SIEMENS

SIMATIC NET

Industrial Ethernet Switches SCALANCE X-200

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

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Disclaimer of Liability

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

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Introduction

Purpose of the Operating Instructions

These operating instructions support you when commissioning networks with the devices of the product line SCALANCE X-200.

Validity of the Operating Instructions

These Operating Instructions apply to the following devices:

SCALANCE X-200	
Device	**Article number**
X204-2	6GK5 204-2BB10-2AA3
X204-2TS	6GK5 204-2BB10-2CA2
X204-2FM	6GK5 204-2BB11-2AA3
X204-2LD	6GK5 204-2BC10-2AA3
X204-2LD TS	6GK5 204-2BC10-2CA2
X206-1	6GK5 206-1BB10-2AA3
X206-1LD	6GK5 206-1BC10-2AA3
X208	6GK5 208-0BA10-2AA3
X208PRO	6GK5 208-0HA10-2AA6
X212-2	6GK5 212-2BB00-2AA3
X212-2LD	6GK5 212-2BC00-2AA3
X216	6GK5 216-0BA00-2AA3
X224	6GK5 224-0BA00-2AA3

SCALANCE XF-200	
Device	**Article number**
XF204	6GK5 204-0BA00-2AF2
XF204-2	6GK5 204-2BC00-2AF2
XF206-1	6GK5 206-1BC00-2AF2
XF208	6GK5 208-0BA00-2AF2

SCALANCE X-200IRT	
Device	**Article number**
X200-4P IRT **)	6GK5 200-4AH10-2BA3
X201-3P IRT **)	6GK5 201-3BH10-2BA3
X201-3P IRT PRO **)	6GK5 201-3JR10-2BA6
X202-2IRT **)	6GK5 202-2BB10-2BA3

SCALANCE X-200IRT	
Device	**Article number**
X202-2P IRT **)	6GK5 202-2BH10-2BA3
X202-2P IRT PRO **)	6GK5 202-2JR10-2BA6
X204IRT **)	6GK5 204-0BA10-2BA3
X204IRT PRO **)	6GK5 204-0JA10-2BA6

**) The marked devices are successor products, see also the following section, "Successor products".

SCALANCE XF-200IRT	
Device	**Article number**
XF204IRT **)	6GK5 204-0BA10-2BF2
XF204-2BA IRT *)	6GK5 204-2AA00-2BD2

*) Basic device without bus adapter

**) The marked devices are successor products, see also the following section, "Successor products".

Premounted variants			
Device	**Article number**	**Components**	**Component article numbers**
XF201-3P IRT	6GK5 201-3BH00-2BD2	1 basic device XF204-2BA IRT	6GK5 204-2AA00-2BD2
		1 BusAdapter BA 2xSCRJ	6ES7 193-6AP00-0AA0
		1 BusAdapter BA SCRJ/RJ45	6ES7 193-6AP20-0AA0
XF202-2P IRT	6GK5 202-2BH00-2BD2	1 basic device XF204-2BA IRT	6GK5 204-2AA00-2BD2
		2 bus adapters BA SCRJ/RJ45	6ES7 193-6AP20-0AA0

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

Successor products

The table compares the article numbers of previous devices and their successor products. The designations of the devices remain the same, but only the article numbers of the successor products remain valid.

The successor products have an extended temperature range and can be used at higher ambient temperatures.

Device	Article number		Article no. / Successor product
X200-4P IRT	6GK5 200-4AH00-2BA3	➡	6GK5 200-4AH10-2BA3
X201-3P IRT	6GK5 201-3BH00-2BA3		6GK5 201-3BH10-2BA3
X201-3P IRT PRO	6GK5 201-3JR00-2BA6		6GK5 201-3JR10-2BA6
X202-2IRT	6GK5 202-2BB00-2BA3		6GK5 202-2BB10-2BA3
X202-2P IRT	6GK5 202-2BH00-2BA3		6GK5 202-2BH10-2BA3
X202-2P IRT PRO	6GK5 202-2JR00-2BA6		6GK5 202-2JR10-2BA6
X204IRT	6GK5 204-0BA00-2BA3		6GK5 204-0BA10-2BA3
X204IRT PRO	6GK5 204-0JA00-2BA6		6GK5 204-0JA10-2BA6
XF204IRT	6GK5 204-0BA00-2BF2		6GK5 204-0BA10-2BF2

You can find operating instructions with technical specifications for the previous devices on the Internet pages of Siemens Industry Online Support with the entry ID: 102051962 (https://support.industry.siemens.com/cs/de/en/view/102051962) (Document identification number: C79000-G8900-C284-15, edition 11/2021).

Designations used

Classification	Description	Terms used
Product line	For all devices and variants of all product groups within the SCALANCE X-200 product line, the term X-200 IE switches is used.	X-200 IE switches
Product group	For all devices and variants of a product group, only the product group is used.	SCALANCE X-200 SCALANCE XF-200 SCALANCE X-200IRT SCALANCE XF-200IRT
Device	For a device, only the device name is used.	e.g. SCALANCE X204-2

Documentation on configuration

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

- SIMATIC NET Industrial Ethernet switches SCALANCE X-200 Configuration Manual

You will find the Configuration Manual 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).

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 Internet pages of Siemens Industry Online Support (https://support.industry.siemens.com/cs/ww/en/ps/15247).

SIMATIC NET glossary

The SIMATIC NET glossary describes terms that may be used in this document.

You will find the SIMATIC NET glossary in the Siemens Industry Online Support at the following address:

50305045 (https://support.industry.siemens.com/cs/ww/en/view/50305045)

Security information

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
https://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 customer's exposure to cyber threats.

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

Note on firmware/software support

Check regularly for new firmware/software versions or security updates and apply them. After the release of a new version, previous versions are no longer supported and are not maintained.

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.

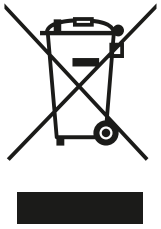
Decommissioning

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.

Also restore the factory settings on the storage medium.

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 conductive packaging such as metalized plastic or metal containers, conductive foam or household aluminum foil.

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Safety notices

1

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 instructions for use in hazardous locations according to UL/FM HazLoc

If you use the device under UL or FM HazLoc conditions, you must also adhere to the following safety instructions in addition to the general safety instructions 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

2

NOTICE
Information security Connect to the device and change the standard passwords for the users "admin" and "user" before you operate the device. To be able to change passwords you need to be logged in with write access to the configuration data.

To prevent unauthorized access to the device and/or network, observe the following security recommendations.

General

- Check the device regularly to ensure that these recommendations and/or other internal security policies are complied with.
- Evaluate the security of your location and use a cell protection concept with suitable products (https://www.industry.siemens.com/topics/global/en/industrial-security/Seiten/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.
- No product liability will be accepted for operation in a non-secure infrastructure.
- Use VPN to encrypt and authenticate communication from and to the devices.
- For data transmission via a non-secure network, use an encrypted VPN tunnel (IPsec, OpenVPN).
- Separate connections correctly (WBM, SSH etc.).
- Check the user documentation of other Siemens products that are used together with the device for additional security recommendations.
- Using remote logging, ensure that the system protocols are forwarded to a central logging server. Make sure that the server is within the protected network and check the protocols regularly for potential security violations or vulnerabilities.

Physical access

- Restrict physical access to the device to qualified personnel because the plug-in data medium can contain sensitive data.
- Lock unused physical interfaces on the device. Unused interfaces can be used to gain access to the plant without permission.

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 (http://www.siemens.com/industrialsecurity) website.
- Inform yourself regularly about security recommendations published by Siemens ProductCERT (http://www.siemens.com/cert/en/cert-security-advisories.htm).
- Only activate protocols that you require to use the device.
- Disable encryption methods with a low security level.
- 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.

Authentication

Note

Accessibility risk - Risk of data loss

Do not lose the passwords for the device. Access to the device can only be restored by resetting the device to factory settings which completely removes all configuration data.

- Replace the default passwords for all user accounts, access modes and applications (if applicable) before you use the device.
- Define rules for the assignment of passwords.
- Use passwords with a high password strength. Avoid weak passwords, (e.g. password1, 123456789, abcdefgh) or recurring characters (e.g. abcabc).
  This recommendation also applies to symmetrical passwords/keys configured on the device.
- Make sure that passwords are protected and only disclosed to authorized personnel.
- Do not use the same passwords for multiple user names and systems.
- Store the passwords in a safe location (not online) to have them available if they are lost.
- Regularly change your passwords to increase security.
- A password must be changed if it is known or suspected to be known by unauthorized persons.
- When user authentication is performed via RADIUS, make sure that all communication takes place within the security environment or is protected by a secure channel.
- Watch out for link layer protocols that do not offer their own authentication between endpoints, such as ARP or IPv4. An attacker could use vulnerabilities in these protocols to attack hosts, switches and routers connected to your layer 2 network, for example, through manipulation (poisoning) of the ARP caches of systems in the subnet and subsequent interception of the data traffic. Appropriate security measures must be taken for non-secure layer 2 protocols to prevent unauthorized access to the network. Physical access to the local network can be secured or secure, higher layer protocols can be used, among other things.

Certificates and keys

- As of firmware version V5.2.5 for SCALANCE X-200/XF-200 and V5.5.2 for SCALANCE X-200IRT/XF-200IRT, there has been a conversion from RSA certificates to certificates for elliptic-curve cryptography ("ECDSA certificates"). Only use ECDSA certificates in PEM format that were generated with the following curves:
  - secp256r1 (NIST P-256)
  - secp384r1 (NIST P-384)
  - secp521r1 (NIST P-521)

  RSA certificates are no longer supported as of this firmware version. The existing RSA certificates on the device are automatically replaced with self-signed ECDSA certificates.
- On the device there is a preset SSL certificate with the key length 256 bits for the elliptic-curves cryptography. 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.
- Verify certificates and fingerprints on the server and client to prevent "man in the middle" attacks.
- Change certificates and keys immediately if there is a suspicion of compromise.

Secure/non-secure protocols

- Avoid or disable non-secure protocols, for example 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
  - LLDP
  - DHCP Options 66/67

  The following protocols provide secure alternatives:
  - HTTP → HTTPS
  - TFTP → FTPS
  - Telnet → SSH
  - SNTP → NTP
    Check whether use the use of NTP is necessary. NTP is classified as non-secure. Activate Secure NTP when the NTP server supports this protocol and use the authentication and encryption mechanisms of Secure NTP.
  - SNMPv1/v2c → SNMPv3
    Check whether use of SNMPv1/v2c. is necessary. SNMPv1/v2c are 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 "DCP read-only" mode after commissioning.

Available protocols

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

The table includes the following columns:

- **Protocol**
- **Port number**
- **Port status**
  - Open
  - Closed

- **Factory setting**
  Indicates the state of the port on delivery or after reset to factory settings.
- **Authentication**
  Specifies whether the communication partner is authenticated.
- **Encryption**
  Specifies whether or not the transfer is encrypted.

Protocol	Port number	Port status	Factory setting	Authentication	Encryption
DHCP	UDP/68	Open (when configured)	Closed	No	No
HTTP	TCP/80	Open (when configured)	Open	Yes	No
HTTPS	TCP/443	Open	Open	Yes	Yes
NTP (secure)	UDP/123	Open (when configured)	Closed	No	Yes
PROFINET IO Service	TCP/84	Open [3]	Open	No	No
PROFINET IO	UDP/34962 UDP/34963 UDP/34964 UDP/49152 ... 65535 [1]	Open	Open	No	No
SNMP	UDP/161	Open	Open	Yes	Yes (SNMPv3)
SNMP traps	UDP/162	Open (when configured)	Closed [2]	No	No
SNTP	UDP/123	Open (when configured)	Closed	No	No
SSH	TCP/22	Open (when configured)	Open	Yes	Yes
TELNET	TCP/23	Open (when configured)	Closed	Yes	No

[1] These ports are assigned dynamically.

[2] Is opened as soon as traps are sent.

[3] As from SCALANCE X-200IRT/XF-200IRT firmware version 5.5.2, closed by default.

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.

Also restore the factory settings on the storage medium.

Description of the device

3

3.1 Functions

Functions of the X-200 IE Switches

The X-200 IE switches are ideally suited for setting up Industrial Ethernet networks in bus, star and ring structures with transmission rates of 10/100 Mbps. All X-200 switches operate in the SIMATIC environment.

Hardware properties:

- X devices have a rugged metal housing and can be installed on a DIN rail, a standard rail or directly on a wall.
- XF devices have a plastic housing and a flat design. They are suitable for installation on a DIN rail.
- Redundant power supply, 2 x 24 VDC (exception: IRT-PRO devices)
- LED diagnostics
- Signaling contact
- SET button for local configuration of the signaling contact
- Slot for C-PLUG
- Reliable plug-in connections thanks to rugged device connectors suitable for industry in conjunction with PROFINET-compliant FastConnect plugs.
- TS devices have varnished printed circuit boards (conformal coating) and meet the requirements of the railway standard EN 50155

Software properties:

- PROFINET diagnostics
- Topology support (LLDP)
- CLI - Command Line Interface / Telnet
- WBM - Web Based Management
- Configuration with STEP 7
- SNMP
- Ring redundancy including redundancy manager
- Passive Listening
- FM devices support the Fiber Monitoring Protocol and allow the monitoring of optical line sections.

Special features of the X-200IRT IE switches

The IRT variants were designed specifically for setting up Industrial Ethernet networks with isochronous/clock synchronous real-time communication. In addition to the properties named above, the IRT switches also provide the following functions:

- IRT communication based on the combination of the switching methods cut through and store and forward.
- Fast media redundancy thanks to an integrated redundancy manager for Fast Ethernet.
- Standby redundancy

Special features of the PRO variants

⚠ WARNING

The devices with the "PRO" supplement are designed with degree of protection IP65 or IP67 for use outside a cabinet.

The characteristics of the IP67 degree of protection were not the subject of the UL certification.

Frame delay times

The number of IE Switches X-200 connected in a line influences the frame delay.

Note

Frame delay time with X-200 without IRT

When a frame passes through X-200 IE switches, it is delayed by the Store&Forward function of the X-200 IE switches.

- With a 64 byte frame length by approx. 10 microseconds (at 100 Mbps).
- With a 1500 byte frame length by approx. 130 microseconds (at 100 Mbps).

This means that the more IE Switch X-200 devices the frame passes through, the longer the frame delay.

Note

Frame delay time with X-200 with IRT

The more X-200IRT IE switches a frame runs through, the higher the frame delay. By using the "cut through" switching mechanism, the X-200IRT IE switches are ideal to meet the real-time requirements of PROFINET.

Cut through is, however, not possible:

- Between a port set to 10 Mbps and a port set to 100 Mbps.
- When two packets are to be sent at the same time on one port.
  In this case, an X-200 IE switch changes to Store&Forward and the delay increases.

Overview of the functions

The following table shows the hardware and software properties for each product variant of the X-200 switches in detail:

		Hardware										Software										
	Device type	Flat design	Compact housing	LED diagnostics	SIMATIC environment	Redundant Power supply	Signaling contact	SET button	Slot for C-PLUG	Slots for BusAdapter	Railway approval	PROFINET diagnostics	Topology support (LLDP)	Command Line Interface (CLI) / Telnet	Web Based Management (WBM)	Configuration with STEP 7	SNMP	Ring redundancy incl. redundancy manager	Standby redundancy	IRT communication	Passive Listening	Fiber Monitoring Protocol
SCALANCE X-200	X204-2		•	•	•	•	•	•	•			•	•	•	•	•	•	•			•	
	X204-2TS		•	•	•	•	•	•	•		•	•	•	•	•	•	•	•			•	
	X204-2FM		•	•	•	•	•	•	•			•	•	•	•	•	•	•			•	•
	X204-2LD		•	•	•	•	•	•	•			•	•	•	•	•	•	•			•	
	X204-2LD TS		•	•	•	•	•	•	•		•	•	•	•	•	•	•	•			•	
	X206-1		•	•	•	•	•	•	•			•	•	•	•	•	•	•			•	
	X206-1LD		•	•	•	•	•	•	•			•	•	•	•	•	•	•			•	
	X208		•	•	•	•	•	•	•			•	•	•	•	•	•	•			•	
	X208PRO		•	•	•	•	•	•	•			•	•	•	•	•	•	•			•	
	X212-2		•	•	•	•	•	•	•			•	•	•	•	•	•	•			•	
	X212-2LD		•	•	•	•	•	•	•			•	•	•	•	•	•	•			•	
	X216		•	•	•	•	•	•	•			•	•	•	•	•	•	•			•	
	X224		•	•	•	•	•	•	•			•	•	•	•	•	•	•			•	
	XF204	•		•	•	•	•	•	•			•	•	•	•	•	•	•			•	
	XF204-2	•		•	•	•	•	•	•			•	•	•	•	•	•	•			•	
	XF206-1	•		•	•	•	•	•	•			•	•	•	•	•	•	•			•	
	XF208	•		•	•	•	•	•	•			•	•	•	•	•	•	•			•	
SCALANCE X-200IRT	X200-4P IRT		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	
	X201-3P IRT		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	
	X201-3P IRT PRO		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	
	X202-2IRT		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	
	X202-2P IRT		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	
	X202-2P IRT PRO		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	
	X204IRT		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	
	X204IRT PRO		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	
	XF204IRT	•		•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	
	XF204-2BA IRT	•		•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	

• applies

Number of electrical and optical connectors in the product name

The number before the hyphen in the product name indicates the number of electrical connectors. The number following the hyphen indicates the number of optical connectors of the device. For example, the switch X212-2 has twelve electrical and two optical connectors.

