SIEMENS

SIMATIC NET

Industrial Ethernet Switches SCALANCE X-400

Compact Operating Instructions

10/2013

A5E01020054-06

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

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

Disclaimer of Liability

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

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Order number: A5E01020054
Ⓟ 12/2013 Technical data subject to change

Table of contents

Introduction

1

Content of the document

These operating instructions (compact) contain information with which you will be able to install and connect up a device of the SCALANCE X-400 product line.

Names of the devices in these operating instructions (compact)

The descriptions in these operating instructions (compact) always apply to the devices of the SCALANCE X-400 product line unless the description relates to a specific device of the product line. In the remainder of this manual, they are referred to as **IE Switches X-400**.

Where can I find more detailed information on the product?

A CD is supplied with the IE Switches X-400 on which you will find a detailed description of the products in PDF format in the relevant subfolder.

Safety instructions 2

2.1 Important notes on using the device

Safety notices on the use of the device

The following safety notices must be adhered to when setting up and operating the device and during all work relating to it such as installation, connecting up, replacing devices or opening the device.

General notes

⚠ WARNING

Safety extra low voltage

The equipment is designed for operation with Safety Extra-Low Voltage (SELV) by a Limited Power Source (LPS). (This does not apply to 100 V...240 V devices.)

This means that only SELV / LPS complying with IEC 60950-1 / EN 60950-1 / VDE 0805-1 must be connected to the power supply terminals. The power supply unit for the equipment power supply must comply with NEC Class 2, as described by the National Electrical Code (r) (ANSI / NFPA 70).

There is an additional requirement if devices are operated with a redundant power supply:

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

⚠ WARNING

Opening the device

DO NOT OPEN WHEN ENERGIZED.

Information on use in hazardous areas

⚠ WARNING

Risk of explosion when connecting or disconnecting the device

EXPLOSION HAZARD

DO NOT CONNECT OR DISCONNECT EQUIPMENT WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.

⚠ WARNING

Replacing components

EXPLOSION HAZARD

SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2 OR ZONE 2.

⚠ WARNING

Requirements for the cabinet/enclosure

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.

Information on use in hazardous areas according to ATEX

WARNING

Requirements for the cabinet/enclosure

To comply with EU Directive 94/9 (ATEX95), this enclosure must meet the requirements of at least IP54 in compliance with EN 60529.

The fiber-optic bus connections labeled SCALANCE MM400 (see type plate) may also be led through a hazardous area zone1 (see also Auto-Hotspot, section "Explosion Protection Directive (ATEX)").

WARNING

Suitable cables for temperatures in excess of 70 °C

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.

WARNING

Protection against transient voltage surges

Provisions shall be made to prevent the rated voltage from being exceeded by transient voltage surges of more than 40%. This criterion is fulfilled, if supplies are derived from SELV (Safety Extra-Low Voltage) only.

Information on use in hazardous areas according to UL-HazLoc

WARNING

EXPLOSION HAZARD

DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS.

This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D or non-hazardous locations only.

This equipment is suitable for use in Class I, Zone 2, Group IIC or non-hazardous locations only.

Description

3

3.1 SCALANCE X414-3E basic device - overview

Overview

The SCALANCE X414-3E has two integrated gigabit Ethernet twisted pair ports (10, 100 or 1000 Mbps) to interconnect multiple switches. The nodes are connected over 12 Fast Ethernet ports integrated in the switch (10 or 100 Mbps).

To set up optical gigabit networks, both integrated gigabit Ethernet ports can be converted to fiber-optic cable over a 2-port gigabit Ethernet module. The module variants MM492-2 for multimode fiber (up to 750 m), MM492-2LD (up to 10 km), MM492-2LH (up to 40 km), and MM492-2LH+ (up to 70 km) and MM492-2ELH (up to 120 km) for single mode fiber are available.

To set up optical Fast Ethernet networks (100 Mbps), you can insert media modules in slots 6 and/or 7. The module variants MM491-2 for multimode fiber (3 km), MM491-2LD (26 km), and MM491-2LH+ (70 km) for single mode fiber are available.

Using the extender module EM495-8, you can expand the X414-3E device by eight Fast Ethernet copper ports.
Using the extender module EM496-4, you can expand the X414-3E device with four Fast Ethernet media module slots.

Figure 3-1 Basic device without media modules, protective caps and covers

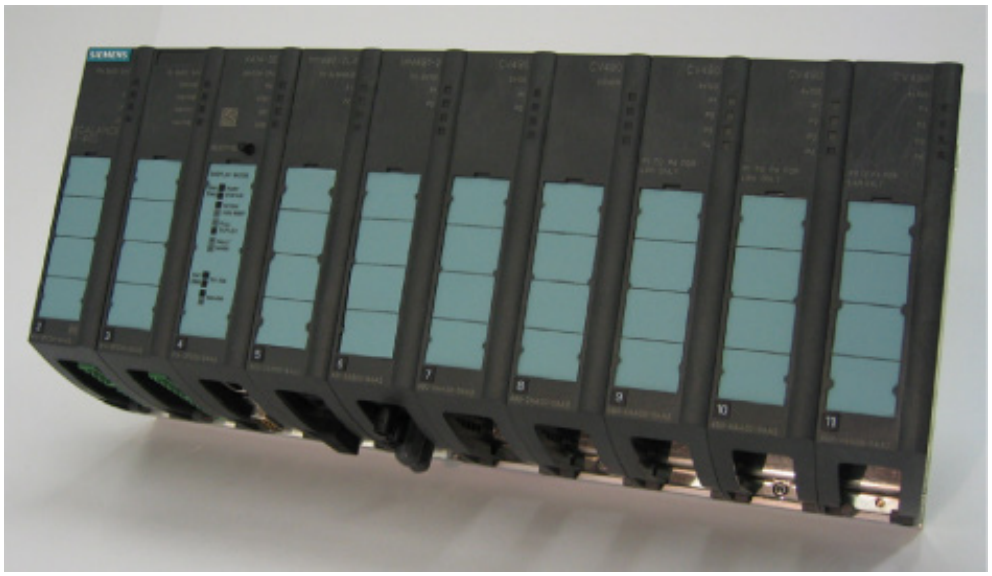

Figure 3-2 Basic device with media modules and covers

Components of the product

The following components are supplied with the SCALANCE X414-3E:

- Basic device with power module in slot 2, DI module with eight digital inputs in slot 3 , CPU module including C-PLUG in slot 4 , protective caps for media module terminal strips in slots 5, 6, and 7.
- 1 CV490 2x1000, cover of media module slot 5
  2 CV490 2x100, cover of media module slots 6 and 7
  1 CV490 cover, dummy cover for slot 8
  3 CV490 4x100, cover for slots 9 to 11
- SIMATIC NET Manual Collection CD
- These operating instructions (compact) A5E01020054
- Slot labels for slots 1 through 18
- 1 connector for power supply (4-pin)
- 1 connector for signaling contact (4-pin)
- 2 connectors for digital inputs (5-pin)
- 1 sheet with 15 labeling strips

Spare parts

- 1 C-PLUG (order number: 6GK1 900-0AB00)
- Cover set CV490 (order number: 6GK5 490-0AA00-0AA2)
  - 1 cover CV490 2x1000
  - 2 covers CV490 2x100
  - 1 dummy cover CV490
  - 3 covers CV490 4x100
- Terminal set (order number: 6GK5 498-1AA00-0AA0)
  - 10 connecting terminals for power supply and signaling contact 4-pin
  - 10 connecting terminals digital inputs 5-pin
- 1 location label (order number: 6ES7 912-0AA00-0AA0)
- 10 DIN A4 sheets each with 15 labeling strips
  (Order number: 6GK5 498-0AA00-0AA0)

3.2 SCALANCE X408-2 basic device - overview

Overview

The SCALANCE X408-2 has four integrated gigabit Ethernet twisted-pair interfaces (10, 100 or 1000 Mbps) to interconnect multiple switches and to connect end devices. Further nodes are connected over four Fast Ethernet ports integrated in the switch (10 or 100 Mbps).

