MACX MCR-PTB(-SP)



Power and fault signaling module

Data sheet
103618_en_01

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1 Description

The power and fault signaling module is used to feed in the supply voltage to the DIN rail connector.

The integrated error evaluation uses a relay contact and flashing LED to signal auxiliary energy failure, a backup error, or in the case of individual operation of the MACX MCR-PTB(-SP), bus line errors of the MACX MCR(-EX)-SL-...NAM... modules connected via the DIN rail connectors.

For more information, see the "Power supply instructions" for the item at www.phoenixcontact.com/products.

Features

- Power and fault signaling module
- Supply of the 24 V supply voltage to the DIN rail connector
- Simple or redundant supply, decoupled from diode, protected against polarity reversal
- Supply current up to 3.75 A
- Relay output (changeover contact) and flashing LED for error messages
- Error message in the event of the failure of the energy supply or a fuse fault
- Bus line fault indicated via DIN rail connectors
- Replaceable fuse
- Installation in zone 2 permitted
- Plug-in connection terminal blocks, with either screw or push-in connection technology

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

This document is valid for the products listed in the “Ordering data” chapter.

You can use the Signal Conditioner app to call-up DIP switch setting help and comprehensive module information via the integrated QR code reader.

2 Table of contents

1 Description 1
2 Table of contents 2
3 Ordering data 3
4 Technical data 5
5 Safety notes 8
5.1 Installation notes 8
5.2 Installation in the Ex area (zone 2) 8
5.3 Installation in zone 22 8
5.4 UL note 8
6 Installation 9
6.1 Connection notes 9
6.2 Electrostatic discharge 9
6.3 Structure 9
6.4 Basic circuit diagram with connection terminal blocks 10
6.5 Power supply 10
6.6 Dimensions 10
6.7 Mounting 10
6.8 Connecting the cables 11
7 Configuration 12
8 Digital nameplate 12
9 Revision history 12

3 Ordering data

Description	Type	Item no.	Pcs./Pkt.
Power and fault signaling module with screw connection, including corresponding ME 17,5 TBUS 1,5/ 5-ST-3,81 GY DIN rail connector	MACX MCR-PTB	2865625	1
Power and fault signaling module with Push-in connection, including corresponding ME 17,5 TBUS 1,5/ 5-ST-3,81 GY DIN rail connector	MACX MCR-PTB-SP	2924184	1

Accessories	Type	Item no.	Pcs./Pkt.
Insulating sleeve, color: white	MPS-IH WH	0201663	10
Insulating sleeve, color: red	MPS-IH RD	0201676	10
Insulating sleeve, color: blue	MPS-IH BU	0201689	10
Insulating sleeve, color: yellow	MPS-IH YE	0201692	10
Insulating sleeve, color: green	MPS-IH GN	0201702	10
Insulating sleeve, color: gray	MPS-IH GY	0201728	10
Insulating sleeve, color: black	MPS-IH BK	0201731	10
Test plug, with solder connection up to 1 mm² conductor cross section, number of positions: 1, color: gray	MPS-MT	0201744	10
Plastic label, Sheet, white, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10	UC-EMLP (11X9)	0819291	10
Plastic label, Sheet, yellow, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10	UC-EMLP (11X9) YE	0822602	10
Plastic label, can be ordered: by sheet, white, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm	UC-EMLP (11X9) CUS	0824547	1
Plastic label, can be ordered: by sheet, yellow, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm	UC-EMLP (11X9) YE CUS	0824548	1
Plastic label, Sheet, silver, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10	UC-EMLP (11X9) SR	0828094	10
Plastic label, can be ordered: by sheet, silver, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10	UC-EMLP (11X9) SR CUS	0828098	1

Accessories	Type	Item no.	Pcs./Pkt.
Plastic label, Card, white, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 135	US-EMLP (11X9)	0828789	10
Plastic label, Card, yellow, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 135	US-EMLP (11X9) YE	0828871	10
Plastic label, Card, silver, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 135	US-EMLP (11X9) SR	0828872	10
Device marker, Sheet, white, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 255	LS-EMLP (11X9) WH	0831678	10
Device marker, Sheet, silver, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 255	LS-EMLP (11X9) SR	0831705	10
Device marker, Sheet, yellow, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 255	LS-EMLP (11X9) YE	0831732	10
Actuation tool, for ST terminal blocks, insulated, also suitable for use as a bladed screwdriver, size: 0.6 x 3.5 x 100 mm, 2-component grip, with non-slip grip	SZS 0,6X3,5	1205053	10

