

Fault LED "F" (red LED)

The fault LED indicates the incorrect functioning of the device.

LED color	LED status	Meaning
Red	Lit	The SCALANCE X-100 media converter detects a fault. 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 14 V.
-	Off	No problem has been detected by the SCALANCE X-100 media converter.

Power LED "L" (green LED)

The power LED shows the status of the power supply.

LED color	LED status	Meaning
Green	Lit	Power supply L1 or L2 is connected.
-	Off	Power supply L1 and L2 are not connected or L1 and L2 <14 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	Port LED	Meaning
Green	Lit	P1	Link exists, no data reception at port
Green	Lit	P2	Link exists, no data reception at port
Yellow	Lit	P1	Link exists, data reception at port

LED color	LED status	Port LED	Meaning
Yellow	Lit	P2	Link exists, data reception at port
Yellow	Flashing	P1 + P2	Setting or display of the fault mask

Note

In standalone mode, the link status of the port LEDs is only displayed if the same link status is detected at both ports P1 and P2.

In transparent link mode, the link status at the optical port (P2) is detected and displayed even without a link at the electrical port P1.

Transparent link LED "TL" (green LED)

The transparent link LED indicates the mode of the device.

LED color	LED status	Meaning
Green	Lit	Transparent link parameters set.
-	Off	Stand-alone mode. End devices are connected to both ports of the media converter (no cascading).

4.7 SET button**Function**

With the SET button, you can display and change the set fault mask. You can also set the transparent link mode if the media converter supports cascading. For more detailed information, refer to the section "Cascade (Page 14)".

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.

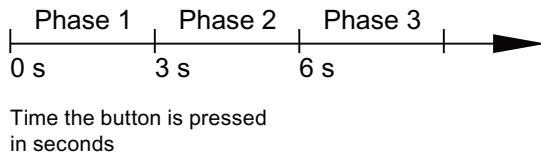
If you connect a power supply to L2+/M2, adapt the fault mask accordingly: Delete the error LED and the signaling contact or set the fault mask to the power supply L2+/M2.

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:

4.7 SET button



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. <ul style="list-style-type: none"> • The LEDs of the ports at which there is currently a link flash. • The LEDs of the connected power supply 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, saving 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. <ul style="list-style-type: none"> • 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

Setting transparent link mode

Factory setting

When shipped, the transparent link mode is disabled. The media converter is in standalone mode. A cascade is not possible.

Enabling transparent link mode

To enable the transparent link mode, press the SET button and keep it pressed for 0.5 seconds.

The transparent link LED lights up. The transparent link mode is enabled.

Disabling transparent link mode

To disable the transparent link mode, press the SET button and keep it pressed for 0.5 seconds.

The transparent link LED is off. The transparent link mode is disabled. The media converter is in standalone mode.

4.7 SET button

Installation and disassembly

5.1 Safety notices for installation

Safety notices

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

 WARNING
--

Ambient temperature above 55 °C
--

If a device is operated in an ambient temperature of more than 55 °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 55 °C.

 WARNING
--

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

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

NOTICE

Improper mounting

Improper mounting may damage the device or impair its operation.
--

- | |
|---|
| <ul style="list-style-type: none">• Before mounting the device, always ensure that there is no visible damage to the device.• Mount the device using suitable tools. Observe the information in the respective section about mounting. |
|---|

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 intended for indoor use only.

 **WARNING**

The device may only be operated in an environment of contamination class 1 or 2 (see EN/IEC 60664-1, GB/T 16935.1).

 **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.

Notes for use in hazardous locations according to ATEX, IECEx, UKEX and CCC Ex

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

 **WARNING**

To comply with EU Directive 2014/34 EU (ATEX 114), UK Regulation SI 2016/1107 or the conditions of IECEx or CCC-Ex, the housing or cabinet must meet the requirements of at least IP54 (according to EN/IEC 60529, GB/T 4208) in compliance with EN IEC/IEC 60079-7, GB/T 3836.3.

 **WARNING**

If the temperature of the cable or housing socket exceeds 60 °C or the temperature at the branching point of the cables 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.

5.2 Types of installation

The devices can be installed in the following ways:

- Installation on a 35 mm DIN rail
- Installation on a SIMATIC S7-300 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

5.3 Installation on a DIN rail

Installation

To install the device on a 35 mm DIN rail, follow the steps below:

1. Place the second housing guide of the device on the top edge of the DIN rail.
2. Press the device down against the DIN rail until the spring catch locks in place.
3. Fit the connectors for the power supply. See also section "Power supply (Page 42)".
4. Fit the connectors for the signaling contacts. See also section "Signaling contacts (Page 43)".
5. Insert the terminal blocks into the sockets on the device.