To set up optical gigabit networks, the integrated gigabit Ethernet ports can be converted to fiber-optic cable over a 2-port gigabit Ethernet module. The module variants MM492-2 for multimode fiber (up to 750 m), MM492-2LD (up to 10 km), MM492-2LH (up to 40 km), MM492-2LH+ (up to 70 km) and MM492-2ELH (up to 120 km) for single mode fiber are available.

To set up optical Fast Ethernet networks (100 Mbps), you can also use slots 5 and/or 6 and insert media modules. The module variants MM491-2 for multimode fiber (3 km), MM491-2LD (26 km), and MM491-2LH+ (70 km) for single mode fiber are available.

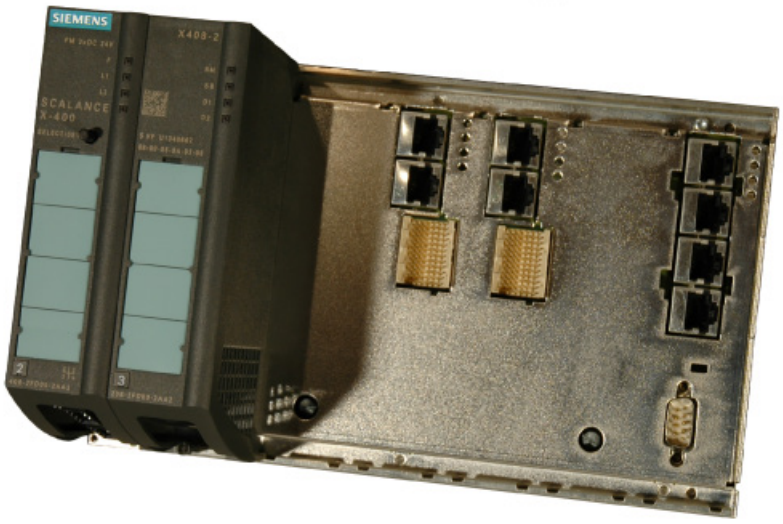

Figure 3-3 SCALANCE X408-2 basic device without media modules, protective caps and covers

Figure 3-4 SCALANCE X408-2 basic device with media modules and covers

Components of the product

The following components are supplied with the SCALANCE X408-2:

- Basic device with power module, CPU module including C-PLUG on slots 2 and 3. Covers for media module terminal strips on slots 5 and 6.
- 2 CV490 2x1000, covers of the media module slots 5 and 6
  2 CV490 cover, dummy covers for slots 4 and 7
  1 CV490 4x100, cover for slot 8
- SIMATIC NET Manual Collection CD
- These operating instructions (compact) A5E01020054
- Slot labels for slots 1 through 8
- 1 connector for power supply (4-pin)
- 1 connector for signaling contact (4-pin)
- 1 sheet with 15 labeling strips

Spare parts

- 1 C-PLUG (order number: 6GK1 900-0AB00)
- Cover set CV490 (order number: 6GK5 490-0AA00-0AA2)
  - 1 cover CV490 2x1000
  - 2 covers CV490 2x100
  - 1 dummy cover CV490
  - 3 covers CV490 4x100
- Terminal set (order number: 6GK5 498-1AA00-0AA0)
  - 10 connecting terminals for power supply and signaling contact 4-pin
  - 10 connecting terminals digital inputs 5-pin
- 1 location label (order number: 6ES7 912-0AA00-0AA0)
- 10 DIN A4 sheets each with 15 labeling strips
  (Order number: 6GK5 498-0AA00-0AA0)

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!

Installation

4

4.1 Safety notices for installation

⚠ 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.

4.2 Installing / uninstalling the SCALANCE X-400

Notes on installation

IE Switches X-400 are designed for installation on an S7-300 standard rail and installation on a 35 mm DIN rail.

Clearances

Certain minimum clearances between an IE Switch X-400 and neighboring equipment must be taken into account. These minimum clearances are necessary during installation and operation to allow the following:

- Install and remove modules,
- to allow the flow of air required for heat dissipation during operation of the IE Switches X-400.

The following figure shows the space you need to allow for an IE Switch X-400.

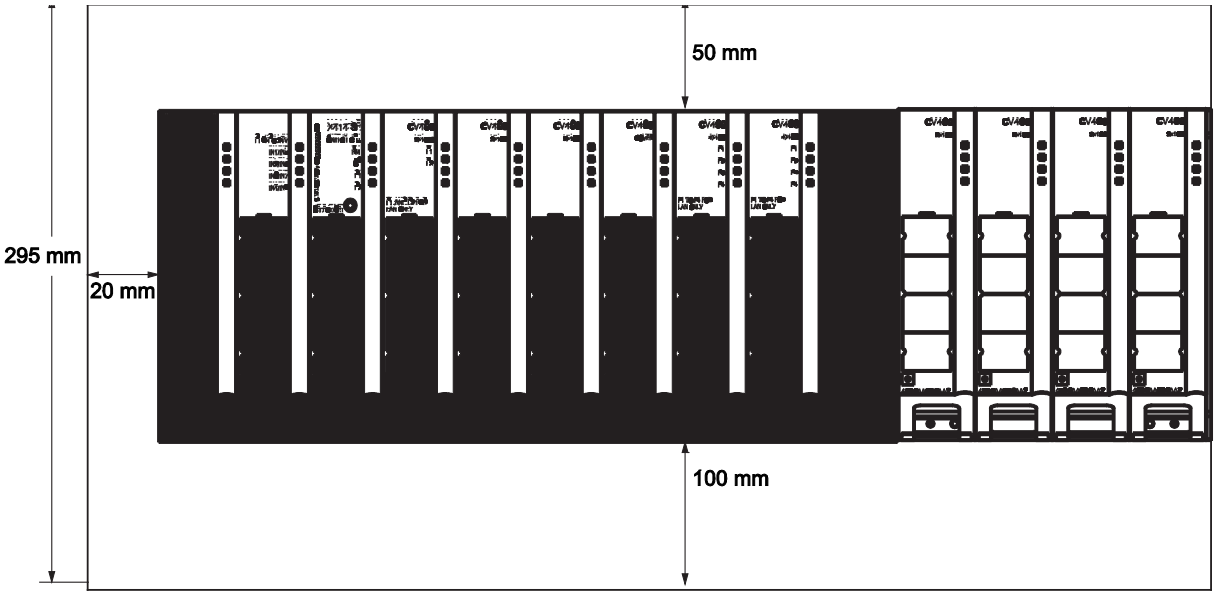

Figure 4-1 Installation clearances for the IE Switches X-400 based on the example of a SCALANCE X414-3E with extender module

See also

SCALANCE X414-3E and X408-2 - technical specifications (Page 41)

4.2.1 Installing / uninstalling with an S7-300 standard rail

Installing on an S7-300 standard rail

For installation, you require a slotted screwdriver with a 5.5 mm wide blade.

