SIEMENS

SIMATIC NET

Industrial Remote Communication Remote Networks SCALANCE MUM856-1

Operating Instructions

10/2024
C79000-G8976-C628-11

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 Aktiengesellschaft. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

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

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1 Introduction

1.1 Purpose of the operating instructions

Based on the operating instructions, you will be able to install and connect the SCALANCE device correctly. The instructions are aimed primarily at planning, commissioning, maintenance and service personnel.

The configuration and the integration of the device in a network are not described in these instructions.

1.2 Scope of validity

These operating instructions cover the following products:

Product	Article numbers	Model
SCALANCE MUM856-1	6GK5856-2EA00-3DA1 6GK5856-2EA00-3FA1	MS5G15R-65-M1-M12-E4-1
	6GK5856-2EA10-3AA1 (A1)	MS5G16R-65-M1-M12-E4-1
	6GK5856-2EA10-3BA1 (B1)	MS5G16R-65-M1-M12-E4-2

These operating instructions apply to the following firmware version:

- SCALANCE M-800/S615 as of version V8.2

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

- Industry Mall - catalog and ordering system for automation and drive technology, Online catalog (https://mall.industry.siemens.com)

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

1.3 QR code

Identification Link

There are multiple scannable codes, including a QR code, on the product. The QR code is an Identification Link (ID-Link), a globally unique product identifier according to IEC 61406-1. You can recognize the ID-Link from the frame, which has a black corner at the bottom right.

Disconnect the device from the power and scan the QR code with a smartphone camera, a bar code scanner or a read app. Open the ID-Link. The Siemens web page corresponding to the product opens with the digital nameplate.

In the digital nameplate, you will find product data, manuals, declarations of conformity, certificates, and other helpful information about your product.

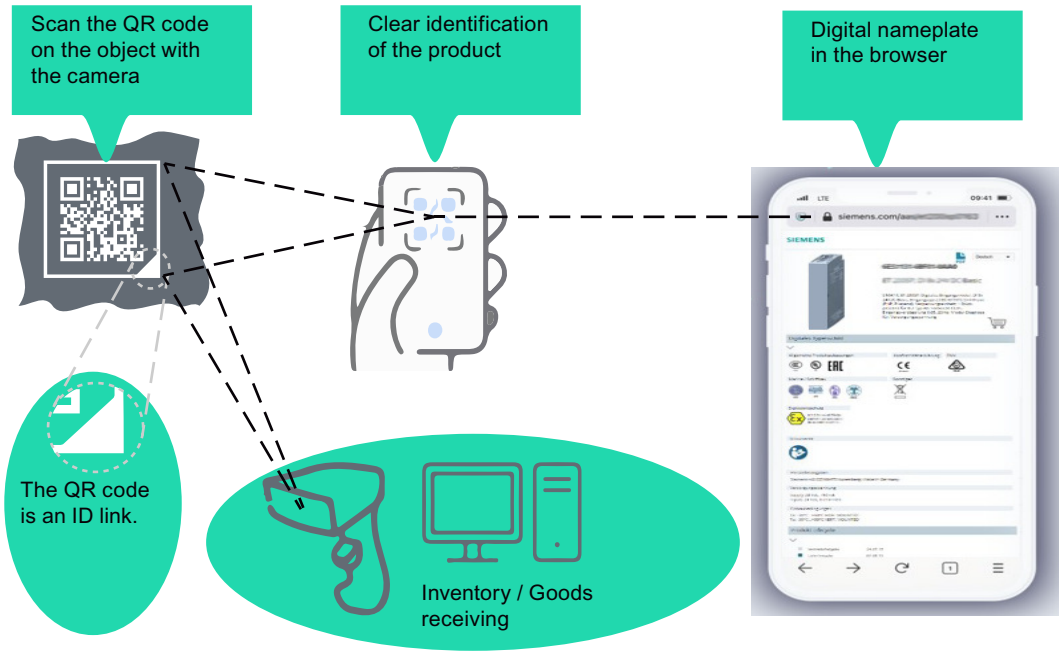


Figure 1-1 Application & functions of the Identification Link

1.4 Supplementary documentation

Documentation on the Internet

You can find the current version of the document on the Internet at. (https://support.industry.siemens.com/cs/ww/en/ps/28821/man)

Enter the name or article number of the product in the search filter.

Documentation on configuration

You will find detailed information on configuring the devices in the following configuration manuals:

- SCALANCE M-800 Web Based Management
- SCALANCE M-800 Command Line Interface

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 (https://support.industry.siemens.com/cs/ww/en/view/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 (https://support.industry.siemens.com/cs/ww/en/view/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 (https://support.industry.siemens.com/cs/ww/en/)
  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" (https://support.industry.siemens.com/cs/ww/en/ps/15982/man)
  Go to the required product group and make the following settings:
  tab "Entry list", Entry type "Manuals"

1.5 Service & Support

Industry Online Support

In addition to the product documentation, you are supported by the comprehensive online information platform of Siemens Industry Online Support at the following Internet address:
Link: (https://support.industry.siemens.com/cs/de/en/)

Apart from news, there you will also find:

- Project information: Manuals, FAQs, downloads, application examples etc.
- Contacts, Technical Forum
- The option submitting a support query:
  Link: (https://support.industry.siemens.com/cs/my?lc=en-WW)
- Our service offer:
  Right across our products and systems, we provide numerous services that support you in every phase of the life of your machine or system - from planning and implementation to commissioning, through to maintenance and modernization.

You will find contact data on the Internet at the following address:
Link: (https://www.automation.siemens.com/aspa_app/?ci=yes&lang=en)

1.6 Training

SITRAIN - Training for Industry

The training offer includes more than 300 courses on basic topics, extended knowledge and special knowledge as well as advanced training for individual sectors - available at more than 130 locations. Courses can also be organized individually and held locally at your location.

You will find detailed information on the training curriculum and how to contact our customer consultants at the following Internet address:

Link: (https://new.siemens.com/global/en/products/services/industry/sitrain/personal.html)

Industrial Networks Education

Training and certification for Industrial Networks

In our Industrial Networks Education courses you'll learn to design and implement wired and wireless data networks and connect them to a corporate network. You will also receive instruction on how to secure, diagnose and optimize communication networks. Certification can also be offered to supplement almost all training courses.

Link: (https://www.siemens.com/industrial-networks-education)

1.7 Cybersecurity information

Siemens provides products and solutions with industrial cybersecurity functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial cybersecurity measures that may be implemented, please visit
https://www.siemens.com/cybersecurity-industry (https://www.siemens.com/cybersecurity-industry).

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no

longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Cybersecurity RSS Feed under
https://new.siemens.com/cert (https://www.siemens.com/cert).

1.8 Firmware

The firmware is available on the Internet pages of the Siemens Industry Online Support: (https://support.industry.siemens.com/cs/ww/en/ps/28821/dl)

Note on firmware/software support

Check regularly for new firmware/software versions or security updates and apply them. After the release of a new version, previous versions are no longer supported and are not maintained.

1.9 Error/fault

If a fault develops, send the device to your SIEMENS representative for repair. Repairs on-site are not permitted.

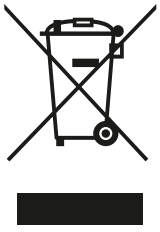
1.10 Decommissioning

Shut down the device properly to prevent unauthorized persons from accessing confidential data in the device memory.

To do this, restore the factory settings on the device.

Also restore the factory settings on the storage medium.

1.11 Recycling and disposal



The products are low in pollutants, can be recycled and meet the requirements of the WEEE directive 2012/19/EU for the disposal of electrical and electronic equipment.

Do not dispose of the products at public disposal sites.

For environmentally friendly recycling and the disposal of your old device contact a certified disposal company for electronic scrap or your Siemens contact (Product return (https://support.industry.siemens.com/cs/ww/en/view/109479891)).

Note the different national regulations.

1.12 Open source license conditions

Note

Open source software

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

The license terms and copyright information can be downloaded from the WBM or CLI as a zip file.

- WBM: System > Load&Save > HTTP / TFTP / SFTP > LicenseCondition
- CLI: `sftp save filetype LicenseConditions / tftp save filetype LicenseConditions`

1.13 SIMATIC NET glossary

The SIMATIC NET glossary describes terms that may be used in this document.

You will find the SIMATIC NET glossary in the Siemens Industry Online Support at the following address:

50305045 (https://support.industry.siemens.com/cs/ww/en/view/50305045)

1.14 Trademarks

The following and possibly other names not identified by the registered trademark sign ® are registered trademarks of Siemens AG:

- SCALANCE
- SINEMA
- SINEC

Safety notices

2

⚠ CAUTION
To prevent injury and damage, read the manual before using the device.

Read the safety notices

Note the following safety notices. These relate to the entire working life of the device.

You should also read the safety notices relating to handling in the individual sections, particularly in the sections "Installation" and "Connecting up".

⚠ WARNING
Hot surfaces Electric devices have hot surfaces. Do not touch these surfaces. They could cause severe burns. • Allow the device to cool down before starting any work on it.

⚠ WARNING
EXPLOSION HAZARD Do not open the device when the supply voltage is turned on.

Security recommendations

3

3.1 Security recommendations

To prevent unauthorized access to the device and/or network, observe the following security recommendations.

Note

Note that GNSS signals can be obfuscated or blocked by malicious third-party devices.

General

- Check the device regularly to ensure that these recommendations and/or other internal security policies are complied with.
- Evaluate the security of your location and use a cell protection concept with suitable products. For more information, refer to:
  Link: (https://www.siemens.com/industrialsecurity)
- When the internal and external network are disconnected, an attacker cannot access internal data from the outside. If possible, operate the device only within a protected network area.
- Use VPN to encrypt and authenticate communication from and to the devices.
- For data transmission via a non-secure network, use an encrypted VPN tunnel (IPsec, OpenVPN).
- Check the user documentation of other Siemens products that are used together with the device for additional security recommendations.
- Using remote logging, ensure that the system protocols are forwarded to a central logging server. Make sure that the server is within the protected network and check the protocols regularly for potential security violations or vulnerabilities.

Authentication

Note

Accessibility risk - Risk of data loss

Do not lose the passwords for the device. Access to the device can only be restored by resetting the device to factory settings which completely removes all configuration data.

- Replace the default passwords for all user accounts, access modes and applications (if applicable) before you use the device. Create a separate user account for each user that will receive access to the device.
- Define rules for the assignment of passwords.

- Use passwords with a high password strength. Avoid weak passwords, (e.g. Passwort1, 123456789, abcdefgh) or recurring characters (e.g. abcabc).
  This recommendation also applies to symmetrical passwords/keys configured on the device.
- Make sure that passwords are protected and only disclosed to authorized personnel.
- Do not use the same passwords for multiple user names and systems.
- Store the user account details in a safe location to have them available if they are lost. You can use password managers or encrypted files/drives for this purpose.
- A password must be changed if it is known or suspected to be known by unauthorized persons.
- When user authentication is performed via RADIUS, make sure that all communication takes place within the security environment or is protected by a secure channel. Use a RADIUS connection with changing passwords, expiry time, etc.
- Watch out for link layer protocols that do not offer their own authentication between endpoints, such as ARP. An attacker could use vulnerabilities in these protocols to attack hosts, switches and routers connected to your layer 2 network, for example, through manipulation (poisoning) of the ARP caches of systems in the subnet and subsequent interception of the data traffic. Appropriate security measures must be taken for non-secure layer 2 protocols to prevent unauthorized access to the network. Physical access to the local network can be secured or secure, higher layer protocols can be used, among other things.
- Use TOTP-based two-factor authentication of the user. You can find more information on this under "Security > Passwords > Two-Factor Authentication".

Certificates and keys

- There is a pre-installed Web server certificate and an SSH Private Key in the device. Replace this certificate with a user-generated, high-quality certificate with key. Use a certificate signed by a reliable external or internal certification authority. You can install the certificate in the WBM via "System > Load & Save".
- Use the certification authority including key revocation and management to sign the certificates.
- Use password-protected certificates in the format "PKCS #12".
- Use certificates with a key length of 4096 bits.
- Make sure that user-defined private keys are protected and inaccessible to unauthorized persons.
- If there is a suspected security violation, change all certificates and keys immediately.
- SSH and SSL keys are available for admin users. Make sure that you take appropriate security measures when shipping the device outside of the trusted environment:
  - Reset the device to the factory settings. Replace the SSH and SSL keys with disposable keys prior to shipping to Siemens.
  - Decommission the existing SSH and SSL keys. Create and program new keys when the device is returned.

- Verify certificates based on the fingerprint on the server and client side to prevent "man in the middle" attacks. Use a second, secure transmission path for this.
- Before sending the device to Siemens for repair, reset it to factory settings and replace the current certificates and keys with temporary throwaway certificates and keys that can be destroyed when the device is returned.

Physical/remote access

- If possible, operate the devices only within a protected network area. Attackers cannot access internal data from the outside when the internal and the external network are separate from each other.
- Limit physical access to the device exclusively to trusted personnel.
  The memory card or the PLUG (C-PLUG, KEY-PLUG, CLP) contains sensitive data such as certificates and keys that can be read out and modified. An attacker with control of the device's removable media could extract critical information such as certificates, keys, etc. or reprogram the media.
- Lock unused physical ports on the device. Unused ports can be used to gain forbidden access to the plant.
- We highly recommend that you keep the protection from brute force attacks (BFA) activated to prevent third parties from gaining access to the device. For more information, see the configuration manuals, section "Brute Force Prevention".
- If possible, use the VPN functionality to encrypt and authenticate communication for communication via non-secure networks.
- When you establish a secure connection to a server (for example for an upgrade), make sure that strong encryption methods and protocols are configured for the server.
- Terminate the management connections (e.g. HTTPS, SSH) properly.
- Make sure that the device has been powered down completely before you decommission it. For more information, refer to "Decommissioning (Page 11)".
- We recommend formatting a PLUG that is not being used.

Hardware / Software

- Use VLANs whenever possible as protection against denial-of-service (DoS) attacks and unauthorized access.
- Restrict access to the device using firewall rules.
- Selected services are enabled by default in the firmware. It is recommended to enable only the services that are absolutely necessary for your installation.
  For more information on available services, see "List of available services".
- To ensure you are using the most secure encryption methods available, use the latest web browser version compatible with the product. Also, the latest web browser versions of Mozilla Firefox, Google Chrome, and Microsoft Edge have 1/n-1 record splitting enabled, which reduces the risk of attacks such as SSL/TLS Protocol Initialization Vector Implementation Information Disclosure Vulnerability (for example, BEAST).

- Ensure that the latest firmware version is installed, including all security-related patches. You can find the latest information on security patches for Siemens products at the Industrial Security (https://www.siemens.com/industrialsecurity) or ProductCERT Security Advisories (https://www.siemens.com/cert/en/cert-security-advisories.htm) website.
  For updates on Siemens product security advisories, subscribe to the RSS feed on the ProductCERT Security Advisories website or follow @ProductCert on Twitter.
- Enable only those services that are used on the device, including physical ports. Free physical ports can potentially be used to gain access to the network behind the device.
- Use the authentication and encryption mechanisms of SNMPv3 if possible. Use strong passwords.
- Configuration files can be downloaded from the device. Ensure that configuration files are adequately protected.
  Configuration files can be password protected during download. You enter passwords on the WBM page "System > Load & Save > Passwords".
- When using SNMP (Simple Network Management Protocol):
  - Configure SNMP to generate a notification when authentication errors occur.
    For more information, see WBM "System > SNMP > Notifications".
  - Ensure that the default community strings are changed to unique values.
  - Use SNMPv3 whenever possible. SNMPv1 and SNMPv2c are considered non-secure and should only be used when absolutely necessary.
  - If possible, prevent write access.
- The names of the configuration files can be changed. To improve security, do not use spaces in the TFTP file name.

