SIEMENS

SIMATIC NET

Industrial Ethernet SCALANCE XB-000

Operating Instructions

07/10
A2B00077300B

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
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

CAUTION
without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

NOTICE
indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

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 device/system may only be set up and used in conjunction with this documentation. Commissioning and operation of a device/system may only be performed by **qualified personnel**. Within the context of the safety notes in this documentation qualified persons are defined as persons who are authorized to commission, ground and label devices, systems and circuits in accordance with established safety practices and standards.

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 adhered to. The information in the relevant documentation must be observed.

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

Siemens AG
Industry Sector Industry Automation Division
Postfach 48 48
90026 NÜRNBERG
GERMANY

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Introduction

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1.1 Preface

Overview

This chapter provides you with an overview of the functions of the unmanaged Industrial Ethernet switches of the SCALANCE XB-000 product line.

Purpose of the Commissioning Manual

This commissioning manual supports you when commissioning networks with the Industrial Ethernet switches of the SCALANCE XB-000 product line.

Validity of this Commissioning Manual

Table 1- 1 This commissioning manual is valid for the following devices

SCALANCE XB004-1	6GK5 004-1BD00-1AB2
SCALANCE XB004-1LD	6GK5 004-1BF00-1AB2
SCALANCE XB005	6GK5 005-0BA00-1AB2
SCALANCE XB008	6GK5 008-0BA00-1AB2
SCALANCE XB004-1G	6GK5 004-1GL00-1AB2
SCALANCE XB004-1LDG	6GK5 004-1GM00-1AB2
SCALANCE XB005G	6GK5 005-0GA00-1AB2
SCALANCE XB008G	6GK5 008-0GA00-1AB2

Further documentation

The "SIMATIC NET Industrial Ethernet Twisted Pair and Fiber Optic Networks" manual contains additional information on other SIMATIC NET products that you can operate along with the switches of the SCALANCE XB-000 product line in an Industrial Ethernet network.

Finding information

To help you to find the information you require more quickly, the manual includes not only the table of contents but also the following sections in the Appendix:

- Index
- Glossary

Audience

This commissioning manual is intended for persons involved in commissioning networks with the Industrial Ethernet switches of the SCALANCE XB-000 product line.

Standards and approvals

The Industrial Ethernet switches of the SCALANCE XB-000 product line meet the requirements for the CE, UL and C-Tick marks. You will find detailed information in the section "Approvals and Markings" in this commissioning manual in the "Approvals" table.

Note

The specified approvals apply only when the corresponding mark is printed on the product.

1.2 Introduction

What is possible?

The devices of the SCALANCE XB-000 product line allow the cost-effective installation of Industrial Ethernet bus and star structures with switching functionality. The SCALANCE XB004-1, SCALANCE XB004-1G, SCALANCE XB004-1LD and SCALANCE XB004-1LDG also allow a switchover between electrical/optical media.

Note

It is not possible to use devices of the SCALANCE XB-000 product line in a redundant ring because they do not support redundancy.

Note

If devices of the SCALANCE XB-000 product line 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 to attest the immunity of devices of the SCALANCE XB-000 product line to electromagnetic interference is the "surge immunity test" according to EN61000-4-5. This test requires overvoltage protection for the power supply lines. A suitable device is, for example, the Dehn Blitzductor VT AD 24 V type no. 918 402 or comparable protective element.

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

Network topologies

2

2.1 Network topologies

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

Which topologies can be implemented?

Using the Industrial Ethernet switches of the SCALANCE XB-000 product line, you can implement bus and star topologies.

Note

Make sure that the maximum permitted cable lengths for the relevant devices are not exceeded. You will find the permitted cable lengths in the technical specifications.