Note

When installing the IE Switch X-400, hold it by the backplane and not by the modules, otherwise the device may be damaged.

To install the device, follow the steps below:

1. Tilt the basic device slightly towards the back with the upper groove on the edge of the S7-300 standard rail and push in towards the bottom. In this position, the basic device should not slip off but it can be adjusted horizontally to the left or right until the required position is achieved.
2. Remove the covers and the dummy cover.
3. If media modules are inserted, remove them as well.
   First loosen the screw below the labeling strip of the module.
4. Using a screwdriver with a 5.5 mm wide blade, tighten the two captive screws in the backplane until the basic device can no longer be moved to the side.

Note

Only horizontal installation permitted (ventilation slit top/bottom).

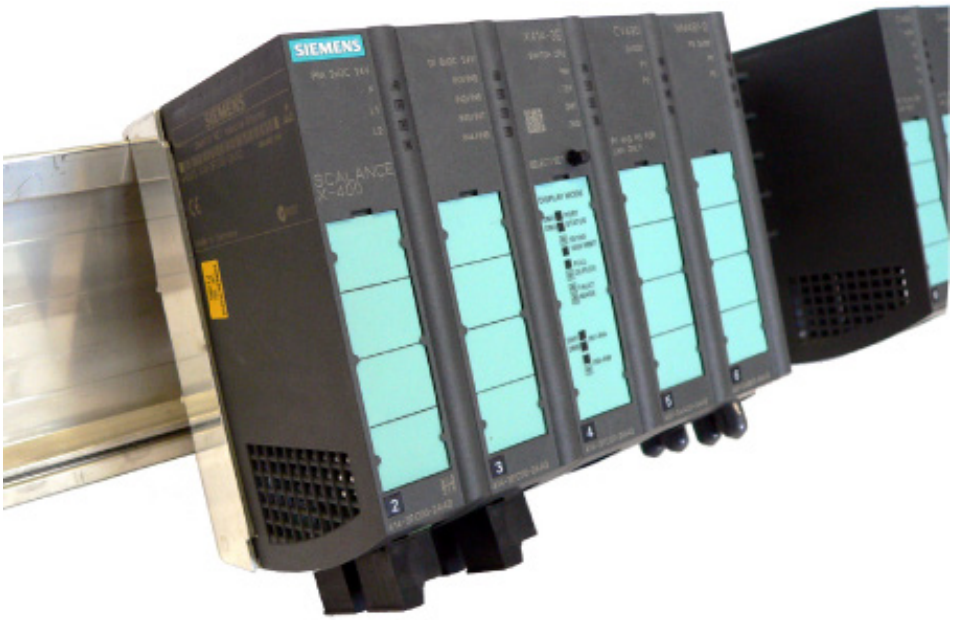

Figure 4-2 Installing on an S7-300 standard rail

Removing from the S7-300 standard rail

To remove the device, you require a slotted screwdriver with a 5.5 mm wide blade.

Note

When uninstalling the IE Switch X-400, hold it by the backplane and not by the modules, otherwise the device may be damaged.

To remove the device, follow the steps below:

1. Remove the covers and the dummy cover.
2. If media modules are inserted, remove them as well.
   First loosen the screw below the labeling strip of the module.
3. Using a slotted screwdriver with a 5.5 mm wide blade, loosen the two captive screws in the backplane.
4. Pull out the lower part of the basic device slightly towards the front and lift it from the S7-300 standard rail.

4.2.2 Installing / uninstalling with a 35 mm DIN rail

Installation on a 35 mm DIN rail

⚠ CAUTION

If the IE Switch X-400 is liable to be subjected to severe vibration (> 10 g), use the S7-300 standard rail for installation. The DIN rail does not provide adequate support for the IE Switch X-400 with vibration greater than 10 g.

Since the two captive screws are not used to secure the device when installing on a 35 mm DIN rail, it is not absolutely necessary to remove the covers and the blind cover, although this does make it easier to handle the basic device.

Note

When installing the IE Switch X-400, hold it by the backplane and not by the modules, otherwise the device may be damaged.

To install the device, follow the steps below:

1. Place the central groove containing two spring clips on the back of the basic device on the upper edge of the DIN rail with the device tilted slightly towards the back. Note that both spring clips must be located behind the edge of the DIN rail.
2. Press the basic device down and push in the lower part until you hear it click into place in the DIN rail.
3. Adjust the basic device to the right or left until it is in the required position.

Note

Only horizontal installation permitted (ventilation slit top/bottom).

Figure 4-3 Installing the SCALANCE X414-3E on a 35 mm DIN rail

Removing the SCALANCE X414-3E from a 35 mm DIN rail

Since the two captive screws are not used to secure the device when removing from a 35 mm DIN rail, it is not absolutely necessary to remove the covers and the blind cover, although this does make it easier to handle the basic device.

Note

When uninstalling the SCALANCE X414-3E, hold it by the backplane and not by the modules, otherwise the device may be damaged.

To remove the device, follow the steps below:

1. Push the basic device down until the lower part can be pulled away from the rail to the front.
2. Lift the IE Switch X-400 up and off the DIN rail.

Removing the SCALANCE X408-2 from a 35 mm DIN rail

Since the two captive screws are not used to secure the device when removing from a 35 mm DIN rail, it is not absolutely necessary to remove the covers and the blind cover, although this does make it easier to handle the basic device.

Note

When uninstalling the SCALANCE X408-2, hold it by the backplane and not by the modules, otherwise the device may be damaged.

To remove the device, follow the steps below:

1. Using a slotted screwdriver with a 5.5 mm wide blade, pull down the clip on the basic device slightly and pull out the lower part of the basic device to the front so that the spring clips can no longer engage.
2. Lift the IE Switch X-400 up and off the DIN rail.

