

## Signal conditioner - MACX MCR-UI-UI - 2811284

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Configurable 3-way isolating amplifier with safe electrical isolation, 24 V, power bridging. DIP switches on the front, over 1600 signal conversions can be set. Order configuration, screw connection, SIL.

### Your advantages

- ✓ Power supply possible via DIN rail connector
- ✓ Over 1600 signal conversions can be set via DIP switches on the front
- ✓ Installation in zone 2 permitted
- ✓ Up to SIL 2 according to EN 61508
- ✓ Configurable input and output signals, including bipolar current and voltage signals
- ✓ 3-way electrical isolation
- ✓ 10 kHz limit frequency for time-critical applications
- ✓ Analog signal conditioner for isolating, filtering, amplifying, and converting standard analog signals
- ✓ Plug-in screw or spring-cage connection technology (Push-in technology)
- ✓ Active or passive output
- ✓ Status indicator for supply voltage



### Key Commercial Data

|              |      |
|--------------|------|
| Packing unit | 1 pc |
|--------------|------|

### Configuration

|                               |                                       |
|-------------------------------|---------------------------------------|
| Input signal                  | 0...30 V [IN39]                       |
| Output signal                 | 0...10 V [OUT03]                      |
| Limit frequency               | 30 Hz [30]                            |
| Plant calibration certificate | No plant calibration certific. [NONE] |

### Technical data

#### Note

|                         |                                                                           |
|-------------------------|---------------------------------------------------------------------------|
| Utilization restriction | EMC: class A product, see manufacturer's declaration in the download area |
|-------------------------|---------------------------------------------------------------------------|

### Dimensions

# Signal conditioner - MACX MCR-UI-UI - 2811284

## Technical data

### Dimensions

|        |          |
|--------|----------|
| Width  | 12.5 mm  |
| Height | 112.5 mm |
| Depth  | 113.7 mm |

### Ambient conditions

|                                         |                                                                                   |
|-----------------------------------------|-----------------------------------------------------------------------------------|
| Ambient temperature (operation)         | -20 °C ... 70 °C                                                                  |
| Ambient temperature (storage/transport) | -40 °C ... 85 °C                                                                  |
| Maximum altitude                        | ≤ 2000 m                                                                          |
| Degree of protection                    | IP20 (not assessed by UL)                                                         |
| Noise immunity                          | EN 61000-6-2 When being exposed to interference, there may be minimal deviations. |

### Input data

| Description of the input | Measuring input                                                   |
|--------------------------|-------------------------------------------------------------------|
| Number of inputs         | 1                                                                 |
| Voltage input signal     | 0 mV ... 50 mV                                                    |
|                          | 0 mV ... 60 mV                                                    |
|                          | 0 mV ... 75 mV                                                    |
|                          | 0 mV ... 100 mV                                                   |
|                          | 0 mV ... 120 mV                                                   |
|                          | 0 mV ... 150 mV                                                   |
|                          | 0 mV ... 200 mV                                                   |
|                          | 0 mV ... 300 mV                                                   |
|                          | 0 mV ... 500 mV                                                   |
|                          | 0 V ... 1 V                                                       |
|                          | 0 V ... 1.5 V                                                     |
|                          | 0 V ... 2 V                                                       |
|                          | 0 V ... 3 V                                                       |
|                          | 0 V ... 5 V                                                       |
|                          | 0 V ... 10 V (please indicate if different setting when ordering) |
|                          | 0 V ... 15 V                                                      |
|                          | 0 V ... 20 V                                                      |
|                          | 0 V ... 30 V                                                      |
|                          | 0 V ... 50 V                                                      |
|                          | 0 V ... 100 V                                                     |
|                          | -50 mV ... 50 mV                                                  |
|                          | -60 mV ... 60 mV                                                  |
|                          | -75 mV ... 75 mV                                                  |
|                          | -100 mV ... 100 mV                                                |
|                          | -120 mV ... 120 mV                                                |
|                          | -150 mV ... 150 mV                                                |
|                          | -200 mV ... 200 mV                                                |

