SIEMENS

SIMATIC NET

Industrial Ethernet OMC

Operating Instructions

Release 8 / 2001

C79000-G8976-C164-01

Classification of Safety-Related Notices

This document contains notices which you should observe to ensure your own personal safety, as well as to protect the product and connected equipment. These notices are highlighted in the manual by a warning triangle and are marked as follows according to the level 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 **can** result if proper precautions are not taken.

Caution

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

Caution

without warning triangle indicates that damage to property can result if proper precautions are not taken.

Notice

indicates that an undesirable result or status can occur if the relevant notice is ignored.

Note

highlights important information on the product, using the product, or part of the documentation that is of particular importance and that will be of benefit to the user.

Trademarks

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Third parties using for their own purposes any other names in this document which refer to trademarks might infringe upon the rights of the trademark owners.

Safety Instructions Regarding your Product

Before you use the product described here, read the safety instructions below thoroughly.

Qualified Personnel

Only qualified personnel should be allowed to install and work on this equipment . Qualified persons are defined as persons who are authorized to commission, to ground, and to tag circuits, equipment, and systems in accordance with established safety practices and standards.

Correct Usage of Hardware Products

Please note the following regarding the correct usage of hardware products:

Caution

This device and its components may only be used for the applications described in the catalog or the technical description, and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens.

This product can only function correctly and safely if it is transported, stored, set up, and installed correctly, and operated and maintained as recommended.

Before you use the supplied sample programs or programs you have written yourself, make certain that no injury to persons nor damage to equipment can result in your plant or process.

EU Directive: Do not start up until you have established that the machine on which you intend to run this component complies with the directive 89/392/EEC.

Prior to Startup

Before putting the product into operation, note the following warning:

Caution

Before installation and startup, read the instructions in the appropriate documentation. For ordering data of the documentation, please refer to catalogs or contact your local Siemens representative.

Preface

Purpose of the Operating Instructions

These Operating Instructions support you when configuring, commissioning, and troubleshooting networks including the Optical Media Converters OMC TP11 and OMC TP11-LD.

The Package

The OMC includes the following components:

- OMC device
- 6-pin plug-in terminal block
- Fittings (fixing brackets, screws) for wall mounting or installation in a 19" cabinet
- Product Information

Mounting the OMC

Follow the instructions in Chapter 5 of these operating instructions.

Validity of the Operating Instructions

These operating instructions are valid for the following devices:

- OMC TP11
- OMC TP11-LD

Further Documentation

The "SIMATIC NET Industrial Ethernet Twisted Pair and Fiber Optic Networks" manual contains information on other SIMATIC NET products that you can operate in conjunction with OMCs in an Industrial Ethernet network.

You can download this manual from Customer Support on the Internet under entry number 1172207:

http://www4.ad.siemens.de/view/cs/de/1172207

Finding Information

To help you to find information quickly, the appendix includes the following sections in addition to the table of contents:

- Glossary
- Index

Guide to the Manual

To help you to find specific information quickly, these operating instructions include the following parts:

- At the front of the operating instructions you will find a complete table of contents.
- The chapters have headings in the left margin with an overview of the contents of the paragraphs in the section.
- Following the appendix, you will find a Glossary in which the most important specialist terms used in the instructions are defined.
- At the back of the operating instructions, you will find an index with which you can find topics quickly.

Audience

These Operating Instructions are intended for persons involved in configuring, commissioning, and troubleshooting networks including the OMC TP11 and OMC TP11-LD.

Personnel Qualification Requirements

Only qualified personnel should be allowed to install and work on this equipment. Qualified personnel as referred to in the operating instructions or in the warning notes are defined as persons who are familiar with the installation, assembly, startup and operation of this product and who possess the relevant qualifications for their work, e.g.:

- Training in or authorization for connecting up, grounding or labeling circuits and devices or systems in accordance with current standards in safety technology;
- Training in or authorization for the maintenance and use of suitable safety equipment in accordance with current standards in safety technology;
- First Aid qualification.

Standards and Approvals

The OMC meets the requirements for the CE mark. For more detailed information about approvals and standards, refer to the appendix.

Contents

Introduction

1

The OSM/ESM V2 (/5/) product generation allows you to structure powerful Fast Ethernet networks in an industrial environment. However, nodes can only be attached to the network over twisted-pair ports; in other words electrically.

To remove this restriction, the OSM/ESM product range has been expanded with the addition of the OMC TP11 and OMC TP11-LD media converters. The OMCs open up new areas of application, such as:

- FO right up to the machine:
  Fast FO node attachment (100 Mbps full duplex) over FO ports of the OSMs and media converters in areas with high levels of electromagnetic interference.

- Spanning of long distances (LD, long-distance):
  FO cable sections up to 26 km to a single remote station.

