HIRSCHMANN
A Belden Company

Description and Operating Instructions Industrial ETHERNET Modular Industrial Communication Equipment

MICE Media modules

MM2-2FXM3/2TX1 MM2-4TX1 MM4-4TX/SFP MM2-2FLM4 MM2-2FXP4 MM3-4TX5 MM2-2FXM2 MM2-2FXS2

MM3-2AUI MM3-2FXM4/2TX1 MM3-2FXS2/2TX1 MM3-2FXM2/2TX1 MM3-1FXM2/3TX1 MM3-1FXL2/3TX1 MM3-1FXS2/3TX1 MM2-4FXM3 MM3-4FXM2 MM3-4FXS2 MM3-4FXM4 MM3-4FLM4 MM3-4FXP4

MB-2T expansion module

The **M**odular **I**ndustrial **C**ommunication **E**quipment, MICE, is a modular network component. It was developed particularly for use in an industrial environment.

The media modules described in this instructions are the interface of the device to the LAN and can be plugged onto the following basic modules of the MICE switch:
– MS2108-2 (MICE 2000)
– MS3124-4 (MICE 3000)
– MS4128-5 (MICE 4000 / Power MICE)
– MS20-... and MS30-...

The MB-2T expansion module allows you to add 2 slots to the MS20-1600, MS30-1602, MS3124-4, MS4128-5 MICE switch basic module for installing media modules.

MICE allows you to construct switched Industrial ETHERNET networks that conform to the IEEE 802. and 802.3u standard using copper wires or optical fibers in a bus or ring topology.

In the
– User manual „Installation“
– User manual „Basic configuration“
– User manual „Redundancy configuration“
– Reference manual „Web-based Interface“
– Reference manual „Command Line Interface“
you will find a detailled description of the MICE and further information.

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The performance features described here are binding only if they have been expressly guaranteed in the contract. We have checked that the contents of the technical publication agree with the hardware and software described. However, it is not possible to rule out deviations completely, so we are unable to guarantee complete agreement. However, the details in the technical publication are checked regularly. Any corrections which prove necessary are contained in subsequent editions. We are grateful for suggestions for improvement.

We reserve the right to make technical modifications.

Safety instructions

Certified usage

Please observe the following:

⚠ **Warning**
The device may only be employed for the purposes described in the catalog and technical description, and only in conjunction with external devices and components recommended or approved by Hirschmann. The product can only be operated correctly and safely if it is transported, stored, installed and assembled properly and correctly. Furthermore, it must be operated and serviced carefully.

Supply voltage

To be supplied by a NEC Class 2 power supply via MICE switch module.
For Power over Ethernet modules: Connect a NEC Class 2 power supply only.

Use 60/75°C or 75°C copper (CU) wire only.

Shielding Ground

Note: The shielding ground of the connectable twisted pairs lines is connected to the front panel as a conductor.

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

Housing

⚠ **Warning!**
Only technicians authorized by Hirschmann are permitted to open the housing.

☐ Make sure that the electrical installation meets local or nationally applicable safety regulations.

⚠ **Warning!**
Never insert pointed objects (thin screwdrivers, wires, etc.) into the inside of the subrack! This especially applies to the area behind the socket connectors. Failure to observe this point may result in injuries caused by electric shocks.

General Safety Instructions

☐ Particular attention is to be paid to all warnings and items of information relating to safety.

⚠ **Warning!**
Any work that may have to be performed on the electrical installation should be performed by fully qualified technicians only.

⚠ **Warning!**
LED- or LASER components according to IEC 60825-1 (2003):
CLASS 1 LASER PRODUCT.
LIGHT EMITTING DIODE - CLASS 1 LED PRODUCT.

⚠ **Warning!**
(POF media modules ...-P4-...)
LED light
DO NOT STARE INTO THE BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS (e.g. lens, microscope). Failure to observe this warning within a distance of 100 mm can endanger your eyes. Light is emitted from the optical connectors or from the ends of the optical fibers that are connected to them.
Light Emitting Diode CLASS 2M
Wave length 650 nm
Power <2 mW
According to IEC/CEI 60825-1:2003.

ESD guidelines

The media modules contain components highly sensitive to electrostatic fields.These components can be easily destroyed or have their lives shortened by an electrical field or by a discharge caused by touching the contacts.
You can find more informationen about devices vulnerable to electrostatic fields in DIN EN 61340-5-1 (2001-08) and
DIN EN 61340-5-2 (2002-01)

♺ **Recycling Note:**
After its use, this product has to be processed as electronic scrap and disposed of according to the prevailing waste disposal regulations of your community / district / country / state.