Secure/non-secure protocols

- Use secure protocols if access to the device is not prevented by physical protection measures.
- Restrict the use of non-secure protocols. While some protocols are secure (e.g. HTTPS, SSH, 802.1X, etc.), others were not designed for the purpose of securing applications (e.g. SNMPv1/v2c, RSTP, etc.).
  Therefore, take appropriate security measures against non-secure protocols to prevent unauthorized access to the device/network. Use non-secure protocols on the device using a secure connection (e.g. SINEMA RC).
- If non-secure protocols and services are required, ensure that the device is operated in a protected network area.

- Check whether use of the following protocols is necessary:
  - Telnet
  - HTTP
  - Broadcast pings
  - Non authenticated and unencrypted interfaces
  - ICMP (redirect)
  - LLDP
  - DHCP Options 66/67
  - SNTP
  - NTP
  - TFTP
  - TIA Portal Cloud Connector (not available with SCALANCE MUx85x)
  - VRRPv3
  - DNS
  - SNMPv1/V2c
- If a secure alternative is available for a protocol, use it.
  The following protocols provide secure alternatives:
  - SNMPv1/v2 → SNMPv3
    Check whether use of SNMPv1 is necessary. SNMPv1 is classified as non-secure. Use the option of preventing write access. The product provides you with suitable setting options. If SNMP is enabled, change the community names. If no unrestricted access is necessary, restrict access with SNMP.
  - HTTP → HTTPS
  - Telnet → SSH
  - NTP → Secure NTP
  - TFTP → SFTP
  - TIA Portal Cloud Connector using a secure connection (not available with SCALANCE MUx85x). Use the "TIA Portal Cloud Connector" integrated in the product over a VPN solution (e.g. SINEMA RC).
    Configure the firewall settings of the SCALANCE M800/S615 (e.g. predefined IPv4 rules "Cloud Connector" to prevent unauthorized access of network devices to the "TIA Portal Cloud Connector Server").
  - DNS > DNSSec
- Using a firewall, restrict the services and protocols available to the outside to a minimum.
- Select a trusted DNS provider.
  Enable the DNSSec option on the WBM page "System > DNS client" or with the CLI command `dnssec`.

- SCALANCE MUM85x, SCALANCE M87x and RUGGEDCOM RM1224:
  For command SMS, use the identifier to secure your SMS messages. You can set a configurable value for a SCALANCE M device that, in addition to the phone number, must match the received identifier of the SMS. You configure the identifier on the WBM page "System > SMS > SMS Command" or with the CLI commands `sms-cmd idx identifier` and `sms-cmd sender`.
- The TCP Diagnostics Stream is considered non-secure without encryption. As of V8.1, encryption that enables secure use in productive operation is supported. Enable encryption of the function to use it securely.
- Only use the TCP Event function in secured networks or VPN. The firewall must be activated beforehand.
- With authentication on the RADIUS server and RADIUS client, use the Message Authenticator attribute to check packets.

3.2 Available services

List of available services

The following is a list of all available protocols and services as well as their ports through which the device can be accessed.

The table includes the following columns:

- **Service**
  The services that the device supports.
- **Protocol / Port number**
  Port number assigned to the protocol.
- **Default port status**
  The port status on delivery (factory setting) distinguishes between local and external access.
  - Local access: The port is accessed via a local connection (vlan1).
  - External access: The port is accessed via an external connection (vlan2).
- **Configurable port/service**
  Indicates whether the port number or the service can be configured via WBM / CLI.
- **Authentication**
  Specifies whether an authentication of the communication partner takes place or whether an authentication can be configured.
- **Encryption**
  Specifies whether the transfer is encrypted or whether the encryption can be configured.

Service	Protocol/ Port number	Default port status		Configurable		Authentication	Encryption [2]
		Local access	External access [1]	Port	Service		
DHCPv4 Client	UDP/68	Closed [3]	Closed	--	✓	--	--
DHCPv6 Client	TCP/546 UDP/546	Open	Open	--	--	--	--
DHCPv4-Server	UDP/67	Closed	Closed [4]	--	✓	--	--
DNS Client	TCP/53 UDP/53	Outgoing only	Outgoing only	--	✓	--	--
DNS Server	TCP/53 UDP/53 UDP/49000 ... UDP/65535	Open [5]	Closed	--	✓	--	--
DynDNS	TCP/80 UDP/80 TCP/443 UDP/443	Outgoing only	Outgoing only	--	✓	✓	--
HTTP	TCP/80	Open	Closed	✓	✓	✓	--
HTTP Proxy	TCP/3128 TCP/8080	Outgoing only	Outgoing only	✓	✓	Optional	--
HTTPS WBM Server/Client	TCP/443	Open	Closed	✓	✓	✓	✓
IPsec/IKE	UDP/500 UDP/4500	Closed	Closed	--	✓	✓	✓
iperf3 [8]	TCP/5201	Closed	Closed	✓	✓	--	--
NTP Client	UDP/123	Outgoing only	Outgoing only	✓	✓	--	--
NTP Client (secure)	UDP/123	Outgoing only	Outgoing only	✓	✓	✓	--
NTP Server	UDP/123	Closed	Closed	✓	✓	--	--
NTP Server (secure)	UDP/123	Closed	Closed	✓	✓	✓	--
OpenVPN [10]	UDP/1194 TCP/1194	Outgoing only	Outgoing only	✓	✓	✓	✓
Packet Capture [11]	TCP/2002	Disabled	Disabled	✓	✓	--	--
Ping	ICMP	Open	Closed	--	✓	--	--
RADIUS Client	UDP/1812	Closed	Closed	✓	✓	✓	Optional
	UDP/1813						--
SFTP Server	TCP/22	Outgoing only	Outgoing only	✓	✓	✓	✓
Siemens Remote Service (cRSP/SRS) [10]	TCP/443	Outgoing only	Outgoing only	--	✓	Optional	✓
SINEMA RC	HTTPS/443 and TCP/UDP depending on the server configuration	Outgoing only	Outgoing only	✓	✓	✓	✓
SMS Relay [7]	TCP/26864	Closed	Closed	✓	✓	--	--

Service	Protocol/ Port number	Default port status		Configurable		Authentication	Encryption [2]
		Local access	External access [1]	Port	Service		
SMTP Client	TCP/25	Outgoing only	Outgoing only	✓	✓	--	--
SMTP (secure)	TCP/465 TCP/587	Outgoing only	Outgoing only	✓	✓	Optional	✓
SNMPv1/v2c [12]	UDP/161	Open	Closed	✓	✓	--	--
SNMPv3 Server	UDP/161	Open	Closed	✓	✓	Optional	Optional
SNMP Trap	UDP/161	Open	Closed	✓	✓	Optional	Optional
SNTP Client	UDP/123	Closed	Closed	✓	✓	--	--
SSH CLI	TCP/22	Open	Closed	✓	✓	✓	✓
Syslog Client	UDP/514	Outgoing only	Outgoing only	✓	✓	--	--
Syslog Client TLS	TCP/6514	Outgoing only	Outgoing only	✓	✓	--	✓
Telnet	TCP/23	Closed	Closed	✓	✓	✓	--
TFTP	UDP/69	Outgoing only	Outgoing only	✓	✓	--	--
TIA Portal Cloud Connector [6]	TCP/9023	Closed	Closed	✓	✓	--	--
TCP Diagnostic Stream [11]	TCP/5510 TCP/5511	Closed	Closed	✓	✓	--	✓
TCP Event	TCP/26864	Closed	Closed	✓	✓	--	--
VXLAN [9]	UDP/4789	Closed	Closed	✓	✓	--	--

[1] With SCALANCE M826 and M804PB, only access via vlan1 is possible in the delivery state (factory setting).

[2] You can find additional information on the encryption methods used in the WBM appendix "Ciphers used".

[3] Only open with SCALANCE M826

[4] Only open with SCALANCE S615

[5] Only closed with SCALANCE S615

[6] Not available with SCALANCE MUx85x

[7] Only available with SCALANCE M87x, MUM85x and RUGGEDCOM RM1224

[8] Only available with SCALANCE MUM85x

[9] Only available with SCALANCE M87x, MUx85x, S615 and RUGGEDCOM RM1224

[10] Not available with SCALANCE MUB852

[11] Only available with SCALANCE MUx85x

[12] Read Only

The following is a list of all available Layer 2 services through which the device can be accessed.

The table includes the following columns:

- **Layer 2 service**
  The Layer 2 services that the device supports**.**
- **Default status**
  The default status of the service (open or closed).
- **Service configurable**
  Indicates whether the service can be configured via WBM / CLI.

Layer 2 service	Default port status	Configurable
DCP	Open (when configured)	✓
LLDP	Open (when configured)	✓
SIMATIC NET TIME	Open (when configured)	✓
VLAN	Open (when configured)	✓
VXLAN [1)]	Open (when configured)	✓

[1)] Only available with SCALANCE M87x, MUx85x, S615 and RUGGEDCOM RM1224

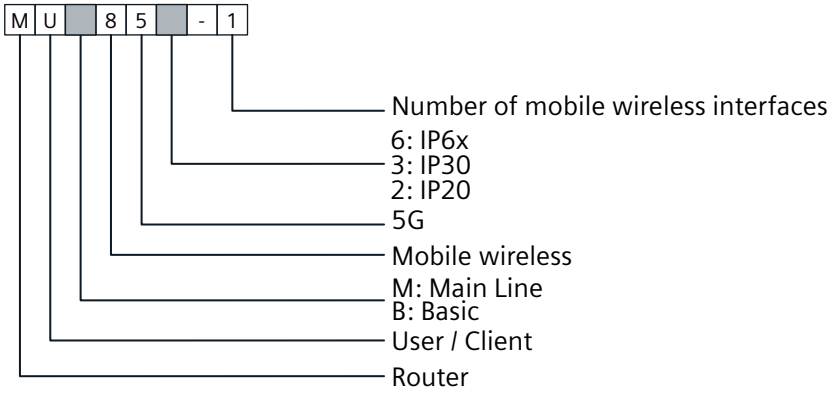
Description of the device

4

4.1 Structure of the type designation

Structure of the type designation

The type designation of the device is made up of several parts that have the following meaning:

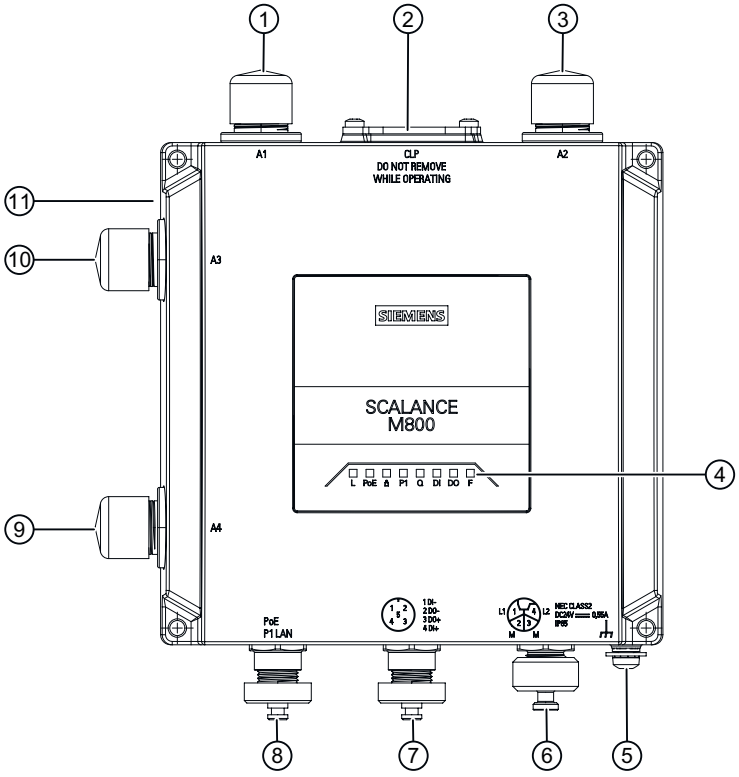


4.2 Product characteristics

Interfaces

Functionality	SCALANCE MUM856-1
Connectors for external antennas	4 x N-Connect
Ethernet interface	1 x M12 Ethernet interface P1 LAN PoE, X-coded, 8-pin
Power supply (direct)	M12 interface, direct infeed, L-coded, 4-pin
Digital input/output	M12 interface, A-coded, 5-pin

4.3 Device view



① A1 antenna port, female N-Connect type
② Screw-down cover:
- for the reset button and
- for the CLP slot
③ A2 antenna port, female N-Connect type
④ LED display
⑤ Ground connector (thread M4) on the bottom
⑥ Connector for power supply (L1, L2)
⑦ Digital input (DI) / Digital output (DQ)
⑧ Ethernet connector P1 (PoE capability)
⑨ A4 antenna port, female N-Connect type
⑩ A3 antenna port, female N-Connect type
⑪ Slot for the micro SIM card 3FF on the device rear under a cover

4.4 Scope of delivery

The following components are supplied with the product:

- A SCALANCE MUM856-1
- A cover for the CLP slot
- Four protective caps for the antenna sockets

- Three protective caps for the M12 sockets
  - 1 x Ethernet
  - 1 x power supply
  - 1 x digital input/digital output
- One grounding screw

Please check that the consignment you have received is complete. If the consignment is incomplete, contact your supplier or your local Siemens office.

Note

Not included with the product

The following components do not ship with the product:

- CLP
  You will find more detailed information in "CLP (Page 28)".
- Antennas and connecting cables
  You will find more detailed information in "Antennas and antenna accessories (Page 32)".
- The DIN rail mounting adapter and the bracket for installation on a DIN rail
  You will find more detailed information in "Installation (Page 28)".
- Micro SIM card
  Use the SIM card from the chosen mobile wireless provider.

Unpacking and checking

⚠ WARNING

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.

4.5 Antennas and accessories

Technical data subject to change.

You will find further information on the range of accessories in the Industry Mall (https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10022025)

Use the TIA Selection Tool (https://mall.industry.siemens.com/tst/) for configuring the device.

4.5.1 Installation

Type	Properties	Article number
Mounting adapter DIN rail	Adapter for mounting on a 35mm DIN rail according to DIN EN 50 022	6GK5798-8MF00-0AA1
Angle adapter	90° angle adapter for standard DIN rail mounting, only in conjunction with SCALANCE MUM856-1/SCALANCE WxM766-1 and standard DIN mounting adapter for 35 mm DIN rails (6GK5798-8MF00-0AA1)	6GK5798-8MF00-0AB1

4.5.2 CLP

Type	Properties	Article number
SCALANCE CLP 2GB SINEMA RC	Removable data storage medium for enabling connection to SINEMA Remote Connect for SCALANCE MUM85x, for simple device replacement in the event of a fault, and for storing configuration data	6GK5908-0UA00-0AA0

4.5.3 Industrial Ethernet

You will find information on the cabling for communication networks in the industry on the Internet pages of Siemens Industry Online Support (https://support.industry.siemens.com/cs/ww/en/view/109766358).