Bus topology

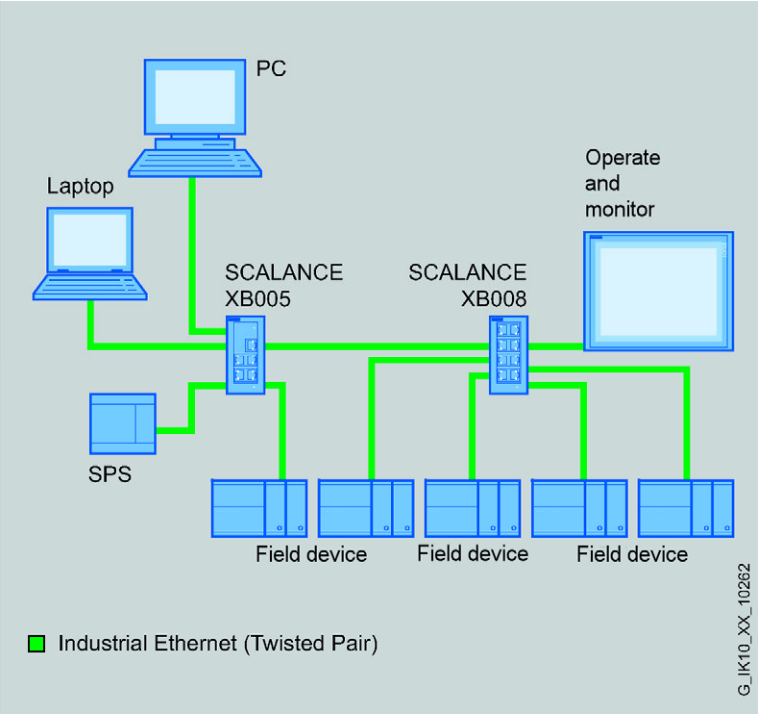


Figure 2-1 Bus topology with SCALANCE XB005 and XB008

Star topology

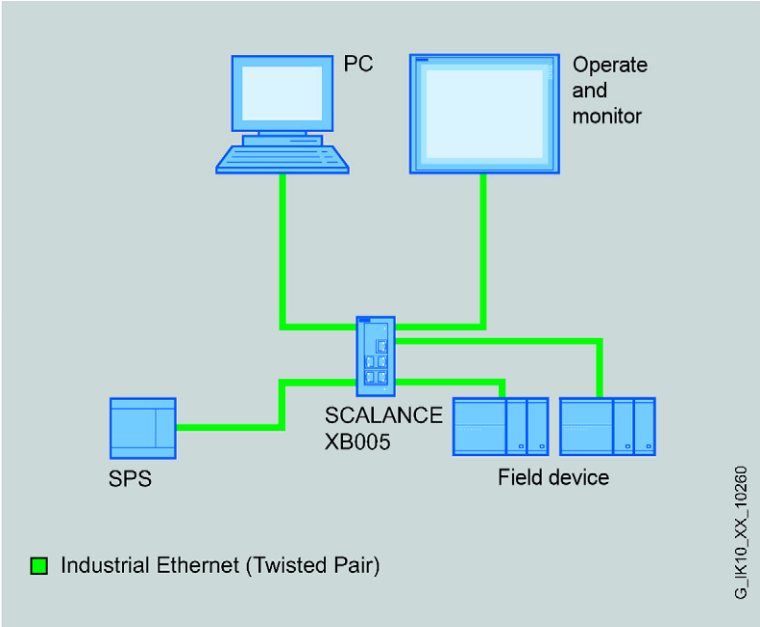


Figure 2-2 Electrical star topology. Example with SCALANCE XB005

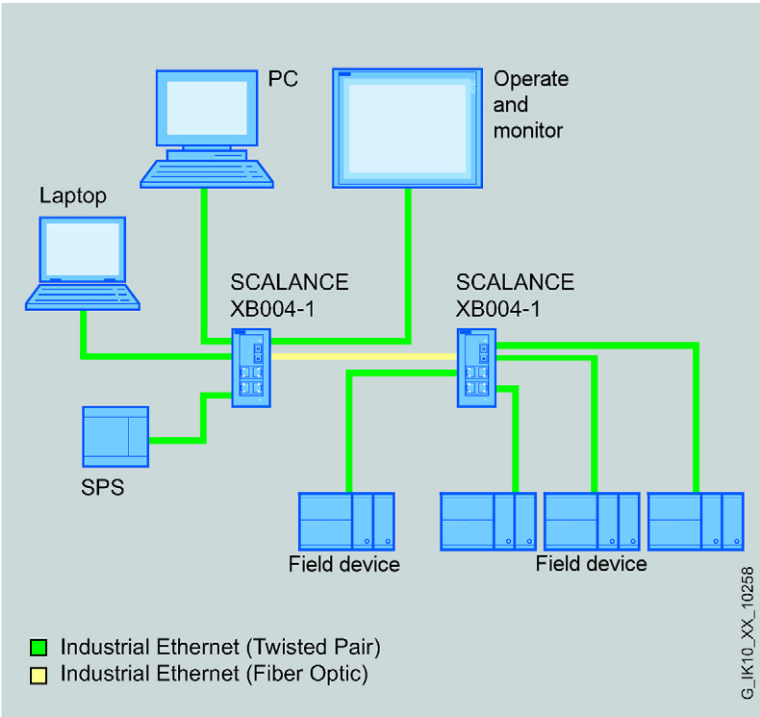


Figure 2-3 Electrical/optical star topology. Example with SCALANCE XB004-1

Product characteristics

3

3.1 Overview of the product characteristics

Table 3- 1 Overview of the product characteristics

	XB004-1	XB004-1LD	XB005	XB008	XB004-1G	XB004-1LDG	XB005G	XB008G
SIMATIC environment	+	+	+	+	+	+	+	+
Diagnostics LED	+	+	+	+	+	+	+	+
24 V DC	+	+	+	+	+	+	+	+
2x 24 V DC	-	-	-	-	-	-	-	-
Signaling contact + on-site operation	-	-	-	-	-	-	-	-
Diagnostics: Web, SNMP, PROFINET	-	-	-	-	-	-	-	-
Passive ring redundancy	-	-	-	-	-	-	-	-
C-PLUG	-	-	-	-	-	-	-	-
Ring redundancy with RM	-	-	-	-	-	-	-	-
Standby redundancy	-	-	-	-	-	-	-	-
IRT capability	-	-	-	-	-	-	-	-
Fast learning	-	-	-	-	-	-	-	-
Passive listening	-	-	-	-	-	-	-	-
Log table	-	-	-	-	-	-	-	-
SNTP + SICLOCK	-	-	-	-	-	-	-	-
Cut Through	-	-	-	-	-	-	-	-

Fast learning:
Quick recognition of MAC addresses on the device that change during operation (for example, when an end node is reconnected).

Table 3- 2 Overview of the connection options

	XB004-1	XB004-1LD	XB005	XB008	XB004-1G	XB004-1LDG	XB005G	XB008G
TP (RJ-45) Fast Ethernet 10 / 100 Mbps	4	4	5	8	-	-	-	-
Fiber multimode (SC) Fast Ethernet 100 Mbps	1	0	-	-	-	-	-	-
Single-mode fiber (SC) Fast Ethernet 100 Mbps	0	1	-	-	-	-	-	-
TP (RJ-45) Fast Ethernet 10 / 100 / 1000 Mbps	-	-	-	-	4	4	5	8
Fiber multimode (SC) Fast Ethernet 1000 Mbps	-	-	-	-	1	0	-	-
Single-mode fiber (SC) Fast Ethernet 1000 Mbps	-	-	-	-	0	1	-	-

3.2 Components of the product

The Industrial Ethernet switches of the SCALANCE XB-000 product line are accompanied by the following:

- 3-pin terminal block (power supply)
- Operating Instructions (on the CD)
- CD

3.3 Unpacking and checking

Unpacking, checking

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

⚠ WARNING
Do not use any parts that show evidence of damage!

3.4 SCALANCE XB004-1 product characteristics

Possible connections

The SCALANCE XB004-1 has four RJ-45 jacks and one SC port for the connection of end devices or other network segments.

Figure 3-1 SCALANCE XB004-1

3.5 SCALANCE XB004-1 TP ports

Connector pinout

On the SCALANCE XB004-1, the TP ports are implemented as an RJ-45 jack with MDI-X assignment (Medium Dependent Interface–Autocrossover) of a network component.

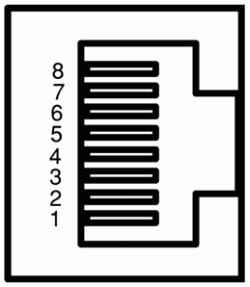


Figure 3-2 RJ-45 jack

Table 3- 3 Pin assignment of the RJ-45 jack

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

NOTICE
TP cords or TP-XP cords with a maximum length of 10 m can be connected to the RJ-45 TP port. With the IE FC cables and IE FC RJ-45 plug 180, an overall cable length of a maximum of 100 m is permitted between two devices depending on the cable type.

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

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

Note

The SCALANCE XB004-1 is a plug-and-play device that does not require settings to be made for commissioning.

Auto polarity exchange

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

MDI/MDIX autocrossover function

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

The devices of the SCALANCE XB-000 product line all support the MDI/MDIX autocrossover function.

Insulation between the TP ports

There are two TP port groups:

Group 1: P1 and P4
Group 2: P2 and P5

Between ports of different port groups, an insulation voltage of 1.5 kV is adhered to (corresponds to IEEE802.3, Chapter 33.4.1.1, Environment B). For example, between P1 and P2.

The requirements for Environment A are met between ports of the same group. For example, between P1 and P4.

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

3.6 SCALANCE XB004-1 FO ports

Transmission rate

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

Transmission mode

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

Since the full duplex mode and the transmission rate cannot be modified for optical transmission, autonegotiation cannot be selected.

Transmission medium

Data transmission is over multimode fiber-optic cable (FOC). The wavelength is 1310 nm.

Multimode fiber-optic cables are used with a core of 50 or 62.5 µm; the light source is an LED.

The outer diameter of the FOC is 125 µm.

Range

The maximum transmission range (segment length) is 3 km for a signal attenuation of the fiber-optic cable of ≤ 1 dB/km at 1310 nm.

Connection method

The cables are connected to SC sockets.

3.7 SCALANCE XB004-1LD product characteristics

Possible connections

The SCALANCE XB004-1LD has four RJ-45 jacks and one SC port for the connection of end devices or other network segments.

Figure 3-3 SCALANCE XB004-1LD

3.8 SCALANCE XB004-1LD TP ports

Connector pinout

On the SCALANCE XB004-1LD, the TP ports are implemented as an RJ-45 jack with MDI-X assignment (Medium Dependent Interface–Autocrossover) of a network component.

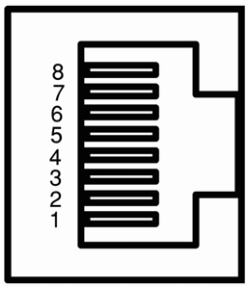


Figure 3-4 RJ-45 jack

Table 3- 4 Pin assignment of the RJ-45 jack

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

NOTICE
TP cords or TP-XP cords with a maximum length of 10 m can be connected to the RJ-45 TP port. With the IE FC cables and IE FC RJ-45 plug 180, an overall cable length of a maximum of 100 m is permitted between two devices depending on the cable type.

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

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

Note

The SCALANCE XB004-1LD is a plug-and-play device that does not require settings to be made for commissioning.

Auto polarity exchange

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

MDI/MDIX autocrossover function

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

The devices of the SCALANCE XB-000 product line all support the MDI/MDIX autocrossover function.

Insulation between the TP ports

There are two TP port groups:

Group 1: P1 and P4
Group 2: P2 and P5

Between ports of different port groups, an insulation voltage of 1.5 kV is adhered to (corresponds to IEEE802.3, Chapter 33.4.1.1, Environment B). For example, between P1 and P2.

The requirements for Environment A are met between ports of the same group. For example, between P1 and P4.

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

3.9 SCALANCE XB004-1LD FO port

Transmission rate

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

Transmission mode

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

Since the full duplex mode and the transmission rate cannot be modified for optical transmission, autonegotiation cannot be selected.

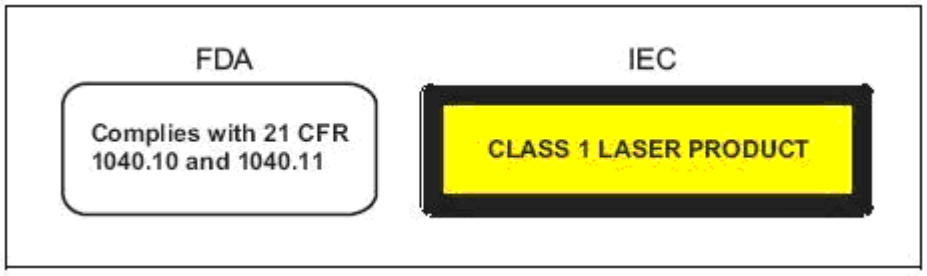
Transmission medium

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

Single-mode fiber-optic cable with a core diameter of 10 µm is used. The outer diameter of the FOC is 125 µm.

Sender

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



Range

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

Connection method

The cables are connected to SC sockets.

3.10 SCALANCE XB005 product characteristics

Possible connections

The SCALANCE XB005 has five RJ-45 jacks for connection of end devices or other network segments.