1. MICE Hardware

1.1 SWITCH BASIC MODULES

The documentation enclosed to the switch basic module gives you a detailed description of the switch basic modules:
– „User Manual Installation Industrial ETHERNET Switch MICE MS20/MS30" for MS20-... and MS30-...
– „User Manual Installation Industrial ETHERNET Switch Power MICE"
– "Description and Operating Instructions Industrial ETHERNET Modular Industrial Communication Equipment MICE/Power MICE" for
  – MS2108-2 (MICE 2000)
  – MS3124-4 (MICE 3000)

1.2 MEDIA MODULES

– MICE 2000: See Table 1.
– MICE 3000: See Table 2.
– MICE 4000: See Table 3.
– MICE media modules open variant: See Table 4.

1.3 MB-2T EXPANSION MODULE

The MB-2T expansion module allows you to add 2 slots to the MS20-1600, MS30-1602, MS3124-4, MS4128-5 MICE switch basic module for installing media modules.

1.4 SFP MODULES

SFP modules are optical transceivers (Fast ETHERNET and Gigabit ETHERNET SFP modules see chapter 7 Technical Data). The SFP modules are plugged into the SFP slots of the Fast ETHERNET media module MM3-4SFP (MM20-Z6Z6Z6Z6) or of the Gigabit ETHERNET media modules MM4-4TX/SFP / MM4-2TX/SFP to provide a F/O port.

The MM3-4SFP (MM20-Z6Z6Z6Z6) has four slots for SFP modules (100 Mbit/s).

The MM4-4TX/SFP / MM4-2TX/SFP has four/two TP interfaces and four/two slots for SFP modules (100/1000 Mbit/s). Inserting the SFP module deactivates the corresponding TP interface.

1.5 MM22-T1T1T1T1 POE MEDIA MODULE

The MM22-T1T1T1T1 PoE media module (deeper module style) supports Power over ETHERNET (PoE) in compliance with IEEE 802.3af. It enables the connection and the remote supply of e.g. IP telephones (voice over IP), webcams, sensors, print servers and WLAN access points via 10BASE-T/100BASE-TX. With PoE, the power supply of these data terminal equipments is served via the twisted pair cable.

The MM22-T1T1T1T1 media module offers four 10BASE-T/100BASE-TX ports (RJ45 connectors) for connecting network segments or PoE data terminal equipments (PD, Powered Device) up to class 0 (respectively class 3) maximum.

The current is supplied on the idle wire pairs (spare pairs); the ports are not electrically isolated against each other.
In compliance with IEEE 802.3af, each port has the attributes:
– Endpoint PSE
– Alternative B.

2. Functional description

The ports of a MICE represent a terminal connection for the connected LAN segment. You can connect single devices or complete network segments.

2.1 INTERFACES

TP/TX/FL/FX terminal devices or other TP/TX/FL/FX segments can be connected to the 10/100/1000 Mbit/s ports of the media modules.

The MICE and MS20 supports both ETHERNET 10 Mbit/s and Fast ETHERNET 100 Mbit/s, the Power MICE and MS30 supports additionally Gigabit ETHERNET 1000 Mbit/s.

The TP/TX ports support autocrossing, autonegotiation and autopolarity.

2.2 DIP SWITCH (MM3-AUI)

With the 3-pin DIP switch on the MM3-2AUI module
– you can switch on or off the SQE test function at port 1 with the **SQE-Test Port 1** switch.

State of delivery: switch in position 0 (Off), i.e. SQE test function not active.
– you can switch on or off the SQE test function at port 2 with the **SQE-Test Port 2** switch.
  State of delivery: switch in position 0 (Off), i.e. SQE test function not active.
– you can switch on or off the monitoring of the DTE voltage, for both ports together, with the **DTEPower-Monitor** switch.
  – ON: monitoring of the DTE voltage active, data transmission only possible if DTE voltage available.
  – OFF: no monitoring of the DTE voltage, data transmission always possible.
  – State of delivery: switch in position 0 (OFF), i.e. no monitoring of DTE voltage.

3. Assembly, startup procedure and dismantling

3.1 UNPACKING, CHECKING

☐ Check whether the package was delivered completely (see scope of delivery).
☐ Check the individual parts for transport damage.

⚠ **Warning!**
Use only undamaged parts!

3.2 ASSEMBLING MEDIA MODULES

Media modules can be assembled and disassembled during running operation.

☐ To fasten a media module, first remove the protective cap over the plug of the MICE.
☐ Plug the media module onto the plug.
☐ Tighten the 4 screws on the corners of the media module.
☐ Check whether the switch pre-setting suits your requirements.
☐ Fit the signal lines.

3.3 ASSEMBLING SFP MODULES

☐ To fasten a SFP module, first remove the protective cap over the socket.
☐ Insert the SFP module with the closed lock into the socket until you hear it snap in.

Note: Use only Hirschmann SFP modules.

3.4 ASSEMBLING THE MB-2T EXPANSION MODULE

The MB-2T expansion module can be installed while in running operation.