3.2 Product overview

Article numbers

You can find the article numbers of the devices in the section "Introduction (Page 3)".

Unpacking, checking

⚠ WARNING

Do not use any parts that show evidence of damage. If you use damaged parts, there is no guarantee that the device will function according to the specification.

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

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

Use only undamaged parts.

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

If the consignment is incomplete or damaged, contact your supplier or your local Siemens office.

Components of the product

The following parts ship with a SCALANCE X-200 IE switch:

- One device
- One 2-pin plug-in terminal block (signaling contact)
- One 4-pin plug-in terminal block (power supply)
- One DVD (configuration manual, operating instructions, SINEC PNI, SNMP OPC profiles)

The following components are supplied with a SCALANCE X-200 IE switch with the **PRO** supplement:

- One device
- Protective caps for the data interfaces
- Protective caps for the connectors of the power supply
- One protective cap for the signaling contact
- One DVD (configuration manual, operating instructions, SINEC PNI, SNMP OPC profiles)

The following parts ship with a SCALANCE XF-200IRT IE switch with slots for **bus adapters**:

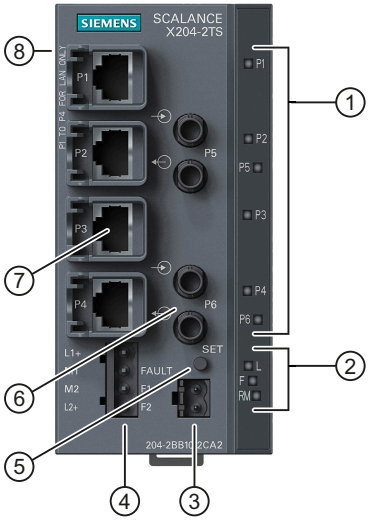
- One device
- One 2-pin plug-in terminal block (signaling contact)

- Two 2-pin plug-in terminal blocks (power supply)
- One DVD (configuration manual, operating instructions, SINEC PNI, SNMP OPC profiles)
- In addition with the premounted variant SCALANCE XF202-2P IRT:
  - 2 bus adapters BA SCRJ/RJ-45
- In addition with the premounted variant SCALANCE XF201-3P IRT:
  - 1 bus adapter BA 2xSCRJ
  - 1 bus adapter BA SCRJ/RJ-45

3.3 Device views

Device view based on the example of an X204-2TS

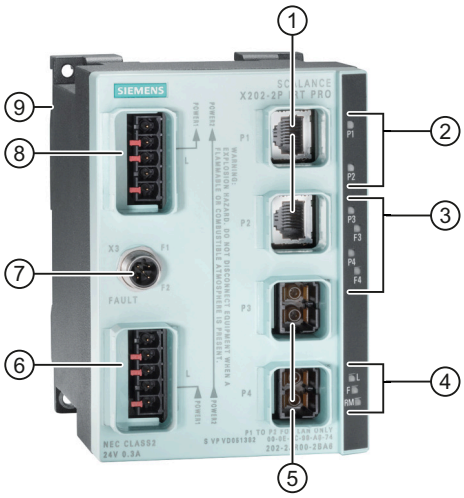
The following figure describes the individual components of an IE switch X200.



1 LEDs for attachments to Industrial Ethernet
2 LEDs
   - L: Power LED, power supply
   - F: Fault LED
   - RM: Redundancy manager or standby
3 Connector for signaling contact
4 Connector for power supply
5 SET button
6 Optical attachment to Industrial Ethernet
7 Electrical attachment to Industrial Ethernet
8 (on rear of device, not shown in figure:) Slot for C-PLUG

Device view based on the example of an X202-2P IRT PRO

The following figure describes the individual components of a PRO version of an IE switch X-200.

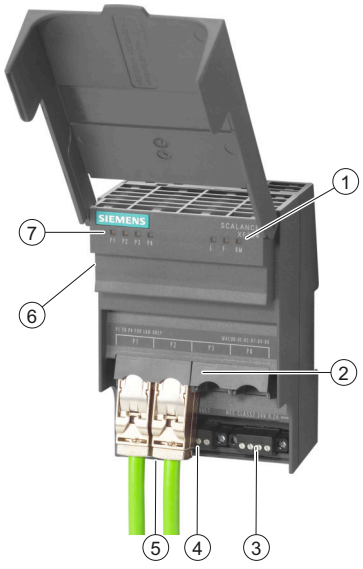


1 Electrical attachments to Industrial Ethernet
2 LEDs for electrical connectors
3 LEDs for optical connectors with diagnostics LEDs
4 LEDs
- L: Power LED, power supply
- F: Fault LED
- RM:
  - green = redundancy manager
  - yellow = standby indicator

5 Optical attachments to Industrial Ethernet
6 Connector for the power supply (supplied with L1, additionally looped through to L2)
7 Connector for signaling contact
8 Power supply for further devices (looped through from L1 to L2)
9 (on rear of device, not shown in figure): Slot for the C-PLUG and SET button

Device view based on the example of an XF204

The following figure describes the individual components of an IE switch X-200, flat design.

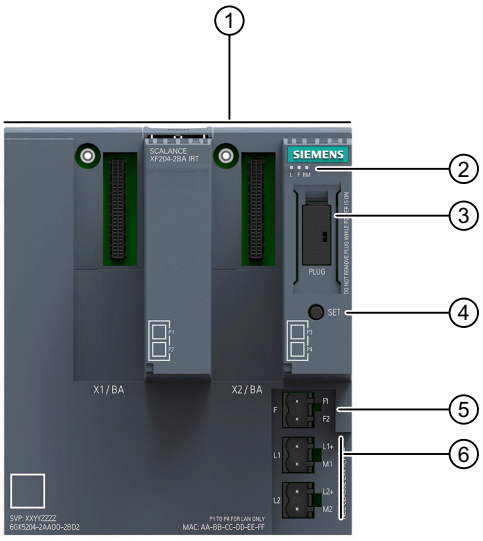


1 LEDs
- L: Power LED, power supply
- F: Fault LED
- RM: Redundancy manager

2 Attachments to Industrial Ethernet
3 Connector for power supply
4 Connector for signaling contact
5 (behind the connectors, not shown in figure:) SET button
6 (on side of device, not shown in figure:) Slot for C-PLUG
7 LEDs for attachments to Industrial Ethernet

Device view based on the example of an XF204-2BA IRT

The following figure describes the individual components of an IE switch XF-200IRT, flat design.



1 BaseUnit with slots for 2 bus adapters

The BaseUnit provides the electrical and mechanical connection of the bus adapters.

2 LEDs

- L: Power LED, power supply
- F: Fault LED
- RM: Redundancy manager

3 Slot for C-PLUG

4 SET button

5 Connector for signaling contact

6 Connector for power supply

3.4 Accessories

C-PLUG

Component	Description	Article number
C-PLUG	Configuration plug, exchangeable storage medium for saving configuration data, 32 MB	6GK1 900-0AB00
	Configuration plug, exchangeable storage medium for saving configuration data, 32 MB, coated (conformal coating)	6GK1 900-0AQ00
	Configuration plug, exchangeable storage medium for saving configuration data, 256 MB	6GK1 900-0AB10
SIPLUS C-PLUG	Configuration plug, exchangeable storage medium for saving configuration data, 32 MB	6AG1 900-0AB00-7AA0
	Configuration plug, exchangeable storage medium for saving configuration data, 32 MB, coated (conformal coating)	6AG1 900-0AB10-7AA0
	Configuration plug, exchangeable storage medium for saving configuration data, 256 MB	6AG1 900-0AB01-4AA0

Power Ilimiter

Component	Description	Article number
Redundancy module SITOP PSE202U NEC Class 2	Extension module for limiting the output power according to NEC Class 2 (power limiter)	6EP1 962-2BA00

Plug Power Plug PRO

Component	Description	Article number
Power Plug PRO	5-pin push-pull plug with metal enclosure for on-site mounting 1 plug per package	6GK1907-0AB11-6AA0

RJ-45 data plug-in connector

Component	Description	Article number
IE FC RJ-45 PLUG PRO (push pull)	RJ-45 data plug-in connector for IE FC TP cables 2x2, IP65 1 connector per package	6GK1 901-1BB20-6AA0
IE RJ-45 PLUG PRO (push pull)	RJ-45 data plug-in connector for IE TP cables 2x2, IP65 1 connector per package	6GK1 901-1BB10-6AA0
IE FC RJ-45 PLUG 180 2x2	RJ-45 data plug-in connector for IE FC cables 2x2, 180° cable outlet 10/100 Mbps, rugged metal housing, 1 connector per package	6GK1 901-1BB10-2AA0
IE FC RJ-45 PLUG 180 2x2	RJ-45 data plug-in connector for IE FC cables 2x2, 180° cable outlet, 10/100 Mbps, rugged metal housing 10 connectors per package	6GK1 901-1BB10-2AB0
IE FC RJ-45 PLUG 180 2x2	RJ-45 data plug-in connector for IE FC cables 2x2, 180° cable outlet, 10/100 Mbps, rugged metal housing 50 connectors per package	6GK1 901-1BB10-2AE0
IE FC RJ-45 PLUG 180 4x2	RJ-45 data plug-in connector for IE FC cables 4x2 (24 AWG), 180° cable outlet, CAT6A, 10/100/1000/10000 Mbps, rugged metal housing 1 connector per package	6GK1 901-1BB12-2AA0
IE FC RJ-45 PLUG 180 4x2	RJ-45 data plug-in connector for IE FC cables 4x2 (24 AWG), 180° cable outlet, CAT6A, 10/100/1000/10000 Mbps, rugged metal housing 10 connectors per package	6GK1 901-1BB12-2AB0
IE FC RJ-45 PLUG 180 4x2	RJ-45 data plug-in connector for IE FC cables 4x2 (24 AWG), 180° cable outlet, CAT6A, 10/100/1000/10000 Mbps, rugged metal housing 50 connectors per package	6GK1 901-1BB12-2AE0

SC RJ plug-in connector

Component	Description	Article number
IE SC RJ POF PLUG PRO (push pull)	SC RJ plug-in connector for POF fiber-optic cables 1 duplex connector per package	6GK1 900-0MB00-6AA0
IE SC RJ PCF PLUG PRO (push pull)	SC RJ plug-in connector for PCF fiber-optic cables 1 duplex connector per package	6GK1 900-0NB00-6AA0

BusAdapter

The BusAdapters allow you a free choice of the connection system for SCALANCE XF-200 IRT.

SCALANCE XF-200 IRTs BusAdapter slots support the following BusAdapters:

Component	Description	Article number
BA 2×RJ45 *)	PROFINET BusAdapter with 2 Ethernet sockets for standard RJ45 plugs	6ES7193-6AR00-0AA0
BA 2×FC *)	PROFINET BusAdapter with 2 FastConnect Ethernet connectors for direct connection of the bus cable	6ES7193-6AF00-0AA0
BA 2xSCRJ	PROFINET BusAdapter with 2 fiber-optic connectors POF/PCF, SCRJ connection system	6ES7193-6AP00-0AA0
BA SCRJ/RJ45	Media converter, PROFINET BusAdapter with 1 fiber-optic connector POF/PCF, SCRJ connection system and 1 Ethernet socket for standard RJ45 plugs	6ES7193-6AP20-0AA0
BA SCRJ/FC	Media converter, PROFINET BusAdapter with 1 fiber-optic connector POF/PCF, SCRJ connection system and 1 FastConnect Ethernet connector for direct connection of the bus cable	6ES7193-6AP40-0AA0
BA 2xLC (supported as of hardware version 4)	PROFINET BusAdapter with 2 glass fiber-optic connectors, LC connection system	6ES7193-6AG00-0AA0
BA LC/RJ45	Media converter, PROFINET BusAdapter with 1 glass fiber-optic connector, LC connection system and 1 Ethernet socket for standard RJ45 plugs	6ES7193-6AG20-0AA0
BA LC/FC	Media converter, PROFINET BusAdapter with 1 glass fiber-optic connector, LC connection system and 1 FastConnect Ethernet connector for direct connection of the bus cable	6ES7193-6AG40-0AA0
SIPLUS BA 2xRJ45	PROFINET BusAdapter with 2 Ethernet sockets for standard RJ45 plug, with conformal coating	6AG1193-6AR00-7AA0
SIPLUS BA 2xFC	PROFINET BusAdapter with 2 FastConnect Ethernet connectors for direct connection of the bus cable, with conformal coating	6AG1193-6AF00-7AA0
SIPLUS BA 2xSCRJ	PROFINET BusAdapter with 2 fiber-optic connectors POF/PCF, SCRJ connection system, with conformal coating	6AG1193-6AP00-2AA0

Component	Description	Article number
SIPLUS BA 2xLC (supported as of hardware version 4)	PROFINET BusAdapter with 2 glass fiber-optic connectors, LC connection system, with conformal coating	6AG1193-6AG00-2AA0
BA 2xRJ45VD HA	BusAdapter VD (Variable Distance), for Ethernet communication via 2, 4 or 8-wire copper cables, 2xRJ45 sockets for Industrial Ethernet and PROFINET, with conformal coating	6GK5991-2VA00-8AA2
BA 2xM12	PROFINET BusAdapter with 2x M12 push-pull sockets, D-coding, also suitable for standard M12	6ES7193-6AM00-0AA0

*) The approvals for shipbuilding are only valid with the indicated BusAdapters

Note

If you wish to operate a SCALANCE XF204-2BA IRT with just one BusAdapter, insert the BusAdapter in the left-hand slot, ports P1 and P2.

If only one BusAdapter is plugged in the right-hand slot (ports P3 and P4), communication via all ports of the SCALANCE XF204-2BA IRT is blocked.

Note

Note approvals of the bus adapters

Bus adapters do not always have the same approvals as the basic devices. If you operate a basic device with a bus adapter that does not meet the conditions of an approval, this approval no longer applies to the basic device.

The bus adapter BA 2xSCRJ (coated), for example has no FM approval. If you operate the basic device with a BA 2xSCRJ (coated) the FM approval of the basic device lapses.

Accessories for devices with bus adapter slots

Reference identification plates

Component	Description	Article number	Figure
Reference identification plates	The reference identification plates (according to EN 81346) can be plugged into every bus adapter, see Manual Collection "Distributed IO system ET 200SP", reference in the section "Introduction (Page 3)" section "Further documentation". The plates allow reference identification of the ET 200SP components. They can be ordered on a mat for thermotransfer and ink jet printers. Due to the standard plotter frame, the reference identification plate is suitable for labeling with ECAD systems. Mat with 16 plates Pack of 10	6ES7 193-6LF30-0AW0	

Cover

Component	Description	Article number
Cover for the bus adapter slots	Cover for the unused bus adapter slots With the cover the plug contacts are protected from contamination. Pack of 5	6ES7 591-3AA00-0AA0

Strain relief

Component	Description	Article number
Strain relief	Screw-on strain relief for guiding the outgoing cables The strain relief is a mechanical protective device for the electrical and optical cables on the bus adapter. The strain relief is available as an optional accessory. 5 units per pack, including screws Cable ties are not included with the product.	6ES7 193-6RA00-1AN0

3.5 The LEDs

3.5.1 LED display when the device starts up

When the X-200 starts up, the LEDs light up in the following sequence:

- The green power LED lights up immediately after turning on the device.
- The LEDs of the Ethernet connectors light up for approximately 6 seconds.
  (does not apply to SCALANCE X-200IRT devices)
- When the Ethernet LEDs go off, the red fault LED is lit for approximately 20 seconds.
- Following this, after approximately 2 seconds the correct link status is displayed.

The X-200 is now ready for operation.

