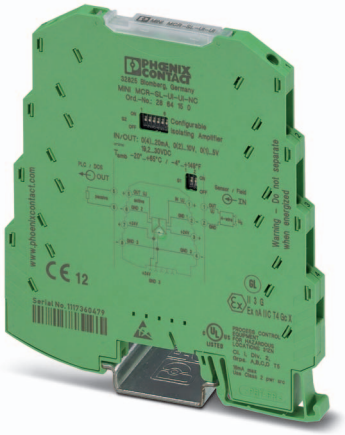
MINI MCR-SL-UI-UI-NC

Configurable 3-way isolating amplifier



Data sheet
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1 Description

The 6.2 mm wide MINI MCR-SL-UI-UI... is a configurable 3-way isolating amplifier. It is used to electrically isolate, condition, amplify, and filter standard signals.

The standard analog signals 0...20 mA, 4...20 mA, 0...10 V, 2...10 V, 0...5 V or 1...5 V are available electrically isolated on the input and output sides.

The DIP switches, which can be accessed on the side of the housing, are used to configure the input and output signal ranges.

The power supply (19.2 ... 30 V DC) can be supplied either via connection terminal blocks "3"/"4" or "7"/"8" on the modules or in conjunction with the DIN rail connector. Please refer to the section titled "Power supply" for more information.

Features

- Configurable 3-way isolating amplifier
- Input and output signal range configurable via DIP switches
- Screw connection available

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

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

2 Table of contents

3 Ordering data

Description	Type	Order No.	Pcs./Pkt.
3-way isolating amplifier for the electrical isolation of analog signals, I/O can be configured via DIP switches, with screw connection, standard configuration	MINI MCR-SL-UI-UI-NC	2864150	1

Accessories	Type	Order No.	Pcs./Pkt.
DIN rail connector for DIN rail mounting. Universal for TBUS housing. Gold-plated contacts, 5-pos.	ME 6,2 TBUS-2 1,5/5-ST-3,81 GN	2869728	10
MCR power terminal block for supplying several MINI Analog modules via the DIN rail connector, with screw connection, maximum current consumption of up to 2 A	MINI MCR-SL-PTB	2864134	1
Primary-switched MINI POWER supply for DIN rail mounting, input: 1-phase, output: 24 V DC/1.5 A	MINI-SYS-PS-100-240AC/ 24DC/1.5	2866983	1
Fold up transparent cover for MINI MCR modules with additional labeling option using insert strips and flat Zack marker strip 6.2 mm	MINI MCR DKL	2308111	10
Label for extended marking of MINI MCR modules in connection with the MINI MCR-DKL	MINI MCR-DKL-LABEL	2810272	10

4 Technical data

Input	
Number of inputs	1
Configurable/programmable	Yes, unconfigured
Voltage input signal	0 V ... 10 V 0 V ... 5 V 1 V ... 5 V 2 V ... 10 V
Max. voltage input signal	30 V
Current input signal	0 mA ... 20 mA 4 mA ... 20 mA
Max. current input signal	50 mA
Input resistance of voltage input	approx. 100 kΩ
Input resistance current input	approx. 50 Ω
Output	
Number of outputs	1
Voltage output signal	0 V ... 10 V 0 V ... 5 V 1 V ... 5 V 2 V ... 10 V
Max. voltage output signal	approx. 12.5 V
Short-circuit current	approx. 22 mA
Current output signal	0 mA ... 20 mA 4 mA ... 20 mA
Max. current output signal	28 mA
Non-load voltage	approx. 12.5 V
Configurable/programmable	Yes, unconfigured
Load/output load voltage output	≥ 10 kΩ
Ripple	< 20 mV_{PP} (at 500 Ω)
Load/output load current output	< 500 Ω (at 20 mA)
Supply	
Nominal supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (The DIN rail bus connector (ME 6,2 TBUS-2 1,5/5-ST-3,81 GN, Order No. 2869728) can be used to bridge the supply voltage. It can be snapped onto a 35 mm DIN rail according to EN 60715))
Max. current consumption	< 19 mA (Current output, at 24 V DC incl. load) < 9 mA (Voltage output, at 24 V DC incl. load)
Power consumption	< 450 mW (Current output) < 200 mW (Voltage output)

General data	
Limit frequency (3 dB)	approx. 100 Hz
Maximum transmission error	≤ 0.1 % (of final value) < 0.4 % (Without adjustment)
Temperature coefficient, typical	< 0.002 %/K
Maximum temperature coefficient	< 0.01 %/K
Step response (10-90%)	approx. 3.2 ms
Electrical isolation	Basic insulation according to EN 61010
Overvoltage category	II
Mounting position	any
Degree of protection	IP20
Degree of pollution	2
Rated insulation voltage	50 V AC/DC
Test voltage, input/output/supply	1.5 kV (50 Hz, 1 min.)
Dimensions W/H/D	6.2 mm / 93.1 mm / 101.2 mm
Type of housing	PBT green