4.5.3.1 Data cables

Cables Industrial Ethernet (pre-assembled)

Component	Description	Article number
IE TP Cord M12-180/RJ45-180	IE Flexible Cable, with 1 x M12 plug (X-coded) 180 degree cable outlet and 1 x RJ45 plug; 180 degree cable outlet	
	Length 0.5m	6XV1878-5TE50
	Length 1m	6XV1878-5TH10
	Length 1.5m	6XV1878-5TH15
	Length 2m	6XV1878-5TH20
	Length 3m	6XV1878-5TH30
	Length 5m	6XV1878-5TH50
	Length 10m	6XV1878-5TN10
	Length 15m	6XV1878-5TN15
IE TP Cord M12-90/RJ45-180	IE Flexible Cable, with 1 x M12 plug (X-coded) 90 degree cable outlet and 1 x RJ45 plug; 180 degree cable outlet	
	Length 0.5m	6XV1878-5SE50
	Length 1m	6XV1878-5SH10
	Length 1.5m	6XV1878-5SH15
	Length 2m	6XV1878-5SH20
	Length 3m	6XV1878-5SH30
	Length 5m	6XV1878-5SH50
	Length 10m	6XV1878-5SN10
	Length 15m	6XV1878-5SN15

Cables Industrial Ethernet (sold by the meter)

Component	Description	Article number
IE FC TP Standard Cable GP 4x2 (AWG 24)	8-wire shielded TP installation cable for universal application Sold by the meter	6XV1878-2A
IE FC TP Flexible Cable GP 4x2 (AWG24)	8-wire shielded TP installation cable for occasional movement Sold by the meter	6XV1878-2B
IE TP Train Cable GP 4x2 (AWG 24)	8-wire shielded TP installation cable for use in rail vehicles and buses, with railway approval Sold by the meter	6XV1878-2T

4.5.3.2 Data plug-in connector

M12 plug-in connector Industrial Ethernet

Component	Description	Article number
IE FC M12 PLUG PRO 4x2	M12 data plug-in connector for IE FC TP cables 4x2, IP65/67, X-coded, axial cable outlet	
	1 connector per package	6GK1901-0DB30-6AA0
	8 connectors per package	6GK1901-0DB30-6AA8
IE FC M12 CABLE CONNECTOR PRO 4X2	M12 plug-in connector (X-coded) can be assembled in the field, 8-pin, metal housing, FC fast connection technology, socket insert	
	1 connector per package	6GK1901-0DB40-6AA0
	8 connectors per package	6GK1901-0DB40-6AA8

4.5.4 Digital input / digital output

4.5.4.1 Cables

Cables digital input / digital output (pre-assembled)

Component	Description	Article number
Control Connecting Cable M12-180/M12-180 (A-coded)	5-wire; IO-Link port class B; pre-assembled with M12 plug and M12 socket (A-coded); straight cable outlet Pack of 1	
	Length 0.5m	6XV1801-2CE50
	Length 1m	6XV1801-2CH10
	Length 1.5m	6XV1801-2CH15
	Length 2m	6XV1801-2CH20
	Length 3m	6XV1801-2CH30
	Length 5m	6XV1801-2CH50
	Length 10m	6XV1801-2CN10
	Length 15m	6XV1801-2CN15

Cables DI/DO interface (sold by the meter)

Component	Description	Article number
SIMATIC NET CONTROL CABLE	5-wire power cable, stranded wire, 5 x AWG24; package item: max. 1000m, minimum order quantity 20m Sold by the meter	6XV1801-2C

4.5.4.2 Plug-in connector

M12 plug-in connector digital input / digital output

Component	Description	Article number
Control M12 Plug PRO	Control M12 Plug PRO; field-assembled connector for connecting IO-Link sensors/ actuators; 5-pin; A-coded Pack of 1	6GK1908-0DB10-6AA0

4.5.5 Power supply

4.5.5.1 Energy cable

Power cables (pre-assembled)

Component	Description	Article number
M12 connecting cable, L-coded, 4-pin M12-180	Flexible plug-in energy cable to connect the power supply 24 V DC, 4-wire, preassembled with a 4-pin M12 plug and an M12 socket (L-coded)	6XV1801-6D*
M12 connecting cable, L-coded, 4-pin M12-90	Flexible plug-in energy cable to connect the power supply 24 V DC, 4-wire, preassembled with a 4-pin M12 plug and an M12 socket (L-coded)	6XV1801-6G*

* Available in different lengths

Power cable (sold by the meter)

Component	Description	Article number
Energy Cable 4 x 1.5	Power cable for connecting the 24 V DC power supply, 4-wire, stranded 4 x 1.5 mm^2, trailing type, not assembled Sold by the meter	6XV1801-2B

4.5.5.2 Plug-in connector power supply

M12 plug-in connector power supply

Component	Description	Article number
Power M12 Cable Connector Pro	Power M12 Cable Connector PRO axial cable outlet for field assembly, female contact insert, L-coded (socket) Pack of 1	6GK1906-0EB00

4.5.6 Antennas and antenna accessories

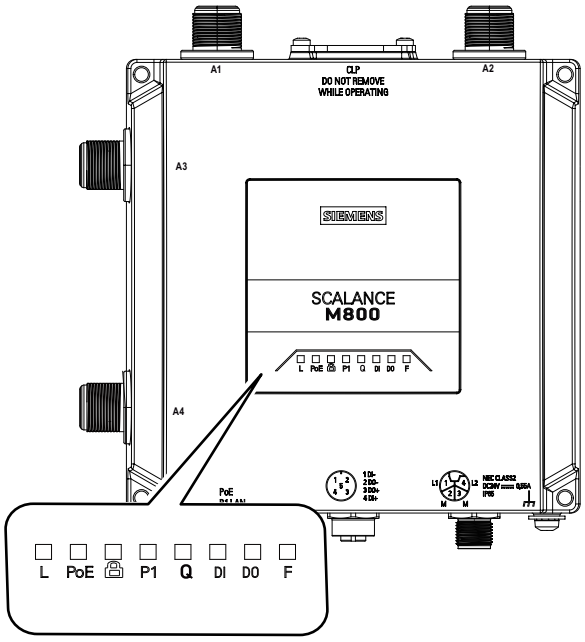
Type	Properties	Article number
Antennas		
ANT795-4MX	Antenna with omnidirectional characteristic for WLAN and private 5G mobile networks; incl. N-Connect connector (male); IP68/69K, -40 ... +85 °C, for direct mounting on SCALANCE devices with N-Connect connection system Frequency range: **1.7...7.125 GHz** [1] Antenna gain: **1.5 ... 3 dBi** [2]	6GK5795-4MX00-0AA0
ANT795-6MN	Antenna with omnidirectional characteristic for WLAN 2.4/ 5 GHz and private 5G networks, incl. N-Connect connector (female); IP65, -40 ... +70 °C, for mounting on roof and vehicles with the mounting kit 6GK5795-6MN01-0AA6 Frequency range: **2.4 ... 7.125 GHz** [1] Antenna gain: **6 ... 8 dBi** [2]	6GK5795-6MN10-0AA6
ANT897-4MC	Mobile wireless antenna with omnidirectional characteristic for GSM (2G), UMTS (3G) and public 3/4/5G mobile networks and private 5G mobile networks worldwide; incl. N-Connect connection (male); IP67, -30 ... +70 °C, for direct mounting on SCALANCE devices with N-Connect connection system Frequency range: **600 ... 5000 MHz** [1] Antenna gain: **2 ... 3 dBi** [2]	6GK5897-4MC00-0AA0

Type	Properties	Article number
ANT897-4ME	Mobile wireless antenna with omnidirectional characteristic for public 3/4/5G mobile wireless networks and private 5G networks worldwide, incl. N-Connect connector (female), IP65; -40 ... +85°C; note country approvals; mounting on wall or mast, scope of delivery: 1x ANT897-4ME, 1x mounting bracket Frequency range: **600 ... 6000 MHz** [1] Antenna gain: **2 ... 6 dBi** [2]	6GK5897-4ME00-0AA0
ANT897-5PN	Omnidirectional antenna with 4 antenna elements for WLAN 2.4/5 GHz and private 5G mobile networks; 4x cable with N-Connect female in staggered lengths 20 ... 27 cm; IP69K; -30 ... +70°C; note country approvals; mounting on roof, vehicle and ceiling Frequency range: **2300 ... 7200 MHz** [1] Antenna gain: **4 ... 6 dBi** [2]	6GK5897-5PN00-0AA0
Antenna accessories		
Flexible Connection Cable N-Connect male/male	Flexible connecting cable, e.g. for connecting antennas, suitable for IWLAN and mobile wireless, different lengths	
	1 meter	6XV1875-5AH10
	2 meters	6XV1875-5AH20
	5 meters	6XV1875-5AH50
	10 meters	6XV1875-5AN10
	Flexible connecting cable for connecting antennas, suitable for IWLAN and mobile wireless, different lengths, railroad applications	
	1 meter	6XV1875-5SH10
	2 meters	6XV1875-5SH20
	5 meters	6XV1875-5SH50
Lightning Protector mit N-Connect female/female LP798-1N	Lightning protection element with two N-Connect female/female connectors, 0 ...6 GHz, IP65, -40 ... +100 °C, 0 ... 6 GHz, with gas discharge technology for SCALANCE W and M antennas	6GK5798-2LP00-2AA6
N-Connect/SMA female/ female Panel Feedthrough	Panel feedthrough for wall thicknesses up to a maximum of 5.5 mm, two N-Connect/SMA female/female connectors	6GK5798-0PT00-2AA0
N-Connect female/female Panel Feedthrough	Cabinet feedthrough for wall thicknesses up to 4.5 mm, two N-Connect female-female connectors	6GK5798-2PP00-2AA6

[1] You will find information on the supported frequency ranges and antenna gains in the respective band in the operating instructions for the antenna.

[2] Depending on the frequency band; see operating instructions for the antenna.

4.6 LED display



LED	Status	Meaning
L	OFF ☐	Device turned off, no power supply.
	Green ■	Device turned on, power supply present.
PoE	OFF ☐	The device is not supplied using PoE.
	Green ■	The device is supplied using PoE.
🔒	OFF ☐	No VPN connection is established.
	Green ■	All configured VPN connections are established.
	Flashing green ✳	Only some of the configured VPN connections are established.

LED	Status	Meaning
P1	OFF 	There is no connection over the Ethernet interface P1.
	Green 	There is a connection over the Ethernet interface P1 (link).
	Flashing green and yellow 	Data transfer over the Ethernet interface P1
Q	OFF 	No reception or mobile wireless disabled.
	Red 	Wrong PIN number or SIM card error
	Flashing red 	Signal strength very poor: • LTE / 5G: < -109 dBm • UMTS: < -99 dBm
	Flashing yellow 	Signal strength poor: • LTE / 5G: -99 dBm to -109 dBm • UMTS: -91 dBm to -99 dBm
	Yellow 	Signal strength medium: • LTE / 5G: -92 dBm to -99 dBm • UMTS: -81 dBm to -91 dBm
	Flashing green 	Signal strength good: • LTE / 5G: -70 dBm to -92 dBm • UMTS: -65 dBm to -81 dBm
	Green 	Signal strength very good: • LTE / 5G: ≥ -70 dBm • UMTS: ≥ -65 dBm
DI	OFF 	Digital input inactive.
	Green 	Digital input active.
DO	OFF 	Digital output inactive.
	Green 	Digital output active.

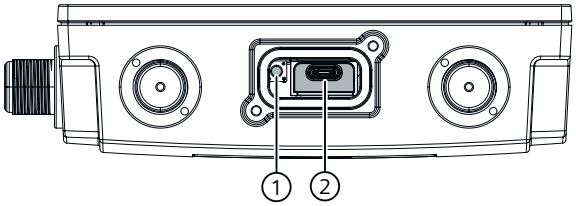
LED	Status	Meaning
F	OFF 	No fault/error.
	Yellow 	Sleep mode is active.
	Red 	The device is starting up or an error has occurred. Possible errors/faults: • Wrong PIN number • The inserted CLP has an invalid or incompatible configuration • Errors due to configured system events, e.g. SIM card missing
	Flashing  at the interval: 1 s on/ 1 s off	The device is starting up for the first time or has been reset to factory settings. The password of the default user "admin" has not yet been changed.
	Flashing red  Interval: 2000 ms on / 200 ms off	Firmware on CLP The device is performing a firmware update or downgrade.
P1, Q, DI, DO and 	Flashing green 	The LEDs flash for detection of device location. The "Flash LED" function is activated • Either with SINEC PNI • Or via the WBM page "Discovery and Set via DCP".

4.7 Reset button

Position

NOTICE
Loss of water and dust protection
If the cover is not mounted correctly, the device is not water and dust proof.

The reset button ① is located behind the screw-down cover on the top of the housing.



① Reset button
② PLUG slot (CLP)

Function

The reset button has the following functions:

- **Restarting the device**
  To restart the device, press the reset button briefly.

  Note

  If you make changes to the configuration and restart immediately afterwards with the reset button, the changes may be lost. If you restart the device using the WBM (menu command "System > Restart") or using the CLI (command "restart" in the Privileged EXEC Modus), the configuration changes are always retained.

- **Loading a firmware file via TFTP**
  If the normal procedure with the "Load & Save" menu of Web Based Management is unsuccessful, the reset button can be used to load new firmware. This situation can occur if there is a power outage during the normal firmware update. You can find more detailed information in the section "Downloading new firmware using TFTP without WBM and CLI (Page 71)".
- **Resetting the device to factory settings**
  If you reset, all the settings you have made will be overwritten by factory defaults. If a PLUG has been inserted in the device, the PLUG is also reset to default settings. You can find more detailed information in the section "Restoring the factory settings (Page 72)".

NOTICE
Inadvertent reset An inadvertent reset can cause disturbances and failures in a configured network with further consequences.

4.8 Configuration License PLUG

The CLP (Configuration License PLUG) is used to transfer the configuration of the old device to the new device when a device is replaced. The CLP is also referred to as PLUG in the description.

The CLP is available in the following variants:

- CLP configuration: The removable data storage medium only saves the configuration data of the device.
- CLP license: In addition to the configuration data, the removable data storage medium also contains a license that allows the use of Siemens Remote Services.

NOTICE
Loss of the degree of protection When the cover is not mounted correctly, the device loses its degree of protection IP65 and is not water and dust proof.

Position

The CLP slot is at the bottom of the device enclosure under a cover, see Reset button (Page 36).

Function

Devices with a CLP slot support the following operating modes:

- **Without CLP**
  The device saves the configuration data in the internal memory. This mode is active when no CLP is inserted.
- **With CLP**
  In the startup phase:
  - When an **empty** CLP (delivery state) is inserted into the device, the device automatically backs up the configuration data on the CLP during startup. After that, it behaves like a CLP with data.
  - When a CLP **with data** is plugged into a device, the device automatically adopts the configuration of the CLP during the startup phase. The prerequisite for this is that the configuration data was written by a compatible device type.
    One exception to this can be the IP configuration if it is set using DHCP and the DHCP server has not been reconfigured accordingly. Reconfiguration is necessary if you use functions based on MAC addresses.
  - If the CLP contains a license, additional functions are also enabled.

    Note

    If the device was configured at some time with a CLP license, the device can no longer be used without this CLP. To be able to use the device again, reset the device to the factory settings.

  During operation:
  - During operation, changes to the configuration are saved on the CLP and in the internal memory.
  - The configuration data of the device is stored in a secured memory area of the CLP. This secured memory area can only be accessed via the authentication of the Siemens device.
  - The device checks whether a CLP is inserted at one second intervals. If the device detects that the CLP has been removed, it restarts automatically.