3.5.2 Power LED "L" (green/yellow LED)

The power LED shows the status of the power supply on the X-200 IE switch. The power LED can light up either green or yellow. The meanings of the display are as follows:

LED color	LED status	Meaning
Green	Lit	Both power supplies are connected; in other words, redundant power supply.
Yellow	Lit	Only one power supply is connected or the voltage is < 14 VDC at one of the two connectors.
-	Off	No power supply is connected or the voltage is < 14 VDC or with TS devices < 8 VDC.

Note

The following devices do not have a redundant power supply:

- X201-3P IRT PRO
- X202-2P IRT PRO
- X204IRT PRO

3.5.3 Fault LED "F" (yellow/red LED)

The fault LED indicates a fault/error on the X-200. If the X-200 detects an error, the signaling contact is opened at the same time assuming that the response of the signaling contact was not configured differently.

The meanings of the fault LED display are as follows:

LED color	LED status	Meaning
Yellow	Lit	The LED can only adopt this status with FM devices. Check the received power or the loss of power on optical connections. If necessary, replace the parts.
Red	Lit	The fault LED lighting up can have the following meanings: • Link down event on a monitored port • Loss of the power supply • C-PLUG error • Device is in PROFINET mode: – There is no connection to the controller. – There is a connection to the controller. A configured diagnostics interrupt is also pending, for example power fail interrupt, C-PLUG interrupt etc. • Redundancy manager connected through: – Enabled by default with HRP. – With MRP, you need to configure the error mask so that an error state is reported when the redundancy manager connects through. • Switchover of standby connection • A defined value was undershot in a monitored optical connection. • A loop was detected. • Device startup. The LED lights up for approximately 20 seconds.
Red	Flashing	Internal error detected. Notify maintenance personnel. If necessary, send the device in for repair.
-	Off	No error detected.

3.5.4 Redundancy manager LED "RM" (green LED)

The green LED shows the following statuses of the X-200:

LED color	LED status	Meaning
Green	Lit	The device is operating in the role of redundancy manager. The ring is operating free of errors. The monitoring is enabled.
Green	Flashing	The device is operating in the role of redundancy manager. An interruption was detected in the ring. The device has switched through.
-	Off	The device is not operating in the role of redundancy manager.

Note

This LED labeled on the device with "RM" has a dual function. The color of the display changes depending on the function:

- If the LED is lit green, the redundancy manager function is indicated.
- If the LED is lit yellow, the standby function is indicated.

In Web Based Management (WBM), the LED is labeled differently depending on the function:

- The redundancy manager function (as shipped) is labeled "RM".
- The standby function is labeled "SB" in the WBM.

3.5.5 Standby LED "RM" (yellow LED)

You will find the standby LED only on devices with the IRT function.

Note

This LED labeled on the device with "RM" has a dual function. The color of the display changes depending on the function:

- If the LED is lit green, the redundancy manager function is indicated.
- If the LED is lit yellow, the standby function is indicated.

In Web Based Management (WBM), the LED is labeled differently depending on the function:

- The redundancy manager function (as shipped) is labeled "RM".
- The standby function is labeled "SB" in the WBM.

The yellow LED indicates the following statuses of the X-200IRT:

LED color	LED status	Meaning
Yellow	Lit	The standby function is activated, the switch is in active mode.
Yellow	Flashes slowly	The standby function is activated, the switch is in passive mode.
Yellow	Flashes quickly	Standby partner lost.
-	Off	The standby function is not activated.

3.5.6 Port LEDs "P" (green/yellow LEDs)

The LEDs of the Ethernet connectors can be lit green or yellow. The meanings of the display are as follows:

LED color	LED status	Meaning
Green	Lit	Link exists, no data reception
Yellow	Lit	Device startup. The LED lights up for approximately 6 seconds. (does not apply to SCALANCE X-200IRT devices)
		For SCALANCE X-200 and SCALANCE XF-200: Link exists, data being received
		For SCALANCE X-200IRT and SCALANCE XF-200IRT: Link exists, data being received or sent
Yellow	Flashing	Setting or display of the fault mask

The following statuses of the port LEDs do not exist on devices with the IRT function:

LED color	LED status	Meaning
Green	flashes once per period	Link exists and port in "blocking" status. In this status, the port only receives management data (no user data).
Green	flashes three times per period	Link exists and port is deactivated by the management. In this status, no data is sent or received via the port.
Green	flashes four times per period	Port exists and is in the "monitor port" status. In this status, the data traffic of another port is mirrored to this port.

3.5.7 Diagnostics LEDs for optical connectors "F" (yellow LED)

You will find the diagnostics LEDs only on the devices with the IRT function. With the SCALANCE XF204-2BA IRT you will only find the diagnostics LEDs on bus adapters with SCRJ ports.

The status of the optical connectors is indicated by an additional yellow LED per connector. The LEDs signal the following statuses:

LED color	LED status	Meaning
Yellow	Lit	Check the plug-in connection and the quality of the fiber-optic cable. If necessary, replace the parts.
-	Off	Relevant only if the link exists. The existing link power margin is adequate for error-free operation.

3.5.8 Show Location

Localizing an IE Switches X-200

To identify an IE Switch X-200 locally and with certainty, you can use the "show location" function on a programming device to select the node over the network and make it flash. This can be used, for example, when assigning addresses to make sure that the correct node receives the address. All port LEDs of the addressed node flash green at 2 Hz.

3.6 The SET button

Function of the SET button

With the SET button, you can change various settings of the device. 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:

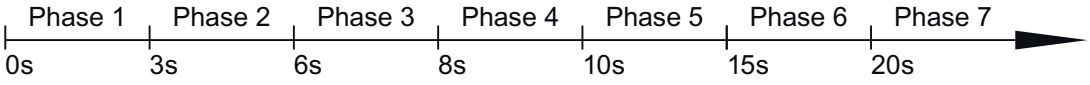


Figure 3-1 Phases for changing settings using the SET button

Phase	Description
1	The currently set fault mask is displayed. If no fault mask has been set, all ports flash one after the other. If you release the button in phase 1, this has no effect.
2	The LEDs of the ports at which there is currently a link flash at 2.5 Hz. If you release the button in phase 2, this has no effect.
3	The LEDs of the ports at which there is currently a link and the LEDs of the connected power supply are lit permanently. If you release the button in phase 3, the fault mask corresponding to the lit LEDs is adopted.
4	The RM LED flashes. If you release the button in phase 4, the redundancy manager is deactivated. The redundancy function remains enabled. The device changes to "Automatic Redundancy Detect" mode.
5	The RM LED is lit permanently. If you release the button in phase 5, the redundancy function is activated and the device is configured as HRP manager.
6	The LEDs of the ring ports flash and the RM LED is off. If you release the button in phase 6, the redundancy function is disabled.
7	All LEDs flash. The device is reset to factory settings.

3.7 The C-PLUG

Area of application

The C-PLUG is an exchangeable medium for storage of the configuration and project engineering data of the basic device. This means that the configuration data remains available if the basic device is replaced.

How it works

Power is supplied by the basic device. The C-PLUG retains all data permanently when the power is turned off.

If an empty C-PLUG (factory settings) is inserted, all configuration data of an IE Switch X-200 is saved to it when the device starts up. Changes to the configuration during operation are also saved on the C-PLUG without any operator intervention being necessary.

If a C-PLUG is inserted, the configuration stored internally on the basic device is no longer changed. Al changes made to the configuration during ongoing operation are only stored on the C-PLUG.

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

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

Compatible devices

As a general rule, the data on the C-PLUG is only compatible with devices having an identical order number and the same device name.

The device combinations shown in the following table are exceptions. With these devices, the exchange of the C-PLUG is possible in one direction.

Device type	C-PLUG created by device with order number		Compatible with device with order number
X204-2	6GK5 204-2BB00-2AA3	➡	6GK5 204-2BB10-2AA3
X204-2LD	6GK5 204-2BC00-2AA3		6GK5 204-2BC10-2AA3
X206-1	6GK5 206-1BB00-2AA3		6GK5 206-1BB10-2AA3
X206-1LD	6GK5 206-1BC00-2AA3		6GK5 206-1BC10-2AA3
X208	6GK5 208-0BA00-2AA3		6GK5 208-0BA10-2AA3
X208PRO	6GK5 208-0HA00-2AA6		6GK5 208-0HA10-2AA6
X200-4P IRT	6GK5 200-4AH00-2BA3		6GK5 200-4AH10-2BA3
X201-3P IRT	6GK5 201-3BH00-2BA3		6GK5 201-3BH10-2BA3
X201-3P IRT PRO	6GK5 201-3JR00-2BA6		6GK5 201-3JR10-2BA6
X202-2IRT	6GK5 202-2BB00-2BA3		6GK5 202-2BB10-2BA3
X202-2P IRT	6GK5 202-2BH00-2BA3		6GK5 202-2BH10-2BA3
X202-2P IRT PRO	6GK5 202-2JR00-2BA6		6GK5 202-2JR10-2BA6
X204IRT	6GK5 204-0BA00-2BA3		6GK5 204-0BA10-2BA3
X204IRT PRO	6GK5 204-0JA00-2BA6		6GK5 204-0JA10-2BA6
XF204IRT	6GK5 204-0BA00-2BF2		6GK5 204-0BA10-2BF2

Note

Combinations other than those shown in the table are not compatible with each other.

Using a previously written C-PLUG

If you want to insert a C-PLUG that has already been used and written to into a new differently configured X-200 IE switch, you will first need to delete the existing data on the C-PLUG. You will find information about this in the configuration manual of the SCALANCE X-200 in the section on the WBM menu items.

Note

The X-200 IE switches normally start up with the configuration of the C-PLUG, assuming this was written to by a compatible device type. If the C-PLUG was written to by an incompatible device type, the basic device will not start up fully and signals an error. The WBM menu "System C-PLUG" is displayed automatically. Here, use the "Modify C-PLUG" function to specify whether or not the device operates with a C-PLUG.

If you operate a device with a C-PLUG, the C-PLUG can either be initialized with the factory settings or with the settings stored internally on the device.

Diagnostics

The following events are signaled by the diagnostics mechanisms of the X-200, such as LEDs, WBM etc.:

- Inserting a C-PLUG that contains the configuration of an incompatible device type.
- The accidental removal of a C-PLUG
- General malfunctions of the C-PLUG.

The C-PLUG does not ship with the product

The C-PLUG is not supplied with the IE switches X-200, see section "Accessories (Page 25)".

Inserting in the slot

NOTICE
• **Insert and remove the C-PLUG only when power is off.** • **In a device with a varnished printed circuit board, you may only use a C-PLUG with a varnished board.**



Figure 3-2 C-PLUG and slot based on the example of an X-200

You will find information regarding the location of the C-PLUG slot for the various product groups in the "Device views (Page 23)".

Follow the steps below to insert the C-PLUG:

1. Remove the screw cover.
2. Insert the C-PLUG in the slot.
3. Close the slot with the screw cover.

Removing the C-PLUG

It is only necessary to remove the C-PLUG if the IE Switch X-200 develops a fault.

You can lever the C-PLUG out of the slot carefully using flat pliers, tweezers, or a small screwdriver.

If no C-PLUG is inserted in the device, when the device restarts, an error message is output in Web Based Management and in the Command Line Interface. In this case, you will need to set the device to operation without C-PLUG. For further information, refer to the section "System C-PLUG" in the section on the WBM menu in the configuration manual.

3.8 Starting the device for the first time

Note

When the device is started up for the first time, the power-up time is approximately 1 minute longer than for all other starts of the device. The reason for this delay is the calculation of the certificates required for encrypted communication. With SCALANCE devices, encrypted access is possible via Web Based Management with HTTPS or via the Command Line Interface with SSH.

Installation and removal

4

4.1 Safety notices for installation

Safety notices

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

WARNING

When used in ships, a DIN rail does provide adequate support

For the following devices, installation on a 35 mm DIN rail for use in ships is not permitted:

- X208PRO
- X212-2
- X212-2LD
- X216
- X224
- X202-2IRT
- X204IRT
- X204IRT PRO
- XF204IRT

In ships, the DIN rail does not provide adequate support.

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.

WARNING

Cable

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

NOTICE

Improper mounting

Improper mounting may damage the device or impair its operation.

- 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

Substitution of components may impair suitability of the equipment.

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 3836.3.

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 89)". This is indicated on the type plate. The FO bus connections may run through or in a Zone 1 and Zone 2 hazardous area with these devices.

Safety notices when using according to FM

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

WARNING

EXPLOSION HAZARD

For operation the device is intended to be installed within an enclosure/control cabinet. The inner temperature of the enclosure/control cabinet corresponds to the ambient temperature of the device. Use installation wiring connections with admitted maximum operating temperature of at least 30 °C higher than maximum ambient temperature.

Note

You must not install the device on a wall in hazardous areas.

WARNING

Wall mounting outside of the control cabinet or housing does not fulfill the requirements of the FM approval.

WARNING

Wall mounting is only permitted if the requirements for the housing, the installation regulations, the clearance and separating regulations for the control cabinets or housings are adhered to. The control cabinet cover or housing must be secured so that it can only be opened with a tool. An appropriate strain-relief assembly for the cable must be used.

WARNING

The IP rating marking is not associated with the FM approvals certification.

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

Substitution of components may impair suitability for Class 1, Division 2.

Safety notices when using the device as industrial control equipment according to UL 61010-2-201

If you use the device under UL 61010-2-201 conditions you must also keep to the following safety notices in addition to the general safety notices for protection against explosion:

WARNING

Open equipment

The devices are "open equipment" according to the standard IEC 61010-2-201 or UL 61010-2-201 / CSA C22.2 No. 61010-2-201. To fulfill requirements for safe operation with regard to mechanical stability, flame retardation, stability, and protection against contact, the following alternative types of installation are specified:

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

Safety notices when using in accordance with UL 62368-1

If you use the device under UL 62368-1 conditions you must also keep to the following safety notices in addition to the general safety notices for protection against explosion:

WARNING

For operation of a SCALANCE X-200IRT PRO according to UL 62368-1, the device may only be accessible to specialist personnel. The device must therefore be installed in an access-restricted area or a locked enclosure or control cabinet that is only accessible to specialist personnel.

Further notes

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.

4.2 Installation options

Types of installation

IE Switches X-200 can be installed in the following ways:

- Installation on a 35 mm DIN rail complying with DIN EN 60715
- Installation on a SIMATIC S7-300 standard rail
- Wall mounting

Unless stated otherwise, the mounting options listed below apply to all X-200 IE switches.

Exception XF-200

The XF devices (flat design) can only be installed on a 35 mm DIN rail.

Installation clearance

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

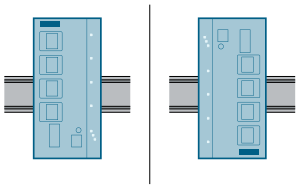
- Below at least 10 cm
- Above at least 10 cm

Installation position

To use of the maximum ambient temperature of the devices, the following mounting position is recommended:

Horizontal

Horizontal installation of the rack (DIN rail)



Note that deviating temperature values may apply to installation positions that deviate from the horizontal; see section "Technical specifications (Page 75)".

Note

Note the mounting position for XF and TS devices

With the following IE switches, an ambient temperature of maximum +40 °C is permitted if the device is installed on a vertical rail:

- X204-2TS
- X204-2LD TS
- XF204
- XF204-2
- XF206-1
- XF208
- XF204IRT

4.3 Installation on a DIN rail

Installation

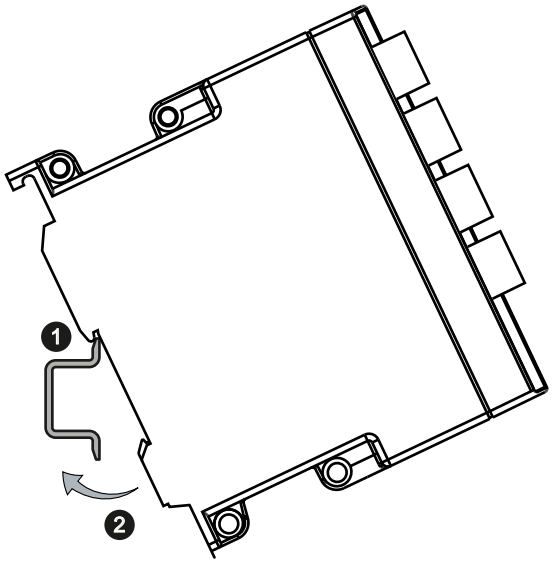


Figure 4-1 Installation on a 35 mm DIN rail

To install an X-200 on a 35 mm DIN rail complying with DIN EN 60715, follow the steps below:

1. Fit the middle locking mechanism of the device on to the DIN rail.
2. Press the device down against the DIN rail until it locks into place.
3. Fit the connectors for the power supply.
4. Fit the connectors for the signaling contact
5. Insert the terminal blocks or M12 cable connectors into the sockets on the device.