1.1 OMC TP11

Possible Attachments

- A network component, such as an ESM electrical switch module or a DTE over the twisted-pair port (RJ-45 socket)
- A network component, such as an OSM optical switch module or a DTE over a second OMC at the optical port (2 BFOC sockets)

Figure 1: OMC TP11

Properties of the OMC TP11	
Electrical port	100 Mbps (full duplex) TP connector technology (RJ-45 socket with MDI-X Pinning (Medium Dependent Interface-Cross Over)) Max. cable length 6 m (TP Cord or TP XP Cord)
Optical port	100 Mbps FO ports (full duplex) BFOC female connectors
Maximum distance between two OMC TP11 modules or to an OSM ITP62-LD	3000 m (multimode graded-index fiber)

1.2 OMC TP11-LD

Possible Attachments

The OMC TP11-LD is suitable for spanning extremely long distances. With the monomode fiber, distances up to 26 km between two OMC TP11-LD or between an OMC TP11-LD and OSM ITP62-LD can be spanned.

Properties of the OMC TP11-LD	
Electrical port	100 Mbps (full duplex) TP attachment technology (RJ-45 socket with MDI-X Pinning (Medium Dependent Interface-Cross Over)) Max. cable length 6 m (TP Cord or TP XP Cord)
Optical port	100 Mbps FO ports (full duplex) BFOC female connectors
Maximum distance between two OMC TP11-LD	26 km (monomode fiber)

Note

The OMC TP11-LD can only be linked with the OMC TP11-LD or OSM ITP62-LD over its optical port.
Linking the optical port with an OMC TP11, OSM ITP62, OSM ITP53 or OSM TP62 is not permitted.

Functions

2

Converting between 100BaseTX and 100BaseFX

The OMC is used to link standard 100BaseTX Ethernet over twisted-pair (TP) cable and 100BaseFX Ethernet over FO cable. All data is forwarded transparently from the optical port to the electrical port and vice versa.

Notice

The devices attached to OMCs must support 100 Mbps and full duplex.

Setting the Transmission Rate or Duplex Mode

- An OMC is connected optically to an OSM FO port:
  In this configuration, if the device connected to the TP interface of the OMC is capable of autonegotiation and the full duplex mode, the device is configured automatically for 100 Mbps and full duplex. Using components of the OSM family and devices capable of autonegotiation and full duplex makes a plug-and-play configuration possible.

- Two OMCs are interconnected over an FO cable:
  If two devices with activated autonegotiation are connected to the two OMCs, the autonegotiation procedure taking place at both ends at the same time may prevent a link from being established. To prevent this, one or both of the TP devices must be permanently set to 100 Mbps and full duplex.

Link Fault Transfer

The link status of the FO link is transferred to the TP port and vice versa.

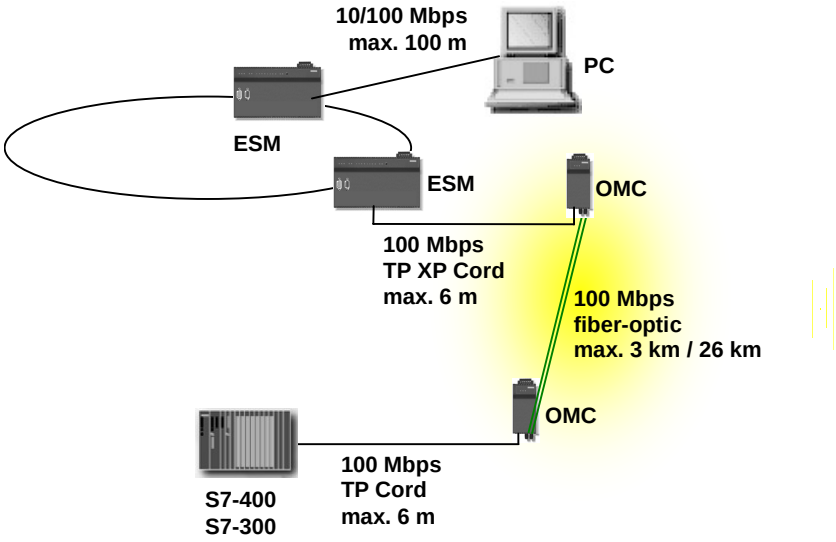
This means that the OMC can also be used in redundant rings or in standby sections for the redundant linking of subnets.

Network Topologies with OMCs

3

Using the media converters OMC TP11 and OMC TP11-LD, the following applications can be implemented.

