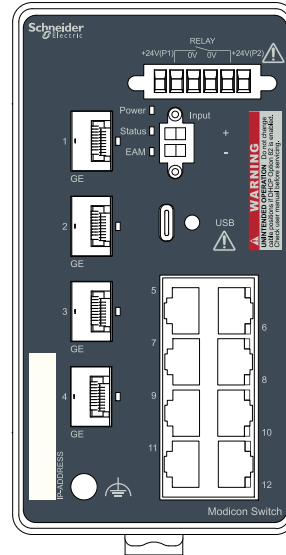
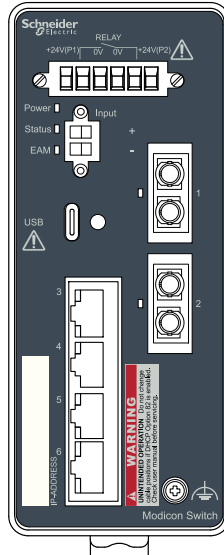
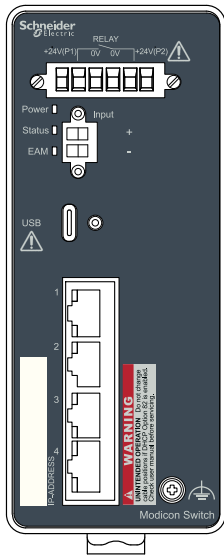
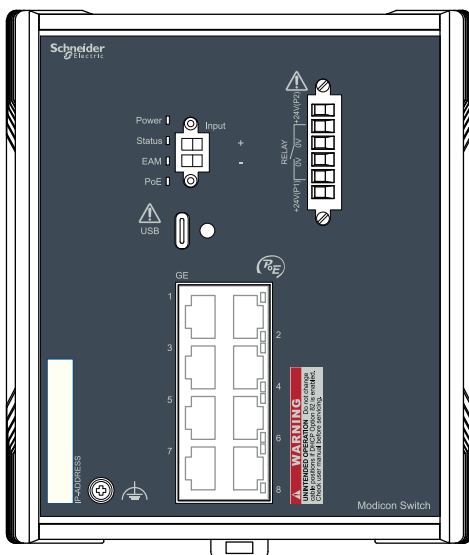


Modicon

MCSESM, MCSESM-E Managed Switch Installation Manual



MCSESM043F23F0 MCSESM063F2CU0/S0 MCSESM123F2LG0



MCSESP083F23G0/T

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer must perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

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About this Manual

Validity Note

The technical characteristics of the devices described in this document also appear online. To access this information online:

Step	Action
1	Go to the Schneider Electric home page www.schneider-electric.com .
2	In the Search box type the reference of a product or the name of a product range. <input type="checkbox"/> Do not include blank spaces in the reference or product range. <input type="checkbox"/> To get information on grouping similar modules, use asterisks (*).
3	If you entered a reference, go to the Product Datasheets search results and click on the reference that interests you. If you entered the name of a product range, go to the Product Ranges search results and click on the product range that interests you.
4	If more than one reference appears in the Products search results, click on the reference that interests you.
5	Depending on the size of your screen, you may need to scroll down to see the data sheet.
6	To save or print a data sheet as a .pdf file, click Download XXX product datasheet.

The characteristics that are presented in this manual should be the same as those characteristics that appear online. In line with our policy of constant improvement, we may revise content over time to improve clarity and accuracy. If you see a difference between the manual and online information, use the online information as your reference.

Related Documents

Title	Reference Number
Modicon MCSESM, MCSESM-E: Managed Switch Installation Manual	QGH59091
Modicon MCSESM, MCSESM-E: Managed Switch Configuration User Manual	QGH59056
Modicon MCSESM, MCSESM-E: Managed Switch GUI Reference Manual	QGH59084
Modicon MCSESM, MCSESM-E: Managed Switch Command Line Interface Reference Manual (English)	QGH59098

You can download these technical publications and other technical information from our website at

<http://www.schneider-electric.com/ww/en/download>.

Note: The Glossary is located in the Reference Manual “Command Line Interface”.

The “Installation” user manual contains a device description, safety instructions, a description of the display, and the other information that you need to install the device.

The “Configuration” user manual contains the information you need to start operating the device. It takes you step by step from the first startup operation through to the basic settings for operation in your environment.

The “Graphical User Interface” reference manual contains detailed information on using the graphical user interface to operate the individual functions of the device.

The “Command Line Interface” reference manual contains detailed information on using the Command Line Interface to operate the individual functions of the device.

Key

The symbols used in this manual have the following meanings:

▶	Listing
□	Work step
■	Subheading

Safety instructions

■ Important Information

Notice: Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a "Danger" or "Warning" safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.



WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.



CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

PLEASE NOTE: Electrical equipment must be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material. A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

■ **Before you begin**

Do not use this product on machinery lacking effective point-of-operation guarding. Lack of effective point-of-operation guarding on a machine can result in serious injury to the operator of that machine.



WARNING

UNGUARDED EQUIPMENT

- Do not use this software and related automation equipment on equipment which does not have point-of-operation protection.
- Do not reach into machinery during operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

This automation equipment and related software is used to control a variety of industrial processes. The type or model of automation equipment suitable for each application will vary depending on factors such as the control function required, degree of protection required, production methods, unusual conditions, government regulations, etc. In some applications, more than one processor may be required, as when backup redundancy is needed.

Only you, the user, machine builder or system integrator can be aware of all the conditions and factors present during setup, operation, and maintenance of the machine and, therefore, can determine the automation equipment and the related safeties and interlocks which can be properly used. When selecting automation and control equipment and related software for a particular application, you should refer to the applicable local and national standards and regulations. The National Safety Council's Accident Prevention Manual (nationally recognized in the United States of America) also provides much useful information.

In some applications, such as packaging machinery, additional operator protection such as point-of-operation guarding must be provided. This is necessary if the operator's hands and other parts of the body are free to enter the pinch points or other hazardous areas and serious injury can occur. Software products alone cannot protect an operator from injury. For this reason the software cannot be substituted for or take the place of point-of-operation protection.

Ensure that appropriate safeties and mechanical/electrical interlocks related to point-of-operation protection have been installed and are operational before placing the equipment into service. All interlocks and safeties related to point-of-operation protection must be coordinated with the related automation equipment and software programming.

Note: Coordination of safeties and mechanical/electrical interlocks for point-of-operation protection is outside the scope of the Function Block Library, System User Guide, or other implementation referenced in this documentation.

■ **Start-up and test**

Before using electrical control and automation equipment for regular operation after installation, the system should be given a start-up test by qualified personnel to verify correct operation of the equipment. It is important that arrangements for such a check be made and that enough time is allowed to perform complete and satisfactory testing.



CAUTION

EQUIPMENT OPERATION HAZARD

- Verify that all installation and set up procedures have been completed.
- Before operational tests are performed, remove all blocks or other temporary holding means used for shipment from all component devices.
- Remove tools, meters, and debris from equipment.

Failure to follow these instructions can result in injury or equipment damage.

Follow all start-up tests recommended in the equipment documentation. Store all equipment documentation for future references.

Software testing must be done in both simulated and real environments.

Verify that the completed system is free from all short circuits and temporary grounds that are not installed according to local regulations (according to the National Electrical Code in the U.S.A, for instance). If high-potential voltage testing is necessary, follow recommendations in equipment documentation to help prevent accidental equipment damage.

Before energizing equipment:

- Remove tools, meters, and debris from equipment.
- Close the equipment enclosure door.
- Remove all temporary grounds from incoming power lines.
- Perform all start-up tests recommended by the manufacturer.

■ **Operation and adjustments**

The following precautions are from the NEMA Standards Publication ICS 7.1-1995 (English version prevails):

- ▶ Regardless of the care exercised in the design and manufacture of equipment or in the selection and ratings of components, there are hazards that can be encountered if such equipment is improperly operated.
- ▶ It is sometimes possible to misadjust the equipment and thus produce unsatisfactory or unsafe operation. Always use the manufacturer's instructions as a guide for functional adjustments. Personnel who have access to these adjustments should be familiar with the equipment manufacturer's instructions and the machinery used with the electrical equipment.
- ▶ Only those operational adjustments actually required by the operator should be accessible to the operator. Access to other controls should be restricted to help prevent unauthorized changes in operating characteristics.

■ **General safety instructions**

You operate this device with electricity. Improper usage of the device entails the risk of physical injury or significant property damage. The proper and safe operation of this device depends on proper handling during transportation, proper storage and installation, and careful operation and maintenance procedures.

- Before connecting any cable, read this document, and the safety instructions and warnings.
- Operate the device with undamaged components exclusively.
- The device is free of any service components. In case of a damaged or malfunctioning device, turn off the supply voltage and return the device to Schneider Electric for inspection.

■ **Qualification requirements for personnel**

- Only allow qualified personnel to work on the device.

Qualified personnel have the following characteristics:

- ▶ Qualified personnel are properly trained. Training as well as practical knowledge and experience make up their qualifications. This is the prerequisite for grounding and labeling circuits, devices, and systems in accordance with current standards in safety technology.
- ▶ Qualified personnel are aware of the dangers that exist in their work.
- ▶ Qualified personnel are familiar with appropriate measures against these hazards in order to reduce the risk for themselves and others.
- ▶ Qualified personnel receive training on a regular basis.

■ **Installation site requirements**

- Install this device only in a switch cabinet or in an operating site with restricted access, to which maintenance staff have exclusive access.
- When you are selecting the installation location, make sure you observe the climatic threshold values specified in the technical data.
- Use the device in an environment with a maximum pollution degree that complies with the specifications in the technical data.

[See “Technical data” on page 46.](#)

■ **Certified usage**

- Use the product only for the application cases described in the Schneider Electric product information, including this manual.
- Operate the product only according to the technical specifications.
[See “Technical data” on page 46.](#)
- Connect to the product only components suitable for the requirements of the specific application case.

■ **Requirements for connecting electrical wires**

Before connecting the electrical wires, **always** verify that the requirements listed are complied with.

The following requirements apply without restrictions:

- ▶ The electrical wires are voltage-free.
- ▶ The cables used are permitted for the temperature range of the application case.



Only use power supply cables that are suitable for a temperature 20 K higher than the maximum ambient air temperature at which the device is used.
Only use copper wire.

■ **Requirements for connecting the signal contact**

Before connecting the signal contact, **always** verify that the requirements listed are complied with.

The following requirements apply without restrictions:

- ▶ The connected power supply complies with the requirements for a safety extra-low voltage (SELV).
- ▶ The connected voltage is limited by a current limitation device or a fuse. Observe the electrical threshold values for the signal contact.
[See "Technical data" on page 46.](#)

■ Requirements for connecting the supply voltage

Before connecting the supply voltage, **always** verify that the requirements listed are complied with.

Prerequisites:

All of the following requirements are complied with:

- ▶ The supply voltage corresponds to the voltage specified on the type plate of the device.
 - ▶ The power supply complies with the requirements for a safety extra-low voltage (SELV).
 - ▶ The power supply has an easily accessible disconnecting device (for example a switch or a plug). This disconnecting device is clearly identified. So in the case of an emergency, it is clear which disconnecting device belongs to which power supply cable.
 - ▶ The wire diameter of the power supply cable is at least 0.75 mm² (North America: AWG18) on the supply voltage input.
The wire diameter of the power supply cable is at least 1 mm² (North America: AWG16) on the supply voltage input for PoE device variants.
 - ▶ The cross-section of the ground conductor is the same size as or bigger than the cross-section of the power supply cables.
-
- ▶ There are fuses suitable for DC voltage in the positive conductors of the supply lines, or the voltage sources are appropriately current-limited. Regarding the properties of this fuse:
[See "Technical data" on page 46.](#)
 - ▶ The negative conductors of the voltage inputs are on ground potential.

Note: The devices can be supplied either via one voltage input or redundantly via both voltage inputs.

■ Supply voltage

The supply voltage is connected to the device casing through protective elements exclusively.

■ Shielding ground

The shielding ground of the connectable twisted pair cables is connected to the ground connection as a conductor.

- Beware of possible short circuits when connecting a cable section with conductive shielding braiding.

■ Device casing

Only technicians authorized by the manufacturer are permitted to open the casing.

■ **Grounding the device**

The device is grounded via the separate ground screw.

- Ground the device before connecting any other cables.
- Disconnect the grounding only after disconnecting all other cables.

■ **National and international safety regulations**

Verify that the electrical installation meets local or nationally applicable safety regulations.

■ **Relevant for use in explosion hazard areas (Hazardous Locations, Class I, Division 2)**

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

This device is an open-type device that is to be installed in an enclosure suitable for the environment and accessible exclusively with the use of a tool.

Exclusively use the device for the application cases specified by the manufacturer. Failure to follow these instructions can impair device protection.