## Signal conditioner - MACX MCR-UI-UI - 2811284

### Technical data

#### Input data

|                      |                                               |
|----------------------|-----------------------------------------------|
|                      | -300 mV ... 300 mV                            |
|                      | -500 mV ... 500 mV                            |
|                      | -1 V ... 1 V                                  |
|                      | -1.5 V ... 1.5 V                              |
|                      | -2 V ... 2 V                                  |
|                      | -3 V ... 3 V                                  |
|                      | -5 V ... 5 V                                  |
|                      | -10 V ... 10 V                                |
|                      | -15 V ... 15 V                                |
|                      | -20 V ... 20 V                                |
|                      | -30 V ... 30 V                                |
|                      | -50 V ... 50 V                                |
|                      | -100 V ... 100 V                              |
|                      | 1 V ... 5 V                                   |
|                      | 2 V ... 10 V                                  |
| Current input signal | 0 mA ... 1 mA (Configurable via DIP switches) |
|                      | 0 mA                                          |
|                      | 0 mA ... 2 mA                                 |
|                      | 0 mA ... 3 mA                                 |
|                      | 0 mA ... 5 mA                                 |
|                      | 0 mA ... 10 mA                                |
|                      | 0 mA ... 15 mA                                |
|                      | 0 mA ... 20 mA                                |
|                      | 0 mA ... 30 mA                                |
|                      | 0 mA ... 50 mA                                |
|                      | 0 mA ... 100 mA                               |
|                      | -1 mA ... 1 mA                                |
|                      | -1.5 mA ... 1.5 mA                            |
|                      | -2 mA ... 2 mA                                |
|                      | -3 mA ... 3 mA                                |
|                      | -5 mA ... 5 mA                                |
|                      | -10 mA ... 10 mA                              |
|                      | -15 mA ... 15 mA                              |
|                      | -20 mA ... 20 mA                              |
|                      | -30 mA ... 30 mA                              |
|                      | -50 mA ... 50 mA                              |
|                      | -100 mA ... 100 mA                            |
|                      | 1 mA ... 5 mA                                 |
|                      | 2 mA ... 10 mA                                |
|                      | 4 mA ... 20 mA                                |

# Signal conditioner - MACX MCR-UI-UI - 2811284

## Technical data

### Input data

|                                   |                                           |
|-----------------------------------|-------------------------------------------|
| Min. input voltage                | ± 50 mV                                   |
| max. input voltage                | ± 100 V                                   |
| Max. input current                | ± 100 mA                                  |
| Input resistance of voltage input | approx. 1 MΩ (±1 V DC ... ±100 V DC)      |
| Input resistance current input    | approx. 10 Ω (± 10 mA DC ... ± 100 mA DC) |

### Output data

|                                 |                                                                     |
|---------------------------------|---------------------------------------------------------------------|
| Output name                     | Screw fastening                                                     |
| Number of outputs               | 1                                                                   |
| Configurable/programmable       | Yes, can be switched                                                |
| Voltage output signal           | 0 V ... 10 V (Configurable via DIP switches)                        |
|                                 | 0 V ... 5 V                                                         |
|                                 | 2 V ... 10 V                                                        |
|                                 | 1 V ... 5 V                                                         |
|                                 | -10 V ... 10 V                                                      |
|                                 | -5 V ... 5 V                                                        |
|                                 | 0 V ... 2.5 V                                                       |
|                                 | 0.5 V ... 2.5 V                                                     |
|                                 | -2.5 V ... 2.5 V                                                    |
| Current output signal           | 0 mA ... 5 mA                                                       |
|                                 | 0 mA ... 10 mA                                                      |
|                                 | 0 mA ... 20 mA (please indicate if different setting when ordering) |
|                                 | 1 mA ... 5 mA                                                       |
|                                 | 2 mA ... 10 mA                                                      |
|                                 | 4 mA ... 20 mA                                                      |
|                                 | -5 mA ... 5 mA                                                      |
|                                 | -10 mA ... 10 mA                                                    |
|                                 | -20 mA ... 20 mA                                                    |
| Load/output load voltage output | ≥ 1 kΩ (10 V)                                                       |
| Load/output load current output | ≤ 600 Ω (20 mA; active)                                             |
|                                 | passive: ≤ (UB-2 V) / I <sub>outmax</sub>                           |
| Ripple                          | < 10 mV <sub>rms</sub>                                              |

### Power supply

|                      |                                       |
|----------------------|---------------------------------------|
| Supply voltage range | 12 V DC ... 24 V DC (-20 % ... +25 %) |
|----------------------|---------------------------------------|