NOTICE
Operating risk - Danger of data loss Only pull and plug the CLP when the device is de-energized.

  - The device signals deviations from normal operation of the CLP (e.g., incompatible data, incorrect operation or malfunctions) via the existing diagnostics mechanisms (e.g., LEDs or user interfaces).

The procedure for inserting and removing the CLP can be found in the section "Replacing a CLP (Page 67)".

Assembly and disassembly

5

5.1 Safety when mounting

Safety notices

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

NOTICE
Improper mounting Improper mounting may damage the device or impair its operation. • Before mounting the device, always ensure that there is no visible damage to the device. • Mount the device using suitable tools. Observe the information in the respective section about mounting.

⚠ CAUTION
Minimum distance to antennas Fit the device so that there is a minimum clearance of 20 cm between antennas and persons.

⚠ 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.

⚠ WARNING
If the device is installed in a cabinet, the inner temperature of the cabinet corresponds to the ambient temperature of the device.

Safety notices on use in hazardous areas

General safety notices relating to protection against explosion

⚠ WARNING
The device is intended for indoor use only.

WARNING

The device shall only be used in an area with pollution degree 1 or 2 (according to EN/IEC 60664-1, GB/T 16935.1).

WARNING

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.

WARNING

EXPLOSION HAZARD

Replacing components may impair suitability for Class 1, Division 2 or Zone 2.

Information on use in hazardous areas according to ATEX, IECEx and UKEX

If you use the device under ATEX, IECEx or UKEX conditions, you must also keep to the following safety instructions in addition to the general safety instructions for protection against explosion:

WARNING

To comply with EU Directive 2014/34 EU (ATEX 114), UK Regulation SI 2016/1107 or the conditions of IECEx or CCC-Ex, the housing or cabinet must meet the requirements of at least IP54 (according to EN/IEC 60529, GB/T 4208) in compliance with EN IEC/IEC 60079-7, GB/T 3836.3.

Safety notices when using according to FM

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

WARNING

EXPLOSION HAZARD

The equipment is intended to be installed within an enclosure/control cabinet. The inner service temperature of the enclosure/control cabinet corresponds to the ambient temperature of the module. Use cables with a maximum permitted operating temperature of at least 20 °C higher than the maximum ambient temperature.

WARNING

Wall mounting is only permitted if the requirements for the housing, the installation regulations, the clearance and separating regulations for the control cabinets or housings are adhered to. The control cabinet cover or housing must be secured so that it can only be opened with a tool. An appropriate strain-relief assembly for the cable must be used.

WARNING

Wall mounting outside of the control cabinet or housing does not fulfill the requirements of the FM approval.

WARNING

The IP65/IP67 degree of protection marking is not associated with FM approval.

Note

You must not install the device on a wall in hazardous areas.

Safety notices when using the device as industrial control equipment according to UL 61010-2-201

If you use the device under UL 61010-2-201 conditions you must also keep to the following safety notices in addition to the general safety notices for protection against explosion:

WARNING

Open equipment

The devices are "open equipment" according to the standard IEC 61010-2-201 or UL 61010-2-201 / CSA C22.2 No. 61010-2-201. To fulfill requirements for safe operation with regard to mechanical stability, flame retardation, stability, and protection against contact, the following alternative types of installation are specified:

- Installation in a suitable cabinet.
- Installation in a suitable enclosure.
- Installation in a suitably equipped, enclosed control room.

WARNING

If the temperature at the cable or housing socket or at the branching points of the cables exceeds 60 °C, special precautions must be taken. If the equipment is operated at ambient temperatures in excess of 40 °C, only use cables with permitted operating temperature of at least 80 °C.

⚠ WARNING

Improper disassembly

Improper disassembly may result in a risk of explosion in hazardous areas.

For proper disassembly, observe the following:

- Before starting work, ensure that the electricity is switched off.
- Secure remaining connections so that no damage can occur as a result of disassembly if the system is accidentally started up.

5.2 Types of installation

Note

- The device is only approved for operation in closed rooms. Note the following environmental conditions.
- Antennas, in particular directional antennas, must be mounted in keeping with their characteristics (refer to the technical specifications of the antenna --> Radiation pattern diagrams).

For the device the following types of installation are permitted:

- Wall mounting
- Mounting on a DIN rail
  The device can be mounted on a DIN rail with
  - a DIN rail mounting adapter
  - a bracket support and the DIN rail mounting adapter for space-saving installation (90° installation)

5.3 Wall mounting

Note

Use suitable fittings depending on the mounting surface.

Note

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

To mount the device on a wall, follow the steps below:

1. Prepare the drill holes for wall mounting. For the precise dimensions, refer to the section "Dimension drawing (Page 81)".
2. Insert the SIM card, see section "SIM card (Page 62)".
3. Secure the device to the wall with four screws. The screws are not supplied with the device.
4. Connect the power supply, refer to the section "Power supply (Page 56)".
5. Fit the antennas, refer to the section "Antennas (Page 59)".

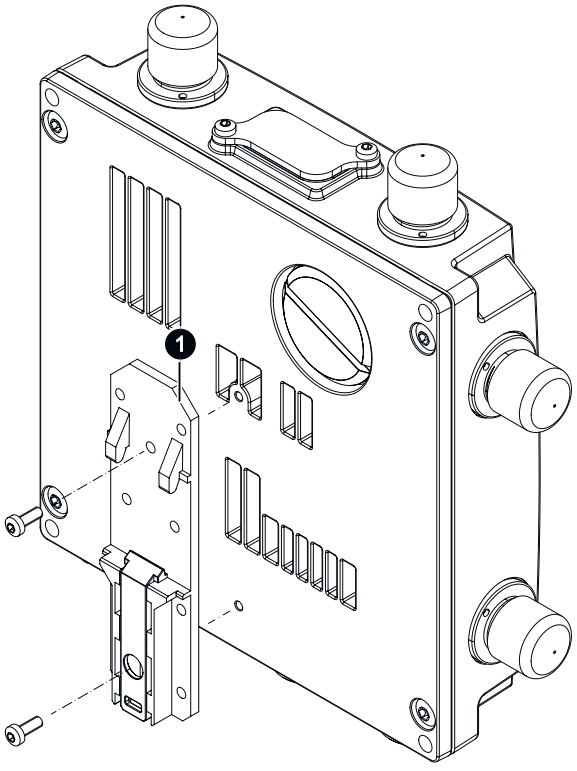
5.4 DIN rail mounting

5.4.1 Installation with the DIN rail mounting adapter

The DIN rail mounting adapter is not included with the product, see Accessories (Page 28).

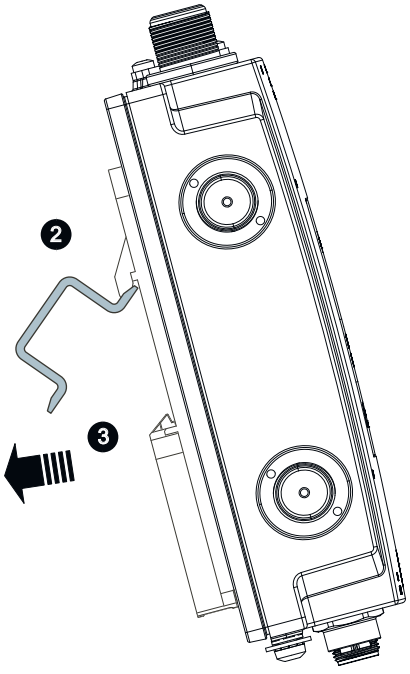
Installation

1. Insert the SIM card, see section "SIM card (Page 62)".
2. Screw the DIN rail mounting adapter ❶ to the rear of the device. The mounting material is supplied with the DIN rail mounting adapter.



3. Place the device on the upper edge of the DIN rail ❷.

4. Press the device against the DIN rail ❸ until the DIN rail slider catch locks into place.

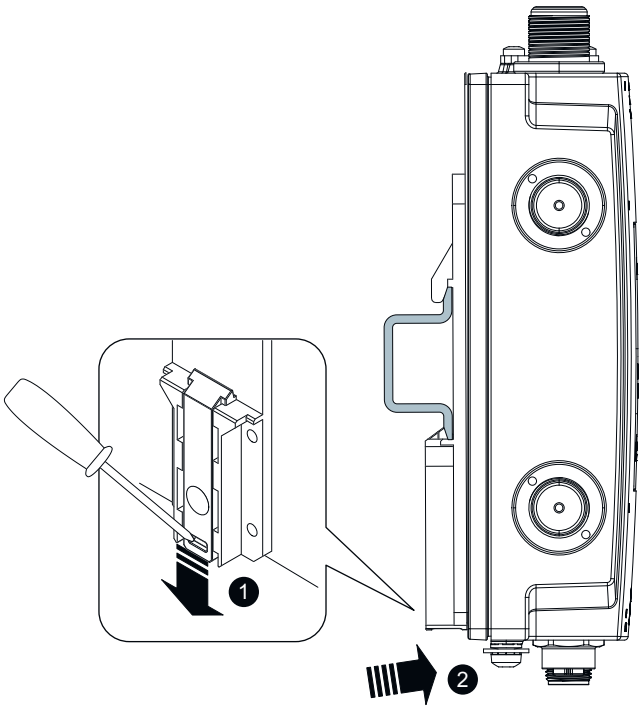


5. Connect the power supply, refer to the section "Power supply (Page 56)".
6. Fit the antennas, refer to the section "Antennas (Page 59)".

Uninstalling

1. Turn off the power to the device.
2. Disconnect all connected cables.
3. Pull the DIN rail slider down with a screwdriver ❶.

4. Tilt the device forward ❷ and remove the device from the DIN rail.



5. Loosen the screws of the DIN rail mounting adapter completely.

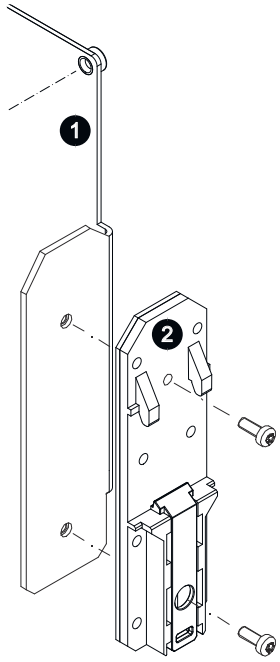
5.4.2 Mounting with bracket support

With the bracket support the device can be mounted on a DIN rail rotated through 90°

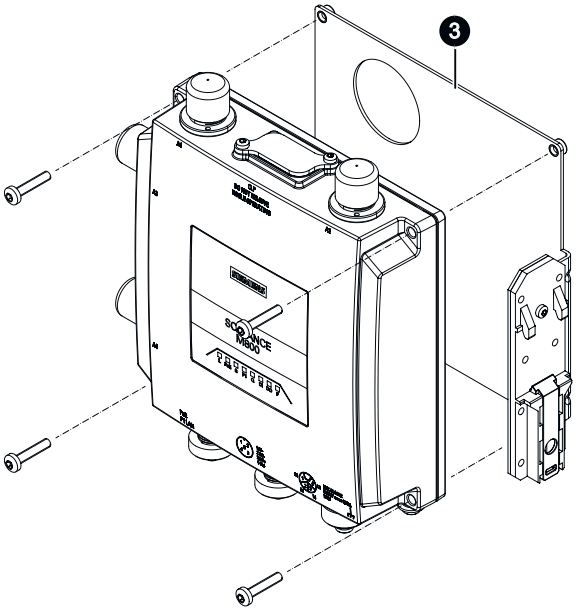
The DIN rail mounting adapter and bracket support are not included with the product, see Accessories (Page 28).

Installation

1. Screw (M3, tightening torque 0.7 Nm) the bracket support ❶ to the DIN rail mounting adapter ❷. The mounting material ships with the product.

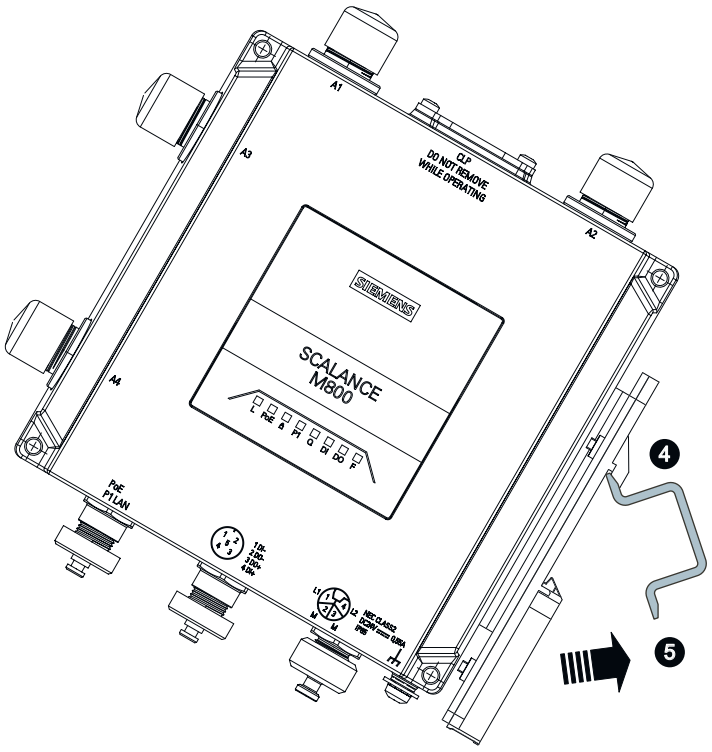


2. Screw (tightening torque 0.7 Nm) the bracket support ❸ to the side of the device.



3. Insert the SIM card, see section "SIM card (Page 62)".
4. Place the device on the upper edge of the DIN rail ❹.

5. Press the device ❺ against the DIN rail until the DIN rail slider catch locks into place.

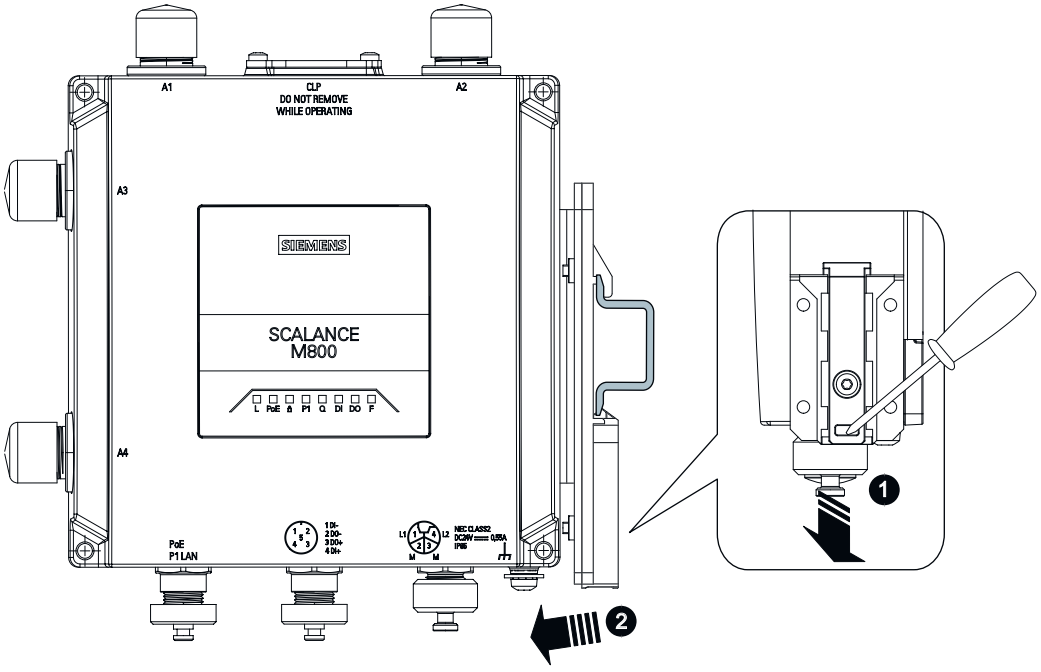


6. Connect the power supply, refer to the section "Power supply (Page 56)".
7. Fit the antennas, refer to the section "Antennas (Page 59)".

