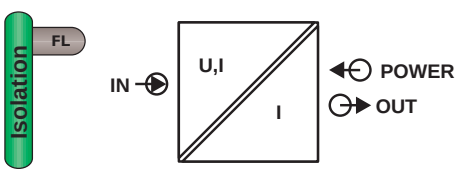
Configurable Passive Isolator
MCR-CLP-UI-I-4

- **No separate supply voltage**
- **Electrical isolation of input**
- **Configurable input**
- **4 ... 20 mA output**
- **± 2% zero/span adjustment**
- **Signal conversion/amplification/filtering**



1. Description

The MCR-CLP-UI-I-4 loop powered isolator is used for electrical isolation and signal matching in analog signal circuits.

On the input side there are more than 25 different signal ranges available, which can be set using DIP switches.

On the output side the isolator is operated in a 4…20 mA current loop, which simultaneously provides the module with the required power for signal conversion.

On the front face of the housing, adjustment of ± 2% of the signal value can be made using the zero/span potentiometers.

The loop powered isolator is especially suitable for signal matching and for electrically isolating active PLC input board cards. If no order references are specified, the device is provided with the default input range of 4…20 mA.

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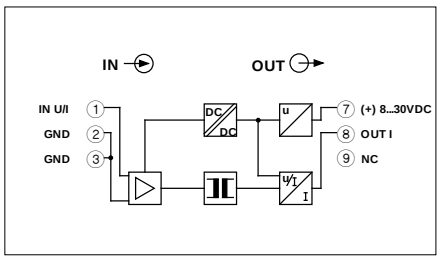
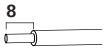
2. Technical Data



MCR-CLP-UI-I-4

with configurable input and 4…20 mA output



	rigid	flexible [mm²]	AWG
Connection data	0.2-2.5	0.2-2.5	24-14

Housing width 17.5 mm (0.689 in.)

Description	Output signal	Type	Order No.	Pcs. Pkt.
MCR passive isolator, loop powered, for electrical isolation of analog signals, **Preconfigurated**	4...20 mA	**MCR-CLP-UI-I-4**[1)]	**28 14 05 8**	1
MCR passive isolator, loop powered, for electrical isolation of analog signals, **Non-configurated**	4...20 mA	**MCR-CLP-UI-I-4-NC**	**28 14 25 2**	1

[1)] Specify configuration (See order example on the last page)

Technical Data

Input		
Input Signal		4…20 mA, other setting configurable using DIP switches
Maximum input signal		30 V/50 mA
Input resistance:	Voltage input	1 MΩ
	Current input	50 Ω
Output		
Output signal		4…20 mA
Maximum output signal		35 mA
Load R_B		(U_B - 8 V) / 20 mA corresponds to 800 Ω at U_B = 24 V
General Data		
Operating voltage U_B		8 - 30 V DC
Power loss		8 V
Transmission error		≤ 0.1% of final value, 0.05%, typical
Temperature coefficient		≤ 0.01%/K, 0.005%/K, typical
Cut-off frequency (3 dB)		30 Hz
Response time (10-90%)		10 ms
ZERO and SPAN adjustment		± 2% full scale
Ambient temperature range		– 25 °C to + 65°C (-4˚F to 149˚F)
Test voltage:	Input/output	1.5 kV, 50 Hz, 1 s
Housing material		Polyamide PA, unarmored

CE

Conforms to the EMC Directive 89/336/EEC and the Low Voltage Directive 73/23/EEC

EMC (Electromagnetic Compatibility)		
Noise immunity in accordance with EN 50082-2		
• Electrostatic discharge (ESD)	EN 61000-4-2	8 kV air discharge[2)]
• Electromagnetic HF field Amplitude modulation Pulsed modulation	EN 61000-4-3	 10 V/m[1)] 10 V/m[1)]
• Fast transients (burst)	EN 61000-4-4	Input/output/supply: 2 kV/5 kHz[2)]
• Surge current load (surge)	EN 61000-4-5	Input/output: 2 kV/42 Ω[2)] Output: 0.5 kV/2 Ω[2)]
• Conducted interference	EN 61000-4-6	Input/output/supply: 10 V [1)]
Noise emission in accordance with EN 50081-2	EN 55011	Class A

EN 61000 corresponds to IEC 1000/
EN 55011 corresponds to CISPR11

[1)]Criterion A: normal operating characteristics within the specified limits.
[2)]Criterion B: temporary adverse effects on the operating characteristics, which the device corrects itself.