WARNING

EXPLOSION HAZARD

Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

Avertissement - Risque d'explosion - Ne pas débrancher tant que le circuit est sous tension à moins que l'emplacement soit connu pour ne contenir aucune concentration de gaz inflammable.



WARNING

EXPLOSION HAZARD

Substitution of any components may impair suitability for CLASS I, DIVISION 2.

Avertissement - Risque d'explosion - La substitution de tout composant peut rendre ce matériel incompatible pour une utilisation en classe I, division 2.

The storage medium (EAM) is mechanically secured to prevent the connection from being disconnected.

Le dispositif de sauvegarde (EAM) est fixé mécaniquement pour éviter toute déconnexion de la connexion.

A USB cable for configuring the device may only be used in a non-explosive area.

Un câble USB pour la configuration de l'équipement ne doit être utilisé que dans une zone non explosive.



WARNING

EXPLOSION HAZARD

Connection or disconnection in an explosive atmosphere could result in an explosion.

Avertissement - Le branchement ou le débranchement dans une atmosphère explosive peut entraîner une explosion.



Ordinary Location,
Non-Hazardous Area,
Non-Explosive Atmosphere



Explosive Atmosphere
Class I, Division 2, Groups A, B,
C, D, T4 (**)
Hazardous Location

MCSESM, MCSESM-E
Managed Switch

Relay contacts:

Equipment with nonincendive field wiring parameters.
Polarity is not relevant.

The relay terminals are dependent upon the following entity parameters^(*):

V max	I max	C _i	L _i
30 V	90 mA	2 nF	1 μH

The Memory Backup Adapter (EAM) storage medium is mechanically secured to help prevent disconnection.

A USB cable for configuration the device may exclusively be used in non-hazardous locations.

WARNING!

Connection or disconnection in an explosive atmosphere could result in an explosion.

(*) Associated apparatus:

The nonincendive field wiring circuit concept allows interconnection of nonincendive field wiring apparatus and associated nonincendive field wiring apparatus using any of the wiring methods permitted for unclassified locations when certain parametric conditions are met.

Capacity: $C_a \geq C_i + C_{Cable}$; **Inductivity:** $L_a \geq L_i + L_{Cable}$

() Temperature Code: T4**

Ambient Temperature rating:

Ta: 0 °C to +60 °C (Standard temperature range)

Ta: -40 °C to +70 °C (Extended temperature range)

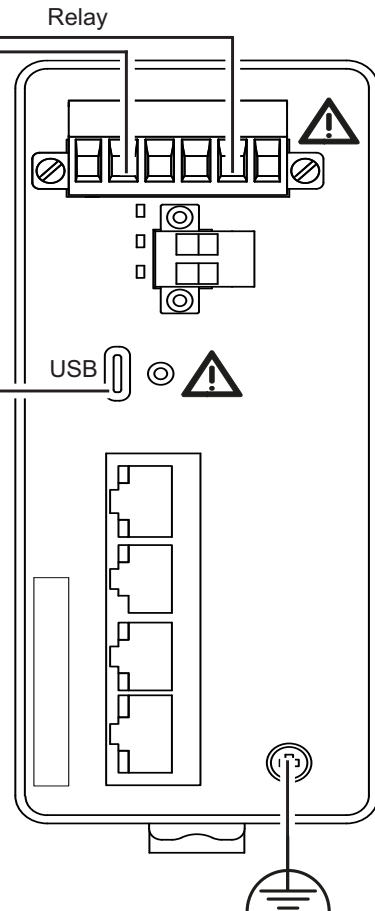
(Refer to the type designation on the device.)

The maximum cable length has to be determined as follows:

(a) max. cable length $< (L_a - L_i) / Cable_L$
 ("Cable_L" denotes the inductance per unit length of used cable)
 and

(b) max. cable length $< (C_a - C_i) / Cable_C$
 ("Cable_C" denotes the capacitance per unit length of used cable)

The lower value of (a) and (b) is to apply.



The earth conductor must be at least the same wire size (mm² or AWG) as the supply conductors of the supply voltage.

Control Drawing for MCSESM and MCSESM-E devices according to Class I, Division 2 Hazardous Locations

Rev.: 3

Document No.: 000217023DNR

Page 1/2

For use in Hazardous Locations Class I, Division 2, Groups A, B, C, D:

Exclusively allowed for MCSESM and MCSESM-E model No's which are individually labeled **"FOR USE IN HAZARDOUS LOCATIONS"**.

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

Nonincendive field wiring circuits must be wired in accordance with the National Electrical Code (NEC), NFPA 70, article 501.

 **WARNING**

EXPLOSION HAZARD

Substitution of any components may impair for hazardous locations or explosive atmospheres.

 **WARNING**

EXPLOSION HAZARD

Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

THIS IS AN OPEN-TYPE DEVICE THAT IS TO BE INSTALLED IN AN ENCLOSURE SUITABLE FOR THE ENVIRONMENT AND ACCESSIBLE EXCLUSIVELY WITH THE USE OF A TOOL.

Control Drawing for MCSESM and MCSESM-E devices according to Class I, Division 2 Hazardous Locations

Rev.: 3

Document No.: 000217023DNR

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■ **LED or laser components**

LED or LASER components according to IEC 60825-1 (2014):
CLASS 1 LASER PRODUCT
CLASS 1 LED PRODUCT

■ **FCC note**

Supplier`s Declaration of Conformity 47 CFR § 2.1077 Compliance Information

MCSESM, MCSESM-E

U.S. Contact Information

Schneider Electric United States
North American Division
Andover Research and Development Center (ARDC)
800 Federal Street
MA 01810, Andover, USA
www.se.com/contact

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference; (2) this device must accept any interference received, including interference that may cause undesired operation. Appropriate testing has established that this device fulfills the requirements of a class A digital device in line with part 15 of the FCC regulations.

These requirements are designed to provide sufficient protection against interference when the device is being used in a business environment. The device creates and uses high frequencies and can also radiate these frequencies. If it is not installed and used in accordance with this operating manual, it can cause radio transmission interference. The use of this device in a residential area can also cause interference, and in this case the user is obliged to cover the costs of removing the interference.

■ **Recycling note**

After usage, this device must be disposed of properly as electronic waste, in accordance with the current disposal regulations of your county, state, and country.

1 Description

1.1 General device description

The device is designed for the special requirements of industrial automation. The device meets the relevant industry standards, provides very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility.

The device allows you to set up switched Industrial Ethernet networks according to standard IEEE 802.3.

You can choose from between a wide range of variants. You have the option to set up your device individually based on different criteria:

- ▶ Number of ports
- ▶ Transmission speed
- ▶ Temperature range
- ▶ Supply voltage range
- ▶ Certifications
- ▶ Software level

Mounting the device

- ▶ Mounting on the DIN rail

You have the option of choosing various media to connect to the end devices and other network components:

- ▶ Twisted pair cable
- ▶ Multimode F/O
- ▶ Singlemode F/O

There are convenient options for managing the device. Manage your devices via:

- ▶ Web browser
- ▶ SSH
- ▶ Telnet
- ▶ USB-C interface (locally on the device)

1.1.1 Device models

Number of ports	Product name	Description	Conformal Coating (158 °F (70 °C))	Metal casing	Additional approval / Software level
04	MCSESM043F23F0	4 × 10/100 TX			
05	MCSESM053F1CU0	4 × 10/100 TX + 1 × 100 FX-MM			
	MCSESM053F1CS0	4 × 10/100 TX + 1 × 100 FX-SM			
06	MCSESM063F2CU0	4 × 10/100 TX + 2 × 100 FX-MM			
	MCSESM063F2CS0	4 × 10/100 TX + 2 × 100 FX-SM			
08	MCSESM083F23F0	8 × 10/100 TX			
	MCSESM083F23F1	8 × 10/100 TX			x
	MCSESM083F23F0H	8 × 10/100 TX	x		
	MCSESM083F23F1H	8 × 10/100 TX	x		x
08 with PoE	MCSESP083F23G0	8 × 10/100/1000 TX with PoE support		x	
	MCSESP083F23G0T	8 × 10/100/1000 TX with PoE support	x	x	
09	MCSESM093F1CU0	8 × 10/100 TX + 1 × 100 FX-MM			
	MCSESM093F1CS0	8 × 10/100 TX + 1 × 100 FX-SM			
10	MCSESM103F2CU0	8 × 10/100 TX + 2 × 100 FX-MM			
	MCSESM103F2CU1	8 × 10/100 TX + 2 × 10/100 FX-MM			x
	MCSESM103F2CU0H	8 × 10/100 TX + 2 × 100 FX-MM	x		
	MCSESM103F2CU1H	8 × 10/100 TX + 2 × 10/100 FX-MM	x		x
	MCSESM103F2CS0	8 × 10/100 TX + 2 × 100 FX-SM			
	MCSESM103F2CS1	8 × 10/100 TX + 2 × 10/100 FX-SM			x
	MCSESM103F2CS0H	8 × 10/100 TX + 2 × 100 FX-SM	x		
	MCSESM103F2CS1H	8 × 10/100 TX + 2 × 10/100 FX-SM	x		x
12	MCSESM123F2LG0 ^a	8 × 10/100 TX +4 × 100/1000 SFP (LWL)			

Table 1: Overview of the MCSESM and MCSESM-E device variants

- a. This product ships with open SFP slots on the fiber ports. In order to use these ports, order SFP transceiver in any combination. (see on page 21 “SFP transceiver”)

1.1.2 SFP transceiver

Product name	Description	Certification type ^a	Temperature range
MCSEAAF1LFU00	Modicon fiber module SFP SX/LC MM (Fast Ethernet)	Entry level	+32 °F ... +140 °F (0 °C ... +60 °C)
MCSEAAF1LFS00	Modicon fiber module SFP LX/LC SM (Fast Ethernet)	Entry level	+32 °F ... +140 °F (0 °C ... +60 °C)
MCSEAAF1LFT00	Modicon Fast module SFP TX/RJ45 (Fast Ethernet)	Standard level	+32 °F ... +140 °F (0 °C ... +60 °C)
MCSEAAF1LFG00	Modicon Gigabit module SFP TX/RJ45 (Gigabit Ethernet)	Standard level	+32 °F ... +140 °F (0 °C ... +60 °C)
TCSEAAF1LFU00	Fiber module SFP-SX/LC (Gigabit Ethernet)	Standard level	+32 °F ... +140 °F (0 °C ... +60 °C)
TCSEAAF1LFS00	Fiber module (Gigabit Ethernet)	Standard level	+32 °F ... +140 °F (0 °C ... +60 °C)
TCSEAAF1LFH00	Fiber module SFP-LH/LC (Gigabit Ethernet)	Standard level	+32 °F ... +140 °F (0 °C ... +60 °C)

Table 2: Overview of the SFP transceiver

- a. Use Entry level SFP transceivers for standard industrial applications that exclusively require the following approvals: CE, FCC or UL61010-2-201. Use Standard level SFP transceivers for applications that also require the following special approvals: DNVGL, Lloyd's Register, Bureau Veritas or UL121201 (Hazardous Locations).

