# **SIEMENS**

## SIMATIC NET

Industrial Remote Communication Remote Networks SCALANCE M812, M816

**Operating Instructions** 

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#### Legal information

#### Warning notice system

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

#### **▲** DANGER

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

#### **▲**WARNING

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

#### **A**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.

## **Preface**

#### Purpose of the Operating Instructions

These compact operating instructions contain information with which you will be able to install and connect up a device of the SCALANCE M -800 product line. The configuration and the integration of the device in a network are not described in these instructions.

#### Validity of the manual

These operating instructions apply to the following devices:

- SCALANCE M812-1
- SCALANCE M816-1

#### Naming of the devices

Classification	Description	Terms used
Product line	For all devices and variants in the product line, the term M-800 800 is used.	
Device family	ce family For all devices and variants in the device family line, the term M81x is used.	
Device	If information relates to a specific device, the device name	M812
	is used.	M816

#### **Further documentation**

• System manual "Industrial Ethernet"

The system manual contains information on other SIMATIC NET products that you can operate along with the devices of this product line in an Industrial Ethernet network.

There, you will find among other things optical performance data of the communications partner that you require for the installation.

The "SIMATIC NET Industrial Ethernet" system manual can be found on the Internet pages of Siemens Industry Online Support under the following entry ID:27069465 (http://support.automation.siemens.com/WW/view/wn/27069465)

• "Passive network components" system manual

This system manual contains installation instructions for several of the most common components and guidelines for setting up networked automation plants in buildings.

The "Passive Network Components" system manual can be found on the Internet pages of Siemens Industry Online Support under the following entry ID:84922825 (http://support.automation.siemens.com/WW/view/en/84922825)

#### SIMATIC NET manuals

You will find SIMATIC NET manuals on the Internet pages of Siemens Industry Online Support:

- using the search function:
  - Link to Siemens Industry Online Support (<a href="http://support.automation.siemens.com/">http://support.automation.siemens.com/</a>)
    Enter the entry ID of the relevant manual as the search item.
- In the navigation panel on the left hand side in the area "Industrial Communication":
   Link to the area "Industrial Communication"
   (http://support.automation.siemens.com/WW/view/en/10805878/133400)

Go to the required product group and make the following settings: tab "Entry list", Entry type "Manuals"

You will find the documentation for the SIMATIC NET products relevant here on the data medium that ships with some products:

- Product CD / product DVD
- SIMATIC NET Manual Collection

You will find the order numbers for the Siemens products of relevance here in the following catalogs:

- SIMATIC NET Industrial Communication / Industrial Identification, catalog IK PI
- SIMATIC Products for Totally Integrated Automation and Micro Automation, catalog ST 70
- Industry Mall catalog and ordering system for automation and drive technology, Online catalog (http://eb.automation.siemens.com/)

You can request the catalogs and additional information from your Siemens representative.

#### Security messages

#### Note

Siemens offers IT security mechanisms for its automation and drive product portfolio in order to support the safe operation of the plant/machine. Our products are also continuously developed further with regard to IT security. We therefore recommend that you regularly check for updates of our products and that you only use the latest versions. You will find information in:

(http://support.automation.siemens.com/WW/llisapi.dll?func=cslib.csinfo2&aktprim=99&lang=en)

Here, you can register for a product-specific newsletter.

For the safe operation of a plant/machine, however, it is also necessary to integrate the automation components into an overall IT security concept for the entire plant/machine, which corresponds to the state-of-the-art IT technology. You will find information on this in: (http://www.siemens.com/industrialsecurity)

Products from other manufacturers that are being used must also be taken into account.

#### License conditions

#### Note

#### Open source software

Read the license conditions for open source software carefully before using the product.

You will find license conditions in the following documents on the supplied data medium:

- DOC\_OSS-SCALANCE-M\_74.pdf
- DC\_LicenseSummaryScalanceM810\_76.htm

#### SIMATIC NET glossary

Explanations of many of the specialist terms used in this documentation can be found in the SIMATIC NET glossary.

You will find the SIMATIC NET glossary here:

- SIMATIC NET Manual Collection or product DVD
   The DVD ships with certain SIMATIC NET products.
- On the Internet under the following entry ID:
   50305045 (http://support.automation.siemens.com/WW/view/en/50305045)

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Description of the device

### 1.1 Product characteristics

#### Interfaces

Functionality	M812-1	M816-1
DSL interface	1x RJ45	1x RJ45
Ethernet interface	1x RJ-45 10 / 100 Mbps	4 x RJ-45 10 / 100 Mbps
Digital input/output	1/1	1/1

### Scope of delivery

The following components ship with the product:

- · One device
- A 5-pin terminal block for the power supply
- A 2-pin terminal block for the digital output
- A 2-pin terminal block for the digital input
- Documentation CD

#### Note

#### Not included with the product

The following components do not ship with the product:

• KEY-PLUG / C-PLUG

You will find more detailed information in "C-PLUG and KEY-PLUG (Page 18)".

