SIEMENS

SIMATIC NET

Industrial Ethernet switches SCALANCE X-400 media modules

Compact Operating Instructions

04/2013

A5E00367420-14

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.

Siemens AG
Industry Sector
Postfach 48 48
90026 NÜRNBERG
GERMANY

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℗ 04/2013 Technical data subject to change

Table of contents

Introduction

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Content of the document

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

Where can I find more detailed information on the product?

A CD is supplied with the IE Switch X-400 basic devices 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 Approvals, Certificates (Page 27), 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.

See also

Approvals, Certificates (Page 27)

Description

3

3.1 Overview of the media modules for SCALANCE X-400

Available module types

Note

Expanded temperature range

To find out the product version as of which the media modules can be used for the expanded temperature range
(-40°C to +70°C), refer to the section on technical specifications.

The following media modules are available to expand the basic devices:

- MM491-2 (100 Mbps)
  order number: 6GK5 491-2AB00-8AA2

  Note

  This media module can be used with the SCALANCE X408-2 as of product version 04.

- MM491-2LD (100 Mbps)
  order number: 6GK5 491-2AC00-8AA2

  Note

  This media module can be used with the SCALANCE X408-2 as of product version 04.

- MM491-2LH+ (100 Mbps)
  order number: 6GK5 491-2AE00-8AA2

  Note

  This media module can be used with the SCALANCE X414-3 as of product version 05.

  This media module is only detected by SCALANCE X414-3E and SCALANCE 408-2 as of firmware version 2.2.0.

- MM492-2 (1000 Mbps)
  order number: 6GK5 492-2AL00-8AA2
- MM492-2LD (1000 Mbps)
  order number: 6GK5 492-2AM00-8AA2

- MM492-2LH (1000 Mbps)
  order number: 6GK5 492-2AN00-8AA2

  Note

  This media module can be used with the SCALANCE X414-3 as of product version 05.

  This media module is only detected by SCALANCE X414-3E and SCALANCE 408-2 as of firmware version 2.2.0.

- MM492-2LH+ (1000 Mbps)
  order number: 6GK5 492-2AP00-8AA2

  Note

  This media module can be used with the SCALANCE X414-3 as of product version 05.

  This media module is only detected by SCALANCE X414-3E and SCALANCE 408-2 as of firmware version 2.2.0.

- MM492-2ELH (1000 Mbps)
  order number: 6GK5 492-2AQ00-8AA2

  Note

  This media module can be used with the SCALANCE X414-3 as of product version 05.

  This media module is recognized by the SCALANCE X414-3E and SCALANCE X408-2 only as of firmware version 3.0.

SCALANCE X414-3E

By using media modules, you can increase the number of available ports in the basic device SCALANCE X414-3E from 14 to 18. Four Fast Ethernet fiber-optic ports are available at the same time on slots 6 and 7. On slot 5, two gigabit fiber-optic ports are also possible instead of TP cable.

SCALANCE X408-2

The use of media modules does not change the number of available ports in the SCALANCE X408-2 basic device. On 4 ports, data transmission is also possible over fiber-optic cable instead of TP cable.

Module type	Procedure	Cabling	Connector	Segment length	Wavelength
MM491-2	100Base-FX	Multimode	BFOC	3 km	1310 nm
MM491-2LD	100Base-FX	Single mode	BFOC	26 km	1310 nm
MM491-2LH+	100Base-FX	Single mode	SC duplex	70 km	1550 nm
MM492-2	1000Base-SX	Multimode	SC duplex	750 m	850 nm
MM492-2LD	1000Base-LX	Single mode	SC duplex	10 km	1310 nm
MM492-2LH	1000Base-LX	Single mode	SC duplex	40 km	1550 nm
MM492-2LH+	1000Base-LX	Single mode	SC duplex	70 km	1550 nm
MM492-2ELH	1000Base-LX	Single mode	SC duplex	120 km	1550 nm

Note

It is possible to insert and remove the media modules during operation. Before inserting a media module, remove the cover and protective cap from the port. Please put these away for safe keeping. If you remove a media module, close the terminal strip with the protective cap and the slot with the cover.