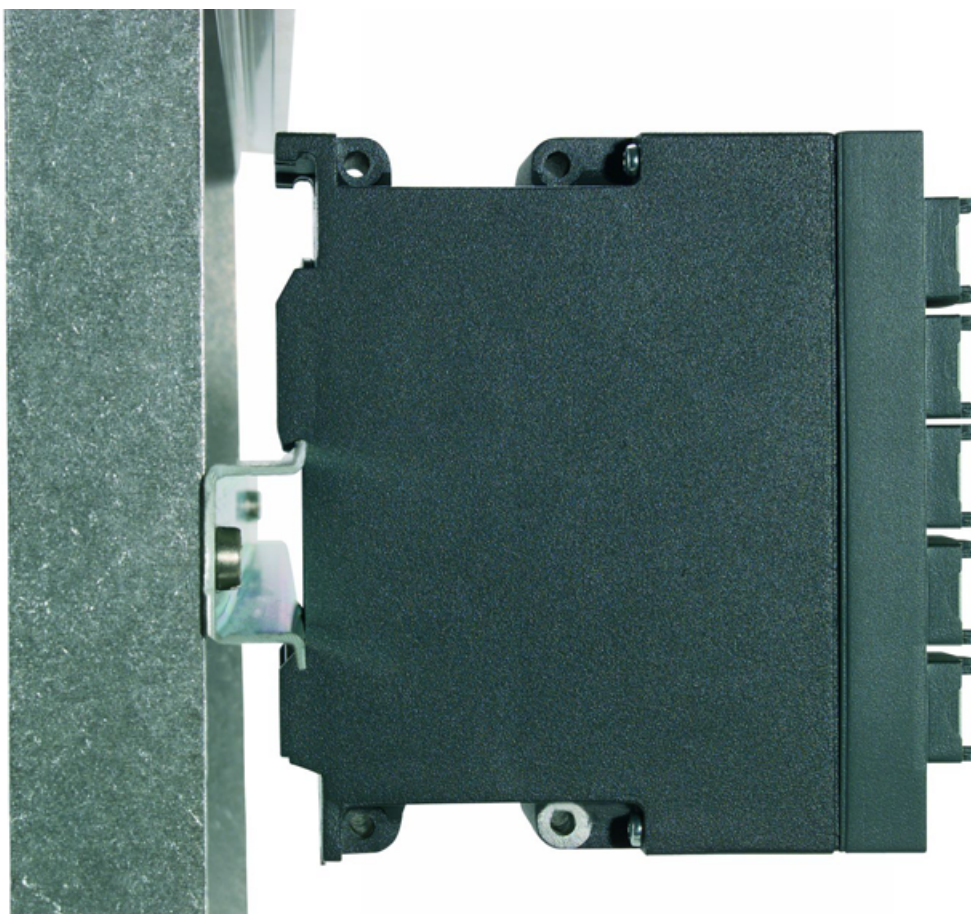


Figure 5-1 Installation on a 35 mm DIN rail

Removal

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

1. Disconnect all connected cables.
2. Pull out the terminal blocks for the power supply and the signaling contact.
3. Release the DIN rail catch on the bottom of the device using a screwdriver.
4. Pull the lower part of the device away from the DIN rail.

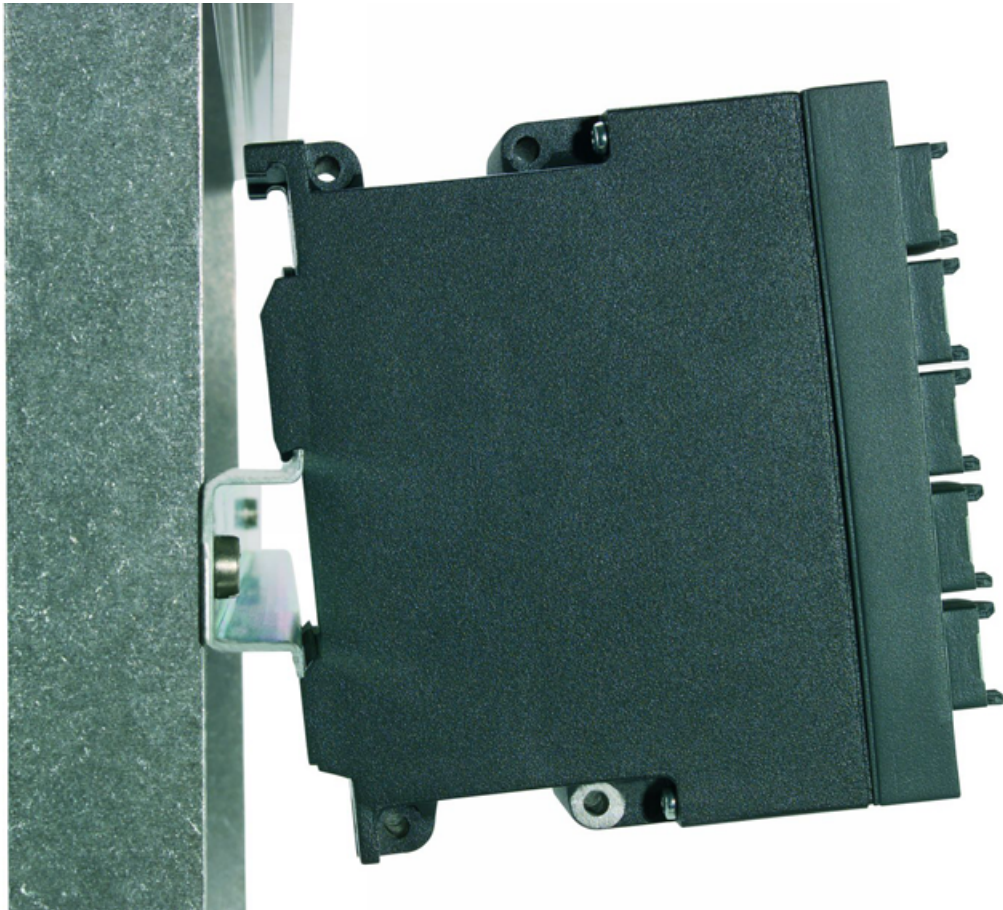


Figure 5-2 Removal from a 35 mm DIN rail

5.4 Installation on a standard rail

Installation on a SIMATIC S7-300 standard rail

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

1. Place the first housing guide of the housing on the top edge of the S7-300 standard rail.
2. Screw the device to the underside of the standard rail (tightening torque 2 Nm).
3. Fit the connectors for the power supply. See also section "Power supply (Page 42)".