#### Order numbers

Туре	Description	Order number
SCALANCE M812-1	ADSL2+ router	
	Analog phone connection (Annex A)	6GK5812-1AA00-2AA2
	ISDN connection (Annex B)	6GK5812-1BA00-2AA2
SCALANCE M816-1	ADSL2+ router	
	Analog phone connection (Annex A)	6GK5816-1AA00-2AA2
	ISDN connection (Annex B)	6GK5816-1BA00-2AA2

#### 1.2 Accessories

### Unpacking and checking



#### Do not use any parts that show evidence of damage

If you use damaged parts, there is no guarantee that the device will function according to the specification.

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

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

Use only undamaged parts.

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

#### 1.2 Accessories

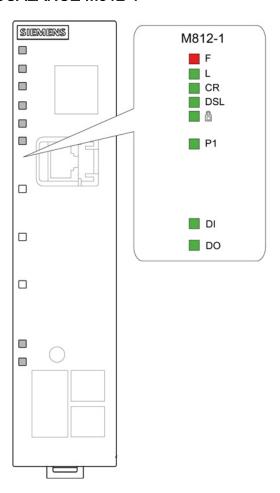
You will find further information on the accessories program for the M812 and M816 in the Industry Mall

(https://eb.automation.siemens.com/goos/WelcomePage.aspx?regionUrl=/de&language=en)

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## 1.3 LED display

## 1.3.1 SCALANCE M812-1



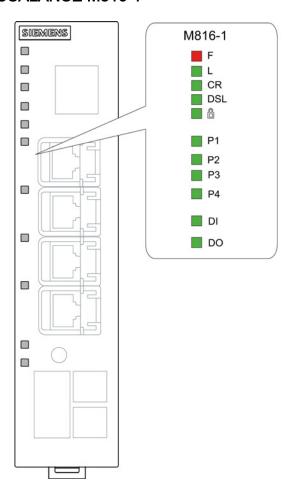
LED	Status	Meaning
F	OFF	No fault/error.
	ON	The device is starting up or an error has occurred.
	Flashing	The bootloader waits in this state for a new firmware file that you can download using TFTP.

## 1.3 LED display

LED	Status	Meaning
L	OFF	Device turned off, no power supply.
	ON	Device turned on, power supply present.
CR	OFF	Device is not dialed in.
	Flashing	DSL line training is completed, the DSL connection is established and
		PPPoE passthrough is enabled.
	ON	The dial-in with the access data was successful and the device was
		assigned an external IP address by the DSL provider.
	ON	The dial-in has failed.
DSL	OFF	DSL interface is off.
	ON	DSL interface is enabled and the DSL line training is running: The device
		synchronizes itself with the DSLAM in the central office.
	Flashing	DSL line training has failed or the DSL cable connection is down.
	ON	DSL line training is completed and the DSL connection is established.
8	OFF	VPN not established
	ON	VPN established
P1	OFF	Ethernet connection to local computer or LAN not established
	ON	Ethernet connection to local computer or LAN established
	ON	Device receiving / sending data

LED	Status	Meaning
DI	OFF	Digital input inactive
	ON	Digital input active.
DO	OFF	Digital output inactive
	ON	Digital output active.

## 1.3.2 SCALANCE M816-1



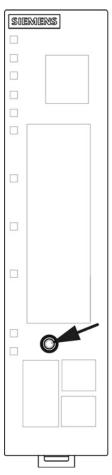
## 1.3 LED display

LED	Status	Meaning
F	OFF	No fault/error.
	ON	The device is starting up or an error has occurred.
	Flashing	The bootloader waits in this state for a new firmware file that you can download using TFTP.
L	OFF	Device turned off, no power supply.
	ON	Device turned on, power supply present.
CR	OFF	The device has not dialed in and / or the "Enable PPPoE Passthrough" function is enabled.
	Flashing	DSL line training is completed, the DSL connection is established and
		PPPoE passthrough is enabled.
	On	The dial-in with the access data was successful and the device was
		assigned an external IP address by the DSL provider.
	ON	The dial-in has failed.
DSL	OFF	The DSL interface is off or the DSL line training has not yet begun.
DOL		The BOL interlace is on or the BOL line training has not yet begun.
	ON	DSL interface is enabled and the DSL line training is running: The device
		synchronizes itself with the DSLAM in the central office.
	Flashing	DSL line training has failed or the DSL cable connection is down.
	ON	DSL line training is completed and the DSL connection is established.
		DOE line training is completed and the DOE connection is established.
	OFF	VPN not established
8		
	ON	VPN established
P1	OFF	Ethernet connection to local computer or LAN not established
P2		
P3 P4	ON	Ethernet connection to local computer or LAN established
	ON	Device receiving / sending data
L		1

LED	Status	Meaning
DI	OFF	Digital input inactive
	ON	Digital input active.
DO	OFF	Digital output inactive
	ON	Digital output active.

