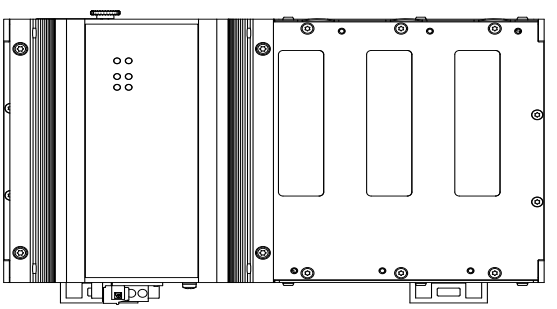
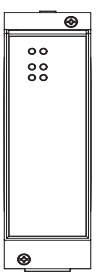
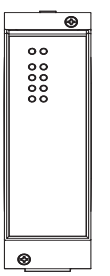
HIRSCHMANN
A BELDEN BRAND

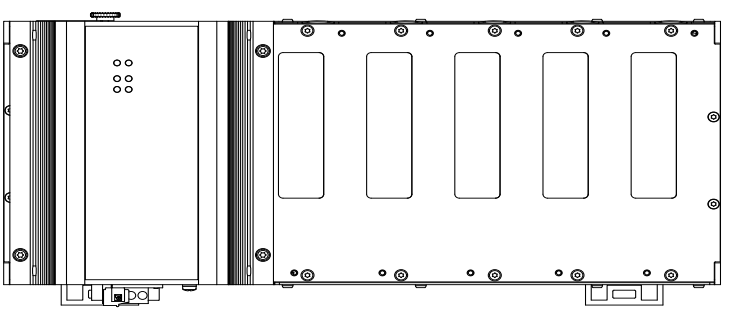
User Manual

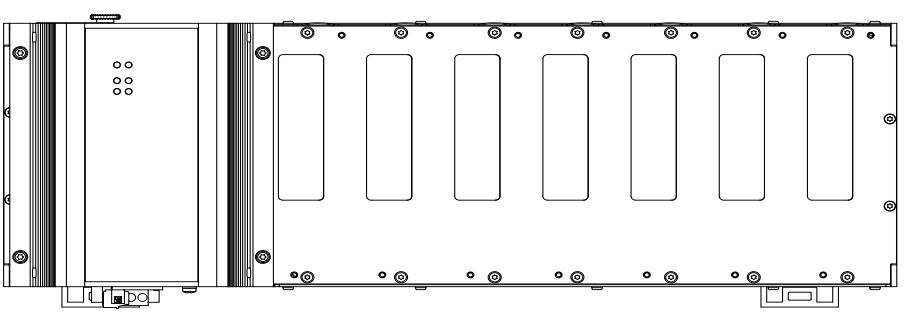
Installation
MICE Switch Power - MSP30/32/40/42
MICE Switch Media modules - MSM20/22/24/40/42/46/50/60











The naming of copyrighted trademarks in this manual, even when not specially indicated, should not be taken to mean that these names may be considered as free in the sense of the trademark and tradename protection law and hence that they may be freely used by anyone.

The performance features described here are binding only if they have been expressly agreed when the contract was made. This document was produced by Hirschmann Automation and Control GmbH according to the best of the company's knowledge. Hirschmann reserves the right to change the contents of this document without prior notice. Hirschmann can give no guarantee in respect of the correctness or accuracy of the information in this document.

Hirschmann can accept no responsibility for damages, resulting from the use of the network components or the associated operating software. In addition, we refer to the conditions of use specified in the license contract.

You can get the latest version of this manual on the Internet at:
https://www.doc.hirschmann.com

Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
72654 Neckartenzlingen
Germany

Contents

Important information

Note: Read these instructions carefully, and familiarize yourself with the device before trying to install, operate, or maintain it. The following notes may appear throughout this documentation or on the device. These notes warn of potential hazards or call attention to information that clarifies or simplifies a procedure.

Symbol explanation

This is a general warning symbol. This symbol alerts you to potential personal injury hazards. Observe all safety notes that follow this symbol to avoid possible injury or death.

If this symbol is displayed in addition to a safety instruction of the type “Danger” or “Warning”, it means that there is a danger of electric shock and failure to observe the instructions will inevitably result in injury.

This symbol indicates the danger of hot surfaces on the device. In connection with safety instructions, non-observance of the instructions will inevitably result in injuries.

⚠ DANGER

DANGER draws attention to an immediately dangerous situation, which will **inevitably** result in a serious or fatal accident if not observed.

⚠ WARNING

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

⚠ CAUTION

CAUTION indicates a possible danger which, if not avoided, **may** result in minor injuries.

NOTICE

NOTICE provides information about procedures that do not involve the risk of injury.

Safety instructions

WARNING

UNCONTROLLED MACHINE ACTIONS

To avoid uncontrolled machine actions caused by data loss, configure all the data transmission devices individually.
Before you start any machine which is controlled via data transmission, be sure to complete the configuration of all data transmission devices.

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

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 Hirschmann for inspection.

National and international safety regulations

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

Certified usage

- ☐ Use the product only for the application cases described in the Hirschmann product information, including this manual.
- ☐ Operate the product only according to the technical specifications. See “Technical data” on page 73.
- ☐ Connect to the product only components suitable for the requirements of the specific application case.

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

☐ Verify that there is at least 10 cm (4 in) of space above and below the device.

☐ Verify that there is at least 2 cm (0.8 in) of space on the right and left sides of the device.

☐ If ambient temperatures are ≥45 °C (≥113 °F), exclusively install the device in “restricted access locations” according to IEC 60950-1.

Strain relief

Note: If the strain relief is insufficient, there is a potential risk of torsion, contact problems and creeping interruptions.

☐ Relieve the connection points of cables and lines from mechanical stress.

☐ Design strain reliefs in such a way that they help prevent any mechanical damage to cables, wires or conductors caused by external influences or their own weight.

☐ To help prevent damage to device connections, connectors and cables, follow the instructions for proper installation in accordance with DIN VDE 0100-520:2013-06, sections 522.6, 522.7 and 522.13.

Device casing

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

- ☐ Never insert pointed objects (narrow screwdrivers, wires, etc.) into the device or into the connection terminals for electric conductors. Do not touch the connection terminals.
- ☐ Make sure there is at least 10 cm (3.94 in) of space in front of the ventilation slits of the casing.
- ☐ Keep the ventilation slits free to ensure good air circulation.
- ☐ If you are operating the device in a living area or office environment, only operate it in switch cabinets with fire protection characteristics in accordance with IEC 60950-1.
- ☐ The surfaces of the device housing may become hot. Avoid touching the device while it is operating.

Note: The basic device is an inseparable unit. The basic device may be damaged by detachment of the display and connection part.

Grounding the device

Grounding the device is by means of a separate ground connection on the device.

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

The overall shield of a connected shielded twisted pair cable is connected to the grounding connector on the front panel as a conductor.

Requirements for connecting electrical wires

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

General requirements for connecting electrical wires
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. ▶ Relevant for North America: Exclusively use 60/75 °C (140/167 °F) or 75 °C (167 °F) copper (Cu) wire.

Requirements for connecting the signal contact
The following requirements apply without restrictions:
▶ The switched voltage complies with the requirements for a safety extra-low voltage (SELV) according to IEC 60950-1 or ES1 according to IEC/EN 62368-1. ▶ The connected voltage is limited by a current limitation device or a fuse. Observe the electrical threshold values for the signal contact. See “General technical data” on page 73.

Requirements for connecting the supply voltage	
The following requirements apply without restrictions:	
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 conforms to overvoltage category I or II. ▶ 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 cross-section of the power supply cable is at least 1 mm² (North America: AWG16) on the supply voltage input.	
The following requirements apply alternatively:	
Relevant when the device is supplied via 1 voltage input:	
Alternative 1	The power supply complies with the requirements for a limited power source (LPS) according to IEC 60950-1 or ES1 + PS2 according to IEC/EN 62368-1.
Alternative 2	Relevant for North America: The power supply complies with the requirements according to NEC Class 2.
Alternative 3	**All** of the following requirements are complied with: ▶ The power supply complies with the requirements for a safety extra-low voltage (SELV) according to IEC 60950-1 or ES1 according to IEC/ EN 62368-1. ▶ A back-up fuse suitable for DC voltage is located in the plus conductor of the power supply. The minus conductor is on ground potential. Otherwise, a back-up fuse is also located in the minus conductor. Regarding the properties of this back-up fuse: See “General technical data” on page 73.
Relevant when the device is supplied via 2 voltage inputs:	
Alternative 1	The **total** power supply complies with the requirements for a limited power source (LPS) according to IEC 60950-1 or IEC/EN 62368-1.
Alternative 2	Relevant for North America: The **total** voltage supply complies with the requirements as per NEC Class 2.
Alternative 3	**All** of the following requirements are complied with: ▶ The power supply complies with the requirements for a safety extra-low voltage (SELV) according to IEC 60950-1 or ES1 according to IEC/ EN 62368-1. ▶ A fuse suitable for DC voltage is located at both voltage inputs in the plus conductor of the power supply. The minus conductor is on ground potential at both voltage inputs. Otherwise, a fuse is also located in the minus conductor. Regarding the properties of this fuse: See “General technical data” on page 73.

ESD Guidelines

The modules are equipped with electrostatically sensitive components. These can be destroyed, or their life cycles reduced, by the effects of an electrical field or by a charge equalization if the connections are touched. You will find information about electrostatically endangered assemblies in DIN EN 61340-5-1 (2007-08) and DIN EN 61340-5-2 (2007-08).

CE marking

The labeled devices comply with the regulations contained in the following European directive(s):

- **2011/65/EU and 2015/863/EU (RoHS)**
  Directive of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- **2014/30/EU (EMC)**
  Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.

In accordance with the above-named EU directive(s), the EU conformity declaration will be at the disposal of the relevant authorities at the following address:

Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
72654 Neckartenzlingen
Germany
www.hirschmann.com

You find the EU conformity declaration as PDF file for downloading on the Internet at: https://www.doc.hirschmann.com/certificates.html

The device can be used in industrial environments.
- Interference immunity: EN 61000-6-2
- Emitted interference: EN 55032

You find more information on technical standards here:
See “Underlying technical standards” on page 97.

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.

Note: The assembly guidelines provided in these instructions must be strictly adhered to in order to observe the EMC threshold values.

LED or laser components

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

LED CLASS 1 - CLASS 1 LED PRODUCT, relevant for the following F/O modules (indicated by the module code): M2, M4.

LASER CLASS 1 - CLASS 1 LASER PRODUCT, relevant for the following F/O modules (indicated by the module code): S2, S4, G2, L2, C1.

For a description of the nomenclature for module codes, see table 2 on page 22.

FCC note

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

MSP30/32/40/42 and MSM20/22/24/40/42/46/50/60

U.S. Contact Information
Belden – St. Louis
1 N. Brentwood Blvd. 15th Floor
St. Louis, Missouri 63105, United States
Phone: 314.854.8000

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: 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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Recycling note

The symbol of a crossed-out wheeled bin shown on the device indicates that the device MUST NOT be disposed of with household waste at the end of its service life.
After its service life, the used device must be disposed of properly as electronic waste in accordance with the locally applicable disposal regulations.
End users are responsible for deleting personal data from the used device prior to disposal.

End users are obliged to separate used batteries and accumulators that are not enclosed by the used device from the used device in a non-destructive manner before disposing of the used device. The used batteries and accumulators must be handed in for separate collection. This does not apply if the used device is handed in for reuse.

The following approvals are only in place for the media modules MSM20/22/24/40/42 in connection with a MSP30/32/40/42 basic device:

- **Relevant for use as industrial switching equipment (according to standards UL 508 / CSA C22.2 No. 142-1987)**

  When using the MSP30/32/40/42 devices as industrial control equipment the following restrictions apply:
  Max. ambient air temperature: +60 °C (+140 °F)
  (... applies to operating temperature characteristic values S, T or E)
  Exclusively use copper conductors.
  Temperature rating of field installed conductors:
  Exclusively use +75 °C (+167 °F) copper conductors.
  Exclusively for use in Pollution degree 2 environment.
  Digital output:
  Basic devices MSP30/32/40/42 - Relay (Fault): max. 30 V DC, 1 A, resistive load.
  Media module MSM24 - (O1, ..., O4): max. 30 V DC, 1 A, resistive load.

About this manual

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 following manuals are available as PDF files for download on the Internet at https://www.doc.hirschmann.com/ :

- User Manual Installation
- User Manual Basic Configuration
- User Manual Redundancy Configuration
- Reference Manual Graphical User Interface
- Reference Manual Command Line Interface

Key

The symbols used in this manual have the following meanings:

▶	Listing
☐	Work step
■	Subheading

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.
The device works without a fan.
You have the option of choosing various media to connect to the end devices and other network components:

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

The device provides you with a large range of functions, which the manuals for the operating software inform you about. You find these manuals as PDF files on the Internet at http://www.doc.hirschmann.com
The Hirschmann network components help you ensure continuous communication across all levels of the company.
The Network Management Software Industrial HiVision provides you with options for smooth configuration and monitoring. You find further information on the Internet at the Hirschmann product pages:
http://www.hirschmann.com/en/QR/INET-Industrial-HiVision

1.1.1 Basic device

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

- Network management software (for example Industrial HiVision)
- Web browser
- V.24 interface (locally on the device)
- HiView
- SSH
- Telnet

1.1.2 Media modules

The media modules form the interface from the device to the LAN.

The media modules have different interface types.

The different interfaces of the media modules provide you with the following functions:

- Specific functions of the TP/TX interface
  - Auto Polarity Exchange
  - Autocrossing (device may be connected with a crossed-over or an un-crossed cable)
  - Autonegotiation (selecting the operating mode: speed/duplex)
  - Link Control
- Specific functions of the F/O interface
  - Link Down monitoring

1.2 Device name and product code

The device name corresponds to the product code. The product code is made up of characteristics with defined positions. The characteristic values stand for specific product properties.
You have numerous options of combining the device characteristics. You can determine the possible combinations using the configurator which is available in the Belden Online Catalog https://catalog.belden.com on the web page of the device.

Basic device

Item	Characteristic	Characteristic value	Description	
1 ... 3	Product	MSP	MICE Switch Power	
4	Data rate	3	10[a]/100 Mbit/s Ports 10[a]/100/1000 Mbit/s ports	
		4	10[a]/100/1000 Mbit/s ports 1000/2500 Mbit/s ports 1000/10000 Mbit/s ports	
5	Hardware type	0	Standard	
		2	Suitable for PoE or PoE+	
6	(hyphen)	-		
7 ... 8	Number: 10[a]/100 Mbit/s ports	00	0 ×	10[a]/100 Mbit/s ports
		08	8 ×	10[a]/100 Mbit/s ports
		16	16 ×	10[a]/100 Mbit/s ports
		24	24 ×	10[a]/100 Mbit/s ports

Table 1: Device name and product code

Item	Characteristic		Characteristic value	Description	
9 ... 10	Number: 10[a]/100/1000 Mbit/s ports	(exclusively MSP30/32)	04	4 ×	10[a]/100/1000 Mbit/s ports
		(exclusively MSP40/42)	12	8 × + 4 × or 2 ×	1000/2500 Mbit/s ports 1000/10000 Mbit/s ports
			20	16 × + 4 × or 2 ×	1000/2500 Mbit/s ports 1000/10000 Mbit/s ports
			28	24 × + 4 × or 2 ×	1000/2500 Mbit/s ports 1000/10000 Mbit/s ports
11	Number: 10[a]/100/1000/10000 Mbit/s ports		0	0 ×	10[a]/100/1000/ 10000 Mbit/s ports
12	Temperature range		S	Standard	0 °C ... +60 °C (+32 °F ... +140 °F)
			T	Extended	-40 °C ... +70 °C (-40 °F ... +158 °F)[b, c]
					under UL conditions: max. +60 °C (+140 °F)
			E	Extended with Conformal Coating	-40 °C ... +70 °C (-40 °F ... +158 °F)[d, e]
					under UL conditions: max. +60 °C (+140 °F)
13	Supply voltage		C		2 voltage inputs for redundant power supply
					Rated voltage range 24 V DC ... 48 V DC
			P	PoE	2 voltage inputs for redundant power supply
					Rated voltage range 45 V DC ... 57 V DC
				PoE+	2 voltage inputs for redundant power supply
					Rated voltage range 51 V DC ... 57 V DC
14 ... 15	Certificates and declarations	**Note:** You will find detailed information on the certificates and declarations applying to your device in a separate overview. See table 3 on page 24.			
16 ... 17	Software packages		99	Reserved	
			UR	Unicast Routing	
			MR	Unicast + Multicast Routing	
18 ... 19	Customer-specific version		HH	Hirschmann standard	
20	Software configuration		E	Entry (Hirschmann Standard)	
			B	Diagnostic User (DBDEW)	
			I	Ethernet/IP	
			P	Profinet	

Table 1: Device name and product code

Item	Characteristic	Characteristic value	Description
21 ... 22	Software level	2A	HiOS Layer 2 Advanced
		3A	HiOS Layer 3 Advanced
23 ... 27	Software version	06.0.	Software version 06.0
		XX.X	Current software version

Table 1: Device name and product code

a. Exclusively for twisted pair connections.
b. Exclusively use SFP transceivers with the “EEC” extension, otherwise the standard temperature range applies.
c. When using media modules MSM50/MSM60, the maximum ambient air temperature is reduced by 10 °C to -40 °C ... +60 °C (-40 °F ... +140 °F).
d. Exclusively use SFP transceivers with the “EEC” extension, otherwise the standard temperature range applies.
e. When using media modules MSM50/MSM60, the maximum ambient air temperature is reduced by 10 °C to -40 °C ... +60 °C (-40 °F ... +140 °F).

Media modules

Item	Characteristic	Characteristic value	Description	
1 ... 3	Product	MSM	MICE Switch Media Module	
4	Data rate	2	10[a]/100 Mbit/s Ports	
		4	10[a]/100/1000 Mbit/s ports	
		5	1000/2500 Mbit/s ports	
		6	1000/10000 Mbit/s ports	
5	Hardware type	0	Standard	
		2	Suitable for PoE or PoE+	
		4	Suitable for I/O operation	
		6	suitable for PoE or PoE+ with external power supply	
6	(hyphen)	-		
7 ... 8	Port 1	T1	Twisted Pair (TX)	RJ45 socket
		T5	Twisted Pair (TX)	M12 socket
		M2	Multimode FX DSC	(100 Mbit/s only)
		M4	Multimode FX ST	(100 Mbit/s only)
		S2	Singlemode FX DSC	(100 Mbit/s only)
		S4	Singlemode FX ST	(100 Mbit/s only)
		L2	Singlemode Long Haul FX DSC	(100 Mbit/s only)
		G2	Singlemode Long Haul FX DSC 200 km	(100 Mbit/s only)
		C1	Combo port: Twisted Pair (TX) F/O	 RJ45 socket SFP slot
		IO	Digital Input/Output	
		Q6	SFP slot	1000/2500 Mbit/s or 1000/10000 Mbit/s
		99	Not present	
9 ... 10	Port 2		See items 7 ... 8	
11 ... 12	Port 3		See items 7 ... 8	
13 ... 14	Port 4		See items 7 ... 8	
15	Temperature range	S	Standard	0 °C ... +60 °C (+32 °F ... +140 °F)
		T	Extended	-40 °C ... +70 °C (-40 °F ... +158 °F)[b, c]
				under UL conditions: max. +60 °C (+140 °F)
		E	Extended with Conformal Coating	-40 °C ... +70 °C (-40 °F ... +158 °F)[d, e]
				under UL conditions: max. +60 °C (+140 °F)
16 ... 17	Certificates and declarations	You will find detailed information on the certificates and declarations applying to your device in a separate overview. See table 3 on page 24.		
18 ... 19	Customer-specific version	HH	Hirschmann standard	

Table 2: Device name and product code

Item	Characteristic	Characteristic value	Description
20	Hardware configuration	9	none
21	Software configuration	E	Entry (Hirschmann Standard)
22 ... 26	Software version	99.9	Without software

Table 2: Device name and product code

a. Exclusively for twisted pair connections.
b. Exclusively use SFP transceivers with the “EEC” extension, otherwise the standard temperature range applies.
c. When using media modules MSM50/MSM60, the maximum ambient air temperature is reduced by 10 °C to -40 °C ... +60 °C (-40 °F ... +140 °F).
d. Exclusively use SFP transceivers with the “EEC” extension, otherwise the standard temperature range applies.
e. When using media modules MSM50/MSM60, the maximum ambient air temperature is reduced by 10 °C to -40 °C ... +60 °C (-40 °F ... +140 °F).