4 Technical data

Hardware/firmware version	
Hardware/firmware version (2865625)	08 / -
Hardware/firmware version (2924184)	08 / -
The technical data and safety characteristics are valid as of the specified HW/FW version.	
Input data	
Voltage input signal	19.2 V DC ... 30 V DC (24 V DC, -20 % ... +25 %)
Output data	
Output signal maximum current	3.75 A
Output voltage	Input voltage - max 0.8 V at 3.75 A
Output data Relay output	
Number	1
Contact switching type	1 changeover contact
Contact material	Gold (Au)
Maximum switching voltage	50 V AC (2 A) 30 V DC (2 A) 50 V DC (0.22 A)
General data	
Nominal supply voltage	24 V DC
Current consumption	3.75 A
Degree of protection	IP20 (not assessed by UL)
Flammability rating according to UL 94	V0 (Housing)
Status display	1 x red LED (error) 2x green LEDs (PWR1 and PWR2)
Dimensions W/H/D	17.5 mm / 112.5 mm / 113.7 mm (MACX MCR-PTB) 17.5 mm / 107.9 mm / 113.7 mm (MACX MCR-PTB-SP)
Depth (Snapped onto DIN rail NS 35/7,5 in accordance with EN 60715)	114.5 mm
Type of housing	Polyamide (PA 6.6)

Ambient conditions	
Ambient temperature (operation)	-40 °C … 60 °C (Any mounting position)
Ambient temperature (storage/transport)	-40 °C … 80 °C
Permissible humidity (operation)	5 % … 95 % (non-condensing)
Altitude Ambient temperature (operation) Rated insulation voltage	≤ 2000 m -40 °C … 60 °C 50 V AC/DC
Height range Ambient temperature (operation) Rated insulation voltage	> 2000 m … 3000 m -40 °C … 54 °C 40 V AC/DC
Height range Ambient temperature (operation) Rated insulation voltage	> 3000 m … 4000 m -40 °C … 48 °C 30 V AC/DC
Height range Ambient temperature (operation) Rated insulation voltage	> 4000 m … 5000 m -40 °C … 42 °C 30 V AC/DC

Electrical isolation (≤ 2000 m above mean sea level)	
Overvoltage category Pollution degree	II 2
Input/switching output Rated insulation voltage	 50 V AC/DC

Connection data	Screw connection	Push-in connection
Conductor cross section, rigid	0.2 mm² … 2.5 mm²	0.2 mm² … 2.5 mm²
Conductor cross section, flexible	0.2 mm² … 2.5 mm²	0.2 mm² … 2.5 mm²
Conductor cross section flexible (2 conductors with same cross section)		0.25 mm² … 0.34 mm² (TWIN ferrule without plastic sleeve) 0.5 mm² … 1.5 mm² (TWIN ferrule with plastic sleeve)
Conductor cross section AWG	24 … 14	24 … 14 24 … 22 (TWIN ferrule without plastic sleeve) 20 … 16 (TWIN ferrule with plastic sleeve)
Stripping length	7 mm	10 mm
Tightening torque	0.5 Nm … 0.6 Nm	

Conformance with EMC directive
Noise immunity according to EN 61000-6-2 When being exposed to interference, there may be minimal deviations.
Noise emission according to EN 61000-6-4

Conformance/Approvals	
CE CE-compliant	
ATEX PxCIF08ATEX2865625X	Ⓔx II 3 G Ex ec nC IIC T4 Gc
IECEx IECEx IBE 08.0004X	Ex ec nC IIC T4 Gc
CCC / China-Ex 2021122303114198	Ex ec nC IIC T4 Gc
UL, USA/Canada	UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T4 Class I, Zone 2, Group IIC T4
Shipbuilding approval DNV GL TAA0000AG Temperature Humidity Vibration EMC Enclosure	 B B A B Required protection according to the Rules shall be provided upon installation on board

5 Safety notes

5.1 Installation notes

- The EPL Gc (ATEX category 3) device is suitable for installation in zone 2 potentially explosive areas. It satisfies the requirements of the following standards:
  IEC/EN 60079-0, IEC/EN 60079-7, IEC/EN 60079-15
  GB/T 3836.1, GB/T 3836.3, GB/T 3836.8
  For detailed information, please refer to the declarations of conformity.
- Installation, operation, and maintenance may only be carried out by qualified electricians. Follow the installation instructions as described.
- When installing and operating the device, observe the applicable regulations and safety directives (including national safety directives), as well as the generally recognized technical regulations.
- Observe the safety information, conditions, and limits of use specified in the product documentation. Comply with them.
- The device must not be opened or modified. Do not repair the device yourself, replace it with an equivalent device. Repairs may only be carried out by the manufacturer. The manufacturer is not liable for damage resulting from violation.
- The IP20 degree of protection (IEC/EN 60529) specifies that the device is intended for use in a clean and dry environment. Do not subject the device to mechanical and/or thermal stress that exceeds the specified limits.
- The device complies with the EMC regulations for industrial areas (EMC class A). When using the device in residential areas, it may cause radio interference.