Removal

To remove an X-200 from a DIN rail, follow the steps below:

1. First disconnect all connected cables.
2. Use a screwdriver to release the lower DIN rail catch of the device and pull the lower part of the device away from the rail.

4.4 Mounting onto standard rail (SCALANCE XF204-2BA IRT)

Installation

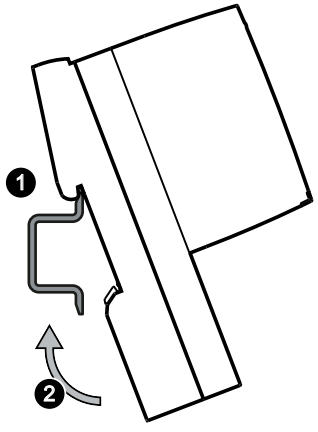


Figure 4-2 DIN rail mounting

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 "Connecting up (Page 53)".
4. Insert the terminal blocks into the sockets on the device.

Removal

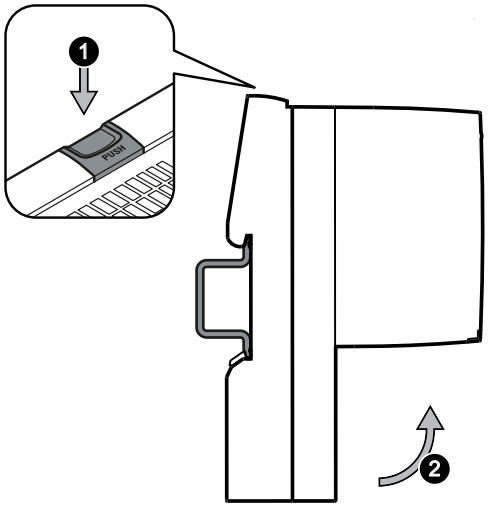


Figure 4-3 Removing from a DIN rail

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.

4.5 Installation on a standard rail

Installation on a SIMATIC S7-300 standard rail

To install an X-200 on a standard rail, follow the steps below:

1. Fit the housing guide on the top of the housing into the standard rail.
2. Screw the X-200 to the underside of the standard rail.
3. Fit the connectors for the power supply.

4. Fit the connectors for the signaling contact.
5. Insert the terminal blocks or M12 cable connectors into the sockets on the X-200.

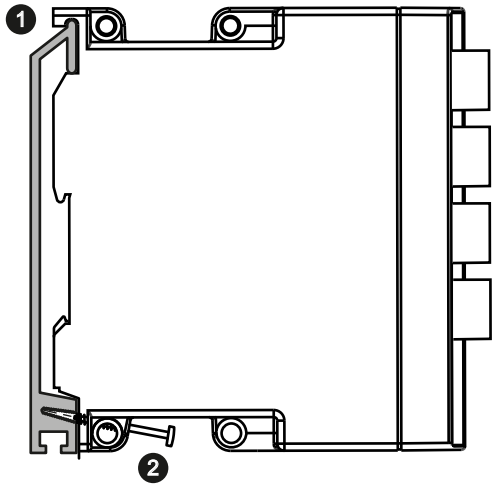


Figure 4-4 Installation on a SIMATIC S7-300 standard rail

Removal

To remove an X-200 from a standard rail, follow the steps below:

1. First disconnect all connected cables.
2. Release the screws on the bottom of the standard rail.
3. Remove the X-200 from the standard rail.

4.6 Wall mounting

Wall mounting

Note

The wall mounting must be capable of supporting at least four times the weight of the X-200, see section Technical specifications (Page 75).

When mounting on a wall, use mounting fittings suitable for the type of wall. To secure the device in concrete, you could, for example use the following material:

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

Follow the steps below to install the X-200 on a wall:

1. Prepare the drill holes for wall mounting.
   You will find the precise dimensions in the Appendix Dimension drawings (Page 97).
2. Connect the electrical cable connecting cables.

3. Fit the connectors for the signaling contact.
4. Insert the terminal blocks or M12 cable connectors into the sockets on the IE Switch X-200.
5. Screw the device to the wall.

4.7 Mounting bus adapters

NOTICE
Cover unused bus adapter slots If you do not cover unused bus adapter slots, this can lead to the following problems: • Loss of the approvals • Violation of the EMC regulations • Failure of the data traffic Close unused bus adapter slots with the supplied covers. Remove the covers only immediately before you mount the bus adapter.

Required tool:

- Slotted screwdriver, blade width 3 to 3.5 mm

or

- Torx screwdriver, size T10

Installation

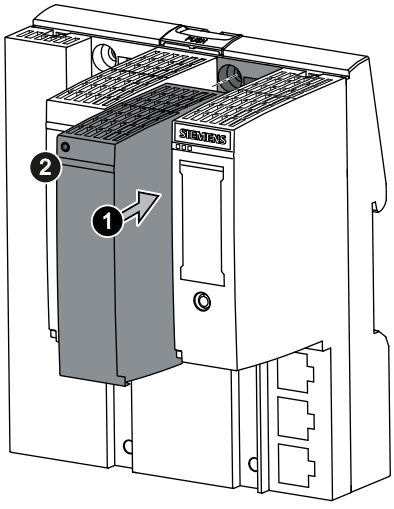


Figure 4-5 Mounting bus adapters

To fit a bus adapter, follow the steps below:

1. Turn off the power to the device.
2. Remove the cover of the bus adapter slot.
3. If necessary mount a strain relief, see section "Mounting tensile strain relief (Page 49)".
4. Plug the bus adapter parallel into the BaseUnit until it can be heard to lock in place ①.
5. Screw the bus adapter to the BaseUnit of the device with the supplied screw (tightening torque 0.2 Nm) ②.
   Use the specified tool for this.
6. Insert the connection plugs into the sockets intended for this on the bus adapter.

Removal

To remove a bus adapter, follow the steps below:

1. Turn off the power to the device.
2. Remove all connected cables from the BusAdapter.
3. Loosen the screw connection of the bus adapter.
4. Pull the bus adapter out of the Base Unit to the front.
5. If necessary remove the strain relief, see section "Mounting tensile strain relief (Page 49)".
6. Close the bus adapter slot with a cover.

4.8 Mounting tensile strain relief

Required tools

- Torx screwdriver, size T10
- Cable ties
  We recommend cable ties with a width of 4.8 mm. The maximum width is 7.0 mm. The length of the cable tie is min. 60 mm.

Installation

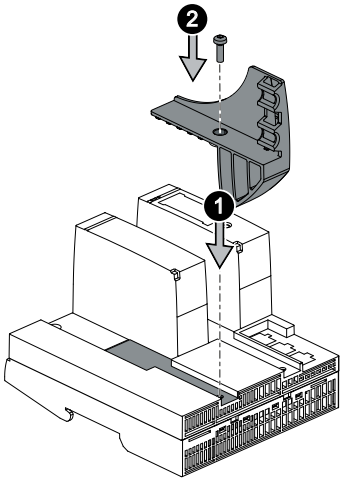


Figure 4-6 Mounting tensile strain relief

To mount tensile strain relief on the device, follow the steps below:

1. Bring the gap in the strain relied in line with the gap in the device ①.
2. Screw the strain relief with the supplied screw (tightening torque 0.8 Nm) ②.
   Use the specified tool for this.
3. Mount a bus adapter, see section "Mounting bus adapters (Page 48)".
4. Insert the connection plugs into the sockets intended for this on the bus adapter.
5. Use cable ties to secure the cable to the strain relief.

Removal

To remove strain relief from the device, follow the steps below:

1. Release the cable from the strain relief and pull the cable.
2. Remove the bus adapter, see section "Mounting bus adapters (Page 48)".
3. Loosen the screw connection.
4. Remove the strain relief.

4.9 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

5

5.1 Safety when connecting up

Safety notices

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

⚠ WARNING

Power supply

The device is designed for operation with a directly connectable safety extra low voltage (SELV) from a limited power source (LPS).

The power supply therefore needs to meet at least one of the following conditions:

- 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).

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

Note

Limitation of the output voltage according to NEC Class 2 by redundancy module

To meet the requirements according to NEC Class 2, you can use a power supply with SELV along with a power limiter, see e.g. the section "Accessories (Page 25)".

Exceptions

For the devices listed below, there are no requirements according to NEC Class 2 or LPS. For these devices, note the conditions described in the section Supply for IRT-PRO devices (Page 59).

- X201-3P IRT PRO
- X202-2P IRT PRO
- X204IRT PRO

Note

Safety extra-low voltage

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

Note

According to NECF NFPA 70, the length of the cables for the power supply and for Ethernet may not exceed 42.6 meters when installed outdoors.

Safety notices on use in hazardous areas

General safety notices relating to protection against explosion

WARNING

Do not remove or replace while circuit is live when a flammable or combustible atmosphere is present.

WARNING

Explosion hazard

Do not disconnect equipment when a flammable or combustible atmosphere is present.

WARNING

EXPLOSION HAZARD

Do not press the SET button 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 enclosure must comply with the IP degree of protection required by EN IEC / IEC 60079-0, GB 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).

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.

⚠ WARNING

EXPLOSION HAZARD

Do not disconnect while circuit is live unless area is known to be non-hazardous.

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).

NOTICE
Overvoltage protection If IE Switches X-200 are supplied over long 24 V power supply lines or networks, measures are necessary to prevent interference by strong electromagnetic pulses on the supply lines. These can result, for example, due to lightning or switching of large inductive loads. One of the tests used to attest the immunity of devices of the IE Switches X-200 to electromagnetic interference was the "surge immunity test" according to EN61000-4-5. This test requires overvoltage protection for the power supply lines. A suitable device is, for example, the Dehn Blitzductor BVT AVD 24 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.

5.2 Wiring rules

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

Wiring rules for ...		**Screw/spring-loaded terminals**
connectable cable cross sections for flexible cables ...	without wire end ferrule	0.25 - 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.

5.3 Power supply

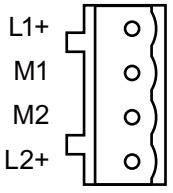
5.3.1 Supply with X-200 via the terminal block

Power supply

The power supply is connected via a 4-pin plug-in terminal block that ships with the device.

- The power supply can be connected redundantly.
  - Both inputs are isolated.
  - No load distribution.
  - The power supply unit with the higher output voltage supplies the device alone.
- Power: 24 VDC
- Only copper cables may be used for the power supply.
- Cable cross section for X-200: 2.5 mm^2
- Cable cross section for XF-200: 1.5 mm^2
- The power supply is connected over a high resistance with the enclosure to allow an ungrounded set up.
- The power supply is non-floating.
- The signal cables of the electrical Ethernet interfaces are floating.

The following table shows the pin assignment:

Assignment	
L1+: 24 VDC **With TS devices:** L1+: 12 to 24 VDC	
M1: Ground	
M2: Ground	
L2+ 24 VDC **With TS devices:** L2+ 12 to 24 VDC	

Note

Special features with X208PRO and the IRT-PRO devices

Note the special requirements for the power supply for the devices in the following sections.

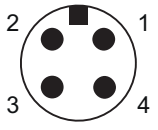
5.3.2 Supply for X208PRO

Power supply for X208PRO

With the IE switch SCALANCE X208PRO, the power supply is connected via two 4-pin a-coded M12 sockets.

- The power supply can be connected redundantly.
  - Both inputs are isolated.
  - No load distribution.
  - The power supply unit with the higher output voltage supplies the device alone.
- Power: 24 VDC
- The power supply is connected over a high resistance with the enclosure to allow an ungrounded set up.
- The power supply is non-floating.
- The signal cables of the electrical Ethernet interfaces are floating.

The following table shows the pin assignment:

Pin no.:	Assignment	
1	L1 or L2: 24 VDC	
2	n. c.	
3	M1 or M2	
4	n. c.	

5.3.3 Supply for IRT-PRO devices

Power supply for the devices of the IRT PRO version

The following descriptions of the power supply apply to the following devices:

- X201-3P IRT PRO
- X202-2P IRT PRO
- X204IRT PRO

Connector

Plastic version (standard)

The power supply is connected by default via the push-pull Power Plug PRO. This plug has a high degree of protection (IP65) and is suitable for use outside cabinets and complies with PROFINET connector technology.

The Power Plug PRO does not ship with the device, see the section "Accessories (Page 25)".

Metal version

In areas subject to the EU directives ATEX and IECEX of the National Electric Code (NEC), the Canadian Electric Code (CEC) and UL, metal connectors must be used.

Further information and technical advice on this subject is available from:
Jürgen Hertlein, juergen.hertlein@siemens.com.

Power supply

- Power: 24 VDC
- The power supply is connected over a high resistance with the enclosure to allow an ungrounded set up.
- The power supply is non-floating.
- The signal cables of the electrical Ethernet interfaces are floating.

Note

No redundant power supply

Since the IRT PRO version of the devices does not have a redundant power supply, connect the power supply to L1 and N1.

Note

Maximum current 16 A

The current through the Power Plug PRO must not exceed 16 A. This value also contains the power consumption of the device itself. For information on the power consumption of the device, see "Technical specifications (Page 75)", under "Electrical data"

Include a fuse that trips at a current higher than 16 A.

In areas subject to the NEC or CEC, the fuse must meet the following requirements:

- Suitable for DC (min. 60 V / max. 16 A)
- Breaking current at least 10 kA
- UL / CSA listed (UL 248-1 / CSA 22.2 No. 248.1)
- Classes R, J, L, T or CC

Otherwise the following requirements must be met:

- Suitable for DC (min. 60 V / max. 16 A)
- Breaking current at least 10 kA
- Approved according to IEC/EN 60127-1
- Breaking characteristics
  - With circuit breakers: B or C
  - With fuses: slow blow

Power supply looped through

The devices also have a connector for the switched mode and unswitched power supply of other devices with 24 VDC. Via these interfaces (L1+, N1 and L2+, N2) it is possible to loop the power through with connector technology compliant with PROFINET.

You should also refer to the manual "SIMATIC Distributed IO System ET 200pro (https://support.industry.siemens.com/cs/ww/en/view/21210852)".

Note

Notes on operating under marginal conditions

When looping through the power supply, take into account the limit values; in other words, the maximum permitted current depending on the ambient temperature; refer to the table "Operation under marginal conditions" below.

When looping through the power supply under the marginal conditions described below, the device may only be operated if it is installed horizontally. Horizontal installation position means that the device is mounted, for example on a horizontal DIN or standard rail or that the labeling on the device can be read in the normal reading direction.

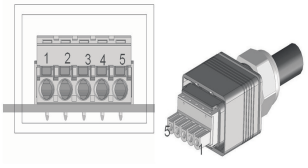
If no power is looped through, any installation position is permitted.

Table 5-1 Operation under marginal conditions

Environment	Max Power 1 (L1+, N1)	Max Power 2 (L2+, N2)
+40°C	16 A	16 A
+50°C	12 A	12 A
+60°C	8 A	8 A
SCALANCE X204IRT PRO only:		
+70°C	6 A	6 A

Pin assignment of the connectors

The following table shows the pin assignment of the two power supply connectors:

Pin no.:	Assignment	
1	L1: 24 VDC	
2	N1	
3	L2: 24 VDC	
4	N2	
5	FE (Functional Earth)	

5.3.4 Supply with XF-200IRT devices with bus adapter slots

Power supply for devices with bus adapter slots

The following descriptions of the power supply apply to the following devices:

- XF204-2BA IRT

Information on the power supply

- The power supply is connected via two 2-pin plug-in terminal blocks that ship with the device.
- The power supply can be connected redundantly.
  - Both inputs are isolated.
  - No load distribution.
  - The power supply unit with the higher output voltage supplies the device alone.
- Power: 24 VDC
- Cable cross-section: max. 2.5 mm^2
- The power supply is connected over a high resistance with the enclosure to allow an ungrounded set up.
- The power supply is non-floating.
- The signal cables of the electrical Ethernet interfaces are floating.