#### 1.4 SET button

With a SCALANCE M81x, the SET button is on the front of the housing.



The SET button has the following functions:

Restart

Hold down the button for longer than 3 seconds to run a restart.

• Loading new firmware

If the normal procedure with the "Load & Save" menu of Web Based Management does not work, the SET button can be used to load new firmware. This situation can occur if there is a power outage during the normal firmware update.

- Hold down the button until the red fault LED (F) starts to flash after approximately 3 seconds.
- Now release the button. The bootloader waits in this state for a new firmware file that you can download by TFTP.

You will find more information in the section "Service and Maintenance" in the SCALANCE M-800 Web Based Management configuration manual.

#### Reset to factory defaults

- Hold down the button until the red fault LED (F) stops flashing after approximately 10 seconds and is permanently lit.
- Now release the button and wait until the fault LED (F) goes off again. The device then starts automatically with the factory settings and can be reached via the IP address 192.168.1.1.

You will find more information in the section "Service and Maintenance" in the SCALANCE M-800 Web Based Management configuration manual.

#### 1.5 C-PLUG and KEY-PLUG

#### How it works

The C-PLUG or KEY-PLUG is used to transfer the configuration of the old device to the new device when a device is replaced.

#### NOTICE

#### Do not remove or insert a C-PLUG / KEY-PLUG during operation!

A PLUG may only be removed or inserted when the device is turned off.
The device checks whether or not a PLUG is present at one second intervals. If it is detected that the PLUG was removed, there is a restart.

If a valid KEY-PLUG was inserted in the device, the device changes to a defined error state following the restart.

When the new device starts up with the PLUG, it then continues automatically with exactly the same configuration as the old device. One exception to this can be the IP configuration if it is set over DHCP and the DHCP server has not been reconfigured accordingly.

A reconfiguration is necessary if you use functions based on MAC addresses. If an incorrect PLUG, for example from another product or a damaged PLUG is inserted, the device signals an error with the "F" LED.

You can either remove the PLUG again or select the option to reformat the PLUG.

In terms of the PLUG, devices work in two modes:

#### Without PLUG

The device stores the configuration in internal memory. This mode is active when no PLUG is inserted.

#### • With PLUG

The configuration stored on the PLUG is displayed in WBM in "Information > PLUG". If changes are made to the configuration, the device stores the configuration directly on the PLUG and in the internal memory. This mode is active as soon as a PLUG is inserted. As soon as the device is started with a PLUG inserted, the device starts up with the configuration data on the PLUG.

#### License information on the KEY-PLUG

In addition to the configuration, the KEY-PLUG also contains a license that allows the use of Siemens Remote Services.

### Order numbers

Туре	Order number	Description
C-PLUG	6GK1900-0AB00	Exchangeable storage medium (32 MB) for the configuration data
KEY-PLUG M800 SRS	6GK5908-0PA00	Exchangeable storage medium (256 MB) to enable Siemens Remote Services and receiving the configuration data.

1.5 C-PLUG and KEY-PLUG

Installation

#### Safety notices

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



If a device is operated in an ambient temperature of more than 50  $^{\circ}$ C, the temperature of the device housing may be higher than 70  $^{\circ}$ 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  $^{\circ}$ C.

#### Safety notices on use in hazardous areas

General safety notices relating to protection against explosion



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.

#### General notes on use according to ATEX and IECEx



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

#### 2.1 Securing the housing

## 2.1 Securing the housing

### Types of installation

For the devices, you have the following options:

- Wall mounting (no ceiling mounting)
- Installing on a DIN rail
- Installing on the S7-300 standard rail
- Installing on the S7-1500 standard rail

#### Strain relief for the cables

Regardless of the type of installation, make sure that there is suitable strain relief for the connecting cable.

#### Permitted installation direction

Vertical mounting (ventilation openings at the top and bottom)

#### Clearances

Keep to the minimum clearances to other components or to walls of a housing so that the convection ventilation of the device is not blocked.

