SIEMENS

SIMATIC NET

Industrial Ethernet Switches SCALANCE XB-200

Operating Instructions

03/2020
C79000-G8976-C359-09

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.

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Introduction

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Purpose of the Operating Instructions

These operating instructions support you when installing and connecting up devices of the SCALANCE XB-200 product group.

The configuration and the integration of the devices in a network are not described in these operating instructions.

Validity of the Operating Instructions

These operating instructions apply to the following devices:

- SCALANCE XB208
- SCALANCE XB205-3 (SC)
- SCALANCE XB205-3LD (SC)
- SCALANCE XB205-3
- SCALANCE XB216
- SCALANCE XB213-3 (SC)
- SCALANCE XB213-3LD (SC)
- SCALANCE XB213-3

Unless mentioned otherwise, the descriptions in these operating instructions refer to all devices of the SCALANCE XB-200 product group named above in the section on validity.

There are two variants of each device, refer to the section "Product overview (Page 17)".

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-200 is used.	SCALANCE X-200
Product group	If information applies to all devices and variants of a product group, the term SCALANCE XB-200 is used.	SCALANCE XB-200
Device	If information relates to a specific device, the device name is used.	e.g. SCALANCE XB205-3

Documentation on configuration

You will find detailed information on configuring the devices in the following configuration manuals:

- SCALANCE XB-200/XC-200/XF-200BA/XP-200/XR-300WG Web Based Management
- SCALANCE XB-200/XC-200/XF-200BA/XP-200/XR-300WG Command Line Interface

You will find the configuration 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/15291/man).

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)

Security information

Siemens provides products and solutions with industrial security 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 security 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 security measures that may be implemented, please visit
http://www.siemens.com/industrialsecurity (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 customers' exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under
http://www.siemens.com/industrialsecurity (https://www.siemens.com/industrialsecurity)

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://eb.automation.siemens.com/goos/WelcomePage.aspx?regionUrl=/en&language=en)

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

Device defective

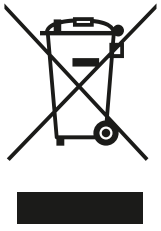
If a fault develops, send the device to your SIEMENS representative for repair. Repairs on-site are not possible.

Decommissioning

Shut down the device properly to prevent unauthorized persons from accessing confidential data in the device memory.

To do this, restore the factory settings on the device.

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:

SIMATIC NET, SCALANCE, C-PLUG, OLM

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".

⚠ CAUTION
To prevent injury, read the manual before use.

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.

Recommendations on network security

3

NOTICE
Information security Connect to the device and change the standard password for the user set in the factory "admin" and "" before you operate the device.

To prevent unauthorized access, note the following security recommendations.

General

- You should make regular checks to make sure that the device meets these recommendations and/or other security guidelines.
- Evaluate your plant as a whole in terms of security. Use a cell protection concept with suitable products (https://www.industry.siemens.com/topics/global/en/industrial-security/pages/default.aspx).
- When the internal and external network are disconnected, an attacker cannot access internal data from the outside. Therefore operate the device only within a protected network area.
- For communication via non-secure networks use additional devices with VPN functionality to encrypt and authenticate the communication.
- Terminate management connections correctly (WBM. Telnet, SSH etc.).

Physical access

- Restrict physical access to the device to qualified personnel.
- Lock unused physical ports on the device. Unused ports can be used to gain forbidden access to the plant.

Software (security functions)

- Keep the firmware up to date. Check regularly for security updates for the device. You can find information on this at the Industrial Security (https://www.siemens.com/industrialsecurity) website.
- Inform yourself regularly about security recommendations published by Siemens ProductCERT (https://www.siemens.com/cert/en/cert-security-advisories.htm).
- Only activate protocols that you require to use the device.
- Restrict access to the management of the device with rules in an access control list (ACL).

- The option of VLAN structuring provides protection against DoS attacks and unauthorized access. Check whether this is practical or useful in your environment.
- Use a central logging server to log changes and accesses. Operate your logging server within the protected network area and check the logging information regularly.

Passwords

- Define rules for the assignment of passwords.
- Regularly change your passwords to increase security.
- Use passwords with a high password strength.
- Make sure that all passwords are protected and inaccessible to unauthorized persons.
- Do not use the same password for different users and systems.

Certificates and keys

- On the device there is a preset SSL certificate with key. Replace this certificate with a self-made certificate with key. We recommend that you use a certificate signed either by a reliable external or by an internal certification authority.
- Use a certification authority including key revocation and management to sign certificates.
- Make sure that user-defined private keys are protected and inaccessible to unauthorized persons.
- It is recommended that you use password-protected certificates in the PKCS #12 format
- Verify certificates and fingerprints on the server and client to prevent "man in the middle" attacks.
- It is recommended that you use certificates with a key length of at least 2048 bits.
- Change certificates and keys immediately, if there is a suspicion of compromise.

Secure/non-secure protocols and services

- Avoid or disable non-secure protocols and services, for example HTTP, Telnet and TFTP. For historical reasons, these protocols are available, however not intended for secure applications. Use non-secure protocols on the device with caution.
- Check whether use of the following protocols and services is necessary:
  - Non authenticated and unencrypted ports
  - MRP, HRP
  - IGMP snooping
  - LLDP
  - Syslog
  - RADIUS
  - DHCP Options 66/67
  - TFTP
  - GMRP and GVRP
- The following protocols provide secure alternatives:
  - HTTP → HTTPS
  - Telnet → SSH
  - SNMPv1/v2c → SNMPv3
    Check whether use of SNMPv1/v2c. is necessary. SNMPv1/v2c is classified as non-secure. Use the option of preventing write access. The device provides you with suitable setting options.
    If SNMP is enabled, change the community names. If no unrestricted access is necessary, restrict access with SNMP.
    Use the authentication and encryption mechanisms of SNMPv3.
- Use secure protocols when access to the device is not prevented by physical protection measures.
- If you require non-secure protocols and services, operate the device only within a protected network area.
- Restrict the services and protocols available to the outside to a minimum.
- For the DCP function, enable the "Read Only" mode after commissioning.
- If you use RADIUS for management access to the device, activate secure protocols and services.

Interfaces security

- Disable unused interfaces.
- Use IEEE 802.1X for interface authentication.
- Use the function "Locked Ports" to block interfaces for unknown nodes.

- Use the configuration options of the interfaces, e.g. the "Edge Type".
- Configure the receive ports so that they discard all untagged frames ("Tagged Frames Only").

Available protocols

The following list provides you with an overview of the open protocol ports.

The table includes the following columns:

- **Protocol**
- **Port**
- **Default port status**
  - Open
    The factory setting of the port is "Open".
  - Closed
    The factory setting of the port is "Closed".
- **Configurable port**
  - ✓
    The port status can be changed.
  - --
    The port status cannot be changed.
- **Authentication**
  Specifies whether the communication partner is authenticated.
- **Encryption**
  Specifies whether or not the transfer is encrypted.

List of available protocols (local access via a local network)

The following is a list of all available protocols and their ports through which the device can be accessed.

Protocol	Protocol/ Port number	Default port status	Configurable port	Authentication	Encryption
TELNET	TCP/23	Open	✓	Yes	No
SSH	TCP/22	Open	✓	Yes	Yes
HTTP	TCP/80	Open	✓	Yes	No
HTTPS	TCP/443	Open	✓	Yes	Yes
SNMP	UDP/161	Open	✓	Yes	Yes (when configured)
PROFINET	UDP/34964 UDP/49154 - 49157 [1)]	Open		No	No

Protocol	Protocol/ Port number	Default port status	Configurable port	Authentication	Encryption
EtherNet/IP	TCP/44818 UDP/2222 UDP/44818	Closed (Open with EtherNetIP variants)	✓	No	No
DHCP	UDP/67 UDP/68	Closed	✓	No	No

[1] Port number can be configured via the WBM.