Position and assignment

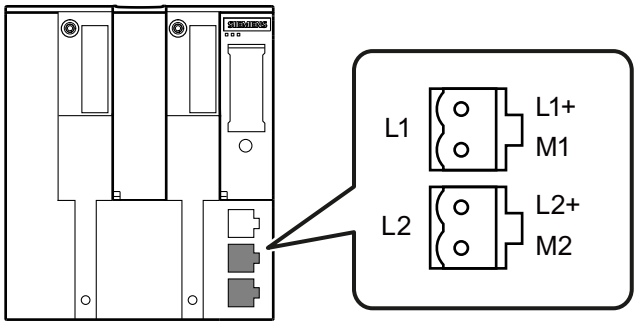


Figure 5-1 Position of the power supply and assignment of the terminal blocks

Contact	Assignment
L+	24 VDC
M	Ground

5.4 Grounding

Grounding when installing on a DIN rail

The device is grounded over the DIN rail.

Grounding when installing on an S7 standard rail

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

Grounding with wall mounting

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

Please note that X-200 IE switches must be grounded over one securing screw with minimum resistance.

If an IE Switch X-200 is mounted on a non-conducting base, a grounding cable must be installed. 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.

5.5 Signaling contact

Signaling contact

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

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

- The loss and the establishment of a link on a monitored port.
- The failure of one of the two redundant power supplies.
  Note: Devices of the IRT PRO version do not have a redundant power supply
- The loss of the connection to the controller in PROFINET IO mode.
- The redundancy manager signals an error
- An incompatible C-PLUG was inserted.

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.

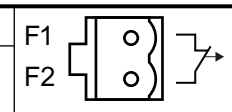
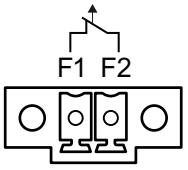
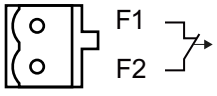
When the IE Switch X-200 is turned off, the signaling contact is always activated, i.e. opened.

NOTICE
Load on the signaling contact The signaling contact can be subjected to a **maximum** load of **100 mA** (safety extra-low voltage (SELV), 24 VDC).

Connection via 2-pin terminal block

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

The following table shows the pin assignment:

Assignment			
F1: Fault contact 1 F2: Fault contact 2	 SCALANCE X-200, XF-200, X-200IRT	 SCALANCE XF-200IRT	 SCALANCE XF204-2BA IRT

Connection via M12 socket

With the X-200 IRT PRO devices and with the X208PRO, the connection is via a 5-pin, b-coded M12 socket.

The following table shows the pin assignment:

Pin no.:	**Assignment**	
1	F1	 SCALANCE X-200 IRT PRO
2	n.c.	
3	n.c.	
4	F2	
5	n.c.	

5.6 Attachment to Industrial Ethernet

Note

Redundancy mechanisms

If you use redundancy mechanisms such as media redundancy "HRP" or "MRP" and/or redundant linking of rings via a standby link, remember the following:

Open the redundant path before you insert a new device or replacement device in an operating network. A bad configuration or attachment of the Ethernet cables to incorrectly configured ports causes overload in the network and a breakdown in communication.

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

- HRP / MRP
  - The ring ports of the device being inserted in the ring were configured as ring ports.
  - The required redundancy mode is also enabled.
  - If the device is intended to operate as the redundancy manager, "Enable Ring Redundancy" must also be set.
- Standby link
  - Select "Enable Standby Master".
  - The "Standby Connection Name" must match the name of the partner device.
  - You must also configure the standby port.

You will find detailed information in the SCALANCE X-200 configuration manual.

5.6.1 Electrical connections

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.

5.6.1.1 Electrical attachments to Industrial Ethernet

Connection via RJ-45 jacks

The electrical connectors for Industrial Ethernet on the X-200 IE switch are designed as RJ-45 jacks with the following properties:

- MDI-X assignment
- Autonegotiation
- Auto polarity exchange

MDI / MDI-X autocrossover function

The advantage of this function is that straight-through cables can be used throughout and external Ethernet crossover cables are unnecessary. 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 switch or accidental connection over several switches causes an illegal loop. Such a loop can lead to network overload and network failures.

Autonegotiation

Autonegotiation means the automatic detection of the functionality of the port at the opposite end. Using autonegotiation, repeaters or end devices can detect the functionality available at the port of a partner device allowing automatic configuration of different types of device. With autonegotiation, two components connected to a link segment can exchange parameters and set themselves to match the supported communication functionality.

Note

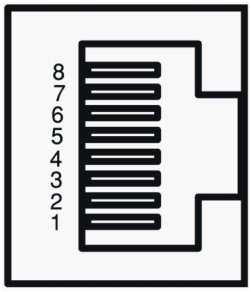
- If a port operating in autonegotiation mode is connected to a partner device that is not operating in autonegotiation mode, the partner device must be set permanently to half duplex mode.
- If a port is set permanently to full duplex, the connected partner device must also be set to full duplex.
- If the autonegotiation function is disabled, the MDI/MDI-X autocrossover function is also inactive. This means it may be necessary to use a crossover cable.

Auto polarity exchange

If the pair of receiving cables is incorrectly connected, in other words, RD+ and RD- are swapped over, the polarity is reversed automatically.

Pin assignment

The following table shows the pin assignment of the RJ-45 connectors:

Pin no.:	Assignment	
8	n. c.	
7	n. c.	
6	TD-	
5	n. c.	
4	n. c.	
3	TD+	
2	RD-	
1	RD+	

Permitted cable lengths

- With connection using TP cords or TP-XP cords: maximum 10 m
- When connected using IE FC cable with IE RJ-45 plug:
  Depending on the cable type, a total length of up to 100 m is permitted between two devices.

5.6.1.2 Electrical connectors of the X208PRO

Connection via M12 sockets

With the IE switch SCALANCE X208PRO, the connection to Industrial Ethernet is via 4-pin, d-coded M12 sockets with MDI-X assignment.

MDI / MDI-X autocrossover function

The advantage of this function is that straight-through cables can be used throughout and external Ethernet crossover cables are unnecessary. This prevents malfunctions resulting from mismatching send and receive wires. This makes installation much easier for the user.

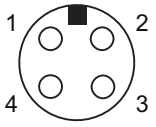
Note

Formation of loops

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

Pin assignment

The following table shows the pin assignment of the M12 sockets:

Pin no.:	Assignment	
1	RX+	
2	TX+	
3	RX-	
4	TX-	

Permitted cable lengths

- With connection using TP cords or TP-XP cords: maximum 10 m
- When connected using IE FC cable with IE RJ45 plug:
  Depending on the cable type, a total length of up to 100 m is permitted between two devices.

IE FC M12 plug PRO

The IE FC M12 Plug PRO has a high degree of protection (IP65/67) and is suitable for connecting the X208PRO to Industrial Ethernet. You can obtain this plug using the following order number: 6GK1 901-0DB20-6AA0.

5.6.2 Optical attachments to Industrial Ethernet

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.

5.6.2.1 Multimode fiber-optic cable

Transmission medium

The following X-200 IE switches use multimode fiber-optic cables as the transmission medium:

- X204-2
- X204-2TS
- X204-2FM
- X206-1
- X212-2
- XF204-2
- XF206-1
- X202-2IRT
- XF204-2BA IRT with corresponding bus adapter

Characteristics:

Transmission speed	100 Mbps
Transmission mode	100Base-FX according to IEEE 802.3
Connectors	• BFOC sockets • LC sockets for BusAdapters
Wavelength	1300 nm
Core diameter	50 or 62.5 µm
Outer diameter	125 µm
Light source	LED
Maximum range (segment length)	5 km*)

*) Depending on the cable used:

- If you are using at least OM1 fibers (attenuation ≤ 1.5 dB/km, bandwidth length product ≥ 500 MHz*km), you can reach a cable length of up to 3 km.
- When are using fibers with attenuation values ≤ 1 dB/km, you can reach a cable length of up to 5 km.

Note

No autonegotiation

With optical transmission, the full duplex mode and transmission speed cannot be changed. For this reason, the autonegotiation function cannot be selected.

5.6.2.2 Single mode fiber-optic cable

Transmission medium

The following X-200 IE switches use single mode fiber-optic cables as the transmission medium:

- X204-2LD
- X204-2LD TS
- X206-1LD
- X212-2LD

Characteristics:

Transmission speed	100 Mbps
Transmission mode	100Base LX
Connectors	BFOC sockets
Wavelength	1310 nm
Core diameter	9 µm
Outer diameter	125 µm
Light source	LED
Maximum range (segment length)	26 km

Note

No autonegotiation

With optical transmission, the full duplex mode and transmission speed cannot be changed. For this reason, the autonegotiation function cannot be selected.

5.6.2.3 POF and PCF cables

Transmission medium

The following X-200 IE switches use Plastic Optical Fiber (POF) or Polymer Cladded Fiber (PCF) as the transmission medium:

- X200-4P IRT
- X201-3P IRT
- X201-3P IRT PRO
- X202-2P IRT
- X202-2P IRT PRO
- XF204-2BA IRT with corresponding bus adapter

Characteristics:

Transmission speed	100 Mbps
Transmission mode	100Base-FX analogous to IEEE 802.3
Connectors	SC RJ jacks
Wavelength	650 nm
Core diameter • with POF • with PCF	 • 980 µm • 200 µm
Outer diameter • with POF • with PCF	 • 1000 µm • 230 µm
Light source	LED
Cable lengths • minimum • maximum segment length	 • 0 m • 50 m for POF 100 m for PCF
Signal attenuation • with POF • with PCF	 • 0.230 dB/m • 0.01 dB/m

Note

No autonegotiation

With optical transmission, the full duplex mode and transmission speed cannot be changed. For this reason, the autonegotiation function cannot be selected.

GI-PCF

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

5.6.3 Push-pull connector for IRT-PRO devices

Push-pull connector technology

With the following devices, the connection to Industrial Ethernet makes use of the PROFINET-compliant push-pull connector technology:

- X204IRT PRO
- X202-2P IRT PRO
- X201-3P IRT PRO

Due to their high degree of protection (IP65), the push-pull connectors are suitable for installation outside cabinets. The plugs do not ship with the product, see the section "Accessories (Page 25)".

Maintenance and cleaning

6

WARNING

Unauthorized repair of devices in explosion-proof design

Risk of explosion in hazardous areas

- Repair work may only be performed by personnel authorized by Siemens.

WARNING

Impermissible accessories and spare parts

Risk of explosion in hazardous areas

- Only use original accessories (Page 25) 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).

- 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.

Technical specifications

7

Construction

Type	Dimensions (W x H x D) in mm	Weight in g	Installation options - DIN rail - S7-300 standard rail - Wall mounting
X204-2	60 x 125 x 124	780	+
X204-2TS	60 x 125 x 124	780	+
X204-2FM	60 x 125 x 124	780	+
X204-2LD	60 x 125 x 124	780	+
X204-2LD TS	60 x 125 x 124	780	+
X206-1	60 x 125 x 124	780	+
X206-1LD	60 x 125 x 124	780	+
X208	60 x 125 x 124	780	+
X208PRO	90 x 125 x 124	1000	+
X212-2	120 x 125 x 124	1200	+
X212-2LD	120 x 125 x 124	1200	+
X216	120 x 125 x 124	1200	+
X224	180 x 125 x 124	1600	+
XF204	75 x 125 x 73	250	DIN rail mounting only
XF204-2	75 x 125 x 73	250	DIN rail mounting only
XF206-1	75 x 125 x 73	250	DIN rail mounting only
XF208	75 x 125 x 73	250	DIN rail mounting only
X200-4P IRT	60 x 125 x 124	780	+
X201-3P IRT	60 x 125 x 124	780	+
X201-3P IRT PRO	90 x 125 x 124	1000	+
X202-2IRT	60 x 125 x 124	780	+
X202-2P IRT	60 x 125 x 124	780	+
X202-2P IRT PRO	90 x 125 x 124	1000	+
X204IRT	60 x 125 x 124	780	+
X204IRT PRO	90 x 125 x 124	1000	+
XF204IRT	75 x 125 x 73	250	DIN rail mounting only
XF204-2BA IRT	100 x 117.1 x 74	250	DIN rail mounting only

Ports

Type	Connectors for end devices or network components via twisted pair RJ45 jacks with MDI X pinning 10/100 Mbps (half / full duplex) [1]	Connections for end devices or network components via FO cable BFOC sockets (100 Mbps, full duplex to 100BaseFX)	Connectors for power supply 4-pin plug-in terminal block, redundant [2]	Connectors for signaling contact 2-pin plug-in terminal block [3]
X204-2	4	2	1	1
X204-2TS	4	2	1	1
X204-2FM	4	2	1	1
X204-2LD	4	2	1	1
X204-2LD TS	4	2	1	1
X206-1	6	1	1	1
X206-1LD	6	1	1	1
X208	8	-	1	1
X208PRO	8 [1]	-	1 [2]	1 [3]
X212-2	12	2	1	1
X212-2LD	12	2	1	1
X216	16	-	1	1
X224	24	-	1	1
XF204	4	-	1	1
XF204-2	4	2	1	1
XF206-1	6	1	1	1
XF208	8	-	1	1
X202-2IRT	2	2	1	1
X204IRT	4	-	1	1
XF204IRT	4	-	1	1

[1] Exception X208PRO: Connection via 4-pin, d-coded M12 socket, IP65/67.

[2] Exception X208PRO: Connection via 4-pin, a-coded M12 socket, IP65/67.

[3] Exception X208PRO: Connection via 5-pin, b-coded M12 socket, IP65/67.

Type	Connectors for end devices or network components via twisted pair RJ45 jacks with MDI X pinning 10/100 Mbps (half / full duplex)	Connections for end devices or network components via FO cable SC RJ jacks (push-pull) (100 Mbps, full duplex to 100BaseFX)	Connector for power supply 4-pin plug-in terminal block, redundant	Connector for signaling contact 2-pin plug-in terminal block
X200-4P IRT	-	4	1	1
X201-3P IRT	1	3	1	1
X202-2P IRT	2	2	1	1

Type	Slots for BusAdapter	Connector for power supply 2-pin plug-in terminal block	Connector for signaling contact 2-pin plug-in terminal block
XF204-2BA IRT	2	2	1

Type	Connectors for end devices or network components via twisted pair RJ45 jacks with MDI X pinning 10/100 Mbps half / full duplex	Connections for end devices or network components via FO cable SC RJ jacks (push-pull), 100 Mbps, full duplex to 100BaseFX	Connector for power supply 5-pin Power Plug PRO connector (male)	Connector for signaling contact 5-pin b-coded M12 connector (male)
X201-3P IRT PRO	1	3	2	1
X202-2P IRT PRO	2	2	2	1
X204IRT PRO	4	-	2	1

Signaling contact

The following applies to all devices:

- Voltage for the signaling contact: 24 VDC
- Current through the signaling contact: maximum 100 mA
- Resistor between F1-F2: < 8 ohms

Electrical data

Type	Supply voltage with redundant connection Rated voltage 12 to 24 VDC SELV Voltage range 10 VDC to 28.8 VDC Permitted voltage range incl. total ripple 10 VDC to 30.2 VDC	Power loss at 12 VDC	Current consumption at rated voltage	Overcurrent protection at input Non-replaceable fuse (F)
X204-2TS	+	6.60 W	600 mA	3.0 A / 32 V
X204-2LD TS	+	6.60 W	600 mA	3.0 A / 32 V

Type	Supply voltage with redundant connection Rated voltage 24 VDC Voltage range 19.2 VDC to 28.8 VDC Permitted voltage range incl. total ripple 18.5 VDC to 30.2 VDC	Power loss at 24 VDC	Current consumption at rated voltage	Overcurrent protection at input PTC resettable fuse
X204-2	+	6.36 W	265 mA	600 mA / 60 V
X204-2FM	+	6.36 W	265 mA	600 mA / 60 V
X204-2LD	+	6.36 W	265 mA	600 mA / 60 V
X206-1	+	5.28 W	220 mA	600 mA / 60 V
X206-1LD	+	5.28 W	220 mA	600 mA / 60 V
X208	+	3.84 W	185 mA	600 mA / 60 V
X208PRO	+	4.4 W	185 mA	600 mA / 60 V

Type	Supply voltage with redundant connection Rated voltage 24 VDC Voltage range 19.2 VDC to 28.8 VDC Permitted voltage range incl. total ripple 18.5 VDC to 30.2 VDC	Power loss at 24 VDC	Current consumption at rated voltage	Overcurrent protection at input PTC resettable fuse
X212-2	+	7.92 W	330 mA	1.1 A / 33 V
X212-2LD	+	7.92 W	330 mA	1.1 A / 33 V
X216	+	5.76 W	240 mA	1.1 A / 33 V
X224	+	8.40 W	350 mA	1.1 A / 33 V
XF204	+	2.64 W	110 mA	1.1 A / 33 V
XF204-2	+	5.28 W	220 mA	1.1 A / 33 V
XF206-1	+	4.08 W	170 mA	1.1 A / 33 V
XF208	+	3.12 W	130 mA	1.1 A / 33 V

Type	Supply voltage with redundant connection Rated voltage 24 VDC Voltage range 19.2 V DC to 31.2 V DC *)	Power loss at 24 VDC	Current consumption at rated voltage	Overcurrent protection at input PTC resettable fuse
X200-4P IRT	+	6.0 W	250 mA	2.5 A (non-replaceable fuse F)
X201-3P IRT	+	5.28 W	220 mA	2.5 A (non-replaceable fuse F)
X201-3P IRT PRO	no redundancy	5.28 W	220 mA	2.5 A (non-replaceable fuse F)
X202-2IRT	+	5.8 W	240 mA	2.5 A (non-replaceable fuse F)
X202-2P IRT	+	4.8 W	200 mA	2.5 A (non-replaceable fuse F)
X202-2P IRT PRO	no redundancy	4.8 W	200 mA	2.5 A (non-replaceable fuse F)
X204IRT	+	3.4 W	140 mA	2.5 A (non-replaceable fuse F)
X204IRT PRO	no redundancy	3.4 W	140 mA	2.5 A (non-replaceable fuse F)
XF204IRT	+	3.4 W	140 mA	1.5 A (non-replaceable fuse F)
XF204-2BA IRT [1)]	+	2.4 W	100 mA	2.5 A (non-replaceable fuse F)

*) The devices meet the requirement according to the voltage range including the total ripple of 18 5 V DC to 30.2 V DC.

