FL MC EF 1300 MM ST



FO converter with B-FOC (ST®) connection (1300 nm), for converting 10/100Base-T(X) to multi-mode fiberglass

Data sheet
104914_en_08

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1 Description

The **FL MC EF 1300 MM ST** FO converter provides a high level of immunity to interference and a long transmission range in industrial applications by converting the 10/100Base-T(X) Ethernet interface to fiber optics (100 Mbps according to FX standard).

If longer distances are to be covered or if an existing fiberglass installation is used, the FO converter covers distances of up to 10,000 m with 62.5/125 µm or 6400 m with 50/125 µm multi-mode fiberglass in full duplex mode.

Features

- 10/100Base-T(X) auto negotiation
- Auto MDI/MDIx switchover
- Operating mode and speed can be set manually
- Link fault pass through (LFPT)
- Far End Fault signaling (FEF)
- B-FOC (ST®) connection
- Mounting on a 35 mm DIN rail
- Redundant power supply possible
- Shipbuilding approval in accordance with DNV GL

Observe these notes

WARNING: Explosion hazard when used in potentially explosive areas

The device is a category 3 item of electrical equipment. Follow the instructions provided here during installation and observe the safety notes.

Make sure you always use the latest documentation.
It can be downloaded at: phoenixcontact.com/product/2902854

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3 Ordering data

Description	Type	Item no.	Pcs./Pkt.
FO converter with B-FOC (ST®) fiber optic connection (1300 nm), for converting 10/100Base-T(X) to multi-mode fiberglass (50/125 µm). Auto negotiation and auto MDI(X) function. Comprehensive link diagnostics. DIN-rail mountable, 18 … 30 V DC supply.	FL MC EF 1300 MM ST	2902854	1

Accessories	Type	Item no.	Pcs./Pkt.
RJ45 connector, design: RJ45, degree of protection: IP20, number of positions: 8, 1 Gbps, CAT5 (IEC 11801:2002), material: Plastic, connection method: Crimp connection, connection cross section: AWG 26- 24, cable outlet: straight, color: gray, Ethernet	FL PLUG RJ45 GR/2	2744856	1
RJ45 connector, design: RJ45, degree of protection: IP20, number of positions: 8, 1 Gbps, CAT5 (IEC 11801:2002), material: Plastic, connection method: Crimp connection, connection cross section: AWG 26- 24, cable outlet: straight, color: green, Ethernet	FL PLUG RJ45 GN/2	2744571	1
CAT5-SF/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable, 2 x 2 x 0.22 mm², solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.75 mm ± 0.15 mm diameter	FL CAT5 HEAVY	2744814	1
By the meter, Installation cable, Ethernet CAT5 (100 Mbps), shielded, PUR halogen-free, water blue RAL 5021, 4-wire (2x2xAWG26/7, SF/UTP), color single wire: white/orange-orange, white/green-green, cable length: Free entry (1.0 … 1000.0 m)	FL CAT5 FLEX	2744830	1
Crimping pliers, for assembling the RJ45 plugs FL PLUG RJ45..., for assembly on site	FL CRIMPTOOL	2744869	1
DIN rail connector, color: green, nominal current: 8 A (parallel contacts), rated voltage (III/2): 125 V, number of positions: 5, product range: TBUS5-22,5.., pitch: 3.81 mm, mounting: DIN rail mounting, locking: without, mounting: without, type of packaging: packed in cardboard, Item with gold-plated contacts, bus connectors for connecting with electronics housings, 5 parallel contacts	ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	2707437	50
Primary-switched power supply, QUINT POWER, screw connection, DIN rail mounting, supply of devices possible via the TBUS DIN rail connector, protective coating, input: single-phase, output: 24 V DC/2.5 A	QUINT4-SYS-PS/1AC/24DC/ 2.5/SC	2904614	1
DIN rail connector for DIN rail mounting. Universal for TBUS housing. Gold-plated contacts, 5-pos.	ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10