1.1.3 Memory Backup Adapter

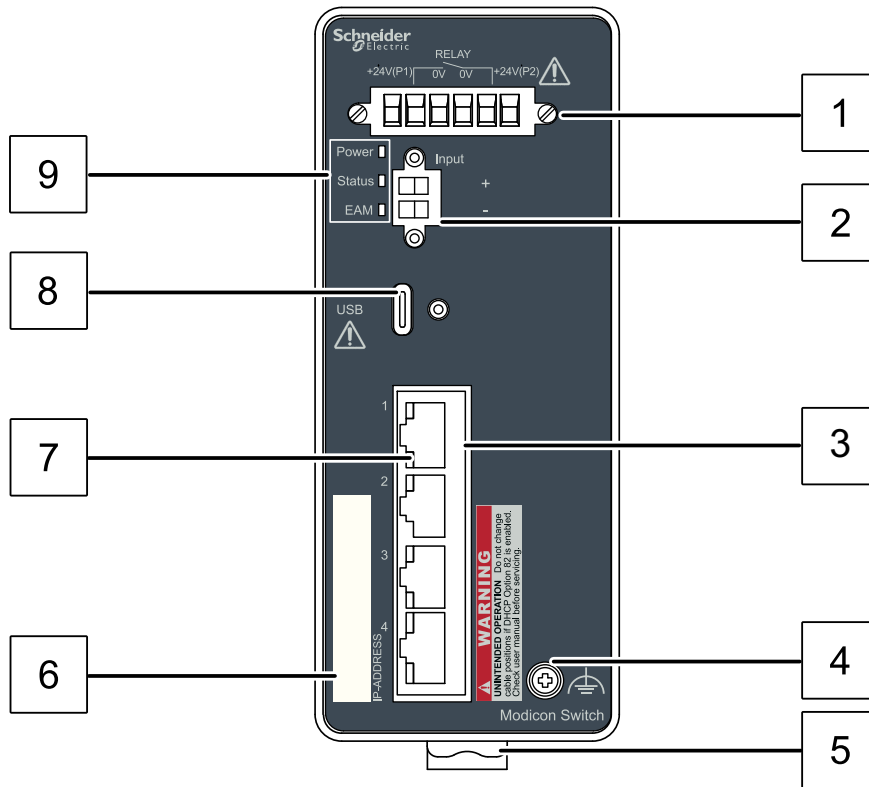
Product name	Description
MCSEAM0100	Modicon Memory Backup Adapter

Table 3: Memory Backup Adapter

1.2 Device views

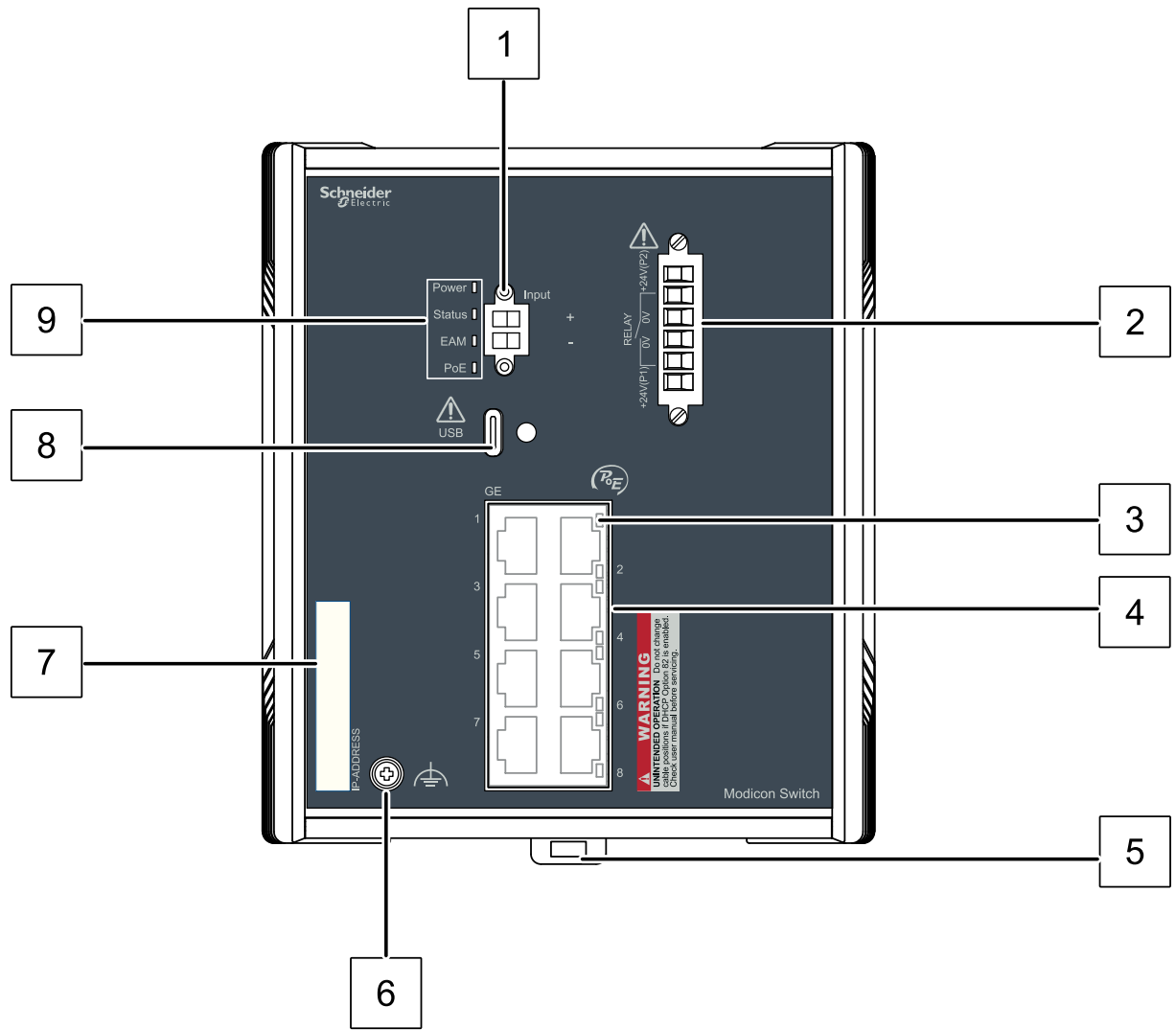
1.2.1 Front view

■ Example of a low port device variant without PoE



1	6-pin terminal block with screw lock for redundant power supply and signal contact
2	2-pin terminal block with screw lock for the digital input
3	RJ45 socket for 10/100 Mbit/s Twisted pair connections
4	Grounding screw
5	Rail lock slide for DIN rail mounting
6	Label area for IP address
7	LED display elements for port status
8	USB-C interface
9	LED display elements for device status

■ Example of a low port device variant with PoE



1	2-pin terminal block with screw lock for the digital input
2	6-pin terminal block with screw lock for redundant power supply and signal contact
3	LED display elements for port status
4	depending on device variant <ul style="list-style-type: none"> ▶ RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections ▶ RJ45 socket with PoE support
5	Rail lock slide for DIN rail mounting
6	Grounding screw
7	Label area for IP address
8	USB-C interface
9	LED display elements for device status

1.3 Ethernet ports

You can connect end devices and other segments to the device ports using twisted pair cables or optical fibers (F/O).

1.3.1 10/100 Mbit/s twisted pair port

The 10/100 Mbit/s twisted pair port allows you to connect network components according to the IEEE 802.3 10BASE-T/100BASE-TX standard.

This port supports:

- ▶ Autonegotiation
- ▶ Autopolarity
- ▶ Autocrossing
- ▶ 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode
- ▶ 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode

Delivery state: Autonegotiation activated

The port casing is electrically connected to the front panel.

The pin assignment corresponds to MDI-X.

1.3.2 10/100/1000 Mbit/s twisted pair port

This port is an RJ45 socket.

The 10/100/1000 Mbit/s twisted pair port allows you to connect network components according to the IEEE 802.3 10BASE-T/100BASE-TX/1000BASE-T standard.

This port supports:

- ▶ Autonegotiation
- ▶ Autopolarity
- ▶ Autocrossing
- ▶ 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode
- ▶ 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
- ▶ 1000 Mbit/s full duplex

Delivery state: Autonegotiation activated

The port casing is electrically connected to the front panel.

The pin assignment corresponds to MDI-X.

■ Pin assignment

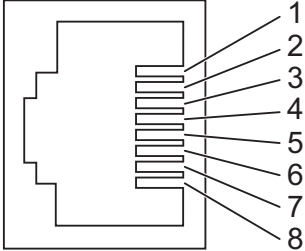
RJ45	Pin	10/100 Mbit/s	1000
	MDI mode		
	1	TX+	BI_DA+
	2	TX-	BI_DA-
	3	RX+	BI_DB+
	4	—	BI_DC+
	5	—	BI_DC-
	6	RX-	BI_DB-
	7	—	BI_DD+
	8	—	BI_DD-
	MDI-X mode		
	1	RX+	BI_DB+
	2	RX-	BI_DB-
	3	TX+	BI_DA+
	4	—	BI_DD+
	5	—	BI_DD-
	6	TX-	BI_DA-
7	—	BI_DC+	
8	—	BI_DC-	

Table 4: Pin assignment 10/100/1000 Mbit/s twisted pair port, RJ45 socket, MDI-X mode

1.3.3 100 Mbit/s F/O port

This port is a DSC socket, or an SFP slot.

The 100 Mbit/s F/O port allows you to connect network components according to the IEEE 802.3 100BASE-FX standard.

This port supports:

- ▶ 100 Mbit/s, full duplex

Delivery state:

- ▶ 100 Mbit/s full duplex when using a Fast Ethernet SFP transceiver

Example:

Sending direction
Receiving direction

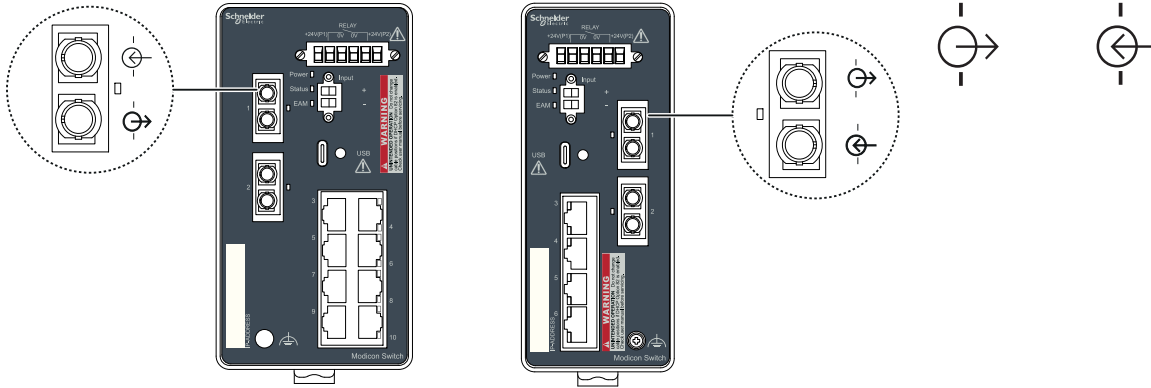


Table 5: Sending and receiving directions for device variants with DSC ports

1.3.4 100/1000 Mbit/s F/O port

This port is an SFP slot.

The 100/1000 Mbit/s F/O port allows you to connect network components according to standard IEEE 802.3 100BASE-FX/1000BASE-SX/1000BASE-LX.

This port supports:

- ▶ 100 Mbit/s, full duplex
- ▶ 1000 Mbit/s full duplex

Delivery state:

- ▶ 100 Mbit/s full duplex when using a Fast Ethernet SFP transceiver
- ▶ 1000 Mbit/s full duplex when using a Gigabit Ethernet SFP transceiver

1.3.5 Support of PoE(+)

The device variants MCSESP083F23G0 and MCSESP083F23G0T support Power over Ethernet (PoE) and Power over Ethernet Plus (PoE+).

PoE-capable Ethernet ports are designed as 8 × RJ45 sockets.

[See “Front view” on page 22.](#)

The port allows you to connect network components via a PoE voltage source according to the standard IEEE 802.3af/at.

With the presence of the PoE power supply, a separate power supply for the connected device is unnecessary.

The PoE power is supplied via the wire pairs transmitting the signal (phantom voltage).

The individual ports are not electrically insulated from each other (common PoE voltage).

For the total maximum power available to PoE end devices see [“Technical data” on page 46](#)

Note: Connect only PoE-supplier devices whose data connections are located in the interior of the building and are specified as SELV circuits.

1.4 Display elements

1.4.1 Device state

These LEDs provide information about conditions which affect the operation of the whole device.

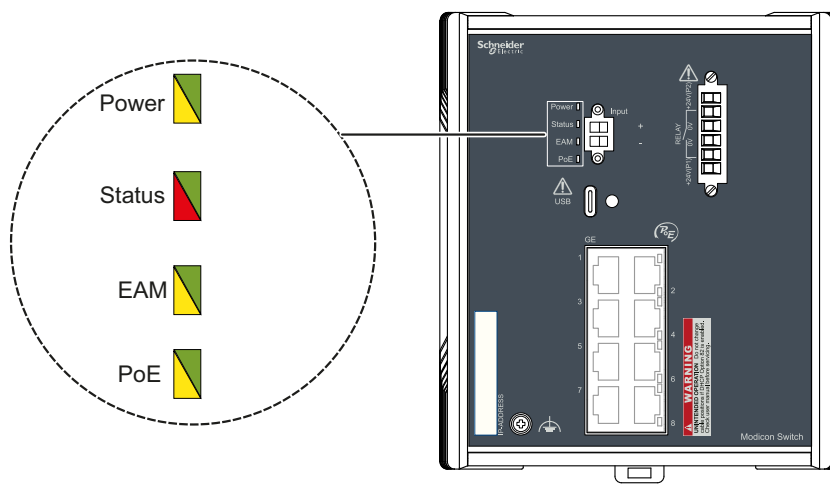


Figure 1: LED display elements for device status

LED	Display	Color	Activity	Meaning
Power	Supply voltage	—	none	Supply voltages 1 and 2 are too low.
		yellow	lights up flashes 4 times a period	Supply voltage 1 or 2 is on Software update is running. Maintain the power supply.
		green	lights up	Supply voltage 1 and 2 is on
Status	Device Status	—	none	Device starts Device is not ready for operation
		green	lights up	Device is ready for operation Characteristics can be configured
		red	lights up flashes 1 time a period	Device is not ready for operation The boot parameters used when the device has been started differ from the boot parameters saved. Start the device again.
		flashes 4 times a period	Device has detected a multiple IP address	
red/ green	flashing alternately	Device is in the recovery mode.		