Certifications

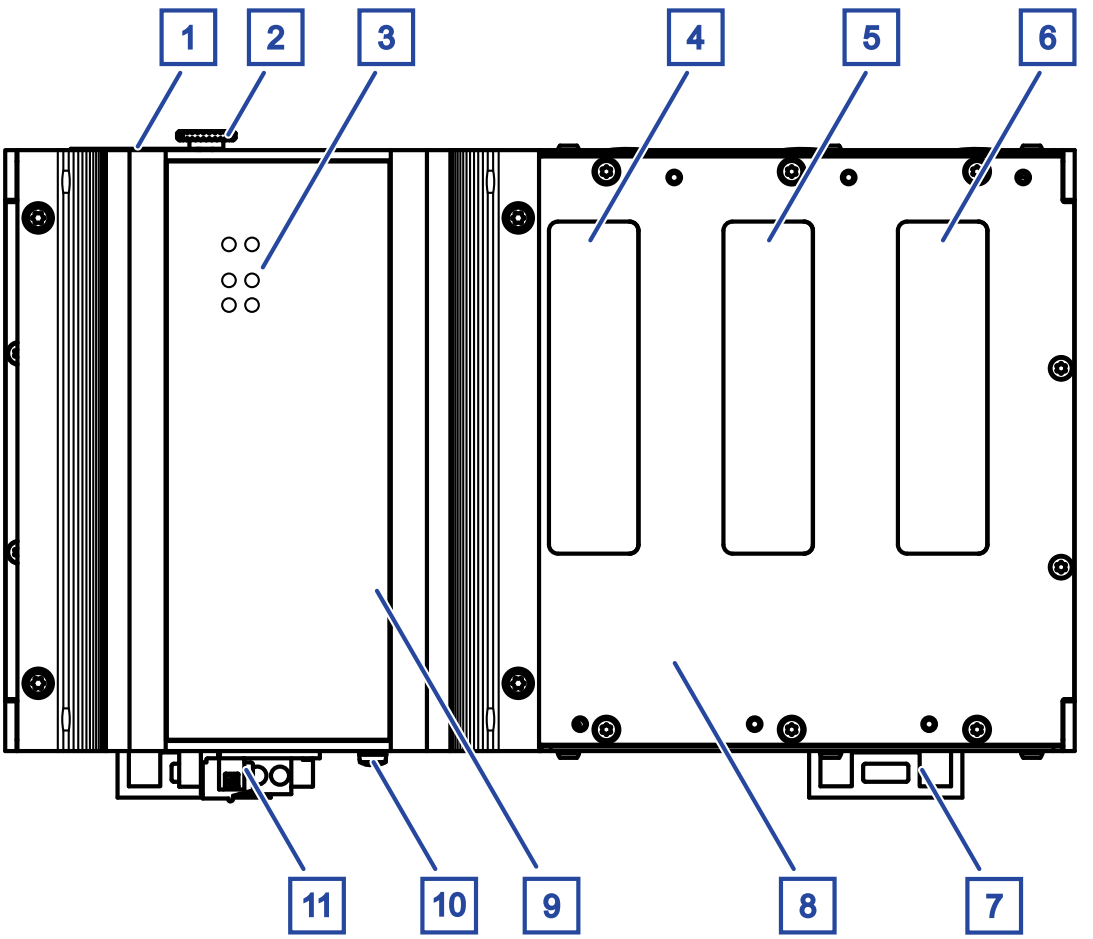
Application case	Certificates and declarations	Characteristic value									
		MSP30/32	MSP40/42	MSM20	MSM22	MSM24	MSM40	MSM42	MSM46	MSM50	MSM60
Standard applications	CE	T9, TY, U9, UY, V9, VT, VU, VY, Y9, Z9									Z9
	IEC 60950-1	T9, TY, U9, UY, V9, VT, VU, VY, Y9, Z9									Z9
	EN 61131-2	T9, TY, U9, UY, V9, VT, VU, VY, Y9, Z9									Z9
	FCC	T9, TY, U9, UY, V9, VT, VU, VY, Y9, Z9									Z9
	UL 508	TY, UY, VT, VU, VY, Y9									TY Y9
Substation applications	IEC 61850-3	V9, VT, VU, VY									—
	IEEE 1613	V9, VT, VU, VY									—
Navy applications	DNV	U9, UY, VU									—
Railway applications	EN 50121-4	TY T9 VT									TY T9

Table 3: Assignment: application cases, certificates and declarations, characteristic values

1.3 Device views

1.3.1 Basic device

Front view

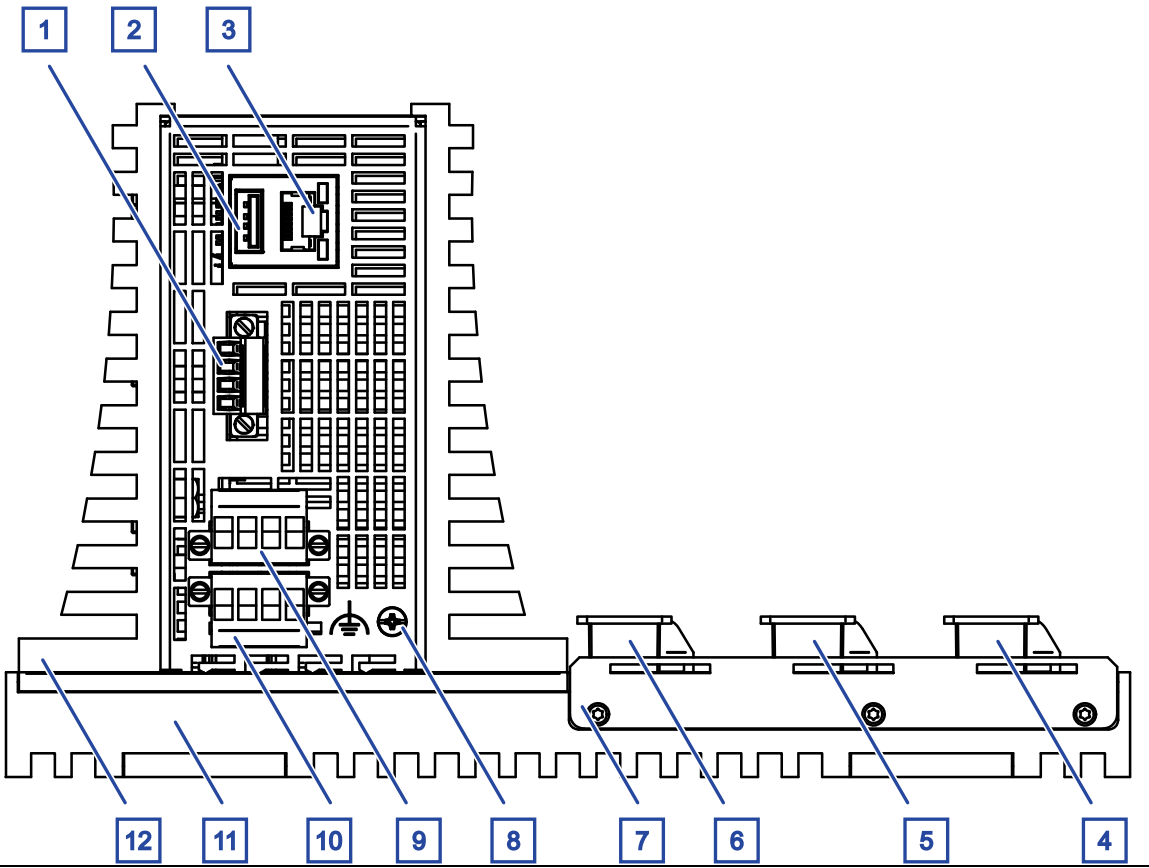


1	Slot for the SD card	
2	Thumb screw	
3	LED display elements for device status	
4	Slot 1 for media modules	
5	Slot 2 for media modules	
6	Slot 3 for media modules	
7	Locking gate for removing the device	
8	Backplane	(Basic device MSP30/32/40/42)
9	Power module	(Basic device MSP30/32/40/42)
10	Grounding screw	
11	Terminal block, V.24 interface, USB interface, signal contacts	

Table 4: Front view (using the example MSP30/32-0804.....HH...)

Note: On the basic device MSP40/42 and MSP30/32 Rev. 2, the media module slot 1 is coded differently from the other slots. Exclusively MSM50 or MSM60 media modules can be installed on this media module slot.

View from below

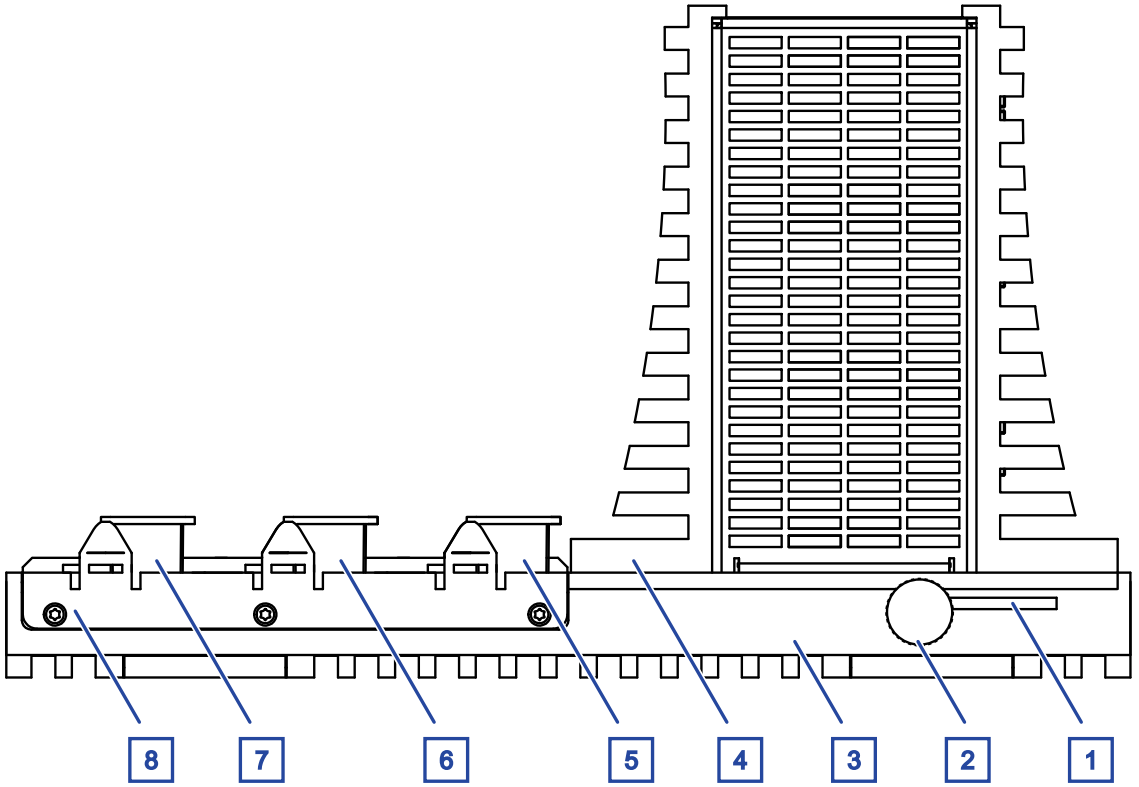


1	Connection for 2 digital inputs	
2	USB interface	The device supports the ACA22 starting with the software version 3.0.
3	V.24 interface	LED display elements are not functional in the existing device version.
4	Slot 3 for media modules	
5	Slot 2 for media modules	
6	Slot 1 for media modules	
7	Positioning bar	
8	Grounding screw	
9	Supply voltage connection	▶ Connection for the signal contact ▶ Low voltage input ▶ Voltage input for redundant power supply ▶ 4-pin terminal block
10	Supply voltage connection	▶ Connection for the signal contact ▶ Low voltage input ▶ Voltage input for redundant power supply ▶ 4-pin terminal block
11	Backplane	(Basic device MSP30/32/40/42)
12	Power module	(Basic device MSP30/32/40/42)

Table 5: Bottom view (using the example MSP30/32-0804.....HH...)

Note: On the basic device MSP40/42 and MSP30/32 Rev. 2, the media module slot 1 is coded differently from the other slots. Exclusively MSM50 or MSM60 media modules can be installed on this media module slot.

View from above



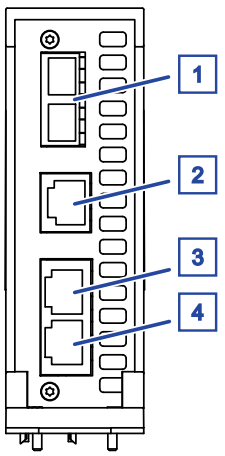
1	Slot for the SD card
2	Thumb screw
3	Backplane (Basic device MSP30/32/40/42)
4	Power module (Basic device MSP30/32/40/42)
5	Slot 1 for media modules
6	Slot 2 for media modules
7	Slot 3 for media modules
8	Female multipoint connector

Table 6: View from above (using the example MSP30/32-0804.....HH...)

Note: On the basic device MSP40/42 and MSP30/32 Rev. 2, the media module slot 1 is coded differently from the other slots. Exclusively MSM50 or MSM60 media modules can be installed on this media module slot.

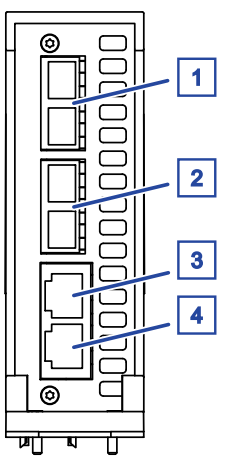
1.3.2 Media modules

Media modules MSM20



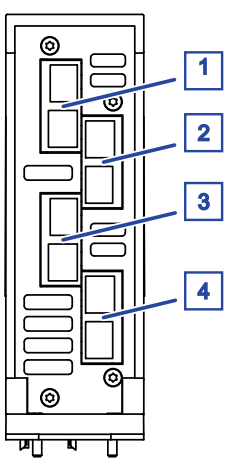
1	Port 1	(F/O)
2	Port 2	(Twisted Pair)
3	Port 3	(Twisted Pair)
4	Port 4	(Twisted Pair)

Table 7: MSM20-S2T1T1T1...



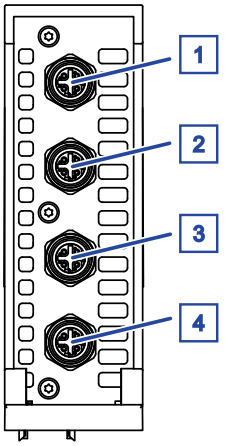
1	Port 1	(F/O)
2	Port 2	(F/O)
3	Port 3	(Twisted Pair)
4	Port 4	(Twisted Pair)

Table 8: MSM20-S2S2T1T1...



1	Port 1	(F/O)
2	Port 2	(F/O)
3	Port 3	(F/O)
4	Port 4	(F/O)

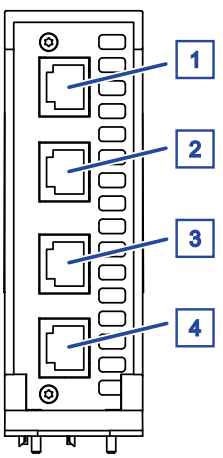
Table 9: MSM20-S4S4S4S4...



1	Port 1	(Twisted Pair)
2	Port 2	(Twisted Pair)
3	Port 3	(Twisted Pair)
4	Port 4	(Twisted Pair)

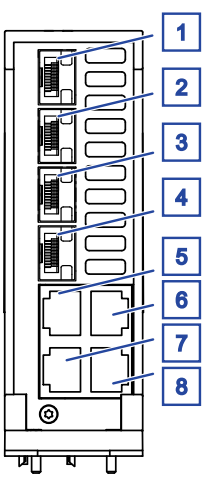
Table 10: MSM20-T5T5T5T5...

Media modules MSM40



1	Port 1	(Twisted Pair)
2	Port 2	(Twisted Pair)
3	Port 3	(Twisted Pair)
4	Port 4	(Twisted Pair)

Table 11: MSM40-T1T1T1T1...



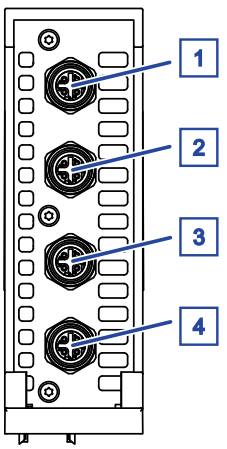
1	Port 1	(F/O)
2	Port 2	(F/O)
3	Port 3	(F/O)
4	Port 4	(F/O)
5	Port 1	(Twisted Pair)
6	Port 2	(Twisted Pair)
7	Port 3	(Twisted Pair)
8	Port 4	(Twisted Pair)

Table 12: MSM40-C1C1C1C1...

The combo port media module MSM40-C1C1C1C1... has 4 twisted pair ports and 4 F/O slots (connection option with SFP transceivers).
You have the option of alternatively connecting a twisted pair cable via a RJ45 socket or an optical fiber via a SFP transceiver to a combo port.

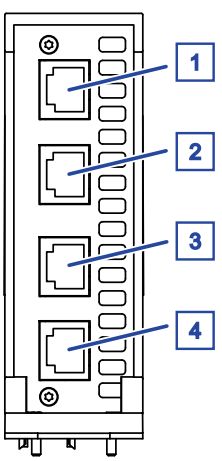
By inserting a SFP transceiver, you deactivate automatically the corresponding twisted pair interface.

PoE-capable media modules MSM22, MSM42 and MSM46



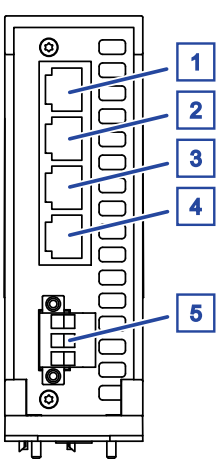
1	Port 1	(Twisted Pair)
2	Port 2	(Twisted Pair)
3	Port 3	(Twisted Pair)
4	Port 4	(Twisted Pair)

Table 13: MSM22-T5T5T5T5...



1	Port 1	(Twisted Pair)
2	Port 2	(Twisted Pair)
3	Port 3	(Twisted Pair)
4	Port 4	(Twisted Pair)

Table 14: MSM42-T1T1T1T1...



1	Port 1	(Twisted Pair)
2	Port 2	(Twisted Pair)
3	Port 3	(Twisted Pair)
4	Port 4	(Twisted Pair)
5	3-pin terminal block for the PoE supply voltage	

Table 15: MSM46-T1T1T1T1...

The MSM22, MSM42 and MSM46 PoE media modules support Power over Ethernet (PoE) according to IEEE 802.3af and Power over Ethernet Plus (PoE+) according to IEEE 802.3at.