Description of the device

4

4.1 Product overview

Article numbers

There are two variants of each device with different article numbers. The two variants differ only in their factory settings. All other properties are identical.

Device	Description	Article number (Ethernet/IP)	Article number (PROFINET)
SCALANCE XB208	8 x 10/100 Mbps RJ-45 ports	6GK5 208-0BA00-2TB2	6GK5 208-0BA00-2AB2
SCALANCE XB205-3 (SC)	5 x 10/100 Mbps RJ-45 ports, 3 x 10/100 Mbps SC ports, multimode fiber-optic cable	6GK5 205-3BD00-2TB2	6GK5 205-3BD00-2AB2
SCALANCE XB205-3LD (SC)	5 x 10/100 Mbps RJ-45 ports, 3 x 10/100 Mbps SC ports, single mode fiber-optic cable	6GK5 205-3BF00-2TB2	6GK5 205-3BF00-2AB2
SCALANCE XB205-3	5 x 10/100 Mbps RJ-45 ports, 3 x 10/100 Mbps ST ports, multimode fiber-optic cable	6GK5 205-3BB00-2TB2	6GK5 205-3BB00-2AB2
SCALANCE XB216	16 x 10/100 Mbps RJ-45 ports	6GK5 216-0BA00-2TB2	6GK5 216-0BA00-2AB2
SCALANCE XB213-3 (SC)	13 x 10/100 Mbps RJ-45 ports, 3 x 10/100 Mbps SC ports, multimode fiber-optic cable	6GK5 213-3BD00-2TB2	6GK5 213-3BD00-2AB2
SCALANCE XB213-3LD (SC)	13 x 10/100 Mbps RJ-45 ports, 3 x 10/100 Mbps SC ports, single mode fiber-optic cable	6GK5 213-3BF00-2TB2	6GK5 213-3BF00-2AB2
SCALANCE XB213-3	13 x 10/100 Mbps RJ-45 ports, 3 x 10/100 Mbps ST ports, multimode fiber-optic cable	6GK5 213-3BB00-2TB2	6GK5 213-3BB00-2AB2

Factory settings

EtherNet/IP variants

- Industrial Ethernet protocol: EtherNet/IP
- Base bridge mode: 802.1Q VLAN Bridge
- Redundancy mechanism: RSTP
- Trust mode: Trust CoS-DSCP
- IGMP Snooping/IGMP Querier: On
- IPv4 Address Collision Detection: Attempt to defend

PROFINET variants

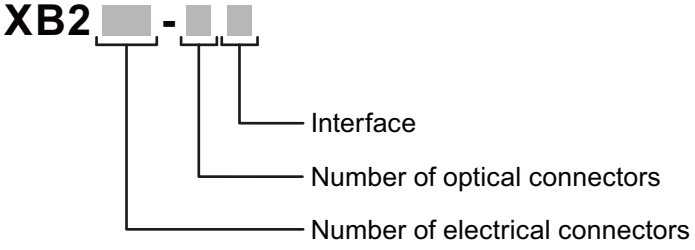
- Industrial Ethernet protocol: PROFINET
- Base bridge mode: 802.1D transparent bridge
- Redundancy mechanism: Ring redundancy

Device	Factory setting ring ports
SCALANCE XB208 and XB216	P0.1 and P0.2
SCALANCE XB205-3, XB205-3 (SC) and XB205-3LD (SC)	P0.7 and P0.8
SCALANCE XB213-3, XB213-3 (SC) and XB213-3LD (SC)	P0.15 and P0.16

- Trust mode: Trust CoS
- IGMP Snooping/IGMP Querier: Off
- IPv4 Address Collision Detection: Never give up

Type designation

The type designation of a SCALANCE XB-200 is made up of several parts that have the following meaning:



Interfaces of devices with optical connectors:

Interface	Property
(SC)	10/100 Mbps SC port, multimode fiber-optic cable, up to 5 km
LD (SC)	10/100 Mbps SC port, single mode fiber-optic cable, up to 26 km
[-]	10/100 Mbps ST port, multimode fiber-optic cable, up to 5 km

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.

Components of the product

The following components are supplied with a SCALANCE XB-200:

- One device
- Two 3-terminal blocks for the power supply
- One product DVD with documentation and software

Accessories

The following accessories are available for SCALANCE XB-200:

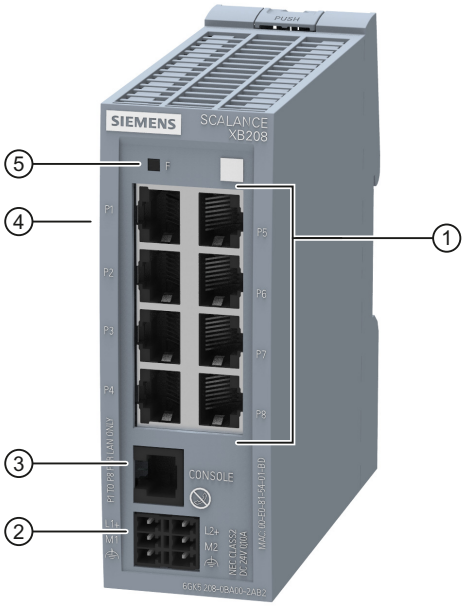
Cable

Component	Description	Article number
Connecting cable (RJ-11/ RS-232)	Preassembled, serial cable with RJ-11 and RS-232 plug, Length: 3 m pack of 1	6GK5 980-3BB00-0AA5

4.2 Device views

4.2.1 SCALANCE XB208

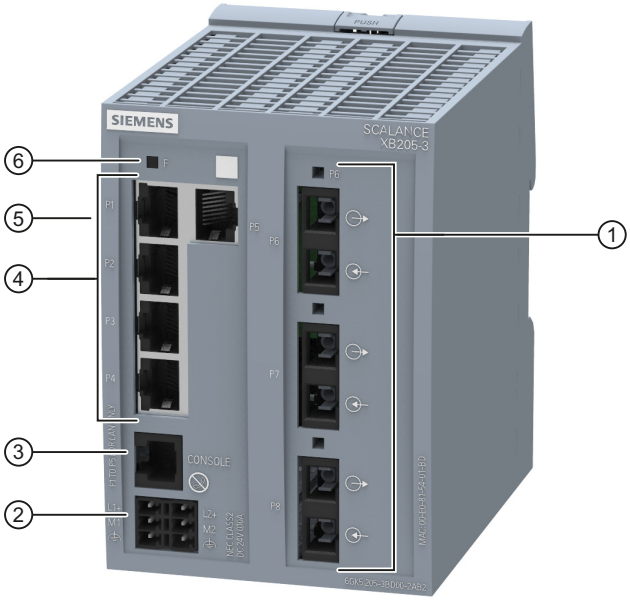
The following figure shows an overview of the components of the SCALANCE XB208.