☐ On the right side of the switch basic module, loosen the screw at the top and at the bottom (1-3 revolutions).
☐ Remove the side cover.
☐ If you have not yet done so, mount the switch basic module onto the top-hat rail.
☐ Slide the MB-2T expansion module on the top-hat rail toward the switch basic module until the modules plug into each other.
☐ On the switch basic module, tighten the screws at the top and at the bottom.

3.5 STARTUP PROCEDURE

You start up the MICE by connecting the supply voltage via the terminal block(s) on the MICE basic module. Lock the terminal block(s).

3.6 CONNECTING THE MM22-T1T1T1T1 POE MEDIA MODULE

The MM22-T1T1T1T1 PoE media module is supplied with the PoE voltage (48 V DC safety extra-low voltage) via an external power supply unit. The PoE voltage is fed into the 3-pin terminal block of the PoE media module. The twisted pair cables are supplied with the PoE voltage on port 1 to 4 via the spare pairs (pins 4&5 and 7&8 of the RJ45 sockets).

Note: Only use the Hirschmann RPS60/48V EEC power supply unit for providing the PoE voltage.

☐ Make sure that the external power supply unit being used for providing the PoE voltage meets, among other things, the following requirements:
  – Isolation requirements in compliance with IEEE 802.3af (electrical strength of the 48V output to “rest of the world" 2250 V DC for 1 min.)
  – Output power < 100 W.
  – Current limiting < 2 A.
  – Power supply unit and PoE media module form a "Limited Power Source" in compliance with IEC60950-1.
  – The external PoE power supply unit has to be able to provide the power for the PDs being connected.
  All these conditions are met by the RPS60/48V EEC power supply unit.
☐ Connect the PoE voltage to the 3-pin terminal block (included in the scope of delivery), as shown in the following figure.
  Make sure that your installation complies with the following conditions:
  – Length of the supply line < 3 m.
  – Cross-section of the supply lines is dimensioned for 1.5 A

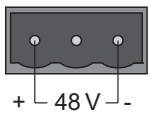


Fig. 1: 3-pin terminal block of the PoE media module

☐ Mount the terminal block for the PoE supply voltage on the bottom side of the PoE module via snap lock. Push it until it locks into position.

Note: Use 4-pair twisted pair cables for connecting the data terminal equipments. Only connect data terminal equipments which are conform to IEEE 802.3af.

4. Further support

In the event of technical queries, please talk to the Hirschmann contract partner responsible for looking after your account or directly to the Hirschmann office. You can find the addresses of our contract partners
– on the Internet
  (http://www.hirschmann-ac.de)

Our support line is also at your disposal:
Tel. +49(1805) 14-1538
Fax +49(7127) 14-1551

Answers to Frequently Asked Questions can be found on the Hirschmann product internet sites on
www.hirschmann-ac.de
The FAQs are located under „Service“ in the Automation and Control section.
www.hicomcenter.com
gives you an up-to-date overview of training courses about technology and products.

5. Technical data

Dimensions W x H x D	38 mm x 110 mm x 79 mm (MM2-...) 38 mm x 110 mm x 119 mm (MM3-..., MM4-...) 38 mm x 110 mm x 79 or 119 mm (MM20-..., MM21-..., MM22-..., MM30-...)			
Humidity	10% to 95% (non condensing)			
Atmospheric pressure	up to 2000 m (795 hPa, higher altitudes on demand)			
Pollution degree	2			
Laser protection	Class 1 conforming to EN 60825 Class 2M conforming to EN 60825-1:2003-10 (POF media modules ...-P4-...)			
Protection type	IP 20			
EMV interference proof		A [1]	B [1]	H [1]
EN 61000-4-2, Discharge of static electricity	Contact discharge: test level 3 Air discharge: test level 3	4 kV 8 kV	8 kV 15 kV	8 KV 15 kV
EN 61000-4-3, Electromagnetic fields	Test level 3 (80 - 2000 MHz)	10 V/m	20 V/m	20 V/m
EN 61000-4-4, Fast transients (burst), Test level 3, x	- Power line - Data line	2 kV 1 kV	4 kV 4 kV	4 kV 4 kV
EN 61000-4-5 Surge voltage	- Power line, line/line: test level 2 - Power line, line/earth: test level 3 - Data line: test level 3	0,5 kV 1 kV 1 kV	1 kV 2 kV 4 kV	1 kV 2 kV 4 kV

EN 61000-4-6	Cable-based RF faults,	10 kHz - 150 kHz	3 V	3 V	3 V
	Test level 3	150 kHz - 80 MHz	10 V	10 V	10 V
EN 61000-4-9	Impulse shaped magnetic fields	Test level 4	-	300 A/m	300 A/m

EMV emitted immunity		A [1]	B [1]	H [1]
EN 55022	Class A	Yes	Yes	Yes
FCC 47 CFR Part 15	Class A	Yes	Yes	Yes
German Lloyd	Rules for Classifikation and Construction VI-7-3 Part 1 Ed. 2001	-	Yes	Yes