The PoE ports allow the connection and remote supply of, for example, IP telephones (Voice over IP), webcams, sensors, printer servers and WLAN access points. With PoE, power is supplied to these terminal devices through the twisted pair cable.
The PoE support complies with the following technical standards:

Standard	Description	
IEEE 802.3af	Brief description	PoE
	Classes	max. Powered Device (PD) class 0 (15,4 W)
IEEE 802.3at	Brief description	PoE+
	Classes	max. Powered Device (PD) class 4 (30 W)

Table 16: PoE support: technical standards

In accordance with IEEE 802.3af and IEEE 802.3at:
- Endpoint PSE
- Alternative A

The following applies to PoE ports:
- The PoE power is supplied via the wire pairs transmitting the signal (phantom voltage).
- The individual ports (joint PoE voltage) are not electrically insulated from each other.

Note: The basic devices MSP32 and MSP42 support a PoE power budget of 120 W. You cannot expand the PoE power budget of the MSP basic devices with MSM46-T1T1T1T1... media modules.
You find the maximum PoE power output in table 44 on page 85.

Note: The PoE/PoE+ power supply of the PoE media module MSM46-T1T1T1T1... takes place using an external power supply unit. The external power supply unit for the PoE supply voltage is connected to the device via a 3-pin terminal block. When you install the media module MSM46-T1T1T1T1... on a MSP basic device without internal PoE power supply (MSP30, MSP40), the media module allows you to supply external devices with PoE voltage.
In the following table you find more information on the pin assignment of the external supply voltage of the media module MSM46:

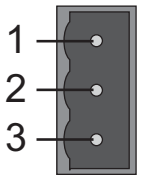
Figure	Pin	
	1	Case
	2	GND
	3	54 V DC

Table 17: 3-pin terminal block pin assignment

MSM24 I/O media module

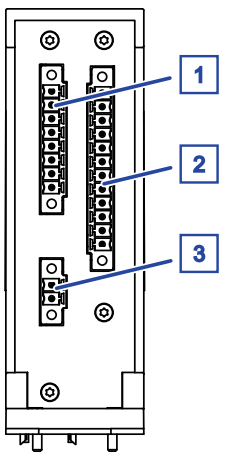
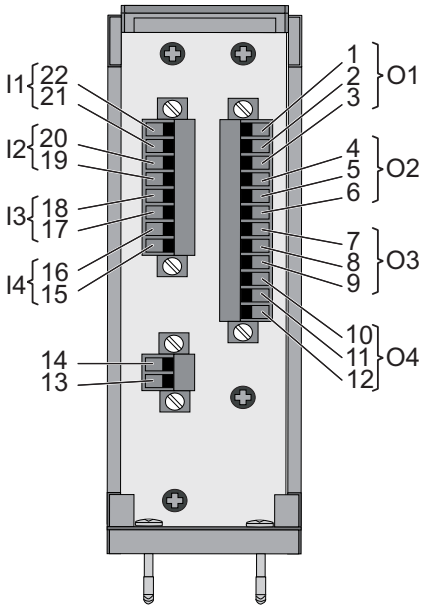
Figure	Item		Function
	1	Input (I)	Input
	2	Output (O)	Output
	3	AUX	Auxiliary voltage

Table 18: MSM24-IOIOIOIO...

The MSM24 I/O module has 4 electrically insulated digital inputs and outputs according to the technical standard EN 61131-2. Through these inputs, the I/O module receives and transmits digital sensor signals. The digital outputs allow a wide range of actuators to be operated in the plant area.
Sensors, actuators and other components are supplied with +24 V DC via an electrically insulated output.
On the bottom of the I/O module there are terminal blocks for connecting the

- digital inputs (I)
- digital outputs (O)
- 24 V DC auxiliary voltage

The pin assignment is shown on the front cover of the I/O module, adjacent to the LEDs.
In the following overview you find more information on the pin assignment:



Pin	Signal, terminal	Function
1	OFF-1	NC contact, channel 1
2	CENTER-1	Center contact, channel 1
3	ON-1	NO contact, channel 1
4	OFF-2	NC contact, channel 2
5	CENTER-2	Center contact, channel 2
6	ON-2	NO contact, channel 2
7	OFF-3	NC contact, channel 3
8	CENTER-3	Center contact, channel 3
9	ON-3	NO contact, channel 3
10	OFF-4	NC contact, channel 4
11	CENTER-4	Center contact, channel 4
12	ON-4	NO contact, channel 4

Table 19: Pin assignment of the digital outputs

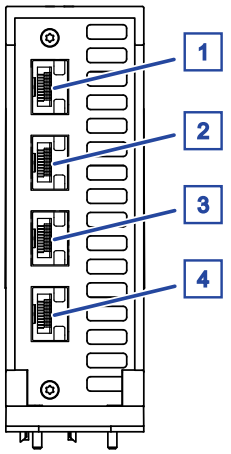
Pin	Signal, terminal	Function
13	AUX_GND	Reference potential
14	AUX_+24 V	Auxiliary voltage

Table 20: Pin assignment of the auxiliary voltage connection

Pin	Signal, terminal	Function
15	IN-4-GND	Reference potential, channel 4
16	IN-4	Signal input, channel 4
17	IN-3-GND	Reference potential, channel 3
18	IN-3	Signal input, channel 3
19	IN-2-GND	Reference potential, channel 2
20	IN-2	Signal input, channel 2
21	IN-1-GND	Reference potential, channel 1
22	IN-1	Signal input, channel 1

Table 21: Pin assignment of the digital inputs

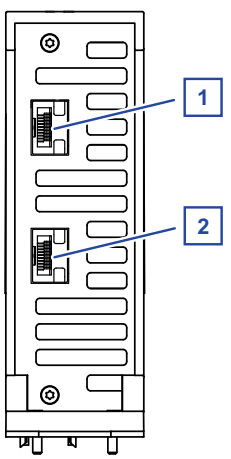
Media modules MSM50 and MSM60



1	Port 1	SFP slot
2	Port 2	SFP slot
3	Port 3	SFP slot
4	Port 4	SFP slot

Table 22: MSM50-Q6Q6Q6Q6...

The media module MSM50-Q6Q6Q6Q6... has 4 SFP slots for 1/2.5 Gbit/s F/O connections (connection via SFP transceivers).



1	Port 1	SFP slot
2	Port 2	SFP slot

Table 23: MSM60-Q6Q69999...

The media module MSM60-Q6Q69999... has 2 SFP slots for 1/10 GBit F/O connections (connection via SFP transceiver).

Note: On the basic device MSP40/42 and MSP30/32 Rev. 2, the media module slot 1 is coded differently from the other slots. Exclusively MSM50 or MSM60 media modules can be installed on this media module slot.

Note: The media modules MSM50 and MSM60 can exclusively be used with MSP40/42 and MSP30/32 Rev. 2 basic devices.

Note: For MSP30/32 Rev. 2, the speed is limited to 1 Gbit.

Note: MSP40 or MSP42 basic devices exclusively support the full range of functions of MSM60 media modules starting with software version 7.5.01 or higher.
You find the latest software version on the Internet on the Hirschmann product pages at www.hirschmann.com.

1.4 Number of ports and connections

Depending on their variant, the basic devices offer you the following number of slots for media modules and the following maximum amount of connectable network segments:

Basic device	Total number of slots	Number of slots for 10/ 100 Mbit/s (FE)	Number of slots for 1000 Mbit/s (GE)	Max. number of connectable 10/ 100 Mbit/s network segments	Max. number of connectable 1000 Mbit/s network segments
MSP30-0804... MSP32-0804...	3	2	1	8	4
MSP30-1604... MSP32-1604...	5	4	1	16	4
MSP30-2404... MSP32-2404...	7	6	1	24	4

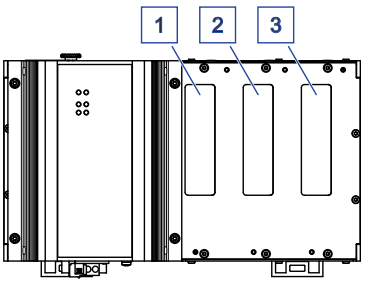
Table 24: Number of slots and maximum connectable network segments

Basic device	Total number of slots	Number of slots for 10/ 100/ 1000 Mbit /s (GE)	Number of slots for 1000/ 2500 Mbit/s (GE/2.5GE) or 1000/ 10000 Mbit/s (GE/10GE)	Max. number of connectable 10/100/ 1000 Mbit/s network segments	Max. number of connectable 1000/ 2500 Mbit/s network segments	Max. number of connectable 1000/ 10000 Mbit/s network segments
MSP40-0012... MSP42-0012...	3	2	1	8	4	2
MSP40-0020... MSP42-0020...	5	4	1	16	4	2
MSP40-0028... MSP42-0028...	7	6	1	24	4	2

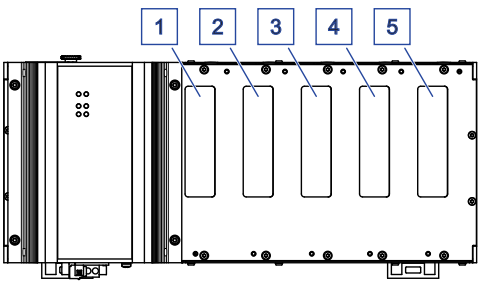
Table 25: Number of slots and maximum connectable network segments

The maximum data rate of the media modules depends on their slot on the basic device. Some media modules only support data rates up to 10/ 100 Mbit/s.
See “Device name and product code” on page 19.

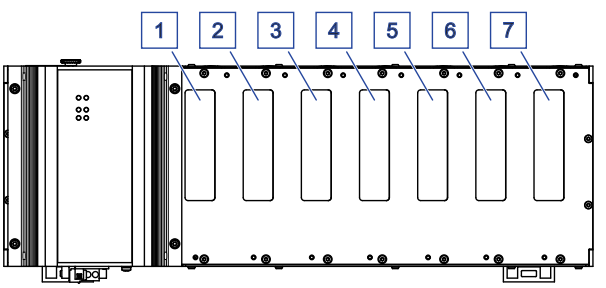
You will find the arrangement and sequence of the slots on the basic device in the following overview:

Slots		MSP30/32-0804...	MSP40/42-0012...
	1	10[a]/100/1000 Mbit/s (Rev. 2 only) 1000 Mbit/s	1000/2500 Mbit/s or 1000/10000 Mbit/s
	2	10[a]/100 Mbit/s	10[a]/100/1000 Mbit/s
	3	10[a]/100 Mbit/s	10[a]/100/1000 Mbit/s

a. Exclusively for twisted pair connections.

Slots		MSP30/32-1604...	MSP40/42-0020...
	1	10[a]/100/1000 Mbit/s (Rev. 2 only) 1000 Mbit/s	1000/2500 Mbit/s or 1000/10000 Mbit/s
	2	10[a]/100 Mbit/s	10[a]/100/1000 Mbit/s
	3	10[a]/100 Mbit/s	10[a]/100/1000 Mbit/s
	4	10[a]/100 Mbit/s	10[a]/100/1000 Mbit/s
	5	10[a]/100 Mbit/s	10[a]/100/1000 Mbit/s

a. Exclusively for twisted pair connections.

Slots			MSP40/42-0028...
	1	10[a]/100/1000 Mbit/s (Rev. 2 only) 1000 Mbit/s	1000/2500 Mbit/s or 1000/10000 Mbit/s
	2	10[a]/100 Mbit/s	10[a]/100/1000 Mbit/s
	3	10[a]/100 Mbit/s	10[a]/100/1000 Mbit/s
	4	10[a]/100 Mbit/s	10[a]/100/1000 Mbit/s
	5	10[a]/100 Mbit/s	10[a]/100/1000 Mbit/s
	6	10[a]/100 Mbit/s	10[a]/100/1000 Mbit/s
	7	10[a]/100 Mbit/s	10[a]/100/1000 Mbit/s

a. Exclusively for twisted pair connections.

1.5 Power supply

1.5.1 Supply voltage with characteristic value C

For the redundant supply of the device, 2 4-pin terminal blocks are available.
See “Supply voltage with characteristic value C” on page 56.

1.5.2 Supply voltage with the characteristic value P

For the redundant supply of the device, 2 4-pin terminal blocks are available. The MSP32 and MSP42 device variants support Power over Ethernet (PoE) or Power over Ethernet Plus (PoE+).
See “Supply voltage with the characteristic value P” on page 57.

1.6 SFP Transceiver

SFP stands for Small Form-factor Pluggable and is also referred to as mini-GBIC (GigaBit Interface Converter).
SFP transceivers allow you to use optical interfaces on your device (Fast Ethernet and Gigabit Ethernet SFP transceivers).
See “Installing an SFP transceiver (optional)” on page 63.
See “Accessories” on page 93.

1.7 Ethernet ports

You have the option to connect terminal devices or other segments to the ports of the media modules via twisted-pair cables or F/O cables.
Connect the ports of the media modules plugged into the basic device as required in order to set up your industrial Ethernet or expand your existing network.

- **10/100 Mbit/s twisted pair port**
  This port is designed as an 4-pin M12 socket.
  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:
  - 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode
  - 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
  - Autocrossing (if autonegotiation is activated)
  - Autonegotiation

- Autopolarity
- In addition, the MSM22 media module allows you to use Power over Ethernet (PoE) according to IEEE 802.3af and Power over Ethernet Plus (PoE+) according to IEEE 802.3at.
  The PoE power is supplied via the wire pairs transmitting the signal (phantom voltage).
  Delivery state: Autonegotiation activated

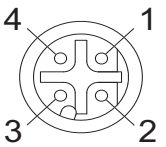
Figure	Pin	MSM20 Function		MSM22 PoE (PSE)
	1	TD+	Transmission path	+
	2	RD+	Receive path	−
	3	TD−	Transmission path	+
	4	RD−	Receive path	−
	Housing: shield			

Table 26: Pin assignment of 10/100 Mbit/s twisted pair port, M12 socket

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:

- 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
- Autocrossing (if autonegotiation is activated)
- Autonegotiation
- Autopolarity
- In addition, the MSM42 media module allows you to use Power over Ethernet (PoE) according to IEEE 802.3af and Power over Ethernet Plus (PoE+) according to IEEE 802.3at.
  The PoE power is supplied via the wire pairs transmitting the signal (phantom voltage).
  Delivery state: Autonegotiation activated

The port casing is electrically connected to the front panel.

The pin assignment corresponds to MDI-X.

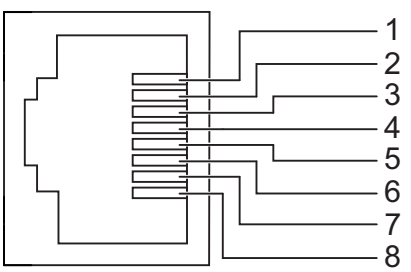
Figure	Pin	MSM40 Function	MSM42 PoE voltage feed
	1	BI_DB+	Minus terminal of the supply voltage
	2	BI_DB−	Minus terminal of the supply voltage
	3	BI_DA+	Plus terminal of the supply voltage
	4	BI_DD+	—
	5	BI_DD−	—
	6	BI_DA−	Plus terminal of the supply voltage
	7	BI_DC+	—
	8	BI_DC−	—

Table 27: Pin assignment 10/100/1000 Mbit/s TP interface in MDI-X mode, RJ45 socket

100 Mbit/s F/O port

This port is a DSC socket or a DST socket.

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

- 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode

Delivery state:

- 100 Mbit/s, full duplex

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 the IEEE 802.3 100BASE-FX/1000BASE-SX/1000BASE-LX standard.

- 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
- 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

1/2.5 Gbit/s F/O port

This port is an SFP slot.
The port allows you to connect network components according to the IEEE 802.3 1000BASE-SX/1000BASE-LX standard.
The port allows you to connect network components according to IEEE P802.3bz 2.5 Gbit/s.
This port supports:
Full duplex mode
Delivery state:
1/2.5 Gbit/s full duplex when using a Gigabit Ethernet SFP transceiver

1/10 Gbit/s F/O port

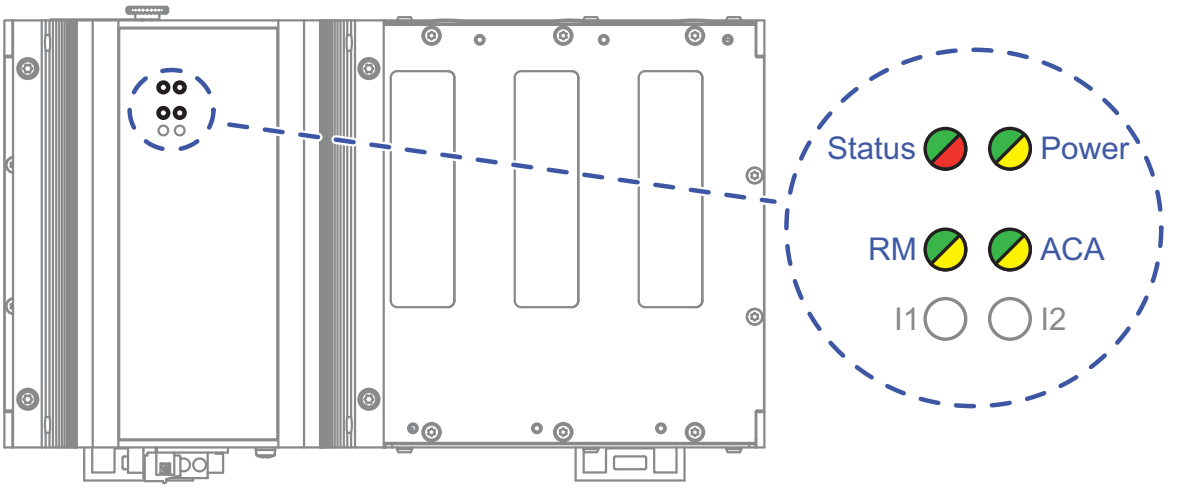
This port is an SFP slot.
The port allows you to connect network components according to the standards IEEE 802.3 1000BASE-SX/1000BASE-LX or IEEE 802.3 (Clause 49) 10GBASE-R.
This port supports:
Full duplex mode
Delivery state:
1 Gbit/s full duplex when using a Gigabit Ethernet SFP transceiver, or 10 Gbit/s full duplex when using a Gigabit Ethernet SFP+ transceiver.

1.8 Display elements

After the supply voltage is set up, the Software starts and initializes the device. Afterwards, the device performs a self-test. During this process, various LEDs light up.

1.8.1 Device status

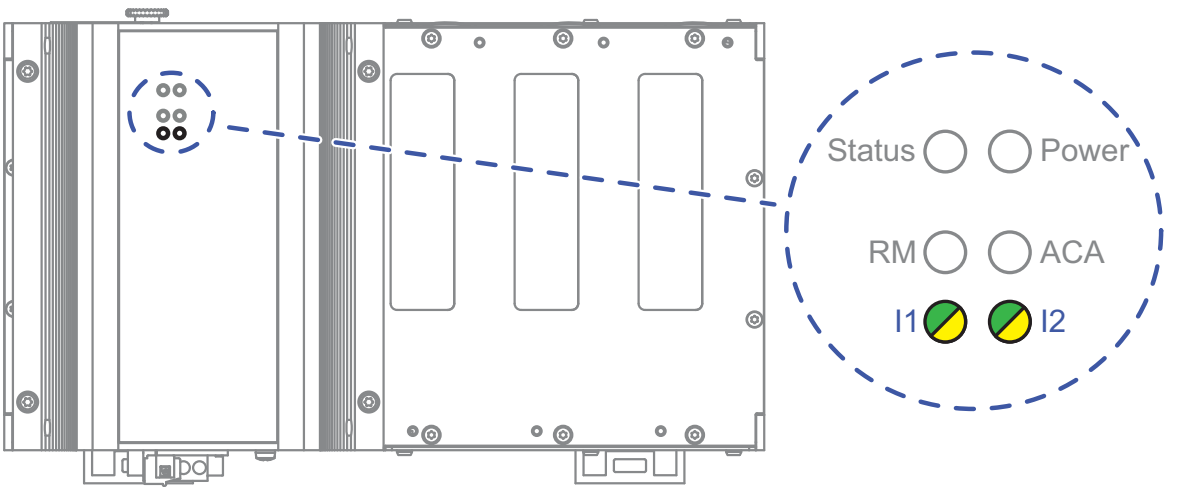
These LEDs provide information about conditions which affect the operation of the whole device.