① Electrical ports with port LEDs
② Power supply with connector for grounding
③ Serial interface
④ "RESET" button (rear)
⑤ Fault LED

4.2.2 SCALANCE XB205-3

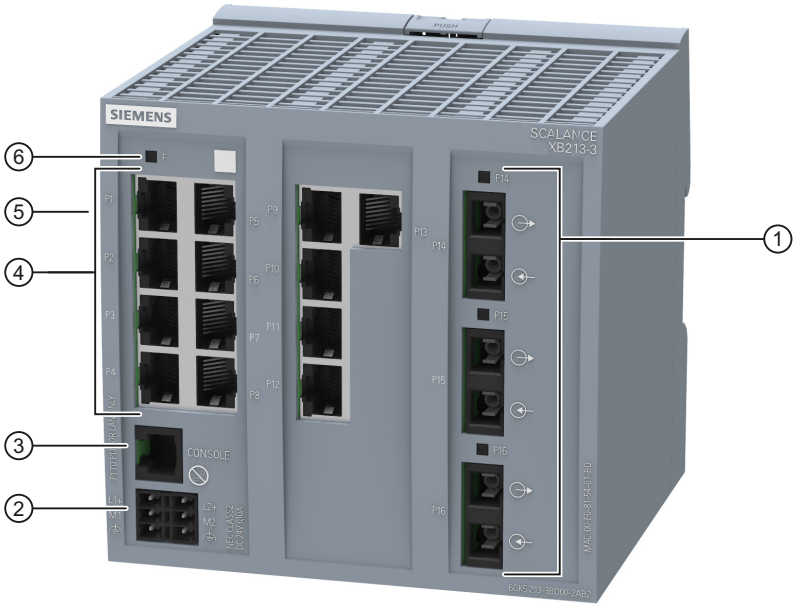
The following figure shows an overview of the components of the SCALANCE XB205-3.



① Optical ports with port LEDs
② Power supply with connector for grounding
③ Serial interface
④ Electrical ports with port LEDs
⑤ "RESET" button (rear)
⑥ Fault LED

4.2.3 SCALANCE XB213-3

The following figure shows an overview of the components of the SCALANCE XB213-3.



① Optical ports with port LEDs
② Power supply with connector for grounding
③ Serial interface
④ Electrical ports with port LEDs
⑤ "RESET" button (rear)
⑥ Fault LED

4.3 RESET button

Position

The "RESET" button is located on the rear of the SCALANCE XB-200.

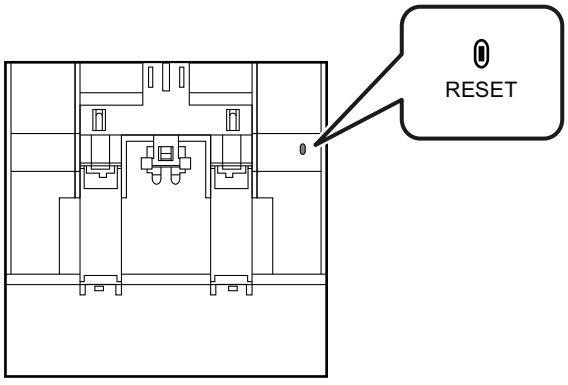


Figure 4-1 Position of the "RESET" button, for example on the SCALANCE XB213-3

Resetting the device to factory defaults

NOTICE
Previous settings If you reset, all the settings you have made will be overwritten by factory defaults.

NOTICE
Inadvertent reset An inadvertent reset can cause disturbances and failures in a configured network with further consequences.

Note

Damage to the button

The RESET button is a short-stroke button with only a slight pressure point. To operate the button, you only need a force 2.5 N (approx. 250 g).

To avoid damaging the button press it with little force. Hold the tool you are using, for example, with only two fingers.

Requirement

- The device is in operation.
- The function "Restore Factory Defaults" is enabled for the RESET button.

Note

Reset despite disabled "RESET" button

If you have disabled the "Restore Factory Defaults"function for the "RESET" button in the configuration, this does not apply during the startup phase, see section "Restoring the factory settings (Page 47)"

If the function has been disabled in the configuration, it is only disabled on completion of the startup phase.

Procedure

To reset the device to the factory defaults during operation, follow the steps below:

1. Press the "RESET" button with only slight force.
   A screwdriver for example with following size is suitable:
   - Blade thickness 0.8 - 1.8 mm
   - Blade width 4.0 - 4.8 mm
2. Hold down the button for approximately 12 seconds.
   After 9 seconds, the fault LED "F" flashes for 3 seconds.
   - If you release the button after approximately 12 seconds, the device is restarted and the factory settings are restored.
   - If you release the button before the 12 seconds have elapsed, the reset is canceled.

Enabling and disabling the button

In the configuration, you can enable or disable the button function.

4.4 LED display

Fault LED "F"

The fault LED "F" indicates the incorrect functioning of the device.

LED color	LED status	Meaning
-	Off	The device is a turned off.
Green	Lit	The device has not detected a problem.
Red	Lit	The device has detected a problem. The connected power supply is too low. Using the WBM and CLI, you can set when the device signals an error and which errors should be signaled.

Port LEDs "P"

The port LEDs indicate the status of the ports.

RJ-45 ports

Each RJ-45 port has 2 integrated LEDs.

The green LED shows the status of the link.

LED color	LED status	Meaning
Green	Lit	link exists
-	Off	No link exists

The yellow LED shows the status of data reception.

LED color	LED status	Meaning
Yellow	Flashing	Receiving data at port
-	Off	Not receiving data at port

SC/ST ports

There is an LED for each SC/ST port.

LED color	LED status	Meaning
Green	Lit	link exists
Orange	Lit	Receiving data at port
-	Off	No link exists

Installation

5

5.1 Safety notices for installation

Safety notices

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

WARNING

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

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 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

The equipment shall only be used in an area of not more than pollution degree 2, as defined in EN/IEC 60664-1.

⚠ WARNING

Requirements for the cabinet/enclosure

The equipment shall be installed in a suitable enclosure that provides a degree of protection not less than IP54 in accordance with EN/IEC 60079-15.

⚠ 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.

Devices with approval [op is Gb] for optical interfaces

Some devices have an additional ATEX approval according to II 3 (2) G Ex nA [op is Gb] IIC T4 Gc and an additional approval in compliance with IECEx according to Ex nA [op is Gb] IIC T4 Gc, see section "Approvals (Page 69)". This is indicated on the type plate. With these devices the FO bus connections may run through or in a Zone 1 hazardous area.

Additional notes

⚠ CAUTION

Use only approved components

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

NOTICE

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

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

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

Note

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

You will find information on the system manuals in the section "Introduction", under "Further documentation".

5.2 Mounting on DIN rails

Installation clearances

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

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

Installation

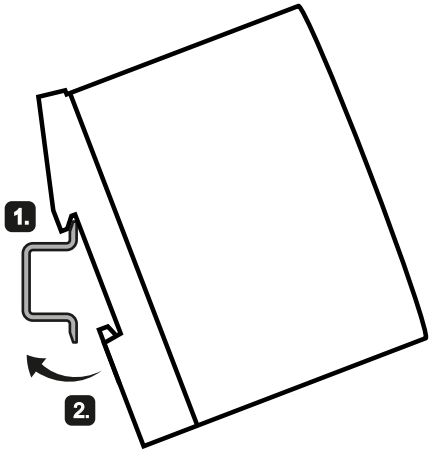


Figure 5-1 DIN rail mounting

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

1. Place the housing guide of the device on the top edge of the DIN rail ①.
2. Press the device down against the DIN rail until the spring catch locks in place ②.
3. Fit the connectors for the power supply, see the section "Power supply (Page 39)".
4. Insert the terminal blocks into the sockets on the device.