Figure 4-4 Removing the SCALANCE X408-2 from a 35 mm DIN rail

4.3 Fitting / removing a cover and dummy cover

4.3.1 Fitting / removing a cover/dummy cover

Variants of the covers/dummy cover

There are three variants of the covers

- CV490 2x1000
  1 Gbps, electrical transmission, 2 port displays
  possible slots:
  SCALANCE X414-3E: 5
  SCALANCE X408-2: 5 and 6
- CV490 2x100
  possible slots
  SCALANCE X414-3E: 6, 7 and extender module EM496-4 slots 12 through 15
- CV490 4x100
  10/100 Mbps, electrical transmission, 4 port displays
  possible slots
  SCALANCE X414-3E: 9 through 11 and extender module EM495-8 slots 12, 13
  SCALANCE X408-2: 8

There is a dummy cover

- CV490 COVER
  (no displays connected to front)
  possible slots
  SCALANCE X414-3E: 8
  SCALANCE X408-2: 4 and 7

Fitting a cover/dummy cover

There is only a dummy cover (no port displays to the front) on slot 8 (SCALANCE X414-3E) or slot 7 (SCALANCE X408-2).

To fit a cover, you do not require any tools.

1. Place the two lower guides of the cover/dummy cover into the recesses at the lower edge of the basic device. It should no longer be possible to move the cover/dummy cover to the side.
2. Tilt the cover/dummy cover at an angle towards the back until the two plastic pins at the back top edge of the cover/dummy cover jut into the recesses in the basic device.
3. Press the upper part of the cover/dummy cover onto the basic device until the fluted middle section of the cover/dummy cover is heard to click into place.
4. Secure the labeling strip on the front of the cover/dummy cover.

Removing a cover/dummy cover

To remove a cover, you do not require any tools.

1. Press on the fluted middle section of the top of the cover/dummy cover next to the backplane.
2. At the same time, tilt the cover/dummy cover down at an angle, the two guides initially remain in the recesses at the lower edge of the basic device.
3. Remove the cover/dummy cover by pulling it upwards.

Connecting up

5

5.1 Connectors

5.1.1 Connectors of the power supply (X1) of the SCALANCE X-400

Polarity reversal protection X1, X2

The two 4-pin male connectors (X1, X2) for the power supply and the signaling contact have no polarity reversal protection. If the connectors are accidentally swapped over, this does not cause damage or destroy circuits. Normal functionality is, however, not available while the connectors are swapped over.

Connectors of the power supply (X1)

The redundant power supply is connected over a 4-pin connector at the front terminal block on the power module.

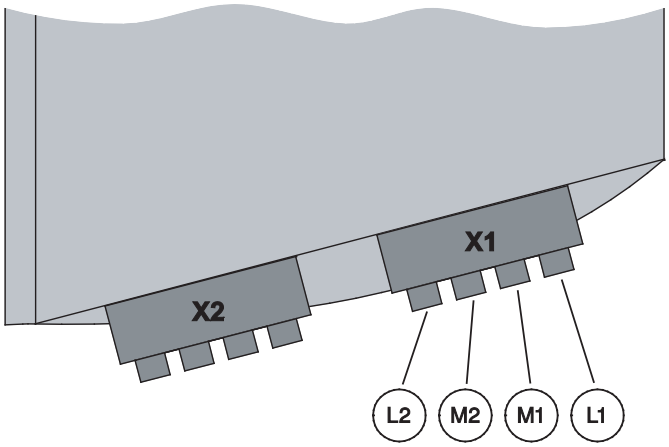

Figure 5-1 Pins of connector X1

Conn. 1	L1+	+ 24 V power supply 1
	M1	Ground
	M2	Ground
	L2+	+ 24 V power supply 2

NOTICE

If IE Switches X-400 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-400 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.

5.1.2 Connectors of the signaling contact and grounding strap (X2) of the SCALANCE X-400

Polarity reversal protection X1, X2

The two 4-pin male connectors (X1, X2) for the power supply and the signaling contact have no polarity reversal protection. If the connectors are accidentally swapped over, this does not cause damage or destroy circuits. Normal functionality is, however, not available while the connectors are swapped over.

Connectors of the signaling contact and grounding strap (X2)

The signaling contact is connected by contacts MK1 and MK2 on the 4-pin connector to the rear terminal block on the power module.

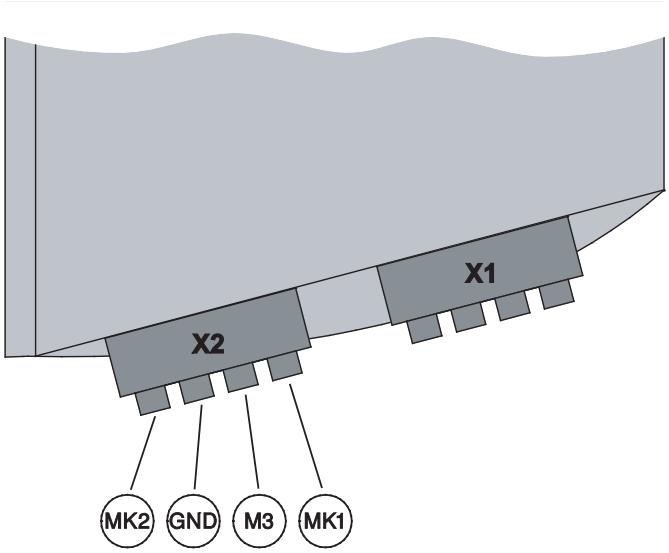

Figure 5-2 Pins of connector X2

By inserting a strap between protective earth GND and M3, IE Switches X-400 can be operated with grounded reference potential.

When the device ships, no strap is fitted (non-grounded reference potential).

Conn. 2	MK1	Floating signaling contact relay connector 1
	M3	Ground
	GND	Protective earth
	MK2	Floating signaling contact relay connector 2

5.1.3 Connectors of the digital inputs of the SCALANCE X414-3E

Polarity reversal protection X1, X2

The two 5-pin male connectors (X1, X2) of the digital inputs 1 through 8 have no polarity reversal protection. If the connectors are accidentally swapped over, this does not cause damage or destroy circuits. In display modes A and C or B and D, incorrect inputs are displayed during the time the connectors are swapped over.

⚠ WARNING
The input voltage must not exceed + 30 V and must not fall below – 30 V, otherwise the DI module will be destroyed.

Connectors of the digital inputs 1 to 4 on male connector X1

Digital inputs 1 through 4 are connected using a 5-pin connector at the front terminal block on the DI module.

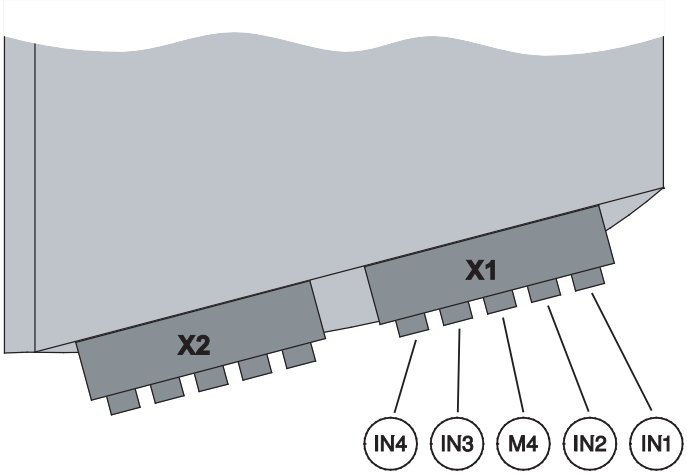

Figure 5-3 Pins of connector X1 (inputs 1-4)

Conn. 1	IN1	Digital input 1
	IN2	Digital input 2
	M4	Ground
	IN3	Digital input 3
	IN4	Digital input 4

Digital inputs 5 to 8 on male connector X2

Digital inputs 5 through 8 are connected using a 5-pin connector at the rear terminal block on the DI module.