LED	Display	Color	Activity	Meaning
Power	Supply voltage	—	none	Supply voltage is too low
		yellow	lights up	Device variants with redundant power supply: Supply voltage 1 **or** 2 is on
			flashes 4 × a period	Software update is running. Maintain the power supply.
		green	lights up	Device variants with redundant power supply: Supply voltage 1 **and** 2 is on
				Device variants with single power supply: Supply voltage is on
Status	Device status	—	none	Device is starting and/or is not ready for operation.
		green	lights up	Device is ready for operation. Characteristics can be configured
		red	lights up	Device is ready for operation. Device has detected at least one error in the monitoring results
			flashes 1 × a period	The boot parameters used when the device has been started differ from the boot parameters saved. Start the device again.
			flashes 4 × a period	Device has detected a multiple IP address
RM	Redundancy Manager	—	none	No redundancy configured
		green	lights up	Redundancy exists
			flashes 1 × a period	Device is reporting an incorrect configuration of the RM function
		yellow	lights up	No redundancy exists

LED	Display	Color	Activity	Meaning
ACA	Storage medium ACA	—	none	ACA storage medium not connected
		green	lights up	ACA storage medium connected
			flashes 3 × a period	Device writes to/reads from the storage medium
		yellow	lights up	ACA storage medium inoperative

1.8.2 Digital input



LED	Display	Color	Activity	Meaning
I1	LED display element for input	—	none	Low level input voltage
		green	lights up	High level input voltage
I2	LED display element for input	—	none	Low level input voltage
		green	lights up	High level input voltage

1.8.3 MSM20 media modules

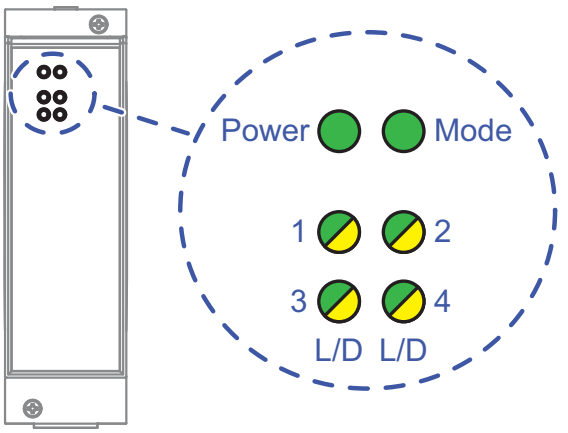


Figure 1: MSM20 media modules: display elements (front view)

LED	Display	Color	Activity	Meaning
Power	Supply voltage	—	none	Media module is inoperative
		green	lights up	Voltage supply to the media module is on
Mode	Device status	—	none	The media module is connected to the Fast Ethernet slot.
		green	lights up	The media module is connected to the Gigabit Ethernet slot.
L/D	Link status	—	none	Device detects an invalid or missing link
		green	lights up	Device detects a valid link
			flashes 1 × a period	Port is switched to stand-by
			flashes 3 × a period	Port is switched off
		yellow	lights up	Device detects a non-supported SFP transceiver or a non-supported data rate
			flashing	Device is transmitting and/or receiving data
			flashes 1 × a period	Device detects at least one unauthorized MAC address (Port Security Violation)

Table 28: Device status and port status for MSM20 media modules

1.8.4 MSM40 media modules

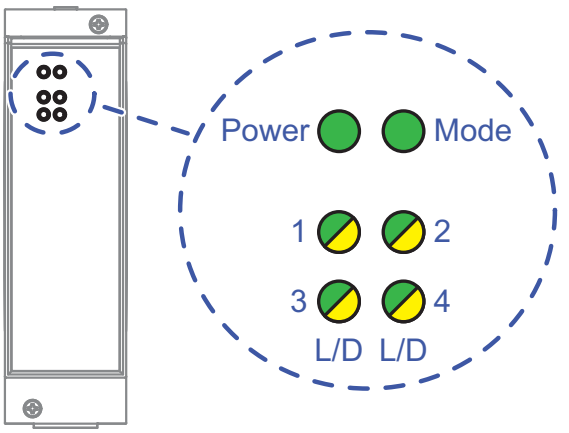


Figure 2: MSM40 media modules: display elements (front view)

LED	Display	Color	Activity	Meaning
Power	Supply voltage	—	none	Media module is inoperative
		green	lights up	Voltage supply to the media module is on
Mode	Device status	—	none	The media module is connected to the Fast Ethernet slot.
		green	lights up	The media module is connected to the Gigabit Ethernet slot.
L/D	Link status	—	none	Device detects an invalid or missing link
		green	lights up	Device detects a valid link
			flashes 1 × a period	Port is switched to stand-by
			flashes 3 × a period	Port is switched off
		yellow	lights up	Device detects a non-supported SFP transceiver or a non-supported data rate
			flashing	Device is transmitting and/or receiving data
			flashes 1 × a period	Device detects at least one unauthorized MAC address (Port Security Violation)

Table 29: Device status and port status for MSM40 media modules

1.8.5 MSM22, MSM42 and MSM46 media modules

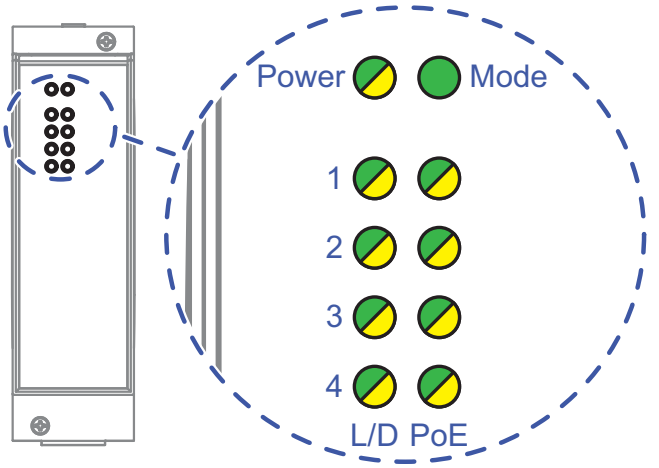


Figure 3: MSM22, MSM42 and MSM46 media modules: display elements (front view)

LED	Display	Color	Activity	Meaning
Power	Supply voltage	—	none	Media module is inoperative
		green	lights up	Voltage supply to the media module is on Voltage supply to the PoE port is on
		yellow	lights up	PoE voltage is missing or is too low
Mode	Device status	—	none	The media module is connected to the Fast Ethernet slot.
		green	lights up	The media module is connected to the Gigabit Ethernet slot.
L/D	Link status	—	none	Device detects an invalid or missing link
		green	lights up	Device detects a valid link
			flashes 1 × a period	Port is switched to stand-by
			flashes 3 × a period	Port is switched off
		yellow	lights up	Device detects a non-supported SFP transceiver or a non-supported data rate
			flashing	Device is transmitting and/or receiving data
			flashes 1 × a period	Device detects at least one unauthorized MAC address (Port Security Violation)
PoE	PoE status	green	lights up	Powered device is supplied with PoE voltage.
			flashes 3 × a period	PoE administrator status deactivated
		yellow	flashes 1 × a period	Output budget has been exceeded Device has detected a connected powered device

Table 30: Device status and port status for MSM22, MSM42 and MSM46 media modules

1.8.6 MSM50 media modules

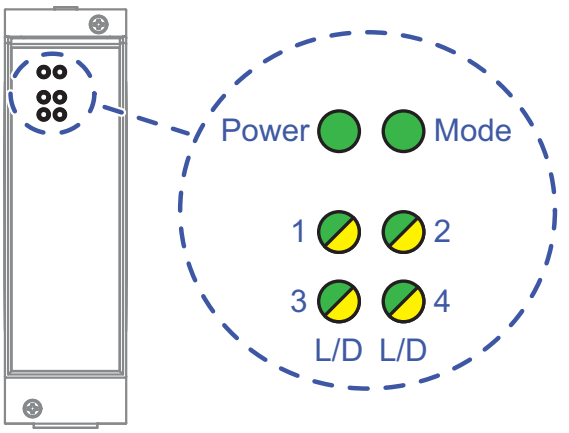


Figure 4: MSM50 media modules: display elements (front view)

LED	Display	Color	Activity	Meaning
Power	Supply voltage	—	none	Media module is inoperative
		green	lights up	Voltage supply to the media module is on
Mode	Device status	green	lights up	The media module is connected to the Gigabit Ethernet slot.
L/D	Link status	—	none	Device detects an invalid or missing link
		green	lights up	Device detects a valid link
			flashes 1 × a period	Port is switched to stand-by
			flashes 3 × a period	Port is switched off
		yellow	lights up	Device detects a non-supported SFP transceiver or a non-supported data rate
			flashing	Device is transmitting and/or receiving data
			flashes 1 × a period	Device detects at least one unauthorized MAC address (Port Security Violation)

Table 31: Device status and port status for MSM50 media modules

1.8.7 MSM60 media modules

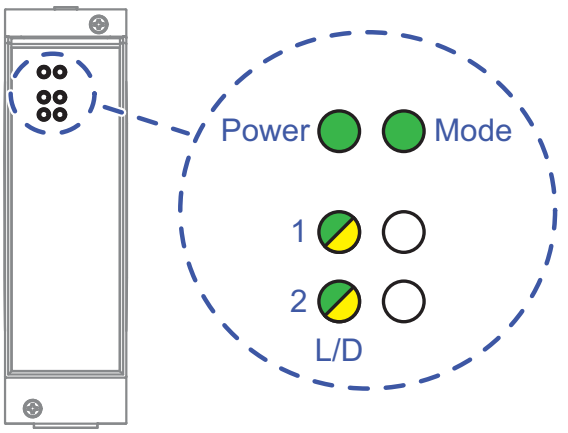


Figure 5: MSM60 media modules: display elements (front view)

LED	Display	Color	Activity	Meaning
Power	Supply voltage	—	none	Media module is inoperative
		green	lights up	Voltage supply to the media module is on
Mode	Device status	green	lights up	The media module is connected to the Gigabit Ethernet slot.
L/D	Link status	—	none	Device detects an invalid or missing link LED display elements are not functional in the existing device version.
		green	lights up	Device detects a valid link
			flashes 1 × a period	Port is switched to stand-by
			flashes 3 × a period	Port is switched off
		yellow	lights up	Device detects a non-supported SFP transceiver or a non-supported data rate
			flashing	Device is transmitting and/or receiving data
			flashes 1 × a period	Device detects at least one unauthorized MAC address (Port Security Violation)
Unmarked	none	—	none	LED display elements are not functional in the existing device version.

Table 32: Device status and port status for MSM60 media modules

1.8.8 MSM24 I/O media module

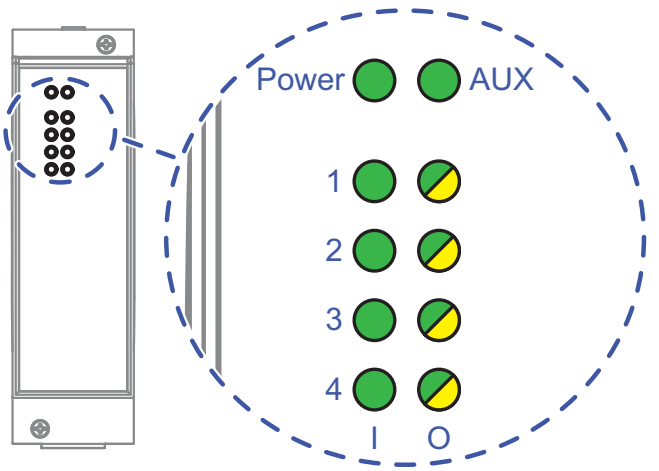


Figure 6: MSM24 I/O media modules: display elements (front view)

LED	Display	Color	Activity	Meaning
Power	Supply voltage	—	none	The I/O module is not operating.
		green	lights up	The voltage supply to the I/O module is on.
AUX	Device status	—	none	The auxiliary supply voltage is not on **or** is too low.
		green	lights up	The auxiliary supply voltage is on.
Input (I)	Digital input	—	none	Input voltage: low level
		green	lights up	Input voltage: high level
Output (O)	Digital output	—	none	The output relay is deactivated (idle status).
		green	lights up	The output relay is activated.
		yellow	flashes 3 × a period	The synchronization of the digital output with the assigned input has failed.

Table 33: Device status and I/O status for MSM24 I/O module

1.9 Management interfaces

1.9.1 V.24 interface (external management)

A serial interface is provided on the RJ45 socket (V.24 interface) for the local connection of an external management station (VT100 terminal or PC with corresponding terminal emulation). This gives you the option to set up a connection to the Command Line Interface (CLI) and to the system monitor.

VT100 terminal settings	
Speed	9600 Baud
Data	8 bit
Stopbit	1 bit
Handshake	off
Parity	none

The socket housing is electrically connected to the front panel of the device. The V.24 interface is electrically insulated from the supply voltage.

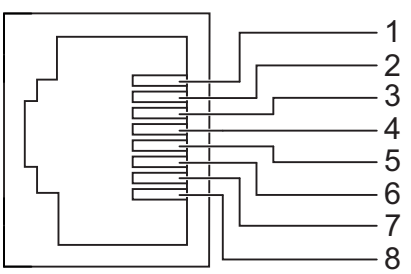
Figure	Pin assignment	Function
	1	—
	2	—
	3	TX
	4	GND
	5	—
	6	RX
	7	—
	8	—

Table 34: Pin assignment of the V.24 interface

Note: For information about the position on the device see “View from below” on page 26.
The Terminal cable is available as an accessory.
See “Accessories” on page 93.

1.9.2 SD card interface (optional)

Exclusively applies to device variants featuring customer-specific version with the characteristic value HH.

The SD card interface allows you to connect the AutoConfiguration Adapter ACA31 storage medium. This is used for saving/loading the configuration data and diagnostic information, and for loading the software.

Note: For information about the position on the device see “View from above” on page 27.

On the front of the device there is an LED display that informs you about the status of the interface.

1.9.3 USB interface

Note: Applies to approval DNV:
Note that the USB interface of the MSP30/32/40/42 is exclusively for service purposes. Do not connect any USB adapter during normal operation.

The USB interface allows you to connect the AutoConfiguration Adapter ACA22 storage medium. This is used for saving/loading the configuration data and diagnostic information, and for loading the software.
The device supports the ACA22 starting with the software version 3.0.

The USB interface has the following properties:
- Supplies current of max. 500 mA
- Voltage not potential-separated
- Connectors: type A
- Supports the USB master mode
- Supports USB 2.0

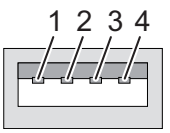
Figure	Pin	Function
	1	VCC (VBus)
	2	- Data
	3	+ Data
	4	Ground (GND)

Table 35: Pin assignment of the USB interface

Note: For information about the position on the device see “View from below” on page 26.

1.10 Input/output interfaces

1.10.1 Signal contact

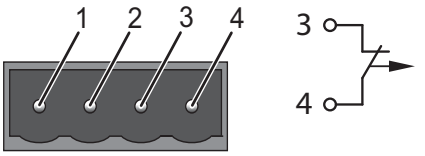
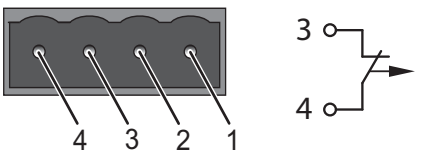
Figure	Pin	Function
Connection for the power supply including signal contact P1		
	1	Plus terminal of the supply voltage
	2	Minus terminal of the supply voltage
	3	**FAULT**
	4	**FAULT**
Connection for the power supply including signal contact P2		
	1	Plus terminal of the supply voltage
	2	Minus terminal of the supply voltage
	3	**FAULT**
	4	**FAULT**

Table 36: Pin assignment of the 4-pin terminal block for the connection of the signal contact

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. You will find the software user documentation as PDF files on the Internet at https://www.doc.hirschmann.com

Note: For information about the position on the device see “View from below” on page 26.

1.10.2 Digital input

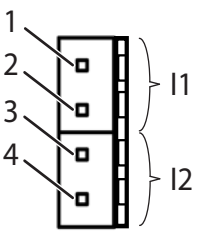
Figure		Pin	Signal, terminal	Function
	Input 1 (I1)	1	IN-1	Signal input, channel 1
		2	IN-1-GND	Reference potential, channel 1
	Input 2 (I2)	3	IN-2	Signal input, channel 2
		4	IN-2-GND	Reference potential, channel 2

Table 37: Pin assignment of the input interface

Note: For information about the position on the device see “View from below” on page 26.

2 Installation

The devices have been developed for practical application in a harsh industrial environment.
Hirschmann supplies the device ready for operation.

Perform the following steps to install and configure the device:

- Checking the package contents
- Installing the SD card (optional)
- Installing and grounding the device
- Connecting the terminal blocks
- Installing terminal blocks, switching on the supply voltage
- Installing media modules
- Connecting an I/O module
- Installing an SFP transceiver (optional)
- Connecting data cables

2.1 Checking the package contents

☐ Check whether the package includes all items named in the section “Scope of delivery” on page 93.
☐ Check the individual parts for transport damage.

2.2 Installing the SD card (optional)

Exclusively applies to device variants featuring customer-specific version with the characteristic value HH.

Note: Only use the AutoConfiguration Adapter ACA31 storage medium. See “Accessories” on page 93.

☐ Deactivate the write protection on the SD card by pushing the write-protect lock away from the middle of the card.
☐ Push the SD card into the slot with the beveled corner facing upwards.
☐ Tighten the thumb screw hand-tight to fix the SD card.

Note: For information about the position on the device see “View from above” on page 27.

2.3 Installing and grounding the device

⚠ WARNING

FIRE HAZARD

Install the device in a fire enclosure according to IEC 60950-1.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

⚠ CAUTION

BURNING HAZARD

The surfaces of the device casing may become hot. Avoid touching the device while it is operating.
If ambient temperatures are ≥45 °C (≥113 °F), exclusively install the device in “restricted access locations” according to IEC 60950-1.

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

☐ When you are selecting the installation location, make sure you observe the climatic threshold values specified in the technical data.
Prevent heat from the surroundings from affecting the device.
☐ Verify that there is at least 10 cm (4 in) of space above and below the device.
☐ Verify that there is at least 2 cm (0.8 in) of space on the right and left sides of the device.

2.3.1 Installing the device onto the DIN rail

The device variants featuring the customer-specific version with characteristic value HH are suitable for installation on a DIN rail.
Perform the following work steps:
☐ Mount the device on a horizontally mounted 1.38 in. (35 mm) DIN rail in accordance with DIN EN 60715.
☐ Insert the upper snap-in guide of the device into the DIN rail and press the device down against the DIN rail until it snaps into place.

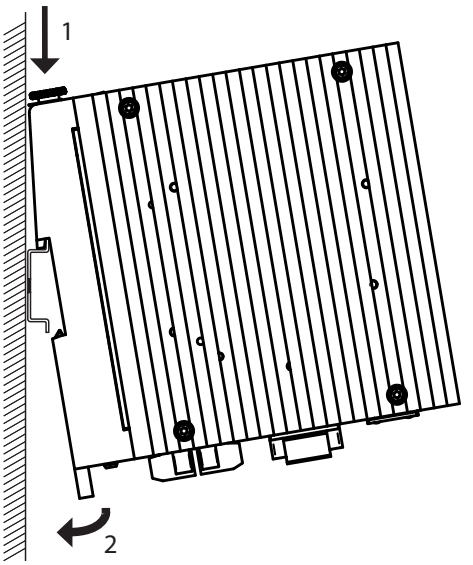


Figure 7: Mounting on the DIN rail

2.3.2 Mounting on a flat surface

The device variants featuring the customer-specific version with characteristic value HX are suitable for installation on a flat surface.
Perform the following work steps:

☐ You will find the drilling dimensions for mounting the device in the chapter“Dimension drawings” on page 78.