1) With the specified power loss and current consumption these are the values of the basic device without plugged in BusAdapters. The values change depending on the port types of

the plugged in BusAdapters. Per port you need to add the following values to the values of the basic device:

Port type	Power loss	Current consumption
RJ45/M12/FC (Fast Connect)	0.6 W	25 mA
SCRJ up to hardware version 5	1.8 W	75 mA
SCRJ as of hardware version 6	1.0 W	40 mA
LC support as of hardware version 4	1.5 W	65 mA
RJ45VD (variable distance)	1.5 W	65 mA
LC-LD	1.25 W	60 mA

Examples

The following table shows the active power loss an current consumption as an example for the basic device with different BusAdapters:

Type	Plugged in BusAdapter	Port types	Power loss	Current consumption
XF204-2BA IRT	2 BusAdapter BA 2 × RJ45	4 x RJ45	4.8 W	200 mA
	2 BusAdapter BA 2 x SCRJ	4 x SCRJ	9.6 W	400 mA
	1 BusAdapter BA 2 x SCRJ 1 BusAdapter BA SCRJ/RJ45	3 x SCRJ 1 x RJ45	8.4 W	350 mA
	2 BusAdapter BA 2 x SCRJ (as of hardware version 6)	4 x SCRJ	6.5 W	270 mA
	1 BusAdapter BA 2 x SCRJ (as of hardware version 6) 1 BusAdapter BA SCRJ / RJ45 (as of hardware version 6)	3 x SCRJ 1 x RJ45	6.0 W	250 mA
	2 BusAdapter LC-LD/LC-LD	4 x LC (SM)	7.4 W	310 mA
	2 BusAdapter RJ45VD/RJ45VD	4 x RJ45VD	8.4 W	350 mA

Optical data

Type	Transmitter output (optical)		Receiver input	
	min. [dBm]	max. [dBm]	Sensitivity min. [dBm]	Input power max. [dBm]
X204-2 **X204-2TS** **X204-2FM** **X206-1** **X212-2** **XF204-2** **XF206-1** **X202-2IRT**	-19	-14	-32	-3
X204-2LD **X204-2LD TS** **X206-1LD** **X212-2LD**	-15	-8	-34	-3
X200-4P IRT **X201-3P IRT** **X201-3P IRT PRO** **X202-2P IRT** **X202-2P IRT PRO**	-8	-2	-23	+1

Type	Connector	Transmitter output (optical)		Receiver input	
XF204-2BA IRT (with corresponding BusAdapters)	Plastic Optical Fiber (SCRJ)	• Minimum • Maximum	• -8 dBm • -2 dBm	• Sensitivity min. • Input power max.	• -23 dBm • +1 dBm
	Polymer Cladded Fiber (SCRJ)	• Minimum • Maximum	• -19 dBm • -11 dBm	• Sensitivity min. • Input power max.	• -26.8 dBm • -4 dBm
	Fiber-optic cable (LC)	• Minimum (at 50 µm) • Minimum (at 62.5 µm) • Maximum	• -24 dBm • -18 dBm • -14 dBm	• Sensitivity min. • Input power max.	• -31 dBm • -12 dBm

Permitted cable lengths - copper

For devices with degree of protection IP20/30

The following cables are permitted in the specified lengths:

- **0 to 55 m:**
  IE TP torsion cable with IE FC RJ45 Plug 180
  - Alternative:
    0 to 45 m IE TP Torsion Cable + 10 m TP Cord via IE Outlet RJ45
- **0 to 85 m:**
  IE FC TP marine / trailing / flexible / FRNC / festoon / food cable with IE FC RJ45 Plug 180
  - Alternative:
    0 to 75 m IE FC TP marine / trailing / flexible / FRNC / festoon / food cable + 10 m TP cord over IE FC outlet RJ45
- **0 to 100 m:**
  IE FC TP standard cable with IE FC RJ45 plug 180
  - Alternative:
    0 to 90 m IE FC TP standard cable + 10 m TP cord via IE FC outlet RJ45

For devices with the "PRO" supplement (degree of protection IP65)

With these devices, splitting of the cables (as above) is not permitted. The following cables are permitted in the specified lengths:

- **0 to 55 m:**
  IE TP torsion cable with IE FC RJ45 Plug 180
- **0 to 85 m:**
  IE FC TP marine / trailing / flexible / FRNC / festoon / food cable with IE FC RJ45 Plug 180
- **0 to 100 m:**
  IE FC TP standard cable with IE FC RJ45 plug 180

For X208PRO (degree of protection IP65/67)

With the X208PRO, splitting of the cables (as above) is not permitted either. The following cables are permitted in the specified lengths:

- **0 to 55 m:**
  IE TP torsion cable with IE FC M12 Plug PRO
- **0 to 85 m:**
  IE FC TP marine / trailing / flexible / FRNC / festoon / food cable with IE FC M12 Plug PRO
- **0 to 100 m:**
  IE FC TP standard cable with IE FC M12 plug PRO

Permitted cable lengths - fiber-optic

Type	1 - 50 m 980/1000 plastic optical fiber (POF)	1 - 100 m 200/230 polymer cladded fiber (PCF) 6 dB max. permitted cable attenuation with 3 dB link power margin	0 - 4000 Glass FO cable 62.5/125 µm glass fibers 0 - 5000 Glass FO cable 50/125 µm glass fibers ≤ 1 dB/km at 1300 nm; 600 MHz x km; 6 dB max. permitted cable attenuation with 3 dB link power margin	0 - 26000 m glass FO cable 9/125 µm single mode fiber; 0.5 dB/km at 1310 nm; 13 dB max. permitted cable attenuation with 2 dB link power margin
X204-2	-	-	+	-
X204-2TS	-	-	+	-
X204-2FM	-	-	+	-
X204-2LD	-	-	-	+
X204-2LD TS	-	-	-	+
X206-1	-	-	+	-
X206-1LD	-	-	-	+
X212-2	-	-	+	-
X212-2LD	-	-	-	+
XF204-2	-	-	+	-
XF206-1	-	-	+	-
X200-4P IRT	+	+	-	-
X201-3P IRT	+	+	-	-
X201-3P IRT PRO	+	+	-	-
X202-2IRT	-	-	+	-
X202-2P IRT	+	+	-	-
X202-2P IRT PRO	+	+	-	-

Degree of protection and MTBF

Type	Degree of protection	MTBF
X204-2	IP30	64 years
X204-2TS	IP20	63 years
X204-2FM	IP30	87 years
X204-2LD	IP30	60 years
X204-2LD TS	IP20	85 years
X206-1	IP30	72 years
X206-1LD	IP30	69 years
X208	IP30	83 years
X208PRO	IP65/67	83 years
X212-2	IP30	46 years
X212-2LD	IP30	43 years
X216	IP30	52 years
X224	IP30	45 years
XF204	IP20	48 years

Type	Degree of protection	MTBF
XF204-2	IP20	60 years
XF206-1	IP20	69 years
XF208	IP20	54 years
X200-4P IRT	IP30	61 years
X201-3P IRT	IP30	65 years
X201-3P IRT PRO	IP65	66 years
X202-2IRT	IP30	73 years
X202-2P IRT	IP30	67 years
X202-2P IRT PRO	IP65	71 years
X204IRT	IP30	77 years
X204IRT PRO	IP65	85 years
XF204IRT	IP20	82 years
XF204-2BA IRT	IP20	78 years

Switching properties

Type	Max. number of learnable addresses	Aging time	Switching technique	Latency
X-200	8000	30 s	Store and forward	5 µs
XF-200	8000	30 s	Store and forward	5 µs
X-200IRT	4096	30 s (configurable)	Store and forward / cut through	< 5 µs
XF-200IRT	4096	30 s (configurable)	Store and forward / cut through	< 5 µs

PRP compatibility

For a device to be used in PRP networks, it must be able to process a frame length of at least 1528 bytes (Jumbo Frames). This value is the maximum frame length including VLAN tag of 1522 bytes plus the length of the PRP trailer of 6 bytes. The following table shows the version as of which the devices are PRP compatible.

Type	As of version *
X204-2	V4.4
X204-2TS	V4.4
X204-2FM	HS 1
X204-2LD	V4.4
X204-2LD TS	HS 1
X206-1	V4.4
X206-1LD	V4.4
X208	V4.4
X208PRO	V4.4
X212-2	V4.4
X212-2LD	V4.4
X216	V4.4
X224	V4.4
XF204	V4.4

Type	As of version *
XF204-2	V4.4
XF206-1	V4.4
XF208	V4.4
X200-4P IRT	HS 1
X201-3P IRT	HS 1
X201-3P IRT PRO	HS 1
X202-2IRT	HS 1
X202-2P IRT	HS 1
X202-2P IRT PRO	HS 1
X204IRT	HS 1
X204IRT PRO	HS 1
XF204IRT	HS 1
XF204-2BA IRT	HS 1

***** Information about the hardware release (HS) or the firmware version (V) as of which PRP is supported.

Temperature class

The following applies to the temperature class: T4

Permitted ambient conditions

Note

Note the mounting position for XF and TS devices

With the following switches an ambient temperature of maximum +40 °C is permitted if the device is installed on a vertical rail:

- X204-2TS
- X204-2LD TS
- XF204
- XF204-2
- XF206-1
- XF208
- XF204IRT

Type	Operating temperature	Storage/transport temperature	Rel. humidity in operation (no condensation)	Operating altitude at max. xx °C ambient temperature
X204-2	-40 °C to +60 °C	-40 °C to +70 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
X204-2TS	-40 °C to +70 °C [1)]	-40 °C to +70 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
X204-2FM	-40 °C to +60 °C	-40 °C to +70 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C

Type	Operating temperature	Storage/transport temperature	Rel. humidity in operation (no condensation)	Operating altitude at max. xx °C ambient temperature
X204-2LD	-40 °C to +60 °C	-40 °C to +70 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
X204-2LD TS	-40 °C to +70 °C [1)]	-40 °C to +70 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
X206-1	-40 °C to +60 °C	-40 °C to +70 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
X206-1LD	-40 °C to +60 °C	-40 °C to +70 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
X208	-40 °C to +60 °C	-40 °C to +70 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
X208PRO	-40 °C to +70 °C	-40 °C to +70 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
X212-2	-40 °C to +60 °C	-40 °C to +70 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
X212-2LD	-40 °C to +60 °C	-40 °C to +70 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
X216	-40 °C to +60 °C	-40 °C to +70 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
X224	-40 °C to +60 °C	-40 °C to +70 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
XF204	-40 °C to +60 °C [1)]	-40 °C to +70 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
XF204-2	-40 °C to +60 °C [1)]	-40 °C to +70 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
XF206-1	-40 °C to +60 °C [1)]	-40 °C to +70 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
XF208	-40 °C to +60 °C [1)]	-40 °C to +70 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
X200-4P IRT	-40 °C to +50 °C [2)]	-40 °C to +85 °C	‹ 95%	2000 m at max. 45 °C 3000 m at max. 40 °C
X201-3P IRT	-40 °C to +60 °C [2)]	-40 °C to +85 °C	‹ 95%	2000 m at max. 55 °C 3000 m at max. 50 °C
X201-3P IRT PRO	-40 °C to +60 °C [2)]	-40 °C to +85 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
X202-2IRT	-40 °C to +60 °C [2)]	-40 °C to +85 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
X202-2P IRT	-40 °C to +60 °C [2)]	-40 °C to +85 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
X202-2P IRT PRO	-40 °C to +60 °C [2)]	-40 °C to +85 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
X204IRT	-40 °C to +70 °C [2)]	-40 °C to +85 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
X204IRT PRO	-40 °C to +70 °C [2)]	-40 °C to +85 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
XF204IRT	-40 °C to +60 °C [1)]	-40 °C to +85 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C

[1)] Note the information on the mounting position above.

[2] The specified temperature is permissible if the devices are mounted at a distance of ≥ 5 cm from the adjacent device. If the devices are mounted at a distance of less than 5 cm from the adjacent device, the maximum ambient temperature is reduced by 10 °C.

Note

Note mounting position

For the following BusAdapters, the maximum operating temperature depends on the mounting position:

- BusAdapter BA 2xSCRJ as of hardware version 6
- BusAdapter BA 2xRJ45VD HA
- BusAdapter BA 2xLC

The specifications for the maximum operating temperature in the following table apply to a DIN rail in horizontal position. The operating temperature is reduced by 10 °C if the DIN rail is vertically mounted.

Type	Plugged in BusAdapter	Operating temperature	Storage/transport temperature	Rel. humidity in operation (no condensation)	Operating altitude at max. xx°C ambient temperature
XF204-2BA IRT	-	-40 °C to +60 °C	-40 °C to +85 °C	‹ 95%	2000 m at max. 56 °C 3000 m at max. 50 °C
	2 BusAdapter BA 2×RJ45 [1]	-30 °C to +60 °C			2000 m at max. 56 °C 3000 m at max. 50 °C
	2 BusAdapters BA 2×RJ45 (coated) [1]	-40 °C to +60 °C			2000 m at max. 56 °C 3000 m at max. 50 °C
	2 BusAdapters BA 2xSCRJ up to hardware version 5	-25 °C to +50 °C			2000 m at max. 45 °C 3000 m at max. 40 °C
	2 BusAdapters BA 2xSCRJ (coated) up to hardware version 5	-40 °C to +50 °C (startup at -25 °C)			2000 m at max. 45 °C 3000 m at max. 40 °C
	2 BusAdapters BA SCRJ/ RJ45 [1] up to hardware version 5	-25 °C to +55 °C			2000 m at max. 50 °C 3000 m at max. 45 °C
	1 BusAdapter BA 2xSCRJ up to hardware version 5 1 BusAdapter BA SCRJ/ RJ45 [1] up to hardware version 5	-25 °C to +50 °C			2000 m at max. 45 °C 3000 m at max. 40 °C
	1 BusAdapter BA 2×RJ45 [1] up to hardware version 5 1 BusAdapter BA SCRJ/ RJ45 [1] up to hardware version 5	-25 °C to +55 °C			2000 m at max. 50 °C 3000 m at max. 45 °C
	1 BusAdapter BA 2xSCRJ up to hardware version 5 1 BusAdapter BA 2×RJ45 [1] up to hardware version 5	-25 °C to +50 °C			2000 m at max. 45 °C 3000 m at max. 40 °C
	2 BusAdapters BA 2xSCRJ as of hardware version 6	-30 °C to +60 °C			2000 m at max. 56 °C 3000 m at max. 50 °C
	2 BusAdapter BA 2xRJ45VD HA	0 °C to +50 °C			2000 m at max. 45 °C 3000 m at max. 40 °C
	2 BusAdapter BA 2xLC	0 °C to +50 °C			2000 m at max. 45 °C 3000 m at max. 40 °C
	2 BusAdapter BA 2xLC-LD	0 °C to +50 °C			2000 m at max. 45 °C 3000 m at max. 40 °C

[1] BusAdapters with FC interfaces have the same temperature values as BusAdapters with RJ45 interfaces.

Frame delay times

The number of IE Switches X-200 connected in a line influences the frame delay.

Note

Frame delay time with X-200 without IRT

When a frame passes through X-200 IE switches, it is delayed by the Store&Forward function of the X-200 IE switches.