Removal

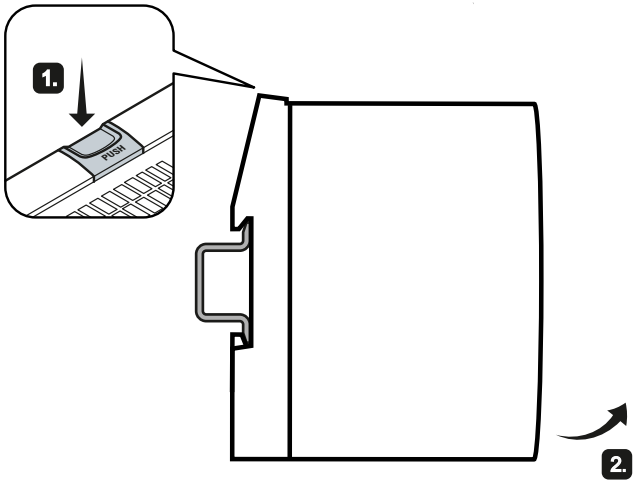


Figure 5-2 Removing from a DIN rail

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

1. Disconnect all connected cables.
2. Release the DIN rail locking mechanism by pressing down on the release button ①.
3. Pull the lower part of the device away from the DIN rail ②.

Connecting up

6

6.1 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, or 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.

Note

No light power measurement (PROFINET diagnostics)

The devices do not support diagnostics with light power measurement.

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

You may only connect or disconnect cables carrying electricity when the power supply is switched off or when the device is in an area without inflammable gas concentrations.

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

Provisions shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 119 V.

Further notes

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).

6.2 Industrial Ethernet

Ring ports

When shipped the ring ports are marked by a label. The labels are only clipped on and you can remove them if necessary.

6.2.1 Electrical

Note

Strain relief for the Ethernet cables

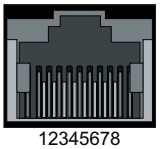
In order to avoid mechanical stress on the Ethernet cables and resulting interruption of the contact, fasten the cables at a short distance from the connector using a cable guide or busbar.

R-45 connector technology

The attachment to Industrial Ethernet uses RJ-45 connected technology with MDI-X assignment.

Pin assignment

The following table shows the pin assignment of the R-45 connectors.

Pin number	Assignment	R-45 connector
Pin 1	RD+	 12345678
Pin 2	RD-	
Pin 3	TD+	
Pin 4	n. c. (Not connected)	
Pin 5	n. c. (Not connected)	
Pin 6	TD-	
Pin 7	n. c. (Not connected)	
Pin 8	n. c. (Not connected)	

MDI / MDI-X autocrossover

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 wires. This makes installation much easier for the user.

Note

Formation of loops

Please note that the direct connection of two ports on the IE switch or accidental connection over several IE switches causes an illegal loop. Such a loop can lead to network overload and network failures.

Autonegotiation

Autonegotiation means the automatic detection/negotiation of the transmission rate and the operating mode of ports at the opposite end. This makes it possible to configure different devices automatically.

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

Note

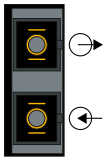
- If a port is set permanently to full duplex, the connected partner port must also be set to full duplex.
- If a port operating in the "Auto negotiation" mode is connected to a partner port that is not operating in the"Auto negotiation" mode, the partner port setting must be fixed at 100 Mbps or 10 Mbps half duplex mode.
- If you disable the "Auto negotiation" function, the "MDI/MDI-X autocrossover" function is also turned off. Then use a crossover cable.

6.2.2 Optical

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. Take the following precautions to avoid functional impairments: • 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.

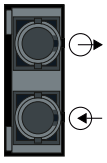
SC connectors

The attachment to Industrial Ethernet uses SC connector technology (Subscriber Connector).



ST/BFOC connectors

The attachment to Industrial Ethernet uses ST/BFOC connector technology (Straight Tip/Bayonet Fiber Optic Connector).



6.3 Wiring rules

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

Wiring rules for ...		Spring-loaded terminals
connectable cable cross sections for flexible cables ...	without wire end ferrule	0.2 - 1.5 mm^2
		AWG: 24 - 14
	with wire end ferrule with plastic ferrule**	0.25 - 0.75 mm^2
		AWG: 24 - 14
	with TWIN wire end ferrule without plastic ferrule**	0.25 - 1.5 mm^2
		AWG: 24 - 18
Stripped length of the cable		10 mm
Wire end ferrule according to DIN 46228 without plastic ferrule**		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.

6.4 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 SCALANCE CB-200 IE switches to electromagnetic interference is the "surge immunity test" according to EN61000-4-5. This test requires overvoltage protection for the power supply lines. A suitable device is, for example, the Dehn Blitzductor BVT AVD 24, article 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 XB-200 with suitable overvoltage protection.

Information on the power supply

- The power supply is connected using a 3-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

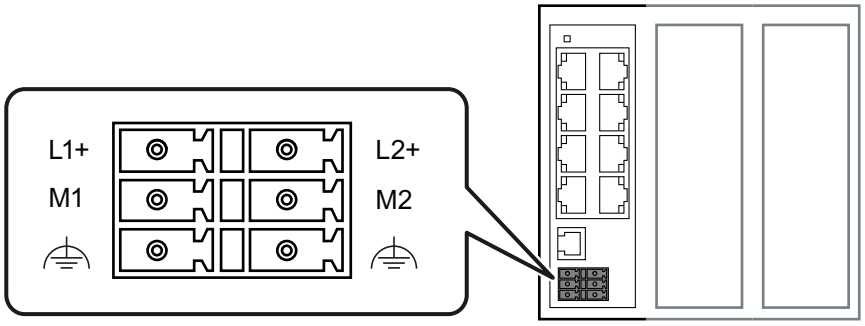


Figure 6-1 Position of the power supply, for example on the SCALANCE XB213-3

Contact	Assignment	Assignment	Contact
L1+	24 VDC	24 VDC	L2+
M1	Ground	Ground	M2
⏚	Functional ground	Functional ground	⏚

6.5 Serial interface

Information on the serial interface

- Via the serial interface (RJ-11 jack), you can access the CLI of the device directly via an RS-232 connection (115200 8N1) without assigning an IP address.
- Access to the device is also possible independent of the Ethernet ports.
- To connect the serial interface to the PC, you require a cable with an RJ-11 plug and 9-pin D-sub female connector. You can order the connecting cable for the serial interface as an accessory.

Position and assignment

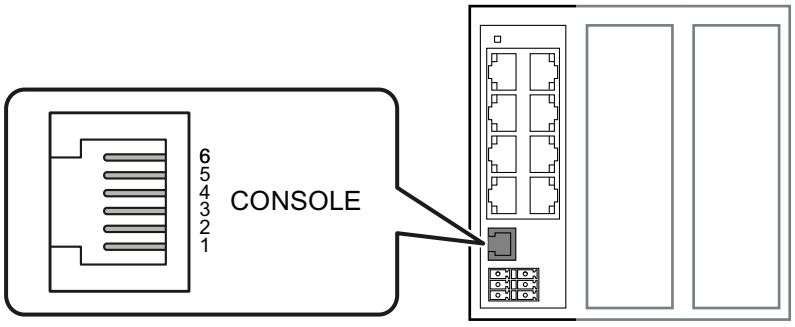


Figure 6-2 Position and pin assignment of the serial interface (RJ-11 jack), for example on the SCALANCE XB213-3

Assignment of the terminal block

The connecting cable listed in the "Accessories" section has the following pin assignment:

Contact	Pin assignment of the RJ-11 plug	Pin assignment of the D-sub female connector
1	-	-
2	-	TD (Transmit Data)
3	TD (Transmit Data)	RD (Receive Data)
4	SG (Signal Ground)	-
5	RD (Receive Data)	SG (Signal Ground)
6	-	-
7		-
8		-
9		-

Note

Pin assignment of the RJ-11 jack on the device

The RJ-11 jack on the device has a pinout to match the RJ-11 plug of the connecting cable mentioned above.

6.6 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 terminal for functional ground, refer to the section "Power supply (Page 39)". Keep to the specified cross-sectional area for the functional ground.

The terminal is identified by the following symbol for the functional ground  .