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

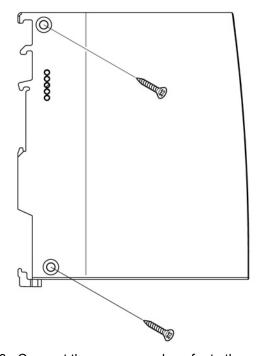
## 2.2 Wall mounting

#### Note

The wall mounting must be capable of supporting four times the weight of the device, but at least 50 N. For information on the weight, refer to the section "Technical specifications (Page 41)".

#### Installation

- 1. Prepare the drill holes for wall mounting. For the precise dimensions, refer to the section "Dimension drawing (Page 37)".
- 2. Secure the device to the wall with two screws. When mounting on a wall, use mounting fittings suitable for the type of wall.

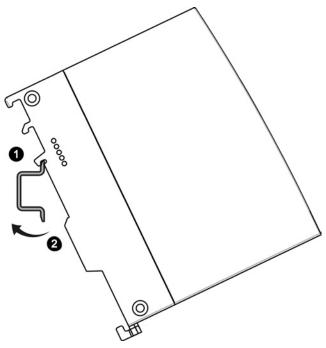


- 3. Connect the power supply, refer to the section "Power supply (Page 29)".
- 4. Fit the connectors for the digital input and digital output, refer to the section "Digital input/output (Page 31)".
- 5. Connect the device to the DSL connection, refer to the section "DSL interface (Page 33)".
- 6. Connect the device to the local network, refer to the section "Ethernet port (Page 34)".

## 2.3 Installing on the DIN rail

#### Installation

1. Place the third housing guide of the device on the top edge of the DIN rail ①.



- 2. Press the device down against the DIN rail until the spring catch locks in place ②.
- 3. Connect the power supply, refer to the section "Power supply (Page 29)".
- 4. Fit the connectors for the digital input and digital output, refer to the section "Digital input/output (Page 31)".
- 5. Connect the device to the DSL connection, refer to the section "DSL interface (Page 33)".
- 6. Connect the device to the local network, refer to the section "Ethernet port (Page 34)".

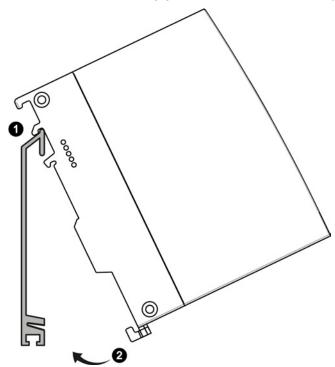
#### Dismantling

- 1. Disconnect all connected cables.
- 2. Release the DIN rail catch on the bottom of the device using a screwdriver.
- 3. Pull lower part of the device away from the DIN rail.

## 2.4 Installing on the S7-300 standard rail

#### Installation

1. Place the second housing guide of the device on the top edge of the standard rail ①.



- 2. Press the device down against the standard rail until the spring catch locks in place ②.
- 3. Connect the power supply, refer to the section "Power supply (Page 29)".
- 4. Fit the connectors for the digital input and digital output, refer to the section "Digital input/output (Page 31)".
- 5. Connect the device to the DSL connection, refer to the section "DSL interface (Page 33)".
- 6. Connect the device to the local network, refer to the section "Ethernet port (Page 34)".

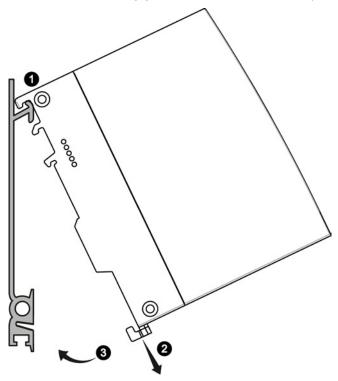
#### Dismantling

- 1. Disconnect all connected cables.
- 2. Using a screwdriver, pull down the catch on the rear of the device.
- 3. Remove the device from the standard rail.

## 2.5 Installing on the S7-1500 standard rail

#### Installation

1. Place the first housing guide of the device on the top edge of the standard rail ①.



- 2. Using a screwdriver, pull down the catch ② on the rear of the device.
- 3. Swing the device down while pressing the catch ③. After it is released, the spring catch locks in place.
- 4. Connect the power supply, refer to the section "Power supply (Page 29)".
- 5. Fit the connectors for the digital input and digital output, refer to the section "Digital input/output (Page 31)".
- 6. Connect the device to the DSL connection, refer to the section "DSL interface (Page 33)".
- 7. Connect the device to the local network, refer to the section "Ethernet port (Page 34)".

## Dismantling

- 1. Disconnect all connected cables.
- 2. Using a screwdriver, pull down the catch on the rear of the device.
- 3. Remove the device from the standard rail.

Connecting up

## 3.1 Safety when connecting up

## Safety notices

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



The equipment is designed for operation with Safety Extra-Low Voltage (SELV) by a Limited Power Source (LPS).