☐ Mount the device with cylinder head screws M4 × 30 to the flat surface.

2.3.3 Grounding the device

⚠ WARNING

ELECTRIC SHOCK

Ground the device before connecting any other cables.

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

The device is grounded via the separate ground screw on the bottom right of the bottom of the device.
Both power supply unit variants have a function ground.

☐ Ground the device via the ground screw.
You find the prescribed tightening torque in chapter:
“General technical data” on page 73

Note: For information about the position on the device see “View from below” on page 26.

2.4 Connecting the terminal blocks

WARNING

ELECTRIC SHOCK

Never insert pointed objects (narrow screwdrivers, wires, etc.) into the device or into the connection terminals for electric conductors.
Do not touch the connection terminals.

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

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

2.4.1 Supply voltage with characteristic value C

You have the option of supplying the supply voltage redundantly, without load distribution.
Both supply voltage inputs are uncoupled.

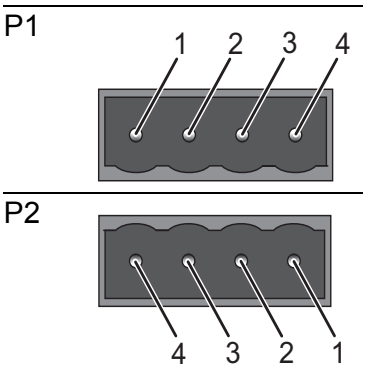


Table 38: Supply voltage characteristic value C: 2 × 4 pin terminal block

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment	Pin	Terminal block
DC voltage	Rated voltage range 24 V DC ... 48 V DC Voltage range incl. maximum tolerances 18 V DC ... 60 V DC	Plus terminal of the supply voltage	1	P1
			1	P2
		Minus terminal of the supply voltage	2	P1
			2	P2

Table 39: Supply voltage with the characteristic value C: type and specification of the supply voltage, connections

☐ Remove the terminal connector from the device.
☐ Connect the protective conductor with the clamp.
☐ Connect the lines for the supply voltage to the + and - terminals.

With non-redundant supply of the mains voltage, the device reports a power failure. You can avoid this message by changing the configuration in the management, or, with power supply units of the same type, by feeding the supply voltage in through both inputs.

2.4.2 Supply voltage with the characteristic value P

You have the option of supplying the supply voltage redundantly, without load distribution.
Both supply voltage inputs are uncoupled.

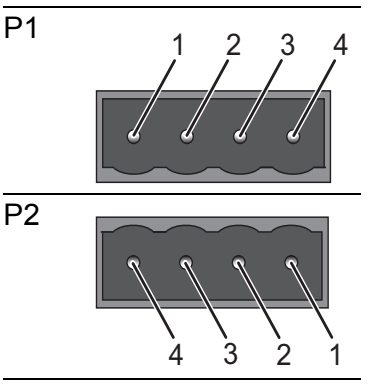


Table 40: Supply voltage characteristic value P: 2 × 4 pin terminal block

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment	Pin	Terminal block
Device variants with PoE: DC voltage	Rated voltage 48 V DC Voltage range incl. maximum tolerances 45 V DC ... 57 V DC	Plus terminal of the supply voltage	1	P1
			1	P2
		Minus terminal of the supply voltage	2	P1
			2	P2
Device variants with PoE Plus: DC voltage	Rated voltage 54 V DC Voltage range incl. maximum tolerances 51 V DC ... 57 V DC	Plus terminal of the supply voltage	1	P1
			1	P2
		Minus terminal of the supply voltage	2	P1
			2	P2

Table 41: Supply voltage with the characteristic value P: type and specification of the supply voltage, connections

☐ Remove the terminal connector from the device.
☐ Connect the protective conductor with the clamp.
☐ Connect the lines for the supply voltage to the + and - terminals.

2.4.3 Signal contact

For every signal contact to be connected, make sure the following requirements are met:

- The electrical wires are voltage-free.
- The connected voltage is limited by a current limitation device or a fuse. Observe the electrical threshold values for the signal contact.
  See “General technical data” on page 73.

☐ Connect the signal contact lines with the terminal block connections.

2.5 Connecting the ferrite

Applies to device variants with approvals for marine applications.
To adhere to EMC conformity, you connect the ferrite supplied to the voltage input via the power supply cable.

☐ Insert the power supply cable through the ferrite 3 times.
☐ Position the ferrite as close as possible to the voltage input (max. distance 50 cm (19.7 in)).
☐ Lock the ferrite.

Note: To open the ferrite use the key supplied.

Figure 8: Connecting the ferrite to the power supply cable

2.6 Installing terminal blocks, switching on the supply voltage

⚠ WARNING

ELECTRIC SHOCK

Connect only a supply voltage that corresponds to the type plate of your device.

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

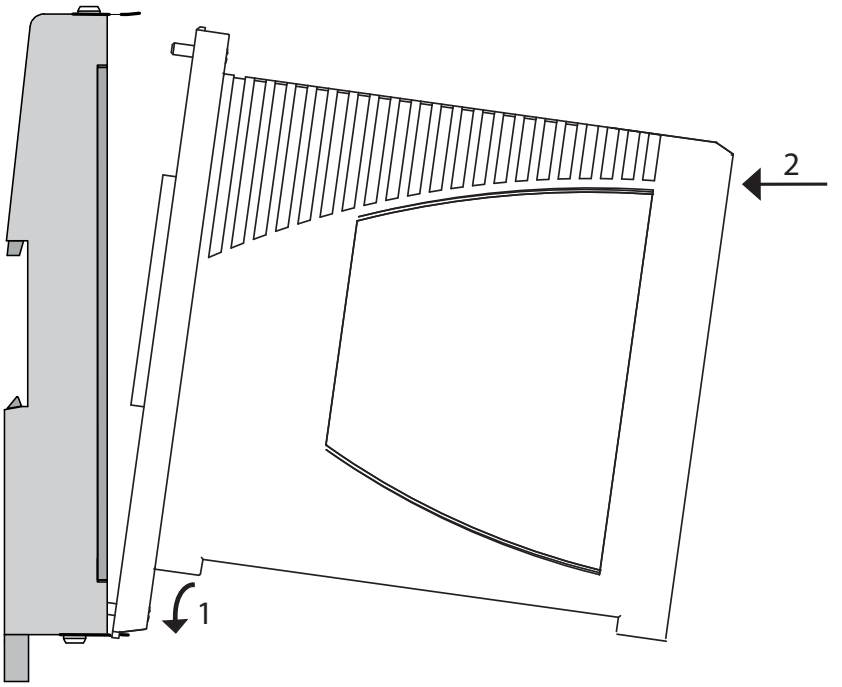
☐ Use screws to secure the connectors to the device.
You find the prescribed tightening torque in chapter:
“General technical data” on page 73
☐ Enable the supply voltage.

Note: Enable the supply voltage for the device only when the following requirements are fulfilled:
☐ the device casing is closed
☐ the terminal blocks are wired correctly
☐ the terminal blocks for the supply voltage are connected

2.7 Installing media modules

Hirschmann supplies the media modules ready for operation.
You have the option to mount the media modules while the device is operating.

2.7.1 Device variants featuring customer-specific version with the characteristic value HH



Perform the following work steps:

☐ Remove the protective cap from the slot for the media module on the device.

☐ Insert the latch on the bottom of the media module into the opening in the lower positioning bar of the basic device.

☐ Press the media module against the basic device until the latch on the top of the media module snaps into the upper female multipoint connector.

☐ Fasten the media modules with 2 screws in the backplane.
You find the prescribed tightening torque in chapter:
“General technical data” on page 73

Note: On the basic device MSP40/42 and MSP30/32 Rev. 2, the media module slot 1 is coded differently from the other slots. Exclusively MSM50 or MSM60 media modules can be installed on this media module slot.

2.7.2 Connecting the external PoE supply voltage of media module MSM46

☐ Remove the terminal connector from the device.

☐ Connect the protective conductor with the clamp.

☐ Connect the PoE voltage to the 3-pin terminal block.
You find the prescribed tightening torque in chapter:
“General technical data” on page 73

The supply voltage inputs are designed for operation with safety extra-low voltage. Connect only SELV circuits with voltage restrictions in line with IEC/EN 60950-1 to the supply voltage connections.

Make sure that the connected supply voltage complies the requirements of IEEE 802.3af or IEEE 802.3at:

- For the use of type-1-powered devices (PoE):
  Rated voltage: 48 V DC
  Max. voltage range: 45 V DC ... 57 V DC
- For the use of Type 2 Powered Devices (PoE+):
  Rated voltage: 54 V DC
  Max. voltage range: 51 V DC ... 57 V DC
- Max. PoE power: 62 W

2.8 Connecting an I/O module

2.8.1 Connecting actuators and sensors

To connect an external device, proceed as follows:

☐ Release the terminal blocks for the digital inputs and digital outputs from the bottom of the I/O module.

☐ Connect the digital outputs and digital inputs of the MSM24 I/O module as required.
See “MSM24 I/O media module” on page 32.

You can select from 3 different connection constellations:

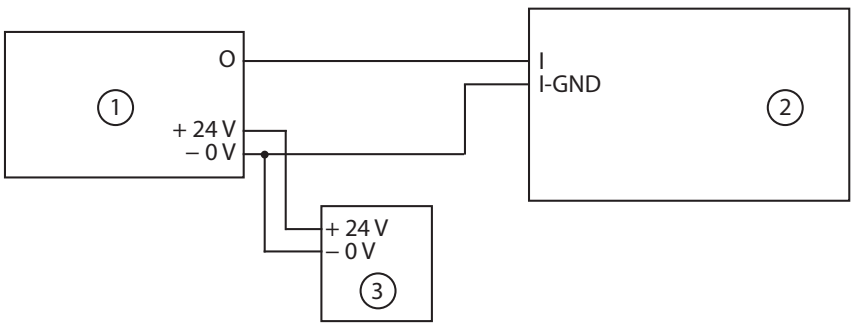


Figure 9: Connection of a sensor with separate voltage supply
1 - Sensor
2 - MSM24 module
3 - Separate voltage supply for sensor

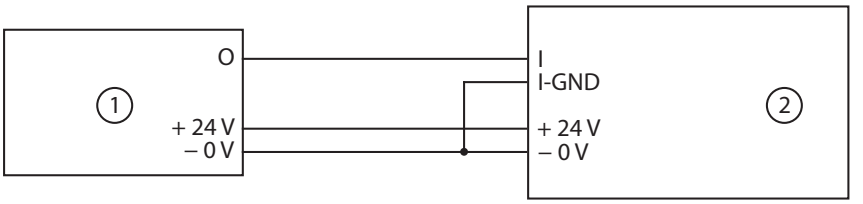


Figure 10: Connection of a sensor with auxiliary voltage supply
1 - Sensor
2 - MSM24 module

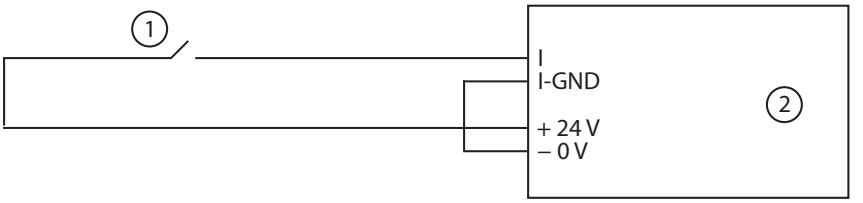


Figure 11: Circuit via auxiliary voltage supply
1 - Switch (2-wire sensor)
2 - MSM24 module

☐ If required, connect the 24 V DC auxiliary voltage (see table 20).

Note: Make sure not to exceed the maximum load (see on page 73 “General technical data”).

☐ Push the terminal blocks back onto the I/O module. Tighten the screws on the terminal blocks.
You find the prescribed tightening torque in chapter:
“General technical data” on page 73

☐ You start the operation of the I/O module by connecting the supply voltage via the terminal block or the terminal blocks to the basic device MSP30/ 32/40/42.

2.9 Installing an SFP transceiver (optional)

Prerequisites:
Exclusively use Hirschmann SFP transceivers.
See “Accessories” on page 93.

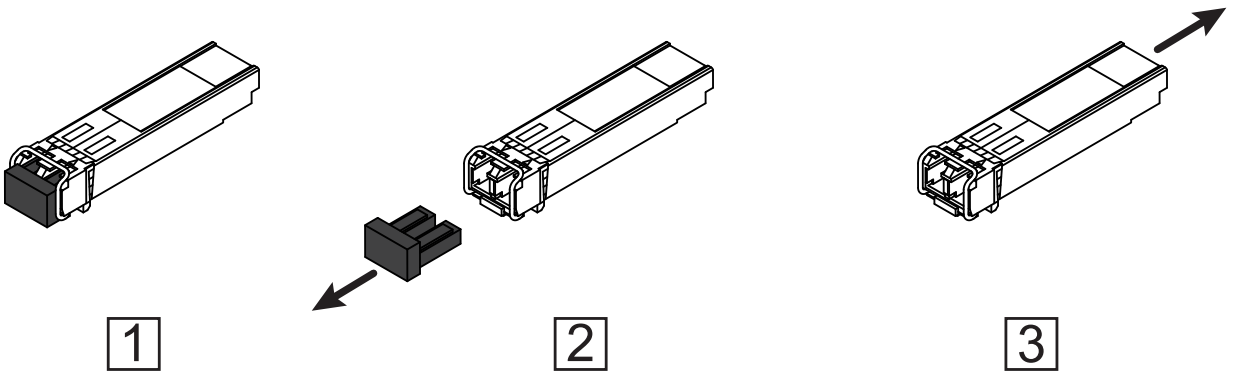


Figure 12: Installing SFP transceivers: Installation sequence

Perform the following work steps:
- ☐ 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).

2.10 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. Ideally, install the cables in separate cable channels.
- ☐ Verify that power supply cables and data cables do not run parallel over longer distances. To reduce inductive coupling, verify that the power supply cables and data cables cross at a 90° angle.
- ☐ Use shielded data cables for gigabit transmission via copper cables, for example SF/UTP cables according to ISO/IEC 11801. To meet EN 50121-4 and marine application requirements, use shielded data cables at all transmission rates.
- ☐ Connect the data cables according to your requirements.
  See “Ethernet ports” on page 38.

Note: Verify that you connect only optical ports with the same optical transmission properties with each other.

Note: For media modules with M12 sockets: Screw all data cables to the media modules.
You find the prescribed tightening torque in chapter:
“General technical data” on page 73
Also note the plug manufacturer's specifications.

2.10.1 10/100 Mbit/s twisted pair port

Further information:
See “10/100 Mbit/s twisted pair port” on page 38.
☐ Connect the data cables according to your requirements.

2.10.2 10/100/1000 Mbit/s twisted pair port

Further information:
See “10/100/1000 Mbit/s twisted pair port” on page 40.
☐ Connect the data cables according to your requirements.

2.10.3 100 Mbit/s F/O port

Further information:
See “100 Mbit/s F/O port” on page 40.
☐ Connect the data cables according to your requirements.

2.10.4 100/1000 Mbit/s F/O port

Further information:
See “100/1000 Mbit/s F/O port” on page 40.
☐ Connect the data cables according to your requirements.

2.10.5 1/2.5 Gbit/s F/O port

Further information:
See “1/2.5 Gbit/s F/O port” on page 41.
☐ Connect the data cables according to your requirements.

2.10.6 1/10 Gbit/s F/O port

Further information:
See “1/10 Gbit/s F/O port” on page 41.
☐ Connect the data cables according to your requirements.

3 Basic Settings

The IP parameters must be entered when the device is installed for the first time. The device provides the following options for configuring IP addresses:

- AutoConfiguration Adapter
- Input via the HiView or Industrial HiVision application. You find further information about the applications HiView or Industrial HiVision on the Internet at the Hirschmann product pages:
  HiView
  http://www.hirschmann.com/en/QR/INET-HiView
  Industrial HiVision
  http://www.hirschmann.com/en/QR/INET-Industrial-HiVision
- Input via the V.24 interface
- Configuration via BOOTP
- Configuration via DHCP (Option 82)

You will find more information in the “Basic Configuration User Manual”.

- **Default settings**
  - Ethernet ports: link status is not evaluated (signal contact)
  - IP address: The device looks for the IP address using DHCP
  - Optical ports: Full duplex
    TP ports: Autonegotiation
  - Management password:
    user, password: public (read only)
    admin, password: private (read/write)
  - Rapid Spanning Tree Protocol: activated
  - V.24 data rate: 9600 Baud

3.1 First log in (password change)

Perform the following steps:

- ☐ Open the Graphical User Interface or the Command Line Interface the first time you log on to the device.
- ☐ Log on to the device with the default password “”. The device prompts you to type in a new password.
- ☐ Type in your new password.
  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 you new password.
- ☐ Log on to the device again with your new password.

4 Monitoring the ambient air temperature

Operate the device below the specified maximum ambient air temperature exclusively.
See “General technical data” on page 73.

The ambient air temperature is the temperature of the air at a distance of 5 cm (2 in) 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 (Command Line Interface) and the GUI (Graphical User Interface) 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.

5 Upgrading Software

The upgrade options for MSP30/32/40/42 and MSM20/22/24/40/42/46/50/60 device depend on the software level of the device.
See “Device name and product code” on page 19.

Note: For software version 04.0 or higher, “HiOS” is available as a common software image for all software levels.
You select only the desired redundancy function during the installation of the image. After finishing the installation and manually restarting the device, the device automatically activates the functions of the software level saved in the product code.

Software version		Software level according to the product code		
		2A	3A (UR)	3A (MR)
Up to HiOS 03.0	Name of the software image	HiOS-2A	HiOS-2A	HiOS-2A
	Range of functions corresponds to	2A	2A	2A
From HiOS 04.0 onward	Name of the software image	HiOS	HiOS	HiOS
	Range of functions corresponds to	2A	3A (UR)	3A (MR)

Table 42: Upgrade options

Note: MSP40 or MSP42 basic devices exclusively support the full range of functions of MSM60 media modules starting with software version 7.5.01 or higher.
You find the latest software version on the Internet on the Hirschmann product pages at www.hirschmann.com.

6 Maintenance and service

- When designing this device, Hirschmann 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.
- Hirschmann is continually working on improving and developing their software. Check regularly whether there is an updated version of the software that provides you with additional benefits. You find information and software downloads on the Hirschmann product pages on the Internet (http://www.hirschmann.com).
- Depending on the degree of pollution in the operating environment, check at regular intervals that the ventilation slots in the device are not obstructed.
- Internal fuses are triggered only in the case of a detected error in the device. In case of damage or malfunction of the device, turn off the supply voltage and return the device to the plant for inspection.

Note: You find information on settling complaints on the Internet at http://www.beldensolutions.com/en/Service/Repairs/index.phtml.