5.5 Wall mounting

4. Fit the connectors for the signaling contacts. See also section "Signaling contacts (Page 43)".
5. Insert the terminal blocks into the sockets on the device.



Figure 5-3 Standard rail mounting X-100MC

Removal

To remove the device from the S7-300 standard rail, follow the steps below:

1. Disconnect all connected cables.
2. Release the screw on the bottom of the standard rail.
3. Lift the device off the standard rail.

5.5 Wall mounting

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

- 4 wall plugs, 6 mm in diameter and 30 mm long
- 4 screws 3.5 mm in diameter and 40 mm long

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

1. Prepare the drill holes for wall mounting. For the precise dimensions, refer to the section "Dimension drawings (Page 55)".
2. Fit the connectors for the power supply. See also section "Power supply (Page 42)".

3. Fit the connectors for the signaling contacts. See also section "Signaling contacts (Page 43)".
4. Insert the terminal blocks into the sockets on the device.
5. Screw the device to the wall.

Note

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

5.6 Disassembly

 WARNING**Improper disassembly**

Improper disassembly may result in a risk of explosion in hazardous areas.

For proper disassembly, observe the following:


- Before starting work, ensure that the electricity is switched off.
- Secure remaining connections so that no damage can occur as a result of disassembly if the system is accidentally started up.

Connecting up

6.1 Safety when connecting up

Safety notices

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

 WARNING
<p>Power supply</p> <p>The device is designed for operation with a directly connectable safety extra low voltage (SELV) from a limited power source (LPS).</p> <p>The power supply therefore needs to meet at least one of the following conditions:</p> <ul style="list-style-type: none"> • Only safety extra low voltage (SELV) with limited power source (LPS) complying with IEC 60950-1 / EN 60950-1 / VDE 0805-1 or IEC 62368-1 / EN 62368-1 / VDE 62368-1 may be connected to the power supply terminals. • The power supply unit for the device must meet NEC Class 2 according to the National Electrical Code (r) (ANSI / NFPA 70). <p>If the equipment is connected to a redundant power supply (two separate power supplies), both must meet these requirements.</p>

NOTICE
<p>Failure of the data traffic due to contamination of optical plug-in connections</p> <p>Optical sockets and plugs are sensitive to contamination of the end face. Contamination can lead to the failure of the optical transmission network. Take the following precautions to avoid functional impairments:</p> <ul style="list-style-type: none"> • Clean the end face of field-assembled connectors carefully before connecting. No residues of processing may remain on the connector. • Only remove the dust caps of optical transceivers and pre-configured cables shortly before connecting the cables. • Close unused optical sockets and plugs as well as pluggable transceivers and slots with the supplied protective caps.

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.

 **WARNING**

Suitable cables at high ambient temperatures in hazardous area

At an ambient temperature of ≥ 60 °C, use heat-resistant cables designed for an ambient temperature at least 20 °C higher. The cable entries used on the housing must comply with the IP degree of protection required by EN IEC / IEC 60079-0, GB/T 3836.1.

 **WARNING**

Unsuitable cables or connectors

Risk of explosion in hazardous areas

- Only use connectors that meet the requirements of the relevant type of protection.
- If necessary, tighten the connector screw connections, device fastening screws, grounding screws, etc. according to the specified torques.
- Close unused cable openings for electrical connections.
- Check the cables for a tight fit after installation.

 **WARNING**

Lack of equipotential bonding

If there is no equipotential bonding in hazardous areas, there is a risk of explosion due to equalizing current or ignition sparks.

- Ensure that equipotential bonding is available for the device.

 **WARNING**

Unprotected cable ends

There is a risk of explosion due to unprotected cable ends in hazardous areas.

- Protect unused cable ends according to IEC/EN 60079-14.

 **WARNING****Improper installation of shielded cables**

There is a risk of explosion due to equalizing currents between the hazardous area and the non-hazardous area.

- Ground shielded cables that cross hazardous areas at one end only.
- Lay a potential equalization conductor when grounding at both ends.

 **WARNING****Insufficient isolation of intrinsically safe and non-intrinsically safe circuits**

Risk of explosion in hazardous areas

- When connecting intrinsically safe and non-intrinsically safe circuits, ensure that the galvanic isolation is performed properly in compliance with local regulations (e.g. IEC 60079-14).
- Observe the device approvals applicable for your country.

Notes for use in hazardous locations according to ATEX, IECEx, UKEX and CCC Ex

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

 **WARNING****Transient overvoltages**

Take measures to prevent transient overvoltages of more than 40% of the rated voltage (or more than 119 V). This is the case if you only operate devices with SELV (safety extra-low voltage).

6.2 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	0.25 - 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

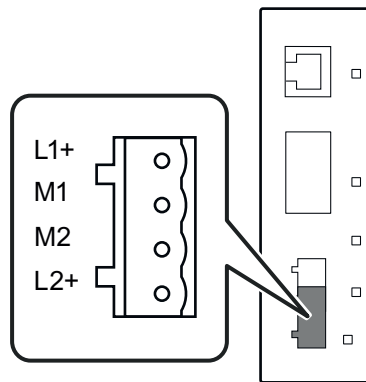
Use crimp shapes with smooth surfaces, such as provided by square and trapeze shaped crimp cross sections.