Follow the steps below to connect the functional ground:

1. Connect the terminal of the IE switch with as short a cable as possible ≤ 150 mm and with the required cross-sectional area to a grounded part of the system (DIN rail).
2. Connect the DIN rail with the ground of the system.

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.

Upkeep and maintenance 7

7.1 Downloading new firmware using TFTP without WBM and CLI

Firmware

The firmware is signed and encrypted. This ensures that only firmware created by Siemens can be downloaded to the device.

Pressing the "RESET" button

To load new firmware, you require the "RESET" button. When pressing the button, remember the information in the section "RESET button (Page 23)".

Procedure with Microsoft Windows

Using TFTP, you can supply a device with new firmware even when it cannot be reached using WBM or CLI. This section explains the procedure based on the example of Microsoft Windows.

Follow the steps below to load new firmware using TFTP:

1. Turn off the power to the device.
2. Press the button and reconnect the power supply to the device while holding down the button.
3. Hold down the button until the red fault LED "F" starts to flash.
4. Release the button as long as the red error LED is still flashing..

   Note

   This time only lasts a few seconds.

   The bootloader of the device waits in this status for a new firmware file that you can download by TFTP.
5. Connect a PC to port "P1" via an Ethernet cable.
6. Assign an IP address to the device using DHCP or the Primary Setup Tool.

7. Open a Windows command prompt and change to the directory where the file with the new firmware is located and then execute the following command :
   `tftp -i <IP address> put <firmware file>`

   Note

   You can enable TFTP in Microsoft Windows as follows:

   "Control Panel" > "Programs and Features" > "Turn Windows features on or off" > "TFTP Client".

8. Once the firmware has been transferred completely to the device and validated, there is an automatic restart on the device. This may take several minutes.

7.2 Restoring the factory settings

NOTICE
Previous settings
If you reset, all the settings you have made will be overwritten by factory defaults.

NOTICE
Inadvertent reset
An inadvertent reset can cause disturbances and failures in the configured network.

With the "RESET" button

Restoring the factory settings during the startup phase

NOTICE
Reset despite disabled "RESET" button
Using the "RESET" button, you can always reset the device parameters to the factory settings during the startup phase of the device. This applies also if the "Reset to Factory Defaults" function was disabled in the configuration. This allows you to reset the device to the factory defaults in an emergency.
If the function has been disabled in the configuration, it is only disabled on completion of the startup phase.

To reset the device to the factory defaults during the startup phase, follow the steps below:

1. Turn off the power to the device.
2. Now press the "RESET" button and reconnect the power supply to the device while holding down the button.
3. Hold down the button until the red error LED "F" stops flashing and is permanently lit.
4. Now release the button and wait until the fault LED "F" goes off again.
5. The device starts automatically with the factory defaults.

Restoring the factory defaults during operation

You can also reset the device to the factory defaults during operation, see section "RESET button (Page 23)".

Via the configuration

You will find detailed information on resetting the device parameters using the WBM and CLI in the configuration manuals see also section "Introduction (Page 5)":

Technical specifications

8

8.1 Technical specifications of the SCALANCE XB208

The following technical specifications apply to the SCALANCE XB208.

Technical specifications		
Attachment to Industrial Ethernet		
	Quantity	8
	Connector	RJ-45 jack
	Properties	Half/full duplex, MDI-X pinning
	Transmission speed	10 / 100 Mbps
Diagnostics interface		
Serial interface	Quantity	1
	Connector	RJ-11 jack
Electrical data		
Power supply	Rated voltage	24 VDC
	Voltage range	19.2 to 28.8 VDC Safe Extra Low Voltage (SELV)
	Design	Terminal block, 3 terminals
	Property	Implemented redundantly
Current consumption	at 24 VDC	170 mA
Effective power loss	at 24 VDC	4.1 W
Fusing		F 2.5 A / 125 V
Permitted ambient conditions		
Ambient temperature	During operation up to 2000 m	0 ℃ to +60 ℃
	During storage	-40 ℃ to +70 ℃
	During transportation	-40 ℃ to +70 ℃
Relative humidity	During operation at 25 ℃	≤ 95 % no condensation
Housing, dimensions and weight		
Design	compact	
Housing material	Polycarbonate (PC-GF10)	
Degree of protection	IP20	
Dimensions (W x H x D)	40 x 117 x 109 mm	
Weight	250 g	
Installation options	Installation on a DIN rail	
Mean time between failure (MTBF)		
MTBF (EN/IEC 61709; 40 °C)	> 84 years	

8.2 Technical specifications of the SCALANCE XB205-3 (SC)

The following technical specifications apply to the SCALANCE XB205-3 (SC).

Technical specifications			
Attachment to Industrial Ethernet			
Electrical connectors	Quantity		5
	Connector		RJ-45 jack
	Properties		Half/full duplex, MDI-X pinning
	Transmission speed		10 / 100 Mbps
Optical connectors	Quantity		3
	Connector		SC 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.		• -34 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
Diagnostics interface			
Serial interface	Quantity		1
	Connector		RJ-11 jack
Electrical data			
Power supply	Rated voltage		24 VDC
	Voltage range		19.2 to 28.8 VDC Safety Extra Low Voltage (SELV)
	Design		Terminal block, 3 terminals
	Properties		Implemented redundantly
Current consumption	at 24 VDC		300 mA *)
Effective power loss	at 24 VDC		7.2 W
Fusing			F 2.5 A / 125 V
Permitted ambient conditions			
Ambient temperature	During operation up to 2000 m		0 °C to +60 °C
	During storage		-40 °C to +70 °C
	During transportation		-40 °C to +70 °C
Relative humidity	During operation at 25 °C		≤ 95 % no condensation
Housing, dimensions and weight			
Design	compact		

Technical specifications	
Housing material	Polycarbonate (PC-GF10)
Degree of protection	IP20
Dimensions (W x H x D)	80 x 117 x 109 mm
Weight	350 g
Installation options	Installation on a DIN rail
Mean time between failure (MTBF)	
MTBF (EN/IEC 61709; 40 °C)	> 55 years

*)For every optical port that you set to "link down", the current consumption of the device is reduced by 30 mA.

8.3 Technical specifications of the SCALANCE XB205-3LD (SC)

The following technical specifications apply to the SCALANCE XB205-3LD (SC).

Technical specifications			
Attachment to Industrial Ethernet			
Electrical connectors	Quantity		5
	Connector		RJ-45 jack
	Properties		Half/full duplex, MDI-X pinning
	Transmission speed		10 / 100 Mbps
Optical connectors	Quantity		3
	Connector		SC socket
	Properties		Full duplex acc. to 100Base-FX
	Transmission speed		100 Mbps
	Cable type		Single mode glass FO cable
	Transmitter output (optical)		
	• Minimum		• -15 dBm
	• Maximum		• -8 dBm
	Receiver input		
	• Sensitivity min.		• -32 dBm
	• Input power max.		• -3 dBm
	Cable cross-section	Cable length	Attenuation
	• 9/125 µm	• 0 to 26 km	• ≤ 0.5 dB/km at 1310 nm
Diagnostics interface			
Serial interface	Quantity		1
	Connector		RJ-11 jack
Electrical data			
Power supply	Rated voltage		24 VDC
	Voltage range		19.2 to 28.8 VDC Safety Extra Low Voltage (SELV)
	Design		Terminal block, 3 terminals
	Properties		Implemented redundantly
Current consumption	at 24 VDC		290 mA *)
Effective power loss	at 24 VDC		7 W
Fusing			F 2.5 A / 125 V
Permitted ambient conditions			
Ambient temperature	During operation up to 2000 m		0 °C to +60 °C
	During storage		-40 °C to +70 °C
	During transportation		-40 °C to +70 °C
Relative humidity	During operation at 25 °C		≤ 95 % no condensation
Housing, dimensions and weight			
Design	compact		
Housing material	Polycarbonate (PC-GF10)		

Technical specifications	
Degree of protection	IP20
Dimensions (W x H x D)	80 x 117 x 109 mm
Weight	350 g
Installation options	Installation on a DIN rail
Mean time between failure (MTBF)	
MTBF (EN/IEC 61709; 40 °C)	> 50 years

*)For every optical port that you set to "link down", the current consumption of the device is reduced by 30 mA.