Table 6: Meaning of the device display elements

LED	Display	Color	Activity	Meaning
EAM	Storage medium (EAM)	—	none	No EAM connected
		green	lights up	EAM is plugged
			flashes 3 times a period	Device writes to/reads from the storage medium
PoE		—	none	Supply voltage is too low
		yellow	lights up	Supply voltage is too low for PoE support.
		green	lights up	PoE voltage is on

Table 6: Meaning of the device display elements

1.4.2 Port status

These LEDs display port-related information.

Note:

- ▶ For device variants with 4 × RJ45 sockets: The LEDs are directly located at the ports. See figure 2 on page 28.
- ▶ For device variants with 8 × RJ45 sockets: The LEDs are located on the right side of the device. See figure 3 on page 29. See figure 4 on page 29.
- ▶ For device variants with ports that are DSC sockets and SFP slots: The LEDs are directly located at the ports. See figure 3 on page 29. See figure 4 on page 29.

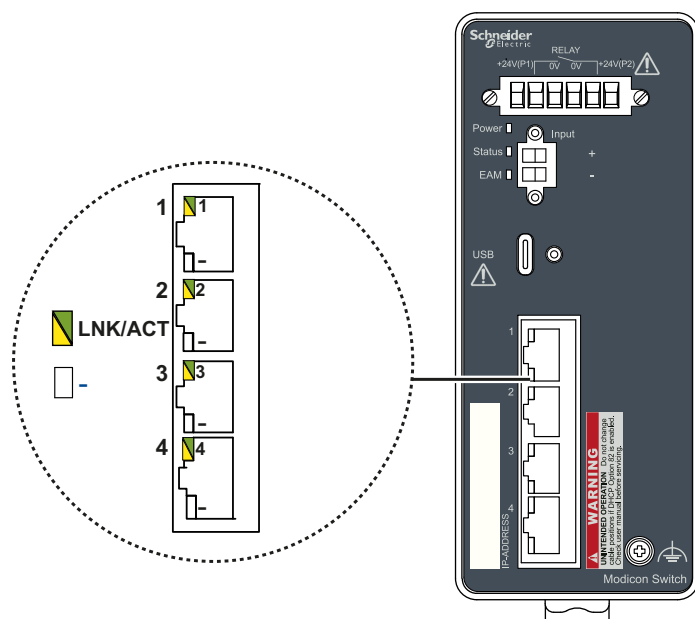


Figure 2: LED display elements for device variants with 4 × RJ45 sockets

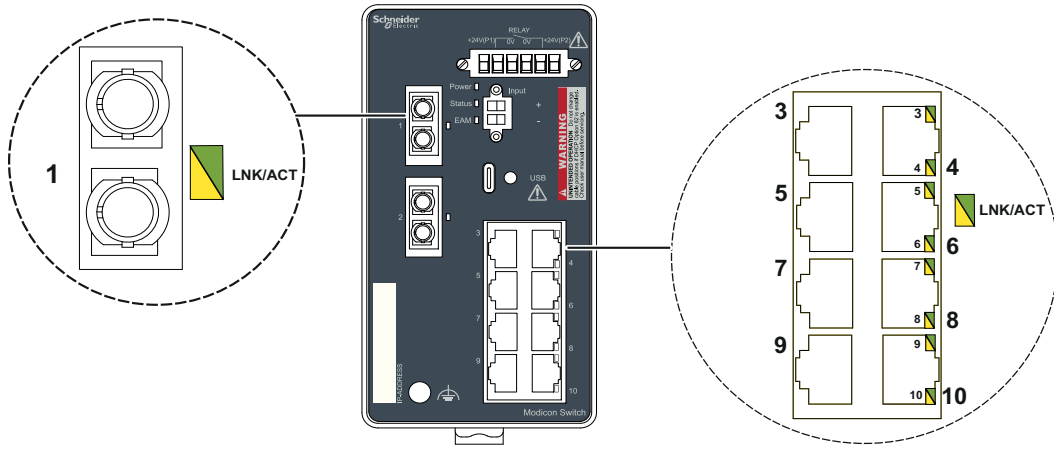


Figure 3: LED display elements for device variants with DSC and 8 × RJ45 sockets

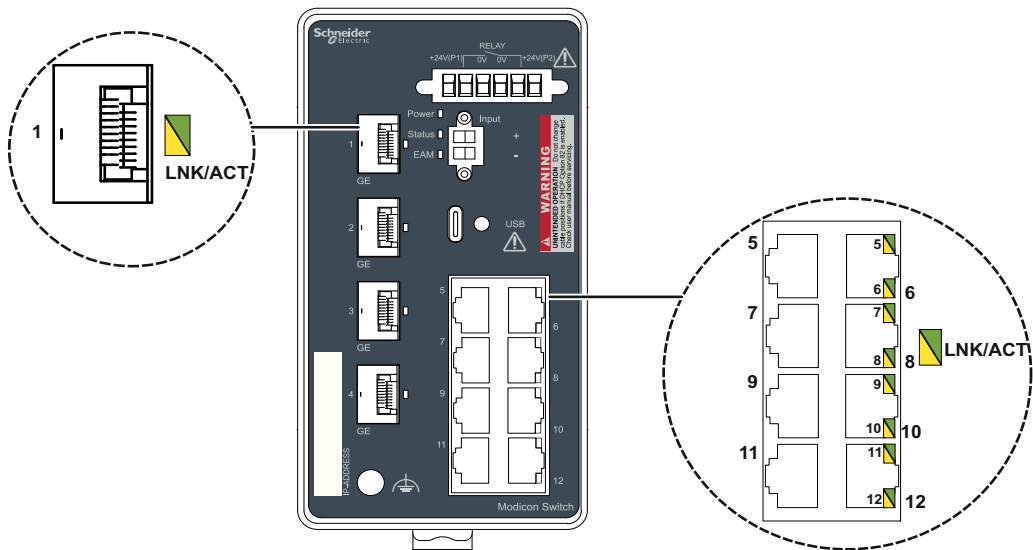


Figure 4: LED display elements for device variants with SFP slots and 8 × RJ45 sockets

Display	Color	Activity	Meaning
Link status	—	none	Device detects an invalid or missing link
Data traffic	green	lights up	Device detects a valid link
		flashes 1 time a period	Port is switched to stand-by
		flashes 3 times a period	Port is switched off
	yellow	flashing	Device is transmitting and/or receiving data

Table 7: Meaning of the port display elements

1.5 Management interfaces

1.5.1 Signal contact

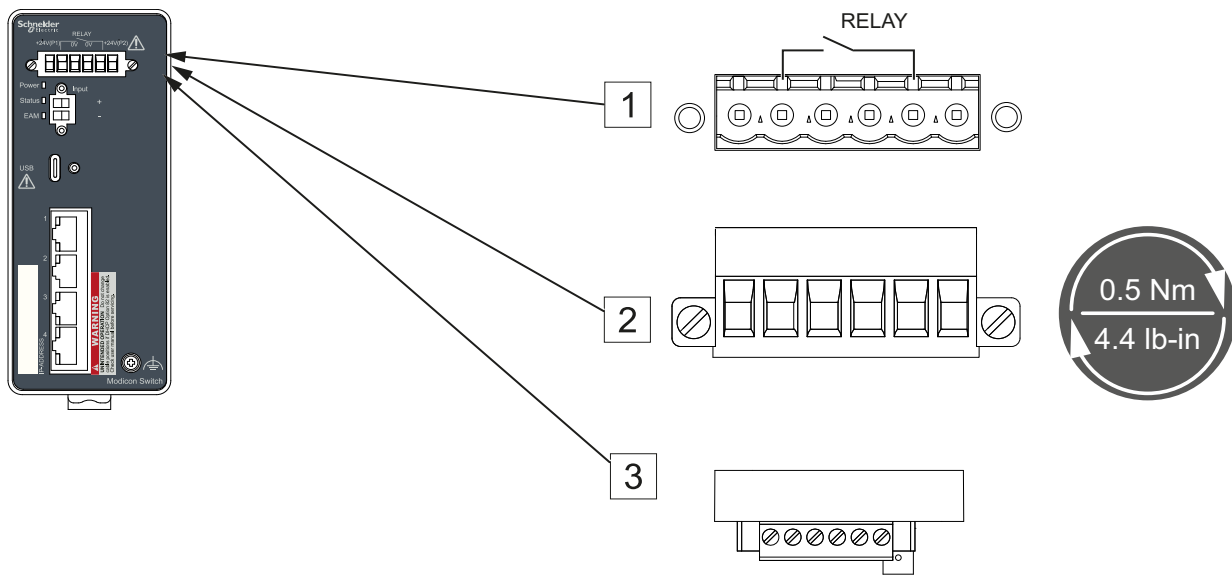


Figure 5: (1) Connection on the device, (2) terminal block mounted on the device (front view), tightening torque, (3) terminal block mounted on the device (view from above).

The signal contact is a potential-free relay contact. The signal contact is open when the device is not connected to a power supply.

The signal contact allows you to control external devices or monitor device functions.

In the configuration, you specify how the device uses the signal contact. You will find detailed information on possible applications and the configuration of the signal contact in the software user documentation.

1.5.2 USB-C interface

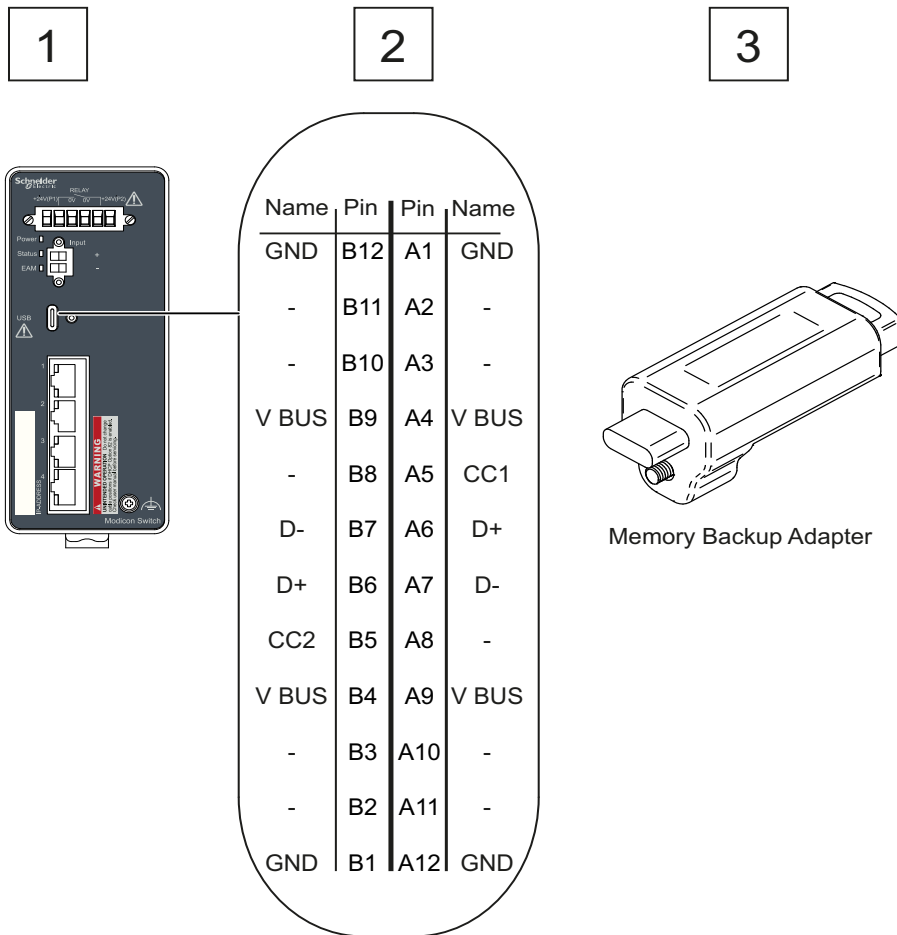


Figure 6: (1) Position of the USB-C interface on the device, (2) pin assignment of the USB-C interface, (3) view of the Memory Backup Adapter (EAM).

The USB-C interface allows you to connect the Memory Backup Adapter (EAM) storage medium. It is used for saving/loading the configuration data and diagnostic information, and for loading the software.

You have the option to configure your device using the USB-C interface. You will find detailed information in the software user documentation.

The USB-C interface has the following properties:

- ▶ Supports the USB master mode and slave
- ▶ Supports USB 2.0 (data rate max. 480 MBit/s)
- ▶ Connector: type C
- ▶ Supplies current of max. 500 mA
- ▶ Voltage not potential-separated
- ▶ Supported file system: FAT32

Note: A USB cable is used exclusively for the configuration of your device.