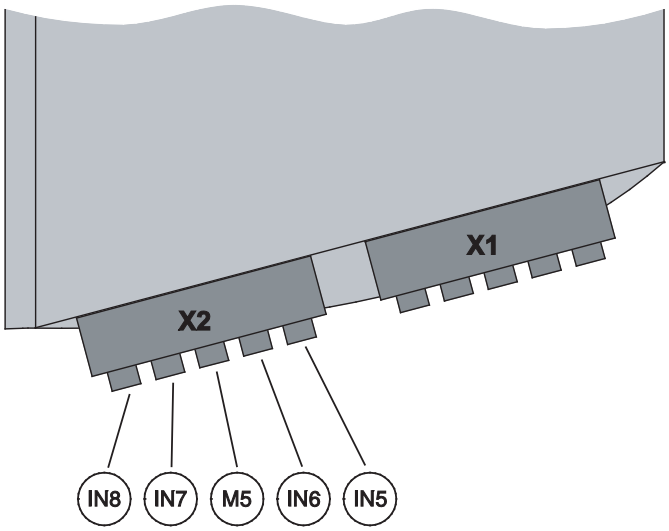

Figure 5-4 Pins of connector X2 (inputs 5-8)

Conn. 2	IN5	Digital input 5
	IN6	Digital input 6
	M5	Ground
	IN7	Digital input 7
	IN8	Digital input 8

Certifications and approvals

6

6.1 Approvals, Certificates

Note

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.

EC directives

SIMATIC NET products meet the requirements and aims of the following EC directives.

Declaration of conformity

You will find the EC Declaration of Conformity for this product on the Internet at the following address:

http://support.automation.siemens.com/WW/view/en/67218486

--> Entry list
--> Entry type "Certificates"
--> Certificate type "Declaration of Conformity"

Example German: "EG-Konformitätserklärung SCALANCE X414-3E",
Example English: "Declaration of Conformity SCALANCE X414-3E".

EMC directive (electromagnetic compatibility)

The SIMATIC NET product meets the requirements of the EC Directive: 2004/108/EEC "Electromagnetic Compatibility"

The product is designed for use in the following areas:

Area of application	Requirements	
	Emission	Immunity
Industrial area	EN 61000-6-4: 2001	EN 61000-6-2 : 2001

WARNING

Personal injury and damage to property may 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.

- **Keep to the installation guidelines**
  The product meets 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 product.
- **You can always find the latest documentation on the Internet!**
  The current descriptions of the currently available products can always be found on the Internet under the specified entry IDs/Internet pages:
  - SIMATIC NET Industrial Twisted Pair and Fiber Optic Networks Manual
    8763736
  - EMC Installation Guideline, Planning Guide
    28518276
- **Working on the product**
  To protect the product from electrostatic discharge, personnel must first discharge any electrostatic charge from their body before touching the product.

Note

The product was tested with a device that also complies with the standards listed above. If the product is operated with a device that does not meet these standards, there is no guarantee that the corresponding values will be adhered to.

Machinery directive

The product remains a component in compliance with Article 4 (2) of the EC Machinery Directive 89/392/EEC.

According to the machinery directive, 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 directive 89/392/EEC.

Note for the manufacturers of machines

This product is not a machine in the sense of the EC Machinery Directive. There is therefore no declaration of conformity relating to the EC Machinery Directive 89/392/EEC for this product.

Explosion protection directive (ATEX)

The SIMATIC NET product meets the requirements of the EC directive:
94/9/EC "Equipment and Protective Devices for Use in Potentially Explosive Atmospheres"

Note

When using (installing) SIMATIC NET products in hazardous area zone 2, make absolutely sure that the associated conditions are adhered to.

You will find these conditions on the SIMATIC NET Manual Collection.

- "Approval of SIMATIC/ SIMATIC NET Products for Direct Installation in Ex-Zone 2"

ATEX classification II 3 G Ex nA IIC T4 Gc

KEMA 07ATEX0145 X

The product meets the requirements of the standards:

- EN 60079-0: 2009
- EN 60079-15: 2005 (electrical apparatus for potentially explosive atmospheres; Type of protection "n")

ATEX classification II 3 (2) G Ex nA [op is] IIC T4 Gc

DEKRA 11ATEX0060 X

The product meets the requirements of the standards:

- EN 60079-0: 2009
- EN 60079-15: 2005
- EN 60079-28: 2007

FM approval

The product meets the requirements of the standards

- Factory Mutual Approval Standard Class Number 3611
- FM Hazardous (Classified) Location Electrical Equipment:
  Non Incendive / Class I / Division 2 / Groups A,B,C,D / T4 A and
  Non Incendive / Class I / Zone 2 / Group IIC / T4

Notice for Australia

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

cULus Approval for Information Technology Equipment

cULus Listed I. T. E. Underwriters Laboratories Inc. to

- UL 60950-1 (Information Technology Equipment)
- CSA C22.2 No. 60950-1-03

Report no. E115352

cULus Approval for Industrial Control Equipment

cULus Listed IND. CONT. EQ. Underwriters Laboratories Inc. to

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

Report no. E85972

cULus Approval Hazardous Location

cULus Listed I. T. E. FOR HAZ. LOC. Underwriters Laboratories Inc. to

- UL 60950-1 (Information Technology Equipment)
- ANSI/ISA 12.12.01
- CSA C22.2 No. 60950-1-03
- CSA C22.2.No. 213-M1987

Approved for use in:

Cl. 1, Div. 2, GP. A, B, C, D, T4 A
Cl. 1, Zone 2, GP. IIC T4
Cl. 1, Zone 2, Aex nC IIC T4

Report no. E240480

FDA and IEC approvals

- No FDA or IEC mark is necessary for the MM491-2 media module.