Accessories	Type	Item no.	Pcs./Pkt.
DIN rail connector, color: light gray, nominal current: 8 A (parallel contacts), rated voltage (III/2): 125 V, number of positions: 5, product range: TBUS5-17,5.., pitch: 3.81 mm, mounting: DIN rail mounting, locking: without, mounting: without, type of packaging: packed in cardboard, Item with gold-plated contacts, bus connectors for connecting with electronics housings, 5 parallel contacts	ME 17,5 TBUS 1,5/ 5-ST-3,81 KMGY	2713645	50
Multi-mode OM2 duplex jumper, ST-SC, UPC polishing, length 1 m	FOC-ST:PA-SC:PA-OM2:D01/1	1115574	1
Multi-mode OM2 duplex jumper, ST-SC, UPC polishing, length 2 m	FOC-ST:PA-SC:PA-OM2:D01/2	1115573	1
Multi-mode OM2 duplex jumper, ST-ST, UPC polishing, length 1 m	FOC-ST:PA-ST:PA-OM2:D01/1	1115560	1
Multi-mode OM2 duplex jumper, ST-ST, UPC polishing, length 2 m	FOC-ST:PA-ST:PA-OM2:D01/2	1115557	1
Multi-mode OM2 duplex jumper, LC-ST, UPC polishing, length 1 m	FOC-LC:PA-ST:PA-OM2:D01/1	1115588	1
Multi-mode OM2 duplex jumper, LC-ST, UPC polishing, length 2 m	FOC-LC:PA-ST:PA-OM2:D01/2	1115587	1
Multi-mode OM1 duplex jumper, LC-ST, UPC polishing, length 1 m	FOC-LC:PA-ST:PA-OM1:D01/1	1146499	1
Multi-mode OM1 duplex jumper, LC-ST, UPC polishing, length 2 m	FOC-LC:PA-ST:PA-OM1:D01/2	1146508	1
Multi-mode OM1 duplex jumper, ST-ST, UPC polishing, length 1 m	FOC-ST:PA-ST:PA-OM1:D01/1	1146501	1
Multi-mode OM1 duplex jumper, ST-ST, UPC polishing, length 2 m	FOC-ST:PA-ST:PA-OM1:D01/2	1146509	1
RJ45 connector, design: RJ45, degree of protection: IP20, number of positions: 8, 1 Gbps, CAT5, material: Plastic, connection method: Insulation displacement connection, connection cross section: AWG 26- 23, cable outlet: straight, color: traffic grey A RAL 7042, Ethernet	VS-08-RJ45-5-Q/IP20	1656725	1
RJ45 connector, design: RJ45, degree of protection: IP20, number of positions: 8, 1 Gbps, CAT5, material: Plastic, connection method: Insulation displacement connection, connection cross section: AWG 26- 23, cable outlet: straight, color: black, Ethernet	VS-08-RJ45-5-Q/IP20 BK	1658008	1
FO connectors, degree of protection: IP20, number of positions: 4, MM, material: Plastic, cable outlet: straight	PSM-SET-B-FOC/4-HCS/PN	2313782	1
Patch cable, CAT5, assembled, 0.5 m	FL CAT5 PATCH 0,5	2832263	1
Patch cable, CAT5, assembled, 1 m	FL CAT5 PATCH 1,0	2832276	1
Patch cable, CAT5, assembled, 2 m	FL CAT5 PATCH 2,0	2832289	1
Patch cable, CAT5, assembled, 3 m	FL CAT5 PATCH 3,0	2832292	1
Patch cable, degree of protection: IP20, number of positions: 8, 10 Gbps, $CAT6_A$, cable outlet: straight, Ethernet	NBC-R4AC-R4AC-IE8A/.../...	1411854	1

Accessories	Type	Item no.	Pcs./Pkt.
Patch cable, CAT6$_A$, 4-pair, shielded, connection not crossed (line), assembled at both ends with RJ45/IP20 connectors, outer sheath material: PUR, length: 2.0 m	NBC-R4AC/10G-R4AC/10G-94F/2,0	1408360	1
Patch cable, CAT6$_A$, 4-pair, shielded, connection not crossed (line), assembled at both ends with RJ45/IP20 connectors, outer sheath material: PUR, length: 3.0 m	NBC-R4AC/10G-R4AC/10G-94F/3,0	1408365	1
The FL DIN RA is installed in a standard, 19-inch rack (EIA-310-D, IEC 60297-3-100) to allow DIN rail mounted equipment to be rack mounted.	FL DIN RA	2891053	1

4 Technical data

Supply	
Supply voltage range	18 V DC … 30 V DC (Screw connection) 18 V DC … 30 V DC (as an alternative or redundant, via back-plane bus contact and system current supply)
Nominal supply voltage	24 V DC
Typical current consumption	100 mA (24 V DC)
Protective circuit	Reverse polarity protection
Electrical isolation	VCC // FE // Ethernet
Test voltage data interface/power supply	0.5 kV_{rms} (50 Hz, 1 min.)
Connection method	**Plug-in screw terminal block (COMBICON), redundancy possible**
Tightening torque	0.56 Nm … 0.79 Nm
Stripping length	7.00 mm
Conductor cross section	
flexible	0.2 mm² … 2.5 mm²
flexible AWG	24 … 14
rigid	0.2 mm² … 2.5 mm²
rigid AWG	24 … 14

Ethernet interface, 10/100Base-T(X) in accordance with IEEE 802.3	
Number of ports	1
Connection method	RJ45 jack, shielded
Transmission speed	10/100 Mbps
Transmission length	100 m (shielded twisted pair)
Transmission medium	Copper
Auto-negotiation modes	Auto
Link through	Link fault pass through
MDI-/MDI-X switchover	Auto-MDI(X)
Signal LEDs	Activity, link status, 10/100 Mbps

FO interface	
Data rate	100 Mbps
Connection method	B-FOC (ST®)
Wavelength	1300 nm
Laser protection	Class 1 according to DIN EN 60825-1
Transmission length incl. 3 dB system reserve	
F-G 50/125 0.7 dB/km F 1000	6.4 km
F-G 50/125 1.6 dB/km F 800	2.8 km
F-G 62.5/125 0.7 dB/km F 1000	10 km
F-G 62.5/125 2.6 dB/km F 600	3 km
Transmit capacity, minimum	
(50/125 µm) dynamic in link mode (average)	≥ -23.5 dBm
(62,5/125 µm) dynamic in link mode (average)	≥ -20 dBm
Transmit capacity, maximum	
(50/125 µm) dynamic in link mode (average)	≤ -14 dBm
(62,5/125 µm) dynamic in link mode (average)	≤ -14 dBm
Minimum receiver sensitivity	
dynamic in link mode (average)	-31 dBm
Overrange receiver	
dynamic in link mode (average)	-14 dBm
Signal LEDs	Far end fault (red LED), link status (yellow LED)