Crimp shapes with wave-shaped profile are unsuitable.

6.3 Power supply

The power supply is connected using a 4-terminal plug-in 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 SCALANCE X-100 media converter alone. The power supply is connected over a high resistance with the enclosure to allow an ungrounded setup.

The following figure shows the position of the power supply of the SCALANCE X-100 media converters and the assignment of the terminal block.



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

⚠ WARNING

Incorrect power supply

The power supply unit to supply the device must comply with NEC Class 2 (voltage range 18 - 32 V, current requirement 350 mA).

Do not operate the device with an AC voltage.

Never operate the device with DC voltages higher than 32 VDC.

6.4 Signaling contact

The signaling contact is connected to a 2-pin plug-in terminal block. The signaling contact (optical relay contact) is a floating switch with which error/fault states can be signaled by breaking the contact.

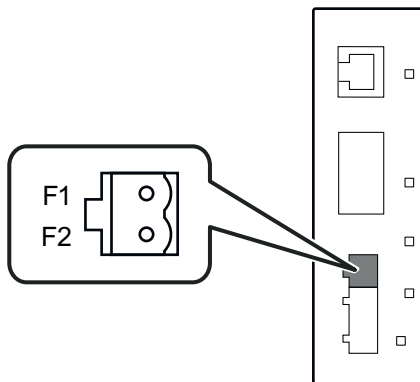
NOTICE

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!

The following figure shows the position of the signaling contacts of the SCALANCE X-100 media converters and the assignment of the terminal block.



Pin number	Assignment
Pin 1	F1
Pin 2	F2

The following errors/faults can be signaled by the signaling contact:

- The failure of a link on one of the two monitored ports.
- The failure of one of the two redundant power supplies.

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 applied as the new desired status using the SET button.

When the device is turned off, the signaling contact is always activated (open).

6.5 Grounding

Installation on a DIN rail

The device is grounded over the DIN rail.

S7 standard rail

The device is grounded over its rear panel and the neck of the screw.

Wall mounting

The device is grounded by the securing screw in the unpainted hole.

Note that the device must be grounded over a securing screw with as low a low resistance as possible.

If the device is mounted on a non-conductive base, a grounding cable must be fitted. The grounding cable is not supplied with the device. Connect the paint-free surface of the device to the nearest grounding point using the grounding cable.

6.6 IE FC RJ-45 Plug 180

The rugged node connectors are designed for industry with PROFINET-compliant connectors and provide additional strain and bending relief with a locking mechanism on the casing.

Fitting the IE FC RJ45 Plug 180 to the IE FC Standard Cable

You will find the notes on installation in the instructions that ship with the IE FC RJ45 Plug 180.

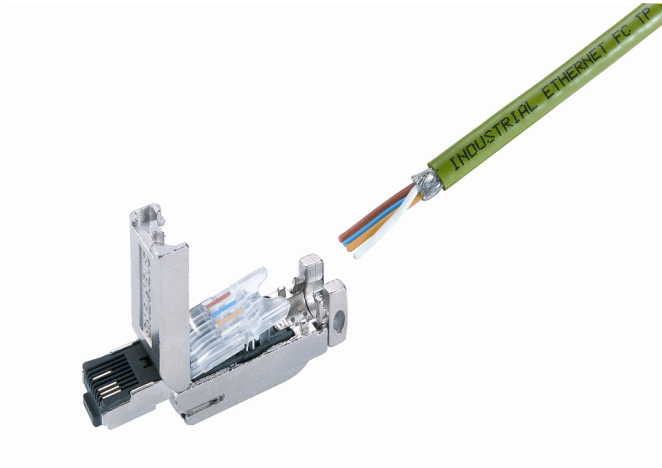


Figure 6-1 IE FC 45 Plug 180

Plugging in the IE FC RJ45 Plug 180

Plug the IE FC RJ45 Plug 180 into the twisted-pair port of the device until it locks in place.




Figure 6-2 Plugging in the IE FC RJ45 Plug 180


With its tight fit and locking mechanism with the PROFINET-compliant male connector IE FC RJ45 Plug 180, the securing collar on the TP port of the device ensures a rugged node attachment that provides strain and bending relief for the RJ-45 jack.

Pulling the IE FC RJ45 Plug 180


Press on the locking lever of the IE FC RJ45 Plug 180 gently to remove the plug.

If there is not enough space to release the lock with your hand, you can also use a 2.5 mm screwdriver. You can then remove the IE FC RJ45 Plug 180 from the RJ-45 jack.

 WARNING
Unauthorized repair of devices in explosion-proof design
Risk of explosion in hazardous areas
<ul style="list-style-type: none">• Repair work may only be performed by personnel authorized by Siemens.

 WARNING
Impermissible accessories and spare parts
Risk of explosion in hazardous areas
<ul style="list-style-type: none">• Only use original accessories (Page 18) and original spare parts.• Observe all relevant installation and safety instructions described in the manuals for the device or supplied with the accessories or spare parts.



 CAUTION
Hot surfaces
Risk of burns during maintenance work on parts with a surface temperature above 70 °C (158 °F).
<ul style="list-style-type: none">• Take appropriate protective measures, for example, wear protective gloves.• Once maintenance work is complete, restore the touch protection measures.

NOTICE
Cleaning the housing
If the device is not in a hazardous area, only clean the outer parts of the housing with a dry cloth.
If the device is in a hazardous area, use a slightly damp cloth for cleaning.
Do not use solvents.