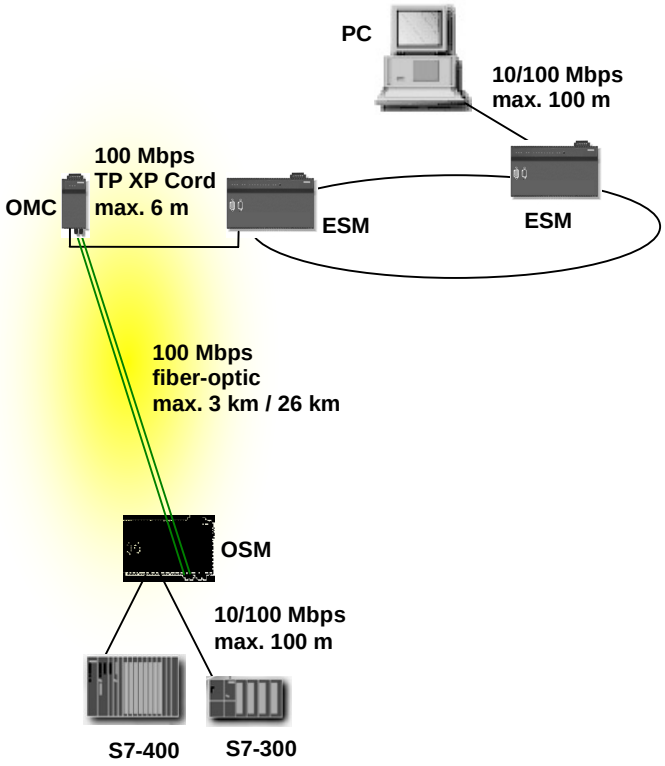
Attachment of Individual Remotely Located DTEs over OMC-FOC-OMC to a Twisted-Pair Network



Notice

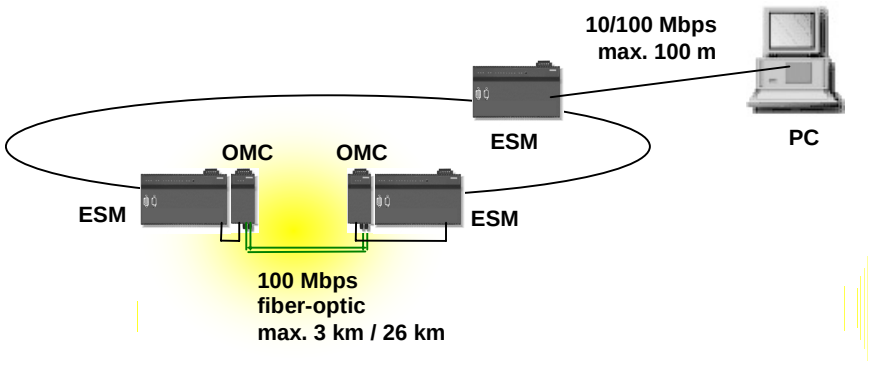
Since two OMCs are connected over FO cable, one of the two TP devices (in the figure: S7-400 CP or ESM port to the OMC) must be permanently set to 100 Mbps and full duplex.

Attachment of Remotely Located Subnets over OSM-FOC-OMC to a Twisted-Pair Network



The ESM port to the OMC sets itself automatically to 100 Mbps and full duplex. Manual setting of the ESM port to the OMC is not necessary.

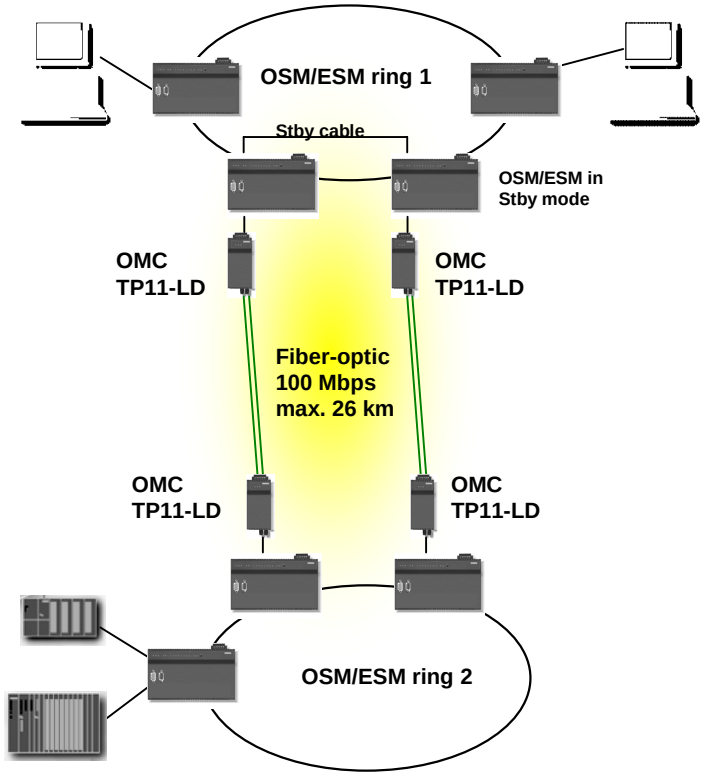
Including FO Cable Sections in a Twisted-Pair Network, for Example in an ESM Ring



Notice

To keep to the specified failover times in a redundant configuration, both TP devices connected to the OMCs must be permanently set to 100 Mbps and full duplex.