Uninstalling

1. Turn off the power to the device.
2. Disconnect all connected cables.
3. Pull the DIN rail slider down with a screwdriver ❶.

4. Tilt the device forward ❷ and remove the device from the DIN rail.



5. Loosen the screws completely.

Connecting up

6

6.1 Safety when connecting

Safety notices

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

Note

Strain relief for the Ethernet cables

In order to avoid mechanical stress on the Ethernet cables and resulting interruption of the contact, fasten the cables at a short distance from the connector using a cable guide or busbar.

Note

Close unused sockets

Close all unused M12 sockets with protective caps (tightening torque at least 0.4 Nm) to achieve the specified type of protection.

Safety notices for operation with a power supply according to NEC Class 2

Operate the device with a power supply according to NEC Class 2. When connecting up the device, keep to the safety notices listed below.

⚠ WARNING

Insulation of external power supplies

Ext. circuits intended to be connected to this device shall be galv. separated from hazardous live voltage by reinforced or double insulation.

⚠ WARNING

Power supply

The device is designed for operation with Safety Extra-Low Voltage (SELV) that can be connected directly by a Limited Power Source (LPS).

The power supply therefore needs to meet at least one of the following conditions:

- Only safety extra low voltage (SELV) with limited power source (LPS) complying with IEC 62368-1 / EN 62368-1 / VDE 62368-1 can be connected to the power supply terminals.
- The power supply unit for the device must meet NEC Class 2 according to the National Electrical Code (r) (ANSI / NFPA 70).

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

Note

Protective ground

A PELV circuit contains a connection to protective ground. Without a connection to protective ground, or in case there is a fault in the connection to the protective ground, the voltage for the circuit is not stabilized.

Note

Minimum temperature rating of the cable to be connected to the field wiring terminals, 90 °C.

Safety notices for operation with a power supply not complying with NEC Class 2

If you operate the device in a control cabinet, you can use a power supply that does not comply with NEC Class 2. When connecting up the device, keep to the safety notices listed below.

⚠ WARNING

Safety extra low voltage

The device is designed for operation with a directly connectable safety extra-low voltage (SELV) according to UL/IEC 61010-1 and UL/IEC 61010-2-201 whose output power corresponds to "Limited Energy" according to UL/IEC 61010-1.

NOTICE

Suitable fuse for the power supply cables (corresponds to "Limited Energy")

The current on the terminal may not exceed 3 A. Use a fuse for the power supply that is suitable for protection of AC/DC power supply circuits *) and protects against currents > 3 A.

- In areas subject to the NEC or CEC, the fuse must meet the following requirements:
  - Suitable for AC/DC *) (min. 60 V / 3 A)
  - Breaking current at least 10 kA
  - Approval according to ANSI/UL 248-14 (suppl. fuses), ANSI/UL 248-4 (Class CC), ANSI/UL 248-8 (J), ANSI/UL 248-15 (T), or CSA C22.2-4 No. 248.14 (suppl. fuses), No. 248-4 (Class CC), No. 248-8 (J), No. 248-15 (T)
- In other areas, the fuse must meet the following requirements:
  - Suitable for AC/DC *) (min. 60 V / 3 A)
  - Breaking current at least 10 kA
  - Approval according to IEC/EN 60947-1/2/3 or IEC/EN 60898-1/2 for circuit breakers
  - Breaking characteristics: B or C
  - Approval according to IEC/EN 60127-1 for fuses
  - Breaking characteristics: max. 120 s at 2 x I_n (corresponds to melting integral $I^2t < 4320$)

If the properties of the supplying current source are known, the following fuse is also possible:

- In areas subject to the NEC or CEC, the fuse must meet the following requirements:
  - Suitable for AC/DC *) (min. 60 V / 3 A)
  - Breaking current > highest possible current of the current source (incl. short circuit current and fault)
  - Approval according to UL 1077 or CSA C22.2 No. 235
- In other areas, the fuse must meet the following requirements:
  - Suitable for AC/DC *) (min. 60 V / 3 A)
  - Breaking current > highest possible current of the current source (incl. short circuit current and fault)
  - Approval according to IEC/EN 60934
  - Breaking characteristics: max. 120s at 2 x I_n

*) AC or DC depending on availability

Safety notices on use in hazardous areas

General safety notices relating to protection against explosion

WARNING

EXPLOSION HAZARD

Do not connect or disconnect cables to or from the device when a flammable or combustible atmosphere is present.

⚠ WARNING

EXPLOSION HAZARD

Do not press the reset button if there is a potentially explosive atmosphere.

⚠ WARNING

Unsuitable cables or connectors

Risk of explosion in hazardous areas

- Only use connectors that meet the requirements of the relevant type of protection.
- If necessary, tighten the connector screw connections, device fastening screws, grounding screws, etc. according to the specified torques.
- Close unused cable openings for electrical connections.
- Check the cables for a tight fit after installation.

⚠ WARNING

Lack of equipotential bonding

If there is no equipotential bonding in hazardous areas, there is a risk of explosion due to equalizing current or ignition sparks.

- Ensure that equipotential bonding is available for the device.

⚠ WARNING

Unprotected cable ends

There is a risk of explosion due to unprotected cable ends in hazardous areas.

- Protect unused cable ends according to IEC/EN 60079-14.

⚠ WARNING

Improper installation of shielded cables

There is a risk of explosion due to equalizing currents between the hazardous area and the non-hazardous area.

- Ground shielded cables that cross hazardous areas at one end only.
- Lay a potential equalization conductor when grounding at both ends.

⚠ WARNING

Insufficient isolation of intrinsically safe and non-intrinsically safe circuits

Risk of explosion in hazardous areas

- When connecting intrinsically safe and non-intrinsically safe circuits, ensure that the galvanic isolation is performed properly in compliance with local regulations (e.g. IEC 60079-14).
- Observe the device approvals applicable for your country.

Information on use in hazardous areas according to ATEX, IECEx and UKEX

If you use the device under ATEX, IECEx or UKEX conditions, you must also keep to the following safety instructions in addition to the general safety instructions for protection against explosion:

⚠ WARNING

Transient overvoltages

Take measures to prevent transient surges of more than 40% of the rated voltage. Under no circumstances may transient surges exceed 119 V. This is the case if you only operate devices with SELV (safety extra low voltage).

⚠ WARNING

Suitable cables at high ambient temperatures in hazardous area

At an ambient temperature of ≥ 60 °C, use heat-resistant cables designed for an ambient temperature at least 20 °C higher. The cable entries used on the housing must comply with the IP degree of protection required by EN IEC / IEC 60079-0.

General notes on use in hazardous areas according to UL-HazLoc

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

⚠ WARNING

WARNING - EXPLOSION HAZARD -

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

⚠ WARNING

Restricted area of application

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

⚠ WARNING

Restricted area of application

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

6.2 Power supply

Note

Galvanic isolation of the power supply unit

To ensure dielectric strength according to IEEE 802.3, the supplying 24 V power supply unit must be galvanically isolated with a dielectric strength of 1500 VAC. The galvanic isolation must also not be bridged by other devices connected to the same power supply unit.

Note

All power supplies (24 V power supply unit or PoE) must not be connected to a mains supply higher than 300 V and the overvoltage category II.

Information on the power supply

There are two options for the power supply:

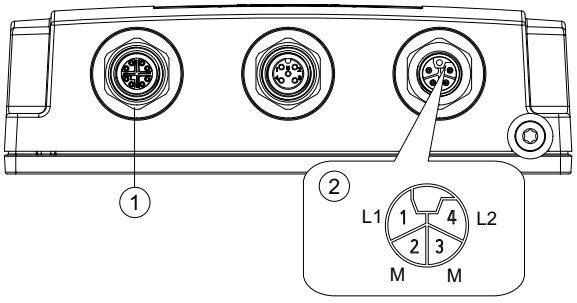
- Power over Ethernet via the 8-pin M12 Ethernet interface P1 ①
  The power supply cannot be connected redundantly.
- Direct infeed via the 4-pin M12 socket ②
  The power supply can be connected redundantly. The inputs L1/L2 are decoupled There is no distribution of load. The power supply unit with the higher output voltage supplies the device alone.

For the direct feed-in of the power supply use copper cables with the following properties:

- Round cable cross-section with 6 to 8 mm diameter.
- Two-wire cable with a cross-section of 0.75 to 1.5 mm^2 per wire or copper cable of the category AWG18-16. The temperature stability must be at least 105 °C.
- With redundant power supply: Four-wire cable with a cross-section of 0.75 to 1.5 mm^2 per wire or copper cable of the category AWG18-16. The temperature stability must be at least 105 °C.
- Permitted tensile load at least 100 N.
- List of cables according to the national installation regulations. In areas where NEC or CEC applies: Type PTLC or ITC.

To connect the functional ground, use a copper cable of category AWG18 or a cable with a cross-section ≥ 0.75 mm^2.

Position and pin assignment



① M12 Ethernet interface P1 LAN PoE, X-coded, 8-pin
The power can also be supplied via this interface (Power over Ethernet).
Pin assignment, see Ethernet (Page 58)

② M12 interface, direct infeed, L-coded, 4-pin

The 4-pin M12 socket has the following pin assignment:

Pin	Color	Signal	Assignment
1	Brown	L1+	24 V DC
2	White	M	Ground
3	Blue	M	Ground
4	Black	L2+	24 V DC

Connecting/disconnecting the power supply

⚠ WARNING

Danger from electric shock

Turn off the power supply before you insert or remove the plug of the power supply.

1. Connect the plug and socket. Make sure that they lock in place correctly.
2. Tighten the knurled screw (tightening torque 1 Nm).

Note

The requirements of EN61000-4-5, "Surge Immunity Test" on power supply lines with 24 VDC are met only when a Blitzductor is used:

24 VDC: BVT AVD 24 type no. 918 422

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

Power over Ethernet (PoE)

Note

Before you pull a plug via which the device is supplied with power using PoE, disable the relevant PoE power supply.

Note

No power sourcing equipment (PSE)

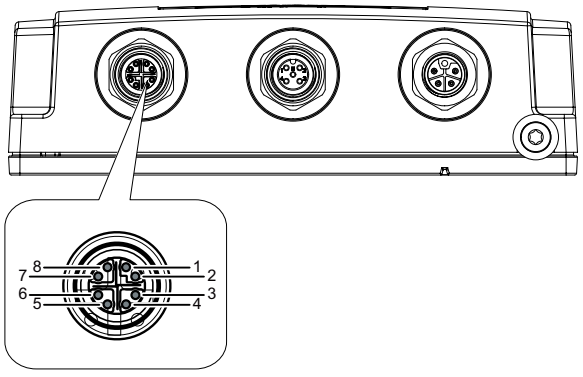
The SCALANCE MUM856-1 devices cannot be used as PoE power supply for other devices.

6.3 Ethernet

For connection to Industrial Ethernet at 10/100/1000 Mbps, the device has an M12 interface: X-coded, 8-pin.

The power can also be supplied via this interface (Power over Ethernet)

Position and pin assignment



Pin	Assignment
1	D0+
2	D0-
3	D1+
4	D1-
5	D3+
6	D3-
7	D2-
8	D2+

Connecting Ethernet ports

1. Connect the plug and socket. Make sure that they lock in place correctly.
2. Tighten the knurled screw (torque 1 Nm).

6.4 Antennas

The SCALANCE MUM856-1 has 4 antenna ports of the type N-Connect female.

Note

Use the antennas from the range of accessories for the device. You will find more detailed information in "Accessories (Page 32)". If you use a different antenna, there is no guarantee that the device will function according to the specification.

⚠ CAUTION

Minimum clearance to the device

The device may only be operated when the distance between the device (or antenna) and user is at least 20 cm.

Notes on lightning protection

⚠ WARNING

Danger due to lightning strikes

Antennas installed outdoors must be within the area covered by a lightning protection system. Make sure that all conductive systems entering from outdoors can be protected by a lightning protection potential equalization system.

When implementing your lightning protection concept, make sure you adhere to the requirements of the VDE 0182 or IEC 62305 standard.

- A suitable lightning conductor LP798-1N (article no. 6GK5798-2LP00-2AA6) is available in the range of accessories of SIMATIC NET Industrial WLAN.

⚠ WARNING

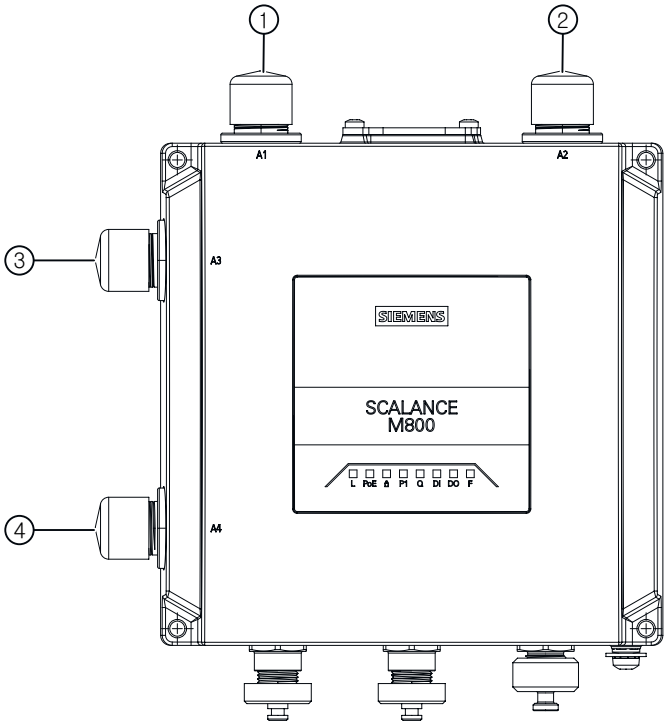
Danger due to lightning strikes

Installing this lightning protector between an antenna and a SCALANCE M device is not adequate protection against a lightning strike. The LP798-1N lightning protector only works within the framework of a comprehensive lightning protection concept. If you have questions, ask a qualified specialist company.

Connecting antennas

You can connect an external antenna to the device directly or using a flexible connecting cable.

Antenna ports A1 and A2 are located on the top of the device and antenna ports A3 and A4 on the left side of the device.



①	Antenna port A1	③	Antenna port A3
②	Antenna port A2	④	Antenna port A4

Note

Antennas

- An antenna must always be connected to all antenna ports in order to use 3/4/5G connectivity.
- For GNSS operation, use the A4 antenna. This must have a clear view of the sky.

Protective caps

Keep the removed protective caps for later use.

To connect an antenna, follow these steps:

1. Remove the protective cap from the relevant N connector on the device.
2. Place the plug connector of the antenna or the flexible connection cable on the antenna port and screw the union nut of the plug connector onto it (open-ended wrench SW19, torque 1.7 Nm).