Fuses

The media converters of the SCALANCE®X-100 product line have a resettable fuse / PTC. If the fuse triggers (all LEDs are off despite correctly applied power supply), the device should be disconnected from the power supply for approximately 30 minutes before turning it on again.

Device defective

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

Technical specifications

8.1 SCALANCE X101-1

Table 8-1 Technical specifications of the SCALANCE X101-1

Technical specifications		
Order number		
SCALANCE X101-1	6GK5101-1BB00-2AA3	
Attachment to Industrial Ethernet		
Quantity	1	
Design	RJ-45 jack with MDI-X pinning	
Properties	Full duplex	
Transmission speed	100 Mbps	
Optical connectors		
Quantity	1	
Design	BFOC socket	
Properties	Full duplex to 100 Base-FX	
Transmission speed	100 Mbps	
Permitted cable lengths (Industrial Ethernet)	Alternative combinations per length range	
0 ... 85 m	<ul style="list-style-type: none"> Max. 85 m IE FC TP Marine/Trailing Cable with IE FC RJ45 Plug 180 Max. 75 m IE FC TP Marine/Trailing Cable + 10 m TP Cord via IE FC RJ45 Outlet 	
0 to 100 m	<ul style="list-style-type: none"> Max. 100 m IE FC TP Standard Cable with IE FC RJ45 Plug 180 Max. 90 m IE FC TP Standard Cable + 10 m TP Cord via IE FC RJ45 Outlet 	
Optical parameters		
Cable type	Multimode glass FO cable, cable cross sections 62.5/125 µm and 50/125 µm	
Permitted cable length (glass FO cable)	Cable cross-section	Permitted cable length
	<ul style="list-style-type: none"> 62.5/125 µm 50/125 µm 	<ul style="list-style-type: none"> 0 to 4000 m 0 to 5000 m
Attenuation	≤ 1 dB/km at 1300 nm 1200 MHz x km at 1300 nm 6 dB max. permitted FO cable attenuation with 3 dB link power margin	
Bending radius	once without tensile force	100 mm
	several times with tensile force	150 mm
Electrical data		
Power supply	Voltage range	18 to 32 VDC Safe Extra Low Voltage (SELV)
	Rated voltage	24 VDC
	Design	4-terminal plug-in block
Signaling contact	Design	2-terminal plug-in block

Technical specifications

8.1 SCALANCE X101-1

Technical specifications		
Current consumption	Typical	120 mA
Minimum rated current of the power supply unit		170 mA
Power loss at 24 VDC	Typical	3 W
Overvoltage protection at input		PTC resettable fuse (0.5 A / 60 V)
Permitted ambient conditions		
Ambient temperature	During operation	-10 °C to +60 °C
	During storage	-40 °C to +80 °C
	During transportation	-40 °C to +80 °C
Relative humidity	During operation	≤ 95 % no condensation
Operating altitude	During operation	≤ 2,000 m above sea level at max. 56 °C ambient temperature
		≤ 3,000 m above sea level at max. 50 °C ambient temperature
Design, dimensions and weight		
Immunity	EN 61000-6-2	
Emission	EN 61000-6-3	
Degree of protection	IP30	
MTBF (EN/IEC 61709, 40 °C)	152 years	
Housing material	Basic housing	Die cast aluminum, powder coated
	Front cover	Polyphenylene ether + polystyrene (PPE+PS plastic)
Weight	550 g	
Dimensions (W x H x D)	40 x 125 x 124 mm	
Installation options	<ul style="list-style-type: none">• Mounting on a DIN rail• Mounting on an S7-300 standard rail• Wall mounting	
Switching properties		
Response to LLDP frames	Blocking	
Response to spanning tree BPDU frames	Forwarding	

Note

The number of SCALANCE X Industrial Ethernet devices connected in a line influences the frame delay time.

When a frame runs through the SCALANCE X-100 media converter, this is delayed typically by approximately 8 μs by the cut through function of the internal switch.

At 100% bus load, these times can be higher depending on the system (maximum 140 μs).

Note

Temperature code for c-UL-us for hazardous locations, FM and ATEX Zone 2

You will find the temperature code "T.." or the maximum ambient temperature "Ta: .." on the type plate.

8.2 SCALANCE X101-1LD

Table 8-2 Technical specifications of the SCALANCE X101-1LD

Technical specifications		
Order number		
SCALANCE X101-1LD	6GK5101-1BC00-2AA3	
Attachment to Industrial Ethernet		
Quantity	1	
Design	RJ-45 jack with MDI-X pinning	
Properties	Full duplex	
Transmission speed	100 Mbps	
Optical connectors		
Quantity	1	
Design	BFOC socket	
Properties	Full duplex to 100 Base-LX	
Transmission speed	100 Mbps	
Permitted cable lengths (Industrial Ethernet)	Alternative combinations per length range	
0 ... 85 m	<ul style="list-style-type: none"> Max. 85 m IE FC TP Marine/Trailing Cable with IE FC RJ45 Plug 180 Max. 75 m IE FC TP Marine/Trailing Cable + 10 m TP Cord via IE FC RJ45 Outlet 	
0 to 100 m	<ul style="list-style-type: none"> Max. 100 m IE FC TP Standard Cable with IE FC RJ45 Plug 180 Max. 90 m IE FC TP Standard Cable + 10 m TP Cord via IE FC RJ45 Outlet 	
Optical parameters		
Cable type	Single mode glass FO cable	
Cable cross-section	10/125 μm	
Permitted cable length	0 to 26,000 m	
Attenuation	≤ 0.5 dB/km at 1310 nm 13 dB max. permitted FO cable attenuation with 2 dB link power margin	
Bending radius	once without tensile force	100 mm
	several times with tensile force	150 mm
Electrical data		
Power supply	Voltage range	18 to 32 VDC Safe Extra Low Voltage (SELV)
	Rated voltage	24 VDC
	Design	4-terminal plug-in block
Signaling contact	Design	2-terminal plug-in block