Figure 3-5 SCALANCE XB005

3.11 SCALANCE XB005 TP ports

Connector pinout

On the SCALANCE XB005, the TP ports are implemented as an RJ-45 jack with MDI-X assignment (Medium Dependent Interface–Autocrossover) of a network component.

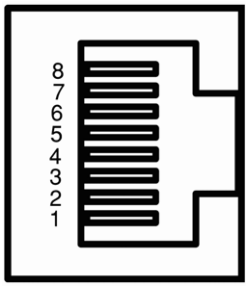


Figure 3-6 RJ-45 jack

Table 3- 5 Pin assignment of the RJ-45 jack

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

NOTICE
TP cords or TP-XP cords with a maximum length of 10 m can be connected to the RJ-45 TP port. With the IE FC cables and IE FC RJ-45 plug 180, an overall cable length of up to 100 m is permitted between two devices depending on the cable type.

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

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

Note

The SCALANCE XB005 is a plug-and-play device that does not require settings to be made for commissioning.

Auto polarity exchange

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

MDI/MDIX autocrossover function

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

The devices of the SCALANCE XB-000 product line all support the MDI/MDIX autocrossover function.

Insulation between the TP ports

There are three TP port groups:

Group 1: P1 and P4
Group 2: P2 and P5
Group 3: P3

Between ports of different port groups, an insulation voltage of 1.5 kV is adhered to (corresponds to IEEE802.3, Chapter 33.4.1.1, Environment B). For example, between P1 and P2.

The requirements for Environment A are met between ports of the same group. For example, between P2 and P5.

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

3.12 SCALANCE XB008 product characteristics

Possible connections

The SCALANCE XB008 has eight RJ-45 jacks for the connection of end devices or other network segments.

Figure 3-7 SCALANCE XB008

3.13 SCALANCE XB008 TP ports

Connector pinout

On the SCALANCE XB008, the TP ports are implemented as an RJ-45 jack with MDI-X assignment (Medium Dependent Interface–Autocrossover) of a network component.

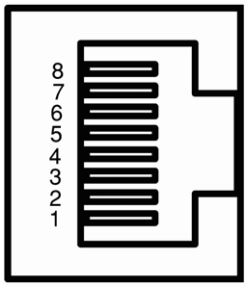


Figure 3-8 RJ-45 jack

Table 3- 6 Pin assignment of the RJ-45 jack

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

NOTICE
TP cords or TP-XP cords with a maximum length of 10 m can be connected to the RJ-45 TP port. With the IE FC cables and IE FC RJ-45 plug 180, an overall cable length of up to 100 m is permitted between two devices depending on the cable type.

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

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

Note

The SCALANCE XB008 is a plug-and-play device that does not require settings to be made for commissioning.

Auto polarity exchange

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

MDI/MDIX autocrossover function

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

The devices of the SCALANCE XB-000 product line all support the MDI/MDIX autocrossover function.

Insulation between the TP ports

There are four TP port groups:

Group 1: P1 and P5
Group 2: P2 and P6
Group 3: P3 and P7
Group 4: P4 and P8

Between ports of different port groups, an insulation voltage of 1.5 kV is adhered to (corresponds to IEEE802.3, Chapter 33.4.1.1, Environment B). For example, between P2 and P4.

The requirements for Environment A are met between ports of the same group. For example, between P1 and P5.

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

3.14 SCALANCE XB004-1G product characteristics

Possible attachments

The SCALANCE XB004-1G has four RJ-45 jacks and one SC port for the connection of end devices or other network segments.

Figure 3-9 SCALANCE XB004-1G

3.15 SCALANCE XB004-1G TP ports

Connector pinout

On the SCALANCE XB004-1G, the TP ports are implemented as an RJ-45 jack with MDI-X assignment (Medium Dependent Interface–Autocrossover) of a network component.

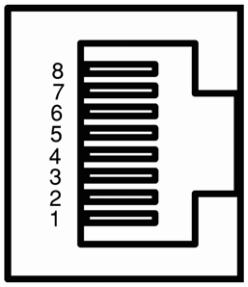


Figure 3-10 RJ-45 jack

Table 3- 7 Pin assignment of the RJ-45 jack

Pin number	Assignment
Pin 8	D4-
Pin 7	D4+
Pin 6	D2-
Pin 5	D3-
Pin 4	D3+
Pin 3	D2+
Pin 2	D1-
Pin 1	D1+

NOTICE
TP cords or TP-XP cords with a maximum length of 10 m can be connected to the RJ-45 TP port. With the IE FC cables (4 x 2), an overall cable length of a maximum of 100 m is permitted between two devices depending on the cable type.

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

Devices not supporting autonegotiation must be set to 1000 Mbps/ half duplex, 100 Mbps/ half duplex or 10 Mbps half duplex.

Note

The SCALANCE XB004-1G is a plug-and-play device that does not require settings to be made for commissioning.

Auto polarity exchange

If a pair of cables is incorrectly connected (Dn+ and Dn- swapped over), the polarity is adapted automatically.

MDI/MDIX autocrossover function

The advantage of the MDI/MDIX autocrossover 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.

The devices of the SCALANCE XB-000G product line all support the MDI/MDIX autocrossover function.

Insulation between the TP ports

There are two TP port groups:

Group 1: P1 and P4
Group 2: P2 and P5

Between ports of different port groups, an insulation voltage of 1.5 kV is adhered to (corresponds to IEEE802.3, Chapter 33.4.1.1, Environment B). For example, between P1 and P2.

The requirements for Environment A are met between ports of the same group. For example, between P1 and P4.

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

3.16 SCALANCE XB004-1G FO ports

Transmission rate

The transmission rate of the optical Fast Ethernet port is 1000 Mbps.

Transmission mode

The transmission mode for 1000Base-SX is specified in the IEEE 802.3z standard.

Since the full duplex mode and the transmission rate cannot be modified for optical transmission, autonegotiation cannot be selected.

Transmission medium

Data transmission is over multimode fiber-optic cable (FOC). The wavelength is 850 nm.

Multimode fiber-optic cable with a core diameter of 50 µm is used. Fiber-optic cables with a core diameter of 62.5 µm are not recommended for 1000Base-SX because this reduces the maximum segment length drastically.

The outer diameter of the FOC is 125 µm.

Sender

The light source is an "eye safe" class 1 laser with a wavelength of 850 nm (EN60825-1).

Transmission range

Depending on the fiber-optic cable used, the maximum transmission range (segment length) is **750 m** when using SIMATIC NET fiber-optic multimode cable with SC duplex connectors or **550 m** when using a standard multimode FO cable.

Connectors

The cables are connected to SC sockets.

3.17 SCALANCE XB004-1LDG product characteristics

Possible attachments

The SCALANCE XB004-1LDG has four RJ-45 jacks and one SC port for the connection of end devices or other network segments.

Figure 3-11 SCALANCE XB004-1LDG

3.18 SCALANCE XB004-1LDG TP ports

Connector pinout

On the SCALANCE XB004-1LDG, the TP ports are implemented as an RJ-45 jack with MDI-X assignment (Medium Dependent Interface–Autocrossover) of a network component.

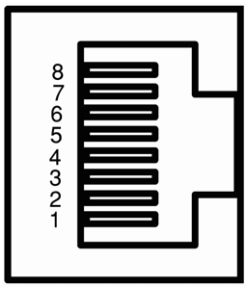


Figure 3-12 RJ-45 jack

Table 3- 8 Pin assignment of the RJ-45 jack

Pin number	Assignment
Pin 8	D4-
Pin 7	D4+
Pin 6	D2-
Pin 5	D3-
Pin 4	D3+
Pin 3	D2+
Pin 2	D1-
Pin 1	D1+

NOTICE
TP cords or TP-XP cords with a maximum length of 10 m can be connected to the RJ-45 TP port. With the IE FC cables (4 x 2), an overall cable length of a maximum of 100 m is permitted between two devices depending on the cable type.

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

Devices not supporting autonegotiation must be set to 1000 Mbps/ half duplex, 100 Mbps/ half duplex or 10 Mbps half duplex.

Note

The SCALANCE XB004-1LDG is a plug-and-play device that does not require settings to be made for commissioning.

Auto polarity exchange

If the pair of receiving cables are incorrectly connected (Dn+ and Dn- swapped over), the polarity is adapted automatically.

MDI/MDIX autocrossover function

The advantage of the MDI/MDIX autocrossover 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.

The devices of the SCALANCE XB-000 product line all support the MDI/MDIX autocrossover function.

Insulation between the TP ports

There are two TP port groups:

Group 1: P1 and P4
Group 2: P2 and P5

Between ports of different port groups, an insulation voltage of 1.5 kV is adhered to (corresponds to IEEE802.3, Chapter 33.4.1.1, Environment B). For example, between P1 and P2.