Class A: industrial application, without special installation measures

These results were achieved using shielded cables.

MCR-CLP-UI-I-4 – Configurable Passive Isolator

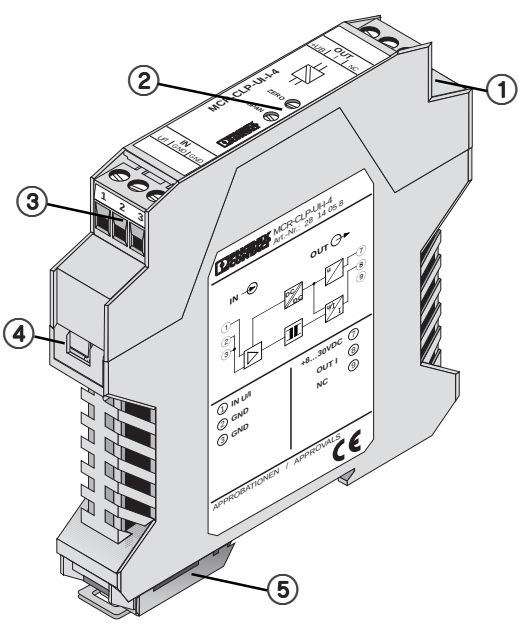
① Plug-in COMBICON screw-clamp terminal blocks

② Zero/span potentiometer

③ Plug-in COMBICON screw-clamp terminal blocks

④ Upper part of housing can be removed for DIP switch setting

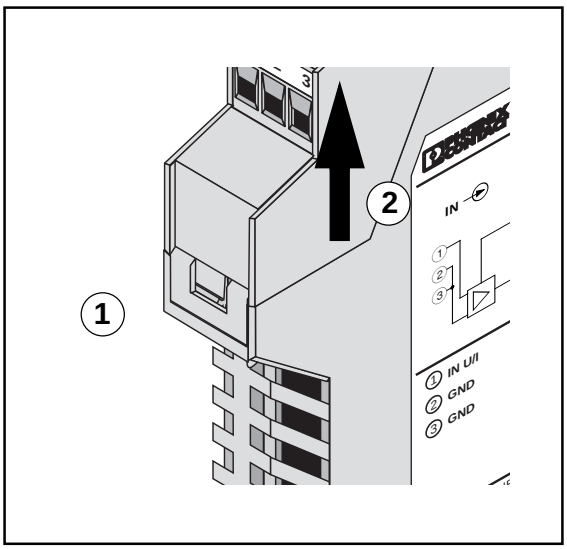
⑤ Metal lock for fastening on the DIN rail



3. Configuration of the Input Signal Ranges

Opening the Device

The locked housing cover is released on both sides using a screwdriver ①. The housing cover and electronics can only be pulled out about 3 cm (1.181 in.) ②.



Changing the Configuration

Select one of the possible input signal ranges according to the table on page 5 and set DIP switches 1 and 2 according to the table specifications (Fig. 9).