8.2 SCALANCE X101-1LD

Technical specifications		
Current consumption	Typical	120 mA
Minimum rated current of the power supply unit		200 mA
Power loss at 24 VDC	Typical	3 W
Overvoltage protection at input		PTC resettable fuse (0.5 A / 60 V)
Permitted ambient conditions		
Ambient temperature	During operation	-10 °C to +60 °C
	During storage	-40 °C to +80 °C
	During transportation	-40 °C to +80 °C
Relative humidity	During operation	≤ 95 % no condensation
Operating altitude	During operation	≤ 2,000 m above sea level at max. 56 °C ambient temperature
		≤ 3,000 m above sea level at max. 50 °C ambient temperature
Design, dimensions and weight		
Immunity	EN 61000-6-2 Class A	
Emission	EN 61000-6-3	
Degree of protection	IP30	
MTBF (EN/IEC 61709, 40 °C)	134 years	
Housing material	Basic housing	Die cast aluminum, powder coated
	Front cover	Polyphenylene ether + polystyrene (PPE+PS plastic)
Weight	550 g	
Dimensions (W x H x D)	40 x 125 x 124 mm	
Installation options	<ul style="list-style-type: none"> • Mounting on a DIN rail • Mounting on an S7-300 standard rail • Wall mounting 	
Switching properties		
Response to LLDP frames	Blocking	
Response to spanning tree BPDU frames	Forwarding	

Note

The number of SCALANCE X Industrial Ethernet devices connected in a line influences the frame delay time.

When a frame runs through the SCALANCE X-100 media converter, this is delayed typically by approximately 8 μs by the cut through function of the internal switch.

At 100% bus load, these times can be higher depending on the system (maximum 140 μs).

Note

Temperature code for c-UL-us for hazardous locations, FM and ATEX Zone 2

You will find the temperature code "T.." or the maximum ambient temperature "Ta: .." on the type plate.