The following media modules meet the FDA and IEC requirements listed below:

- MM491-2LD
- MM491-2LH+
- MM492-2
- MM492-2LD
- MM492-2LH
- MM492-2LH+
- MM492-2ELH

Figure 6-1 FDA and IEC approvals

See also

http://support.automation.siemens.com/WW/view/de/67218486
(http://support.automation.siemens.com/WW/view/en/67218486)

Technical specifications

7

7.1 SCALANCE X414-3E and X408-2 - technical specifications

Interfaces

	SCALANCE X414-3E	SCALANCE X408-2
Connecting end devices or network segments over twisted pair	2 x RJ-45 jack (10/100/1000 Mbps) 12 x RJ-45 jack (10/100 Mbps) All electrical ports support autonegotiation and autocrossover.	4 x RJ-45 jack (10/100/1000 Mbps) 4 x RJ-45 jack (10/100 Mbps) All electrical ports support autonegotiation and autocrossover.
Installation of media modules	2 x slot (6 and 7) for media module types MM491-2, MM491-2LD and MM491-2LH+ 1 x slot (5) for media module types MM492-2, MM492-2LD, MM492-2LH, MM492-2LH+ and MM492-2ELH	2 x universal slot for media module types MM491-2 or MM491-2LD or MM491-2LH+ or MM492-2 or MM492-2LD or MM492-2LH or MM492-2LH+ or MM492-2ELH
Installation of extender modules	1 x slot for extender module EM495-8 or EM496-4	Not present.
Connector for power supply and signaling contact	2 x 4-pin plug-in terminal blocks	2 x 4-pin plug-in terminal blocks
Connection of digital inputs	2 x 5-pin plug-in terminal blocks	Not present.
Power supply (redundant inputs isolated)	2 power supplies 24 V DC (20.4 to 28.8 V) safety extra-low voltage (SELV) Permitted voltage range incl. total ripple: 18.5 VDC - 30.2 VDC Power supply voltage connected over high resistance with housing (not electrically isolated). Tested to IEC 6100-4-5, 1995 "Surge Immunity Test", performed with lightning protection device DEHN Blitzductor VT AD 24 V, article no. 918 402	2 power supplies 24 V DC (20.4 to 28.8 V) safety extra-low voltage (SELV) Permitted voltage range incl. total ripple: 18.5 VDC - 30.2 VDC Power supply voltage connected over high resistance with housing (not electrically isolated). Tested to IEC 6100-4-5, 1995 "Surge Immunity Test", performed with lightning protection device DEHN Blitzductor VT AD 24 V, article no. 918 402
Power consumption (without modules) at 24 V DC	15 W	8 W

	SCALANCE X414-3E	SCALANCE X408-2
Current consumption at 24 V DC	< 2000 mA	< 700 mA
Load on the signaling contact	24 V DC / max. 100 mA safety extra-low voltage (SELV)	24 V DC / max. 100 mA safety extra-low voltage (SELV)
Overvoltage protection at input	Non-replaceable fuse (F 3.15 A / 250 V)	Non-replaceable fuse (F 3 A / 32 V)
Digital Inputs	Input voltage: • Rated value 24 V DC safety extra-low voltage (SELV) • For state "1": + 13 V ...+ 30 V • For state "0": – 30 V to + 3 V Max. input current: 8 mA Max. cable length: 30 m Inputs isolated from electronics.	Inputs not present.

C-PLUG

	SCALANCE X414-3E	SCALANCE X408-2
Dimensions (width x height x depth)	24.3 x 17.0 x 8.1 mm	24.3 x 17.0 x 8.1 mm
Weight	approx. 5 g	approx. 5 g
Power consumption	0.015 W	0.015 W
Memory capacity	32 Mbytes	32 Mbytes

Permitted cable lengths

	SCALANCE X414-3E	SCALANCE X408-2
TP cable length	With TP cord up to 10 m, with FastConnect cabling system up to 100 m.	With TP cord up to 10 m, with FastConnect cabling system up to 100 m.

Redundancy reconfiguration times

Redundancy	Reconfiguration times
HRP	300 ms
Standby link	300 ms
MRP	200 ms

Cascading depth

	SCALANCE X414-3E	SCALANCE X408-2
Linear/star structure	Any (only depending on signal propagation time)	Any (only depending on signal propagation time)
Ring with redundancy manager in HRP mode	50 (for reconfiguration time < 0.3 seconds)	50 (for reconfiguration time < 0.3 seconds)

Switching properties

	SCALANCE X414-3E	SCALANCE X408-2
Max. number of learnable addresses	8000	8000
Aging time (default)	40 s	40 s
Switching technique	Store and forward	Store and forward
Latency (store and forward time)	5 µs	5 µs (10 µs when changing from gigabit to Fast Ethernet or vice versa)

Full wire speed switching

Number of frames		At a frame length of (in bytes):
at 100 Mbps	at 1000 Mbps	
148810	1488095	64
84459	844595	128
45290	452899	256
23496	234962	512
11973	119732	1024
9615	96154	1280
8127	81274	1518

Note

The IE Switches X-400 support full wire speed switching complying with IEEE 802.3 on all ports.

The number of packets depends on the packet length according to the IEEE802.3 standard.

Permitted environmental conditions / EMC

	SCALANCE X414-3E	SCALANCE X408-2
Operating temperature	Product version for 01 to 06 0°C to + 60°C Product version as of 07 -40°C to + 70°C	0°C through + 60°C
Storage/transport temperature	- 40°C through + 80°C	- 40°C through + 80°C
Relative humidity in operation	< 95% (no condensation)	< 95% (no condensation)
Operating altitude	Max. 2000 m	Max. 2000 m
RF interference level	EN 55081 Class A	EN 55081 Class A
Immunity	EN 61000-6-2 : 2001	EN 61000-6-2 : 2001

Construction

	SCALANCE X414-3E	SCALANCE X408-2
Dimensions (W x H x D)	344 x 145 x 117 mm	242 x 145 x 117 mm
Weight	3,070 g	1,900 g
Installation options	35 mm DIN rail S7-300 standard rail	35 mm DIN rail S7-300 standard rail
Degree of protection	IP20	IP20

MTBF information (mean time between failure)

Device type	MTBF
SCALANCE X414-3E basic device 6GK5 414-3FC00-2AA2	24 years
SCALANCE X414-3E basic device 6GK5 414-3FC10-2AA2	24 years
SCALANCE X408-2 basic device 6GK5 408-2FD00-2AA2	18 years