The requirements for Environment A are met between ports of the same group. For example, between P1 and P4.

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

3.19 SCALANCE XB004-1LDG FO port

Transmission rate

The transmission rate of the optical Fast Ethernet port is 1000 Mbps.

Transmission mode

The transmission mode for 1000Base-LH is specified in the IEEE 802.3z standard.

Since the full duplex mode and the transmission rate cannot be modified for optical transmission, autonegotiation cannot be selected.

Transmission medium

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

Single-mode fiber-optic cable with a core diameter of 10 µm is used. The outer diameter of the FOC is 125 µm.

Sender

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

Transmission range

The maximum transmission range (segment length) is 10 km for a signal attenuation of the fiber-optic cable of ≤ 0.5 dB/km.

Connectors

The cables are connected to SC sockets.

3.20 SCALANCE XB005G product characteristics

Possible attachments

The SCALANCE XB005G has five RJ-45 jacks for connection of end devices or other network segments.

Figure 3-13 SCALANCE XB005G

3.21 SCALANCE XB005G TP ports

Connector pinout

On the SCALANCE XB005G, the TP ports are implemented as an RJ-45 jack with MDI-X assignment (Medium Dependent Interface–Autocrossover) of a network component.

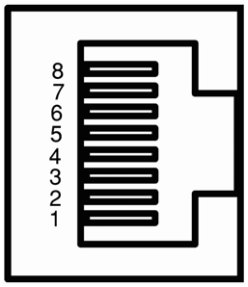


Figure 3-14 RJ-45 jack

Table 3- 9 Pin assignment of the RJ-45 jack

Pin number	Assignment
Pin 8	D4-
Pin 7	D4+
Pin 6	D2-
Pin 5	D3-
Pin 4	D3+
Pin 3	D2+
Pin 2	D1-
Pin 1	D1+

NOTICE
TP cords or TP-XP cords with a maximum length of 10 m can be connected to the RJ-45 TP port. With the IE FC cables (4 x 2), an overall cable length of a maximum of 100 m is permitted between two devices depending on the cable type.

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

Devices not supporting autonegotiation must be set to 1000 Mbps/ half duplex, 100 Mbps/ half duplex or 10 Mbps half duplex.

Note

The SCALANCE XB005G is a plug-and-play device that does not require settings to be made for commissioning.

Auto polarity exchange

If the pair of receiving cables are incorrectly connected (Dn+ and Dn- swapped over), the polarity is adapted automatically.

MDI/MDIX autocrossover function

The advantage of the MDI/MDIX autocrossover 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.

The devices of the SCALANCE XB-000G product line all support the MDI/MDIX autocrossover function.

Insulation between the TP ports

There are three TP port groups:

Group 1: P1 and P4
Group 2: P2 and P5
Group 3: P3

Between ports of different port groups, an insulation voltage of 1.5 kV is adhered to (corresponds to IEEE802.3, Chapter 33.4.1.1, Environment B). For example, between P1 and P2.

The requirements for Environment A are met between ports of the same group. For example, between P2 and P5.

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

3.22 SCALANCE XB008G product characteristics

Possible attachments

The SCALANCE XB008G has eight RJ-45 jacks for the connection of end devices or other network segments.

Figure 3-15 SCALANCE XB008G

3.23 SCALANCE XB008G TP ports

Connector pinout

On the SCALANCE XB008, the TP ports are implemented as an RJ-45 jack with MDI-X assignment (Medium Dependent Interface–Autocrossover) of a network component.

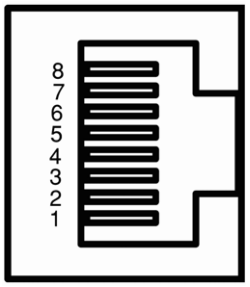


Figure 3-16 RJ-45 jack

Table 3- 10 Pin assignment of the RJ-45 jack

Pin number	Assignment
Pin 8	D4-
Pin 7	D4+
Pin 6	D2-
Pin 5	D3-
Pin 4	D3+
Pin 3	D2+
Pin 2	D1-
Pin 1	D1+

NOTICE
TP cords or TP-XP cords with a maximum length of 10 m can be connected to the RJ-45 TP port. With the IE FC cables (4 x 2), an overall cable length of a maximum of 100 m is permitted between two devices depending on the cable type.

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

Devices not supporting autonegotiation must be set to 1000 Mbps/ half duplex, 100 Mbps/ half duplex or 10 Mbps half duplex.

Note

The SCALANCE XB008G is a plug-and-play device that does not require settings to be made for commissioning.

Auto polarity exchange

If the pair of receiving cables are incorrectly connected (Dn+ and Dn- swapped over), the polarity is adapted automatically.

MDI/MDIX autocrossover function

The advantage of the MDI/MDIX autocrossover 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.

The devices of the SCALANCE XB-000G product line all support the MDI/MDIX autocrossover function.

Insulation between the TP ports

There are four TP port groups:

Group1: P1 and P5
Group2: P2 and P6
Group3: P3 and P7
Group4: P4 and P8

Between ports of different port groups, an insulation voltage of 1.5 kV is adhered to (corresponds to IEEE802.3, Chapter 33.4.1.1, Environment B). For example, between P2 and P4.

The requirements for Environment A are met between ports of the same group. For example, between P1 and P5.

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

3.24 Displays

Indicators of Industrial Ethernet switches of the XB-000 product line

Power indicator 'L' (green LED)

The status of the power supply is indicated by a green LED:

Status	Meaning
LED lit	Power supply is connected
LED not lit	Power supply is not connected or the applied voltage is too low. Refer to the Note in Section 4.8

Port status indicator 'P' (green LED)

The status of the interfaces is signaled for each port by an LED. This is located directly on the port.

Status	Meaning
Port LED is lit	Link exists, no data being received at 10 or 100 or 1000 Mbps
Port LED flashes	Link exists, data being received at port at 10 or 100 or 1000 Mbps
Port LEDs flashing / in sequence	Test phase during power on

3.25 Technical specifications

Table 3- 11 Connectors

Device type SCALANCE	Attachment of end devices or network components over twisted pair	Attachment of end devices or network segments over fiber-optic cable	Connector for power supply
XB004-1	4 x RJ-45 jacks with MDI-X pinning 10/100 Mbps (half / full duplex)	1 x 2 SC sockets (100 Mbps, full duplex to 100BaseFX)	1 x 3-pin plug-in terminal block
XB004-1LD	4 x RJ-45 jacks with MDI-X assignment 10/100 Mbps (half / full duplex)	1 x 2 SC sockets (100 Mbps, full duplex to 100BaseFX)	1 x 3-pin plug-in terminal block
XB005	5 x RJ-45 jacks with MDI-X assignment 10/100 Mbps (half / full duplex)	-	1 x 3-pin plug-in terminal block
XB008	8 x RJ-45 jacks with MDI-X assignment 10/100 Mbps (half / full duplex)	-	1 x 3-pin plug-in terminal block
XB004-1G	4 x RJ-45 sockets with MDI-X pinning 10/100/1000 Mbps (half / full duplex)	1 x 2 SC sockets (1000 Mbps, full duplex to 1000BaseSX)	1 x 3-pin plug-in terminal block
XB004-1LDG	4 x RJ-45 jacks with MDI-X assignment 10/100/1000 Mbps (half / full duplex)	1 x 2 SC sockets (1000 Mbps, full duplex to 1000Base-LX)	1 x 3-pin plug-in terminal block
XB005G	5 x RJ-45 jacks with MDI-X assignment 10/100/1000 Mbps (half / full duplex)	-	1 x 3-pin plug-in terminal block
XB008G	8 x RJ-45 jacks with MDI-X assignment 10/100/1000 Mbps (half / full duplex)	-	1 x 3-pin plug-in terminal block

Table 3- 12 Electrical data

Device type SCALANCE	Power supply 24 V DC (19.2-28.8 V DC) Safety extra-low voltage (SELV)	Power loss (max)	Current consumption (max)	Overcurrent protection at input PTC resettable fuse
XB004-1	+	3.40 W	150 mA	0.6 A / 60 V
XB004-1LD	+	3.40 W	150 mA	0.6 A / 60 V
XB005	+	2.30 W	100 mA	0.6 A / 60 V
XB008	+	3.40 W	150 mA	0.6 A / 60 V
XB004-1G	+	15.6 W	650 mA	1.0 A / 30 V
XB004-1LDG	+	15.6 W	650 mA	1.0 A / 30 V
XB005G	+	13.2 W	550 mA	1.0 A / 30 V
XB008G	+	15.6 W	650 mA	1.0 A / 30 V