Options for slot 5 (SCALANCE X414-3E)

Slot 5 of the basic device has two RJ-45 jacks for connecting TP cables. The possible data transmission rates on electrical connections are 10, 100, or 1000 Mbps.
An optical gigabit module in slot 5 allows data transmission with multimode or single mode FOC. In this case, the two RJ-45 jacks can no longer be used.

Options for slots 6 and 7 (SCALANCE X414-3E)

Slots 6 and 7 do not have any ports but allow two optical Fast Ethernet modules to be inserted each with ports. This gives you the opportunity of data transmission at a data transmission rate of 100 Mbps over multimode or single mode FOC.

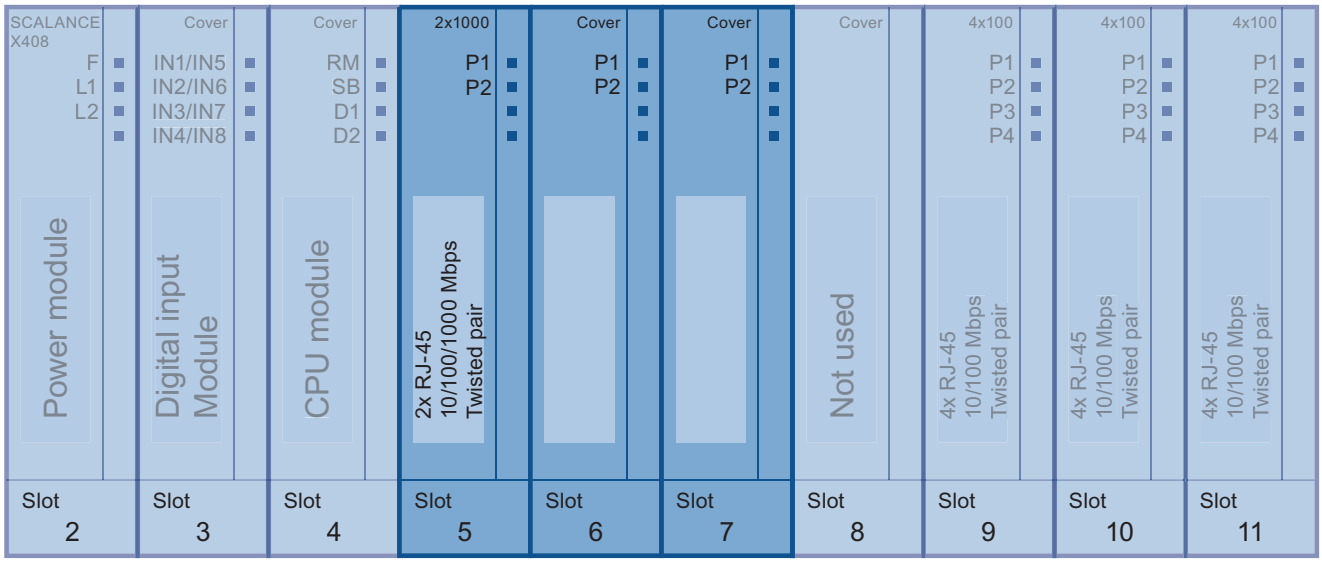

Figure 3-1 Slots of the media modules

Options for slots 5 and 6 (SCALANCE X408-2)

Slots 5 and 6 of the basic device each have two RJ-45 jacks for connecting TP cables. The possible data transmission rates on electrical connections are 10, 100, or 1000 Mbps. An optical gigabit or Fast Ethernet module in slot 5 and/or 6 allows data transmission with multimode or single mode FOC. In this case, the two RJ-45 jacks below the module can no longer be used.