Redundant Linking of OSM/ESM Subnets Located a Long Distance Apart over OMC TP11 or OMC TP11-LD



Notice

To keep to the specified failover times in a redundant configuration, all TP devices connected to the OMCs must be permanently set to 100 Mbps and full duplex.

Interfaces and Displays

4

4.1 TP Port

Pinning

On the OMC, the TP port is implemented as an RJ-45 with MDI-X Pinning (Medium Dependent Interface-Cross Over) socket.

Notice

TP Cords or TP-XP Cords with a maximum length of 6 m can be connected to the TP port. Other attachments (connections via outlets, longer TP Cords) are not permitted.

Link Control

The attached cable segments are monitored according to the 100BASETX standard for short circuits or wire breaks. A fault on the link is signaled by the port status displays of the OMC and of the devices connected to the TP and FO ports.

Duplex Mode

The OMC is capable of full duplex mode; in other words data can be transferred in both directions at the same time. The optical interfaces of the OMC also operate in full duplex mode so that TP devices connected to these ports must also be set to this mode.

Note

Both devices connected to the OMC (FO and TP) must be set to full duplex mode. If the devices do not support autonegotiation, full duplex mode must be configured manually.

Autonegotiation

Using the autonegotiation mechanism according to the IEEE standard 802.3, a TP device capable of autonegotiation and full duplex is automatically set to 100 Mbps and full duplex.

Note

- It is not possible to link two OMCs over their TP interfaces.
- The OMC can be used along with products of the OSM/ESM family in redundant rings or in standby links (see Network Topologies OMC, Part 3). To keep to the specified failover times in a redundant configuration, both TP devices connected to the OMCs must be permanently set to 100 Mbps and full duplex.
- If two OMCs are interconnected over an FO cable and if two devices with activated autonegotiation are connected over their TP ports, the autonegotiation procedure taking place at both ends at the same time may prevent a link from being established. To prevent this, one or both of the TP devices must be permanently set to 100 Mbps and full duplex.

4.2 FO Port

The FO port has a BFOC/2.5(ST) female connector. The connected cable is monitored for wire breaks complying with the IEEE 802.3 100BaseFX standard. A break on the FO cable is always signaled by the port status displays of the OMC and of the two attached devices. (Status LED of the port goes off).

4.3 Signaling Contact and Power Supply

The attachment of the power supply and the signaling contact is made using a 6-pin plug-in terminal block with a screw securing mechanism.

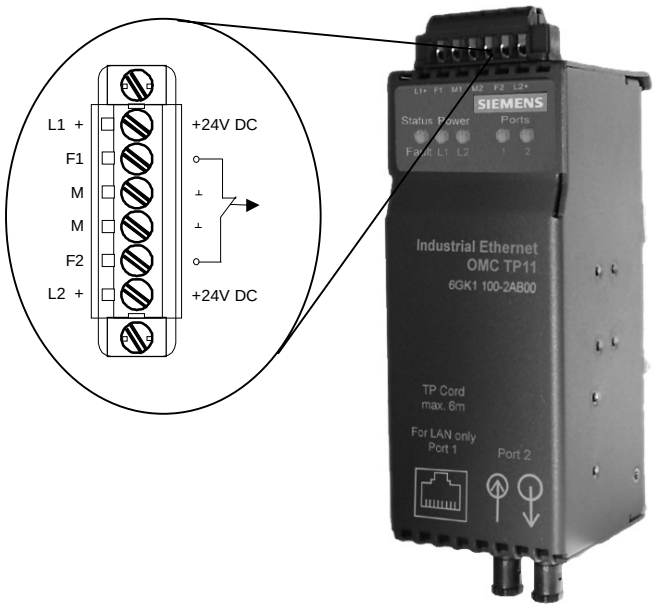


Figure 2: Terminal Block

Warning

Industrial Ethernet OMCs are designed for operation with safety extra-low voltage. This means that only safety extra-low voltages (SELV) complying with IEC950/EN60950/ VDE0805 can be connected to the power supply terminals and the signaling contact.

The power supply unit to supply the OMC must comply with NEC Class 2 (voltage range 18 - 32 V, current requirement 1 A)

The signaling contact can carry a load of maximum 100 mA (safety extra-low voltage (SELV), DC 24V).

Power Supply

The power supply can be connected redundantly. Both inputs are isolated. There is no load distribution. With redundant power supply, the power supply unit with the higher output voltage supplies the OMC alone. The power supply is connected over a high resistance with the enclosure to all an ungrounded setup.