Table 3- 13 Permitted cable lengths (copper)

Device type SCALANCE	0 - 55 m IE TP torsion cable with IE FC RJ-45 Plug 180 or 0 - 45 m IE TP torsion cable with IE outlet RJ-45 + 10 m TP cord	0 - 85 m IE FC TP marine / trailing / flexible / festoon / FRNC / food cable with IE FC RJ-45 Plug 180 or 0 - 75 m IE FC TP marine / trailing / flexible / festoon / FRNC / food cable + 10 m TP cord over IE FC outlet RJ-45	0 - 100 m IE FC TP standard cable with IE FC RJ-45 plug 180 or over IE FC outlet RJ-45 with 0 - 90 m IE FC TP standard cable + 10 m TP cord
XB004-1	+	+	+
XB004-1LD	+	+	+
XB005	+	+	+
XB008	+	+	+
XB004-1G	+ (4x2)	+ (4x2)	+ (4x2)
XB004-1LDG	+ (4x2)	+ (4x2)	+ (4x2)
XB005G	+ (4x2)	+ (4x2)	+ (4x2)
XB008G	+ (4x2)	+ (4x2)	+ (4x2)

Table 3- 14 Permitted cable lengths (fiber-optic)

Device type SCALANCE	980/1000 plastic optical fiber (POF)	200/230 polymer cladded fiber (PCF) 6 dB max. permitted FO cable attenuation with 3 dB link power margin	Glass FOC 1) 50/125 µm SIMATIC NET fiber-optic multimode cable or 2) 62.5/125 µm multimode glass FO cable	Glass FOC 10/125 µm single mode fiber; 0.5 dB/km at 1300 nm; 13 dB max. permitted FO cable attenuation with 2 dB link power margin
XB004-1	-	-	0 - 3000 m 1) 2)	-
XB004-1LD	-	-	-	0 - 26000 m
XB005	-	-	-	-
XB008	-	-	-	-
XB004-1G	-	-	0 - 750 m 1)	-
XB004-1LDG	-	-	-	0 - 10000 m
XB005G	-	-	-	-
XB008G	-	-	-	-

Table 3- 15 Aging time / learnable MAC addresses / MTBF

Device type SCALANCE	Aging Time	learnable MAC addresses	MTBF
XB004-1	280 Sekunden	2048	232 Jahre
XB004-1LD	280 Sekunden	2048	238 Jahre
XB005	280 Sekunden	2048	241 Jahre
XB008	300 Sekunden	1024	214 Jahre
XB004-1G	300 Sekunden	8096	124 Jahre
XB004-1LDG	300 Sekunden	8096	124 Jahre
XB005G	300 Sekunden	8096	139 Jahre
XB008G	300 Sekunden	8096	112 Jahre

Table 3- 16 Permitted environmental conditions / EMC

Device type SCALANCE	Operating temperature	Storage/transportation temperature	Relative humidity in operation	Operating altitude at max. xx°C ambient temperature
XB004-1	-10 °C to +60 °C	-40 °C to +80 °C	‹ 95 % (no condensation)	2000 m at max. 56 °C 3000 m at max. 50 °C
XB004-1LD	-10 °C to +60 °C	-40 °C to +80 °C	‹ 95 % (no condensation)	2000 m at max. 56 °C 3000 m at max. 50 °C
XB005	-10 °C to +60 °C	-40 °C to +80 °C	‹ 95 % (no condensation)	2000 m at max. 56 °C 3000 m at max. 50 °C
XB008	-10 °C to +60 °C	-40 °C to +80 °C	‹ 95 % (no condensation)	2000 m at max. 56 °C 3000 m at max. 50 °C
XB004-1G	-10 °C to +60 °C	-40 °C to +80 °C	‹ 95 % (no condensation)	2000 m at max. 56 °C 3000 m at max. 50 °C
XB004-1LDG	-10 °C to +60 °C	-40 °C to +80 °C	‹ 95 % (no condensation)	2000 m at max. 56 °C 3000 m at max. 50 °C
XB005G	-10 °C to +60 °C	-40 °C to +80 °C	‹ 95 % (no condensation)	2000 m at max. 56 °C 3000 m at max. 50 °C
XB008G	-10 °C to +60 °C	-40 °C to +80 °C	‹ 95 % (no condensation)	2000 m at max. 56 °C 3000 m at max. 50 °C

Table 3- 17 Order numbers for accessories

	Order number	XB-000 Fast Ethernet	XB-000(G) Gigabit Ethernet
"Industrial Ethernet TP and Fiber Optic Networks" manual	6GK1970-1BA10-0AA0	+	+
IE TP Cord RJ-45/RJ-45, CAT 6, TP cable 4x2, fitted with 2 RJ-45 connectors, length 0.5 m	6XV1870-3QE50	+	+
IE TP Cord RJ-45/RJ-45, CAT 6, TP cable 4x2, fitted with 2 RJ-45 connectors, length 1 m	6XV1870-3QH10	+	+
IE TP Cord RJ-45/RJ-45, CAT 6, TP cable 4x2, fitted with 2 RJ-45 connectors, length 2 m	6XV1870-3QH20	+	+
IE TP Cord RJ-45/RJ-45, CAT 6, TP cable 4x2, fitted with 2 RJ-45 connectors, length 6 m	6XV1870-3QH60	+	+
IE TP Cord RJ-45/RJ-45, CAT 6, TP cable 4x2, fitted with 2 RJ-45 connectors, length 10 m	6XV1870-3QN10	+	+
IE FC Stripping Tool	6GK1901-1GA00	+	+
IE FC blade cassettes (5 mm)	6GK1901-1GB01	+	+
IE FC TP standard cable GP 2x2	6XV1840-2AH10	+	-
IE FC TP standard cable GP 4x2	6XV1878-2A	(+)	+
IE FC TP trailing cable	6XV1840-3AH10	+	-
IE FC TP marine cable	6XV1840-4AH10	+	-
IE FC TP trailing cable GP	6XV1870-2D	+	-
IE FC TP flexible cable GP 2x2	6XV1870-2B	+	-
IE FC TP flexible cable GP 4x2	6XV1878-2B	(+)	+
IE FC TP FRNC cable GP	6XV1871-2F	+	-
IE FC TP festoon cable GP	6XV1871-2S	+	-
IE FC TP food cable	6XV1871-2L	+	-
IE TP torsion cable	6XV1870-2F	+	-
FO standard cable 50/125, fitted with 2x2 SC connectors, pulling aid, length 80 m	6XV1873-6AN80	+	+
FO standard cable 50/125, fitted with 2x2 SC connectors, pulling aid, length 100 m	6XV1873-6AT10	+	+
FO standard cable 50/125, fitted with 2x2 SC connectors, pulling aid, length 150 m	6XV1873-6AT15	+	+
FO standard cable 50/125, fitted with 2x2 SC connectors, pulling aid, length 200 m	6XV1873-6AT20	+	+
FO standard cable 50/125, fitted with 2x2 SC connectors, pulling aid, length 300 m	6XV1873-6AT30	+	+
FO standard cable GP (50/125)	6XV1873-2A	+	+
FO trailing cable (50/125)	6XV1873-2C	+	+
FO trailing cable GP (50/125)	6XV1873-2D	+	+

	Order number	XB-000 Fast Ethernet	XB-000(G) Gigabit Ethernet
FO ground cable (50/125)	6XV1873-2G	+	+
FO FRNC cable (50/125)	6XV1873-2B	+	+
IE FC RJ-45 Plug 180 2x2 pack of 1	6GK1901-1BB10-2AA0	+	-
IE FC RJ-45 Plug 4x2 pack of 1	6GK1901-1BB11-2AA0	(+)	+
IE FC RJ-45 Plug 180 2x2 pack of 10	6GK1901-1BB10-2AB0	+	-
IE FC RJ-45 Plug 4x2 pack of 10	6GK1901-1BB11-2AB0	(+)	+
IE FC RJ-45 Plug 180 2x2 pack of 50	6GK1901-1BB10-2AE0	+	-
IE FC RJ-45 Plug 4x2 pack of 50	6GK1901-1BB11-2AE0	(+)	+

Legend: (+) Use is possible but not necessary

Note

The number of SCALANCE XB Industrial Ethernet switches connected in series influences the frame propagation time.

When a frame passes through devices of the SCALANCE XB-000 product line, it is delayed by the store and forward function of the switch

- 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 the more devices of the SCALANCE XB-000 product line that the frame passes through, the longer the frame propagation time.