7 Disassembly

7.1 Removing an SFP transceiver (optional)

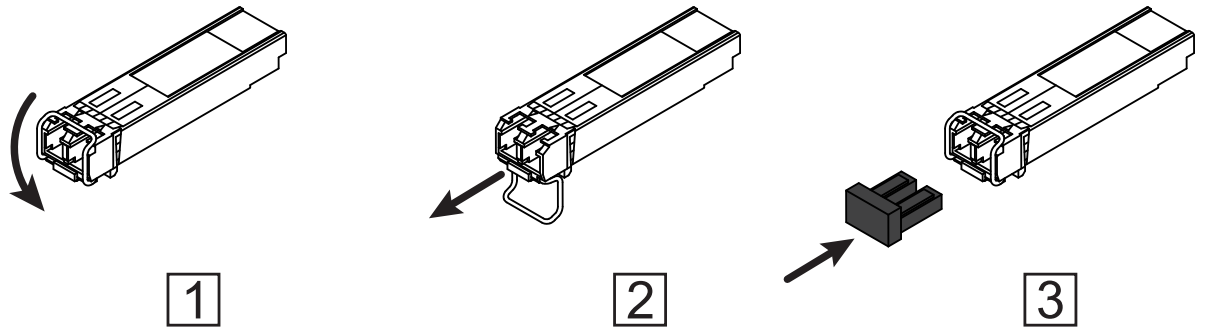


Figure 13: De-installing SFP transceivers: De-installation sequence

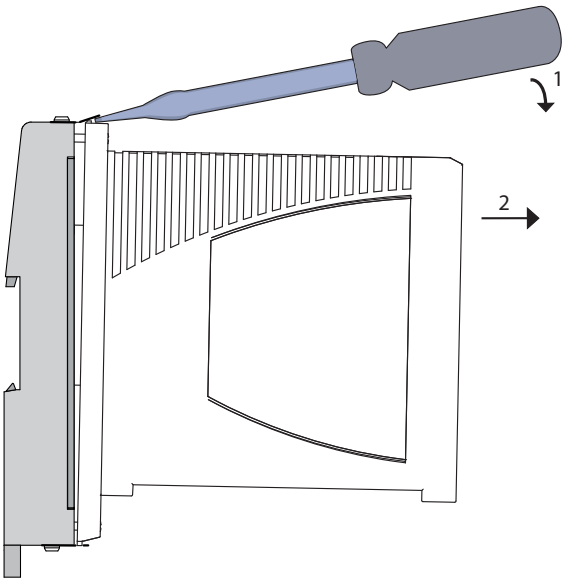
Perform the following work steps:

☐ 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).

7.2 Removing a media module

You have the option to remove the media modules while the device is operating.

7.2.1 Device variants featuring customer-specific version with the characteristic value HH



Perform the following work steps:

- ☐ Disable the supply voltage.
- ☐ Additionally with MSM24/MSM46: Disconnect the terminal block.
- ☐ Disconnect the data cables.
- ☐ Remove the 2 screws.
- ☐ Insert a screwdriver between the female multipoint connector and the media module.
- ☐ Use the screwdriver to carefully lever the female multipoint connector away from the media module and pull the media module out of the slot.

7.3 Removing the device

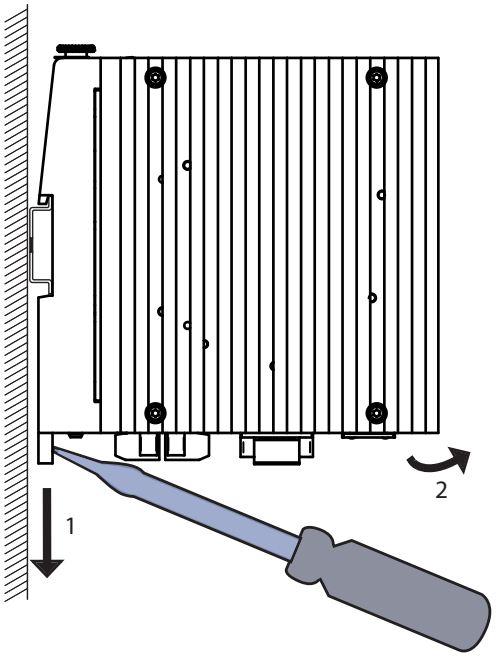
⚠ WARNING

ELECTRIC SHOCK

Disconnect the grounding only after disconnecting all other cables.

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

7.3.1 Device variants featuring customer-specific version with the characteristic value HH



Perform the following work steps:

- ☐ Disable the supply voltage.
- ☐ Disconnect the data cables.
- ☐ Disconnect the terminal blocks.
- ☐ Disconnect the grounding.
- ☐ Insert a screwdriver horizontally below the casing into the locking gate.
- ☐ Without tilting the screwdriver, pull the locking gate down and tilt the device upwards.

8 Technical data

8.1 General technical data

Basic device

Dimensions W × H × D	MSP30/32-0804.....HH...	See figure 14 on page 78.	
	MSP40/42-0012.....HH...		
	MSP30/32-1604.....HH...	See figure 15 on page 79.	
	MSP40/42-0020.....HH...		
	MSP30/32-2404.....HH...	See figure 16 on page 79.	
	MSP40/42-0028.....HH...		
Weight	MSP30-0804.....HH...	2.1 kg (4.6 lb)	
	MSP40-0012.....HH...		
	MSP32-0804.....HH...	2.2 kg (4.9 lb)	
	MSP42-0012.....HH...		
	MSP30-1604.....HH...	2.4 kg (5.3 lb)	
	MSP40-0020.....HH...		
	MSP32-1604.....HH...	2.5 kg (5.5 lb)	
	MSP42-0020.....HH...		
	MSP30-2404.....HH...	2.65 kg (5.9 lb)	
	MSP40-0028.....HH...		
	MSP32-2404.....HH...	2.75 kg (6.1 lb)	
	MSP42-0028.....HH...		
Supply voltage with characteristic value C	Rated voltage range	24 V DC ... 48 V DC	
	Voltage range incl. maximum tolerances	18 V DC ... 60 V DC	
	Connection type	4-pin terminal block	
		max. conductor cross section AWG12 (2.5 mm²)	
	Power loss buffer	>10 ms at 20.4 V DC (only applies to the basic device)	
	Overload current protection on the device	Non-replaceable fuse	
	Back-up fuse	Nominal rating:	6.3 A
		Characteristic:	slow blow
	Peak inrush current	<5 A	

Supply voltage with the characteristic value P	Rated voltage	Device variants with PoE:	48 V DC
		Device variants with PoE Plus:	54 V DC
	Voltage range incl. maximum tolerances	Device variants with PoE:	45 V DC ... 57 V DC
		Device variants with PoE Plus:	51 V DC ... 57 V DC
	Max. PoE power	124 W[a]	
	Connection type	4-pin terminal block	
		max. conductor cross section AWG12 (2.5 mm²)	
	Power loss buffer	>10 ms at 20.4 V DC (only applies to the basic device)	
	Overload current protection on the device	Non-replaceable fuse	
	Back-up fuse	Nominal rating:	6.3 A
		Characteristic:	slow blow
	Peak inrush current	<5 A	
Climatic conditions during operation	Ambient air temperature[b]	Devices with operating temperature characteristic value S (Standard): 0 °C ... +60 °C (+32 °F ... +140 °F)[c]	
		Devices with operating temperature characteristic value E and T (extended): -40 °C ... +70 °C (-40 °F ... +158 °F)[d, e]	
		under UL conditions: max. +140 °F (+60 °C)	
	Humidity	5 % ... 95 % (non-condensing)	
	Air pressure	min. 700 hPa (+3000 m ASL; +9842 ft ASL) max. 1060 hPa (-400 m ASL; -1312 ft ASL)	
Climatic conditions during storage	Ambient air temperature[a]	-40 °C ... +85 °C (-40 °F ... +185 °F)	
	Humidity	5 % ... 95 % (non-condensing)	
	Air pressure	min. 700 hPa (+3000 m ASL; +9842 ft ASL) max. 1060 hPa (-400 m ASL; -1312 ft ASL)	
Signal contact “FAULT”	Switching current	max. 1 A SELV according to IEC 60950-1 or ES1 according to IEC/EN 62368-1	
	Switching voltage	max. 60 V DC or max. 30 V AC SELV according to IEC 60950-1 or ES1 according to IEC/EN 62368-1	
		under UL conditions: max. 30 V DC, resistive load	
Pollution degree		2	
Protection classes	Laser protection	Class 1 in compliance with IEC 60825-1	
	Degree of protection	IP20	
Tightening torque	4-pin terminal block	0.5 Nm (4.4 lb-in)	
	Grounding screw	0.5 Nm (4.4 lb-in)	

a. The MSP basic devices MSP32 and MSP42 support a PoE power budget of 120 W. You cannot expand the PoE power budget of the basic devices with media modules.
b. Temperature of the ambient air at a distance of 5 cm (2 in) from the device
c. Hirschmann recommends to use SFP transceivers with “EEC” extension.
d. Exclusively use SFP transceivers with the “EEC” extension, otherwise the standard temperature range applies.
e. When using media modules MSM50/MSM60, the maximum ambient air temperature is reduced by 10 °C to -40 °C ... +60 °C (-40 °F ... +140 °F).

Media modules

Dimensions W × H × D	MSM20 MSM22 MSM24 MSM40 MSM42 MSM46 MSM50 MSM60	See “Media modules” on page 80.
Weight[a]	MSM20-xxT1T1T1...	199 g (7.02 oz)
	MSM20-xxxxT1T1...	201 g (7.09 oz)
	MSM20-xxxxxxxx...	249 g (8.78 oz)
	MSM20-T5T5T5T5...HH	220 g (7.76 oz)
	MSM22-T5T5T5T5...	226 g (7.97 oz)
	MSM24-IOIOIOIO...	251 g (8.85 oz)
	MSM40-T1T1T1T1...	193 g (6.81 oz)
	MSM40-C1C1C1C1...	214 g (7.55 oz) without SFP transceiver
	MSM42-T1T1T1T1...	202 g (7.13 oz)
	MSM46-T1T1T1T1...	225 g (7.94 oz)
	MSM50-Q6Q6Q6Q6...	195 g (6.88 oz) without SFP transceiver
	MSM60-Q6Q69999...	216 g (7.62 oz) without SFP transceiver
Climatic conditions during operation	Ambient air temperature[b]	Devices with operating temperature characteristic value S (Standard): 0 °C ... +60 °C (+32 °F ... +140 °F)[c]
		Devices with operating temperature characteristic value E and T (extended): -40 °C ... +70 °C (-40 °F ... +158 °F)[d, e]
		under UL conditions: max. +60 °C (+140 °F)
	Humidity	5 % ... 95 % (non-condensing)
	Air pressure	min. 700 hPa (+3000 m ASL; +9842 ft ASL) max. 1060 hPa (-400 m ASL; -1312 ft ASL)

Climatic conditions during storage	Ambient air temperature[b]	-40 °C ... +85 °C (-40 °F ... +185 °F)
	Humidity	5 % ... 95 % (non-condensing)
	Air pressure	min. 700 hPa (+3000 m ASL; +9842 ft ASL) max. 1060 hPa (-400 m ASL; -1312 ft ASL)
Pollution degree		2
Protection classes	Laser protection	Class 1 in compliance with IEC 60825-1
	Degree of protection	IP20
Tightening torque	2-pin terminal block	0.34 Nm (3 lb-in)
	3-pin terminal block	0.5 Nm (4.4 lb-in)
	8-pin terminal block	0.34 Nm (3 lb-in)
	12-pin terminal block	0.34 Nm (3 lb-in)
	4-pin M12 connector	0.6 Nm (5.3 lb-in)
	Installation on the backplane with screws Device variants with characteristic value HH	0.3 Nm (2.65 lb-in)

a. xx = M2, M4, S2, S4, L2, G2
b. Temperature of the ambient air at a distance of 5 cm (2 in) from the device
c. Hirschmann recommends to use SFP transceivers with “EEC” extension.
d. Exclusively use SFP transceivers with the “EEC” extension, otherwise the standard temperature range applies.
e. When using media modules MSM50/MSM60, the maximum ambient air temperature is reduced by 10 °C to -40 °C ... +60 °C (-40 °F ... +140 °F).

8.2 Digital input

Maximum permitted input voltage range	-32 V DC … +32 V DC
Nominal input voltage	+24 V DC
Input voltage, low level, status “0”	-0.3 V DC ... +5.0 V DC
Input voltage, high level, status “1”	+11 V DC … +30 V DC
Maximum input current at 24 V input voltage	15 mA
Input characteristic according to IEC 61131-2 (current-consuming)	Type 3
Connection type	8-pin terminal block
Tightening torque	0.34 Nm (3 lb-in)

Note: For the pin assignment see “Digital input” on page 52.

8.3 Digital output

Maximum permitted supply voltage	max. 60 V DC or max. 30 V AC SELV according to IEC 60950-1 or ES1 according to IEC/EN 62368-1 under UL conditions: max. 30 V DC, ohmic load
Maximum current load of relay contacts and terminals	1 A
Maximum switching frequency	1 Hz
Relay type	Changeover
Contact voltage	isolated
Protective circuit of relay contacts	No
Digital output acc. to IEC 61131-2 (current-consuming)	Yes
Connection type	12-pin terminal block

Note: For the pin assignment see table 20 on page 33.

8.4 24 V DC auxiliary voltage (AUX)

Output voltage range	+24 V DC ... +27 V DC
Maximum output power	3.0 W
Short-circuit protection	yes (electronically)
Under-voltage deactivation	Yes
Connection type	2-pin terminal block

Note: For the pin assignment see table 20 on page 33.

8.5 External PoE power supply (MSM46)

Rated voltage	Device variants with PoE:	48 V DC
	Device variants with PoE Plus:	54 V DC
Voltage range incl. maximum tolerances	Device variants with PoE:	45 V DC ... 57 V DC
	Device variants with PoE Plus:	51 V DC ... 57 V DC
Max. PoE power		62 W
Connection type		3-pin terminal block
Back-up fuse	Nominal rating:	6.3 A
	Characteristic:	slow blow
Peak inrush current		<5 A

Note: For the pin assignment see “MSM22, MSM42 and MSM46 media modules” on page 46.

8.6 Dimension drawings

Basic device

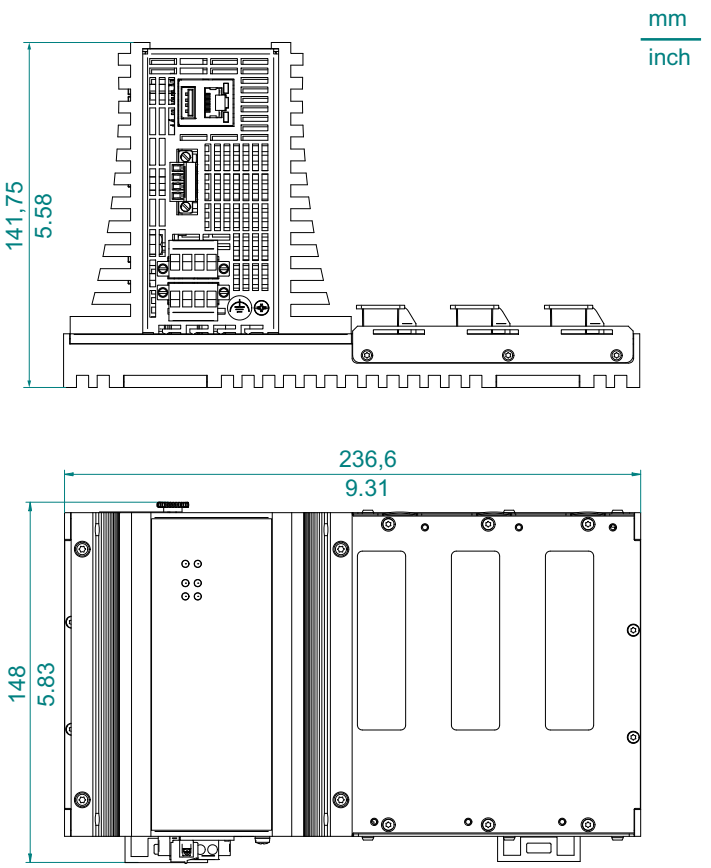


Figure 14: MSP30/32-0804.....HH..., MSP40/42-0012.....HH...

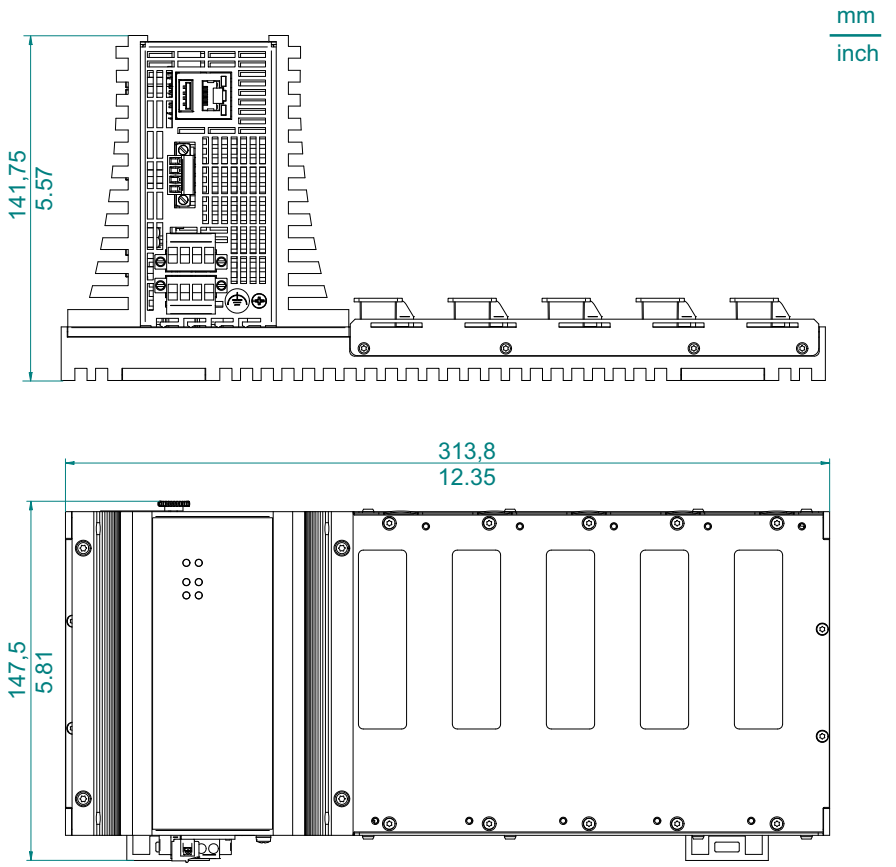


Figure 15: MSP30/32-1604.....HH..., MSP40/42-0020.....HH...

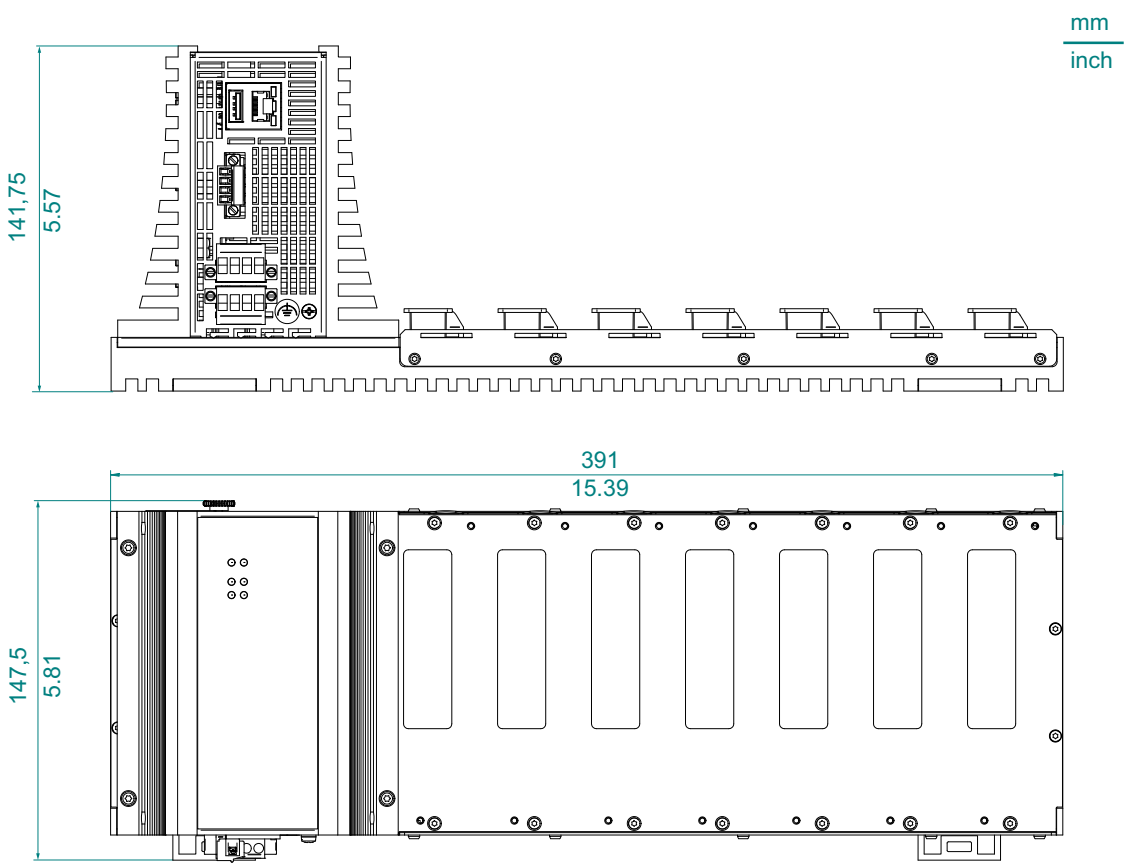


Figure 16: MSP30/32-2404.....HH..., MSP40/42-0028.....HH...