Frequency bands

6GK5856-2EA00-3DA1 (EU)	5G Standalone (SA)	n1, n3, n5, n7, n8, n12, n20, n28, n38, n40, n41, n48, n71, n77, n78, n79
	5G Non-Standalone (NSA)	n1, n3, n5, n7, n8, n20, n28, n38, n40, n41, n48, n66, n77, n78, n79
	LTE	B1, B2, B3, B4, B5, B7, B8, B12, B13, B14, B17, B18, B19, B20, B25, B26, B28, B29, B30, B32, B66, B71, B34, B38, B39, B40, B41, B42, B43, B46, B48
	UMTS	B1, B2, B3, B4, B5, B8
	GNSS	GPS L1 (1575.42 MHz) GPS L5 (1176.45 MHz) For GNSS operation, the A4 antenna must have a clear view of the sky.
6GK5856-2EA00-3FA1 (CN)	5G Standalone (SA)	n1, n2, n3, n5, n7, n8, n12, n20, n28, n38, n40, n41, n48, n66, n71, n77, n78, n79
	5G Non-Standalone (NSA)	n41, n77, n78, n79
	LTE	B1, B2, B3, B4, B5, B7, B8, B12, B13, B14, B17, B18, B19, B20, B25, B26, B28, B29, B30, B32, B66, B71, B34, B38, B39, B40, B41, B42, B43, B46, B48
	UMTS	B1, B2, B3, B4, B5, B8
	GNSS	GPS L1 (1575.42 MHz) GPS L5 (1176.45 MHz) For GNSS operation, the A4 antenna must have a clear view of the sky.
6GK5856-2EA10-3AA1 (A1)	5G Standalone (SA)	n1, n2, n3, n5, n7, n8, n20, n25, n28, n30, n38, n40, n41, n48, n66, n71, n75(DL), n77, n78, n79
	5G Non-Standalone (NSA)	n1, n2, n3, n5, n7, n8, n20, n25, n28, n30, n38, n40, n41, n66, n71, n77, n78, n79
	LTE	B1, B2, B3, B4, B5, B7, B8, B12, B13, B14, B17, B18, B19, B20, B25, B26, B28, B29(DL), B30, B32(DL), B34, B38, B39, B40, B41, B42, B43, B46(DL), B48, B66, B71
	UMTS	B1, B2, B4, B5, B6, B8, B19
	GNSS	GPS L1 (1575.42 MHz) Galileo E1 (1575.42 MHz) For GNSS operation, the A4 antenna must have a clear view of the sky.

6GK5856-2EA10-3BA1 (B1)	5G Standalone (SA)	n1, n3, n5, n8, n28, n41, n77, n78, n79
	5G Non-Standalone (NSA)	n41, n77, n78, n79
	LTE	B1, B3, B5, B8, B34, B38, B39, B40, B41
	UMTS	B1, B5, B8
	GNSS	Not supported

Depending on the frequency bands used by your mobile wireless provider, antennas must be tuned to the suitable frequencies. Check with your mobile wireless provider for the frequency bands.

Signal quality

During installation make sure that there is a good signal strength of > -73 dBm.

If the "Q" LED is lit permanently, the signal quality is good. For more detailed information, refer to the section "LED display (Page 34)".

Avoid large metallic objects in the immediate vicinity.

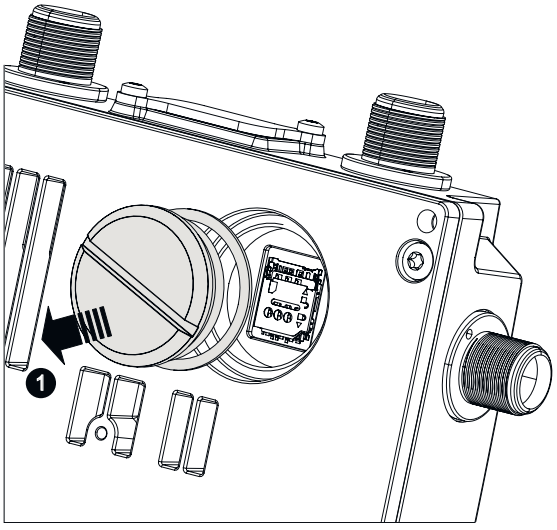
6.5 SIM card

NOTICE
Turn off the power supply before replacing SIM cards
Before you insert or remove the SIM card, turn off the power supply of the device.
Do not open the SIM card tray during operation. This can damage the SIM card and the device.

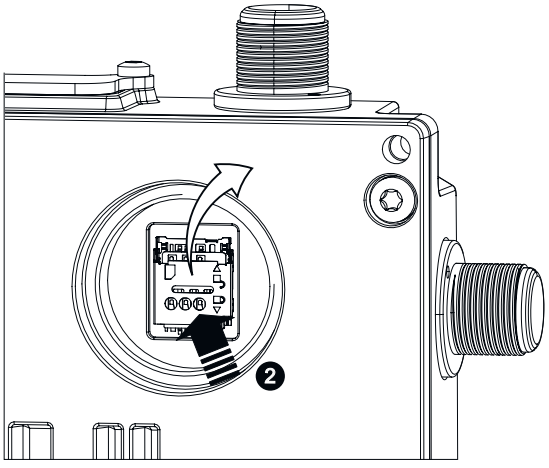
The tray for the 3FF micro SIM card is located on the back of the device under a cover.

Inserting the SIM card

1. Remove the cover.

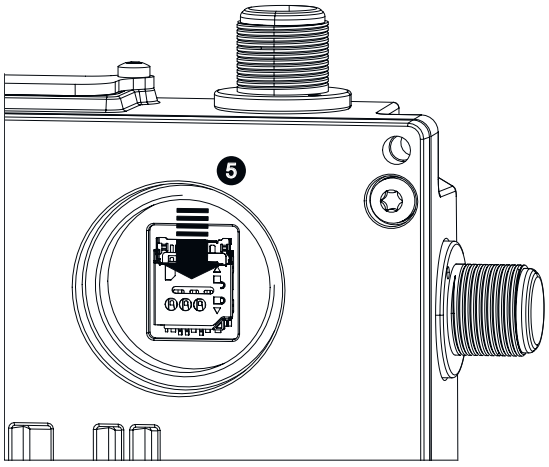


2. Press the tray with index finger and move it slightly upwards.
   The tray opens.

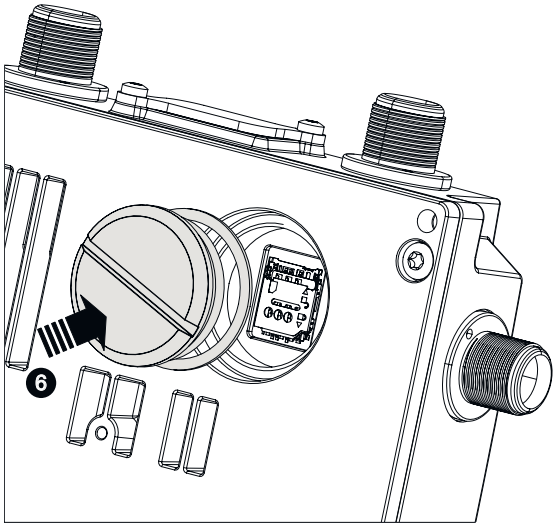


3. Insert the SIM card.
4. Close the tray.

5. Lightly push the tray down with your finger until it locks into place.



6. Set the cover on again.



6.6 Grounding

EMC disturbances are diverted to ground via the functional ground. This ensures the immunity of the data transmission.

The grounding screw is identified by the following symbol for the functional ground ⏚.

Protective earth/functional ground

The connection of the reference potential surface with the protective earth system is normally in the cabinet close to the power feed-in. This earth conducts fault currents to ground safely and according to DIN/VDE 0100 is a protective earth to protect people, animals and property from too high contact voltages.

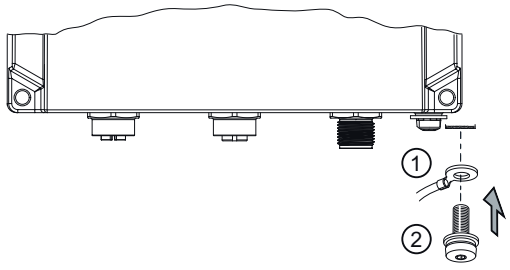
Apart from the protective earth, there is functional grounding in the cabinet. According to EN60204-1 (DIN/VDE 0113 T1) electrical circuits must be grounded. The chassis (0 V) is grounded at one defined point. Here, once again the grounding is implemented with the lowest leakage resistance to ground in the vicinity of the power feed-in.

With automation components, functional ground also ensures interference-free operation of a controller. Via the functional ground, interference currents coupled in via the connecting cables are discharged to ground.

Connecting up functional ground

Follow the steps below to connect the functional ground:

1. Put the grounding terminal ①, and the screw ② together as shown in the drawing.



① Grounding terminal with cable
② Screw (M4 thread) with spring washer and washer

2. Screw in the screw ② with a maximum tightening torque of 1.5 Nm.

6.7 Digital input/output

The device features a digital input and output (M12 A-coded).

⚠ CAUTION

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.

Note

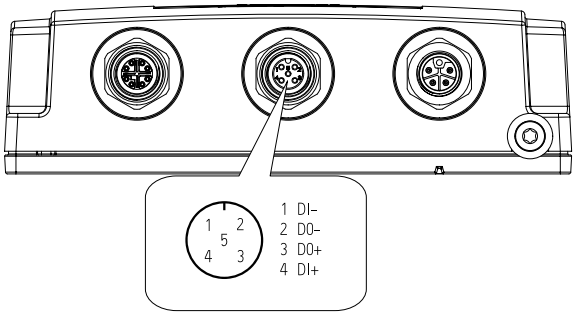
Interference pulse

To avoid evaluating an interference pulse, the pulse for the signal 1 (TRUE / HIGH) must be at least 200 ms.

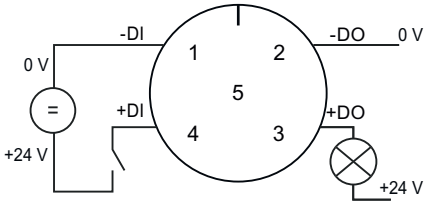
Rules for wiring

- To wire the digital input/output, use a copper cable of category AWG18-16 or a cable with a cross-section of 0.75 to 1.5 mm^2.
- Always wire the digital input/output in pairs.
- The maximum permissible cable length is 30 m.

Position / Assignment



Example:



1	DI-	Ground
2	DO-	Ground
3	DO+	Switching signal
4	DI+	Input
5	NC	Not connected

If there is an adequate switching voltage at the digital input, the digital input is active and the "DI" LED is lit.

The voltage applied to the "DI" contact is converted to a digital status by the device as follows:

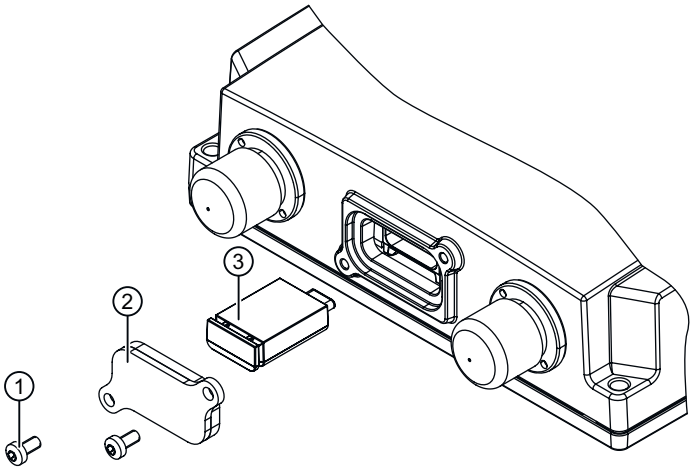
Voltage	**Status**
-30 to +3 V DC	0
+10 to +30 V DC	1

The digital output is a switch that connects the signal at +DO through to -DO.

6.8 Replacing a CLP

Position

The CLP slot is at the top of the device enclosure under a cover, see Reset button (Page 36).



① M3 screws (Torx T10)
② Slot cover
③ CLP

Removing a CLP

Note

Loss of the configuration

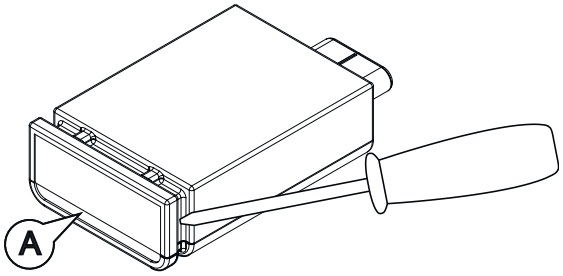
The reset button is located directly beside the slot for the CLP. The reset button cannot be used to remove the CLP.

If you press and hold down the reset button you reset all the settings of the device to the factory defaults.

To remove a CLP from the device, follow the steps below:

1. Turn off the power to the device.
2. Loosen the screws M3 ① with a Torx screwdriver T10 and remove the slot cover ②.
   As an alternative, you can loosen only one of the screws ① and swivel the slot cover ② to the side.

3. To release the CLP ③, insert a screwdriver between the front edge of the CLP (A) and the slot.

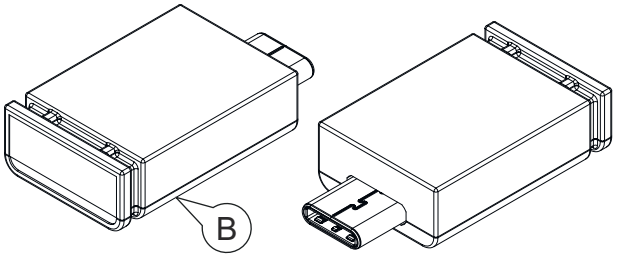


4. Remove the CLP from the slot.
5. Close the slot cover (torque 0.8 Nm) to ensure that the device maintains the degree of protection IP65.

Inserting the CLP

To insert a CLP into the device, follow the steps below:

1. Turn off the power to the device.
2. Loosen the screws M3 ① with a Torx screwdriver T10 and remove the slot cover ②.
   As an alternative, you can loosen only one of the screws ① and swivel the slot cover ② to the side.
3. The housing of the CLP has a rounded underside (B). Accordingly, the slot opening has a rounded edge. Note this orientation when inserting the CLP.
   Insert the CLP ③ in the correct orientation into the slot.



4. Close the slot cover (torque 0.8 Nm) to ensure that the device maintains the degree of protection IP65.

Maintenance and cleaning

7

⚠ WARNING

Unauthorized repair of devices in explosion-proof design

Risk of explosion in hazardous areas

- Repair work may only be performed by personnel authorized by Siemens.
- For function checks, maintenance and servicing work, you need to observe the requirements on checking and maintaining plants in hazardous areas according to the standards EN / IEC 60079-17.

⚠ WARNING

Impermissible accessories and spare parts

Risk of explosion in hazardous areas

- Only use original accessories (Page 28) and original spare parts.
- Observe all relevant installation and safety instructions described in the manuals for the device or supplied with the accessories or spare parts.

⚠ CAUTION

Hot surfaces

Risk of burns during maintenance work on parts with a surface temperature above 70 °C (158 °F).

- Take appropriate protective measures, for example, wear protective gloves.
- Once maintenance work is complete, restore the touch protection measures.

NOTICE

Cleaning the housing

If the device is not in a hazardous area, only clean the outer parts of the housing with a dry cloth.

If the device is in a hazardous area, use a slightly damp cloth for cleaning.