Dimension drawings

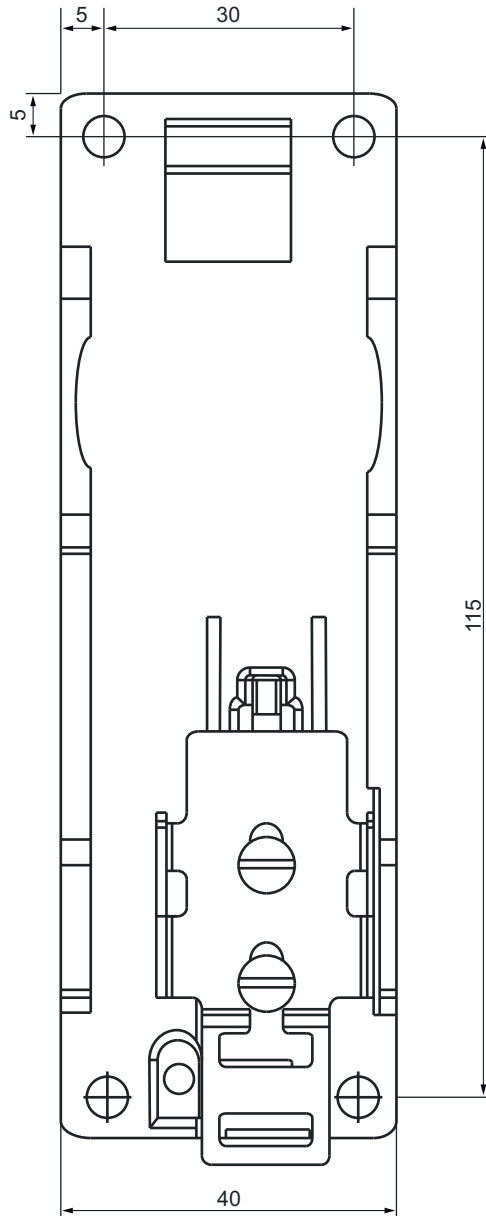


Figure 9-1 Dimension drawing, rear view

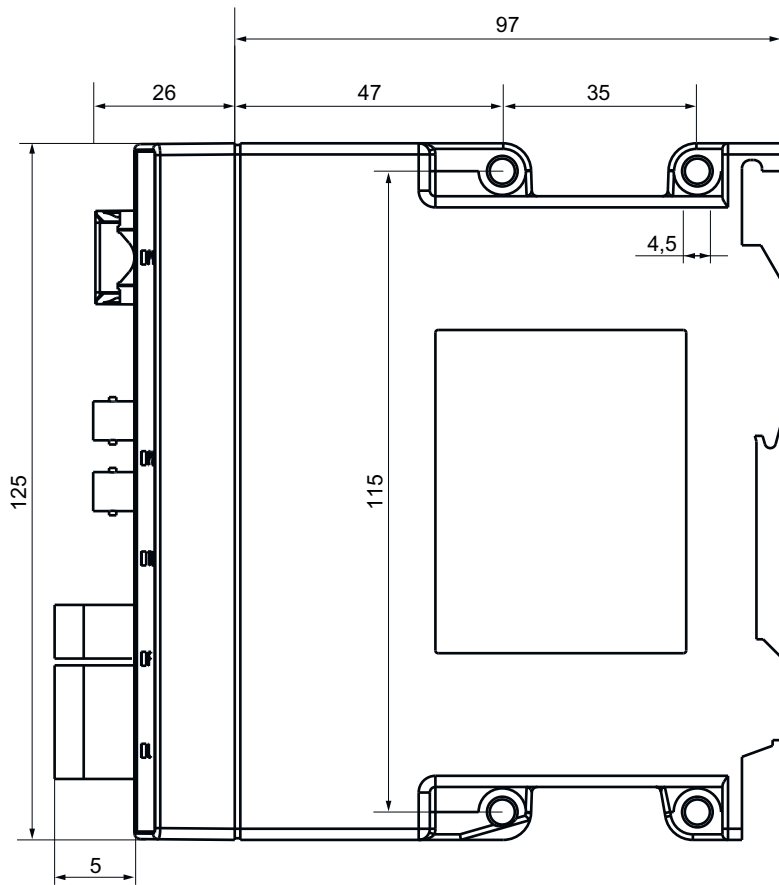


Figure 9-2 Dimension drawing, side view

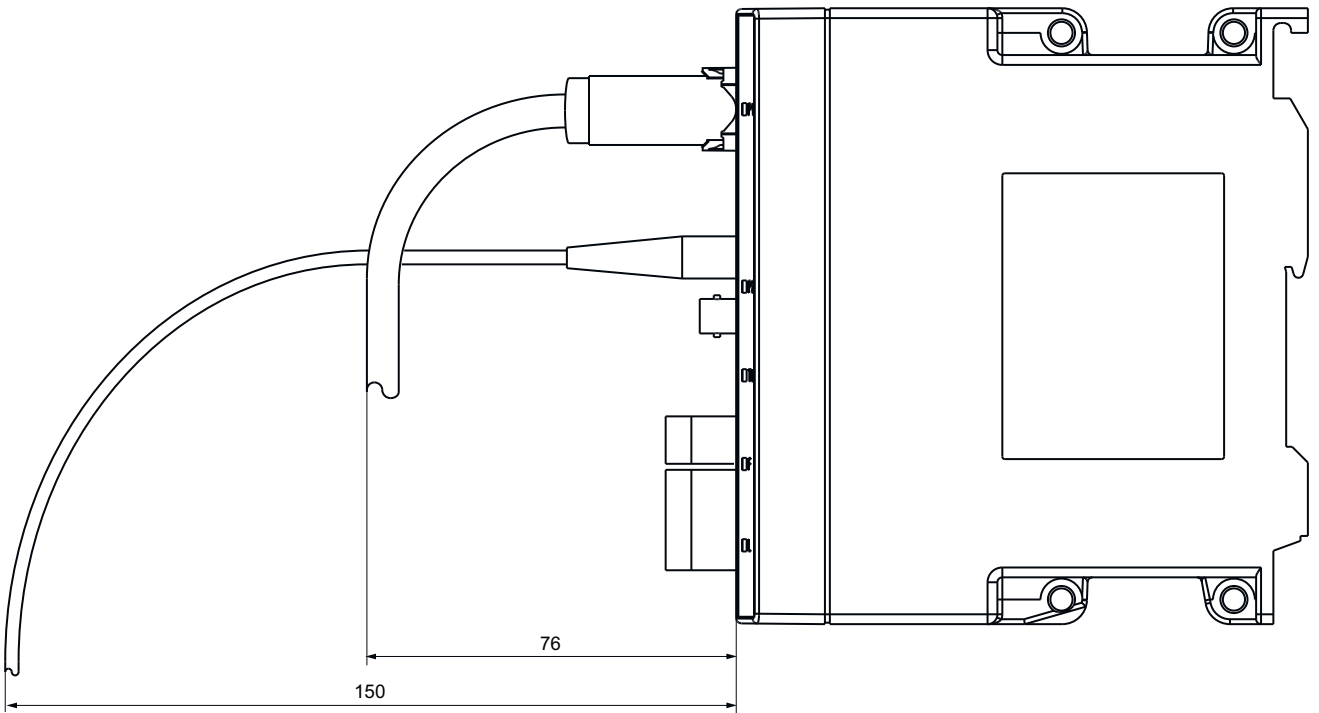


Figure 9-3 Dimension drawing, bending radii

Approvals

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>).

Notes for the manufacturers of machines

This product is not a machine in the sense of the EC Machinery Directive or the Supply of Machinery (Safety) Regulations (UK).

There is therefore no declaration of conformity relating to the EC Machinery Directive 2006/42/EEC or the Supply of Machinery (Safety) Regulations 2008 (UK) for this product.

If the product is part of the equipment of a machine, it must be included in the procedure for obtaining the EU/UK conformity assessment by the manufacturer of the machine.

Machinery directive

The product is a component in compliance with the EC Machinery Directive 2006/42/EEC and the Supply of Machinery (Safety) Regulations 2008 (UK).

According to the Machinery Directive respectively the Supply of Machinery (Safety) Regulations (UK), 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 Machinery Directive 2006/42/EEC and the Supply of Machinery (Safety) Regulations 2008 (UK).

See also

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

EC declaration of conformity



The SIMATIC NET products described in these operating instructions meet the requirements and safety objectives of the following EC directives and comply with the harmonized European standards (EN) which are published in the official documentation of the European Union and here.