Note: The Memory Backup Adapter can remain permanently connected to the device.

1.5.3 Digital input

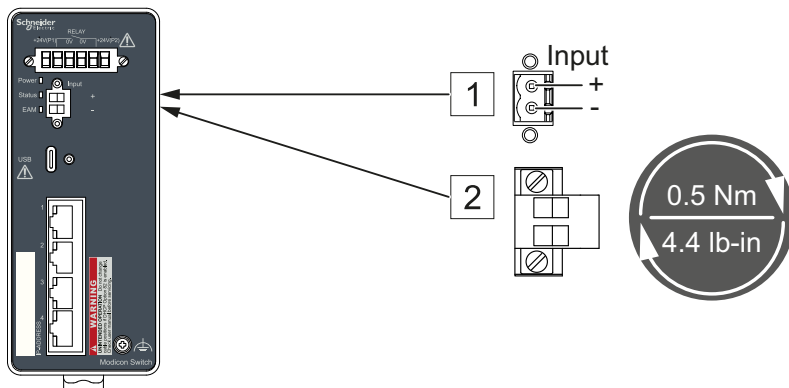


Figure 7: (1) Connection on the device, (2) terminal block mounted on the device (front view), tightening torque.

The digital input allows you to capture and forward signals from digital sensors. In the configuration, you specify how the device uses the digital input.

You will find detailed information on possible applications and the configuration of the digital input in the software user documentation.

2 Installation

The devices have been developed for practical application in a harsh industrial environment.

On delivery, the device is ready for operation.

Perform the following steps to install and configure the device:

- ▶ [Checking the package contents](#)
- ▶ [Installing and grounding the device](#)
- ▶ [Connecting the ferrite \(optional\)](#)
- ▶ [Installing an SFP transceiver \(optional\)](#)
- ▶ [Connecting the terminal blocks](#)
- ▶ [Connecting data cables](#)
- ▶ [Filling out the inscription label](#)
- ▶ [Making basic settings](#)

2.1 Checking the package contents

- Check whether the package includes all items named in the section [“Scope of delivery” on page 59](#).
- Check the individual parts for transport damage.

2.2 Installing and grounding the device

2.2.1 Installing the device onto the DIN rail

Prerequisite:

- Verify that the device maintains the minimum clearance to meet the climatic conditions during operation:
Minimum clearance at the ventilation slots: 2 in (5 cm)

Note: Decreasing the minimum clearance reduces the specified maximum operating temperature.

See [“Derating for different mounting positions” on page 34](#).

Mounting	Minimum clearance at the ventilation slots	Temperature derating
Standard mounting (vertical)	2 in (5 cm)	0 K
	0.8 in (2 cm)	3 K
	0 in (0 cm)	15 K
90° rotated mounting (horizontal)	0 in (0 cm)	15 K

Table 8: Derating for different mounting positions

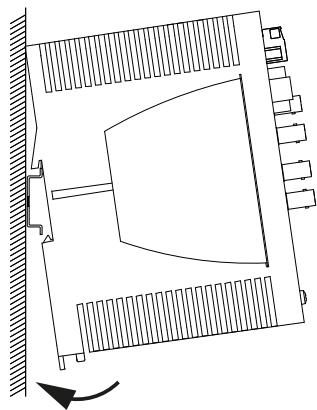


Figure 8: Mounting on the DIN rail (left: plastic casing, right: metal casing)

Proceed as follows:

- Slide the upper snap-in guide of the device into the DIN rail.
- Push the device downwards and onto the DIN rail.
- Snap-in the device.

2.2.2 Grounding the device

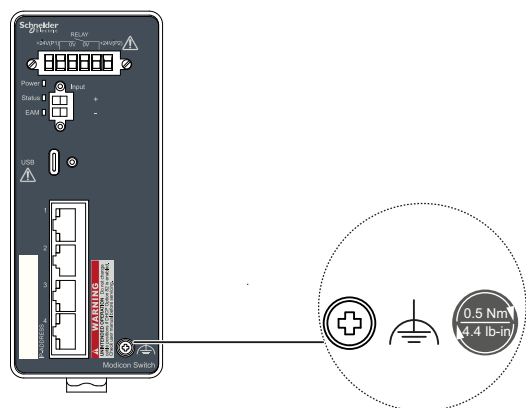


Figure 9: Position of the ground connection on the device; tightening torque.

All device variants have a functional ground connection.

Proceed as follows:

- Ground the device via the ground screw.

2.2.3 Connecting the ferrite (optional)

Exclusively applies to devices used in applications requiring ship approval according to DNVGL, Bureau Veritas or Lloyd's Register.

To adhere to EMC conformity, you connect the ferrite supplied to the voltage input via the power supply cable.

Proceed as follows:

- Insert the power supply cable through the ferrite 2 times.
- Position the ferrite as close as possible to the voltage input (max. distance 2 in (5 cm)).

2.3 Installing an SFP transceiver (optional)

Prerequisites:

Exclusively use Schneider Electric SFP transceivers.

See [“Technical data” on page 46](#).

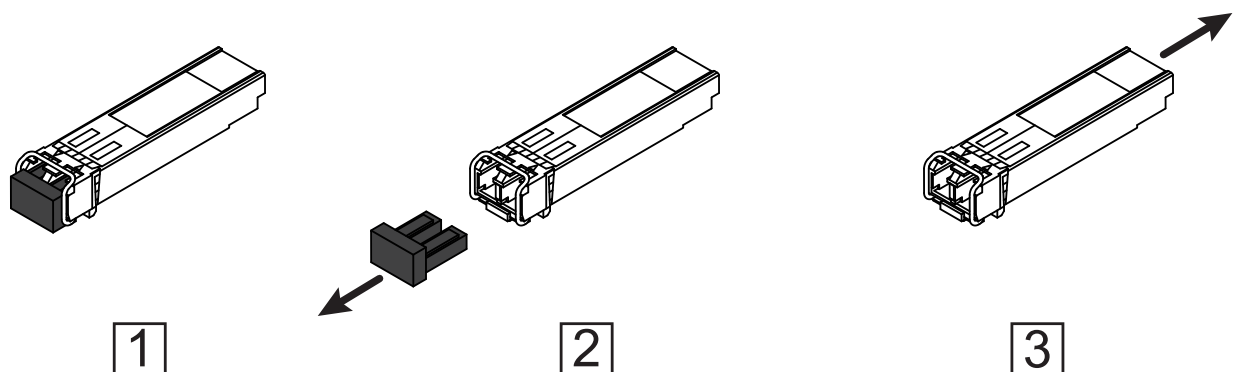


Figure 10: Installing SFP transceivers: Installation sequence

Proceed as follows:

- Take the SFP transceiver out of the transport packaging (1).
- Remove the protection cap from the SFP transceiver (2).
- Push the SFP transceiver with the lock closed into the slot until it latches in (3).

2.4 Connecting the terminal blocks

Note: The supply voltage is connected to the device casing through protective elements exclusively.

2.4.1 Device variants without PoE

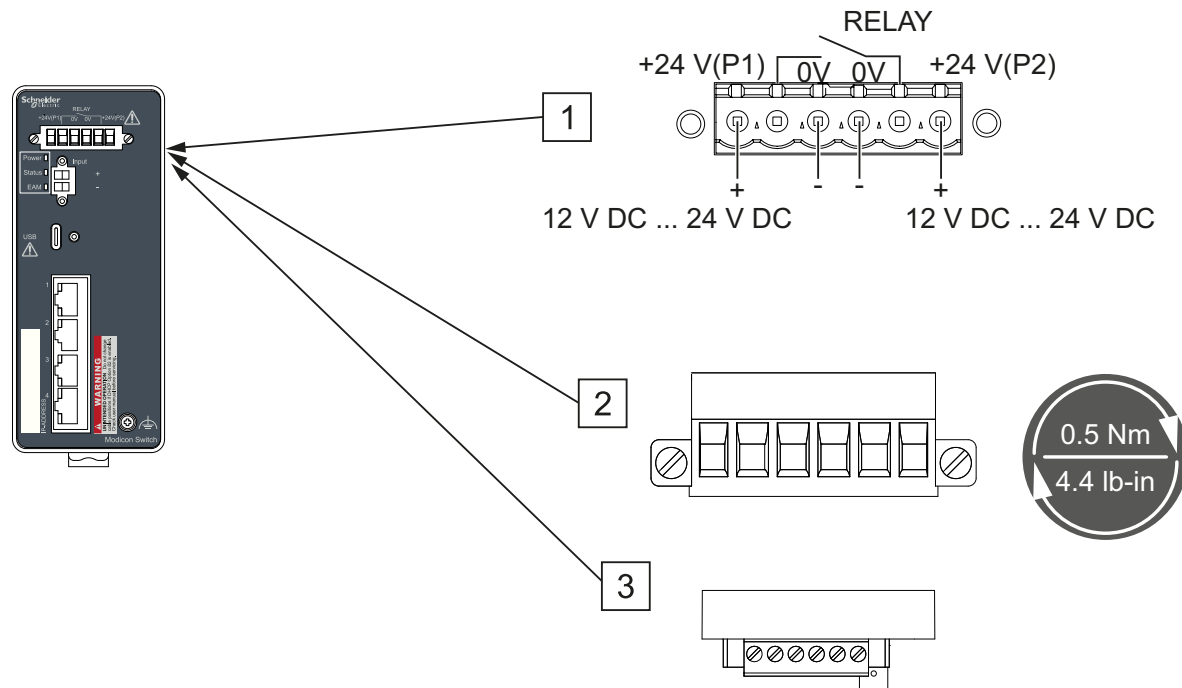


Figure 11: (1) DC voltage connection on the device, (2) terminal block mounted on the device (front view), tightening torque, (3) terminal block mounted on the device (view from above).

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment
DC voltage	Rated voltage range DC: 12 V DC ... 24 V DC	+24 V Plus terminal of the supply voltage
	Voltage range DC incl. maximum tolerances: 9.6 V DC ... 32 V DC	0 V Minus terminal of the supply voltage

Table 9: Type and specification of the supply voltage, pin assignment

For the supply voltage to be connected, perform the following steps:

- Remove the terminal connector from the device.
- Connect the wires according to the pin assignment on the device with the clamps.
- Fasten the wires in the terminal block by tightening the terminal screws.
- Mount the terminal block on the device using screws.

2.4.2 Device variants with PoE

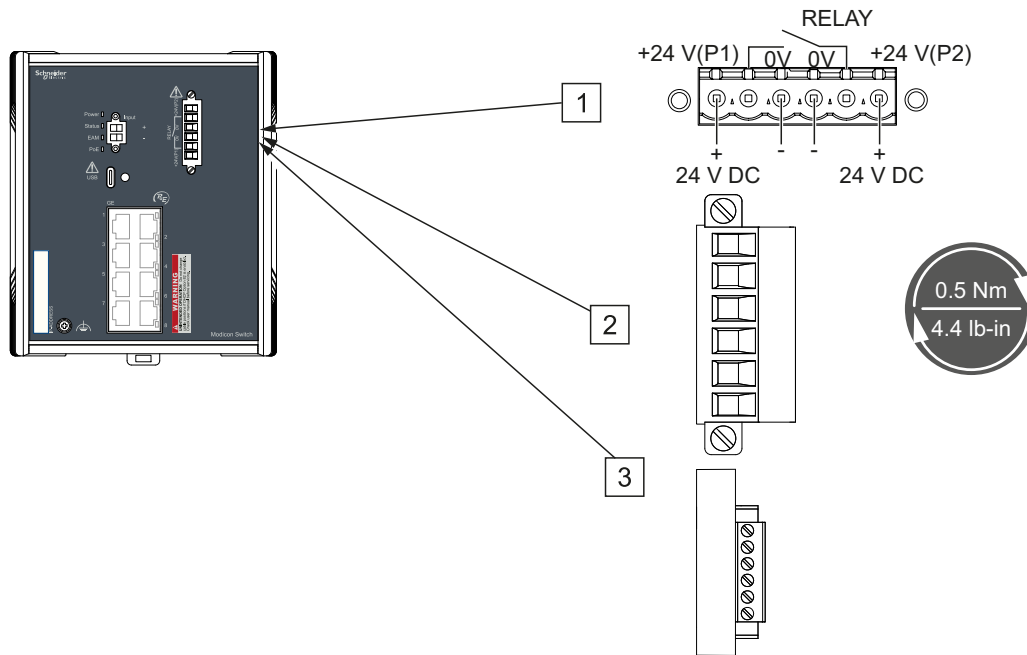


Figure 12: (1) DC voltage connection on the device, (2) terminal block mounted on the device (front view), tightening torque, (3) terminal block mounted on the device (view from above).