Do not use solvents.

Troubleshooting

8

8.1 Downloading new firmware using TFTP without WBM and CLI

Firmware

The firmware is signed and encrypted. This ensures that only firmware created by Siemens can be downloaded to the device.

You can download new firmware to the device using TFTP. To do this, the device does not need to be reachable either using Web Based Management (WBM) or using the Command Line Interface (CLI). This can be the case if there was a power failure during a firmware update.

When pressing the button, make sure you adhere to the instructions in the section "Reset button (Page 36)".

To load a new firmware via TFTP, follow these steps:

1. Turn off the power to the device.
2. Loosen the screws of the cover.
3. Remove the cover.
4. Press and hold down the reset button.
5. Connect the device to the power supply again while holding down the button.
6. Hold down the button until the red fault LED "F" starts to flash after approximately 2 seconds (500ms on/500ms off).
7. Release the button. The F-LED lights continuously red.
   The bootloader waits in this state for a new firmware file that you can download using TFTP.
8. Connect a PC to the device over the Ethernet interface.
9. Assign an IP address to the device using DHCP or the SINEC PNI.
10. Open a DOS box and change to the directory where the file with the new firmware is located and then execute the following command:
    `tftp -i <IP address> put <firmware file>`
    As an alternative, you can use a different TFTP client.
    Once the firmware has been transferred completely to the device, there is an automatic restart on the device. This process can take several minutes.
11. Close the cover (tightening torque 0.8 Nm), to ensure that the device is closed and water and dust proof.

8.2 Restoring the factory settings

NOTICE
Previous settings If you reset, all the settings you have made will be overwritten by factory defaults.

NOTICE
Inadvertent reset An inadvertent reset can cause disturbances and failures in a configured network with further consequences.

With the reset button

When pressing the button, make sure you adhere to the instructions in the section "Reset button (Page 36)".

To reset the device to the factory defaults during the startup phase, follow the steps below:

1. Turn off the power to the device.
2. Loosen the screws of the cover.
3. Remove the cover.
4. Press the reset button and reconnect the device to the power supply while holding down the button.
5. Hold down the button until the red error LED "F" stops flashing after approximately 10 seconds and is permanently lit.
6. Release the button and wait until the fault LED "F" goes off.
   The device starts automatically with the factory settings.
7. Close the cover (tightening torque 0.8 Nm), to ensure that the device is closed and water and dust proof.

With SINEC PNI

Follow the steps below to reset the device parameters to the factory settings with the SINEC PNI:

1. Select the device whose parameters you want to reset.
2. Click the "Reset device" button.
3. Select the "Reset to factory settings" option in the following dialog.

Via the configuration

You will find detailed information on resetting the device parameters using the WBM and CLI in the configuration manuals:

- Web Based Management, section "Restart"
- Command Line Interface, section "Reset and Defaults"

Technical specifications

9

The following technical specifications apply to the following devices:

- SCALANCE MUM856-1 (model MS5G15R-65-M1-M12-E4-1)
- SCALANCE MUM856-1 (model MS5G16R-65-M1-M12-E4-1)
- SCALANCE MUM856-1 (model MS5G16R-65-M1-M12-E4-2)

Technical specifications		
Data transfer		
Ethernet transfer rate		10 Mbps, 100 Mbps, 1000 Mbps
Wireless transfer rate	5G	• Downlink: up to 1000 Mbps • Uplink: up to 500 Mbps
	LTE	• Downlink: up to 1000 Mbps • Uplink: up to 200 Mbps
	UMTS	• Downlink: up to 42 Mbps • Uplink: up to 5.76 Mbps
Power supply for POE standards supported	Standards	IEEE802.3bt/ IEEE802.3at/ IEEE802.3af
	Class	Class 0 (0.44 ... 12.95 W)
Ethernet interface		
Connection to Industrial Ethernet	Quantity	1
	Design	M12 socket, X-coded
	Properties	Half duplex/full duplex, autocrossover, autonegotiation, autosensing, floating, PoE
Radio interface		
Wireless network type		5G public networks, 5G private networks, LTE, UMTS
Mobile wireless service type		HSDPA, HSUPA, HSPA+

Device	Mobile wireless standard	Max. conducted power		
		23 dBm (200 mW)	26 dBm (400 mW)	Downlink only
6GK5856-2EA10-3AA1 (A1)	5G NR	n1, n2, n3, n5, n7, n8, n20, n25, n28, n30, n38, n40, n41, n48, n66, n71, n77, n78, n79	n41, n77, n78, n79	n75
	LTE	B1, B2, B3, B4, B5, B7, B8, B12, B13, B14, B17, B18, B19, B20, B25, B26, B28, B30, B34, B38, B39, B40, B41, B42, B43, B48, B66, B71	B41	B29, B32, B46
	WCDMA	B1, B2, B4, B5, B6, B8, B19	-	-

Technical specifications				
6GK5856-2EA10-3BA1 (B1)	5G NR	n1, n3, n5, n8, n28, n41, n77, n78, n79	n41, n77, n78, n79	-
	LTE	B1, B3, B5, B8, B34, B38, B39, B40, B41	-	-
	WCDMA	B1, B5, B8	-	-
6GK5856-2EA00-3DA1 (EU) 6GK5856-2EA00-3FA1 (CN)	5G NR	n1, n2, n3, n5, n7, n8, n12, n20, n28, n38, n40, n41, n48, n66, n71, n77, n78, n79	-	-
	LTE	B1, B2, B3, B4, B5, B7, B8, B12, B13, B14, B17, B18, B19, B20, B25, B26, B28, B30, B34, B38, B39, B40, B41, B42, B43, B48, B66, B71	-	B29, B32
	WCDMA	B1, B2, B3, B4, B5, B8	-	-
Antenna port	Quantity		4 A1, A2: Main antenna A3, A4: RX MIMO	
	Design		N connector (straight)	
	Impedance		50 Ω nominal	
Electrical data				
Direct 24 V DC supply	Supply voltage from socket		24 V DC Safety Extra Low Voltage (SELV)	
	Type of current		⎓	
	Permissible range	+/- 30 %	16.8 to 31.2 V DC	
	Design		M12 socket, L-coded	
	Properties		Not galvanically isolated	
Supply voltage from PoE	Supply voltage		48 V DC	
	Type of current		⎓	
	Permissible range		36 to 57 V DC	
	Design		M12 socket, X-coded	
	Properties		Galvanically isolated	
Current consumption	24 V DC/maximum		550 mA	
	PoE 48 V / maximum		270 mA	
	24 V DC Sleep Mode / maximum		12.5 mA	
Active power loss	24 V DC/maximum		13.2 W	
	PoE 48 V / maximum		12.96 W	
	24 V DC Sleep Mode / maximum		300 mW	

Technical specifications			
Digital input	Quantity		1
	Design		M12 socket, A-coded
	Status "0"		-30 V to 3 V DC
	Status "1"		10 V DC .. 30 V
	Max. input current		8 mA
	Max. cable length		< 30 m Cables should be routed in pairs
	Properties		Input isolated from electronics
Digital output	Quantity		1
	Design		M12 socket, A-coded
	Rated voltage		24 V DC safety extra-low voltage (SELV)
	Fuse		0.5 A
	Max. cable length		< 30 m Cables should be routed in pairs
	Properties		Output isolated from electronics
Permissible ambient conditions			
Ambient temperature	During operation	6GK5856-2EA00-3DA1 (EU) 6GK5856-2EA00-3AA1 (ROW) 6GK5856-2EA00-3FA1 (CN)	-30 °C to +60 °C
		6GK5856-2EA10-3AA1 (A1) 6GK5856-2EA10-3BA1 (B1)	-30 °C to +70 °C
	During storage		-40 °C to +85 °C
	During transportation		-40 °C to +85 °C
Relative humidity	During operation		≤ 95% at 25 °C, no condensation
Operating altitude	During operation		≤ 2,000 m above sea level at max. 60 °C ambient temperature
Contaminant concentration			According to ISA-S71.04.-2013 Class G3
Degree of pollution			2
Degree of protection			IP65
Design, dimensions and weight			
Module format			Compact module
Weight			1.3 kg
Dimensions (W x H x D)			165.5 x 179.4 x 45 mm
Installation options			
	Direct		• Wall mounting

Technical specifications		
	With additional adapter	• Mounting on a DIN rail • With additional bracket support for installation rotated though 90°
Mean time between failure (MTBF)		
	at 40 °C ambient temperature	24 years
Product functions		
Configuration / management	• Web-based management (WBM) via HTTPS • Command Line Interface (CLI) via SSH	
Security	• Router with NAT function – IP masquerading – NAPT – SourceNAT – NETMAP • Password protection • Firewall function – Port forwarding – IP firewall with stateful packet inspection (layer 3 and 4) – Global and user-defined firewall rules • VPN functions To establish a VPN (Virtual Private Network), the following functions are available: – Up to 20 connections – IPsec VPN, OpenVPN (as client) • SINEMA RC client • Proxy server • Siemens Remote Service (SRS)	

Technical specifications	
Monitoring / diagnostics / maintenance	• LEDs Display of operating statuses via the LED display • Logging For logging events • SNMPv1/v2/v3 For monitoring and controlling network components • Packet Capture For network diagnostics via a connected PC
Other functions	• Time-of-day synchronization – NTP client and NTP server – Secure NTP server – SIMATIC time client – SNTP client – GPS time • DHCP – DHCP server (internal network) • Virtual networks (VLAN) To structure Industrial Ethernet networks with a fast growing number of devices, a physical network can be divided into several virtual subnets • Digital input/digital output • Dynamic DNS client • DNS client and DNS proxy • SMTP client • Location determination via GPS (not available with the 6GK5856-2EA10-3BA1 (B1) device variant) • Geofencing • eSIM (not available with the 6GK5856-2EA10-3BA1 (B1) and 6GK5856-2EA00-3FA1 device variants) • Secure Boot

Dimension drawings

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Note

CAx data

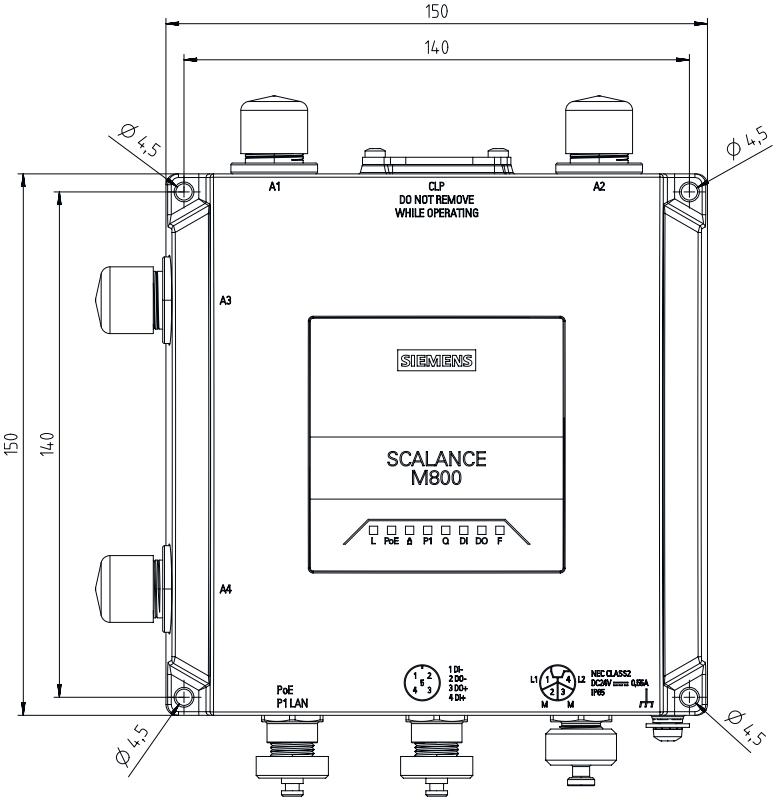
You can find the CAx data on the Internet at (https://www.automation.siemens.com/bilddb/index.aspx?lang=en)

1. Click on the "CAx data" link in the "Direct Links" area.
   The Industry Image Database page is loaded.
2. Enter the name or article number of the product in the search filter.
   You can refine your search using the "Motif type" selection list.

Note

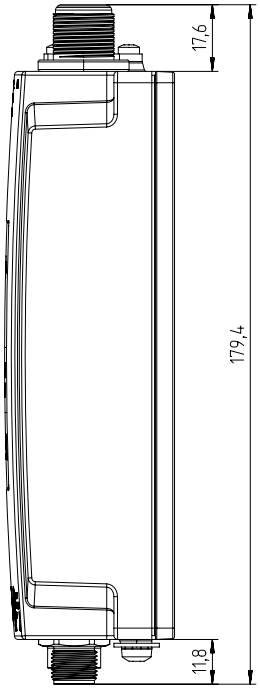
Dimensions are specified in mm.

Front view

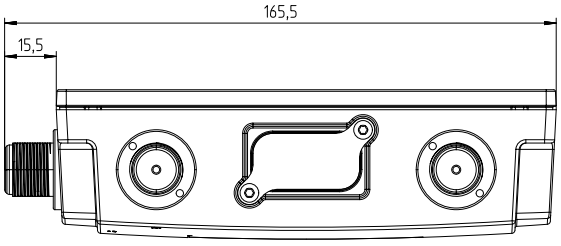


Width, height and dimensions for wall mounting

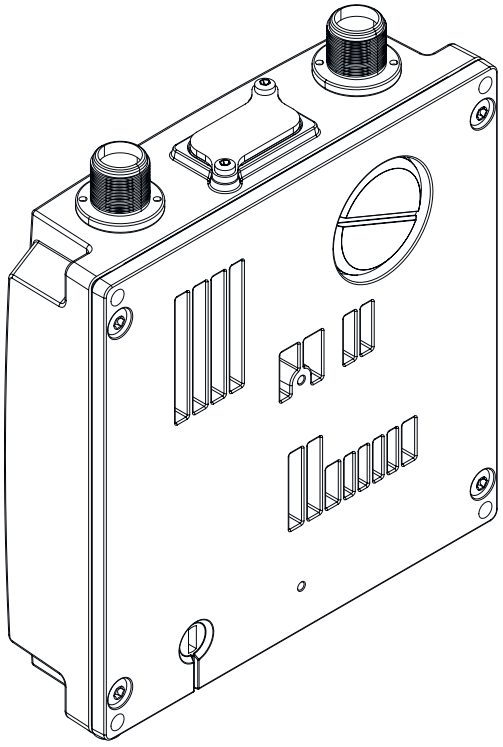
Side view



Top view



Rear view



Approvals

11

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.

Approvals for shipbuilding are not printed on the device type plate.

Current approvals on the Internet

You will find the current approvals for the product on the Internet pages of Siemens Industry Online Support at the following link: (https://support.industry.siemens.com/cs/ww/en/ps/28821/cert)

National approvals

You can find an overview of the country-specific wireless approvals of SIMATIC NET devices on the Internet pages of Siemens Industry Online Support. You can find the link to the document on the following page

ik-Info (https://www.siemens.com/mobilenetwork-approvals)

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.

- "Industrial Ethernet / PROFINET Industrial Ethernet" System Manual (https://support.industry.siemens.com/cs/ww/en/view/27069465)
- "Industrial Ethernet / PROFINET - Passive Network Components" System Manual (https://support.industry.siemens.com/cs/ww/en/view/84922825)
- "EMC Installation Guidelines" configuration manual (https://support.industry.siemens.com/cs/ww/en/view/60612658)

⚠ WARNING

Personal injury and property damage can occur

The installation of expansions that are not approved for 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.