Signaling Contact

The following is signaled via a floating signaling contact (relay contact) when contact is broken:

- The failure of one or both power supplies.

  Notice

  Both power supplies are always monitored (L1 and L2). If only one power supply exists, this must be applied via L1 **and** L2 otherwise the signaling contact will signal an error.

- The incorrect link status of a port (in other words, the port is not correctly attached or there are no link test pulses coming from the partner device).

4.4 Displays

Fault display (red LED)

Status	Meaning
On	The OMC has detected an error. The signaling contact opens at the same time. The signaled errors are described in Chapter 4.3.
Off	No errors detected by the OMC.

Power display (green LEDs)

The status of the redundant power supply is signaled by two green LEDs:

Status	Meaning
On	Power supply L1 or L2 is connected
Off	Power supply L1 or L2 is not connected or <14 V

Port status display (green/yellow LEDs)

The status of the ports is signaled by two LEDs:

Status	Meaning
Port 1 LED green	TP link exists, no data reception
Port 1 LED yellow	TP link exists, receiving data at TP port
Port 1 LED off	No TP link exists
Port 2 LED green	FO link exists, no data reception
Port 2 LED yellow	FO link exists, receiving data at FO port
Port 2 LED off	No FO link exists

Installation and Maintenance

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5.1 Components of the Product

Unpacking, Checking the Consignment

1. Check that the consignment includes the following components:
   - OMC device
   - Mounting brackets, screws and terminal block
   - Product Information
2. Check each component for any damage.

Warning
Do not install damaged components!

5.2 Installation

There are several ways of installing the OMC:

- Installation on a 35 mm standard rail
- Installation on a SIMATIC S7-300 rail
- Installation in a 19" cabinet (along with other OMCs and OSMs/ESMs)
- Wall mounted

Note

- Remember that the OMC must only be installed horizontally (ventilation slits top/bottom see Figure 4). To ensure adequate convection, there must be a clearance of at least 5 cm above and below the ventilation slits. You should also make sure that the permitted ambient temperature range is not exceeded.
- The optical transmitter and receiver elements are sensitive to contamination. You should therefore only remove the dust protection caps from the BFOC sockets immediately before plugging in the FO connector.
  If you remove the connector, cover the sockets immediately with the dust protection caps.
- During installation and operation, make sure that you adhere to the installation instructions and safety-related notices in this description and in the SIMATIC NET Industrial Twisted Pair and Fiber-Optic Networks manual /2/.

Preparations

Remove the terminal block from the OMC and wire up the power supply and signal lines as described in Section 4.3.

Standard Rail Mounting

1. Install the OMC on a 35 mm standard rail complying with DIN EN 50022.
2. Fit the OMC on to the rail from above and press in the bottom of the device until the catch engages.
3. Connect the electrical and optical cables and the terminal block for the power supply.

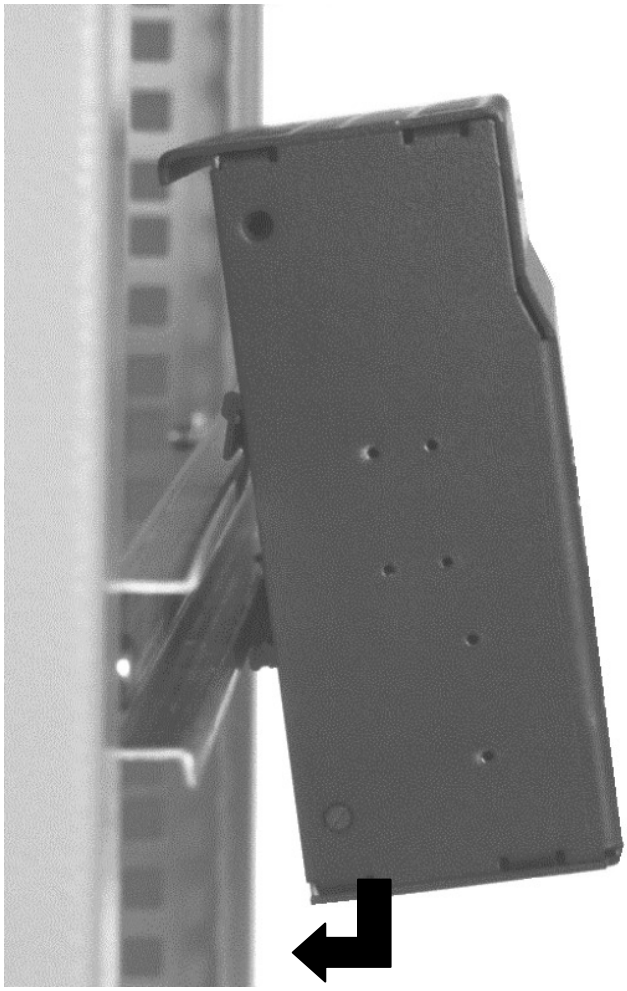

Figure 3: Installing the OMC on a DIN Standard Rail

Removing from a Standard Rail

To remove the OMC from the rail, first disconnect the FO and TP cables and pull off the terminal block.
Then pull down the device and release it from the rail.