Dimension drawings

8

8.1 Dimension drawing - SCALANCE X414-3E

Dimension drawing X414-3E

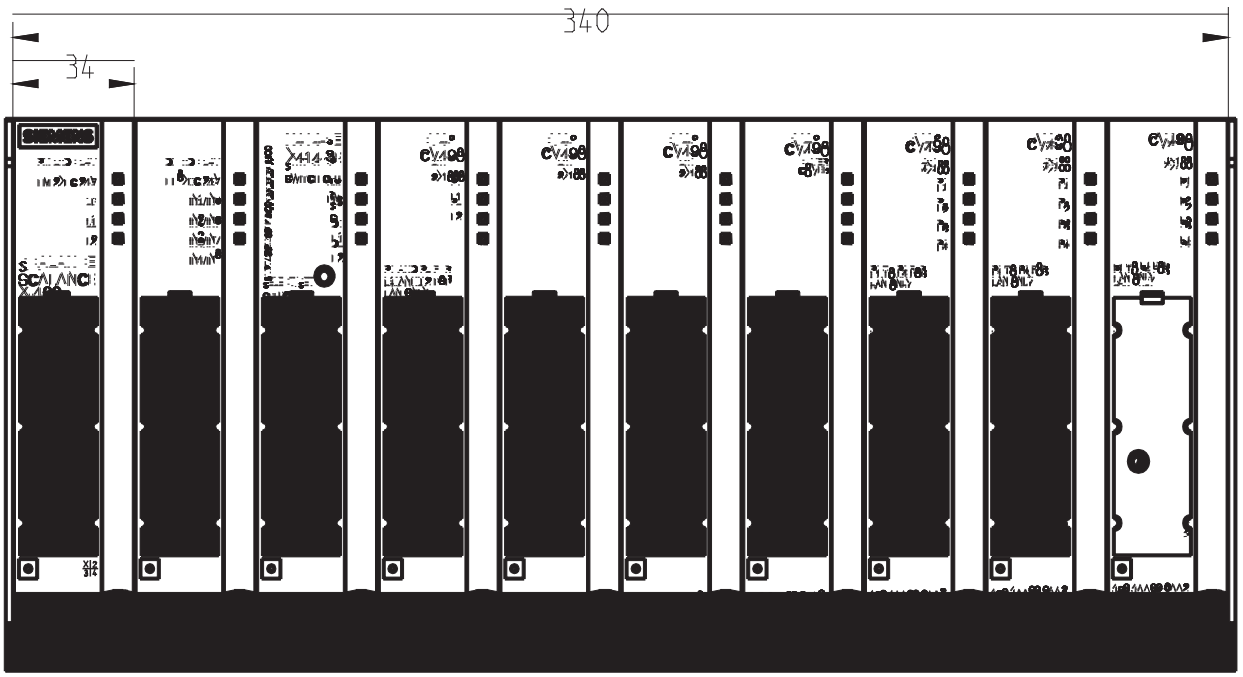

Figure 8-1 SCALANCE X414 front

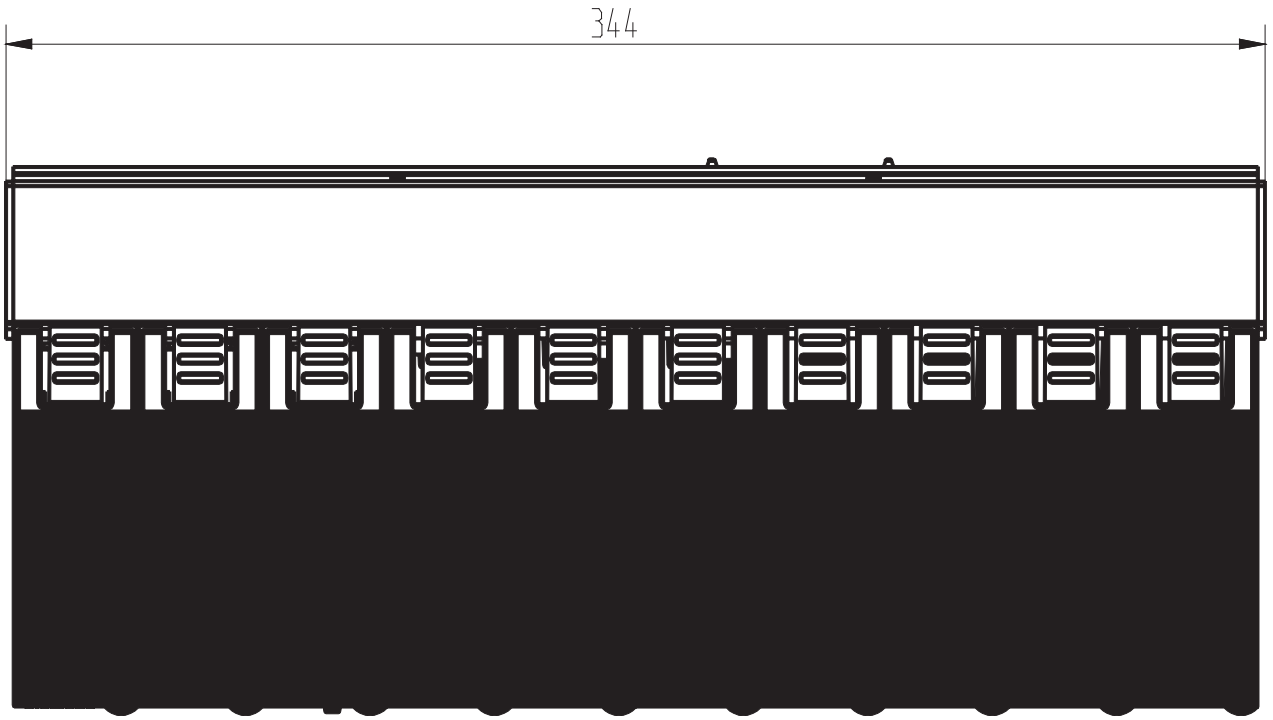

Figure 8-2 SCALANCE X414 top

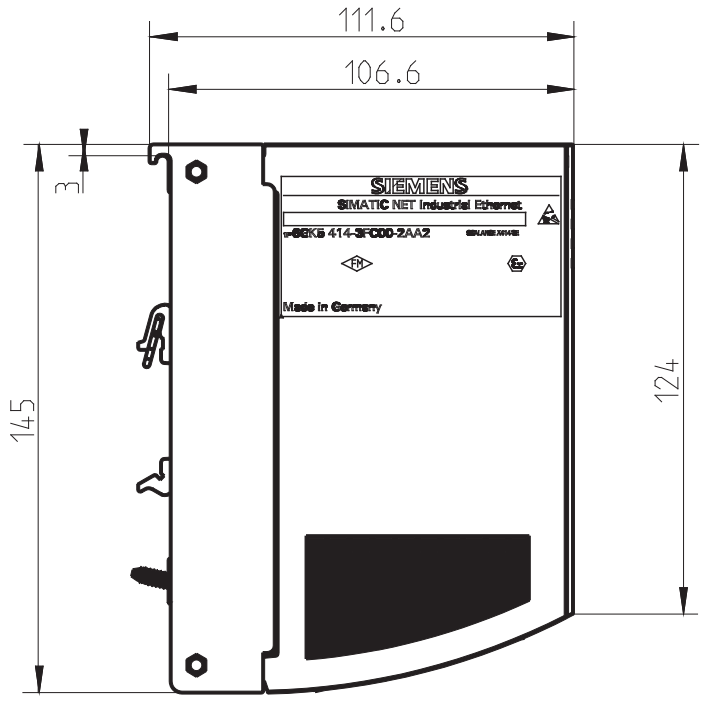

Figure 8-3 SCALANCE X414 left