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment
DC voltage	Rated voltage DC: 24 V DC	+24 V Plus terminal of the supply voltage
	Voltage range DC incl. maximum tolerances: 18 V DC ... 30 V DC	0 V Minus terminal of the supply voltage

Table 10: Type and specification of the supply voltage, pin assignment

For the supply voltage to be connected, perform the following steps:

- Remove the terminal connector from the device.
- Connect the wires according to the pin assignment on the device with the clamps.
- Fasten the wires in the terminal block by tightening the terminal screws.
- Mount the terminal block on the device using screws.

2.4.3 Signal contact (optional)

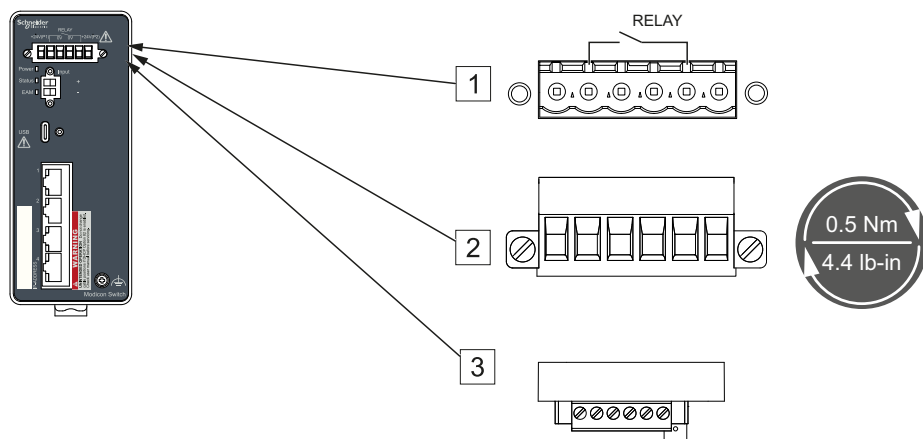


Figure 13: (1) Connection on the device, (2) terminal block mounted on the device (front view), tightening torque, (3) terminal block mounted on the device (view from above).

Proceed as follows:

- Connect the signal contact lines with the terminal block connections.
- Fasten the wires in the terminal block by tightening the terminal screws.
- Mount the terminal block on the device using screws.

2.4.4 Digital input (optional)

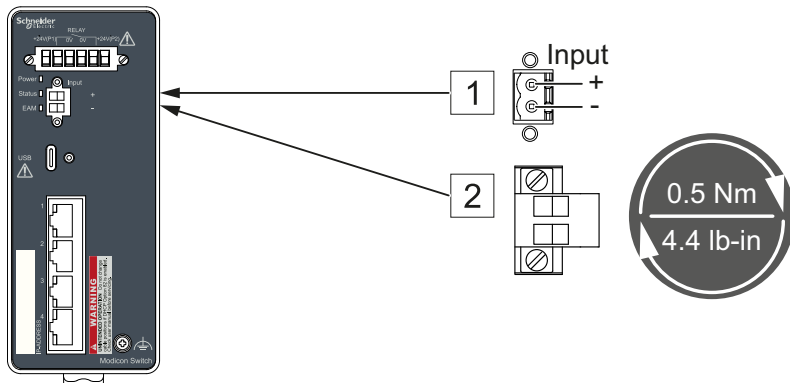


Figure 14: (1) Connection on the device, (2) terminal block mounted on the device (front view), tightening torque.

Pin	Signal, terminal	Function
1	DI (+)	Signal input
2	DI (-)	Reference potential

Table 11: Digital input: pin assignment

Proceed as follows:

- Remove the terminal connector from the device.
- Connect the wires according to the pin assignment on the device with the clamps.
- Fasten the wires in the terminal block by tightening the terminal screws.
- Mount the terminal block on the device using screws.

■ Connection constellations of sensors

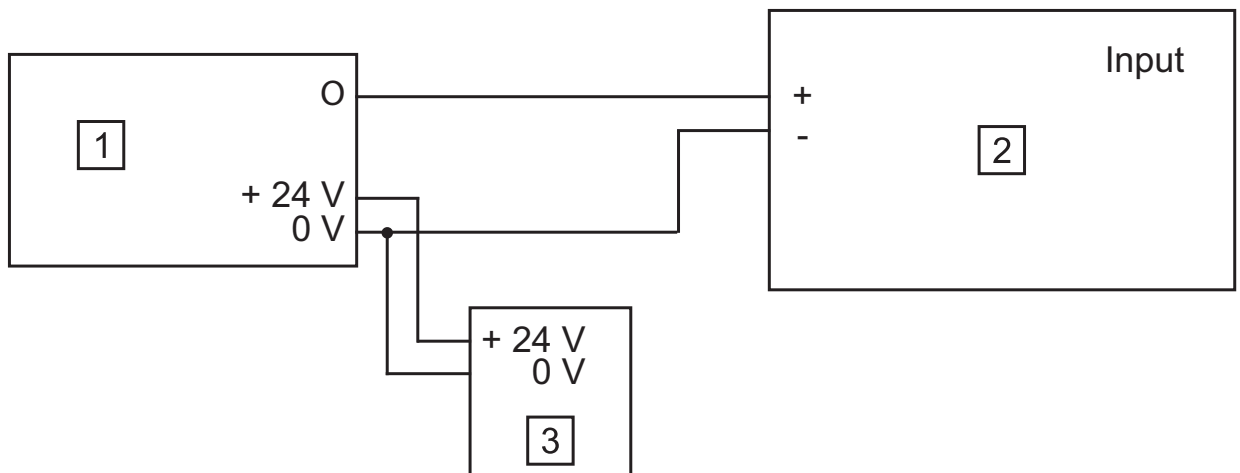


Figure 15: Connection of a sensor with separate power supply

1 - Sensor

2 - MCSESM, MCSESM-E

3 - Separate power supply for sensor

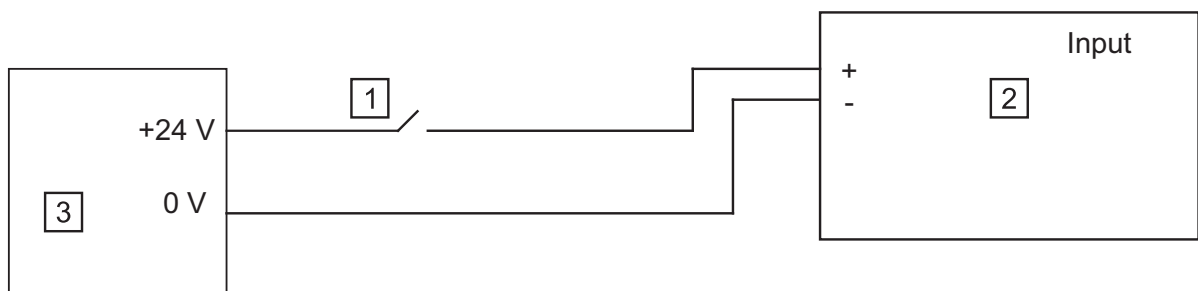


Figure 16: Connection of a sensor with separate power supply

1 - Switch (2-wire sensor)

2 - MCSESM, MCSESM-E

3 - Separate power supply for sensor

2.5 Operating the device

When you connect the supply voltage, you start up the device.

2.6 Connecting data cables

Note the following general recommendations for data cable connections in environments with high electrical interference levels:

- Keep the length of the data cables as short as possible.
- Use optical data cables for the data transmission between the buildings.
- When using copper cables, provide a sufficient separation between the power supply cables and the data cables. Ideally, install the cables in separate cable channels.
- Verify that power supply cables and data cables do not run parallel over longer distances. If reducing the inductive coupling is necessary, verify that the power supply cables and data cables cross at a 90° angle.
- Use shielded data cables for gigabit transmission via copper cables. Only use shielded data cables to meet EMC requirements according to EN 50121-4 and marine applications.
[See “Electromagnetic compatibility \(EMC\)” on page 54.](#)
- Connect the data cables according to your requirements.
[See “Ethernet ports” on page 24.](#)

2.7 Filling out the inscription label

The information field for the IP address helps you identify your device.

2.8 Making basic settings

Note: 2 or more devices configured with the same IP address can cause unpredictable operation of your network.

WARNING

UNINTENDED EQUIPMENT OPERATION

Establish and maintain a process for assigning unique IP addresses to all devices on the network.

Failure to follow these instructions can result in death, serious injury, or equipment damage.



WARNING

UNINTENDED OPERATION

Do not change cable positions if DHCP Option 82 is enabled. Check the user manual before servicing.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Verify that the IP parameters are entered when the device is installed for the first time. The device provides the following options for configuring IP addresses:

- ▶ Configuration via BOOTP
- ▶ Configuration via DHCP (Option 82)
- ▶ Configuration via Schneider Electric Viewer
- ▶ Configuration via Memory Backup Adapter (EAM)
- ▶ Configuration via USB-C interface
- ▶ Configuration via Ethernet Switch Configurator

2.8.1 Default settings

- ▶ IP address: The device looks for the IP address using DHCP
- ▶ Ethernet ports: link status is not evaluated (signal contact)
- ▶ Optical ports: Full duplex
TP ports: Autonegotiation
- ▶ RSTP (Rapid Spanning Tree) activated

2.8.2 First login (Password change)

Perform the following steps:

- Open the Graphical User Interface, the Command Line Interface, or Schneider Electric Viewer the first time you log on to the device.
- Log on to the device with the default password “private”. The device prompts you to type in a new password.
- Type in your new password.
- To help increase security, choose a password that contains at least 8 characters which includes upper-case characters, lower-case characters, numerical digits, and special characters.
- When you log on to the device with the Command Line Interface, then the device prompts you to confirm your new password.
- Log on to the device again with your new password.

Note: If you lost your password, then use the System Monitor to reset the password.

3 Monitoring the ambient air temperature

Operate the device below the specified maximum ambient air temperature exclusively.

See [“Climatic conditions during operation” on page 50.](#)

The ambient air temperature is the temperature of the air at a distance of 2 in (5 cm) from the device. It depends on the installation conditions of the device, for example the distance from other devices or other objects, and the output of neighboring devices.

The temperature displayed in the CLI and the GUI is the internal temperature of the device. It is higher than the ambient air temperature. The maximum internal temperature of the device named in the technical data is a guideline that indicates to you that the maximum ambient air temperature has possibly been exceeded.

4 Maintenance and service

- ▶ When designing this device, Schneider Electric largely avoided using high-wear parts. The parts subject to wear and tear are dimensioned to last longer than the lifetime of the product when it is operated normally. Operate this device according to the specifications.
- ▶ Relays are subject to natural wear. This wear depends on the frequency of the switching operations. Check the resistance of the closed relay contacts and the switching function depending on the frequency of the switching operations.
- ▶ Depending on the degree of pollution in the operating environment, check at regular intervals that the ventilation slots in the device are not obstructed.

5 Disassembly

5.1 Removing an SFP transceiver (optional)

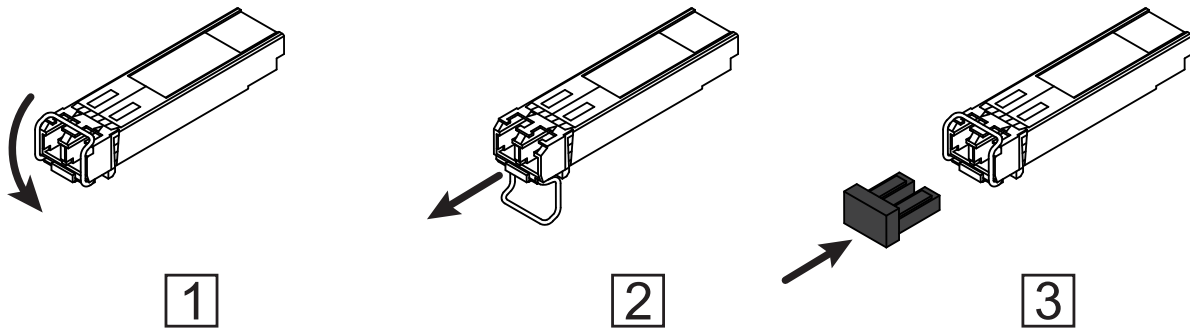


Figure 17: De-installing SFP transceivers: De-installation sequence

Proceed as follows:

- Open the locking mechanism of the SFP transceiver (1).
- Pull the SFP transceiver out of the slot via the open locking mechanism (2).
- Close the SFP transceiver with the protection cap (3).