### Connection data

|                                  |                     |
|----------------------------------|---------------------|
| Connection method                | Screw connection    |
| Stripping length                 | 7 mm                |
| Screw thread                     | M3                  |
| Conductor cross section solid    | 0.2 mm² ... 2.5 mm² |
| Conductor cross section flexible | 0.2 mm² ... 2.5 mm² |

# Signal conditioner - MACX MCR-UI-UI - 2811284

## Technical data

### Connection data

|                             |           |
|-----------------------------|-----------|
| Conductor cross section AWG | 24 ... 14 |
|-----------------------------|-----------|

### General

|                                   |                                                                                   |
|-----------------------------------|-----------------------------------------------------------------------------------|
| No. of channels                   | 1                                                                                 |
| Maximum transmission error        | ≤ 0.1 % (Compared to the final value)                                             |
| Maximum temperature coefficient   | 0.0075 %/K                                                                        |
| Limit frequency (3 dB)            | 10 kHz (Can be switched to 30 Hz)                                                 |
| Alignment zero                    | ± 4 %                                                                             |
| Alignment span                    | ± 4 %                                                                             |
| Step response (10-90%)            | 35 µs (at 10 kHz)                                                                 |
|                                   | 11 ms (At 30 Hz)                                                                  |
| Protective circuit                | Transient protection                                                              |
| Overvoltage category              | II                                                                                |
| Degree of pollution               | 2                                                                                 |
| Rated insulation voltage          | 300 V AC                                                                          |
| Test voltage, input/output/supply | 2.5 kV (50 Hz, 1 min.)                                                            |
| Electromagnetic compatibility     | Conformance with EMC directive                                                    |
| Noise emission                    | EN 61000-6-4                                                                      |
| Noise immunity                    | EN 61000-6-2 When being exposed to interference, there may be minimal deviations. |
| Color                             | gray                                                                              |
| Housing material                  | PA 6.6-FR                                                                         |
| Mounting position                 | any                                                                               |

### EMC data

|                                                        |                          |
|--------------------------------------------------------|--------------------------|
| Designation                                            | Electromagnetic RF field |
| Standards/regulations                                  | EN 61000-4-3             |
| Typical deviation from the measuring range final value | 1 %                      |
| Designation                                            | Fast transients (burst)  |
| Standards/regulations                                  | EN 61000-4-4             |
| Typical deviation from the measuring range final value | 1 %                      |
| Designation                                            | Conducted interferences  |
| Standards/regulations                                  | EN 61000-4-6             |
| Typical deviation from the measuring range final value | 1 %                      |

### Standards and Regulations

|                               |                                |
|-------------------------------|--------------------------------|
| Electromagnetic compatibility | Conformance with EMC directive |
| Noise emission                | EN 61000-6-4                   |
| Designation                   | Electromagnetic RF field       |
| Standards/regulations         | EN 61000-4-3                   |
|                               | EN 61000-4-4                   |
| Designation                   | Conducted interferences        |
| Standards/regulations         | EN 61000-4-6                   |

## Signal conditioner - MACX MCR-UI-UI - 2811284

### Technical data

#### Standards and Regulations

|                    |                                                                                         |
|--------------------|-----------------------------------------------------------------------------------------|
| Conformance        | CE-compliant                                                                            |
| ATEX               | # II 3 G Ex nA IIC T4 Gc                                                                |
| IECEX              | Ex nA IIC T4 Gc                                                                         |
| UL, USA/Canada     | UL 61010 Listed                                                                         |
|                    | Class I, Div. 2, Groups A, B, C, D T6                                                   |
|                    | Class I, Zone 2, Group IIC                                                              |
| DNV GL-Temperature | B                                                                                       |
| DNV GL-Humidity    | B                                                                                       |
| DNV GL-Vibration   | A                                                                                       |
| DNV GL-EMC         | A                                                                                       |
| DNV GL-Enclosure   | Required protection according to the Rules shall be provided upon installation on board |