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).

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

#### Safety notices on use in hazardous areas

General safety notices relating to protection against explosion



#### **EXPLOSION HAZARD**

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



#### **EXPLOSION HAZARD**

DO NOT OPEN WHEN ENERGIZED.

#### 3.1 Safety when connecting up

#### Safety notices when using the device according to ATEX

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



Take measures to prevent transient voltage surges of more than 40% of the rated voltage. This is the case if you only operate devices with SELV (safety extra-low voltage).



#### **EXPLOSION HAZARD**

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

#### Safety notices when using the device according to Hazardous Locations (HazLoc)

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

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.

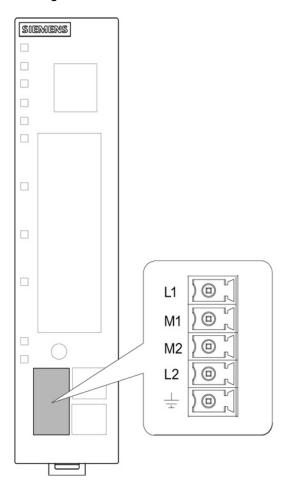


#### **EXPLOSION HAZARD**

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

## 3.2 Power supply

The power supply is connected using a 5-pin terminal block. The power supply is non-floating.



PIN	Signal	Description
1	L1+	24 VDC
2	M1	Ground
3	M2	Ground
4	L2+	24 VDC
5	뱌	Functional ground, refer to the section Grounding (Page 30)"

#### 3.3 Grounding

#### External power supply

#### Note

#### Permitted external power supplies

The power supply unit to supply the SCALANCE M81x must comply with the requirements for a limited power source according to IEC/EN 60950-1, section 2.5.

The external power supply for the SCALANCE M81x must meet the requirements for NEC class 2 circuits as specified in the National Electrical Code ® (ANSI/NFPA 70).

Refer to the section Connecting up (Page 27) and the installation instructions and instructions for use of the manufacturer of the power supply, the battery or the accumulator.

## 3.3 Grounding

A functional grounding must be established for example by connecting a cable from terminal 5 to the DIN rail, refer to the section "Power supply (Page 29)". Such a cable should be kept as short as possible.

## 3.4 Digital input/output

The digital input/output is a floating optical switch with which error/fault states can be signaled by breaking the contact.

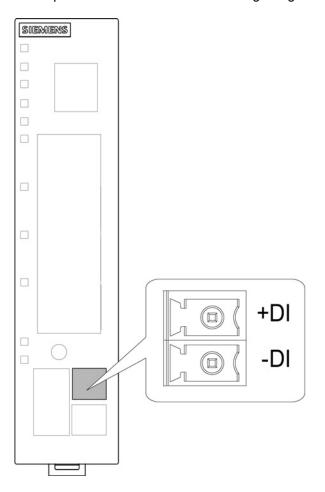


#### Damage due to voltage being too high or too low

The voltage at the digital input/output must not exceed 30 VDC and not fall below -30 VDC, otherwise the digital input/output will be destroyed.

#### Digital input

The 2-pin terminal block has the following assignment:



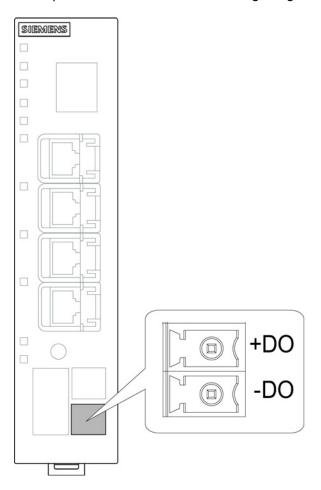
DI+	24 VDC
DI- (input ground)	-

If there is an adequate switching voltage at the digital input, the digital input is active and the "DI" LED is lit. This means that, for example a local application connected to the in port can trigger an alarm message by SMS outside the IP data connection.

#### 3.4 Digital input/output

## Digital output

The 2-pin terminal block has the following assignment:



DO+	Relay 24 VDC / 1 A
DO-	Relay 24 VDC / 1 A

The digital output signals an existing VPN connection. If at least one VPN connection is established, the digital input is active and the "DO" LED is lit.

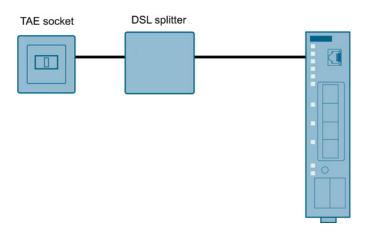
## 3.5 DSL interface



#### Risk of fire

To reduce the risk of fire only use telephone cable with 26 AWG (0.125 mm²) or larger.