8.4 Technical specifications of the SCALANCE XB205-3

The following technical specifications apply to the SCALANCE XB205-3.

Technical specifications			
Attachment to Industrial Ethernet			
Electrical connectors	Quantity		5
	Connector		RJ-45 jack
	Properties		Half/full duplex, MDI-X pinning
	Transmission speed		10 / 100 Mbps
Optical connectors	Quantity		3
	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
Diagnostics interface			
Serial interface	Quantity		1
	Connector		RJ-11 jack
Electrical data			
Power supply	Rated voltage		24 VDC
	Voltage range		19.2 to 28.8 VDC Safety Extra Low Voltage (SELV)
	Design		Terminal block, 3 terminals
	Properties		Implemented redundantly
Current consumption	at 24 VDC		300 mA *)
Effective power loss	at 24 VDC		7.2 W
Fusing			F 2.5 A / 125 V
Permitted ambient conditions			
Ambient temperature	During operation up to 2000 m		0 °C to +60 °C
	During storage		-40 °C to +70 °C
	During transportation		-40 °C to +70 °C
Relative humidity	During operation at 25 °C		≤ 95 % no condensation
Housing, dimensions and weight			
Design	compact		

Technical specifications	
Housing material	Polycarbonate (PC-GF10)
Degree of protection	IP20
Dimensions (W x H x D)	80 x 117 x 109 mm
Weight	350 g
Installation options	Installation on a DIN rail
Mean time between failure (MTBF)	
MTBF (EN/IEC 61709; 40 °C)	> 55 years

*)For every optical port that you set to "link down", the current consumption of the device is reduced by 30 mA.

8.5 Technical specifications of the SCALANCE XB216

The following technical specifications apply to the SCALANCE XB216.

Technical specifications		
Attachment to Industrial Ethernet		
	Quantity	16
	Connector	RJ-45 jack
	Properties	Half/full duplex, MDI-X pinning
	Transmission speed	10 / 100 Mbps
Diagnostics interface		
Serial interface	Quantity	1
	Connector	RJ-11 jack
Electrical data		
Power supply	Rated voltage	24 VDC
	Voltage range	19.2 to 28.8 VDC Safe Extra Low Voltage (SELV)
	Design	Terminal block, 3 terminals
	Property	Implemented redundantly
Current consumption	at 24 VDC	280 mA
Effective power loss	at 24 VDC	6.7 W
Fusing		F 2.5 A / 125 V
Permitted ambient conditions		
Ambient temperature	During operation up to 2000 m	0 ℃ to +60 ℃
	During storage	-40 ℃ to +70 ℃
	During transportation	-40 ℃ to +70 ℃
Relative humidity	During operation at 25 ℃	≤ 95 % no condensation
Housing, dimensions and weight		
Design	compact	
Housing material	Polycarbonate (PC-GF10)	
Degree of protection	IP20	
Dimensions (W x H x D)	80 x 117 x 109 mm	
Weight	400 g	
Installation options	Installation on a DIN rail	
Mean time between failure (MTBF)		
MTBF (EN/IEC 61709; 40 °C)	> 60 years	

8.6 Technical specifications of the SCALANCE XB213-3 (SC)

The following technical specifications apply to the SCALANCE XB213-3 (SC).

Technical specifications			
Attachment to Industrial Ethernet			
Electrical connectors	Quantity		13
	Connector		RJ-45 jack
	Properties		Half/full duplex, MDI-X pinning
	Transmission speed		10 / 100 Mbps
Optical connectors	Quantity		3
	Connector		SC 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.		• -34 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
Diagnostics interface			
Serial interface	Quantity		1
	Connector		RJ-11 jack
Electrical data			
Power supply	Rated voltage		24 VDC
	Voltage range		19.2 to 28.8 VDC Safety Extra Low Voltage (SELV)
	Design		Terminal block, 3 terminals
	Properties		Implemented redundantly
Current consumption	at 24 VDC		410 mA *)
Effective power loss	at 24 VDC		9.8 W
Fusing			F 2.5 A / 125 V
Permitted ambient conditions			
Ambient temperature	During operation up to 2000 m		0 °C to +60 °C
	During storage		-40 °C to +70 °C
	During transportation		-40 °C to +70 °C
Relative humidity	During operation at 25 °C		≤ 95 % no condensation
Housing, dimensions and weight			
Design	compact		

Technical specifications	
Housing material	Polycarbonate (PC-GF10)
Degree of protection	IP20
Dimensions (W x H x D)	120 x 117 x 109 mm
Weight	500 g
Installation options	Installation on a DIN rail
Mean time between failure (MTBF)	
MTBF (EN/IEC 61709; 40 °C)	> 45 years

*)For every optical port that you set to "link down", the current consumption of the device is reduced by 30 mA.

8.7 Technical specifications of the SCALANCE XB213-3LD (SC)

The following technical specifications apply to the SCALANCE XB213-3LD (SC).

Technical specifications			
Attachment to Industrial Ethernet			
Electrical connectors	Quantity		13
	Connector		RJ-45 jack
	Properties		Half/full duplex, MDI-X pinning
	Transmission speed		10 / 100 Mbps
Optical connectors	Quantity		3
	Connector		SC socket
	Properties		Full duplex acc. to 100Base-FX
	Transmission speed		100 Mbps
	Cable type		Single mode glass FO cable
	Transmitter output (optical)		
	• Minimum		• -15 dBm
	• Maximum		• -8 dBm
	Receiver input		
	• Sensitivity min.		• -32 dBm
	• Input power max.		• -3 dBm
	Cable cross-section	Cable length	Attenuation
	• 9/125 µm	• 0 to 26 km	• ≤ 0.5 dB/km at 1310 nm
Diagnostics interface			
Serial interface	Quantity		1
	Connector		RJ-11 jack
Electrical data			
Power supply	Rated voltage		24 VDC
	Voltage range		19.2 to 28.8 VDC Safety Extra Low Voltage (SELV)
	Design		Terminal block, 3 terminals
	Properties		Implemented redundantly
Current consumption	at 24 VDC		400 mA *)
Effective power loss	at 24 VDC		9.6 W
Fusing			F 2.5 A / 125 V
Permitted ambient conditions			
Ambient temperature	During operation up to 2000 m		0 °C to +60 °C
	During storage		-40 °C to +70 °C
	During transportation		-40 °C to +70 °C
Relative humidity	During operation at 25 °C		≤ 95 % no condensation
Housing, dimensions and weight			
Design	compact		
Housing material	Polycarbonate (PC-GF10)		

Technical specifications	
Degree of protection	IP20
Dimensions (W x H x D)	120 x 117 x 109 mm
Weight	500 g
Installation options	Installation on a DIN rail
Mean time between failure (MTBF)	
MTBF (EN/IEC 61709; 40 °C)	> 40 years

*)For every optical port that you set to "link down", the current consumption of the device is reduced by 30 mA.

8.8 Technical specifications of the SCALANCE XB213-3

The following technical specifications apply to the SCALANCE XB213-3.