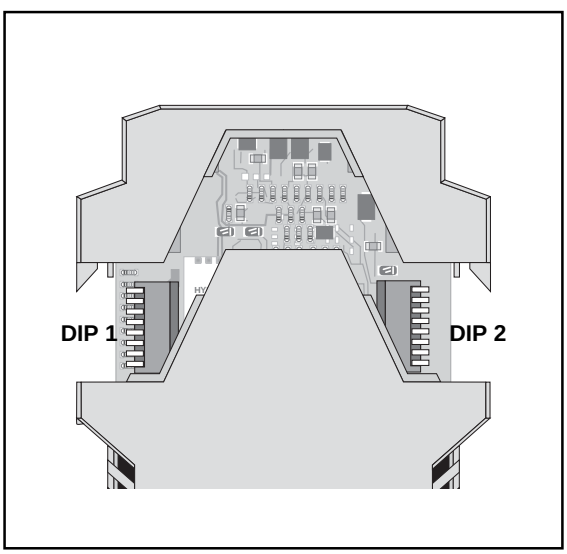


Table for Input Signal Ranges

DIP Switch DIP 1

Input	1	2	3	4	5	6	7	8
0…60 mV		ON				ON	ON	
0…100 mV		ON					ON	
0…200 mV			ON				ON	
0…300 mV				ON		ON	ON	
0…500 mV		ON						ON
0…1 V		ON						
0…2 V			ON					
0…5 V				ON				
0…10 V					ON			ON
0…20 V					ON			
0…5 mA	ON		ON			ON		
0…10 mA	ON	ON						ON
0…20 mA	ON	ON						
± 60 mV		ON				ON	ON	
± 100 mV		ON					ON	
± 200 mV			ON				ON	
± 300 mV				ON		ON	ON	
± 500 mV		ON						ON
± 1 V		ON						
± 2 V			ON					
± 5 V				ON				
± 10 V					ON			ON
± 20 V					ON			
± 5 mA	ON		ON			ON		
± 10 mA	ON	ON						ON
± 20 mA	ON	ON						
1…5 V				ON				
4…20 mA	ON	ON						

DIP Switch DIP 2

Input	1	2	3	4	5	6	7	8
0…60 mV			ON		ON		ON	
0…100 mV			ON		ON		ON	
0…200 mV			ON		ON		ON	
0…300 mV			ON		ON		ON	
0…500 mV			ON		ON		ON	
0…1 V			ON		ON		ON	
0…2 V			ON		ON		ON	
0…5 V			ON		ON		ON	
0…10 V			ON		ON		ON	
0…20 V			ON		ON		ON	
0…5 mA			ON		ON		ON	
0…10 mA			ON		ON		ON	
0…20 mA			ON		ON		ON	
± 60 mV		ON				ON		
± 100 mV		ON				ON		
± 200 mV		ON				ON		
± 300 mV		ON				ON		
± 500 mV		ON				ON		
± 1 V		ON				ON		
± 2 V		ON				ON		
± 5 V		ON				ON		
± 10 V		ON				ON		
± 20 V		ON				ON		
± 5 mA		ON				ON		
± 10 mA		ON				ON		
± 20 mA		ON				ON		
1…5 V	ON						ON	
4…20 mA	ON						ON	

4. Adjustment

Easy Adjustment

Adjustment of the module using two potentiometers (see figure, below right)

- Zero potentiometer: Zero point adjustment
- Span potentiometer: Final value adjustment

Allow the module to warm up for two minutes before starting the adjustment

Output with Adjustment Point Calculation

- Specify a start value and final value of the input signal with a calibration source.
- Record the measured output value using a digital multimeter.

Output Signal: 4…20 mA

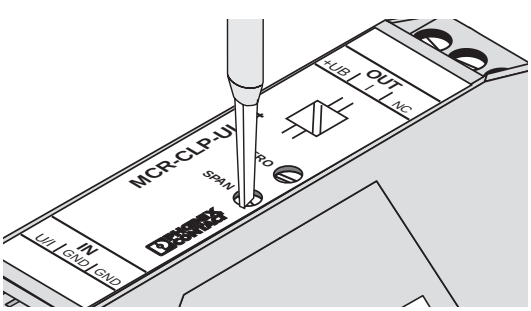
Specification (Input)	**Measured Value**
Start value	MW 1 [mA]
Final value	MW 2 [mA]

• Calculation of the FS Adjustment Point A

$$A = \frac{MW\ 2 \bullet 16\ mA}{MW2 - MW\ 1}$$

Adjustment procedure:

- Specify the final value of the input signal range with the calibration source.
- Span potentiometer: FS adjustment point A ± 1µA
- Zero potentiometer: 20 mA ± 1 µA



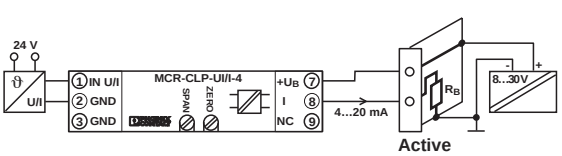
5. Order Key MCR-CLP-UI-I-4

Standard Configuration		Configurable Input Signals[2])
MCR-CLP-UI-I-4	/	4 -20 mA
		0 - 60 mV 0-100 mV 0-200 mV 0-300 mV 0-500 mV
		0 - 1 V 0 - 2 V 0 - 5 V 0 -10 V 0 -20 V 1 - 5 V
		0 - 5 mA 0 -10 mA 0 -20 mA 4 -20 mA
		± 60 mV ± 100 mV ± 200 mV ± 300 mV ± 500 mV
		± 1 V ± 2 V ± 5 V ± 10 V ± 20 V
		± 5 mA ± 10 mA ± 20 mA

[2]) If no specification is given, the devices are supplied with the standard input range of 4…20 mA.