Installation, connection, sources of problems

4

4.1 Installation

Type of mounting

The Industrial Ethernet switches of the SCALANCE XB-000 product line allow two types of installation:

- Installation on a 35 mm DIN rail
- Wall mounting

Note

When installing and operating the device, keep to the installation instructions and safety-related notices as described here and in the manual SIMATIC NET Industrial Ethernet Twisted Pair and Fiber Optic Networks /1/.

Note

Provide suitable shade to protect the device against direct sunlight. This avoids unwanted warming of the device and prevents premature aging of the device and cabling.

⚠ WARNING

If temperatures in excess of 70 °C occur on the cable or at the cable feed-in point, or the temperature at the branching point of the cables exceeds 80 °C, special measures need to be taken. If the equipment is operated at an ambient temperature of 50°C - 60°C, use cables with a permitted ambient temperature of at least 80°C.

⚠ WARNING

Protective measures must be taken to avoid the rated voltage of the equipment being exceeded by more than 40% by transient overvoltages. This is the case if the equipment is supplied exclusively by SELV circuits.

⚠ WARNING

If a device of the SCALANCE XB-000 product line is operated at an ambient temperature higher than 55 °C, the temperature of the device housing may be higher than 70 °C.

The subject unit must be located in a Restricted Access Location where access can only be gained by SERVICE PERSONNEL or by USERS who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken when operated in an air ambient in excess of 55 °C.

4.2 Fixing onto standard mounting rails

Installation on a 35 mm DIN rail

1. Place the upper guide at the top of the housing in the 35 mm DIN rail (DIN EN 60715 TH35).
2. Press the bottom end of the device of the SCALANCE XB-000 product line onto the rail until it locks in place.

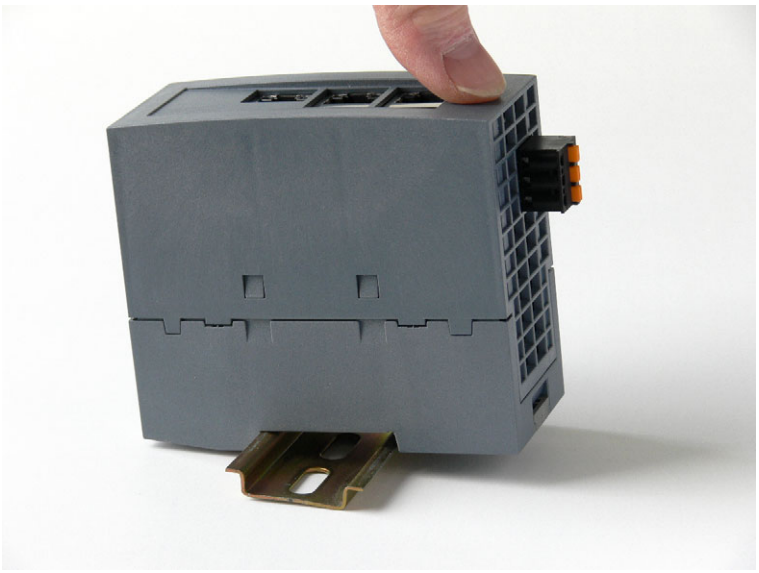


Figure 4-1 Mounting on the DIN rail

3. Fit the connectors for the power supply. See Figure 4-7
4. Insert the terminal block into the sockets on the device. See Figure 4-6

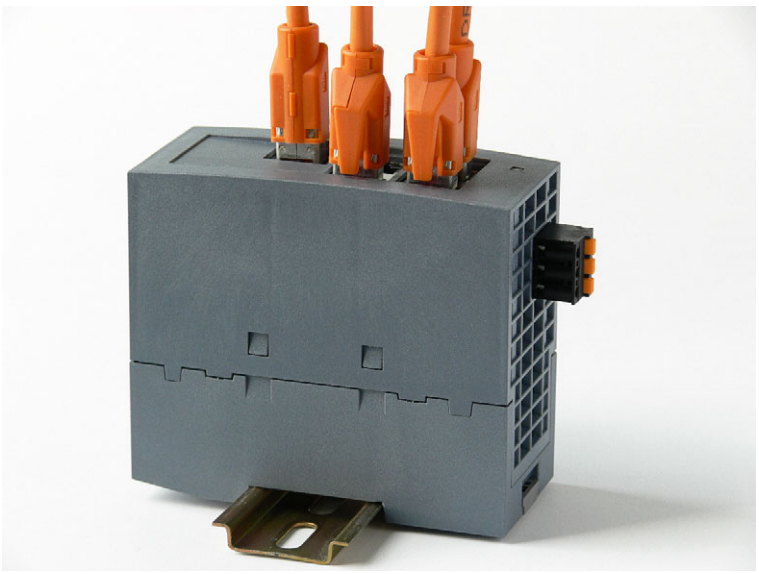


Figure 4-2 XB-000 mounted on the DIN rail

Removal

To remove the device of the SCALANCE XB-000 product line from the DIN rail:

1. First disconnect all connected cables.
2. Using a screwdriver, lever out the catch on the bottom of the device approximately 5 mm while pulling the device away from the rail at the same time.

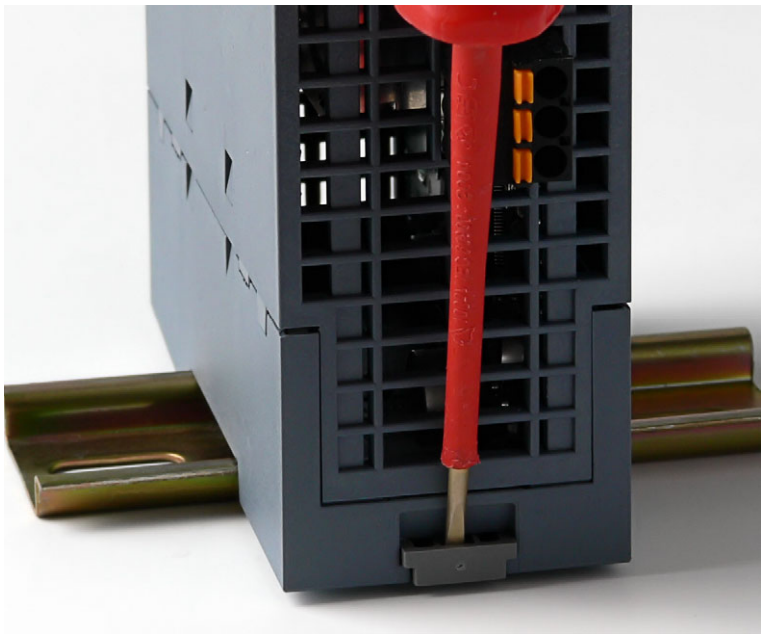


Figure 4-3 Removal of the XB-000

4.3 Wall mounting

Wall mounting

1. By pushing out the two catches, you prepare the device for wall mounting. The distance from the hole center to hole center is 118 mm.

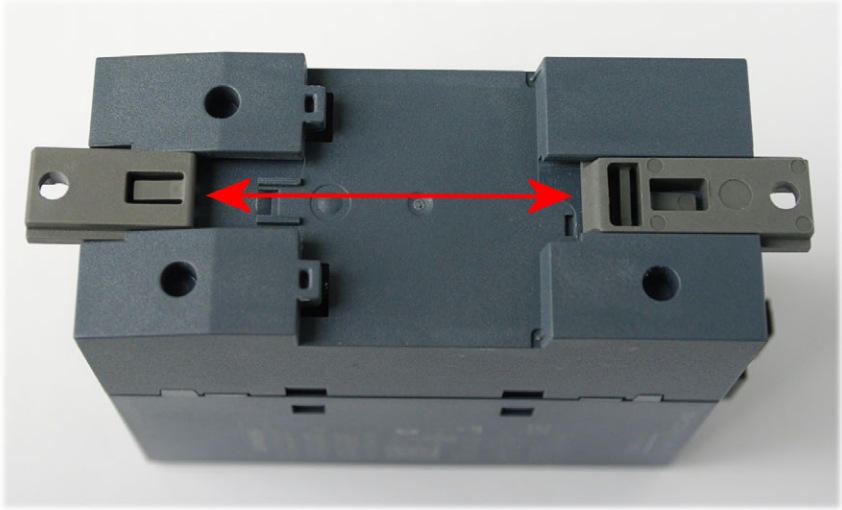


Figure 4-4 Preparation for wall mounting

2. For wall mounting, use suitable mounting fittings for the wall
(for example, for a concrete wall, two plugs 6 mm diameter and 30 mm long, 2 washers and 2 screws 3.5 mm in diameter and 35 mm long).