Connection data	
Connection method	Screw connection
Conductor cross section solid	0.2 mm² ... 2.5 mm²
Conductor cross section flexible	0.2 mm² ... 2.5 mm²
Conductor cross section AWG	26 ... 12
Stripping length	12 mm

Ambient conditions	
Ambient temperature (operation)	-20 °C ... 65 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Permissible humidity (operation)	5 % ... 95 % (non-condensing)
Maximum altitude for use above sea level	≤ 2000 m

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
UL, USA/Canada	UL 508 Recognized Class I, Div. 2, Groups A, B, C, D T5
Shipbuilding approval (DNV GL TAA000020N)	
Temperature	B
Humidity	B
Vibration	B
EMC	A
Enclosure	Required protection according to the Rules shall be provided upon installation on board

5 Safety regulations and installation notes

5.1 Installation notes

- 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 generally approved technical regulations, must be observed. The safety data is provided in this package slip and on the certificates (conformity assessment, additional approvals where applicable).
- 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 is not designed for use in atmospheres with a danger of dust explosions.

6 Installation

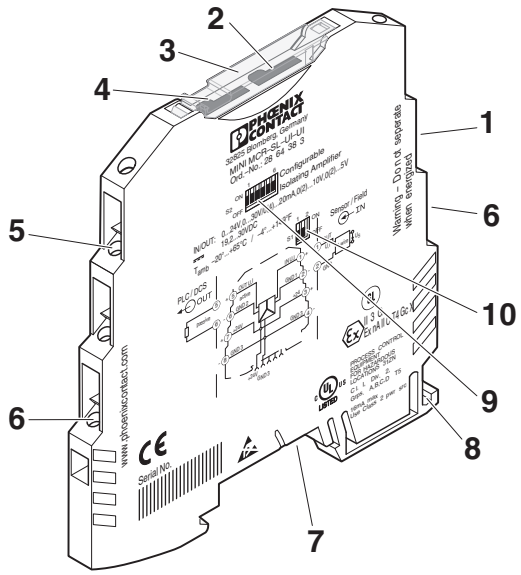
6.1 Connection notes

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) according to EN 61340-5-1 and EN 61340-5-1.

6.2 Structure

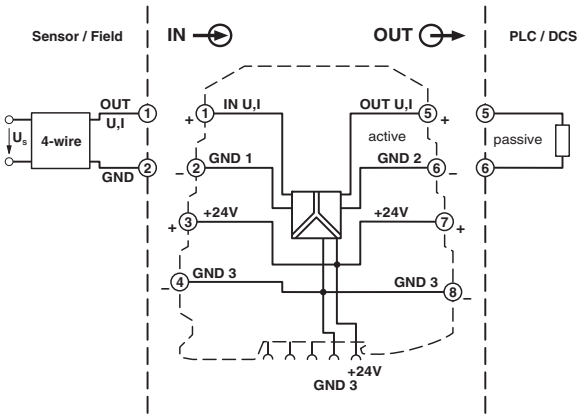
Figure 1 Structure



1. Input: Standard signals
2. Cover
3. Potentiometer for adjustment
4. Groove for ZBF 6 zack marker strip
5. Output: Standard signals
6. Supply voltage
7. Connection option for DIN rail bus connector
8. Universal snap-on foot for EN DIN rails
9. DIP switch S2
10. DIP switch S1

6.3 Block diagram

Figure 2 Block diagram



6.4 Power supply

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.

Supply via the module

Where the total current consumption of the aligned modules does not exceed 400 mA, the power can be supplied directly at the connection terminal blocks of the module.

A 400 mA fuse should be connected upstream.

Supply via a power terminal block

The MINI MCR-SL-PTB power terminal block (Order No. 2864134) of the same shape is used to feed in the supply voltage to the DIN rail connector.

A 2 A fuse should be connected upstream.

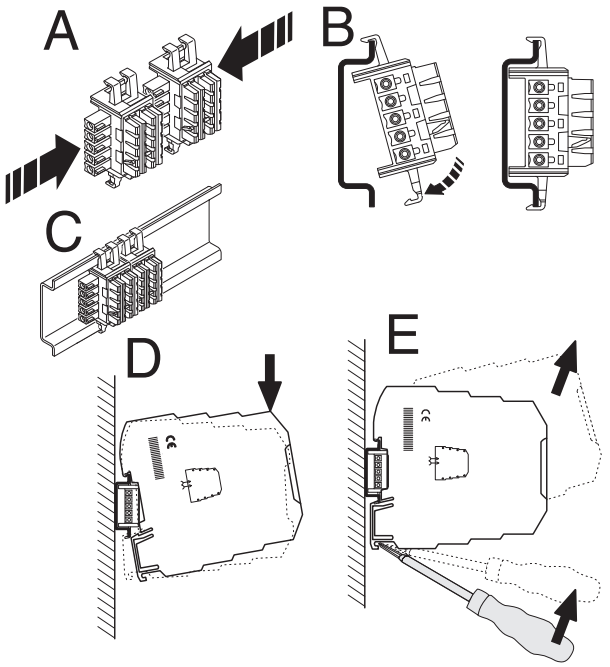
Supply via a system power supply unit

The system power supply unit with 1.5 A output current connects the DIN rail connector to the supply voltage and can therefore be used to supply several modules from the mains.