8.2 Dimension drawing - SCALANCE X408-2

Dimension drawing X408-2

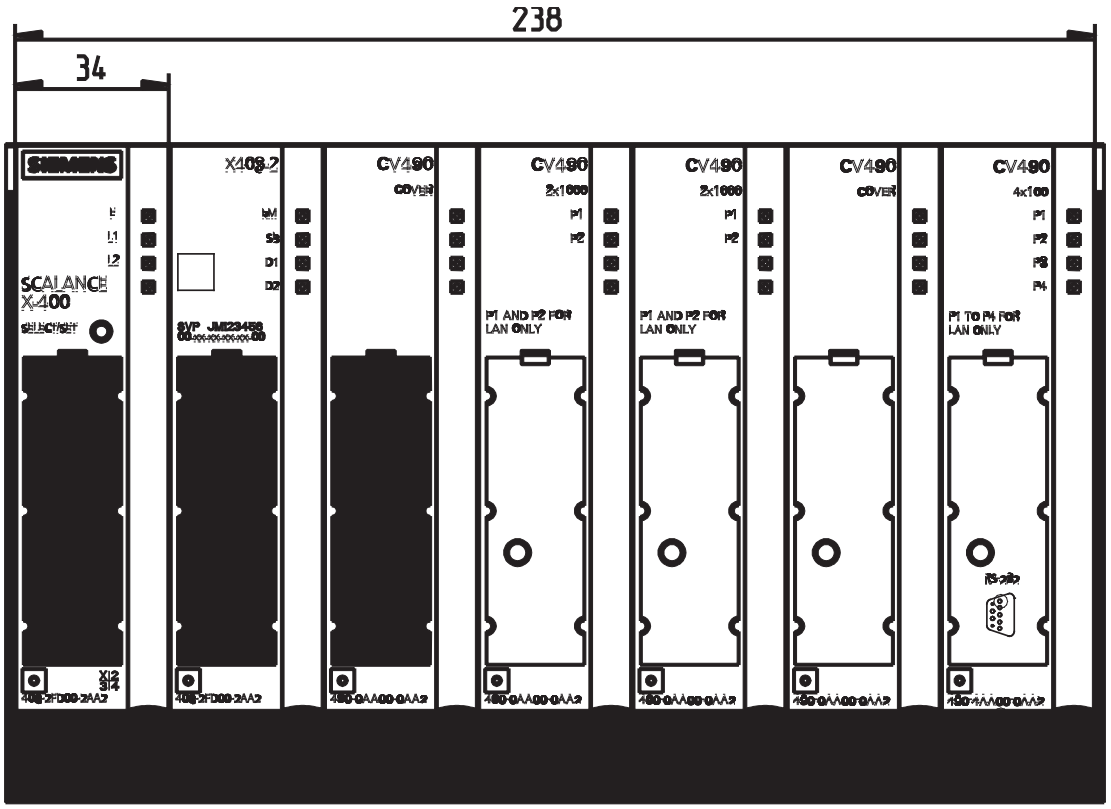

Figure 8-4 SCALANCE X408 front

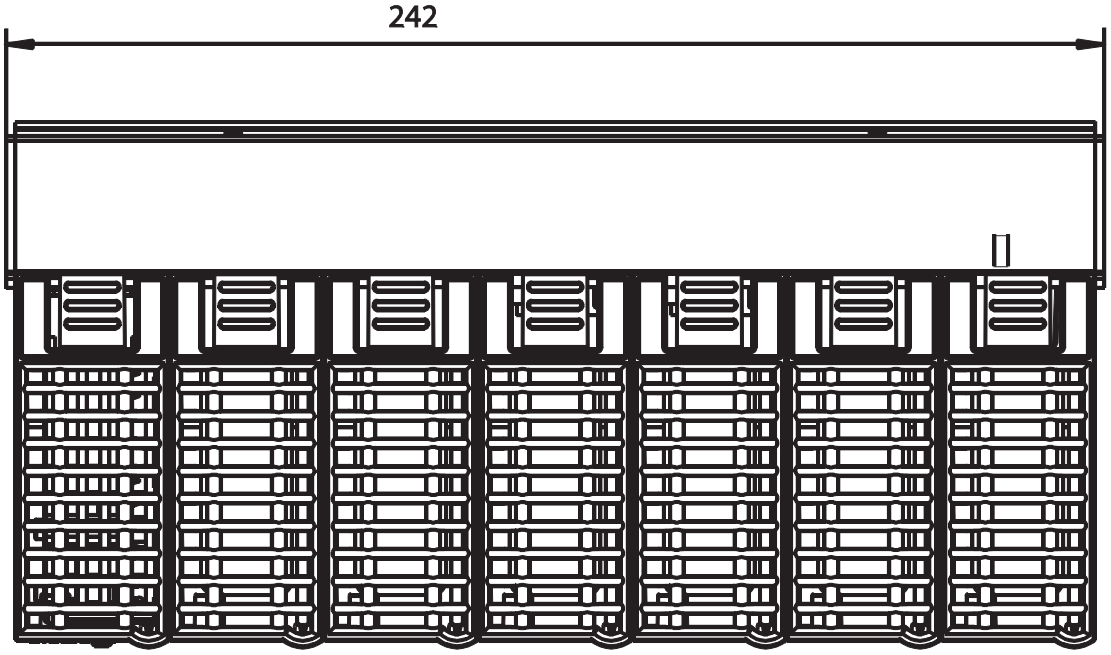

Figure 8-5 SCALANCE X408 top

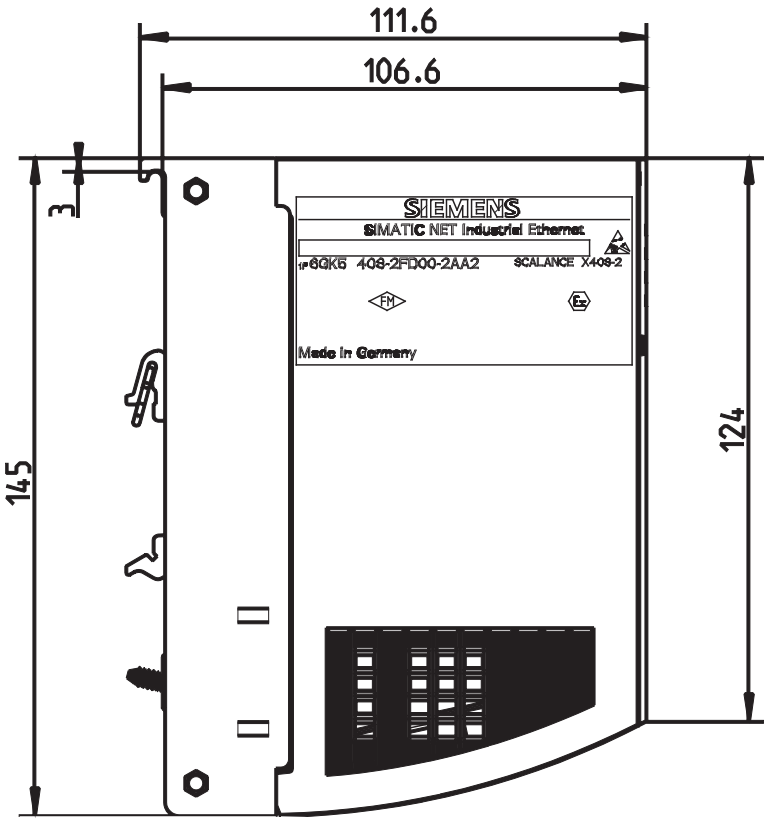

Figure 8-6 SCALANCE X408 left

Index