5.2 Installation in the Ex area (zone 2)

- Observe the specified conditions for use in potentially explosive areas! Install the device in a suitable, approved housing with a minimum degree of protection of IP54 that meets the requirements of IEC/EN 60079-0 and IEC/EN 60079-7 or GB/T 3836.1, GB/T 3836.3, and GB/T 3836.8. Also observe the requirements of IEC/EN 60079-14 and ensure sufficient UV protection.
- Only devices which are designed for operation in Ex zone 2 and are suitable for the conditions at the installation location may be connected to the circuits in the Ex zone.
- Only use category 3G devices (ATEX 2014/34/EU).
- In potentially explosive areas, connecting and disconnecting cables and connectors in non-intrinsically safe circuits, latching devices onto and unlatching devices from the DIN rail connector, changing fuses, or actuating DIP switches is only permitted in a de-energized state or when the atmosphere is not potentially explosive.
- Use only the fuse type indicated in the section Technical data.
- The device must be stopped and immediately removed from the Ex area if it is damaged, was subject to an impermissible load, stored incorrectly or if it malfunctions.

5.3 Installation in zone 22

- The device is not suitable for installation in zone 22.
- If, however, you wish to use the device in zone 22, it must be installed in a housing that complies with IEC/EN 60079-31. In doing so, observe the maximum surface temperatures. Observe the requirements of IEC/EN 60079-14.

5.4 UL note

PROCESS CONTROL EQUIPMENT FOR HAZARDOUS LOCATIONS 31ZN

1 Suitable for use in class 1, division 2, groups A, B, C and D hazardous locations, or nonhazardous locations only.

2 WARNING - EXPLOSION HAZARD: Do not disconnect equipment while the circuit is live or unless the area is known to be free of ignitable concentrations.

3 WARNING - EXPLOSION HAZARD: Substitution of any components may impair suitability for Class I, Division 2.

6 Installation

6.1 Connection notes

WARNING: Electrical danger due to improper installation

Observe the connection notes for safe installation in accordance with EN/UL 61010-1:

- Disconnecting devices and branch circuit protection with suitable AC or DC rating shall be provided in the building installation.
- Provide a switch/circuit breaker close to the device, which is labeled as the disconnecting device for this device.
- Provide overcurrent protection (I ≤ 16 A) within the installation.
- To protect the device against mechanical or electrical damage, install it in a suitable housing with appropriate degree of protection as per IEC 60529.
- During maintenance work, disconnect the device from all effective power sources.
- Before configuring settings using DIP switch, make sure the device has been de-energized.
- If the device is not used as described in the documentation, the intended protection can be negatively affected.
- The housing of the device provides basic insulation against the neighboring devices for 300 V_{eff}. If several devices are installed next to each other, this must be taken into account, and additional insulation must be installed if necessary.
- Voltages found on the input, output, and relay output are extra-low voltages (ELVs).

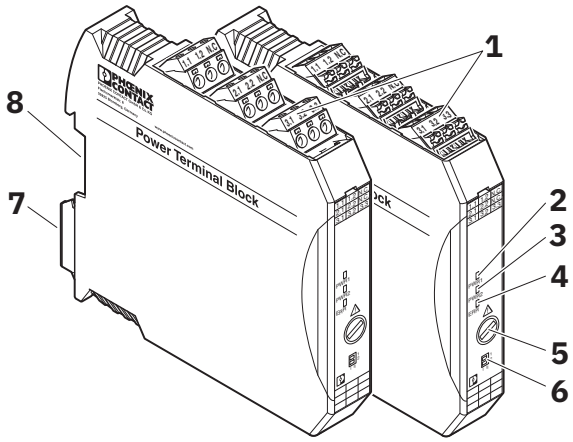
6.2 Electrostatic discharge

NOTE: Electrostatic discharge

The device contains components that can be damaged or destroyed by electrostatic discharge. When handling the device, observe the necessary safety precautions against electrostatic discharge (ESD) in accordance with IEC/EN 61340-5-1.