General data	
Basic functions	Store-and-forward media converter
Degree of protection	IP20
Mounting type	DIN rail mounting
Dimensions (W/H/D)	22.5 mm x 99 mm x 114.5 mm
Material	
Housing	PA 6.6-FR
Color	
Housing	green (6021)
Free fall in acc. with IEC 60068-2-32	1 m
Vibration resistance in acc. EN 60068-2-6/IEC 60068-2-6	5g, 10...150 Hz, 2.5 h, in XYZ direction
Shock in acc. with EN 60068-2-27/IEC 60068-2-27	25g, 11 ms period, half-sine shock pulse
Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
Free from substances that could impair the application of coating	VDMA 24364:2018-05

MTTF (mean time to failure)	
SN 29500 standard, temperature 25°C, operating cycle 21%	1400 Years
SN 29500 standard, temperature 40°C, operating cycle 34.25%	599 Years
SN 29500 standard, temperature 40°C, operating cycle 100%	101 Years

Ambient conditions	
Ambient temperature	
Operation	-40 °C ... 65 °C
Storage/transport	-40 °C ... 85 °C
Humidity	
Operation	5 % ... 95 % (non-condensing)
Storage/transport	5 % ... 95 % (non-condensing)
Altitude	≤ 5000 m (for restrictions, see the manufacturer's declaration for altitude operation) ≤ 2000 m (in acc. with UL)
Air pressure	
Operation	80 kPa ... 110 kPa

Conformance/Approvals	
CE	CE-compliant
IECEx	Ex ec [op is Gb] IIC T4 Gc [Ex op is Db] IIIC IECEx ULD 24.0009X
ATEX	Ⓔx II 3 (2) G Ex ec [op is Gb] IIC T4 Gc Ⓔx II (2) D [Ex op is Db] IIIC UL 24 ATEX 3197X Please follow the special installation instructions in the documentation!
UL, USA/Canada	508 Listed Class I, Zone 2, AEx nA IIC T4 Class I, Zone 2, Ex nA IIC T4 Gc X Class I, Div. 2, Groups A, B, C, D
KC approval for South Korea	MSIP-REI-PCK-2902854
Corrosive gas test	ISA-S71.04-1985 G3 Harsh Group A
Shipbuilding	DNV GL
Temperature	B
Humidity	A
Vibration	A
EMC	B
Enclosure	Required protection according to the Rules shall be provided upon installation on board

Conformance with EMC Directive 2014/30/EU		
Immunity in accordance with EN 61000-6-2		
Electrostatic discharge	EN 61000-4-2	
	Contact discharge	± 6 kV (Test Level 3)
	Discharge in air	± 8 kV (Test Level 3)
	Indirect discharge	± 6 kV
	Comments	Criterion B
Electromagnetic HF field	EN 61000-4-3	
	Frequency range	80 MHz ... 3 GHz (Test Level 3)
	Field intensity	10 V/m
	Comments	Criterion A
Fast transients (burst)	EN 61000-4-4	
	Input	± 2 kV (Test Level 3)
	Signal	± 2 kV (Test Level 3)
	Comments	Criterion B
Surge current loads (surge)	EN 61000-4-5	
	Input	± 0.5 kV (DC supply)
	Signal	± 1 kV (Data line, asymmetrical)
	Comments	Criterion B
Conducted interference	EN 61000-4-6	
	Frequency range	0.15 MHz ... 80 MHz
	Voltage	10 V
	Comments	Criterion A

Criterion A	Normal operating behavior within the specified limits.
Criterion B	Temporary impairment to operational behavior that is corrected by the device itself.

Emitted interference in acc. with EN 61000-6-4	
Interference emission	EN 55032 Class A, industrial applications

5 Safety regulations and installation notes

5.1 Installation notes

CAUTION:

Observe the following safety notes when using the device.

- The product is an item of Ex associated devices (category 2) with “inherently safe optical radiation” type of protection and can be installed in zone 2 potentially explosive areas as a category 3 device.
- The product satisfies the requirements of the following standards:
  - EN/IEC 60079-0, EN/IEC 60079-7, EN/IEC 60079-28
  - Comprehensive details are to be found in the EU Declaration of Conformity which is enclosed and also available on our website in the latest version.
- Installation, operation, and maintenance may only be carried out by qualified electricians. Follow the installation instructions as described.
- When installing and operating the device, the applicable regulations and safety directives (including national safety directives), as well as general technical regulations, must be observed. The safety-relevant data is listed in this document.
- Observe the specified conditions for use in potentially explosive areas! Also observe the requirements of EN/IEC 60079-14.
- The product must not be opened or modified apart from the configuration of the DIP switches. Do not repair the product yourself; replace it with an equivalent product. Repairs may only be carried out by the manufacturer. The manufacturer is not liable for damage resulting from failure to comply.
- Do not subject the product to mechanical and/or thermal stress that exceeds the specified limits.
- The product must be stopped and immediately removed from the Ex area if it is damaged, has been subjected to an impermissible load, stored incorrectly, or if it malfunctions.