Technical specifications			
Attachment to Industrial Ethernet			
Electrical connectors	Quantity		13
	Connector		RJ-45 jack
	Properties		Half/full duplex, MDI-X pinning
	Transmission speed		10 / 100 Mbps
Optical connectors	Quantity		3
	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
Diagnostics interface			
Serial interface	Quantity		1
	Connector		RJ-11 jack
Electrical data			
Power supply	Rated voltage		24 VDC
	Voltage range		19.2 to 28.8 VDC Safety Extra Low Voltage (SELV)
	Design		Terminal block, 3 terminals
	Properties		Implemented redundantly
Current consumption	at 24 VDC		410 mA *)
Effective power loss	at 24 VDC		9.8 W
Fusing			F 2.5 A / 125 V
Permitted ambient conditions			
Ambient temperature	During operation up to 2000 m		0 °C to +60 °C
	During storage		-40 °C to +70 °C
	During transportation		-40 °C to +70 °C
Relative humidity	During operation at 25 °C		≤ 95 % no condensation
Housing, dimensions and weight			
Design	compact		

Technical specifications	
Housing material	Polycarbonate (PC-GF10)
Degree of protection	IP20
Dimensions (W x H x D)	120 x 117 x 109 mm
Weight	500 g
Installation options	Installation on a DIN rail
Mean time between failure (MTBF)	
MTBF (EN/IEC 61709; 40 °C)	> 45 years

*)For every optical port that you set to "link down", the current consumption of the device is reduced by 30 mA.

8.9 Cable lengths

The following cable lengths listed are valid for SCALANCE XB-200.

Cable	Permitted cable length
IE TP torsion cable with IE FC Outlet RJ-45 + 10 m TP cord	0 to 45 m + 10 m TP cord
IE TP torsion cable with IE FC RJ-45 Plug 180	0 to 55 m
IE FC TP Marine / Trailing / Flexible cable with IE FC Outlet RJ-45 + 10 m TP cord	0 to 75 m + 10 m TP cord
IE FC TP Marine / Trailing / Flexible cable with IE FC RJ-45 Plug 180	0 to 85 m
IE FC TP standard cable with IE FC Outlet RJ-45 + 10 m TP cord	0 to 90 m + 10 m TP cord
IE FC TP standard cable with IE FC RJ-45 Plug 180	0 to 100 m

8.10 Switching properties

The following switching properties listed are valid for SCALANCE XB-200.

Switching properties		
Aging time	Can be configured (default value: 30 seconds)	
Maximum frame size	1632	
Max. number of learnable addresses	8192	
Response to LLDP frames	Blocking	
Response to spanning tree BPDU frames	Forwarding	
CoS acc. to IEEE 802.1Q	Yes	
QoS priority queues	4	
Switching technique	Store and forward	
Latency	10 microseconds	
Full wire speed switching	**Frame length (bytes)**	**Number of frames per second (at 100 Mbps)**
	64	148810
	128	84459
	256	45290
	512	23496
	1024	11973
	1280	9615
	1518	8127

Note

The number of SCALANCE XB-200 modules connected in a line influences the frame delay. When a frame passes through the switch, this is delayed by the store-and-forward function of the SCALANCE XB-200 by 10-130 microseconds (at 100 Mbps).

Dimension drawings

9

Note

Dimensions are specified in mm.