5.2 Removing the device

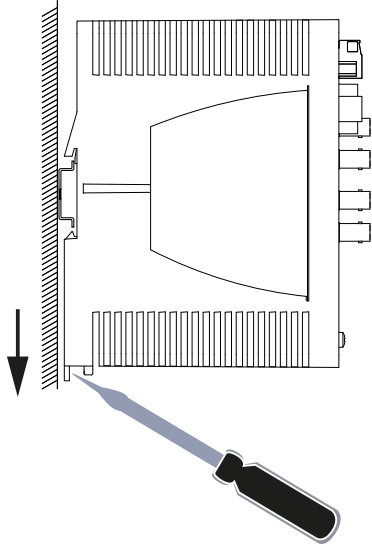


Figure 18: Removal from the DIN rail

Proceed as follows:

- Disconnect the data cables.
- Disable the supply voltage.
- Disconnect the terminal blocks.
- Disconnect the grounding.
- Insert a screwdriver horizontally below the casing into the locking gate.
- Pull the rail lock slide down using a screwdriver and fold the device up.

6 Technical data

6.1 General data

Number of ports	Product name	Weight Plastic casing	Weight Metal casing
04	MCSESM043F23F0	12.22 oz (380 g)	–
05	MCSESM053F1CU0 MCSESM053F1CS0	14.82 oz (420 g)	–
06	MCSESM063F2CU0 MCSESM063F2CS0	14.82 oz (420 g)	–
08	MCSESM083F23F0 MCSESM083F23F1 MCSESM083F23F0H MCSESM083F23F1H	14.82 oz (420 g) 17.64 oz (500 g)	–
08 with PoE	MCSESP083F23G0 MCSESP083F23G0T	–	49.38 oz (1400 g)
09	MCSESM093F1CU0 MCSESM093F1CS0	17.64 oz (500 g)	–
10	MCSESM103F2CU0 MCSESM103F2CU1 MCSESM103F2CU0H MCSESM103F2CU1H MCSESM103F2CS0 MCSESM103F2CS1 MCSESM103F2CS0H MCSESM103F2CS1H	17.64 oz (500 g) 20.10 oz (570 g) 17.64 oz (500 g)	–
12	MCSESM123F2LG0	20.10 oz (570 g)	–
Dimensions W × H × D	See “Dimension drawings” on page 51.		
Mounting	See “Installing the device onto the DIN rail” on page 33.		
Pollution degree	2		
Degree of protection	IP30		
Note: IP protection is not evaluated by UL.			
Laser protection	Class 1 in compliance with IEC 60825-1		

Table 12: General data

6.2 Supply voltage

Device variants without PoE	
Rated voltage range DC:	12 V DC ... 24 V DC
Voltage range DC incl. maximum tolerances:	9.6 V DC ... 32 V DC
Connection type	6-pin terminal block with screw lock
	Tightening torque 4.4 lb-in (0.5 Nm)
	min. conductor diameter AWG18 (0.75 mm ²)
	max. conductor diameter AWG12 (2.5 mm ²)
Power loss buffer	>10 ms at 20.4 V DC
Overload current protection on the device	Non-replaceable fuse
Back-up fuse for each voltage input	Nominal rating: 2 A ... 10 A
	Characteristic: slow blow
Current integral I ² t	<1 A ² s
Connection for functional ground	See "Grounding the device" on page 34.

Table 13: Device variants without PoE

Device variants with PoE	
Rated voltage DC:	24 V DC
Voltage range DC incl. maximum tolerances:	18 V DC ... 30 V DC
Max. PoE power	90 W <60 °C ambient temperature
	60 W +140 °F ... +158 °F (+60 °C ... +70 °C) ambient air temperature
Connection type	6-pin terminal block with screw lock
	Tightening torque 4.4 lb-in (0.5 Nm)
	min. conductor diameter AWG16 (1 mm ²)
	max. conductor diameter AWG12 (2.5 mm ²)
Power loss buffer	>10 ms at 20.4 V DC
Overload current protection on the device	Non-replaceable fuse
Back-up fuse for each voltage input	Nominal rating: 10 A
	Characteristic: slow blow
Current integral I ² t	<36 A ² s
Connection for functional ground	See "Grounding the device" on page 34.

Table 14: Device variants with PoE

6.3 Power consumption/power output

Number of ports	Part Number	Total power consumption	Thermal power output	PoE power output
04	MCSESM043F23F0	5 W	17 Btu (IT)/h	0 W
05	MCSESM053F1CU0 MCSESM053F1CS0	6 W	20 Btu (IT)/h	0 W
06	MCSESM063F2CU0 MCSESM063F2CS0	7 W	24 Btu (IT)/h	0 W
08	MCSESM083F23F0 MCSESM083F23F1 MCSESM083F23F0H MCSESM083F23F1H	6 W	20 Btu (IT)/h	0 W
08 with PoE	MCSESP083F23G0 MCSESP083F23G0T	106 W	55 Btu (IT)/h	90 W
09	MCSESM093F1CU0 MCSESM093F1CS0	7 W	24 Btu (IT)/h	0 W
10	MCSESM103F2CU0 MCSESM103F2CU1 MCSESM103F2CU0H MCSESM103F2CU1H MCSESM103F2CS0 MCSESM103F2CS1 MCSESM103F2CS0H MCSESM103F2CS1H	8 W	27 Btu (IT)/h	0 W
12	MCSESM123F2LG0	9 W	31 Btu (IT)/h	0 W

Table 15: Power consumption/power output

6.4 Signal contact

Signal contact	
Connection type	6-pin terminal block with screw lock
	Tightening torque 4.4 lb-in (0.5 Nm)
	min. conductor diameter 0.08 mm ² (AWG 28)
	max. conductor diameter AWG12 (2.5 mm ²)
Nominal value	$I_{\max} = 1 \text{ A}$ at $U_{\max} = 30 \text{ V AC}$ (resistive load) $I_{\max} = 1 \text{ A}$ at $U_{\max} = 60 \text{ V DC}$ (resistive load) according to the UL Standards: $I_{\max} = 0.5 \text{ A}$ at $U_{\max} = 30 \text{ V AC}$ (resistive load) $I_{\max} = 1 \text{ A}$ at $U_{\max} = 30 \text{ V DC}$ (resistive load) as per ANSI/UL 121201: See control drawing in chapter “Relevant for use in explosion hazard areas (Hazardous Locations, Class I, Division 2)” on page 14

Table 16: Signal contact

6.5 Digital input

Digital input	
Connection type	2-pin terminal block with screw lock
Tightening torque	4.4 lb-in (0.5 Nm)
min. conductor diameter	0.08 mm ² (AWG 28)
max. conductor diameter	AWG12 (2.5 mm ²)
Maximum permitted input voltage range	between -32 V DC and +32 V DC
Nominal input voltage	+24 V DC
Input voltage, low level, status "0"	-0.3 V DC ... +5 V DC
Input voltage, high level, status "1"	+11 V DC ... +30 V DC
Maximum input current at nominal input voltage	15 mA
Permitted closed-circuit current for 2-wire sensors	1.5 mA
Input characteristic according to IEC 61131-2 (current-consuming)	Typ 3

Table 17: Digital input

6.6 Climatic conditions during operation

Climatic conditions during operation	
Minimum clearance around the device	See "Installing the device onto the DIN rail" on page 33.
Ambient air temperature ^a	<p>Standard</p> <ul style="list-style-type: none"> ▶ up to 6562 ft ASL (2000 m ASL) +32 °F ... +140 °F (0 °C ... +60 °C) ▶ 6562 ft ASL ... 13123 ft ASL (2000 m ASL ... 4000 m ASL) +32 °F ... +131 °F (0 °C ... +55 °C) <p>Harsh</p> <ul style="list-style-type: none"> ▶ up to 6562 ft ASL (2000 m ASL) -40 °F ... +158 °F (-40 °C ... +70 °C) ▶ 6562 ft ASL ... 13123 ft ASL (2000 m ASL ... 4000 m ASL) -40 °F ... +149 °F (-40 °C ... +65 °C)
Maximum inner temperature of device (guideline)	tbd
Humidity	1 % ... 95 % (non-condensing)
Air pressure	<p>Without derating</p> <ul style="list-style-type: none"> ▶ min. 795 hPa (+6562 ft; +2000 m) ▶ max. 1060 hPa (-1312 ft; -400 m) <p>With derating</p> <ul style="list-style-type: none"> ▶ min. 600 hPa (+13123 ft; +4000 m) ▶ max. 1060 hPa (-1312 ft; -400 m)

Table 18: Climatic conditions during operation

a. Temperature of the ambient air at a distance of 2 in (5 cm) from the device

6.7 Climatic conditions during storage

Climatic conditions during storage	
Ambient temperature	<p>-40 °F ... +185 °F (-40 °C ... +85 °C) up to 3 months</p> <p>-40 °F ... +158 °F (-40 °C ... +70 °C) up to 1 year</p> <p>-40 °F ... +122 °F (-40 °C ... +50 °C) up to 2 years</p> <p>+32 °F ... +86 °F (0 °C ... +30 °C) up to 10 years</p>
Humidity	1 % ... 95 % (non-condensing)
Air pressure	<ul style="list-style-type: none"> ▶ min. 600 hPa (+13123 ft; +4000 m) ▶ max. 1060 hPa (-1312 ft; -400 m)