6.3 Structure

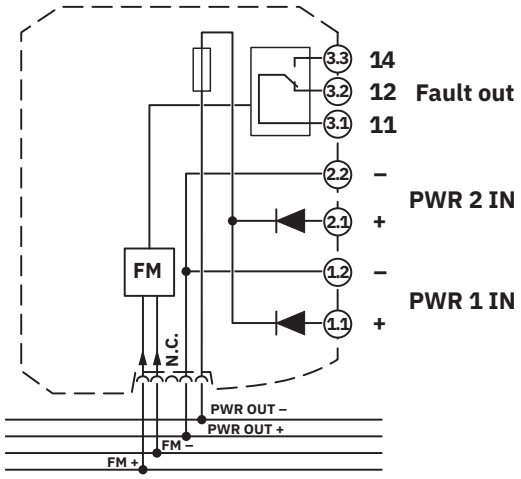
Figure 1 Structure



1 COMBICON plug-in screw or push-in connection terminal
2 Green LED “PWR1 ”, power supply 1
3 Green LED “PWR2 ”, power supply 2
4 Error indicator "ERR" red LED
5 Fuse
6 DIP switch
7 Snap-on foot for DIN rail mounting
8 Connection option for DIN rail connector

6.4 Basic circuit diagram with connection terminal blocks

Figure 2 Basic circuit diagram



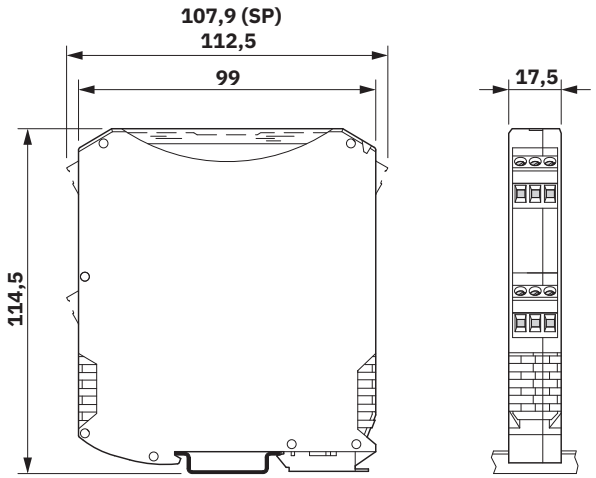
6.5 Power supply

You must refer to the “MACX and MINI Analog power manual“ for the design of the power supply; it is available to download at www.phoenixcontact.com/products under the item listing.

NOTE: Never connect the supply voltage directly to the DIN rail connector. It is not permitted to draw power from the DIN rail connector or from individual modules.

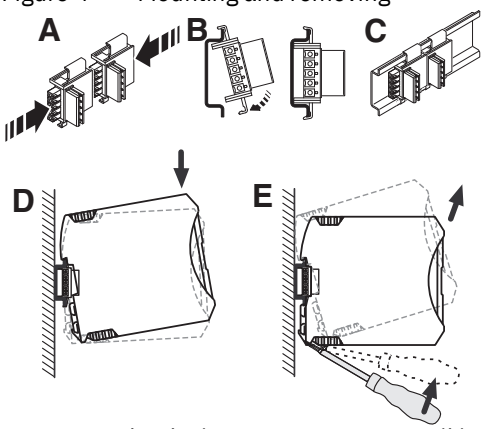
6.6 Dimensions

Figure 3 Dimensions



6.7 Mounting

Figure 4 Mounting and removing

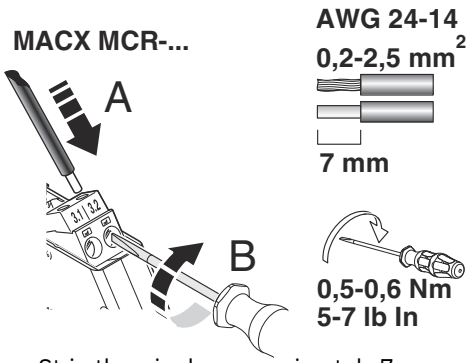


- Mount the device on a 35 mm DIN rail in accordance with EN 60715.
- When using the DIN rail connector, first insert it in the 35 mm DIN rail in accordance with EN 60715 (A – C). DIN rails with a height of 7.5 mm or more can be used. The DIN rail connector is used to bridge the power supply and communication.
- The snap-in direction of device (D) and DIN rail connector (C) must be observed: snap-on foot on the bottom and connector on the left.
- Install the module in a suitable housing to meet the requirements for the protection class.