Connect the device to the DSL socket of the splitter.



## Cable assignment

Contact	10/100 Mbps	DSL
1	Tx+	-
2	Tx-	-
3	Rx+	-
4	-	а
5	-	b
6	RX-	-
7	-	-
8	-	-

3.6 Ethernet port

## 3.6 Ethernet port

#### Note

Do not use the device as a router between internal subnets.

Connect the local network with the local applications to the Ethernet port, for example a programmable logic controller, a machine with an Ethernet interface for remote monitoring or a PC.

For the connection, use a path cable with an RJ-45 plug. You will find the properties of the Ethernet interface in the technical specifications.

## 3.7 Replacing the PLUG

#### **NOTICE**

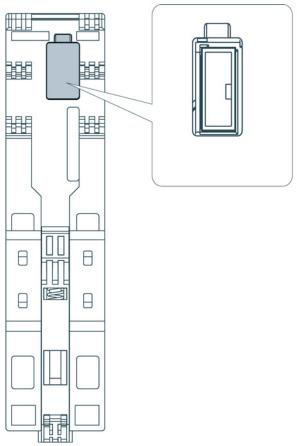
#### Do not remove or insert a C-PLUG / KEY-PLUG during operation!

A PLUG may only be removed or inserted when the device is turned off. The device checks whether or not a PLUG is present at one second intervals. If it is detected that the PLUG was removed, there is a restart. If a valid KEY-PLUG was inserted in the device, the device changes to a defined error state following the restart.

#### Inserting the PLUG

- 1. Turn off the power to the device.
- 2. Insert the PLUG correctly oriented into the slot.

To ensure this, the housing of the PLUG has a protruding ridge on the long side. The slot has a groove at this position.



#### 3.7 Replacing the PLUG

## Removing the PLUG

- 1. Turn off the power to the device.
- 2. Insert a screwdriver between the front edge of the PLUG and the slot and release the PLUG.
- 3. Remove the PLUG.

Dimension drawing

# 4.1 SCALANCE M812-1

Dimensions are specified in mm.

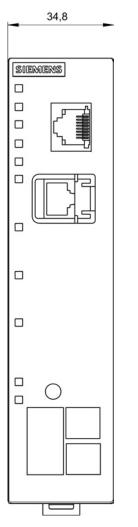


Figure 4-1 Front view

# 4.1 SCALANCE M812-1

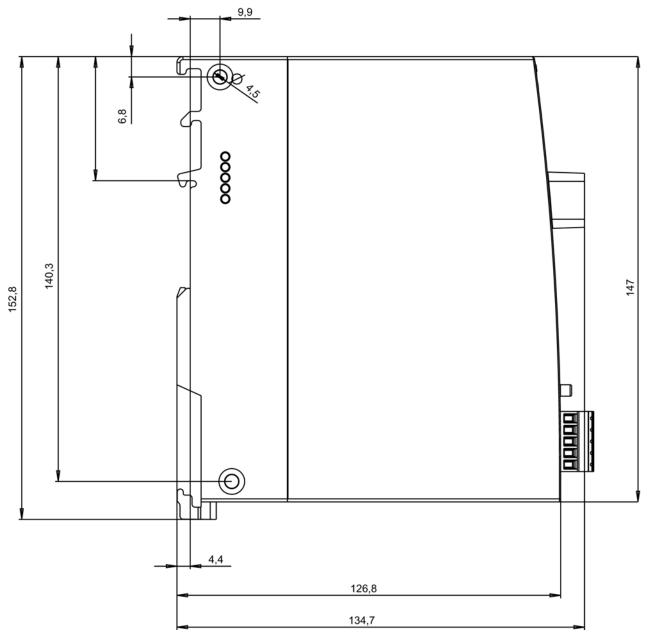


Figure 4-2 Side view

# 4.2 SCALANCE M816-1

Dimensions are specified in mm.