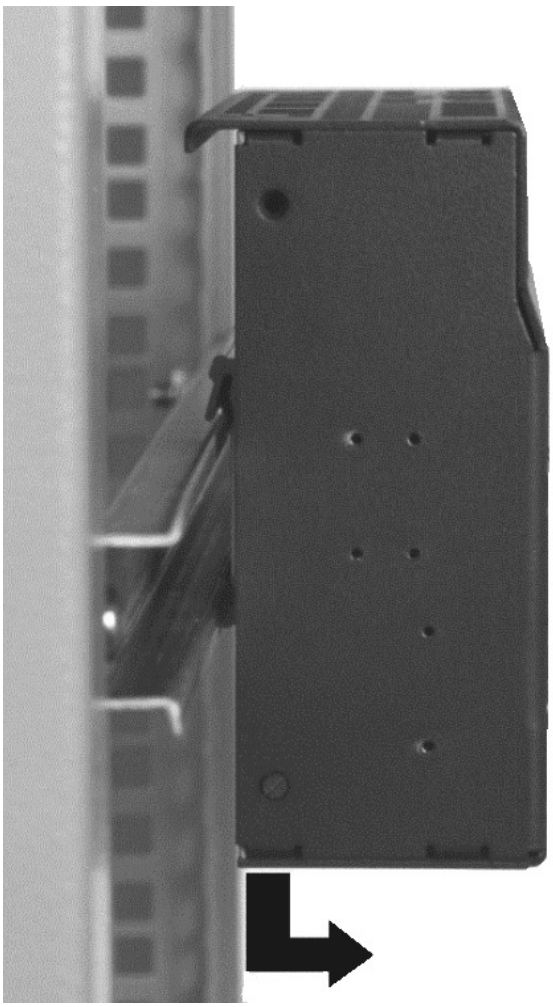

Figure 4. Removing from the Standard Rail

Installation on a SIMATIC S7-300 Rail

1. First fix one of the two supplied brackets to the right (OMC mounted on the right) or the left (OMC mounted on the left) side of the OMC.
2. Fit the guide on the top of the OMC casing into the S7 rail.
3. Screw the OMC to the bottom of the standard rail.

Installation in a 19" Cubicle

To install in the 19" cubicle, you require the two securing brackets supplied. You can achieve the 19" width

- with eight OMCs
- with one OSM / ESM and four OMCs

Follow the steps outlined below:

1. First screw the OMCs or ESMs/OSMs to the supplied mounting plates at the rear.
2. Fit two of the supplied brackets to the sides
3. Secure the devices using the brackets in the 19" cubicle. Please note that the OMC must be grounded with low resistance via the two holding brackets.

Note

To install in a 19" cubicle, you require a Torx screwdriver size T10 x 80.

Wall Mounting

To install an OMC on a wall, follow the steps below:

1. Fit the supplied mounting brackets on the sides of the OMC.
2. Secure the device to the wall using the brackets.
3. Connect the device to protective earth with a low-resistance connection via one of the brackets.

The table below shows how to secure the module depending on the wall type.

Wall Type	Mounting
Concrete wall	Use four wall plugs 6 mm in diameter 30 mm long (drillhole 6 mm diameter, 45 mm deep). Use screws 4.5 mm in diameter and 40 mm long.
Metal wall (min. 2 mm thick)	Use screws 4 mm in diameter and at least 15 mm long.
Sandwich type plaster wall (min. 15 mm thick)	Use an anchoring plug with at least 4 mm diameter.

Note

The module must be secured to the wall so that the mounting can carry at least four times the weight of the module.

5.3 Cleaning

The OMC casing can be cleaned, when necessary with a dry cloth.

5.4 Maintenance

If a fault develops, please send the module to your SIEMENS service department for repair. The devices cannot be repaired on site.