Media modules

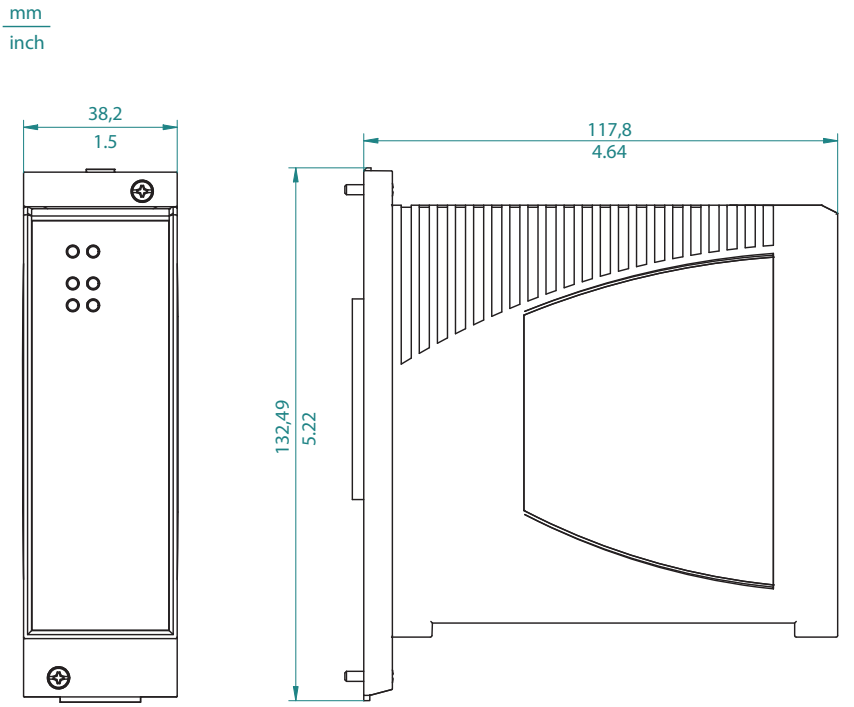


Figure 17: Dimensions for media modules with characteristic value HH

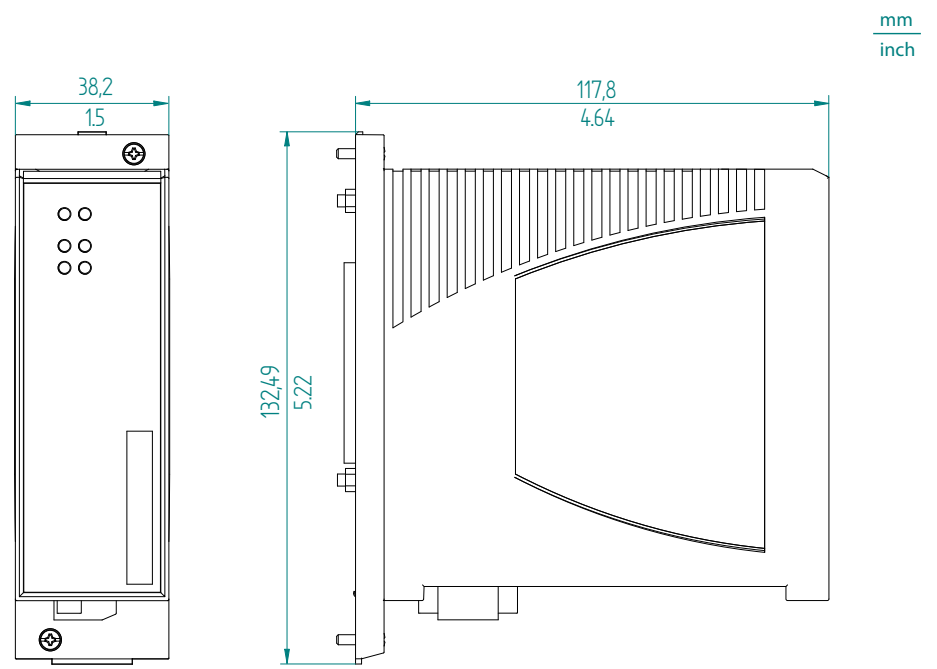


Figure 18: Dimensions for media module MSM46-T1T1T1T1... with characteristic value HH (with terminal block for external PoE supply voltage)

8.7 EMC and immunity

EMC interference emission		Standard applications[a]	Naval applications[b]	Railway applications (trackside) [c]	Substation applications[d]
Radiated emission					
EN 55032		Class A	Class A	Class A	Class A
DNV Guidelines		—	EMC 1	—	—
FCC 47 CFR Part 15		Class A	Class A	Class A	Class A
EN 61000-6-4		Fulfilled	Fulfilled	Fulfilled	Fulfilled
Conducted emission					
EN 55032	DC supply connection	Class A	Class A	Class A	Class A
DNV Guidelines	DC supply connection	—	EMC 1	—	—
FCC 47 CFR Part 15	DC supply connection	Class A	Class A	Class A	Class A
EN 61000-6-4	DC supply connection	Fulfilled	Fulfilled	Fulfilled	Fulfilled
EN 55032	Telecommunication connections	Class A	Class A	Class A	Class A
EN 61000-6-4	Telecommunication connections	Fulfilled	Fulfilled	Fulfilled	Fulfilled

a. EN 61131-2, CE, FCC – applies to all devices
b. Merchant Navy – applies to devices with the approval codes VU, U9, UY
c. EN 50121-4 – applies to devices with the certification codes VT, T9, TY
d. EN 61850-3, IEEE 1613 – applies to devices with the approval codes V9, VY, VU, VT

Note: The PoE media module MSM46 only complies with the requirements of the EMC directive if a suitable power supply unit is connected. Hirschmann recommends RPS 90/48V power supply units. See “Accessories” on page 93.

EMC interference immunity		Standard applications[a]	Naval applications[b]	Railway applications (trackside) [c]	Substation applications[d]
Electrostatic discharge					
EN 61000-4-2 IEEE C37.90.3	Contact discharge	±4 kV	±6 kV	±6 kV	± 8 kV[e]

EMC interference immunity		Standard applications[a]	Naval applications[b]	Railway applications (trackside) [c]	Substation applications[d]
EN 61000-4-2 IEEE C37.90.3	Air discharge	±8 kV	±8 kV	±8 kV	±15 kV
Electromagnetic field					
EN 61000-4-3	80 MHz ... 3000 MHz	max. 10 V/m	max. 10 V/m	max. 20 V/m	max. 10 V/m
IEEE 1613	80 MHz ... 1000 MHz	—	—	—	max. 35 V/m
Fast transients (burst)					
EN 61000-4-4 IEEE C37.90.1	DC supply connection	±2 kV	±2 kV	±2 kV	±4 kV
EN 61000-4-4 IEEE C37.90.1	Data line	±4 kV	±4 kV	±2 kV	±4 kV
Voltage surges - DC supply connection					
EN 61000-4-5	line/ground	±2 kV	±2 kV	±2 kV	±2 kV
IEEE 1613	line/ground	—	—	—	±5 kV
EN 61000-4-5	line/line	±1 kV	±1 kV	±1 kV	±1 kV
Voltage surges - data line					
EN 61000-4-5	line/ground	±1 kV	±1 kV	±2 kV	±2 kV
Conducted disturbances					
EN 61000-4-6	150 kHz ... 80 MHz	10 V	10 V	10 V	10 V
Damped oscillation – DC supply connection					
EN 61000-4-12 IEEE C37.90.1	line/ground	—	—	—	2.5 kV
EN 61000-4-12 IEEE C37.90.1	line/line	—	—	—	1 kV
Damped oscillation – data line					
EN 61000-4-12 IEEE C37.90.1	line/ground	—	—	—	2.5 kV
EN 61000-4-12	line/line	—	—	—	±1 kV
Pulse magnetic field					
EN 61000-4-9		—	—	300 A/m	—

a. EN 61131-2, CE, FCC – applies to all devices
b. Merchant Navy – applies to devices with the approval codes VU, U9, UY
c. EN 50121-4 – applies to devices with the certification codes VT, T9, TY
d. EN 61850-3, IEEE 1613 – applies to devices with the approval codes V9, VY, VU, VT
e. Media modules MSM2x-T5T5T5T5...HH: 6 kV

Immunity		Standard applications[a]	Naval applications[b]	Railway applications (trackside) [c]	Substation applications[d]
IEC 60068-2-6, test Fc	Vibration	5 Hz ... 8.4 Hz with 3.5 mm (0.14 in) amplitude	2 Hz ... 13.2 Hz with 0.04 in (1 mm) amplitude[e]	—	2 Hz ... 9 Hz with 3 mm (0.11 in) amplitude
		8.4 Hz ... 150 Hz with 1 g	13.2 Hz ... 200 Hz with 0.7 g[e]	—	9 Hz ... 200 Hz with 1 g 200 Hz ... 500 Hz with 1.5 g
		—	—	—	
		—	2 Hz ... 25 Hz with 0.06 in (1.6 mm) amplitude	—	—
IEC 60068-2-27, test Ea	Shock	15 g at 11 ms	—	—	10 g at 11 ms

a. EN 61131-2, CE, FCC – applies to all devices
b. Merchant Navy – applies to devices with the approval codes VU, U9, UY, UX
c. EN 50121-4 – applies to devices with the certification codes VT, T9, TY
d. EN 61850-3, IEEE 1613 – applies to devices with the approval codes V9, VY, VU, VT
e. Applies to device variants featuring customer-specific version with the characteristic value HH

8.8 Power consumption/power output

The order numbers correspond to the product codes of the devices.
See “Device name and product code” on page 19.

Device name	Maximum power consumption	Power output
MSP30-0804...	17.0 W	58.0 Btu (IT)/h
MSP30-1604...	19.0 W	65.0 Btu (IT)/h
MSP30-2404...	21.5 W	73.0 Btu (IT)/h
MSP32-0804...	18.0 W	61.0 Btu (IT)/h
MSP32-1604...	19.5 W	67.0 Btu (IT)/h
MSP32-2404...	22.5 W	77.0 Btu (IT)/h
MSP40-0012...	17.0 W	58.0 Btu (IT)/h
MSP40-0020...	19.0 W	65.0 Btu (IT)/h
MSP40-0028...	21.5 W	73.0 Btu (IT)/h
MSP42-0012...	18.0 W	61.0 Btu (IT)/h
MSP42-0020...	19.5 W	67.0 Btu (IT)/h
MSP42-0028...	22.5 W	77.0 Btu (IT)/h

Module[a]	Slot[b]	Maximum power consumption	Maximum power output
MSM20 media modules:			
MSM20-xxT1T1T1...	GE	5.0 W	17.0 Btu (IT)/h
MSM20-xxT1T1T1...	FE	4.0 W	14.0 Btu (IT)/h
MSM20-xxxxT1T1...	GE	4.0 W	14.0 Btu (IT)/h
MSM20-xxxxT1T1...	FE	4.0 W	14.0 Btu (IT)/h
MSM20-xxxxxxxx...	GE	5.0 W	17.0 Btu (IT)/h
MSM20-xxxxxxxx...	FE	5.0 W	17.0 Btu (IT)/h
MSM20-T5T5T5T5...	FE	2.0 W	7.0 Btu (IT)/h
MSM22-T5T5T5T5...	FE	3.0 W	10.0 Btu (IT)/h
MSM24 media modules:			
MSM24-IOIOIOIO...	—	7.0 W	24.0 Btu (IT)/h
MSM40 media modules:			
MSM40-C1C1C1C1...	GE	5.0 W	17.0 Btu (IT)/h
MSM40-C1C1C1C1...	FE	5.0 W	17.0 Btu (IT)/h
MSM40-T1T1T1T1...	GE	3.0 W	10.0 Btu (IT)/h
MSM40-T1T1T1T1...	FE	2.0 W	7.0 Btu (IT)/h
MSM42 media modules:			
MSM42-T1T1T1T1...	GE	4.0 W	14.0 Btu (IT)/h
MSM42-T1T1T1T1...	FE	3.0 W	10.0 Btu (IT)/h
MSM46 media modules:			
MSM46-T1T1T1T1...	GE	4.0 W	14.0 Btu (IT)/h
MSM46-T1T1T1T1...	FE	3.0 W	10.0 Btu (IT)/h
MSM50 media modules:			
MSM50-Q6Q6Q6Q6...	GE	3.0 W	10.0 Btu (IT)/h
MSM50-Q6Q6Q6Q6...	2.5 GE	4.0 W	14.0 Btu (IT)/h
MSM60 media modules:			
MSM60-Q6Q69999...	10GE	7.0 W	24.0 Btu (IT)/h

Table 43: Overview: Power consumption and power output

a. xx = M2, M4, S2, S4, L2, G2
b. FE= Fast Ethernet 100 MBit/s; GE= Gigabit Ethernet 1000 MBit/s

Media modules	Maximum power output
MSM22	62 W
MSM42	62 W
MSM46	124 W

Table 44: Maximum PoE power output

8.9 Network range

Note: The following SFP transceivers exclusively have approvals according to characteristic value Z9:

- SFP-FAST-MM/LC
- SFP-FAST-MM/LC EEC
- SFP-FAST-SM/LC
- SFP-FAST-SM/LC EEC
- SFP-GIG-LX/LC...
- SFP-GIG-BA LX/LC EEC
- SFP-GIG-BB LX/LC EEC
- SFP-GIG-BA LX+/LC EEC
- SFP-GIG-BB LX+/LC EEC
- SFP-GIG-BA LH/LC EEC
- SFP-GIG-BB LH/LC EEC

When in use with devices with additional approvals, these additional approvals are void.

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

8.9.1 10/100/1000 Mbit/s twisted pair port

10/100/1000 Mbit/s twisted pair port	
Length of a twisted pair segment	max. 100 m (328 ft) (for Cat5e cable)

Table 45: Network range: 10/100/1000 Mbit/s twisted pair port

8.9.2 Fast Ethernet SFP transceiver

Product code	Mode[a]	Wave length	Fiber	System attenuation	Example for F/O line length[b]	Fiber attenuation	BLP/Dispersion
M-FAST-SFP-MM/LC...	MM	1310 nm	50/125 µm	0 dB ... 8 dB	0 km ... 5 km (0 mi ... 3.11 mi)	1.0 dB/km	800 MHz×km
M-FAST-SFP-MM/LC...	MM	1310 nm	62.5/125 µm	0 dB ... 11 dB	0 km ... 4 km (0 mi ... 2.49 mi)	1.0 dB/km	500 MHz×km
M-FAST-SFP-SM/LC...	SM	1310 nm	9/125 µm	0 dB ... 13 dB	0 km ... 25 km (0 mi ... 15.53 mi)	0.4 dB/km	3.5 ps/(nm×km)
M-FAST-SFP-SM+/LC...	SM	1310 nm	9/125 µm	10 dB ... 29 dB	25 km ... 65 km (15.53 mi ... 40.39 mi)	0.4 dB/km	3.5 ps/(nm×km)
M-FAST-SFP-LH/LC...	SM	1550 nm	9/125 µm	10 dB ... 29 dB	47 km ... 104 km (29.20 mi ... 64.62 mi)	0.25 dB/km	19 ps/(nm×km)
M-FAST-SFP-LH/LC...	SM	1550 nm	9/125 µm	10 dB ... 29 dB	55 km ... 140 km (14.29 mi ... 86.99 mi)	0.18 dB/km[c]	18 ps/(nm×km)
SFP-FAST-MM/LC[d]	MM	1310 nm	50/125 µm	0 dB ... 8 dB	0 km ... 5 km (0 mi ... 3.11 mi)	1.0 dB/km	800 MHz×km
SFP-FAST-MM/LC EEC[d]	MM	1310 nm	62.5/125 µm	0 dB ... 11 dB	0 km ... 4 km (0 mi ... 2.49 mi)	1.0 dB/km	500 MHz×km
SFP-FAST-SM/LC[d]	SM	1310 nm	9/125 µm	0 dB ... 13 dB	0 km ... 25 km (0 mi ... 15.53 mi)	0.4 dB/km	3.5 ps/(nm×km)
SFP-FAST-SM/LC EEC[d]	SM	1310 nm	9/125 µm	0 dB ... 13 dB	0 km ... 25 km (0 mi ... 15.53 mi)	0.4 dB/km	3.5 ps/(nm×km)

Table 46: F/O port 100BASE-FX (SFP 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.
c. With ultra-low-loss optical fiber.
d. You will find further information on certifications on the Internet on the Hirschmann product pages (www.hirschmann.com).