- With a 64 byte frame length by approx. 10 microseconds (at 100 Mbps).
- With a 1500 byte frame length by approx. 130 microseconds (at 100 Mbps).

This means that the more X-200 IE switches the frame passes through, the longer the frame delay.

Note

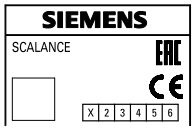
Frame delay time with X-200 with IRT

The more X-200IRT IE switches a frame runs through, the higher the frame delay. By using the "cut through" switching mechanism, the X-200IRT IE switches are ideal to meet the real-time requirements of PROFINET.

Cut through is, however, not possible:

- Between a port set to 10 Mbps and a port set to 100 Mbps.
- When two packets are to be sent at the same time on one port.
  In this case, an X-200 IE switch changes to Store&Forward and the delay increases.

Hardware version



You will find the hardware version of your device on the type plate. On the type plate, the hardware version is printed as a placeholder “X”.

Example: X 2 3 4 5 6

In this case, "X" would be the placeholder for hardware version 1.

Approvals

8

Approvals issued

Note

Issued approvals on the type plate of the device

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

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

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).

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:

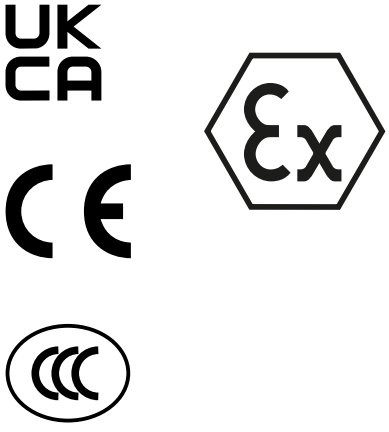
"SIMATIC NET Product Information Use of subassemblies/modules in a Zone 2 Hazardous Area".

You will find this document

- 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.

EMC directive (railway applications)

The TS device variant also meets the requirements of the EU Directive 2014/30/EU "Electromagnetic Compatibility" (EMC Directive).

Applied standards:

- EN 50121-3-2 Railway applications - Electromagnetic compatibility - part 3-2: Rolling stock - Devices
- EN 50121-4 Railway applications - Electromagnetic compatibility - part 4: Interference emissions and immunity of signal telecommunications equipment

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 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 / 3600 / 3810 / ANSI ISA-61010-1
- FM Hazardous (Classified) Location Electrical Equipment:
  Non Incendive / Class I / Division 2 / Groups A,B,C,D / T4 and
  Non Incendive / Class I / Zone 2 / Group IIC / T4

cULus approval for industrial control equipment

cULus Listed IND. CONT. EQ.

Underwriters Laboratories Inc. according to either

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

or

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

Report no. E85972

cULus Approval for Information Technology Equipment

cULus Listed I. T. E.

Underwriters Laboratories Inc. according to either

- UL 60950-1 (information technology equipment)
- CSA C22.2 No. 60950-1 (information technology equipment)

or

- UL 62368-1 (information/communication technology)
- CSA C22.2 No. 62368-1 (information/communication technology)

Report no. E115352

cULus Approval Hazardous Location

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

Underwriters Laboratories Inc. according to either

- UL 60950-1 (Information Technology Equipment)
- CSA C22.2 No. 60950-1 (information technology equipment)

- ANSI/ISA 12.12.01
- CSA C22.2 No. 213

or

- UL 62368-1 (information/communication technology)
- CSA C22.2 No. 62368-1 (information/communication technology)
- ANSI/ISA 12.12.01
- CSA C22.2 No. 213

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)

Shipbuilding

Note that the approvals for shipbuilding with the SCALANCE XF204-2BA IRT are valid with all bus adapters, see section "Accessories (Page 25)".

FDA and IEC marking

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

Device	CLASS 1 LASER Product
SCALANCE X200-4P IRT	●
SCALANCE X201-3P IRT	●
SCALANCE X201-3P IRT PRO	●
SCALANCE X202-2IRT	●
SCALANCE X202-2P IRT	●
SCALANCE X202-2P IRT PRO	●
SCALANCE X204-2	●
SCALANCE X204-2 TS	●
SCALANCE X204-2FM	●
SCALANCE XF204-2	●
SCALANCE X204-2LD	●
SCALANCE X204-2LD TS	●
SCALANCE X206-1	●
SCALANCE XF206-1	●
SCALANCE X206-1LD	●
SCALANCE X212-2	●
SCALANCE X212-2LD	●



Figure 8-1 FDA and IEC approvals

CAUTION

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

Railway approval

TS variants meet the requirements of the railway standards:

- EN 50155 "Railway applications - Electronic equipment used on rolling stock".

Note

When used on railway stock, a stabilized power supply must be used to comply with EN50155.

Railway approval

The SCALANCE X204-2 TS meets the requirements of the railway standard EN 50155:2007 "Railway Applications - Electronic equipment used on rolling stock".

The two TS device variants SCALANCE X204-2 TS and SCALANCE X204-2LD TS meet the requirements of the railway standard DIN EN 45545-2+A1 "Railway Applications - Fire protection on railway vehicles - Part 2: Requirements for fire behavior of materials and components".

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.

Dimension drawings

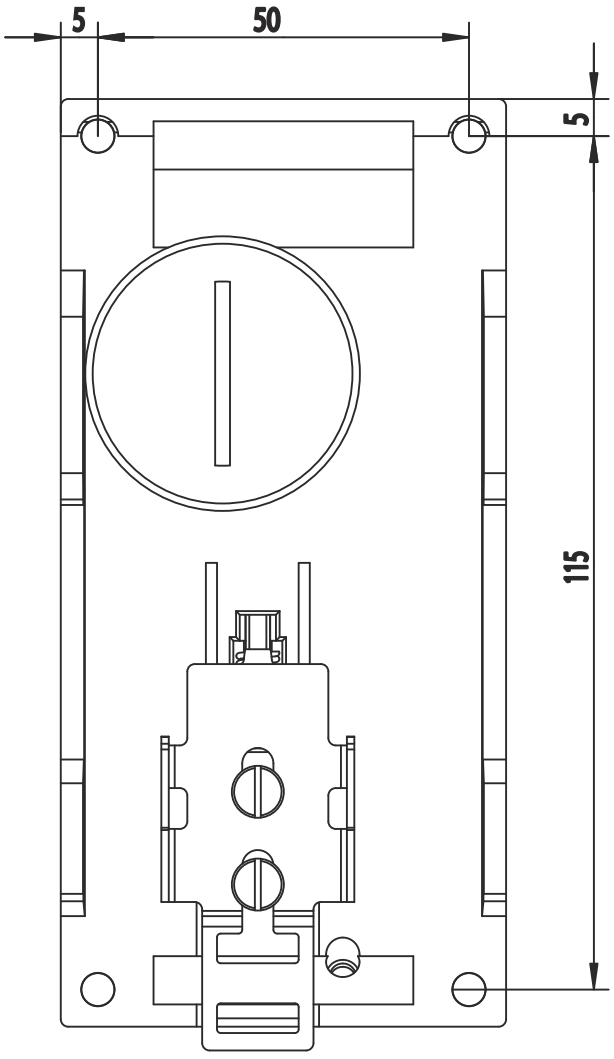


Figure A-1 Drilling pattern SCALANCE X204-2, X204-2TS, X204-2FM, X204-2LD, X204-2LD TS, X206-1, X206-1LD, X208, X200-4P IRT, X201-3P IRT, X202-2IRT, X202-2P IRT, X204IRT