Front view of the SCALANCE XB208

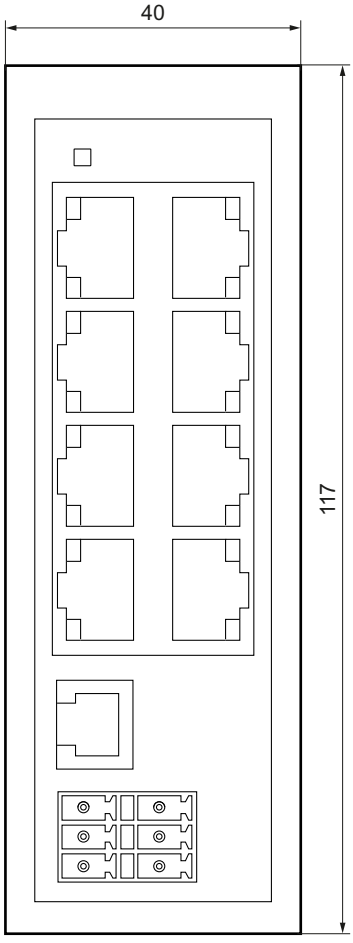


Figure 9-1 Width and height

Front view of the SCALANCE XB205-3 (SC), XB205-3LD (SC), XB205-3 and XB216

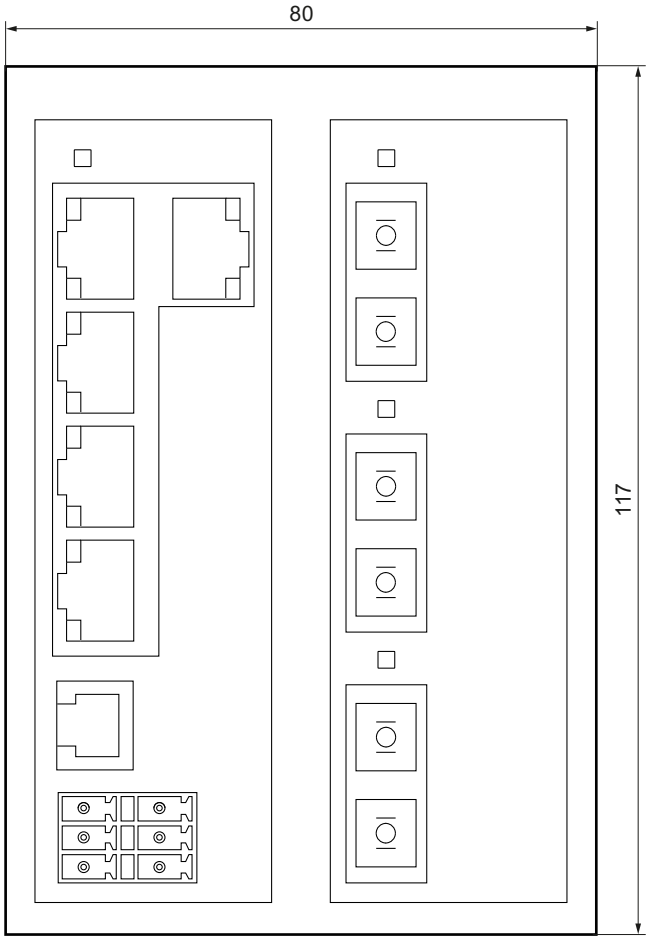


Figure 9-2 Width and height based on the example of the SCALANCE XB205-3

Front view of the SCALANCE XB213-3 (SC), XB213-3LD (SC) and XB213-3

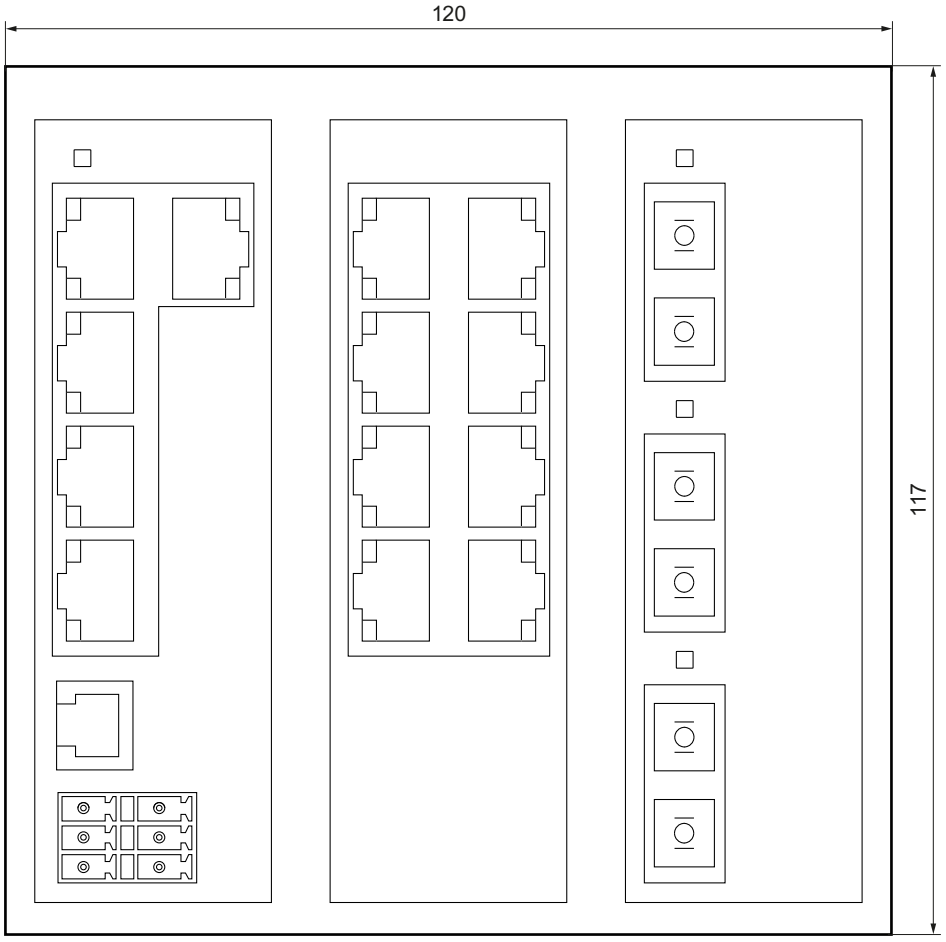


Figure 9-3 Width and height based on the example of the SCALANCE XB213-3

Side view of the SCALANCE XB-200

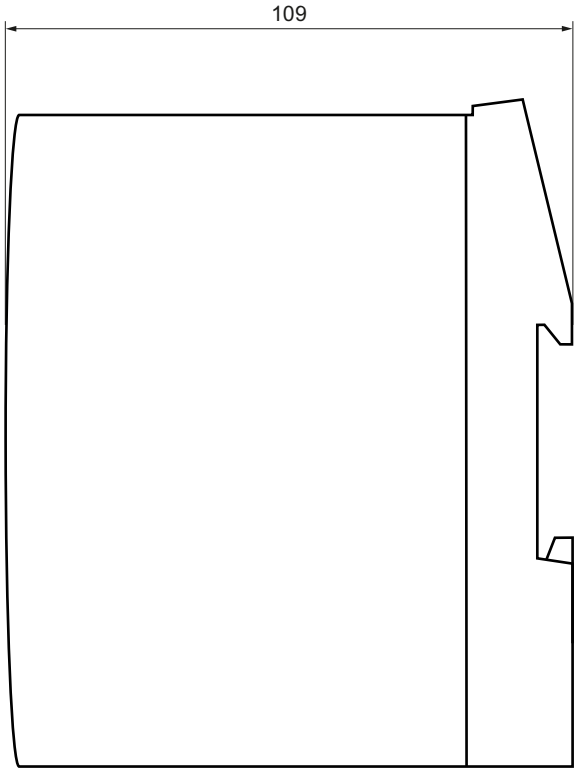


Figure 9-4 Depth

Approvals

A

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

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 into the EU declaration of conformity procedure by the manufacturer of the machine.

EC declaration of conformity

CE

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/es/ps/15273/cert).

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

Siemens Aktiengesellschaft

Digital Industries
DE-76181 Karlsruhe
Germany

ATEX (explosion protection directive)

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 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/view/78381013)

The SIMATIC NET products described in these operating instructions meet the requirements of the EU directive 2014/34/EU "Equipment and Protective Devices for Use in Potentially Explosive Atmospheres".

Note

Type of protection of the device

The devices are approved for various types of protection. You can find the type of protection of your device and the ATEX certificate number on the nameplate.

Permitted types of protection

The following types of protection are possible:

- nA
  ATEX classification: II 3G Ex nA IIC T4 Gc
  Certificate no.: KEMA 07ATEX0145 X
  The products meet the requirements of the following standards:
  - EN 60079-15 (Explosive atmospheres - Part 15: Equipment protection by type of protection "n")
  - EN 60079-0 (Explosive atmospheres - Part 0: Equipment - General requirements)
- nA [op is]
  ATEX classification: II 3 (2) G Ex nA [op is Gb] IIC T4 Gc
  Certificate no.: DEKRA 11ATEX0060 X
  The products meet the requirements of the following standards:
  - EN 60079-28 (Explosive atmospheres - Part 28: Protection of equipment and transmission systems using with optical radiation)
  - EN 60079-15 (Explosive atmospheres - Part 15: Equipment protection by type of protection "n")
  - EN 60079-0 (Explosive atmospheres - Part 0: Equipment - General requirements)
- ec
  ATEX classification: II 3 G Ex ec IIC T4 Gc
  Certificate no.: DEKRA 18ATEX0025 X
  The products meet the requirements of the following standards:
  - EN 60079-7 (Explosive atmospheres - Part 7: Equipment protection through increased safety "e")
  - 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 described in these operating instructions meet the requirements of explosion protection according to IECEx.

Note

Type of protection of the device

The devices are approved for various types of protection. You can find the type of protection of your device and the IECEx certificate number on the nameplate.

Permitted types of protection

The following types of protection are possible:

- nA
  IECEx classification: Ex nA IIC T4 Gc
  Certificate no.: 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)
- nA [op is]
  IECEx classification: Ex nA [op is Gb] IIC T4 Gc
  Certificate no.: DEK 14.0026X
  The products meet the requirements of the following standards:
  - IEC 60079-28 (Explosive atmospheres - Part 28: Protection of equipment and transmission systems using with optical radiation)
  - IEC 60079-15 (Explosive atmospheres - Part 15: Equipment protection by type of protection "n")
  - IEC 60079-0 (Explosive atmospheres - Part 0: Equipment - General requirements)
- ec
  IECEx classification: Ex ec IIC T4 Gc
  Certificate no.: DEK 18.0017X
  The products meet the requirements of the following standards:
  - IEC 60079-7 (Explosive atmospheres - Part 7: Equipment protection through increased safety "e")
  - 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.

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 18ATEX0025X 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 directive (electromagnetic compatibility)

The SIMATIC NET products described in these operating instructions meet the requirements of EU directive 2014/30/EU "Electromagnetic Compatibility" (EMC Directive).

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 declaration of conformity.

RoHS

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:

- EN 50581

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 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

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 바라며, 가정 외의 지역에서 사용하는것을 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 XB208	-
SCALANCE XB205-3 (SC)	•
SCALANCE XB205-3LD (SC)	•
SCALANCE XB205-3	•
SCALANCE XB216	-
SCALANCE XB213-3 (SC)	•
SCALANCE XB213-3LD (SC)	•
SCALANCE XB213-3	•

FDA

Complies with 21 CFR 1040.10 and 1040.11

IEC

Figure A-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	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 XB208	•	•
SCALANCE XB205-3	•	•
SCALANCE XB205-3 (LD)	•	•
SCALANCE XB205-3 (ST)	•	•
SCALANCE XB216	•	•
SCALANCE XB213-3	•	•
SCALANCE XB213-3 (LD)	•	•
SCALANCE XB213-3 (ST)	•	•

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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