- **2014/34/EU (ATEX explosion protection directive)**
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, official journal of the EU L96, 29/03/2014, pages. 309-356
- **2014/30/EU (EMC)**
EMC directive of the European Parliament and of the Council of February 26, 2014 on the approximation of the laws of the member states relating to electromagnetic compatibility; official journal of the EU L96, 29/03/2014, pages. 79-106
- **2011/65/EU (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, official journal of the EC L174, 01/07/2011, pages 88-110

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

Siemens Aktiengesellschaft
Digital Industries
DE-76181 Karlsruhe
Germany

UK Declaration of Conformity



The UK declaration of conformity is available to all responsible authorities at:

Siemens Aktiengesellschaft
Digital Industries
Process Automation
DE-76181 Karlsruhe
Germany

Importer UK:


Siemens plc,
Manchester M20 2UR

You can find the current UK Declaration of Conformity for these products on the Internet pages under Siemens Industry Online Support (<https://support.industry.siemens.com/cs/ww/en/ps/15273/cert>).

The SIMATIC NET products described in this document meet the requirements of the following directives:

- UK-Regulation
SI 2016/1107 Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016, and related amendments
- EMC Regulation
SI 2016/1091 Electromagnetic Compatibility Regulations 2016, and related amendments
- RoHS Regulation
SI 2012/3032 Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012, and related amendments

ATEX, IECEx, UKEX and CCC Ex certification

 WARNING
Risk of explosion in hazardous areas
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 subassemblies/modules in a Zone 2 Hazardous Area". You will find this document
<ul style="list-style-type: none"> • on the data medium that ships with some devices. • on the Internet pages under Siemens Industry Online Support (https://support.industry.siemens.com/cs/ww/en/view/78381013).
Enter the document identification number "C234" as the search term.

The markings of the electrical devices are:



II 3 G Ex ec IIC T4 Gc
 DEKRA 18ATEX0025 X
 DEKRA 21UKEX0001 X
 IECEx DEK 18.0017X
 Importer UK:
 Siemens plc,
 Manchester
 M20 2UR
 (Ex ec IIC T4 Gc, not on the nameplate)

The products meet the requirements of the following standards:

- EN/IEC 60079-7, GB 3836.3
- EN IEC/IEC 60079-0, GB 3836.1

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

Note for devices with CLASS 1 LASER

Important note on products certified according to Type Examination Certificate KEMA 07ATEX0145 X as of Issue 95 / DEKRA 18ATEX0025 X and IECEx Certificate of Conformity DEK 14.0025X as of Issue 43 / DEK 18.0017X and containing Class 1 optical radiation sources.

Note

CLASS 1 LASER

The device contains optical radiation sources which comply with the limits of Class 1 according to IEC 60825-1. Fiber-optic cables connected to these optical radiation sources may therefore be routed either to or through hazardous areas requiring Category 2G, 3G, 2D or 3D equipment.

EMC (electromagnetic compatibility)

The SIMATIC NET products described in these operating instructions meet the electromagnetic compatibility requirements according to the EU Directive 2014/30/EU as well as the UK-Regulation SI 2016/1091 and their associated amendments.

Applied standards:

- EN 61000-6-2 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
- EN 61000-6-4 Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments

You will find the current versions of the standards in the currently valid EC/UK Declaration of Conformity.

RoHS

The SIMATIC NET products described in these operating instructions meet the requirements on the restriction of the use of certain hazardous substances in electrical and electronic equipment according to the EU Directive 2011/65/EU as well as the UK-Regulation SI 2012/3032 and their associated amendments.

Applied standard:

- EN IEC 63000

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 for Hazardous Locations

ANSI/ISA 12.12.01-2007, CSA C22.2 No. 213-M1987
 CL. 1, Div. 2 GP. A.B.C.D T..
 CL. 1, Zone 2, GP, IIC, T..
 (T.. = For detailed information on the temperature class, refer to the type plate)

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 for Australia - RCM

The product meets the requirements of the RCM standard.

Applied standards:

- AS/NZS CISPR11 (Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement).
- EN 61000-6-4 Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments

You will find the current versions of the standards in the currently valid RCM SDoCs (Self-Declaration of Conformity).

MSIP 요구사항 - For Korea only

A급 기기(업무용 방송통신기자재)

이 기기는 업무용(A급) 전자파 적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라
 며, 가정 외의 지역에서 사용하는 것을 목적으로 합니다.

Marking for the customs union



EAC (Eurasian Conformity)

Eurasian Economic Union of Russia, Belarus, Armenia, Kazakhstan and Kyrgyzstan

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

FDA and IEC marking

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

Device	CLASS 1 LASER Product
SCALANCE XC101-1	●
SCALANCE X101-1LD	●



Figure 10-1 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.

Mechanical stability (in operation)

Device	DIN EN 60068-2-6 oscillation	DIN EN 60068-2-29 permanent shock
		10 - 58 Hz: 0.075 mm 58 - 500 Hz: 10 m/s ² 10 cycles
X101-1	●	●
X101-1LD	●	●

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 (<https://support.industry.siemens.com/cs/ww/en/view/27069465>)
- "Industrial Ethernet / PROFINET - Passive Network Components" System Manual (<https://support.industry.siemens.com/cs/ww/en/view/84922825>)
- "EMC Installation Guidelines" configuration manual (<https://support.industry.siemens.com/cs/ww/en/view/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.

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