Stability					
Vibration	IEC 60068-2-6	Test FC, test level in line with IEC 61131-2V	Yes	Yes	Yes
	German Lloyd	Guidelines for the Performance of Type Tests Part 1	-	Yes	Yes
	IEC 870-2-2 Table 3	Normal Installation in line with EN 61850-3	-	Yes	Yes
Shock	IEC 60068-2-27	Test Ea, test level in line with IEC 61131-2	Yes	Yes	Yes
	IEC 870-2-2 Table 3	Normal Installation in line with EN 61850-3	-	Yes	Yes

[1] Product code A: Certification = CE, UL
Product code B: Certification = CE, UL, GL, Railway (along track), Substation, ATEX
Product code H: Certification = CE, UL, GL, Railway (along track), Substation
The media modules in Table 1 to 3 (see page 5) have the certification “A”.

Network size

AUI port

Length of a AUI cable	50 m max.

TP/TX port 10/100/1000BASE-T/TX

Length of a twisted pair segment	100 m (328 ft) max. (cat5e cable with 1000BASE-T)

F/O port 10BASE-FL

Product code	Wave length		Fiber	System attenuation	Expansion	Fiber data
-M4	MM	850 nm	50/125 µm	0-9.5 dB	0-2,000 m	3.0 dB/km; 400 MHz*km
-M4	MM	850 nm	62.5/125 µm	0-12.5 dB	0-3,000 m	3.2 dB/km; 200 MHz*km

F/O port 100BASE-FX

Product code		Wave length	Fiber	System attenuation	Expansion	Fiber data
-M2, -M4	MM	1300 nm	50/125 µm	0-8 dB	0-5 km	1.0 dB/km; 800 MHz*km
-M2, -M4	MM	1300 nm	62.5/125 µm	0-11 dB	0-4 km	1.0 dB/km; 500 MHz*km
-S2	SM	1300 nm	9/125 µm	0-16 dB	0-30 km	0.4 dB/km; 3.5 ps/(nm*km)
-L2	LH	1550 nm	9/125 µm	7-29 dB	24-86 km	0.3 dB/km; 19 ps/(nm*km)
-P4	MM POF	650 nm	980/1000 µm	0-15.5 dB	0-65 m	200 dB/km; 10 MHz*km
-P4	MM HCS	650 nm	200/230 µm	0-7.0 dB	0-140 m	10 dB/km; 17 MHz*km
-G2	LH+	1550 nm	9/125 µm	14-47 dB	67-176 km	0.25 dB/km; 19 ps/(nm*km)

F/O port 100BASE-FX (SFP Fiberoptic Fast ETHERNET Transceiver)

Product code M-FAST-SFP-...		Wave length	Fiber	System attenuation	Expansion	Fiber data
-MM/LC (EEC)	MM	1310 nm	50/125 µm	0-11 dB	0-5 km	1.0 dB/km; 800 MHz*km
-MM/LC (EEC)	MM	1310 nm	62.5/125 µm	0-8 dB	0-4 km	1.0 dB/km; 500 MHz*km
-SM/LC (EEC)	SM	1310 nm	9/125 µm	0-13 dB	0-25 km	0.4 dB/km; 3.5 ps/(nm*km)
-SM+/LC (EEC)	SM	1310 nm	9/125 µm	10-29 dB	25-65 km	0.4 dB/km; 3.5 ps/(nm*km)
-LH/LC	SM	1550 nm	9/125 µm	10-29 dB	40-104 km	0.25 dB/km; 19 ps/(nm*km)

F/O port 1000BASE-FX (SFP Fiberoptic Gigabit ETHERNET Transceiver)

Product code M-SFP-...	Wave length		Fiber	System attenuation	Expansion	Fiber data
-SX/LC (EEC)	MM	850 nm	50/125 µm	0-7.5 dB	0-550 m	3.0 dB/km; 400 MHz*km
-LX/LC (EEC)	SM	1310 nm [1]	50/125 µm	0-11 dB	0-550 m	1.0 dB/km; 800 MHz*km
-SX/LC (EEC)	MM	850 nm	62.5/125 µm	0-7.5 dB	0-275 m	3.2 dB/km; 200 MHz*km
-LX/LC (EEC)	SM	1310 nm [1]	62.5/125 µm	0-11 dB	0-550 m	1.0 dB/km; 500 MHz*km
-LX/LC (EEC)	SM	1310 nm	9/125 µm	0-11 dB	0-20 km	0.4 dB/km; 3.5 ps/(nm*km)
-LH/LC (EEC)	LH	1550 nm	9/125 µm	6-22 dB	24-72 km	0.25 dB/km; 19 ps/(nm*km)
-LH+/LC	LH	1550 nm	9/125 µm	15-32 dB	60-120 km	0.25 dB/km; 19 ps/(nm*km)

MM = multimode, SM = singlemode, LH = singlemode longhaul
[1] with F/O adapter in line with IEEE802.3-2002 clause 38 (single-mode fiber offset-launch mode conditioning patch cord)

Displays

Device status	1 x green LED **P** – Power, internal supply voltage present
Port status	4 x green/yellow LED **1 to 4** – The meaning depends on the setting of the display status.