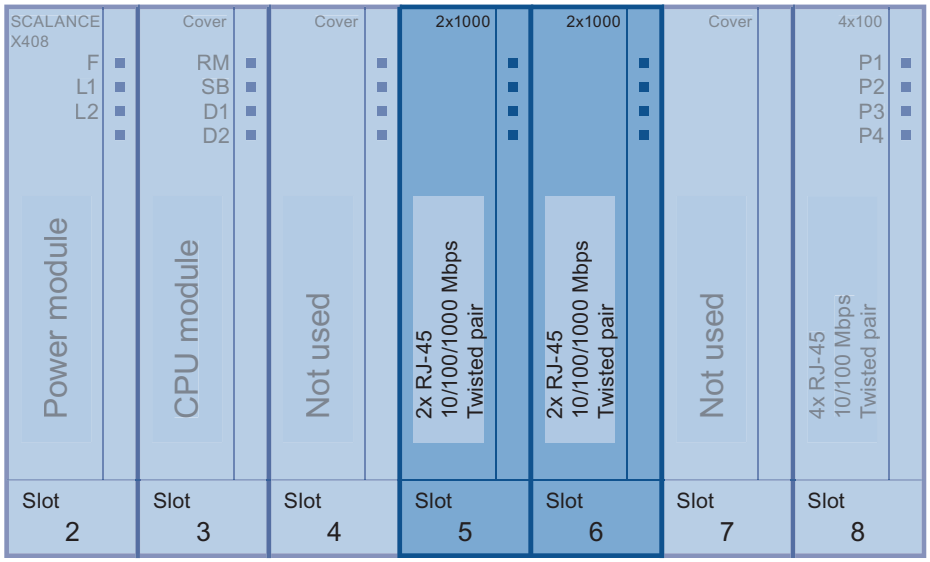

Figure 3-2 Slots of the media modules

LED display of the FO media modules

The LED displays of a module are the same as the LEDs of the basic device. With optical transmission, only a fixed transmission rate and full duplex mode are possible. The display in display modes B and C is analogous.

- In display mode A, the current connection status is displayed.
- In display mode B, the fixed transmission rate is displayed.
- In display mode C, the full duplex mode is always displayed.
- In display mode D, you can see whether or not the port is monitored.

3.2 Fast Ethernet media module MM491-2 (100Base-FX)

Introduction

- SCALANCE X414-3E
  The Fast Ethernet media module MM491-2 can be used optionally in slots 6 and 7 and when using the media module extender EM496-4, it can also be used in slots 12 through 15. Mixed operation with the Fast Ethernet media modules MM491-2LD and MM491-2LH+ is possible.
- SCALANCE X408-2
  As an option, the Fast Ethernet media module MM491-2 can be used in slots 5 and 6 of the basic device. Mixed operation with the Fast Ethernet media modules MM491-2LD and MM491-2LH+ and the gigabit Ethernet media modules MM492-2LD, MM492-2LH, MM492-2LH+ and MM492-2ELH is possible.

Note

The Fast Ethernet media module MM491-2 can only be used with the SCALANCE X408-2 as of product version 04.

Properties

The Fast Ethernet media module provides two ports for connecting the multimode FOC. Both ports of the module can be configured as ring ports. The signal is transmitted by LED with a wavelength of 1310 nm. The maximum cable length is 3 km.

Connector

The connectors are 2x2 BFOC sockets.

3.3 Fast Ethernet media module MM491-2LD (100Base-FX)

Introduction

- SCALANCE X414-3E
  The Fast Ethernet media module MM491-2LD can be used optionally in slots 6 and 7 of the basic device and when using the media module extender EM496-4, it can also be used in slots 12 through 15. Mixed operation with the Fast Ethernet media modules MM491-2 and MM491-2LH+ is possible.
- SCALANCE X408-2
  As an option, the Fast Ethernet MM491-2LD media module can be used in slots 5 and 6 of the basic device. Mixed operation with the Fast Ethernet media modules MM491-2 and MM491-2LH+ and the gigabit Ethernet media modules MM492-2LD, MM492-2LH, MM492-2LH+ and MM492-2ELH is possible.

Note

The Fast Ethernet media module MM491-2LD can only be used with the SCALANCE X408-2 as of product version 04.

Properties

The Fast Ethernet media module provides two ports for connecting the single mode FOC. Both ports of the module can be configured as ring ports. The signals are transmitted with a laser diode at a wavelength of 1310 nm. The maximum cable length is 26 km.

Connector

The connectors are 2x2 BFOC sockets.

3.4 Fast Ethernet media module MM491-2LH+ (100Base-FX)

Introduction

- SCALANCE X414-3E
  The Fast Ethernet media module MM491-2LH+ can be used optionally in slots 6 and 7 of the basic device and when using the media module extender EM496-4, it can also be used in slots 12 through 15. Mixed operation with the Fast Ethernet media modules MM491-2 and MM491-2LH+ and the gigabit media modules MM492 is possible.
- SCALANCE X408-2
  As an option, the Fast Ethernet MM491-2LH+ media module can be used in slots 5 and 6 of the basic device. Mixed operation with the Fast Ethernet media modules MM491-2 and MM491-2LD and the gigabit Ethernet media modules MM492-2LD, MM492-2LH, MM492-2LH+ and MM492-2ELH is possible.