Technical Specifications

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Attachments	
Attachment of DTEs or Network Components over Twisted Pair	1 x RJ-45 with MDI-X Pinning (Medium Dependent Interface-Cross Over) on OMC TP11 and OMC TP11-LD The ports operate at 100 Mbps, full duplex (100BaseTX)
Attachment of other network components or OMCs over FO cable	2 BFOC sockets on the OMC TP11 and OMC TP11-LD (100 Mbps, full duplex complying with 100BaseFX)
Connector for power supply and signaling contact	1 x 6-pin plug-in terminal block

Electrical Data	
Power supply (redundant inputs isolated)	2 supplies DC 24 V (DC 18 to 32 V) safety extra-low voltage (SELV)
Power loss at DC 24 V	3.6 W
Load on the signaling contact	DC 24 V / max. 1000 mA safety extra-low voltage (SELV)
Current consumption at rated voltage	150 mA
Overcurrent protection at input	PTC resettable fuse (0.6 A / 60 V)

Permitted Cable Lengths	
FO link between two OMCs	OMC TP11: 0-3000m (62.5/125 µm or 50/125µm glass fiber; 1 dB/km at 1300 nm; 600 MHz*km; 6 dB max. permitted FO cable attenuation at 3 dB link power margin) OMC TP11-LD: 0-26000m (10/125 µm monomode fiber; 0.5 dB/km at 1300 nm; 13 dB max. permitted FO cable attenuation at 2 dB
TP Connection	0-6 m with TP cord

Permitted Ambient Conditions/EMC	
Operating temperature	0°C to +60°C
Storage/transport temperature	-40°C to +80°C
Relative humidity in operation	‹ 95% (no condensation)
Operating altitude	Max. 2000 m
Noise emission	EN 55081 Class A
Noise immunity	EN 50082-2
Degree of protection	IP 20
Laser protection	Class 1 complying with IEC 60825 –1

Mechanical Design	
Dimensions (W x H x D) in mm	54 x 136.5 x 69
Weight in g	500
Installation options	Standard rail S7-300 rail Wall mounted Installation in 19” cubicle **Only horizontal installation permitted** **(ventilation slits top/bottom)**

Product and Ordering Data	
OMC TP11 and OMC TP11-LD	• OMC device • Mounting brackets, screws and terminal block • Product Information

Order numbers:	
OMC TP11	6GK1100-2AB00
OMC TP11-LD	6GK1100-2AC00
“Industrial Twisted Pair and Fiber Optic Networks” Manual	6GK1970-1BA10-0AA1

Further Support

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Who to Contact

If you have technical questions about using the described product and your problem is not dealt with in the documentation or in the integrated help system, please contact your Siemens representative or dealer.

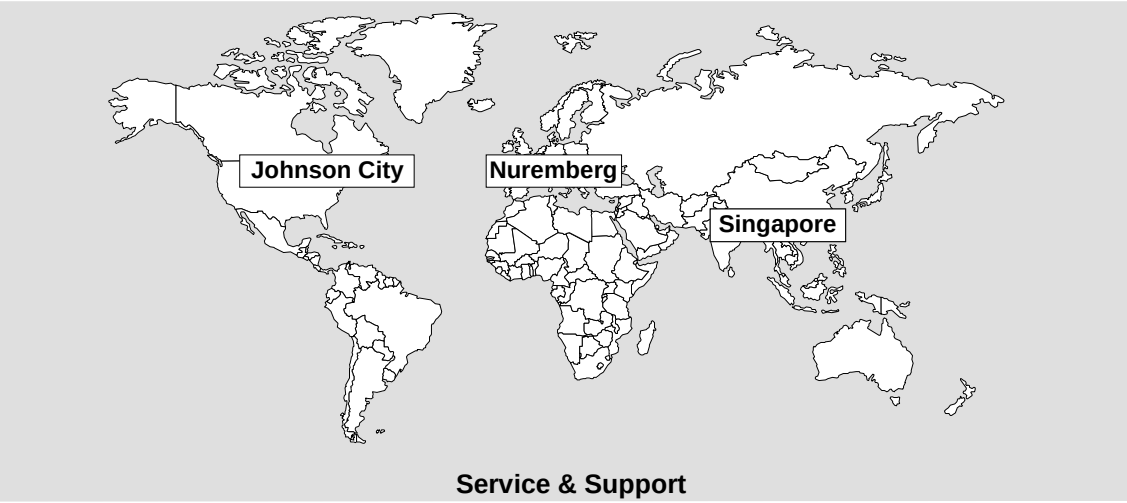
You will find the addresses:

- in our catalog IK PI
- on the Web (http://www.ad.siemens.de/net)

Automation and Drives, Service & Support

Service & Support from A&D is available round the clock worldwide.

The languages spoken are German and English.
French, Italian, and Spanish are also spoken on the authorization hotline.