8.9.3 Bidirectional Fast Ethernet SFP transceiver

Product code	Mode[a]	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O line length[b]	Fiber attenuation	BLP/Dispersion
SFP-FAST-BA MM/LC EEC	MM	1310 nm	1550 nm	50/125 µm 62.5/125 µm	0 dB ... 16 dB	0 km ... 2 km (0 mi ... 1.24 mi)	1.0 dB/km	800 MHz×km 500 MHz×km
SFP-FAST-BB MM/LC EEC	MM	1550 nm	1310 nm	50/125 µm 62.5/125 µm	0 dB ... 16 dB	0 km ... 2 km (0 mi ... 1.24 mi)	1.0 dB/km	800 MHz×km 500 MHz×km
SFP-FAST-BA SM/LC EEC	SM	1310 nm	1550 nm	9/125 µm	0 dB ... 18 dB	0 km ... 20 km (0 mi ... 12.43 mi)	0.4 dB/km	3.5 ps/(nm×km)
SFP-FAST-BB SM/LC EEC	SM	1550 nm	1310 nm	9/125 µm	0 dB ... 18 dB	0 km ... 20 km (0 mi ... 12.43 mi)	0.25 dB/km	19 ps/(nm×km)
SFP-FAST-BA SM+/LC EEC	SM	1310 nm	1550 nm	9/125 µm	0 dB ... 29 dB	0 km ... 60 km (0 mi ... 37.29 mi)	0.4 dB/km	3.5 ps/(nm×km)
SFP-FAST-BB SM+/LC EEC	SM	1550 nm	1310 nm	9/125 µm	0 dB ... 29 dB	0 km ... 60 km (0 mi ... 37.29 mi)	0.25 dB/km	19 ps/(nm×km)

Table 47: F/O port (bidirectional Fast Ethernet SFP transceiver)

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

8.9.4 Gigabit Ethernet SFP transceiver

Product code	Mode[a]	Wave length	Fiber	System attenuation	Example for F/O line length[b]	Fiber attenuation	BLP/Dispersion
M-SFP-SX/LC...	MM	850 nm	50/125 µm	0 dB ... 7.5 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	3.0 dB/km	400 MHz×km
M-SFP-SX/LC...	MM	850 nm	62.5/125 µm	0 dB ... 7.5 dB	0 km ... 0.275 km (0 mi ... 0.17 mi)	3.2 dB/km	200 MHz×km
M-SFP-MX/LC...	MM	1310 nm	50/125 µm	0 dB ... 12 dB	0 km ... 1.5 km (0 mi ... 0.93 mi)	1.0 dB/km	800 MHz×km

Table 48: F/O port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)

Product code	Mode[a]	Wave length	Fiber	System attenuation	Example for F/O line length[b]	Fiber attenuation	BLP/Dispersion
M-SFP-MX/LC...	MM	1310 nm	62.5/125 µm	0 dB ... 12 dB	0 km ... 50 km (0 mi ... 31.06 mi)	1.0 dB/km	500 MHz×km
M-SFP-LX/LC...	MM	1310 nm[c]	50/125 µm	0 dB ... 10.5 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	1.0 dB/km	800 MHz×km
M-SFP-LX/LC...	MM	1310 nm[d]	62.5/125 µm	0 dB ... 10.5 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	1.0 dB/km	500 MHz×km
M-SFP-LX/LC...	SM	1310 nm	9/125 µm	0 dB ... 10.5 dB	0 km ... 20 km (0 mi ... 12.43 mi)[e]	0.4 dB/km	3.5 ps/(nm×km)
M-SFP-LX+/LC...	SM	1310 nm	9/125 µm	5 dB ... 20 dB	14 km ... 42 km (8.70 mi ... 26.10 mi)	0.4 dB/km	3.5 ps/(nm×km)
M-SFP-LH/LC...	LH	1550 nm	9/125 µm	5 dB ... 22 dB	23 km ... 80 km (14.29 mi ... 49.71 mi)	0.25 dB/km	19 ps/(nm×km)
M-SFP-LH+/LC	LH	1550 nm	9/125 µm	15 dB ... 30 dB	71 km ... 108 km (44.12 mi ... 67.11 mi)	0.25 dB/km	19 ps/(nm×km)
M-SFP-LH+/LC	LH	1550 nm	9/125 µm	15 dB ... 30 dB	71 km ... 128 km (44.12 mi ... 79.54 mi)	0.21 dB/km (typically)	19 ps/(nm×km)
M-SFP-LH+/LC EEC	LH	1550 nm	9/125 µm	13 dB ... 32 dB	62 km ... 116 km (38.52 mi ... 72.07 mi)	0.25 dB/km	19 ps/(nm×km)
M-SFP-LH+/LC EEC	LH	1550 nm	9/125 µm	13 dB ... 32 dB	62 km ... 138 km (38.52 mi ... 85.75 mi)	0.21 dB/km (typically)	19 ps/(nm×km)
SFP-GIG-LX/LC...	MM	1310 nm[f]	50/125 µm	0 dB ... 10.5 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	1.0 dB/km	800 MHz×km
SFP-GIG-LX/LC...	MM	1310 nm[g]	62.5/125 µm	0 dB ... 10.5 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	1.0 dB/km	500 MHz×km
SFP-GIG-LX/LC...	SM	1310 nm	9/125 µm	0 dB ... 10.5 dB	0 km ... 20 km (0 mi ... 12.43 mi)[h]	0.4 dB/km	3.5 ps/(nm×km)

Table 48: F/O port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)

a. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul
b. Including 3 dB system reserve when compliance with the fiber data is observed.
c. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
d. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
e. Including 2.5 dB system reserve when compliance with the fiber data is observed.

f. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
g. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
h. Including 2.5 dB system reserve when compliance with the fiber data is observed.

8.9.5 Bidirectional Gigabit Ethernet SFP transceiver

Product code	Mode[a]	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O line length[b]	Fiber attenuation	BLP/Dispersion
M-SFP-BIDI Type A LX/LC EEC	SM	1310 nm	1550 nm	9/125 µm	0 dB ... 11 dB	0 km ... 20 km (0 mi ... 12.43 mi)	0.4 dB/km	3.5 ps/(nm×km)
M-SFP-BIDI Type B LX/LC EEC	SM	1550 nm	1310 nm	9/125 µm	0 dB ... 11 dB	0 km ... 20 km (0 mi ... 12.43 mi)	0.25 dB/km	19 ps/(nm×km)
M-SFP-BIDI Type A LH/LC EEC	LH	1490 nm	1590 nm	9/125 µm	5 dB ... 24 dB	23 km ... 80 km (14.29 mi ... 49.71 mi)	0.25 dB/km	19 ps/(nm×km)
M-SFP-BIDI Type B LH/LC EEC	LH	1590 nm	1490 nm	9/125 µm	5 dB ... 24 dB	23 km ... 80 km (14.29 mi ... 49.71 mi)	0.25 dB/km	19 ps/(nm×km)
SFP-GIG-BA LX/LC EEC	SM	1310 nm	1550 nm	9/125 µm	0 dB ... 15 dB	0 km ... 20 km (0 mi ... 12.43 mi)	0.4 dB/km	3.5 ps/(nm×km)
SFP-GIG-BB LX/LC EEC	SM	1550 nm	1310 nm	9/125 µm	0 dB ... 15 dB	0 km ... 20 km (0 mi ... 12.43 mi)	0.25 dB/km	19 ps/(nm×km)
SFP-GIG-BA LX+/LC EEC	SM	1310 nm	1550 nm	9/125 µm	3 dB ... 20 dB	12 km ... 40 km (7.45 mi ... 24.86 mi)	0.4 dB/km	3.5 ps/(nm×km)
SFP-GIG-BB LX+/LC EEC	SM	1550 nm	1310 nm	9/125 µm	3 dB ... 20 dB	12 km ... 40 km (7.45 mi ... 24.86 mi)	0.25 dB/km	19 ps/(nm×km)
SFP-GIG-BA LH/LC EEC	LH	1490 nm	1550 nm	9/125 µm	4 dB ... 24 dB	19 km ... 80 km (11.80 mi ... 49.71 mi)	0.25 dB/km	19 ps/(nm×km)
SFP-GIG-BB LH/LC EEC	LH	1550 nm	1490 nm	9/125 µm	4 dB ... 24 dB	19 km ... 80 km (11.80 mi ... 49.71 mi)	0.25 dB/km	19 ps/(nm×km)

Table 49: F/O port (bidirectional Gigabit Ethernet SFP transceiver)

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

8.9.6 2.5 Gigabit Ethernet SFP transceiver

Product code	Mode[a]	Wave length	Fiber	System attenuation	Example for F/O line length[b]	Fiber attenuation	BLP/Dispersion
M-SFP-2.5-MM/LC EEC	MM	850 nm	50/125 µm	0 dB ... 4 dB	0.55 km (0.34 mi)	3.5 dB/km	2000 MHz×km (OM3)
M-SFP-2.5-MM/LC EEC	MM	850 nm	50/125 µm	0 dB ... 4 dB	0.4 km (0.25 mi)	3.5 dB/km	500 MHz×km (OM2)
M-SFP-2.5-MM/LC EEC	MM	850 nm	62.5/125 µm	0 dB ... 4 dB	0.17 km (0.11 mi)	3.5 dB/km	200 MHz×km (OM1)
M-SFP-2.5-SM-/LC EEC	SM	1310 nm	9/125 µm	0 dB ... 8.5 dB	5 km (3.11 mi)	0.4 dB/km	3.5 ps/(nm×km)
M-SFP-2.5-SM/LC EEC	SM	1310 nm	9/125 µm	0 dB ... 13 dB	20 km (12.43 mi)	0.4 dB/km	3.5 ps/(nm×km)
M-SFP-2.5-SM+/LC EEC	SM	1310 nm	9/125 µm	12 dB ... 25 dB	45 km (27.96 mi)	0.4 dB/km	3.5 ps/(nm×km)
M-SFP-2.5-LH/LC	LH	1551 nm	9/125 µm	14 dB ... 28 dB	80 km (49.71 mi)[c]	0.25 dB/km	19 ps/(nm×km)

Table 50: F/O port 2.5 Gbit/s (SFP fiber optic Gigabit Ethernet transceiver)

a. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul
b. Including 3 dB system reserve when compliance with the fiber data is observed.
c. Typically the DWDM (Dense Wave Division Multiplexing) links have filters because the remaining attenuation budget is consumed by the filters.For point-to-point connections without filters and with max. 1.5 dB of connector losses you can cover up to 59 mi (95 km).

8.9.7 10 Gigabit Ethernet SFP+ transceiver

Product code	Mode[a]	Wave length	Fiber	System attenuation	Example for F/O line length[b]	Fiber attenuation	BLP/dispersion
M-SFP-10-SR/LC EEC	MM	850 nm	50/125 µm	0 dB ... 8.1 dB	0.066 km (0.041 mi)	3 dB/km	400 MHz×km
M-SFP-10-SR/LC EEC	MM	850 nm	50/125 µm	0 dB ... 8.1 dB	0.082 km (0.051 mi)	3 dB/km	500 MHz×km (OM2)
M-SFP-10-SR/LC EEC	MM	850 nm	50/125 µm	0 dB ... 8.1 dB	0.3 km (0.186 mi)	3 dB/km	2000 MHz×km (OM3)
M-SFP-10-SR/LC EEC	MM	850 nm	50/125 µm	0 dB ... 8.1 dB	0.4 km (0.25 mi)	3 dB/km	4700 MHz×km (OM4)
M-SFP-10-SR/LC EEC	MM	850 nm	62.5/125 µm	0 dB ... 8.1 dB	0.026 km (0.016 mi)	3.2 dB/km	160 MHz×km
M-SFP-10-SR/LC EEC	MM	850 nm	62.5/125 µm	0 dB ... 8.1 dB	0.033 km (0.021 mi)	3.2 dB/km	200 MHz×km (OM1)

Table 51: F/O port 10 Gbit/s (SFP+ fiber optic Gigabit Ethernet transceiver)

Product code	Mode[a]	Wave length	Fiber	System attenuation	Example for F/O line length[b]	Fiber attenuation	BLP/dispersion
M-SFP-10-LR/LC EEC	SM	1310 nm	9/125 µm	0 dB ... 7.4 dB	10 km (6.21 mi)	0.4 dB/km	3.5 ps/(nm×km)
M-SFP-10-ER/LC EEC	LH	1550 nm	9/125 µm	3 dB ... 15 dB	10 km ... 40 km (6.21 mi ... 24.86 mi)	0.25 dB/km	19 ps/(nm×km)
M-SFP-10-ZR/LC	LH	1550 nm	9/125 µm	11 dB ... 22 dB	40 km ... 80 km (24.86 mi ... 49.71 mi)	0.25 dB/km	19 ps/(nm×km)

Table 51: F/O port 10 Gbit/s (SFP+ fiber optic Gigabit Ethernet transceiver)

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

9 Scope of delivery, order numbers and accessories

9.1 Scope of delivery

Basic device

Amount	Article
1 ×	Basic device
1 ×	Safety and general information sheet
1 ×	4-pin terminal block for digital input
2 ×	4-pin terminal block for supply voltage

Media modules

Amount	Article	
1 ×	Device	
1 ×	Safety and general information sheet	
1 ×	Only with media module MSM24	2-pin terminal block for 24 V DC auxiliary voltage
		8-pin terminal block for digital input
		12-pin terminal block for digital output
1 ×	Only with media module MSM46	3-pin terminal block for external PoE power supply

9.2 Accessories

Fast Ethernet SFP transceiver	Order number
M-FAST SFP-TX/RJ45	942 098-001
M-FAST SFP-TX/RJ45 EEC	942 098-002
The following operating conditions apply to twisted pair transceivers: ▶ Usable with: - HiOS as of software version 03.0.00 - for PRP ports on RSP devices, as of software version 02.0.01 - for PRP ports on EES devices, as of software version 02.0.02 - Classic switch software as of software version 08.0.00 - HiSecOS as of software version 01.2.00 ▶ Longer RSTP switching times and link loss detection times compared to twisted pair ports provided by the device directly. ▶ Not applicable for combo ports. ▶ Not applicable for ports which support only Gigabit Ethernet. ▶ It is currently not possible to set autocrossing manually.	
M-FAST SFP-MM/LC	943 865-001

Table 52: Accessory: Fast Ethernet SFP transceiver

Fast Ethernet SFP transceiver	Order number
M-FAST SFP-MM/LC EEC	943 945-001
M-FAST SFP-SM/LC	943 866-001
M-FAST SFP-SM/LC EEC	943 946-001
M-FAST SFP-SM+/LC	943 867-001
M-FAST SFP-SM+/LC EEC	943 947-001
M-FAST SFP-LH/LC	943 868-001
M-FAST SFP-LH/LC EEC	943 948-001
SFP-FAST-MM/LC[a]	942 194-001
SFP-FAST-MM/LC EEC[a]	942 194-002
SFP-FAST-SM/LC[a]	942 195-001
SFP-FAST-SM/LC EEC[a]	942 195-002

Table 52: Accessory: Fast Ethernet SFP transceiver

a. You will find further information on certifications on the Internet on the Hirschmann product pages (www.hirschmann.com).

Bidirectional Fast Ethernet SFP transceiver	Order number
SFP-FAST-BA MM/LC EEC[a]	942 204-001
SFP-FAST-BB MM/LC EEC[a]	942 204-002
SFP-FAST-BA SM/LC EEC[a]	942 205-001
SFP-FAST-BB SM/LC EEC[a]	942 205-002
SFP-FAST-BA SM+/LC EEC[a]	942 206-001
SFP-FAST-BB SM+/LC EEC[a]	942 206-002

Table 53: Accessory: Bidirectional Fast Ethernet SFP transceiver

a. You will find further information on certifications on the Internet on the Hirschmann product pages (www.hirschmann.com).

Gigabit Ethernet SFP transceiver	Order number
M-SFP-TX/RJ45	943 977-001
M-SFP-TX/RJ45 EEC	942 161-001
The following operating conditions apply to twisted pair transceivers: ▶ Usable with: - HiOS as of software version 03.0.00 - Classic Switch software, as of software version 04.1.00. - HiSecOS as of software version 01.2.00 Do not use with the following devices: - SPIDER II - MSP/MSM - EES ▶ Longer RSTP switching times and link loss detection times compared to twisted pair ports provided by the device directly. ▶ Not applicable for combo and Fast Ethernet ports. ▶ Exclusively supports the autonegotiation mode including autocrossing.	
M-SFP-SX/LC	943 014-001
M-SFP-SX/LC EEC	943 896-001
M-SFP-MX/LC EEC	942 108-001
M-SFP-LX/LC	943 015-001

Table 54: Accessory: Gigabit Ethernet SFP transceiver

Gigabit Ethernet SFP transceiver	Order number
M-SFP-LX/LC EEC	943 897-001
M-SFP-LX+/LC	942 023-001
M-SFP-LX+/ LC EEC	942 024-001
M-SFP-LH/LC	943 042-001
M-SFP-LH/LC EEC	943 898-001
M-SFP-LH+/LC	943 049-001
M-SFP-LH+/LC EEC	942 119-001
SFP-GIG-LX/LC[a]	942 196-001
SFP-GIG-LX/LC EEC[a]	942 196-002

Table 54: Accessory: Gigabit Ethernet SFP transceiver

a. You will find further information on certifications on the Internet on the Hirschmann product pages (www.hirschmann.com).

Bidirectional Gigabit Ethernet SFP transceiver	Order number
M-SFP-BIDI Type A LX/LC EEC	943 974-001
M-SFP-BIDI Type B LX/LC EEC	943 974-002
M-SFP-BIDI Type A LH/LC EEC	943 975-001
M-SFP-BIDI Type B LH/LC EEC	943 975-002
M-SFP-BIDI Bundle LX/LC EEC (Type A + B)	943 974-101
M-SFP-BIDI Bundle LH/LC EEC (Type A + B)	943 975-101
SFP-GIG-BA LX/LC EEC[a]	942 207-001
SFP-GIG-BB LX/LC EEC[a]	942 207-002
SFP-GIG-BA LX+/LC EEC[a]	942 208-001
SFP-GIG-BB LX+/LC EEC[a]	942 208-002
SFP-GIG-BA LH/LC EEC[a]	942 209-001
SFP-GIG-BB LH/LC EEC[a]	942 209-002

a. You will find further information on certifications on the Internet on the Hirschmann product pages (www.hirschmann.com).

2.5 Gigabit Ethernet SFP transceiver	Order number
M-SFP-2.5-MM/LC EEC	942 162-001
M-SFP-2.5-SM-/LC EEC	942 163-001
M-SFP-2.5-SM/LC EEC	942 164-001
M-SFP-2.5-SM+/LC EEC	942 165-001

10 Gigabit Ethernet SFP+ transceiver	Order number
M-SFP-10-SR/LC-EEC	942 210-001
M-SFP-10-LR/LC-EEC	942 211-001
M-SFP-10-ER/LC-EEC	942 212-001
M-SFP-10-ZR/LC	942 213-001

Designation	Order number
AutoConfiguration Adapter ACA22-USB (EEC)	942 124-001
AutoConfiguration Adapter ACA31	942 074-001

Designation	Order number
Network management software Industrial HiVision	943 156-xxx
Terminal cable: RJ45 on USB	942 096-001
Terminal cable: RJ45 on Sub-D, 9-pin	942 097-001
RPS 90/48V HV (high-voltage) PoE power unit	943 979-001
RPS 90/48V LV (low-voltage) PoE power unit	943 980-001

Note: Some products recommended as accessories do not support the entire temperature range specified for the device and can thus restrict the possible range of usage for the overall system.

10 Underlying technical standards

Designation	
CSA C22.2 No. 142	Canadian National Standard(s) – Process Control Equipment Industrial Products
EN 50121-4	Railway applications – EMC – Emission and immunity of the signaling and telecommunications apparatus (Rail Trackside)
EN 55032	Electromagnetic compatibility of multimedia equipment – Emission Requirements
IEC 60950-1	Information technology equipment – Safety – Part 1: General requirements
EN 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
EN 61131-2	Programmable controllers – Part 2: Equipment requirements and tests
FCC 47 CFR Part 15	Code of Federal Regulations
DNV-CG-0339	Environmental test specification for electrical, electronic and programmable equipment and systems
IEC/EN 61850-3	Communications networks and systems in stations
IEEE 1613	Standard Environment and Testing Requirements for Communication Networking Devices in Electric Power Substations
IEEE 802.1AB	Station and Media Access Control Connectivity Discovery
IEEE 802.1D	Media Access Control Bridges
IEEE 802.1Q	Virtual Bridged Local Area Networks
IEEE 802.3	Ethernet
ISA-12.12.01	Non-incendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
NEMA TS 2	Traffic Controller Assemblies with NTCIP Requirements (environmental requirements)
UL 508	Safety for Industrial Control Equipment

Table 55: List of norms and standards

The device has an approval based on a specific standard exclusively if the approval indicator appears on the device casing.
If your device has a shipping approval according to DNV, you find the approval mark printed on the device label. You will find out whether your device has other shipping approvals on the Hirschmann website at www.hirschmann.com in the product information.
The device generally fulfills the technical standards named in their current versions.

A Further support

Technical questions

For technical questions, please contact any Hirschmann dealer in your area or Hirschmann directly.

You find the addresses of our partners on the Internet at http://www.hirschmann.com.

A list of local telephone numbers and email addresses for technical support directly from Hirschmann is available at https://hirschmann-support.belden.com.

This site also includes a free of charge knowledge base and a software download section.

Customer Innovation Center

The Customer Innovation Center is ahead of its competitors on three counts with its complete range of innovative services:

- Consulting incorporates comprehensive technical advice, from system evaluation through network planning to project planning.
- Training offers you an introduction to the basics, product briefing and user training with certification.
  You find the training courses on technology and products currently available at https://www.belden.com/solutions/customer-innovation-center.
- Support ranges from the first installation through the standby service to maintenance concepts.

With the Customer Innovation Center, you decide against making any compromises in any case. Our client-customized package leaves you free to choose the service components you want to use.

Internet:
https://www.belden.com/solutions/customer-innovation-center

HIRSCHMANN

A BELDEN BRAND