Note

This media module can be used as of product version 05 of the SCALANCE X414-3.

This media module is recognized by the SCALANCE X414-3E and SCALANCE X408-2 only as of firmware version 2.2.0

Properties

The Fast Ethernet media module provides two ports for connecting the single mode FOC. Both ports of the module can be configured as ring ports. The signals are transmitted with a DFB laser diode at a wavelength of 1550 nm. The maximum cable length is 70 km.

Connector

SC duplex female connectors are used.

3.5 Gigabit media module MM492-2 (1000Base-SX)

Introduction

- SCALANCE X414-3E
  The MM492-2 gigabit media module can be inserted as an option in slot 5.
- SCALANCE X408-2
  The MM492-2 gigabit media module can be inserted as an option in slots 5 and 6. Mixed operation with the gigabit Ethernet media modules MM492-2LD, MM492-2LH, MM492-2LH+ and MM492-2ELH and the Fast Ethernet media modules MM491-2, MM491-2LD and MM491 2LH+ is possible.

Properties

The gigabit media module provides two ports for connecting the multimode FOC. The signal is transmitted by LED with a wavelength of 850 nm. Both ports of the module can be configured as ring ports. The maximum cable length is 750 m when using SIMATIC NET fiber-optic cables.

Connector

SC duplex female connectors are used.

3.6 Gigabit media module MM492-2 LD (1000Base-LX)

Introduction

- SCALANCE X414-3E
  The MM492-2LD gigabit media module can be inserted as an option in slot 5.
- SCALANCE X408-2
  The MM492-2LD gigabit media module can be inserted as an option in slots 5 and 6. Mixed operation with the gigabit Ethernet media modules MM492-2, MM492-2LH, MM492-2LH+ and MM492-2ELH and the Fast Ethernet media modules MM491-2, MM491-2LD and MM491 2LH+ is possible.

Properties

The media module provides two ports for connecting the single mode FOC. The signals are transmitted with a laser diode at a wavelength of 1310 nm. Both ports of the module can be configured as ring ports. The maximum cable length is 10 km when using SIMATIC NET fiber-optic cables.

Connector

SC duplex female connectors are used.

3.7 Gigabit media module MM492-2LH (1000Base-LX)

Introduction

- SCALANCE X414-3E
  The MM492-2LH gigabit media module can be inserted as an option in slot 5.
- SCALANCE X408-2
  The MM492-2LH gigabit media module can be inserted as an option in slots 5 and 6.
  Mixed operation with the gigabit Ethernet media modules MM492-2, MM492-2LD, MM492-2LH+ and MM492-2ELH and the Fast Ethernet media modules MM491-2, MM491-2LD and MM491-2LH+ is possible.

Note

This media module can be used as of product version 05 of the SCALANCE X414-3.

This media module is recognized by the SCALANCE X414-3E and SCALANCE X408-2 only as of firmware version 2.2.0

Properties

The media module provides two ports for connecting the single mode FOC. The signals are transmitted with a DFB laser diode at a wavelength of 1550 nm. Both ports of the module can be configured as ring ports. The max. line length is 40 km.

Connector

SC duplex female connectors are used.

3.8 Gigabit media module MM492-2LH+ (1000Base-LX)

Introduction

- SCALANCE X414-3E
  The MM492-2LH+ gigabit media module can be inserted as an option in slot 5.
- SCALANCE X408-2
  The MM492-2LH+ gigabit media module can be inserted as an option in slots 5 and 6. Mixed operation with the gigabit Ethernet media modules MM492-2, MM492-2LD, MM492-2LH and MM492-2ELH and the Fast Ethernet media modules MM491-2, MM491-2LD and MM491-2LH+ is possible.

Note

This media module can be used as of product version 05 of the SCALANCE X414-3.