5.2 Installation in Zone 2

WARNING: Explosion hazard when used in potentially explosive areas

Please make sure that the following notes and instructions are observed.

- Use in potentially explosive areas is not permitted in China.
- Install the device in such a way that a degree of protection of at least IP54 is achieved in accordance with EN/IEC 60529. To this end, a suitable, approved housing that meets the requirements of EN/IEC 60079-0 should be used.
- Only devices that are designed for operation in the specific Ex zone and for the specific conditions at the installation location may be connected to circuits in potentially explosive areas.
- In potentially explosive areas, only connect and disconnect cables and plug-in connections (e.g., connector, SD card, DIN rail connector, etc.) when the power is disconnected.
- For safe operation, lockable plug-in connections (e.g., connector, SD card, DIN rail connector, etc.) must be fully inserted and have a functional interlock (e.g., locking clip, screw connection, etc.).
- Insert the interlock. Repair any damaged plug-in connections immediately.
- Only connect one cable per terminal point.
- Use the device in an environment that does not exceed pollution degree 2 in accordance with EN/IEC 60664-1.
- Use transient protection so that short-term surge voltages do not exceed 119 V.
- The switches of the device that can be accessed may only be actuated when the power supply to the device is disconnected or when it has been ensured that there is no potentially explosive atmosphere present.
- The product is not designed for use in potentially dust-explosive atmospheres.

5.3 UL note

WARNING: Explosion hazard when used in potentially explosive areas
Please make sure that the following notes and instructions are observed.

INDUSTRIAL CONTROL EQUIPMENT 11AE
Wire Range: 24-14 AWG
Torque: 5-7 (Lbs-Ins)
Environmental designation: "Open Type Device"
"Pollution Degree 2 Installation Environment"

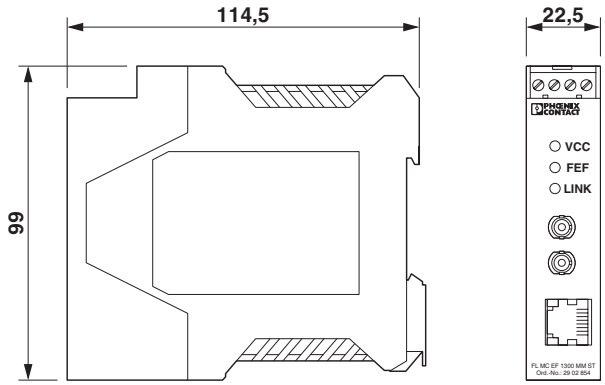
PROCESS CONTROL EQUIPMENT FOR HAZARDOUS LOCATIONS 31ZN

A) This equipment is suitable for use in Class I, Zone 2, AEx nA IIC T4; Ex nA IIC T4 Gc X or Class I, Division 2, Groups A, B, C, D or non-hazardous locations only.
B) Provision shall be made to prevent transient disturbances of more than 140% of the rated supply voltage.
C) The device must be installed in a Class I, Zone 2 certified overall enclosure rated IP54 with tool-accessible only cover or door and in degree of pollution 2 environment only.
D) Unit shall be supplied by Limited Energy circuit according to clause 9.4 of UL 61010-1 3rd edition of Limited Power Source according to clause 2.5 of UL 60950-1 or NEC Class 2.
E) Conductor temperature rating must be 72°C or higher.
F) Maximum relative humidity 80 % for temperatures up to 31°C decreasing linearly to 50 % relative humidity at 40°C.

6 Product description

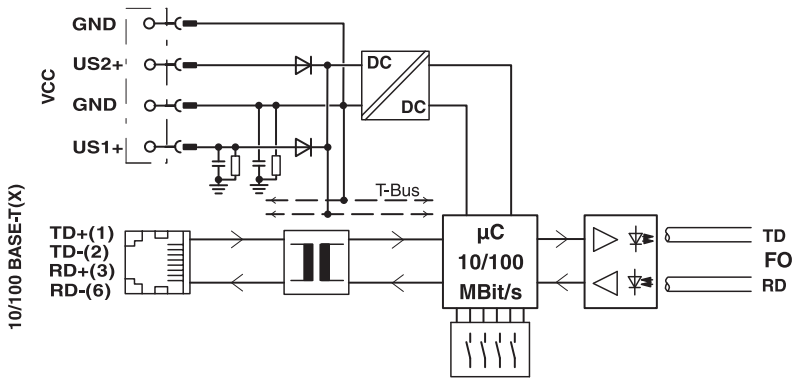
6.1 Dimensions

Figure 1 Housing dimensions



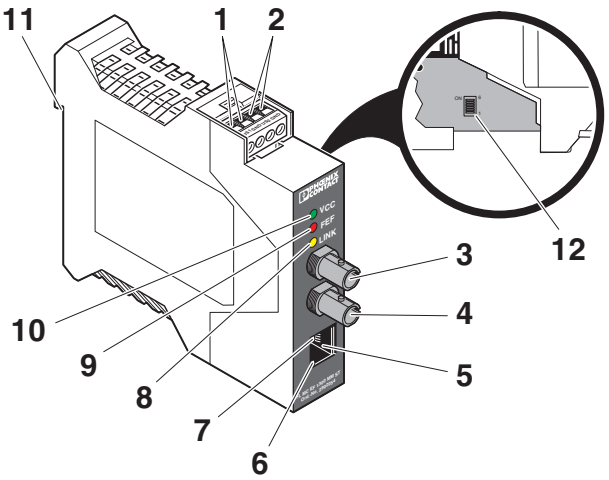
6.2 Basic circuit diagram

Figure 2 Basic circuit diagram



6.3 Function elements

Figure 3 Function elements



1 24 V DC Supply voltage
2 24 V DC Supply voltage, redundant
3 Fiber optic (FO) transmitter
4 Fiber optic (FO) receiver
5 RJ45 Ethernet port, 10/100Base-T(X)
6 LED Link/Activity/10/100
7 LED HD/FD
8 LED LINK
9 LED FEF
10 LED VCC
11 Functional ground
12 DIP switch