Service & Support

Technical Support	**Authorization Hotline**
Europe and Africa (Nuremberg) Mo. To Fr. 7:00 to 17:00 (local time, GMT +1) Phone: +49 – (0) 180 – 5050 – 222 Fax: +49 – (0) 180 – 5050 – 223 E-mail: techsupport@ad.siemens.de	**Europe and Africa** (Nuremberg) Mo. To Fr. 7:00 to 17:00 (local time, GMT +1) Phone: +49 – (0) 911 – 895 – 7200 Fax: +49 – (0) 911 – 895 – 7201 E-mail: authorization@nbgm.siemens.de
America (Johnson City) Mo. To Fr. 8:00 to 19:00 (local time, GMT –5) Phone: +1 – (0) 423 – 262 – 2522 Fax: +1 – (0) 423 – 262 – 2231 E-mail: simatic.hotline@sea.siemens.com	
Asia and Australia (Singapore) Mo. To Fr. 8:30 to 17:30 (local time, GMT +8) Phone: +65 – (0) 740 – 7000 Fax: +65 – (0) 740 – 7001 E-mail: simatic.hotline@sae.siemens.com.sg	

SIMATIC Premium Hotline	
Worldwide (Nuremberg) Workdays 0:00 to 24:00 (local time, GMT +1) Phone: +49 – (0) 911 – 895 – 7777 Fax: +49 – (0) 911 – 895 – 7001 E-mail: techsupport@ad.siemens.de	Fast callback guaranteed within a maximum of two hours (charged, only with the SIMATIC Card)

Service & Support on the Internet

On the World Wide Web, you will find the very latest information on the entire SIMATIC product range, for example, answers to frequently asked questions (FAQs), Tips and Tricks, software updates, and user information.

In addition to this free information, you can also order the following, for which a charge is made:

- Software products
- Sample application programs

These are charged to the SIMATIC CARD.

Internet address:
http://www.siemens.de/automation/service&support

You can also formulate a question for the SIMATIC Knowledge Manager that will find the solution in the knowledge database.

If you are working in an area without an online connection, part of the free information area is available on the “SIMATIC Customer Support Knowledge Base” CD.

Training for SIMATIC NET

Who to Contact about Training Courses:

Siemens AG
Trainings-Center für Automatisierungs- und Antriebstechnik
A&D PT 49 Kursbüro

Östliche Rheinbrückenstraße 50
76181 Karlsruhe
Germany

Phone: +49 – (0) 721 – 595 – 2917
Fax: +49 – (0) 721 – 595 – 6087
Internet: http://www.sitrain

Certification

The products of SIMATIC NET are manufactured and marketed using a quality management system complying with DIN ISO 9001 and certified by DQS (certificate registration no. 2613). The DQS certificate is recognized in all IQNet countries (Reg. No. 2613).

Notes on the CE Mark

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Product name:

SIMATIC NET	OMC TP11	6GK1100-2AB00
	OMC TP11-LD	6GK1100-2AC00

The SIMATIC NET products listed above meet the requirements of the following EU directives:

EMC Directive

Directive 89/336/EEC “Electromagnetic Compatibility”

Area of Application

The products are designed for use in an industrial environment:

Area of Application	Requirements	
	Noise emission	Noise immunity
Industry	EN 50081-2 : 1993	EN 50082-2 : 1995

Installation Guidelines

- The products meet the requirements if you adhere to the installation and safety instructions contained in this description and in the “SIMATIC NET Industrial Ethernet TP and Fiber-Optic Networks” manual.

Conformity Certificates

The EU declaration of conformity is available for the responsible authorities according to the above-mentioned EU directive at the following address:

Siemens Aktiengesellschaft
Bereich Automatisierungs- und Antriebstechnik
Industrielle Kommunikation (A&D PT2)
Postfach 4848
D-90327 Nürnberg
Germany

Notes for the Manufacturers of Machines

This product is not a machine in the sense of the EU directive on machines. There is therefore no declaration of conformity for the EU directive on machines 89/392/EEC.

If the product is part of the equipment of a machine, it must be included in the procedure for obtaining the declaration of conformity by the manufacture of the machine.

Glossary

9

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.
Autosensing	See Autonegotiation
BFOC	Bayonet Fiber-Optic Connector (ST-compatible).
EMC	Electromagnetic compatibility
ESM	Electrical Switching Module. SIMATIC NET Ethernet switch with electrical ports
FOC	Fiber-optic cable
LD	Long Distance
MDI-X	MDI-X Pinning (Medium Dependent Interface-Cross Over)
OMC	Optical Media Converter
OSM	Optical Switching Module. SIMATIC NET Ethernet switch with optical and electrical ports
Signaling contact	Floating relay contact via which the error states detected by the OMC can be signaled.
TP Port	Twisted-pair port

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References

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/1/ SIMATIC NET Industrial Ethernet OSM/ESM Network Management, Release 08/2001
Available at
http://www4.ad.siemens.de/view/cs/de/8677203
on the Web.

/2/ SIMATIC NET Industrial Twisted Pair and Fiber-Optic Networks, Release 05/2001
Order numbers:
6GK1970-1BA10-0AA0 German
6GK1970-1BA10-0AA1 English
6GK1970-1BA10-0AA2 French
6GK1970-1BA10-0AA4 Italian

/3/ SINEC H1 Manual for Triaxial Networtks, Release 04
Order number 6GK1970-1AA20-0AA0 (German/English)