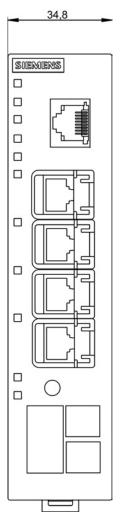
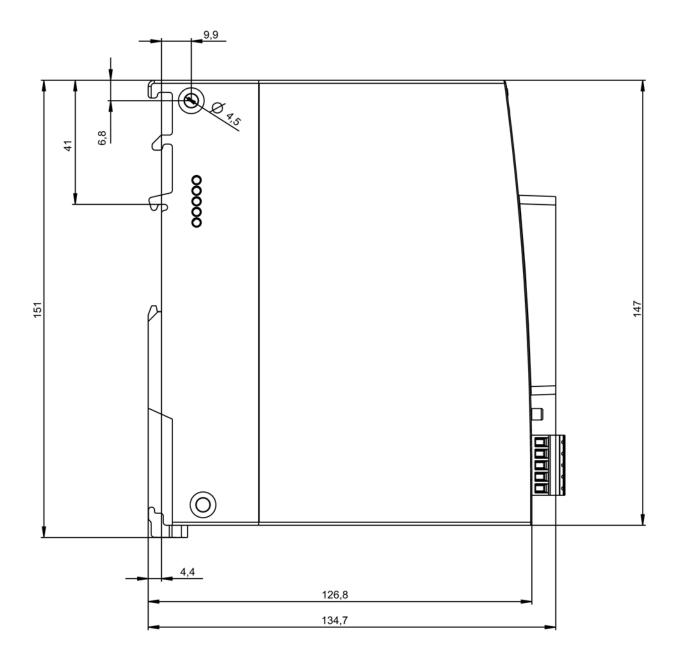


Figure 4-3 Front view

# 4.2 SCALANCE M816-1



1236

Figure 4-4 Side view

Technical specifications

# 5.1 SCALANCE M812 \ M816

		SCALANCE M812- 1	SCALANCE M816-1
Order number	Annex A	6GK5 812-1AA00-2AA2	6GK5 816-1AA00-2AA2
	Annex B	6GK5 812-1BA00-2AA2	6GK5 816-1BA00-2AA2
Ethernet interface			
Attachment to Industrial Ethernet	Quantity	1	4
	Design	RJ-45 jack	
		Characteristics:	
		• 10/100BASE-T	
		• Ethernet IEEE 802	
		<ul> <li>10/100 Mbps</li> </ul>	
WAN interface			
DSL connection	Quantity	1	1
	Design	RJ-45 jack	
ADSL	Properties	ITU-T G.992.1, ITU-T G.9	992.2
	Transmission speed	Download: up to 8 Mb	ops
		<ul> <li>Upload: up to 1 Mbps</li> </ul>	
ADSL2	Properties	ITU-T G.992.3, ITU-T G.9	992.4
	Transmission speed	Download: up to 12 M	1bps
		Upload: up to 1 Mbps	
ADSL2+	Properties	ITU-T G.992.5	
	Transmission speed	Download: up to 25 M	1bps
		Upload: up to 1.4 Mbp	•
Electrical data			
Power supply	Input voltage	12 24 VDC	
		min. 10.8 VDC, max. 28.8 V	
	Power	max. 8 W	
	consumption		

# 5.1 SCALANCE M812 | M816

12- 1 SCALANCE M816-1	
Terminal block, 2 terminals	
4 VDC Safe Extra Low Voltage	
to 30 VDC	
0 to 3 VDC	
current 8 mA	
length: < 30 m	
Inputs isolated from electronics.	
1	
Terminal block, 2 terminals	
Rated voltage 24 VDC Safe Extra Low Voltage (SELV)	
rrent limited	
Maximum current carrying capacity 1 A	
Maximum cable length: < 30 m	
Output isolated from electronics	
no condensation	
e S7-1500	
34.7 mm	
ng	
a DIN rail	
an S7-300 standard rail	
an S7-1500 standard rail	
ion openings at the top and bottom)	

	SCALANCE M812- 1 SCALANCE M816-1
Product functions	
Firewall and security	Stateful inspection
	<ul> <li>Packet filter</li> </ul>
	<ul> <li>IPsec VPN for up to 20 connections</li> </ul>
	<ul> <li>Password protection</li> </ul>
Router functions	NAPT (port forwarding)
	<ul> <li>NAT (IP masquerading)</li> </ul>
	<ul> <li>NAT traversal</li> </ul>
	• 1:1 NAT
	<ul> <li>Dynamic DNS client</li> </ul>
	DNS cache
	• NTP
	Remote logging
	<ul> <li>Connection monitoring</li> </ul>
Configuration / management	Web-based administration user interface (WBM)
	<ul> <li>Remote access with HTTPS</li> </ul>
	<ul> <li>SNMP and SNMP traps</li> </ul>

5.1 SCALANCE M812 | M816

# Approvals

# Approvals issued

#### Note

# Issued approvals on the type plate of the device

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

# A.1 INSTALLATION



#### Personal injury and property damage can occur

The installation of expansions that are not approved for SIMATIC NET products or their target systems may violate the requirements and regulations for safety and electromagnetic compatibility.

Only use expansions that are approved for the system.

#### Keep to the installation guidelines

The devices meet the requirements if you adhere to the installation and safety instructions contained in this documentation and in the following documentation when installing and operating the devices.