This media module is recognized by the SCALANCE X414-3E and SCALANCE X408-2 only as of firmware version 2.2.0

Properties

The media module provides two ports for connecting the single mode FOC. The signals are transmitted with a DFB laser diode at a wavelength of 1550 nm. Both ports of the module can be configured as ring ports. The max. line length is 70 km.

Connector

SC duplex female connectors are used.

3.9 Gigabit media module MM492-2ELH (1000Base-LX)

Introduction

- SCALANCE X414-3E
  The MM492-2ELH gigabit media module can be inserted as an option in slot 5.
- SCALANCE X408-2
  The MM492-2ELH gigabit media module can be inserted as an option in slots 5 and 6. Mixed operation with the gigabit Ethernet media modules MM492-2, MM492-2LD; MM492-2LH and MM492-2LH+ and the Fast Ethernet media modules MM491-2, MM491-2LD and MM491-2LH+ is possible.

Note

This media module can be used as of product version 05 of the SCALANCE X414-3.

This media module is recognized by the SCALANCE X414-3E and SCALANCE X408-2 only as of firmware version 3.0

Properties

The media module provides two ports for connecting the single mode FOC. The signals are transmitted with a DFB laser diode at a wavelength of 1550 nm. Both ports of the module can be configured as ring ports. The max. line length is 120 km.

Connector

SC duplex female connectors are used.

3.10 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!

Assembly

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 / removing a media module

Installing a media module

For installation, you require a slotted screwdriver with a 2.8 mm wide blade.

Note

Installing a Fast Ethernet media module is the same in the IE Switch X-400 and in the media module extender.

1. Remove the cover from the slot of the media module and remove the protective cap of the module terminal strip underneath from the backplane of the basic device.

   Note

   Keep these parts in a safe place in case you want to remove the media module later.

2. Remove the inserted labeling strip from the front of the media module.
3. Place the two lower guides of the media module into the recesses at the lower edge of the basic device. It should no longer be possible to move the media module to the side.
4. Tilt the media module at an angle towards the back until the two plastic pins at the back top edge of the media module jut into the recesses in the basic device. The terminal strip of the media module must fit into the guide in the backplane.
5. Press the upper part of the media module onto the basic device until the fluted middle section of the media module is heard to click into place.
6. Tighten the captive screw on the front of the media module with a slotted screwdriver with a 2.8 mm wide blade.
7. Secure the labeling strip on the front of the media module.

Figure 4-1 Inserting a media module

Removing a media module

To remove the device, you require a slotted screwdriver with a 2.8 mm wide blade.

Note

Removing a Fast Ethernet media module is the same in the IE Switch X-400 and in the media module extender.

1. Remove the inserted labeling strip from the front of the media module.
2. Release the captive screw on the front of the media module as far as it will go with a slotted screwdriver with a 2.8 mm wide blade.
3. Press on the fluted middle section of the top of the media module next to the backplane.
4. At the same time, tilt the media module down at an angle, the two guides initially remain in the recesses at the lower edge of the basic device.
5. Remove the media module by pulling it upwards.
6. Fit the protective cap on the module terminal strip on the backplane of the basic device. Fit a suitable cover on the slot of the media module.

Certification

5

5.1 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
(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 (http://support.automation.siemens.com/WW/view/en/8763736)
  - EMC Installation Guideline, Planning Guide 28518276 (http://support.automation.siemens.com/WW/view/en/8763736)
- **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 5-1 FDA and IEC approvals

See also

http://supportauthoring.automation.siemens.com
(http://supportauthoring.automation.siemens.com)

Technical specifications

6

6.1 Media module MM491-2 (100Base-FX) - technical specifications

Interface

Connection of end devices or network segments over FOC	2x2 BFOC sockets (100 Mbps, 100BaseFX, full duplex)
Diode power	< -14 dBm
Power consumption • For product versions 01 to 04 • As of product version 05	 2 W 4 W

Permitted cable lengths

FO cable lengths: • 50/125 µm multimode fiber	 0 – 3 km (1 dB/km at 1310 nm; 1200 MHz*km; maximum insertion loss 0.5 dB; 4.5 dB max. permitted FO cable attenuation at 3 dB link power margin)