– MINI-SYS-PS-100-240AC/24DC/1.5 (Order No. 2866983)

6.5 Mounting

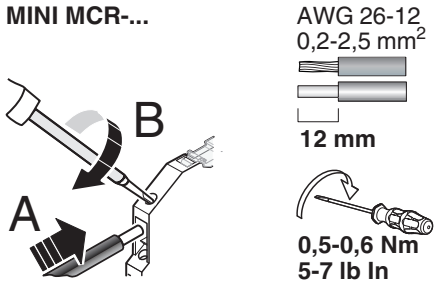
Figure 3 Mounting and removing



– Mount the module on a 35 mm DIN rail according to EN 60715.
– When using the DIN rail connector, first place it into the DIN rail (see A – C). It is used to bridge the power supply. It is also absolutely vital that you snap the module and the DIN rail connector into position in the correct direction: the snap-on foot should be at the bottom and the connector on the left.

6.6 Connection of the cables

Figure 4 Screw connection



- Insert the wire into the corresponding connection terminal block.
- Use a screwdriver to tighten the screw in the opening above the connection terminal block.

7 Configuration

DIP switches S1 and S2 are used to specify the combination of input and output standard signal ranges (see "Configuration table").

7.1 Standard configuration

– Input 0 ... 10 V
– Output 0 ... 20 mA

(All DIP switches are set to the "off" position, transmission error < 0.1 %.)

7.2 Configuration table

		DIP S2						DIP S1	
IN	OUT	1	2	3	4	5	6	1	2
0...10 V	0...20 mA	off	off	off	off	off	off	off	off
	4...20 mA	off	off	off	off	off	**ON**	off	off
	0...10 V	**ON**	off	**ON**	off	off	off	off	off
	2...10 V	**ON**	off	**ON**	off	off	**ON**	off	off
	0...5 V	**ON**	**ON**	off	off	off	off	off	off
	1...5 V	**ON**	**ON**	off	off	off	**ON**	off	off
2...10 V	0...20 mA	off	off	off	**ON**	**ON**	off	off	off
	4...20 mA	off	off	off	off	off	off	off	off
	0...10 V	**ON**	off	**ON**	**ON**	**ON**	off	off	off
	2...10 V	**ON**	off	**ON**	off	off	off	off	off
	0...5 V	**ON**	**ON**	off	**ON**	**ON**	off	off	off
	1...5 V	**ON**	**ON**	off	off	off	off	off	off
0...5 V	0...20 mA	off	off	off	off	off	off	**ON**	off
	4...20 mA	off	off	off	off	off	**ON**	**ON**	off
	0...10 V	**ON**	off	**ON**	off	off	off	**ON**	off
	2...10 V	**ON**	off	**ON**	off	off	**ON**	**ON**	off
	0...5 V	**ON**	**ON**	off	off	off	off	**ON**	off
	1...5 V	**ON**	**ON**	off	off	off	**ON**	**ON**	off
1...5 V	0...20 mA	off	off	off	**ON**	**ON**	off	**ON**	off
	4...20 mA	off	off	off	off	off	off	**ON**	off
	0...10 V	**ON**	off	**ON**	**ON**	**ON**	off	**ON**	off
	2...10 V	**ON**	off	**ON**	off	off	off	**ON**	off
	0...5 V	**ON**	**ON**	off	**ON**	**ON**	off	**ON**	off
	1...5 V	**ON**	**ON**	off	off	off	off	**ON**	off
0...20 mA	0...20 mA	off	off	off	off	off	off	off	**ON**
	4... 20 mA	off	off	off	off	off	**ON**	off	**ON**
	0...10 V	**ON**	off	**ON**	off	off	off	off	**ON**
	2...10 V	**ON**	off	**ON**	off	off	**ON**	off	**ON**
	0...5 V	**ON**	**ON**	off	off	off	off	off	**ON**
	1...5 V	**ON**	**ON**	off	off	off	**ON**	off	**ON**
4...20 mA	0...20 mA	off	off	off	**ON**	**ON**	off	off	**ON**
	4...20 mA	off	off	off	off	off	off	off	**ON**
	0...10 V	**ON**	off	**ON**	**ON**	**ON**	off	off	**ON**
	2...10 V	**ON**	off	**ON**	off	off	off	off	**ON**
	0...5 V	**ON**	**ON**	off	**ON**	**ON**	off	off	**ON**
	1...5 V	**ON**	**ON**	off	off	off	off	off	**ON**

8 Adjustment

A potentiometer is located underneath the cover; this is used for fine adjustment of the analog signals once the configuration of the DIP switches has been modified.

NOTE

Once the configuration of the DIP switches has been modified, the potentiometer allows the accuracy to be increased from < 0.4% to < 0.1%.

The module is adjusted via its output final value:

- Connect the calibration source to the input of the isolating amplifier and specify the final value of the set input signal.
- Use the potentiometer to set the exact final value of the set output signal.

9 Connection/application example

Figure 5 Example application