#### 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:

- "Industrial Ethernet / PROFINET Industrial Ethernet" System Manual
- "Industrial Ethernet / PROFINET Passive network components" System Manual You will find information on the system manuals in the section "ID = 27069465 (http://support.automation.siemens.com/WW/view/en/27069465)", in "Further documentation".
- "EMC Installation Guidelines" configuration manual
   ID = 60612658 (<a href="http://support.automation.siemens.com/WW/view/en/60612658">http://support.automation.siemens.com/WW/view/en/60612658</a>)

#### Working on the device

To protect the device from electrostatic discharge, personnel must first discharge any electrostatic charge from their body before touching the device.

#### Note

The test was performed with a device and a connected communications partner that also meets the requirements of the standards listed above.

When operating the device with a communications partner that does not comply with these standards, adherence to the corresponding values cannot be guaranteed.

# A.2 Individual approvals on the Internet

#### Current approvals on the Internet

You will also find the current approvals for the product on the Internet pages of Siemens Automation Customer Support under the following entry ID:

134200 (http://support.automation.siemens.com/WW/view/en/80046561/134200)

→ "Entry list" tab, entry type "Certificates"

# A.3 EU declaration of conformity



When used for its intended purpose, the product is compliant with the requirements of the following European directives:

 Directive 2004/108/EC (EMC) of the European Parliament and of the Council of December 15, 2004 on the approximation of the laws of the member states relating to electromagnetic compatibility

#### Applied standards:

EN 61000-6-4: 2007 + A1: 2011EN 61000-6-2: 2005 + AC: 2005

You will find the EC declaration of conformity for these products on the Internet under the following entry IDs/Internet page specified here:

ID = 39971776 (http://support.automation.siemens.com/WW/view/en/48284698)

- Entry list
- Entry type "Certificates"
- Type of certificate "Declaration of Conformity"

# A.4 ATEX

# **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".



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 code:

II 3 G Ex nA IIC T4 Gc

#### Test type certificate

**KEMA 07 ATEX 0145X** 

The product meets the requirements of the standards

- EN 60079-0:2009 (Explosive atmospheres Part 0: Equipment General requirements)
- and EN 60079-15: 2010 (electrical apparatus for potentially explosive atmospheres; Type of protection "n")

# A.5 IECEx

#### **IECEx**

The SIMATIC NET products meet the requirements of explosion protection according to IECEx.

IECEx classification:

Ex nA IIC T4 Gc

DEK 14.0025X

The products meet the requirements of the following standards:

- IEC 60079-15: 2010 (Explosive atmospheres Part 15: Equipment protection by type of protection "n"
- IEC 60079-0: 2011 (Explosive atmospheres Part 0: Equipment General requirements)

# A.6 EMC directive

# EMC directive (electromagnetic compatibility)

The SIMATIC NET products described in these operating instructions meet the requirements of EC directive 2004/108/EC "Electromagnetic Compatibility" for the following areas of application:

Area of application	Requirements for		
	Emission	Immunity	
Industry	EN 61000-6-4 : 2007 + A1 : 2011	EN 61000-6-2 : 2005 + AC : 2005	

# A.7 RoHS directive

#### RoHS directive (restriction of the use of certain hazardous substances)

The SIMATIC NET products described in these operating instructions meet the requirements of the EC directive 2011/65/EC for the restriction of the use of certain hazardous substances in electrical and electronic equipment:

Applied standard:

• EN 50581: 2012

#### A.8 RCM / C-TICK

The products meet the requirements of the AS/NZS CISPR11 : 2011 standard (Industrial, scientific and medical equipment - Radio- frequency disturbance characteristics - Limits and methods of measurement).

# A.9 FM certification



Approved for use in Cl. 1, Div. 2, GP. A, B, C, D, T4 Cl. 1, Zone 2, GP. IIC T4

Ta: -40 °C to + 70 °C

For the use of the product in hazardous areas, the following requirements are met:

- 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 and Non Incendive / Class I / Zone 2 / Group IIC / T4

# A.10 UL certification (product safety)



#### Applied standards

- UL 60950-1 (Information Technology Equipment)
- UL 508 (Industrial Control Equipment)
- CSA C22.2 No.60950-1 (Information Technology Equipment)

# A.11 UL HAZ. LOC certification (explosion protection)



I.T.E. for HAZ.LOC.

CL.I, DIV.2, GP A,B,C,D T4

CL.1, Zone2, GP IIC, T4

# Applied standards

- UL 60950-1 (Information Technology Equipment)
- CSA C22.2 No.60950-1 (Information Technology Equipment)
- ANSI/ISA 12.12.01-2007
- CSA C22.2 No. 213-M1987

A.11 UL HAZ. LOC certification (explosion protection)

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