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.

11.1 EC declaration of conformity

CE

The EC Declaration of Conformity is available for all responsible authorities at:

Siemens Aktiengesellschaft
Digital Industries
Process Automation
DE-76187 Karlsruhe
Germany

You can find the current EU declaration of conformity for these products on the Internet pages under Siemens Industry Online Support (https://support.industry.siemens.com/cs/ww/en/ps/28821/cert).

The products described in this document meet the requirements of the following EC directives:

- RoHS directive 2011/65/EU
  Directive of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, official journal of the EU L174, 01/07/2011, pages 88-110
- Radio equipment directive 2014/53/EU (RED, Radio Equipment Directive)
  Directive of the European Parliament and of the Council of 16 April 2014 on the harmonization of the laws of the Member States relating to the making available on the market of radio equipment; official journal of the EU L153, 22/05/2014, pages 62-106

Name, address and identification number of the notified body:	American Certification Body, Inc. 6731 Whittier Avenue, Suite C110 McLean, VA 22101 USA 1588
Number of the EU type examination certificate:	ATCB027001 (6GK5856-2EA00-3DA1) ATCB031205 (6GK5856-2EA10-3AA1)

11.1.1 RoHS

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 IEC 63000
  Technical documentation for the assessment of electrical and electronic products with respect to restriction of hazardous substances

11.1.2 RED

11.1.2.1 Protection of health and safety

- EN IEC 62368-1
  Equipment for audio, video, information and communication technology - Part 1: Safety requirements
- EN IEC 62368-3
  Audio/video, information and communication technology equipment - Part 3: Safety aspects for DC power transmission via communication cables and connectors
- EN IEC 62311
  Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz)

11.1.2.2 EMC

- EN 50121-3-2
  Railway applications - Electromagnetic compatibility - Part 3-2: Rolling stock - Apparatus
- EN 50121-4
  Railway applications - Electromagnetic compatibility - Part 4: Emission and immunity of the signaling and telecommunications apparatus
- ETSI EN 301 489-1
  Electromagnetic compatibility and radio spectrum matters (ERM) - Electromagnetic compatibility for radio equipment and services - Part 1: Common technical requirements
- ETSI EN 301 489-52
  Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 52: Specific conditions for cellular communication mobile and portable (UE) radio and ancillary equipment
- EN 55011
  Industrial, scientific and medical (ISM) radio-frequency equipment – Electromagnetic disturbance characteristics – Limits and methods of measurement

- EN 55032
  Electromagnetic compatibility of multimedia equipment – Emission requirements
- EN 55035
  Electromagnetic compatibility of multimedia equipment - Immunity requirements
- EN IEC 61000-6-1
  Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
- EN IEC 61000-6-2
  Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
- EN IEC 61000-6-3
  Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
- EN IEC 61000-6-4
  Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments
- EN IEC 61000-6-8
  Electromagnetic compatibility (EMC) - Part 6-8: Generic standards - Emission standard for professional equipment in commercial and light-industrial locations

11.1.2.3 Efficient use of the radio spectrum

- ETSI EN 301 908-1
  IMT cellular networks - Harmonized standard for access to radio spectrum - Part 1: Introduction and common requirements for Release 15
- ETSI EN 301 908-2
  IMT cellular networks - Harmonized standard for access to radio spectrum - Part 2: CDMA Direct Spread (UTRA FDD) User Equipment (UE)
- ETSI EN 301 908-13
  IMT cellular networks - Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive - Part 13: Further developed universal terrestrial wireless access (E-UTRA) end devices (UE)
- ETSI EN 301 908-25
  IMT cellular networks - Harmonised Standard for access to radio spectrum - Part 25: New Radio (NR) User Equipment (UE) Release 15
- ETSI EN 303 413
  Satellite Earth Stations and Systems (SES) - Global Navigation Satellite System - Radios for operation in the frequency bands from 1164 MHz to 1300 MHz and from 1559 MHz to 1610 MHz

11.1.3 Other technical standards

- CISPR 11
  Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
- CISPR 32
  Electromagnetic compatibility of multimedia equipment - Emission requirements
- CISPR 35
  Electromagnetic compatibility of multimedia equipment - Immunity requirements
- NAMUR NE21
  Automation engineering of modular systems in the process industry - Modelling of module services

11.2 UK Declaration of Conformity

UK CA

The UK declaration of conformity is available to all responsible authorities at:

Siemens Aktiengesellschaft
Digital Industries
Process Automation
DE-76187 Karlsruhe
Germany

Importer UK:
Siemens plc,
Manchester M20 2UR
United Kingdom

You can find the current UK Declaration of Conformity for these products on the Internet pages under Siemens Industry Online Support (https://support.industry.siemens.com/cs/ww/en/ps/28821/cert).

The SIMATIC NET product described in these operating instructions meets the requirements of the following directives:

- RoHS Regulation
  SI 2012/3032 Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012, and related amendments
- Radio Equipment Regulation
  SI 2017/1206 The Radio Equipment Regulations 2017

11.2.1 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Restriction of the use of certain hazardous substances

The SIMATIC NET products described in these operating instructions meet the requirements of "The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012".

Applied standard:

- EN IEC 63000
  Technical documentation for the assessment of electrical and electronic products with respect to restriction of hazardous substances

11.2.2 The Radio Equipment Regulations 2017

11.2.2.1 Protection of health and safety

- EN IEC 62368-1
  Equipment for audio, video, information and communication technology - Part 1: Safety requirements
- EN IEC 62368-3
  Audio/video, information and communication technology equipment - Part 3: Safety aspects for DC power transmission via communication cables and connectors
- EN IEC 62311
  Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz)

11.2.2.2 EMC

- EN 50121-3-2
  Railway applications - Electromagnetic compatibility - Part 3-2: Rolling stock - Apparatus
- EN 50121-4
  Railway applications - Electromagnetic compatibility - Part 4: Emission and immunity of the signaling and telecommunications apparatus
- ETSI EN 301 489-1
  Electromagnetic compatibility and radio spectrum matters (ERM) - Electromagnetic compatibility for radio equipment and services - Part 1: Common technical requirements
- ETSI EN 301 489-52
  Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 52: Specific conditions for cellular communication mobile and portable (UE) radio and ancillary equipment
- EN 55011
  Industrial, scientific and medical (ISM) radio-frequency equipment – Electromagnetic disturbance characteristics – Limits and methods of measurement

- EN 55032
  Electromagnetic compatibility of multimedia equipment – Emission requirements
- EN 55035
  Electromagnetic compatibility of multimedia equipment - Immunity requirements
- EN IEC 61000-6-1
  Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
- EN IEC 61000-6-2
  Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
- EN IEC 61000-6-3
  Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
- EN IEC 61000-6-4
  Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments
- EN IEC 61000-6-8
  Electromagnetic compatibility (EMC) - Part 6-8: Generic standards - Emission standard for professional equipment in commercial and light-industrial locations

11.2.2.3 Efficient use of the radio spectrum

- ETSI EN 301 908-1
  IMT cellular networks - Harmonized standard for access to radio spectrum - Part 1: Introduction and common requirements for Release 15
- ETSI EN 301 908-2
  IMT cellular networks - Harmonized standard for access to radio spectrum - Part 2: CDMA Direct Spread (UTRA FDD) User Equipment (UE)
- ETSI EN 301 908-13
  IMT cellular networks - Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive - Part 13: Further developed universal terrestrial wireless access (E-UTRA) end devices (UE)
- ETSI EN 301 908-25
  IMT cellular networks - Harmonised Standard for access to radio spectrum - Part 25: New Radio (NR) User Equipment (UE) Release 15
- ETSI EN 303 413
  Satellite Earth Stations and Systems (SES) - Global Navigation Satellite System - Radios for operation in the frequency bands from 1164 MHz to 1300 MHz and from 1559 MHz to 1610 MHz

11.2.3 Other technical standards

- CISPR 11
  Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
- CISPR 32
  Electromagnetic compatibility of multimedia equipment - Emission requirements
- CISPR 35
  Electromagnetic compatibility of multimedia equipment - Immunity requirements
- NAMUR NE21
  Automation engineering of modular systems in the process industry - Modelling of module services

11.3 Supplier's declaration of conformity

The RCM declaration of conformity is available to all responsible authorities at:

Siemens Aktiengesellschaft
Digital Industries
Process Automation
DE-76187 Karlsruhe
Germany

You can find the current Supplier's declaration of conformity for these products on the Internet pages under Siemens Industry Online Support (https://support.industry.siemens.com/cs/ww/en/ps/28821/cert)

As required by the following Notices:

- Radiocommunications (Compliance Labelling - Devices) Notice 2014 made under section 182 of the Radiocommunications Act 1992;
- Radiocommunications Labelling (Electromagnetic Compatibility) Notice 2017 made under section 182 of the Radiocommunications Act 1992
- Radiocommunications (Compliance Labelling – Electromagnetic Radiation) Notice 2014 made under section 182 of the Radiocommunications Act 1992
- Telecommunications (Labelling Notice for Customer Equipment and Customer Cabling) Instrument 2015 made under section 407 of the Telecommunications Act 1997.

Including the standard

- ETSI EN 301 489-1
- ETSI EN 301 489-19
- ETSI EN 301 489-52
- ETSI EN 301 908-13
- ETSI EN 301 908-25
- ETSI EN 303 413

11.4 General 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.

Approvals for shipbuilding are not printed on the device type plate.

FM

The product meets the requirements of the standards:

- FM Class 3600, FM Class 3611, FM Class 3810
- ANSI/UL 121201, ANSI/UL 61010-1
- 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

You can find the temperature class on the nameplate of the product.

Permissible temperature range of the product:

Product		Permissible temperature range of the product
Article numbers	**Model**	
6GK5856-2EA00-3DA1 6GK5856-2EA00-3FA1	MS5G15R-65-M1-M12-E4-1	-30 °C ... +60 °C
6GK5856-2EA10-3AA1 (A1)	MS5G16R-65-M1-M12-E4-1	-30 °C TO +70 °C
6GK5856-2EA10-3BA1 (B1)	MS5G16R-65-M1-M12-E4-2	

cULus Approval for Information Technology Equipment

cULus Listed I. T. E.

Underwriters Laboratories Inc. complying with

- UL 62368-1
- CSA C22.2 No. 62368-1

Report no. E115352

cULus approval for industrial control equipment

cULus Listed PROG-CNTLR.

Underwriters Laboratories Inc. complying with

- UL 61010-1
- UL 61010-2-201
- CSA C22.2 NO 61010-1
- CSA C22.2 NO 61010-2-201

Report no. E85972

cULus Approval Hazardous Location

cULus Listed I. T. E. FOR HAZ. LOC.

Underwriters Laboratories Inc. complying with

- UL 121201 (Non Incendive electrical equipment) approved for use in Class I, Division 2, Groups A, B, C, D, T4.
- UL CSA C22.2 NO 213 (Non Incendive electrical equipment) approved for use in Class I, Zone 2, Group IIC, T4.

Railway approval

The product meets the requirements of the railroad standard:

- EN 45545
- EN 50155
- EN 50121-3-2
- EN 50121-4

Marking for the customs union

EAC (Eurasian Conformity)

Eurasian Economic Union of Russia, Belarus, Armenia, Kazakhstan and Kyrgyzstan

Declaration of conformity according to the technical regulations of the customs union (TR ZU)

11.5 Country-specific notes

11.5.1 Note for Australia and New Zealand

RCM (C-Tick)

Australian Communications and Media Authority, for compliance levels 1, 2 and 3 in Australia and levels of conformity 1, 2 and 3 in New Zealand. As required by notices under:

- Section 182 of the Australian Radiocommunications Act 1992
- Section 407 of the Australian Telecommunications Act 1997
- Section 134 of the New Zealand Radiocommunications Act 1989
- Radiocommunications (Compliance Labelling - Devices) Notice 2014 made under section 182 of the Radiocommunications Act 1992
- Radiocommunications Labelling (Electromagnetic Compatibility) Notice 2008 made under section 182 of the Radiocommunications Act 1992
- Radiocommunications (Compliance Labelling – Electromagnetic Radiation) Notice 2014 made under section 182 of the Radiocommunications Act 1992 and
- Telecommunications (Labelling Notice for Customer Equipment and Customer Cabling) Instrument 2015 made under section 407 of the Telecommunications Act 1997

You can find the current declaration of conformity for these products on the Internet pages under Siemens Industry Online Support (https://support.industry.siemens.com/cs/ww/en/ps/15914/cert)

The SIMATIC NET products described in this document meet the requirements of the standards designated under Product:

1a	EN 60950-1
1b	EN 60950-1 + A11 + A1 + a12
2	ETSI EN 301 489-1
3	ETSI EN 301 489-7
4	ETSI EN 301 489-24
5	ETSI EN 301 489-52
6	ETSI EN 301 511
7	ETSI EN 301 908-1
8	ETSI EN 301 908-13
9	1999/519/EC
10	EN 62311
11	FCC part 22
12	FCC part 24
13	FCC part 27
14	AS/CA S042.1
15	AS/ACIF S042.3

16 AS/CA S042.4
17 AS/NZS 60950.1 + Amdt

Products

Product name	Standards	
	Australia	New Zealand
SCALANCE MUM856-1	--	--

11.5.2 Note for Brazil

Brazil

Para maiores informações, consulte o site da ANATEL – www.anatel.gov.br

11.5.3 Notes for Mexico

Este equipo NO cuenta con la tecnología VoLTE incorporada.

Instrucciones para localizar el IMEI

Usted podrá visualizar el IMEI del equipo en su respectiva etiqueta exterior.

11.5.4 Notes for the United States (FCC approval)

FCC Part 15

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy.

If not installed and used in accordance with the instructions, this may cause harmful interference to wireless communications. There can be no guarantee, however, with certain installations, even when complying with the instructions, that no interference will be caused. If this equipment does cause harmful interference to radio or television reception that can be determined by turning the equipment off and on, the user is recommended to try to combat the interference with the following measures.

- Change the orientation of the receiving antenna or install it at a different location.
- Increase the distance between the SCALANCE M and the radio or television receiver.

- Connect the device to an outlet on a circuit different from that to which the receiver is connected.
- Consult a dealer / installer or an experienced radio / TV technician.

FCC Part 15.19

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

- This device must not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

FCC Part 15.21

Modifications to the device not expressly approved by the manufacturer could void the user's right to operate the equipment.

The SCALANCE M may only be used with an antenna from the range of accessories of the SCALANCE M.

The installation of the SCALANCE M and the antenna as well as servicing must be performed by qualified technical personnel only. When servicing the antenna, or working at distances closer than those listed below, make sure that the device has been turned off.

This device contains GSM, GPRS Class 12, EGPRS Class 10, and UMTS functions in the 900 and 1800 MHz band that must not be used in territories of the USA.

This device can be used for mobile and fixed applications. The internal/external antennas used with this device must be at least 26 cm away from people and must be positioned or operated in such a way that they work in conjunction with another antenna or transmitter.

Users and installers must be provided with antenna installation instructions and transmitter operating conditions that must be followed to avoid exceeding the permitted RF exposure.

Antennas for the transmitter module used must not exceed the following antenna gains in operating configurations for mobile and fixed applications, see Maximum antenna gain.

This device is approved as a module for installation in other devices.

Conformity with FCC

The FCC approval applies to the following SCALANCE device:

Product	FCC ID
SCALANCE MUM856-1	RI7FN990A28

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