Figure 4-5 Wall mounting

3. Connect the electrical cable connecting cables.
4. Insert the terminal block into the socket on the device.

Note

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

4.4 Power supply

Power supply

The power supply is connected using a 3-pin plug-in terminal block. The functional ground can be connected to the grounded DIN rail. It does not need to be connected for problem-free operation. The power supply is non-floating.

Figure 4-6 Connecting the power supply

Figure 4-7 Pin assignment of the terminal block

Table 4- 1 Pin assignment for the power supply

Pin number	Assignment
Pin 1	Functional ground
Pin 2	M (chassis ground)
Pin 3	L+ (24 V DC)

⚠WARNING

The device is designed for operation with safety extra-low voltage. This means that only safety extra-low voltages (SELV) complying with IEC 60950-1/EN60950/VDE0805 can be connected to the power supply terminals.

The power supply unit for the device power supply must meet NEC Class 2, as described by the National Electrical Code(r) (ANSI/NFPA 70).

The power of all connected power supply units must total the equivalent of a power source with limited power (LPS limited power source).

Never connect the device to AC voltage.
Never operate the device with DC voltage higher than 28.8 V DC.

4.5 Grounding

35 mm DIN rail

A functional ground can be established by connecting a cable from terminal 1, for example to the DIN rail. Such a cable should be kept as short as possible. Grounding is, however, not necessary for operation.

4.6 Twisted pair cable

Recommendation

- Cable quality at least CAT 5
- Standard cables and IE FC RJ-45 Plug 180 connectors that can be assembled in the field for connection to the LAN over greater distances.
- Prefabricated cables, such as TP Cord RJ-45 0.5 m, for connection of Industrial Ethernet switches of the SCALANCE XB-000 product line over short distances

4.7 Fitting the IE FC RJ-45 Plug

IE FC RJ-45 Plug 180

The rugged node connectors with PROFINET-compliant plug-in connectors are designed for industry and provide sure contact.

Assembly of the IE FC RJ-45 Plug 180 on an IE FC standard cable

For information on assembling an IE FC RJ-45 Plug 180 on a SIMATIC NET Industrial Ethernet FastConnect cable, please refer to the instructions supplied with the IE FC RJ-45 Plug.

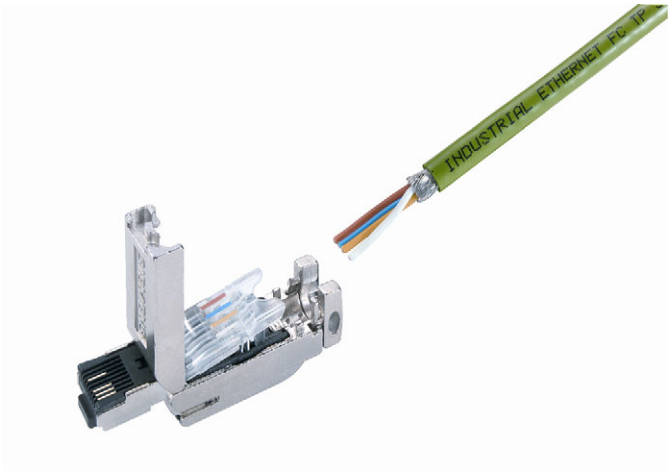


Figure 4-8 IE FC RJ-45 Plug 180

Inserting the IE FC RJ-45 Plug 180

Insert the IE FC RJ-45 Plug 180 into the twisted pair port of the SCALANCE XB000 until it locks in place.

Figure 4-9 Inserting the IE FC RJ-45 Plug 180

Removing the IE FC RJ-45 Plug 180

Press the release button of the IE FC RJ-45 Plug 180 and pull it out of the twisted pair port of the SCALANCE XB000.

4.8 Possible sources of problems and how to deal with them

Fuses

Note

The devices of the SCALANCE XB-000 product line have a resettable fuse/PTC. If the fuse triggers (all LEDs are off despite correctly applied power supply), the device should be disconnected from the power supply for approximately 30 minutes before turning it on again.

LED display when voltage drops

If the power supply is too low, the internal power supply switches off, the L-LED and all port LEDs go off. The functionality of the SCALANCE XB000 is no longer available. A supply voltage of at least 19.2 V is necessary for correct operation.

Device defective

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

Approvals and markings

5

5.1 Notes on the CE Mark

Product name

SCALANCE XB-000		
SIMATIC NET	XB004-1	6GK5 004-1BD00-1AB2
SIMATIC NET	XB004-1LD	6GK5 004-1BF00-1AB2
SIMATIC NET	XB005	6GK5 005-0BA00-1AB2
SIMATIC NET	XB008	6GK5 008-0BA00-1AB2
SIMATIC NET	XB004-1G	6GK5 004-1GL00-1AB2
SIMATIC NET	XB004-1LDG	6GK5 004-1GM00-1AB2
SIMATIC NET	XB005G	6GK5 005-0GA00-1AB2
SIMATIC NET	XB008G	6GK5 008-0GA00-1AB2

EMC directive

89/336/EEC "Electromagnetic Compatibility"

Area of application

The product is designed for use in an industrial environment:

Area of application	Requirements	
	RF interference level	Immunity
Industrial area	EN 61000-6-4: 2007	EN 61000-6-2: 2005

Installation guidelines

The products meet the requirements if you keep to the installation instructions and safety-related notices as described here and in the manual "SIMATIC NET Industrial Ethernet Twisted Pair and Fiber Optic Networks" /1/ when installing and operating the device.

Conformity certificates

The EC Declaration of Conformity is available for the responsible authorities according to the above-mentioned EC Directive at the following address:

Siemens Aktiengesellschaft
Industry Sector Industry Automation Division
Industrielle Kommunikation (I IA SC IC)
Postfach 4848
D-90026 Nürnberg

Notes for the manufacturers of machines

The products are not machines in the sense of the EC Machinery Directive. There is therefore no declaration of conformity relating to the EC Machinery Directive 98/37/EC for these products.

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

Approvals

Table 5- 1

Device type SCALANCE	c-UL-us	FM[1]	C-TICK	CE	ATEX Zone 2[1]	E1
XB004-1	UL 60950-1 CSA C22.2 No. 60950-1	FM 3611 CL.1, Div.2 GP. A.B.C.D T.. CL.1, Zone 2, GP. IIC, T.. Ta:..	AS/NZS 2064 (Class A)	EN 61000-6-4, EN 61000-6-2	EN60079-15:2005 EN60079-0:2006 II 3 G Ex nA II T.. KEMA 08 ATEX 0003 X	-
XB004-1LD	UL 60950-1 CSA C22.2 No. 60950-1	FM 3611 CL.1, Div.2 GP. A.B.C.D T.. CL.1, Zone 2, GP. IIC, T.. Ta:..	AS/NZS 2064 (Class A)	EN 61000-6-4, EN 61000-6-2	EN60079-15:2005 EN60079-0:2006 II 3 G Ex nA II T.. KEMA 08 ATEX 0003 X	-
XB005	UL 60950-1 CSA C22.2 No. 60950-1	FM 3611 CL.1, Div.2 GP. A.B.C.D T.. CL.1, Zone 2, GP. IIC, T.. Ta:..	AS/NZS 2064 (Class A)	EN 61000-6-4, EN 61000-6-2	EN60079-15:2005 EN60079-0:2006 II 3 G Ex nA II T.. KEMA 08 ATEX 0003 X	-
XB008	UL 60950-1 CSA C22.2 No. 60950-1	FM 3611 CL.1, Div.2 GP. A.B.C.D T.. CL.1, Zone 2, GP. IIC, T.. Ta:..	AS/NZS 2064 (Class A)	EN 61000-6-4, EN 61000-6-2	EN60079-15:2005 EN60079-0:2006 II 3 G Ex nA II T.. KEMA 08 ATEX 0003 X	-
XB004-1G	UL 60950-1 CSA C22.2 No. 60950-1	FM 3611 CL.1, Div.2 GP. A.B.C.D T.. CL.1, Zone 2, GP. IIC, T.. Ta:..	AS/NZS 2064 (Class A)	EN 61000-6-4, EN 61000-6-2	EN60079-15:2005 EN60079-0:2006 II 3 G Ex nA II T.. KEMA 08 ATEX 0003 X	-
XB004-1LDG	UL 60950-1 CSA C22.2 No. 60950-1	FM 3611 CL.1, Div.2 GP. A.B.C.D T.. CL.1, Zone 2, GP. IIC, T.. Ta:..	AS/NZS 2064 (Class A)	EN 61000-6-4, EN 61000-6-2	EN60079-15:2005 EN60079-0:2006 II 3 G Ex nA II T.. KEMA 08 ATEX 0003 X	-
XB005G	UL 60950-1 CSA C22.2 No. 60950-1	FM 3611 CL.1, Div.2 GP. A.B.C.D T.. CL.1, Zone 2, GP. IIC, T.. Ta:..	AS/NZS 2064 (Class A)	EN 61000-6-4, EN 61000-6-2	EN60079-15:2005 EN60079-0:2006 II 3 G Ex nA II T.. KEMA 08 ATEX 0003 X	-
XB008G	UL 60950-1 CSA C22.2 No. 60950-1	FM 3611 CL.1, Div.2 GP. A.B.C.D T.. CL.1, Zone 2, GP. IIC, T.. Ta:..	AS/NZS 2064 (Class A)	EN 61000-6-4, EN 61000-6-2	EN60079-15:2005 EN60079-0:2006 II 3 G Ex nA II T.. KEMA 08 ATEX 0003 X	-

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

Note: No applications for shipbuilding approvals will be made for the SCALANCE XB-000.