Permitted environmental conditions / EMC

Operating temperature • For product versions 01 to 04 • As of product version 05	 0 °C through + 60 °C -40 °C through + 70 °C
Storage/transport temperature	- 40°C through + 80°C
Relative humidity in operation	< 95% (no condensation)
Operating altitude	Max. 2000 m
RF interference level	EN 55081 Class A
Immunity	EN 61000-6-2: 2001

Construction

Dimensions (W x H x D)	35 x 145 x 90 mm
Weight	260 g
Degree of protection	IP20

6.2 Media module MM491-2LD (100Base-FX) - technical specifications

Interfaces

Connection of end devices or network segments over FOC	2x2 BFOC sockets (100 Mbps, 100BaseFX, full duplex)
Power of the laser diode	< -8 dBm
Power consumption • For product versions 01 to 04 • As of product version 05	 2 W 4 W

Permitted cable lengths

FO cable lengths: • 9/125 µm single mode fiber	 0 - 26 km (0.5 dB/km at 1310 nm; maximum insertion loss 0.5 dB; 14 dB max. permitted FO cable attenuation at 2 dB link power margin)

Permitted environmental conditions / EMC

Operating temperature • For product versions 01 to 04 • As of product version 05	 0 °C through + 60 °C -40 °C through + 70 °C
Storage/transport temperature	- 40°C through + 80°C
Relative humidity in operation	< 95% (no condensation)
Operating altitude	Max. 2000 m
RF interference level	EN 55081 Class A
Immunity	EN 61000-6-2: 2001
Laser protection	Class 1 complying with IEC 60825-1

Construction

Dimensions (W x H x D)	35 x 145 x 90 mm
Weight	260 g
Degree of protection	IP20

6.3 Media module MM491-2LH+ (100Base-FX) - technical specifications

Interfaces

Connection of end devices or network segments over FOC	2x SC duplex sockets (100 Mbps, 100BaseFX, full duplex)
Power of the laser diode	< 0 dBm
Power consumption	4 W

Permitted cable lengths

FO cable lengths: • 9/125 µm single mode fiber	0 - 70 km (0.38 dB/km at 1550 nm; maximum insertion loss 0.5 dB; 26 dB max. permitted FO cable attenuation at 3 dB link power margin minimum cable attenuation at 3 dB)

Permitted environmental conditions / EMC

Operating temperature	- 40°C through + 70°C
Storage/transport temperature	- 40°C through + 80°C
Relative humidity in operation	< 95% (no condensation)
Operating altitude	Max. 2000 m
RF interference level	EN 55081 Class A
Immunity	EN 61000-6-2: 2001
Laser protection	Class 1 complying with IEC 60825-1

Construction

Dimensions (W x H x D)	35 x 145 x 90 mm
Weight	260 g
Degree of protection	IP20

6.4 Media module MM492-2 (1000Base-SX) - technical specifications

Interfaces

Connection of end devices or network segments over FOC	2 x SC duplex sockets (1000 Mbps, 1000BaseSX, full duplex)
Power of the laser diode	< -4 dBm
Power consumption	4 W

Permitted cable lengths

FO cable lengths: • 50/125 µm multimode fiber	0 - 750 m (2.5 dB/km at 850 nm; 1200 MHz*km; maximum insertion loss 0.5 dB; 4.5 dB max. permitted FO cable attenuation at 3 dB link power margin)
• 62.5/125 µm multimode fiber	0 – 350 m (3.1 dB/km at 850 nm; 200 MHz*km; maximum insertion loss 0.5 dB; 4.5 dB max. permitted FO cable attenuation at 3 dB link power margin)

Environmental conditions / EMC

Operating temperature: • For product versions 01 to 04 • As of product version 05	0 °C through + 60 °C - 40 °C through + 70 °C
Storage/transport temperature	- 40°C through + 80°C
Relative humidity in operation	< 95% (no condensation)
Operating altitude	Max. 2000 m
RF interference level	EN 55081 Class A
Immunity	EN 61000-6-2: 2001
Laser protection	Class 1 complying with IEC 60825-1

Construction

Dimensions (W x H x D)	35 x 145 x 90 mm
Weight	250 g
Degree of protection	IP20

6.5 Media module MM492-2LD (1000Base-LX) - technical specifications

Interfaces

Connection of end devices or network segments over FOC	2 x SC duplex sockets (1000 Mbps, 1000Base-LX, full duplex)
Power of the laser diode	< -3 dBm
Power consumption	4 W