Table 19: Climatic conditions during storage

6.8 Dimension drawings

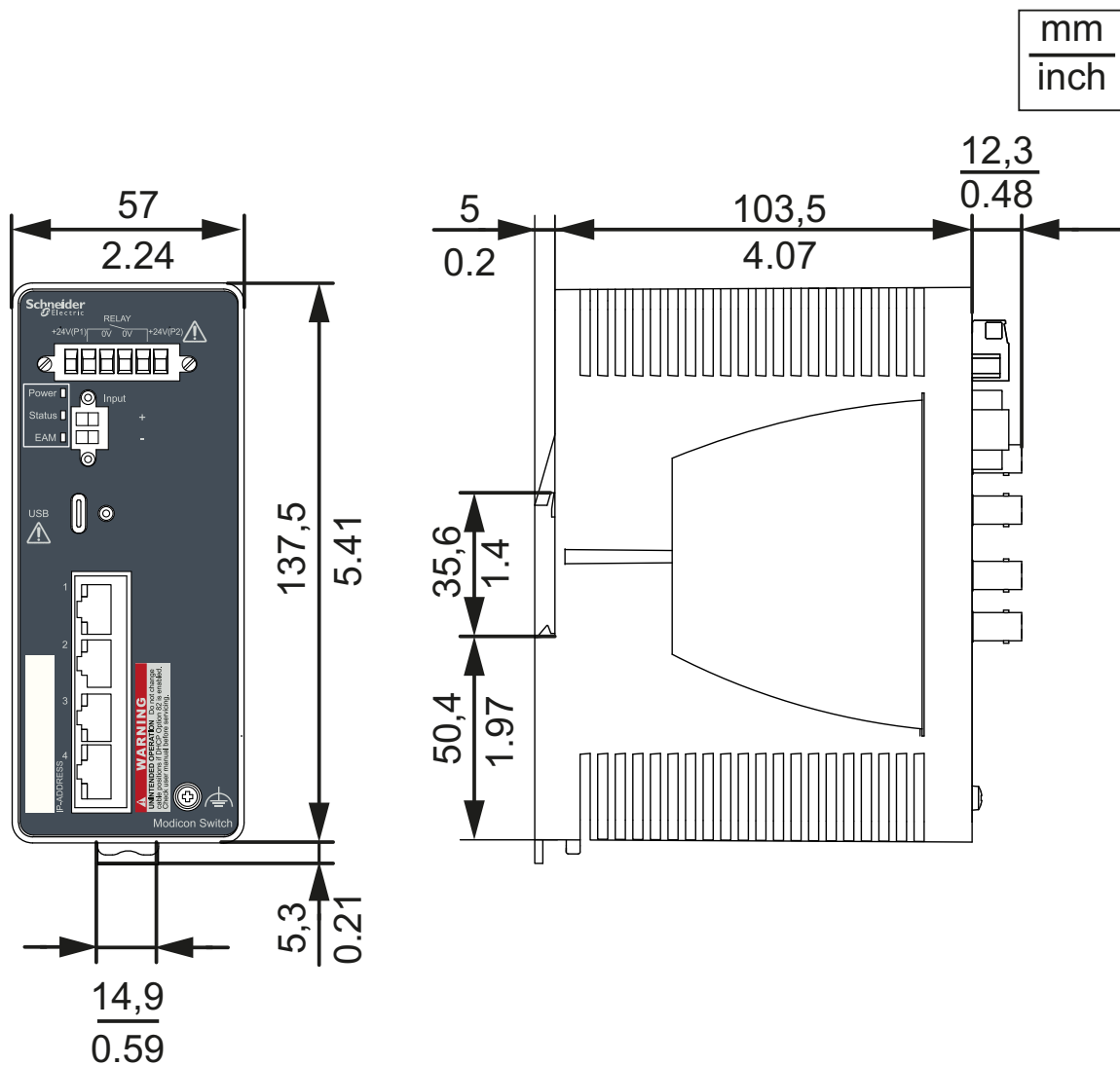


Figure 19: Device variants with 4 ... 6 ports without PoE

mm
inch

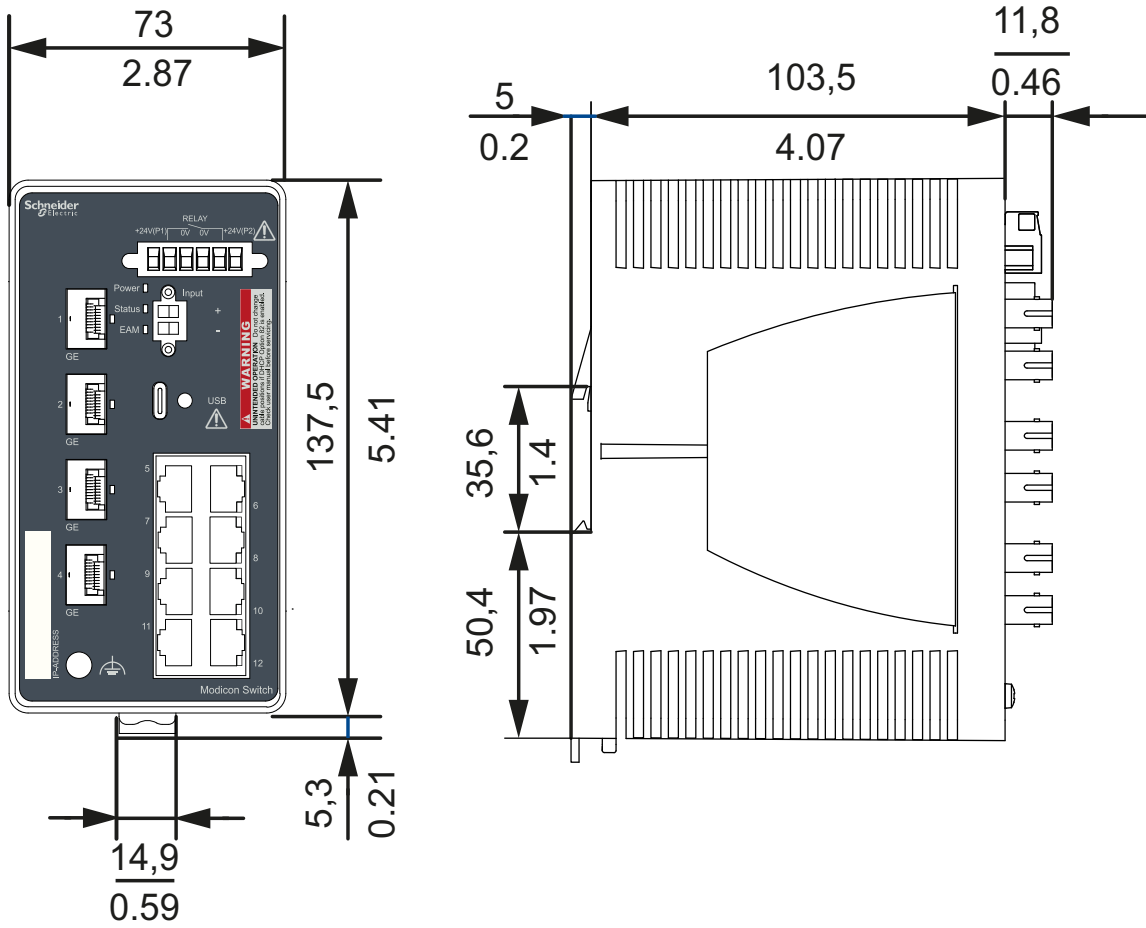


Figure 20: Device variants with 8 ... 12 ports without PoE

mm
inch

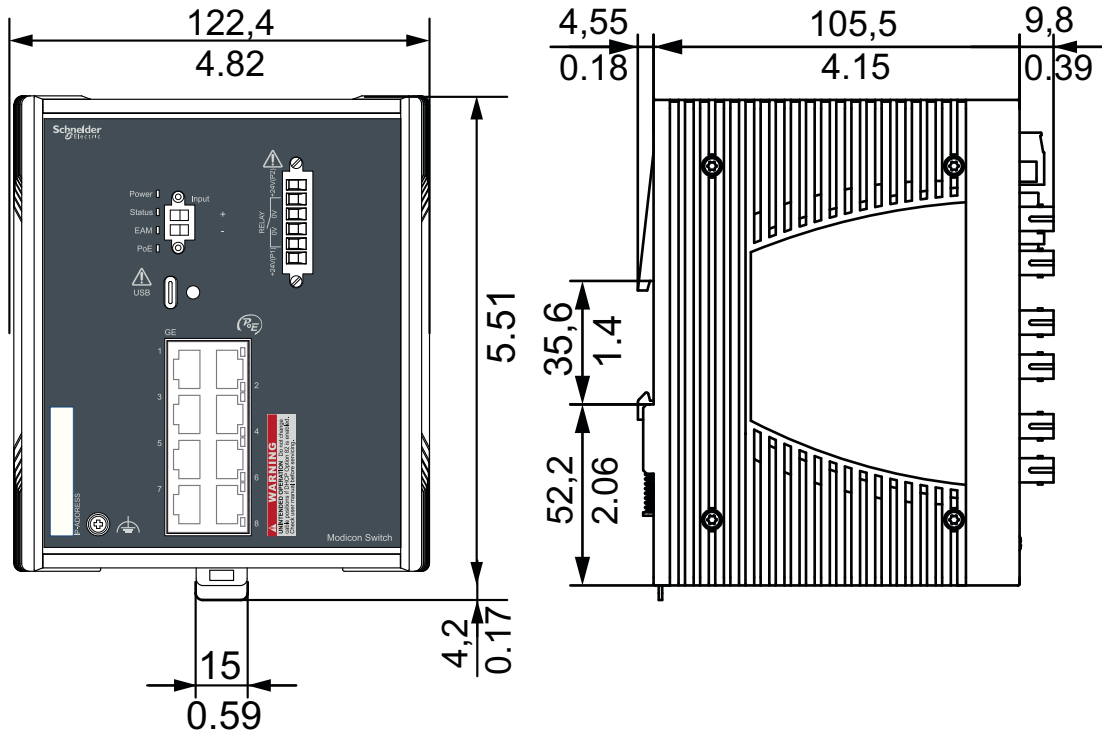


Figure 21: Device variants with PoE

6.9 Immunity

Immunity		Navy applications
IEC 60068-2-6, test Fc	Vibration	5 Hz ... 8.4 Hz with 0.14 in (3.5 mm) amplitude
		2 Hz ... 13.2 Hz with 0.04 in (1 mm) amplitude
		8.4 Hz ... 200 Hz with 1 g
IEC 60068-2-27, test Ea	Shock	13.2 Hz ... 100 Hz with 0.7 g
		15 g at 11 ms

Table 20: Immunity

6.10 Electromagnetic compatibility (EMC)

Note: Use shielded data cables for gigabit transmission via copper cables. Use shielded data cables for all transmission rates to meet the requirements according to EN 50121-4 and marine applications.

WARNING

This is a class A device. This device can cause interference in living areas, and in this case the operator may be required to take appropriate measures.

EMC interference emission	Navy applications
EN 55032	Class A
DNV GL Guidelines	EMC B
FCC 47 CFR Part 15	Class A
EN 61000-6-4	Fulfilled

Table 21: EMC interference emission

EMC interference immunity		Navy applications
Electrostatic discharge		
EN 61000-4-2	Contact discharge	±6 kV
EN 61000-4-2	Air discharge	±8 kV
Electromagnetic field		

Table 22: EMC interference immunity

EMC interference immunity		Navy applications
EN 61000-4-3	80 MHz ... 800 MHz	—
	80 MHz ... 1000 MHz	max. 10 V/m
	800 MHz ... 1000 MHz	—
	80 MHz ... 2000 MHz	max. 10 V/m
	1.4 GHz ... 2.0 GHz	3 V/m
	2.0 GHz ... 2.7 GHz	1 V/m
	5.1 GHz ... 6.0 GHz	—
Fast transients (burst) – power supply connection		
EN 61000-4-4		±2 kV
Fast transients (burst) – data line		
EN 61000-4-4		±1 kV
Voltage surges – power supply connection		
EN 61000-4-5	line/ground	±1 kV
EN 61000-4-5	line/line	±1 kV
Voltage surges - data line		
EN 61000-4-5	line/ground	±1 kV
Conducted disturbances		
EN 61000-4-6	150 kHz ... 80 MHz	10 V

Table 22: EMC interference immunity

6.11 Network range

Note: The line lengths specified for the transceivers apply for the respective fiber data (fiber attenuation and Bandwidth Length Product (BLP)/ Dispersion).

10/100/1000 Mbit/s twisted pair port

Length of a twisted pair segment max. 328 ft (100 m) (for Cat5e cable)

Table 23: Network range: 10/100/1000 Mbit/s twisted pair port

Description	Mode ^a	Wave length	Fiber	System attenuation	Example for F/O cable length ^b	Fiber attenuation	BLP/Dispersion
Multimode FX, DSC, 10/100 Mbit/s	MM	1300 nm	50/125 μm	0 dB ... 8 dB	0 mi ... 3.11 mi (0 km ... 5 km)	1.0 dB/km	800 MHz×km
Multimode FX, DSC, 10/100 Mbit/s	MM	1300 nm	62.5/125 μm	0 dB ... 11 dB	0 mi ... 2.49 mi (0 km ... 4 km)	1.0 dB/km	500 MHz×km
Singlemode FX, DSC, 10/100 Mbit/s	SM	1300 nm	9/125 μm	0 dB ... 16 dB	0 mi ... 18.64 mi (0 km ... 30 km)	0.4 dB/km	3.5 ps/(nm×km)

Table 24: F/O port 100BASE-FX (DSC fiber optic Fast Ethernet Transceiver)

- a. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul
 b. Including 3 dB system reserve when compliance with the fiber data is observed.

Description SFP-...	Mode ^a	Wave length	Fiber	System attenuation	Example for F/O cable length	Fiber data	BLP/Dispersion
-SX/LC...	MM	850 nm	50/125 μm	0 dB ... 7.5 dB	0 mi ... 0.34 mi (0 km ... 0.55 km)	3.0 dB/km	400 MHz×km
-MX/LC...	MM	1310 nm	50/125 μm	0 dB ... 12 dB	0 mi ... 0.93 mi (0 km ... 1.5 km)	1.0 dB/km	800 MHz×km
-MX/LC...	MM	1310 nm	62.5/125 μm	0 dB ... 12 dB	0 mi ... 31.06 mi (0 km ... 50 km)	1.0 dB/km	500 MHz×km
-LX/LC...	MM	1310 nm ^b	50/125 μm	0 dB ... 10.5 dB	0 mi ... 0.34 mi (0 km ... 0.55 km)	1.0 dB/km	800 MHz×km
-LH/LC...	LH	1550 nm	9/125 μm	5 dB ... 22 dB	14.29 mi ... 49.71 mi (23 km ... 80 km)	0.25 dB/km	19 ps/(nm×km)
-LX+/LC...	SM	1310 nm	9/125 μm	5 dB ... 20 dB	8.70 mi ... 26.10 mi (14 km ... 42 km)	0.4 dB/km	3.5 ps/(nm×km)

Table 25: F/O port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)

a. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul

b. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).

6.12 De-rating due to SFP transceiver

Description	De-rating for a device with operating temperature +140 °F (+60 °C) per SFP transceiver used	De-rating for a device with operating temperature +158 °F (+70 °C) per SFP transceiver used
M-SFP-TX/RJ45	0 K	a
M-FAST SFP-TX/RJ45	0 K	a
SFP-FAST-MM/LC	0 K	a
SFP-FAST-SM/LC	0 K	a

Table 26: De-rating due to Fast Ethernet SFP transceiver

a - By using a SFP transceiver without “EEC” extension, the temperature of the device is reduced by 15 K.

Description	De-rating for a device with operating temperature +140 °F (+60 °C) per SFP transceiver used	De-rating for a device with operating temperature +158 °F (+70 °C) per SFP transceiver used
M-SFP-SX/LC	0 K	a
M-SFP-LX/LC	0 K	a
M-SFP-LH/LC	2 K	a
M-SFP-LH+/LC	2 K	a
M-SFP-TX/RJ45	3 K	a
M-SFP-LX+/LC	0 K	a

Table 27: De-rating due to Gigabit Ethernet SFP transceiver

a - By using a SFP transceiver without “EEC” extension, the temperature of the device is reduced by 15 K.

7 Scope of delivery

Scope of delivery
1 × Device
1 × Terminal block for supply voltage and signal contact
1 × Terminal block for the digital input
depending on device variant
2 × Ferrites with key
1 × Readme document

Table 28: Scope of delivery