References

6

6.1 References

Sources of information and other documentation

1. SIMATIC NET Industrial Twisted Pair and Fiber-Optic Networks,
   Order numbers:
   6GK1970-1BA10-0AA0 German
   6GK1970-1BA10-0AA1 English
   6GK1970-1BA10-0AA2 French
   6GK1970-1BA10-0AA4 Italian
2. PROFINET Cabling and Interconnection Technology Guideline
   Can be ordered from the PROFIBUS User Organization (PNO)

6.2 Internet

Further information on the Internet

You will find further information on SIMATIC NET products on the Internet at
http://www.automation.siemens.com/net/index_00.htm

Dimension drawings

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7.1 Dimension drawings

Dimension drawing

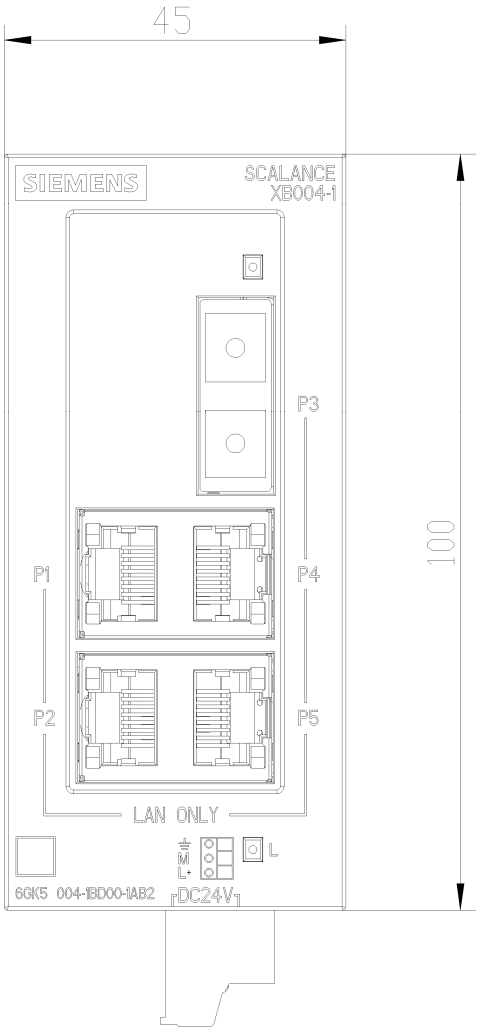

Figure 7-1 Dimension drawing, top view (example: SCALANCE XB004-1)

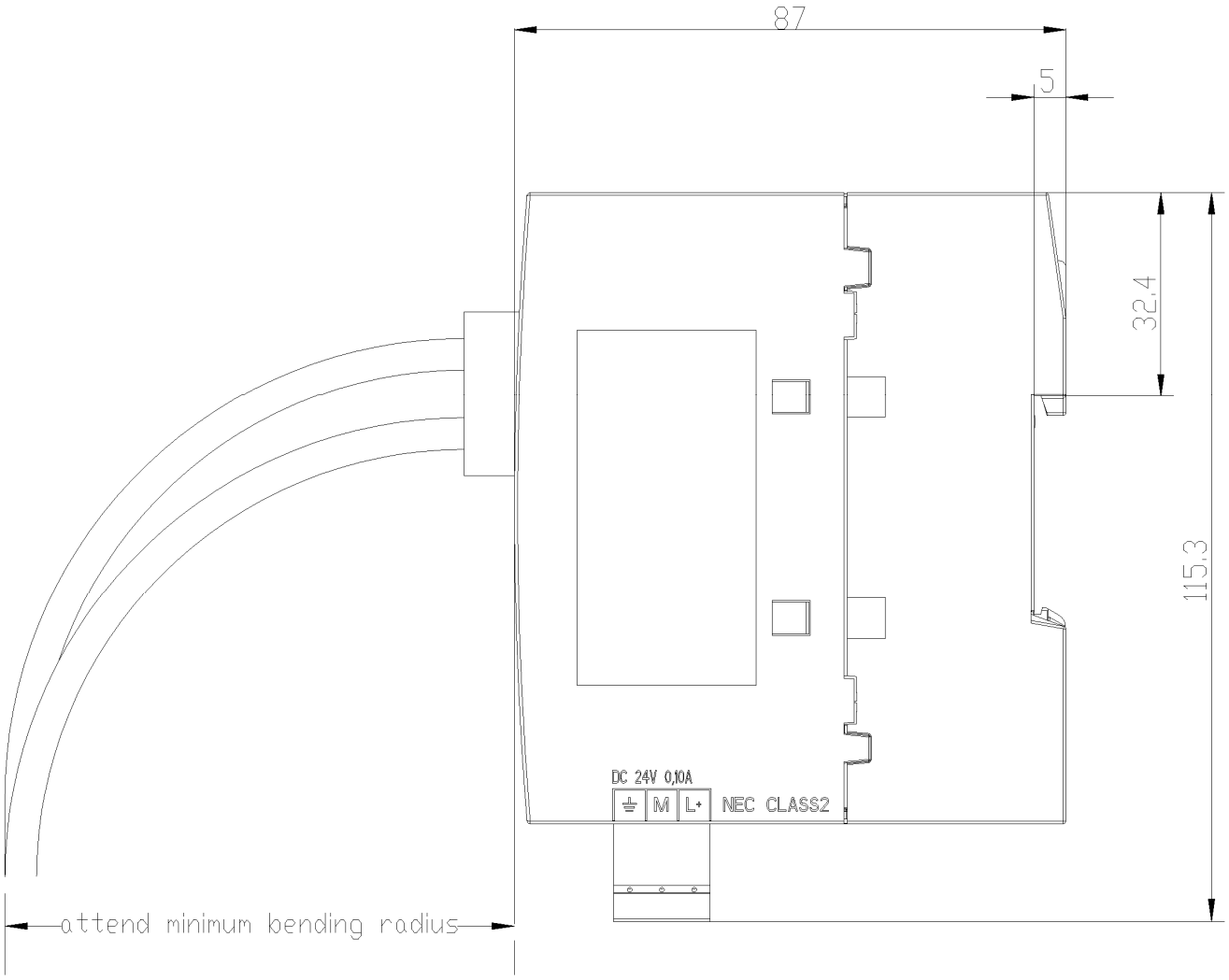

Figure 7-2 Dimension drawing, side view (example: SCALANCE XB004-1)

NOTICE
The minimum bending radius of the optical and electrical signal cables used must not be fallen below.

Example:

SIMATIC NET FO standard cable - bending radius ≥ 70 mm

Glossary

Aging time

The aging time is the time period after which a learned MAC address is discarded if an Industrial Ethernet switch of the SCALANCE XB-000 product line has not received frames with this sender address during this time.

Autocrossover

Technique with which a TP port is automatically switched over between MDI and MDI-X assignment to make a connection independent of the port assignment of the device being attached. This means that crossover cables are not required. The autocrossover function can only be used when the port is set to autonegotiation mode.

Autonegotiation

Procedure standardized by IEEE 802.3 in which the transmission parameters (for example 10/100 Mbps, full/half duplex) are negotiated automatically between the devices.

CRC

Cyclic Redundancy Check. A checksum used in transmission protocols to detect errors in frames.

Multicast

A frame with a multicast address is received by all nodes prepared to receive this address.

Segment

In the Ethernet bus system, transceivers connected together over the bus cable along with the nodes connected over patch cables form a segment. Several such segments can be connected via repeaters. When using twisted pair and fiber-optic cables, each subsection forms a segment.

Store and forward

An entire frame is received, its validity checked (checksum, length etc.) and then buffered. Invalid frames are discarded, in other words, a frame is forwarded only when it is error-free.

TP

Twisted Pair

TP port

Port with a TP connector (RJ-45 jack)

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