6.4 Diagnostics and status indicators

Ethernet interface				
6	Link/Activity/10/100			
		Yellow	On	10 Mbps link
			Flashing	10 Mbps link - active data transmission
		Green	On	100 Mbps link
			Flashing	100 Mbps link - active data transmission
7	HD/FD	Green	Off	Half duplex transmission
			On	Full duplex transmission

Fiber optics interface (FO port)				
8	LINK	Yellow	On	Fiber optics link available, no data communication
			Flashing	Data transmission at FO port
9	FEF	Red	On	Far-end fault, remote station reports: “no light”

Supply voltage				
10	VCC	Green	On	Supply voltage OK

Far End Fault signal (FEF)

If in the case of a FO converter the fiber optic connection for transmission fails, the FO converter on the opposite side sends the “No light” signal. This Far End Fault signal is received by the FO converter with the transmission fault via the receive cable and indicated with the red FEF LED.

If the copper connection is interrupted at one of the FO converters, data communication for both FO converters in both the optical and copper segment is disabled by the link fault pass through function. In this case, all Link LEDs go out. However, in order that error diagnostics can be carried out, the red FEF LED lights up on the FO converter where the copper segment is interrupted.

7 Transport and unpacking

- Check the delivery for visible damage caused by transportation.
- Submit claims for any transport damage immediately. Inform Phoenix Contact or your supplier as well as the shipping company without delay.
- Read the entire packing slip carefully.
- Retain the packing slip.
- Keep the packaging for a possible later transport.

8 Configuration via DIP switches

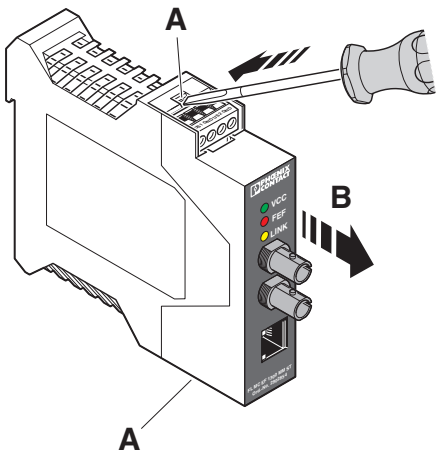
NOTE: Electrostatic discharge!

Electrostatic discharge can damage or destroy components.

– When handling the device, observe the necessary safety precautions against electrostatic discharge (ESD) in accordance with EN 61340-5-1 and IEC 61340-5-1.

Only select the mode of operation when the power is disconnected! The change is activated after renewed power up.

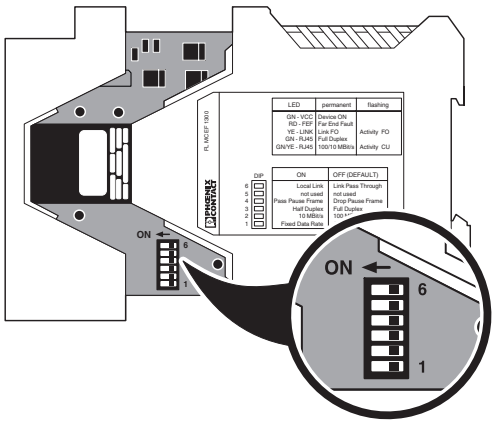
Figure 4 Opening the housing



- Disengage the housing cover with a screwdriver (A).
- Then carefully pull the PCB out of the housing as far as possible (B).

By default, all DIP switches are in the “OFF” position. The copper side of the device operates in “Auto negotiation” mode.

Figure 5 DIP switches



DIP	ON	OFF (default setting)
6	LFPT deactivated (local)	LFPT activated (global)
5	Not used	
4	Pass pause frame	Drop pause frame
3	Half duplex transmission	Full duplex transmission
2	10 Mbps	100 Mbps
1	Fixed transmission speed on the copper side	Auto negotiation

8.1 Setting data transmission (DIP 1, DIP 2, and DIP 3)

DIP 1 = OFF: the connected end devices negotiate 10/100 Mbps transmission speed and half/full transmission mode directly. The entire path behaves like a directly connected copper cable.

DIP 1 = ON: you set the transmission speed and mode manually with DIP switches 2 and 3.

DIP 1	OFF	Auto negotiation		
DIP 1	ON	**DIP 2**	OFF	100 Mbps
			ON	10 Mbps
		DIP 3	OFF	Full duplex transmission
			ON	Half duplex transmission

If DIP switch 1 is in the “OFF” position, the position of DIP switch 2 and 3 is not queried.