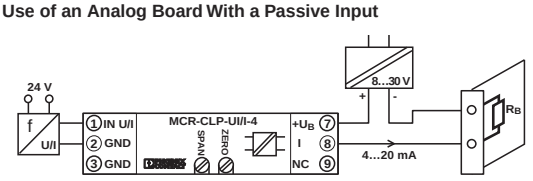
6. Application Examples

Use of an Active Analog Board



Active

Use of an Analog Board With a Passive Input



Passive

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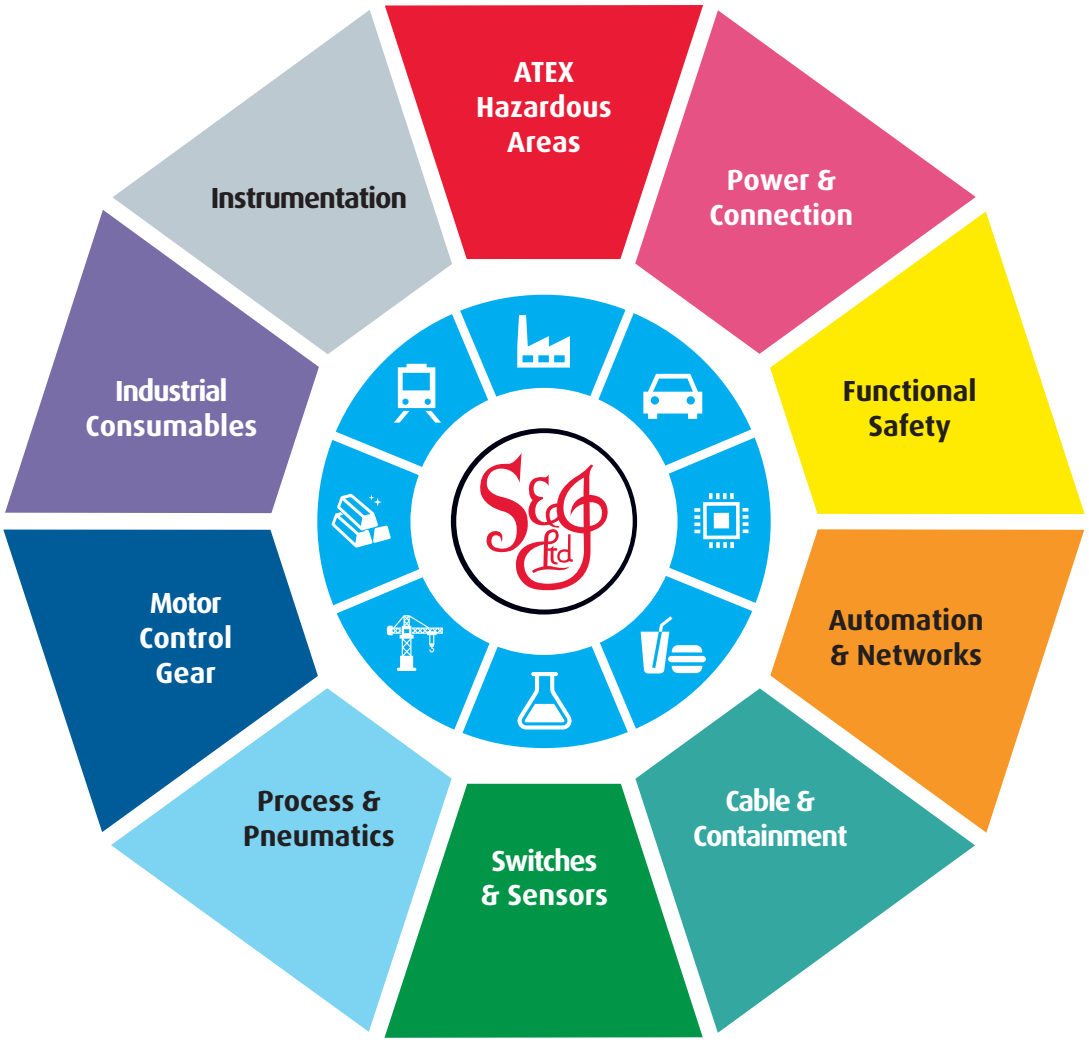

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