Permitted cable lengths

FO cable lengths: • 9/125 µm single mode fiber	0 – 10 km (0.5 dB/km at 1310 nm; maximum insertion loss 0.5 dB; 6 dB max. permitted FO cable attenuation at 3 dB link power margin)

Environmental conditions / EMC

Operating temperature: • For product versions 01 to 04 • As of product version 05	0 °C through + 60 °C - 40 °C through + 70 °C
Storage/transport temperature	- 40°C through + 80°C
Relative humidity in operation	< 95% (no condensation)
Operating altitude	Max. 2000 m
RF interference level	EN 55081 Class A
Immunity	EN 61000-6-2: 2001
Laser protection	Class 1 complying with IEC 60825-1

Construction

Dimensions (W x H x D)	35 x 145 x 90 mm
Weight	250 g
Degree of protection	IP20

6.6 Media module MM492-2LH (1000Base-LX) - technical specifications

Interfaces

Connection of end devices or network segments over FOC	2 x SC duplex sockets (1000 Mbps, 1000Base-LX, full duplex)
Power of the laser diode	< 0 dBm
Power consumption	4 W

Permitted cable lengths

FOC lengths • 9/125 µm single mode fiber	*) – 40 km (0.4 dB/km at 1550 nm; maximum insertion loss 0.5 dB; 8 dB max. permitted FO cable attenuation at 2 dB link power margin, minimum cable attenuation 3 dB)

Environmental conditions / EMC

Operating temperature • For product version 01 • As of product version 02	0 °C through + 60 °C - 40 °C through + 70 °C
Storage/transport temperature	- 40°C through + 80°C
Relative humidity in operation	< 95% (no condensation)
Operating altitude	Max. 2000 m
RF interference level	EN 55081 Class A
Immunity	EN 61000-6-2: 2001
Laser protection	Class 1 complying with IEC 60825-1

Construction

Dimensions (W x H x D)	35 x 145 x 90 mm
Weight	250 g
Degree of protection	IP20

6.7 Media module MM492-2LH+ (1000Base-LX) - technical specifications

Interfaces

Connection of end devices or network segments over FOC	2 x SC duplex sockets (1000 Mbps, 1000Base-LX, full duplex)
Power of the laser diode	< 5 dBm
Power consumption	4 W

Permitted cable lengths

FO cable lengths: • 9/125 µm single mode fiber	*) – 70 km (0.28 dB/km at 1550 nm; maximum insertion loss 0.5 dB, 21 dB max. permitted FO cable attenuation at 2 dB link power margin, *) minimum cable attenuation 8 dB)

Environmental conditions / EMC

Operating temperature • For product version 01 • As of product version 02	0 °C through + 60 °C - 40 °C through + 70 °C
Storage/transport temperature	- 40°C through + 80°C
Relative humidity in operation	< 95% (no condensation)
Operating altitude	Max. 2000 m
RF interference level	EN 55081 Class A
Immunity	EN 61000-6-2: 2001
Laser protection	Class 1 complying with IEC 60825-1

Construction

Dimensions (W x H x D)	35 x 145 x 90 mm
Weight	250 g
Degree of protection	IP20

6.8 Media module MM492-2ELH (1000Base-LX) - technical specifications

Interfaces

Connection of end devices or network segments over FOC	2 x SC duplex sockets (1000 Mbps, 1000Base-LX, full duplex)
Power of the laser diode	< 5 dBm
Power consumption	4 W

Permitted cable lengths

FOC lengths • 9/125 µm single mode fiber	*) – 120 km (0.225 dB/km at 1550 nm; maximum insertion loss 0.5 dB, 27 dB max. permitted FO cable attenuation at 2 dB link power margin, minimum cable attenuation 8 dB)

Environmental conditions / EMC

Operating temperature	- 40°C through + 70°C
Storage/transport temperature	- 40°C through + 80°C
Relative humidity in operation	< 95% (no condensation)
Operating altitude	Max. 2000 m
RF interference level	EN 55081 Class A
Immunity	EN 61000-6-2: 2001
Laser protection	Class 1 complying with IEC 60825-1

Construction

Dimensions (W x H x D)	35 x 145 x 90 mm
Weight	250 g
Degree of protection	IP20

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