8.2 Pause frame (DIP 4)

A pause frame signal can request an Ethernet device to temporarily interrupt data transmission. This avoids overloading the partner when, for example, communication takes place with different transmission speeds.

DIP 4 = OFF: the device does not respond to an incoming pause frame signal. It is also not forwarded. A pause frame signal cannot be generated by the device itself.

The transmission of pause frame signals is negotiated in sections.

DIP 4 = ON: the device responds to pause frame signals or forwards them. A pause frame signal can be generated by the device itself.

8.3 Link fault pass through (DIP 6)

The LFPT (link fault pass through) function provides permanent connection monitoring. The link on the fiber optic connection switches off if the connection is lost on the copper side of a FO converter. The FO converter on the other side registers the aborted link via the fiber optic path and likewise interrupts the connection for its twisted pair segment.

The entire connection over the optical path is therefore as transparent as it would be were communication purely copper-based. Both sides of the network connection can therefore detect a lost link immediately and respond accordingly. In the event of an error, this keeps the network load low and ensures that redundancy mechanisms can be activated.

DIP 6 = OFF: the LFPT function is activated.
In the event of a fault, the entire connection is disabled (global).

DIP 6 = ON: the LFPT function is deactivated.
In the event of a fault, only the interrupted segment is disabled (local). This is useful during startup and in the event of an error.

9 Installation

NOTE: device damage

Only mount and remove devices when the power supply is disconnected.

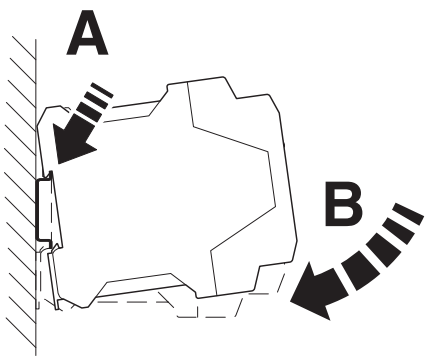
NOTE: Malfunction

Use a grounding terminal block to connect the DIN rail to protective earth ground. The devices are grounded when they are snapped onto the DIN rail (installation according to PELV).
This ensures that the shielding is effective.
Connect protective earth ground with low impedance.

The device is intended for installation in a control cabinet. The product can be snapped onto all 35 mm DIN rails in accordance with EN/IEC 60715.

9.1 Mounting on a DIN rail

Figure 6 Mounting on a DIN rail



- To avoid contact resistance, only use clean, corrosion-free 35 mm DIN rails according to DIN EN 60715.
- Install an end bracket next to the left-hand device to prevent the devices from slipping.
- Place the device onto the DIN rail from above. Push the device from the front toward the mounting surface until it audibly engages.
- Snap the other devices that are to be contacted onto the DIN rail next to one another.

9.2 Combined mounting

A joining station must not consist of more than ten devices.

Observe the snap-in direction of the device and DIN rail connector: snap-on foot below and plug on the left.

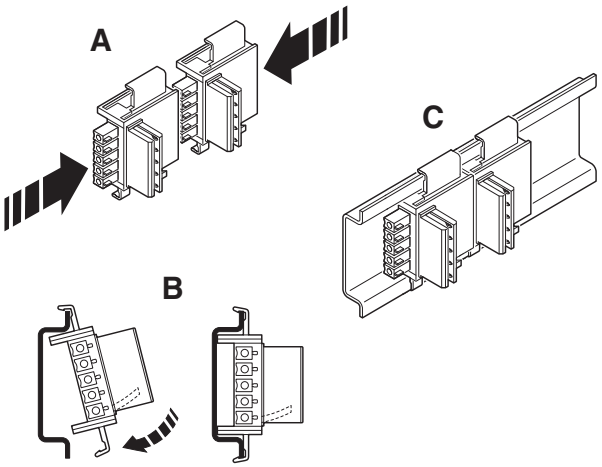
The DIN rail connector bridges the supply voltage.

Only connect the following devices together via the DIN rail connector:

– FL MC EF...
– QUINT4-SYS-PS/1AC/24DC/2.5/SC, Item No. 2904614

The pin assignment may differ for other devices.

Figure 7 Combined assembly



- To form a joining station, connect the DIN rail connectors (item no.: 2707437, 1 pc. per device) together.
- Push the connected DIN rail connectors into the DIN rail.
- Place the device onto the DIN rail from above. Ensure the device and DIN rail connector are aligned correctly.
- Push the front of the device toward the mounting surface until it audibly snaps into place.

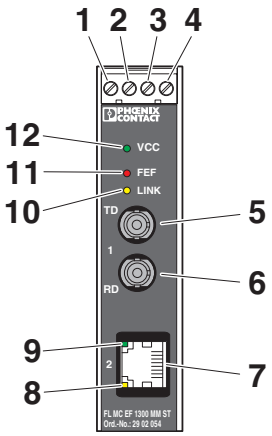
9.3 Removal

- Disconnect all cables from the device.
- Push down the locking tab with a screwdriver, needle-nose pliers or similar.
- Slightly pull the bottom edge of the device away from the mounting surface.
- Pull the device away from the DIN rail.
- When removing a complete joining station, also remove the DIN rail connectors.