Controls (MM3-2AUI)

3-pole DIP switch	**1** – **SQE-Test Port 1** – ON = SQE test function on port 1 enabled **2** – **SQE-Test Port 2** – ON = SQE test function on port 2 enabled **3** – **DTEPower-Monitor** – ON = Monitoring of the DTE voltage active

Scope of delivery

MICE media module incl.	Labels, description and operating instructions

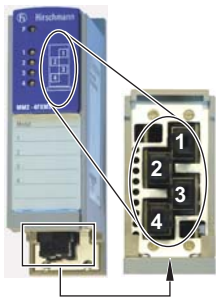
Accessories

Pocket Guide	280 720-851
AutoConfigurationAdapter ACA 11	943 751-001
Terminal access cable	943 301-001
6-pin terminal block (50 pieces)	943 845-002
Rail Power Supply RPS 30	943 662-003
Rail Power Supply RPS 80 EEC	943 662-080
Rail Power Supply RPS 120 EEC	943 662-120
Rail Power Supply RPS60/48V EEC	943 952-001
Network Management Software HiVision	943 471-100

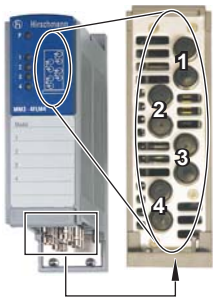
6. MICE media modules

6.1 PORT ASSIGNMENT (EXAMPLES)

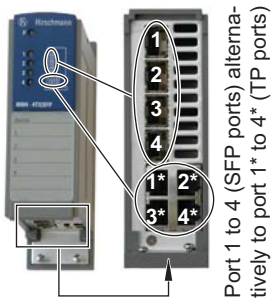
MM2-4FXM3



MM3-4FLM4

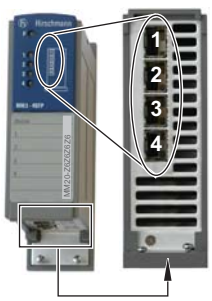


MM4-4TX/SFP



Port 1 to 4 (SFP ports) alternatively to port 1* to 4* (TP ports)

MM3-4SFP (MM20-Z6Z6Z6Z6)



6.2 NUMBER AND KIND OF MEDIA CONNECTORS

MICE 2000 media modules

Module type	AUI port	TP ports 10/100	F/O port multimode 10 Mbit/s	F/O port multimode POF 100 Mbit/s	F/O port multimode 100 Mbit/s	F/O port singlemode 1300 nm, 100 Mbit/s	F/O port singlemode 1550 nm, 100 Mbit/s	Supported since MICE SW release MICE	Power MICE	MS20 MS30
MM2-4TX1(-EEC)	–	4, RJ45	–	–	–	–	–	1.0	1.0	1.0
MM2-2FLM4	–	–	2, ST	–	–	–	–	1.0	1.0	1.0
MM2-2FXP4	–	–	–	2, ST	–	–	–	4.0	1.0	1.0
MM2-4FXM3	–	–	–	–	4, MTRJ	–	–	1.0	1.0	1.0
MM2-2FXM3/2TX1	–	2, RJ45	–	–	2, MTRJ	–	–	1.0	1.0	1.0
MM2-2FXM2	–	–	–	–	2, DSC	–	–	1.0	1.0	1.0
MM2-2FXS2	–	–	–	–	–	2, DSC	–	2.0	1.0	1.0

Table 1: Number of media connectors each MICE 2000 media module, kind of connector and necessary software