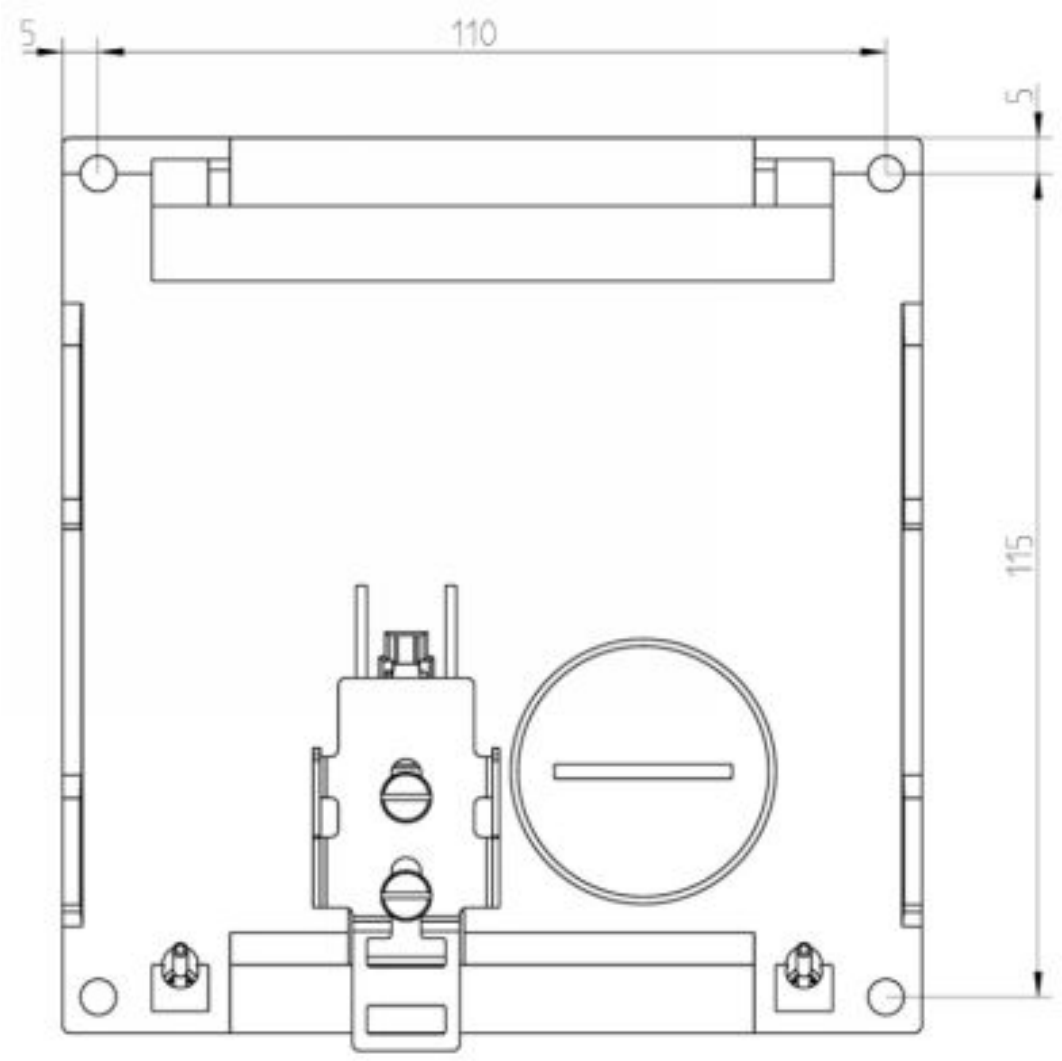


Figure A-2 Drilling pattern SCALANCE X212-2, X212-2LD and X216

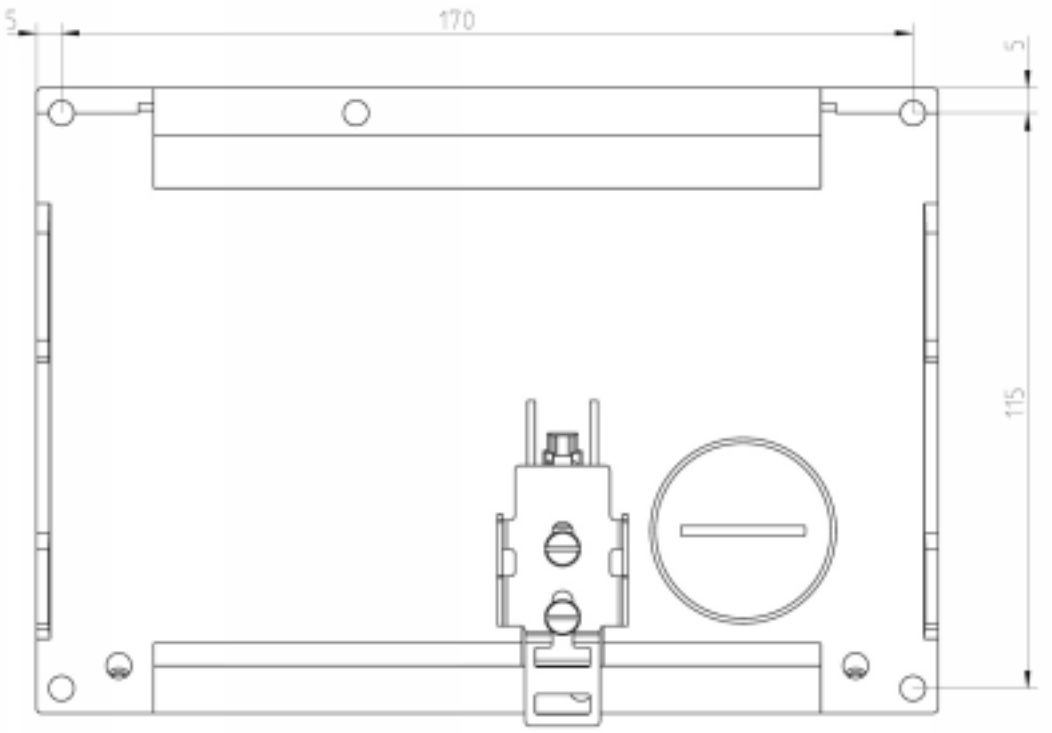


Figure A-3 Drilling pattern SCALANCE X224

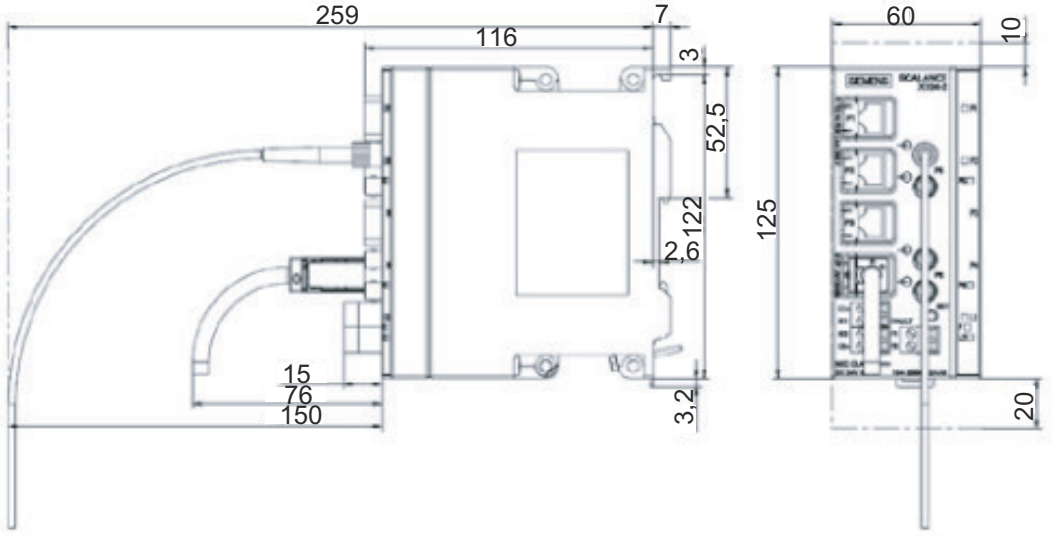


Figure A-4 Side view SCALANCE X-200

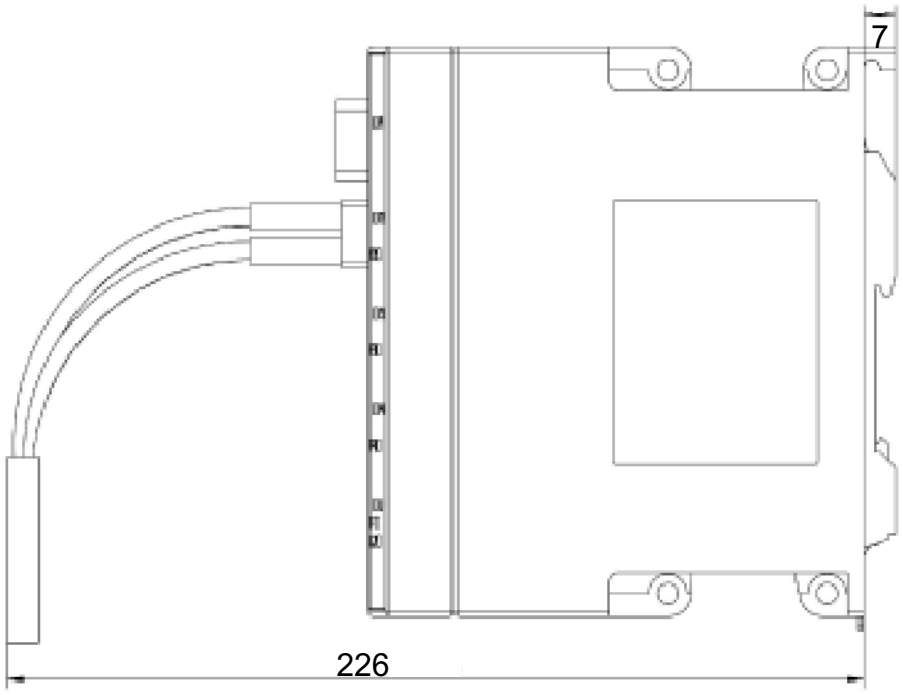


Figure A-5 Side view SCALANCE X-200 POF with POF interface

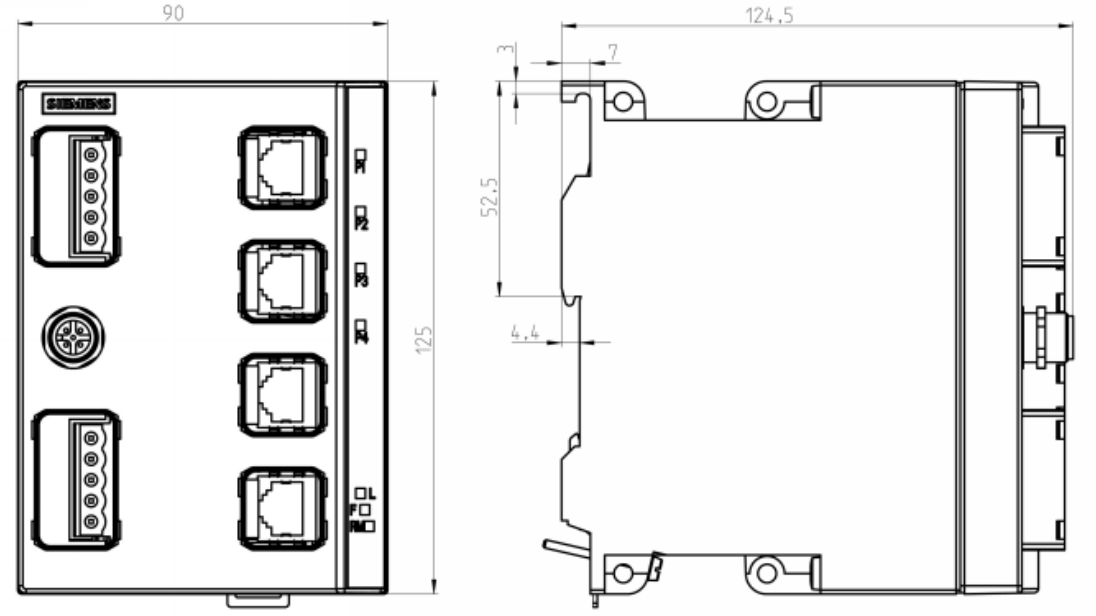


Figure A-6 Dimension drawings of the SCALANCE X208PRO, SCALANCE X201-3P IRT PRO, SCALANCE X202-2P IRT PRO and SCALANCE X204IRT PRO

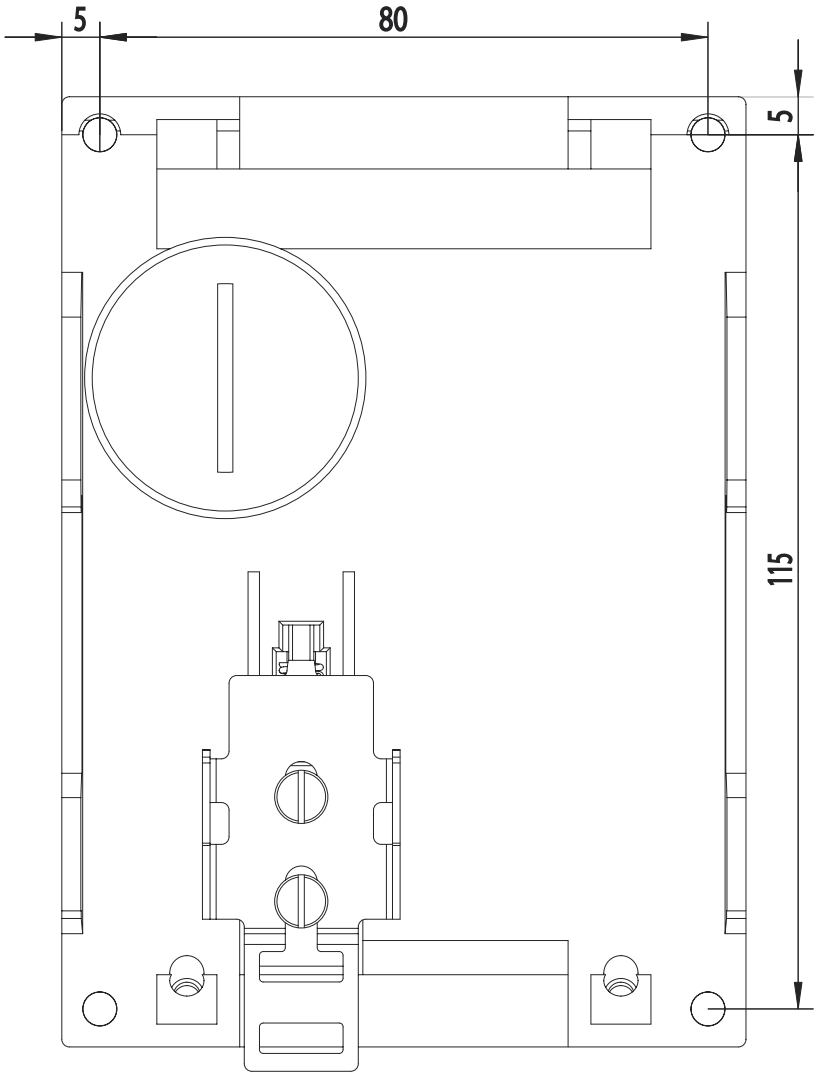


Figure A-7 Drilling pattern of the SCALANCE X208PRO, SCALANCE X201-3P IRT PRO, SCALANCE X202-2P IRT PRO and SCALANCE X204IRT PRO

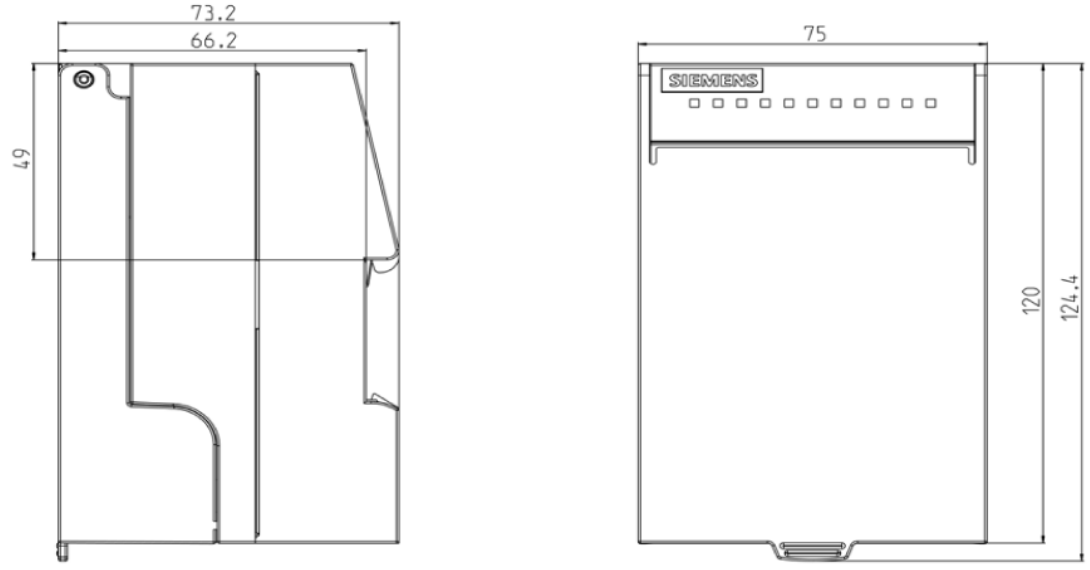


Figure A-8 SCALANCE XF-200 dimension drawings

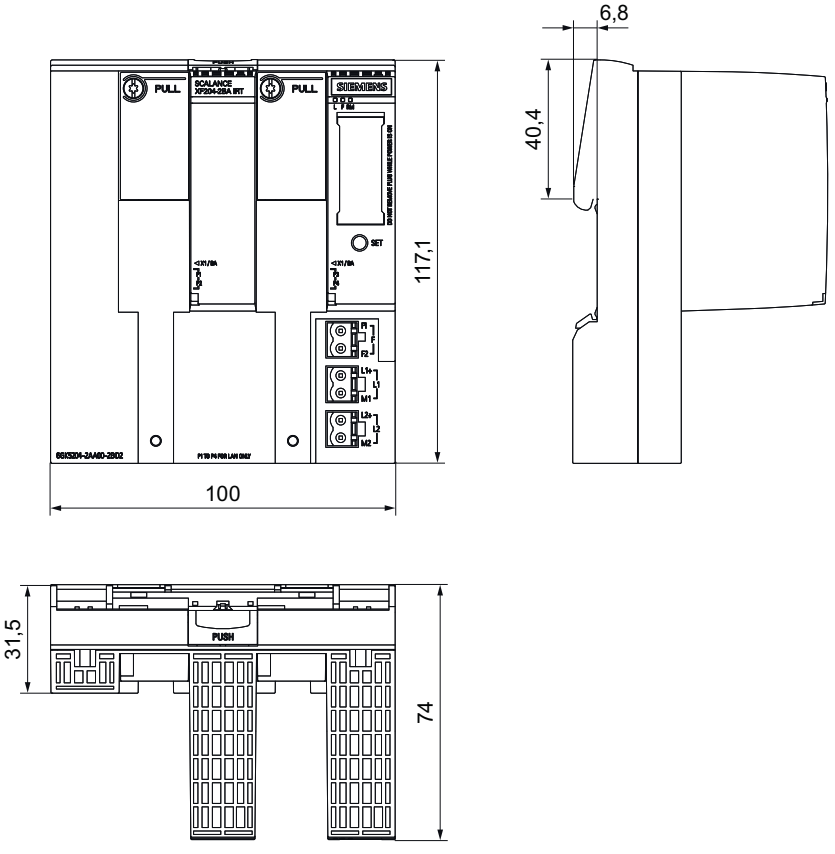


Figure A-9 Dimension drawing SCALANCE XF204-2BA IRT

Test of mechanical stability

B

Mechanical stability

Device type SCALANCE	IEC 60068-2-6 vibration		IEC 60068-2-27 shock	
X204-2	5 – 9 Hz: 3.5 mm 9 – 500 Hz: 1 g 1 octave/min, 20 sweeps		15 g, 6 ms duration 6 shocks per axis	
X204-2TS	5 – 9 Hz: 3.5 mm 9 – 500 Hz: 1 g 1 octave/min, 20 sweeps	5 – 150 Hz: Max. 7.9 g random	15 g, 6 ms duration 6 shocks per axis	50 g, 30 ms duration 6 shocks per axis
X204-2FM	5 – 9 Hz: 3.5 mm 9 – 500 Hz: 1 g 1 octave/min, 20 sweeps		15 g, 6 ms duration 6 shocks per axis	
X204-2LD	5 – 9 Hz: 3.5 mm 9 – 500 Hz: 1 g 1 octave/min, 20 sweeps		15 g, 11 ms duration 6 shocks per axis	
X204-2LD TS	5 – 9 Hz: 3.5 mm 9 – 500 Hz: 1 g 1 octave/min, 20 sweeps	5 – 150 Hz: Max. 7.9 g random	15 g, 6 ms duration 6 shocks per axis	50 g, 30 ms duration 6 shocks per axis
X206-1	5 – 9 Hz: 3.5 mm 9 – 500 Hz: 1 g 1 octave/min, 20 sweeps		15 g, 6 ms duration 6 shocks per axis	
X206-1 LD	5 – 9 Hz: 3.5 mm 9 – 500 Hz: 1 g 1 octave/min, 20 sweeps		15 g, 6 ms duration 6 shocks per axis	
X208	5 – 9 Hz: 3.5 mm 9 – 500 Hz: 1 g 1 octave/min, 20 sweeps		15 g, 6 ms duration 6 shocks per axis	
X208PRO	5 - 9 Hz 3.5 mm 9 - 150 Hz 1 g 10 cycles		15 g, 11 ms duration 6 shocks/axis	
X212-2	5 – 9 Hz: 3.5 mm 9 – 500 Hz: 1 g 1 octave/min, 20 sweeps		15 g, 11 ms duration 6 shocks per axis	
X212-2LD	5 – 9 Hz: 3.5 mm 9 – 500 Hz: 1 g 1 octave/min, 20 sweeps		15 g, 6 ms duration 6 shocks per axis	
X216	5 – 9 Hz: 3.5 mm 9 – 500 Hz: 1 g 1 octave/min, 20 sweeps		15 g, 11 ms duration 6 shocks per axis	
X224	5 – 9 Hz: 3.5 mm 9 – 500 Hz: 1 g 1 octave/min, 20 sweeps		15 g, 11 ms duration 6 shocks per axis	
XF204	5 – 9 Hz: 3.5 mm 9 – 500 Hz: 1 g 1 octave/min, 20 sweeps		15 g, 6 ms duration 6 shocks per axis	

Device type SCALANCE	IEC 60068-2-6 vibration	IEC 60068-2-27 shock
XF204-2	5 – 9 Hz: 3.5 mm 9 – 500 Hz: 1 g 1 octave/min, 20 sweeps	15 g, 6 ms duration 6 shocks per axis
XF206-1	5 – 9 Hz: 3.5 mm 9 – 500 Hz: 1 g 1 octave/min, 20 sweeps	15 g, 6 ms duration 6 shocks per axis
XF208	5 – 9 Hz: 3.5 mm 9 – 500 Hz: 1 g 1 octave/min, 20 sweeps	15 g, 6 ms duration 6 shocks per axis
X200-4P IRT	10 - 58 Hz: 0.075 mm 58 - 500 Hz: 1 g 10 cycles per axis	10 g, 16 ms duration 6 shocks per axis
X201-3P IRT	10 - 58 Hz: 0.075 mm 58 - 500 Hz: 1 g 10 cycles per axis	10 g, 16 ms duration 6 shocks per axis
X201-3P IRT PRO	10 - 58 Hz: 0.075 mm 58 - 500 Hz: 1 g 10 cycles per axis	10 g, 16 ms duration 6 shocks per axis
X202-2IRT	10 - 58 Hz: 0.075 mm 58 - 500 Hz: 1 g 10 cycles per axis	10 g, 16 ms duration 6 shocks per axis
X202-2P IRT	10 - 58 Hz: 0.075 mm 58 - 500 Hz: 1 g 10 cycles per axis	10 g, 16 ms duration 6 shocks per axis
X202-2P IRT PRO	10 - 58 Hz: 0.075 mm 58 - 500 Hz: 1 g 10 cycles per axis	10 g, 16 ms duration 6 shocks per axis
X204IRT	10 - 58 Hz: 0.075 mm 58 - 500 Hz: 1 g 10 cycles per axis	10 g, 16 ms duration 6 shocks per axis
X204IRT PRO	10 - 58 Hz: 0.075 mm 58 - 500 Hz: 1 g 10 cycles per axis	10 g, 16 ms duration 6 shocks per axis
XF204IRT	10 - 58 Hz: 0.075 mm 58 - 500 Hz: 1 g 10 cycles per axis	10 g, 16 ms duration 6 shocks per axis
XF204-2BA IRT	10 - 58 Hz: 0.075 mm 58 - 500 Hz: 1 g 10 cycles per axis	10 g, 16 ms duration 6 shocks per axis

Note

The interfaces of the X-200 IE switches can be divided into groups each with 4 ports:

- P1 to P4
- P5 to P8
- P9 to P12
- etc.

If only ports of different port groups are used, the device meets the requirements for Environment B in compliance with IEEE 802.3, Section 33.4.1.1. If ports of the same port group are used, the requirements for Environment A are met.

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