6.8 Connecting the cables

Screw connection

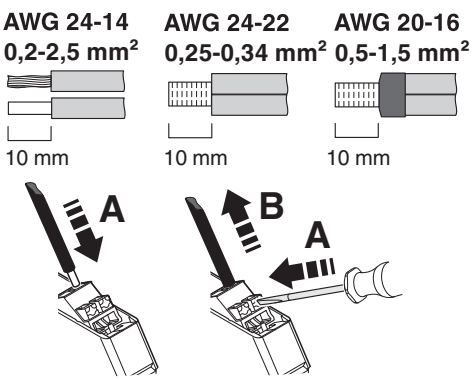
Figure 5 Screw connection



- Strip the wire by approximately 7 mm and crimp the ferrules.
- Insert the wire into the corresponding connection terminal block.
- Use a screwdriver to tighten the screw in the opening above the connection terminal block.
  Tightening torque: 0.6 Nm

Push-in connection (PSPT):

Figure 6 Push-in connection



If you want to use conductors with ferrule:

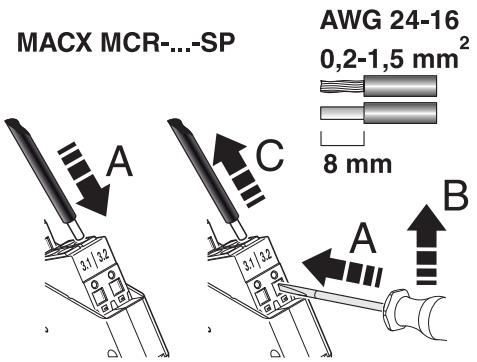
- Strip the wire by approximately 10 mm and crimp ferrules to the end of the wire.
- Insert the wire into the corresponding connection terminal block.
- Push in the pushbutton with a screwdriver to release.

If you want to use conductors without ferrule:

- Strip 10 mm off the wire.
- Push the pushbutton in with a screwdriver.
- Insert the wire into the corresponding connection terminal block.
- Push in the pushbutton with a screwdriver to release.

Push-in connection (TVFKC):

Figure 7 Push-in connection



If you want to use conductors with ferrule:

- Strip the wire by approximately 8 mm and crimp ferrules to the end of the wires.
- Insert the wire into the corresponding connection terminal block.
- Push in the pushbutton with a screwdriver to release.

If you want to use conductors without ferrule:

- Strip 8 mm off the wires.
- Push the pushbutton in with a screwdriver.
- Insert the wire into the corresponding connection terminal block.
- Push in the pushbutton with a screwdriver to release.

7 Configuration

NOTE

When supplying the DIN rail connector via two MACX MCR-PTB(-SP) modules, you must switch off the group error message.

You can make the following adjustments via the DIP switches.

– Deactivate error message for simple supply (DIP 1)
– Activate/deactivate group error detection for connected devices (DIP 2)

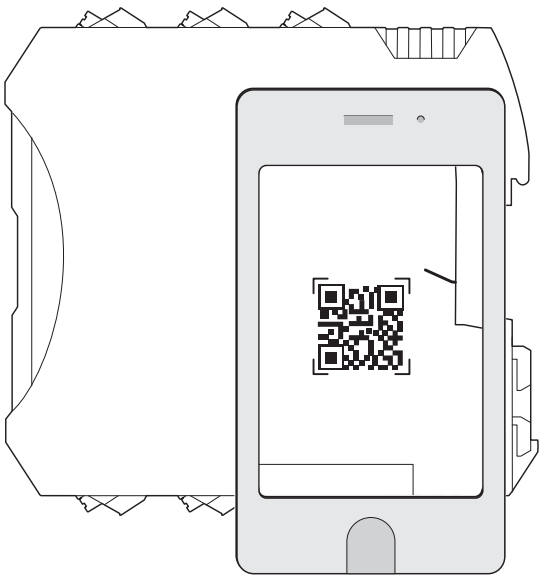
DIP	I	II
1	Redundant operation	Simple supply
2	Group error message on	Group error message off

8 Digital nameplate

The digital nameplate provides the option of obtaining product-specific data related to a specific serial number.

If you scan the QR code (digital nameplate) on the device, you can, for example, retrieve documents on the production status as well as clearly identify the hardware and firmware status of the device at hand.

Figure 8 Scan QR code



9 Revision history

Document revision	Hardware revision	Firmware revision	Date	Description
01	08	-	2024-09-16	Figure 1, Figure 2, and Figure 3 updated
				Description of new Push-in connection technology (PSPT) added
				Description of digital nameplate added
				CCC Ex approval obtained
				DNV GL ship approval added
				Adaptation within the scope of an update of the IECEx approval
				Adaptation within the scope of an update of the ATEX approval