MICE 3000 media modules

Module type	AUI port	TP ports 10/100	F/O port multimode 10 Mbit/s	F/O port multimode POF 100 Mbit/s	F/O port multimode 100 Mbit/s	F/O port singlemode 1300 nm, 100 Mbit/s	F/O port singlemode 1550 nm, 100 Mbit/s	Supported since MICE SW release MICE	Power MICE	MS20 MS30
MM3-2AUI	2, Sub-D-St.	–	–	–	–	–	–	4.0	1.0	1.0
MM3-4TX5	–	4, M12	–	–	–	–	–	4.0	1.0	1.0
MM3-4TX1-RT [1)]	–	4, RJ45	–	–	–	–	–	5.0	2.0	1.0
MM3-2FLM4/2TX1-RT [1)]	–	2, RJ45	2, ST	–	–	–	–	5.0	2.0	1.0
MM3-4FLM4	–	–	4, ST	–	–	–	–	2.0	1.0	1.0
MM3-4FXP4	–	–	–	4, ST	–	–	–	4.0	1.0	1.0
MM3-1FXM2/3TX1	–	3, RJ45	–	–	1, DSC	–	–	3.1	1.0	1.0
MM3-2FXM2/2TX1(-EEC)	–	2, RJ45	–	–	2, DSC	–	–	2.0	1.0	1.0
MM3-2FXM2/2TX1-RT [1)]	–	2, RJ45	–	–	2, DSC	–	–	5.0	2.0	1.0
MM3-2FXM4/2TX1	–	2, RJ45	–	–	2, ST	–	–	3.1	1.0	1.0
MM3-4FXM2	–	–	–	–	4, DSC	–	–	2.0	1.0	1.0
MM3-4FXM4	–	–	–	–	4, ST	–	–	3.1	1.0	1.0
MM3-1FXS2/3TX1(-EEC)	–	3, RJ45	–	–	–	1, DSC	–	3.1	1.0	1.0
MM3-2FXS2/2TX1	–	2, RJ45	–	–	–	2, DSC	–	2.0	1.0	1.0
MM3-2FXS2/2TX1-RT [1)]	–	2, RJ45	–	–	–	2, DSC	–	5.0	2.0	1.0
MM3-4FXS2	–	–	–	–	–	4, DSC	–	3.1	1.0	1.0
MM3-1FXL2/3TX1	–	3, RJ45	–	–	–	–	1, DSC	2.0	1.0	1.0

Table 2: Number of media connectors each MICE 3000 media module, kind of connector and necessary software

[1)] Realtime modules, in line with IEEE 1588 PTP (Precision Time Protocol)

MICE 4000 media modules

Module type	TP ports 10/100/1000	SFP ports alternativ zu TP-Ports/ alternatively to TP ports	Supported since MICE SW release		
			MICE	Power MICE	MS20 MS30
MM4-2TX/SFP	2, RJ45	2	–	2.0	1.0
MM4-4TX/SFP	4, RJ45	4	–	1.0	1.0

Table 3: Number of media connectors each MICE 4000 media module, kind of connector and necessary software

Open variant media modules

Module type	TP ports 10/100/1000	SFP ports alternativ zu TP-Ports/ alternatively to TP ports	Supported since MICE SW release		
			MICE	Power MICE	MS20 MS30
MM20..., MM21..., MM30...	0 to 4 ports (media and connector at your option, see chapter 8 “Open Variant”)		–	–	2.0
MM22-T1T1T1T1	4 ports (twisted pair, RJ45 connector)		–	3.0	3.0
MM20-Z6Z6Z6Z6	4 ports (fiber optic, SFP slot, 100 Mbit/s)		–	4.0	4.0

Table 4: MICE open variant media module, necessary software

6.3 PIN ASSIGNMENT OF THE INTERFACES

10/100 Mbit/s twisted pair connection

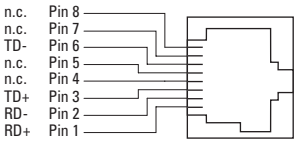


Fig. 3: Pin assignment of a TP/TX interface in MDI-X mode, RJ45 socket

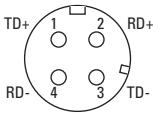


Fig. 4: Pin assignment of a TP/TX interface, M12 socket

10/100 Mbit/s twisted pair connection PoE (Power over Ethernet) at MM22-T1T1T1T1 PoE media module

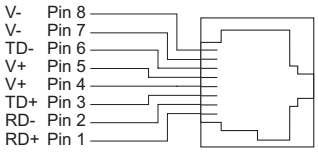


Fig. 5: Pin assignment of a TP/TX interface with PoE, for supply via the the idle wire pairs (spare pairs), RJ45 socket

3-pin terminal block (PoE module)