9.4 Power supply voltage

CAUTION: Electric shock

The device is designed exclusively for operation with SELV/PELV from a Class ES1 “electrical energy source” in accordance with EN/IEC 62368-1 and VDE 0868-1.



1	24 V DC	Supply voltage
2	0 V DC	Supply voltage
3	24 V DC	Supply voltage, redundant
4	0 V DC	Supply voltage, redundant

Single device

- Supply voltage to the device via terminal blocks **1** (24 V) and **2** (0 V).
- Optional: for a redundant power supply, connect an additional power supply unit to terminal blocks 3 and 4.

Joining station with system power supply

When mounting the media converter on the DIN rail connector, please observe section "9.2 Combined mounting".

- Connect the system power supply with one DIN rail connector to the left of the joining station.
  - QUINT4-SYS-PS/1AC/24DC/2.5/SC, Item No. 2904614
  - DIN rail connector, Item No. 2713645
- A second power supply unit can be used to create a redundant supply concept.

Refer to the user documentation for the power supply at www.phoenixcontact.com/product/2904614.

10 Ethernet interface

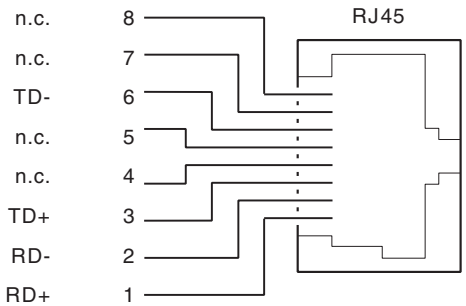
NOTE: Interference

Only use shielded twisted pair cables and corresponding shielded RJ45 connectors.

- Only twisted pair cables with an impedance of 100 Ω can be connected to the RJ45 Ethernet interface.

The data transmission speed is 10/100 Mbps

Figure 8 Pin assignment



- Insert the Ethernet cable with the RJ45 connector into the Ethernet port until the connector engages with a click. Observe the connector coding.

11 Fiber optic interface (FO port)

WARNING: Risk of eye injury

The light can cause damage to eyes.

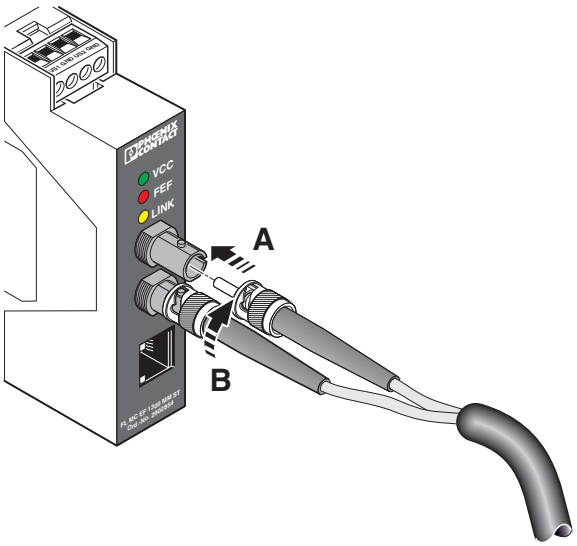
– During operation, do not look directly into the transmitter diodes or use optical aids to look into the fiberglass. The infrared light is not visible.

Avoid contamination.

– Do not remove the dust protection caps until just before the connectors are connected.

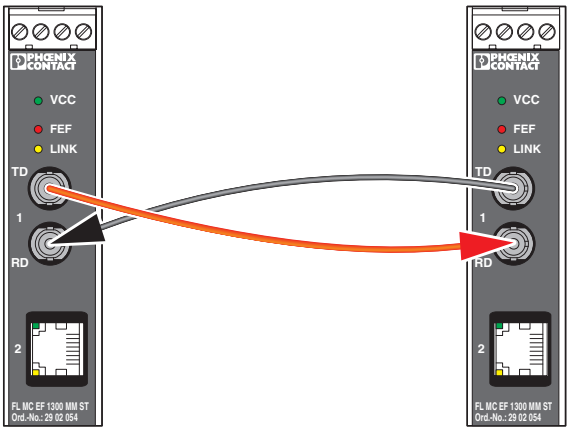
When using fiber optics, observe the fiber optic installation guidelines, DB GB IBS SYS FOC ASSEMBLY, Item No. 9423439.

Figure 9 Connect B-FOC (ST®) plug



- Remove the dust protection cap.
- Connect the fiber optic cable to the B-FOC (ST®) connector for the transmit and receive channel. Make sure the coding is in the correct position.
- Push the connector spring mechanism downwards.
- Secure the connection with a quarter turn to the right (B).

Figure 10 Signal direction for the fiber connection



When connecting two FO converters, note the signal direction of the fiber optics.

– Fiber connection “TD” (transmitter) at device 1

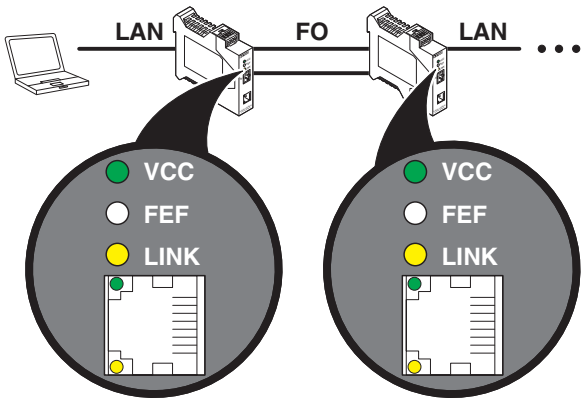
– Fiber connection “RD” (receiver) at device 2

Please note the transmit and receive channel crossover.