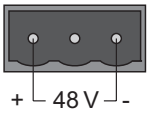


Fig. 6: 3-pin terminal block of the PoE media module

10/100/1000 Mbit/s twisted pair connection

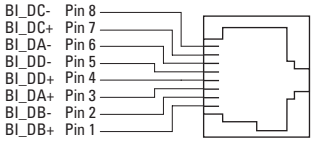


Fig. 7: Pin assignment of the 1000 Mbit/s twisted pair interface

AUI connection

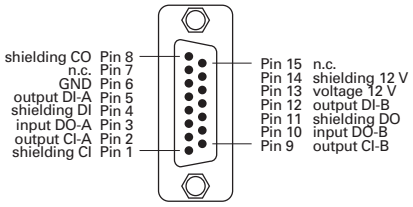


Fig. 8: Pin assignment of the AUI interface

7. General data

	Power consumption	Power output	Operating temp. surrounding air	Storage temperature	Order number
MICE 2000 media modules:					
MM2-4TX1	0.8 W	2.8 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 722-101
MM2-4TX1-EEC	0.8 W	2.8 Btu (IT)/h	-40 °C ... +70 °C	-40 °C ... +85 °C	943 722-151
MM2-2FXP4	3.8 W	13.0 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 842-101
MM2-4FXM3	6.8 W	23.2 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 721-101
MM2-2FXM3 / 2TX1	3.8 W	13.0 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 720-101
MM2-2FXM2	3.8 W	13.0 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 718-101
MM2-2FXS2	3.8 W	13.0 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 719-101
MICE 3000 media modules:					
MM3-2AUI	3.4 W	11.6 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 840-101
MM3-4FLM4	5.0 W	17.1 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 760-101
MM3-2FLM4 / 2TX1-RT	5.0 W	17.1 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 117-004
MM3-4TX5	0.8 W	2.8 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 841-101
MM3-4TX1-RT	0.8 W	2.8 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 117-001
MM3-4FXP4	6.8 W	23.2 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 843-101
MM3-1FXM2 / 3TX1	2.3 W	7.9 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 839-101
MM3-1FXM2 / 3TX1-EEC	2.3 W	7.9 Btu (IT)/h	-40 °C ... +70 °C	-40 °C ... +85 °C	943 839-151
MM3-2FXM2 / 2TX1	3.8 W	13.0 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 761-101
MM3-2FXM2 / 2TX1-EEC	3.8 W	13.0 Btu (IT)/h	-40 °C ... +70 °C	-40 °C ... +85 °C	943 761-151
MM3-2FXM2 / 2TX1-RT	3.8 W	13.0 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 117-002

MM3-2FXM4 / 2TX1	3.8 W	13.0 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 837-101
MM3-4FXM2	6.8 W	23.2 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 764-101
MM3-4FXM4	6.8 W	23.2 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 835-101
MM3-1FXS2 / 3TX1	2.3 W	7.9 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 838-101
MM3-1FXS2 / 3TX1 EEC	2.3 W	7.9 Btu (IT)/h	-40 °C ... +70 °C	-40 °C ... +85 °C	943 838-151
MM3-2FXS2 / 2TX1	3.8 W	13.0 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 762-101
MM3-2FXS2 / 2TX1-EEC	3.8 W	13.0 Btu (IT)/h	-40 °C ... +70 °C	-40 °C ... +85 °C	943 762-151
MM3-2FXS2 / 2TX1-RT	3.8 W	13.0 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 117-003
MM3-4FXS2	6.8 W	23.2 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 836-101
MM3-1FXL2 / 3TX1	3.4 W	11.6 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 763-101
MM3-4SFP	8.0 W	27.3 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 938-001
MICE 4000 media modules:					
MM4-4TX / SFP	9.0 W	30.8 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 010-001
MM4-2TX / SFP	5.8 W	19.8 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 622-001
Open variant media modules (You will find further informationen on www.hirschmann-ac.com):					
MM20-... 4 TX-/0 FX-Ports	0.8 W	2.8 Btu (IT)/h	see chapter 8	see chapter 8	product code; chap. 8
MM20-... 3 TX-/1 FX-Ports	2.3 W	7.9 Btu (IT)/h	see chapter 8	see chapter 8	product code; chap. 8
MM20-... 2 TX-/2 FX-Ports	3.8 W	13.0 Btu (IT)/h	see chapter 8	see chapter 8	product code; chap. 8
MM20-... 0 TX-/2 FX-Ports	3.8 W	13.0 Btu (IT)/h	see chapter 8	see chapter 8	product code; chap. 8
MM20-... 1 TX-/3 FX-Ports	5.3 W	18.1 Btu (IT)/h	see chapter 8	see chapter 8	product code; chap. 8
MM20-... 0 TX-/4 FX-Ports	6.8 W	23.2 Btu (IT)/h	see chapter 8	see chapter 8	product code; chap. 8
MM20-A8A89999	3.4 W	11.6 Btu (IT)/h	see chapter 8	see chapter 8	product code; chap. 8
MM20-F4F4F4F4	5.0 W	17.1 Btu (IT)/h	see chapter 8	see chapter 8	product code; chap. 8
MM20-Z6Z6Z6Z6	8.0 W	27.3 Btu (IT)/h	see chapter 8	see chapter 8	product code; chap. 8
MM30-O7O7O7O7	9.0 W	30.8 Btu (IT)/h	see chapter 8	see chapter 8	product code; chap. 8
MM30-O7O79999	5.8 W	19.8 Btu (IT)/h	see chapter 8	see chapter 8	product code; chap. 8
MM21-T1T1T1T1	0.8 W	2.8 Btu (IT)/h	see chapter 8	see chapter 8	product code; chap. 8
MM21-F4F4T1T1	5.0 W	17.1 Btu (IT)/h	see chapter 8	see chapter 8	product code; chap. 8
MM21-M2M2T1T1	3.8 W	13.0 Btu (IT)/h	see chapter 8	see chapter 8	product code; chap. 8
MM21-S2S2T1T1	3.8 W	13.0 Btu (IT)/h	see chapter 8	see chapter 8	product code; chap. 8
MM22-T1T1T1T1	0.8 W	2.8 Btu (IT)/h	see chapter 8	see chapter 8	product code, chap. 8
Expansion moduel					
MB-2T	0 W	0 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 733-002
Fast ETHERNET SFP modules:					
M-FAST SFP-MM / LC	0 W	0 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 865-001
M-FAST SFP-MM / LC EEC	0 W	0 Btu (IT)/h	-40 °C ... +70 °C	-40 °C ... +85 °C	943 945-001
M-FAST SFP-SM / LC	0 W	0 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 866-001
M-FAST SFP-SM / LC EEC	0 W	0 Btu (IT)/h	-40 °C ... +70 °C	-40 °C ... +85 °C	943 946-001
M-FAST SFP-SM+ / LC	0 W	0 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 867-001
M-FAST SFP-SM+ / LC EEC	0 W	0 Btu (IT)/h	-40 °C ... +70 °C	-40 °C ... +85 °C	943 947-001
M-FAST SFP-LH / LC	0 W	0 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 868-001
Gigabit ETHERNET SFP modules:					
M-SFP-SX / LC	0 W	0 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 014-001
M-SFP-SX / LC EEC	0 W	0 Btu (IT)/h	-40 °C ... +70 °C	-40 °C ... +85 °C	943 896-001
M-SFP-LX / LC	0 W	0 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 015-001
M-SFP-LX / LC EEC	0 W	0 Btu (IT)/h	-40 °C ... +70 °C	-40 °C ... +85 °C	943 897-001
M-SFP-LH / LC	0 W	0 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 042-001
M-SFP-LH / LC EEC	0 W	0 Btu (IT)/h	-40 °C ... +70 °C	-40 °C ... +85 °C	943 898-001
M-SFP-LH+ / LC	0 W	0 Btu (IT)/h	0 °C ... +60 °C	-40 °C ... +70 °C	943 049-001

8. Open variant product code

Alternatively to the order number (ref. table in chapter 7, last column) you can use the product code. It offers you, tailored to your requirements, an additional variety of media module types.

The product code of your media module is made from combining the desired product characteristics in accordance with the following table. The short designation is in column “Ident.”.

Example:
Product code MM30-O7O7O7O7SA = media module 1000 Mbit/s with four combo ports gigabit Ethernet (four SFP ports or alternatively four TP ports RJ45). This example equals the module MM4-4TX/SFP with the order number 943 010-001.

Position	Attribute	Ident.	Feature
1 to 4	Product	MM20	Media module 10/100 Mbit/s (standard)
		MM21	Media module 10/100 Mbit/s (realtime)
		MM22	Media module 10/100 Mbit/s (Power over Ethernet)
		MM30	Media module 1000 Mbit/s (standard)
5	- (hyphen)		
6 and 7	1st port (media/connector)	T1	Twisted pair (TX) / RJ45
		T5	Twisted pair (TX) / M12
		M2	Multimode FX DSC (only 100 Mbit/s)
		M3	Multimode FX MTRJ (only 100 Mbit/s)
		M4	Multimode FX ST (only 100 Mbit/s)
		S2	Singlemode FX DSC (only 100 Mbit/s)
		S4	Singlemode FX ST (only 100 Mbit/s)
		L2	Singlemode longhaul FX DSC (only 100 Mbit/s)
		G2	Singlemode longhaul FX DSC 200km (only 100 Mbit/s)
		F4	Multimode FL ST (only 10 Mbit/s)
		P4	POF FX ST (only 100 Mbit/s)
		O7	Combo port gigabit Ethernet (SFP only 1000 Mbit/s)
		A8	AUI Sub-D
		Z6	Fiber optic / SFP slot (100 Mbit/s)
8 and 9	2nd port (media/connector)	...	See position 6 and 7
10 and 11	3rd port (media/connector)	...	See position 6 and 7
		99	Empty
12 and 13	4th port (media/connector)	...	See position 6 and 7
		99	Empty
14	Temperature range	S	Standard 0 °C to +60 °C
		T	Extended -40 °C to +70 °C
		E	Extended -40 °C to +70 °C & Conformal Coating
15	Specifications	A	CE, UL 508, ISA 12.12.01 (UL 1604)
		H	A plus GL, IEC 61850, IEEE 1613 substation, EN 50121-4 railway (along track)
		B	H plus ATEX100a

Hirschmann Automation and Control GmbH
Stuttgarter Straße 45-51
D-72654 Neckartenzlingen
Germany
Tel.: +49-1805-14-1538
Fax: +49-7127-14-1551
E-Mail: hac-support@hirschmann.de
Internet: http://www.hirschmann-ac.com

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