12 Error localization

12.1 Normal operation

Figure 11 Diagnostics indicators in normal operation

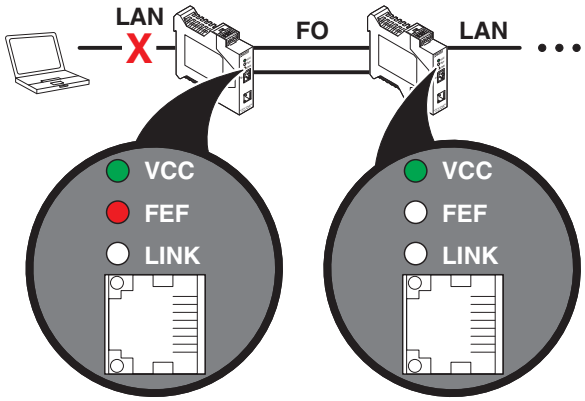


12.2 Fault on the copper cable

The diagnostics indicator depends on DIP 6.

LFPT activated, global (DIP 6 = OFF, default setting)

Figure 12 LAN fault with LFPT activated, global

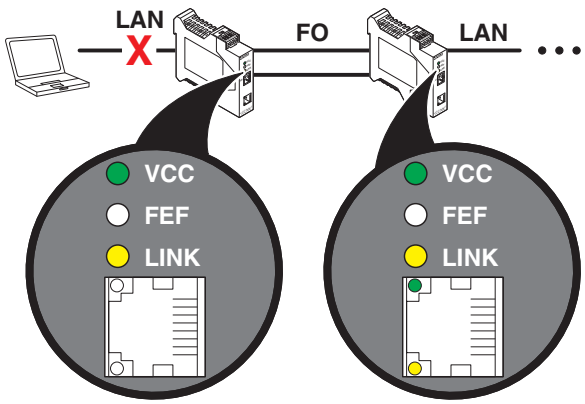


DIP 6 = OFF: by default, all Link LEDs go out in the event of a fault in a twisted pair segment.

The red FEF LED indicates the FO converter where the twisted pair segment failed.

LFPT deactivated, local (DIP 6 = ON)

Figure 13 LAN fault with LFPT deactivated, local



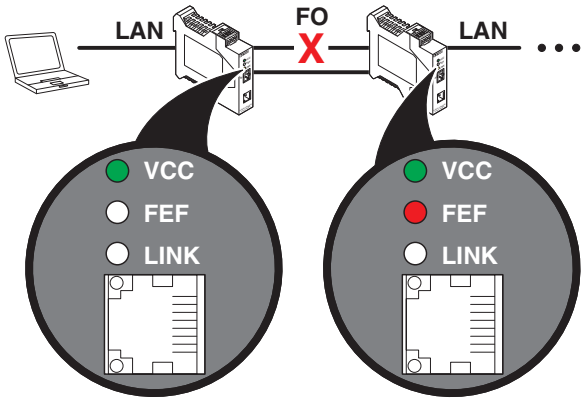
DIP 6 = ON: in the “LFPT deactivated, local” setting, only the Link LEDs of the corresponding port go out in the event of a fault in a twisted pair segment. The Link LEDs at the copper port on the other media converter and for the fiber optic connection are on. The “LFPT deactivated, local” setting therefore enables more precise diagnostics.

12.3 Fault on the fiber optic cable

The diagnostics indicator depends on DIP 6.

LFPT activated, global (DIP 6 = OFF, default setting)

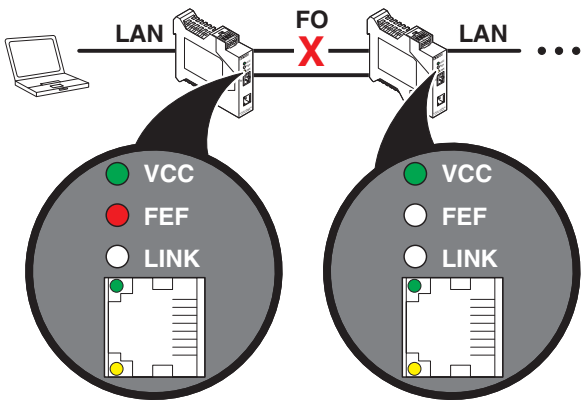
Figure 14 Fiber optic fault with LFPT activated, global



If just one of the optical fibers is interrupted, you can determine which is the affected fiber via the FEF LEDs. If the FEF LED at a media converter lights up, the fiber connected to the transmit port (TD) is interrupted. The entire connection is disabled.

LFPT deactivated, local (DIP 6 = ON)

Figure 15 Fiber optic fault with LFPT deactivated, local



The red FEF LED lights up if the optical fiber at the transmit port of the device is interrupted. Only the affected segment is disabled, the copper port connections remain.

13 Disposal

The symbol with the crossed-out trash can indicates that this item must be collected and disposed of separately. Phoenix Contact or our service partners will take the item back for free disposal. For information on the available disposal options, visit www.phoenixcontact.com.