#### Conformance/approvals

|                |                                                                                         |
|----------------|-----------------------------------------------------------------------------------------|
| Designation    | CE                                                                                      |
| Identification | CE-compliant                                                                            |
| Designation    | ATEX                                                                                    |
| Identification | # II 3 G Ex nA IIC T4 Gc                                                                |
| Certificate    | BVS 10 ATEX E 059 X                                                                     |
| Designation    | IECEX                                                                                   |
| Identification | Ex nA IIC T4 Gc                                                                         |
| Certificate    | IECEX BVS 10.0044X                                                                      |
| Designation    | UL, USA/Canada                                                                          |
| Identification | UL 61010 Listed                                                                         |
|                | Class I, Div. 2, Groups A, B, C, D T6                                                   |
|                | Class I, Zone 2, Group IIC                                                              |
| Designation    | Shipbuilding approval                                                                   |
| Certificate    | DNV GL TAA000020C                                                                       |
| Designation    | Safety Integrity Level (SIL, IEC 61508)                                                 |
| Identification | 2                                                                                       |
| Temperature    | B                                                                                       |
| Humidity       | B                                                                                       |
| Vibration      | A                                                                                       |
| EMC            | A                                                                                       |
| Enclosure      | Required protection according to the Rules shall be provided upon installation on board |

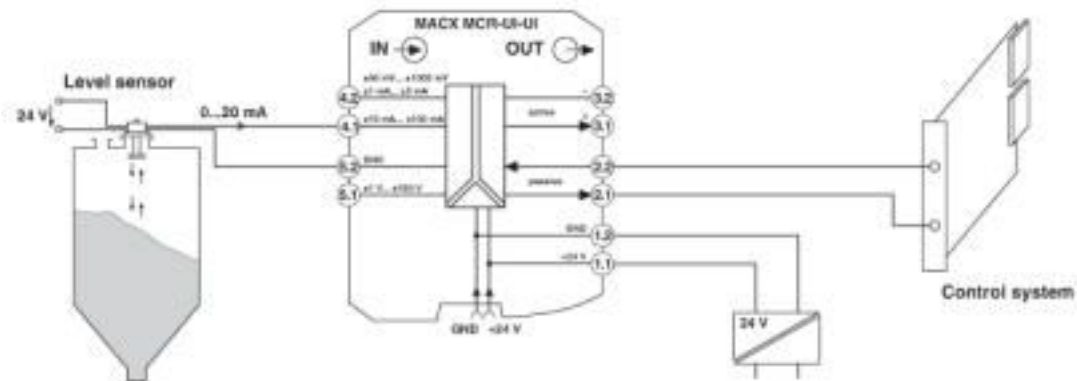
#### Environmental Product Compliance

|            |                                                                                                     |
|------------|-----------------------------------------------------------------------------------------------------|
| REACH SVHC | Lead 7439-92-1                                                                                      |
| China RoHS | Environmentally Friendly Use Period = 50 years                                                      |
|            | For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration" |

## Signal conditioner - MACX MCR-UI-UI - 2811284

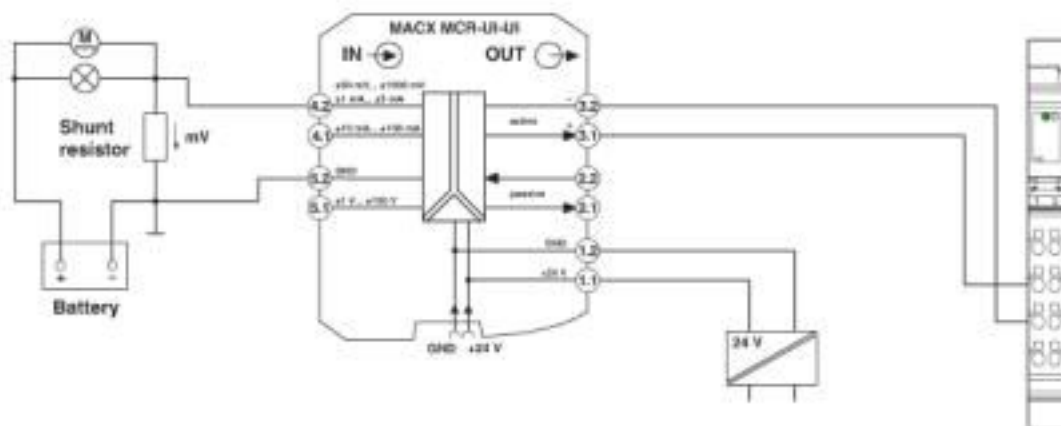
### Drawings

Application drawing



Level measurement with analog input terminals (active input card)

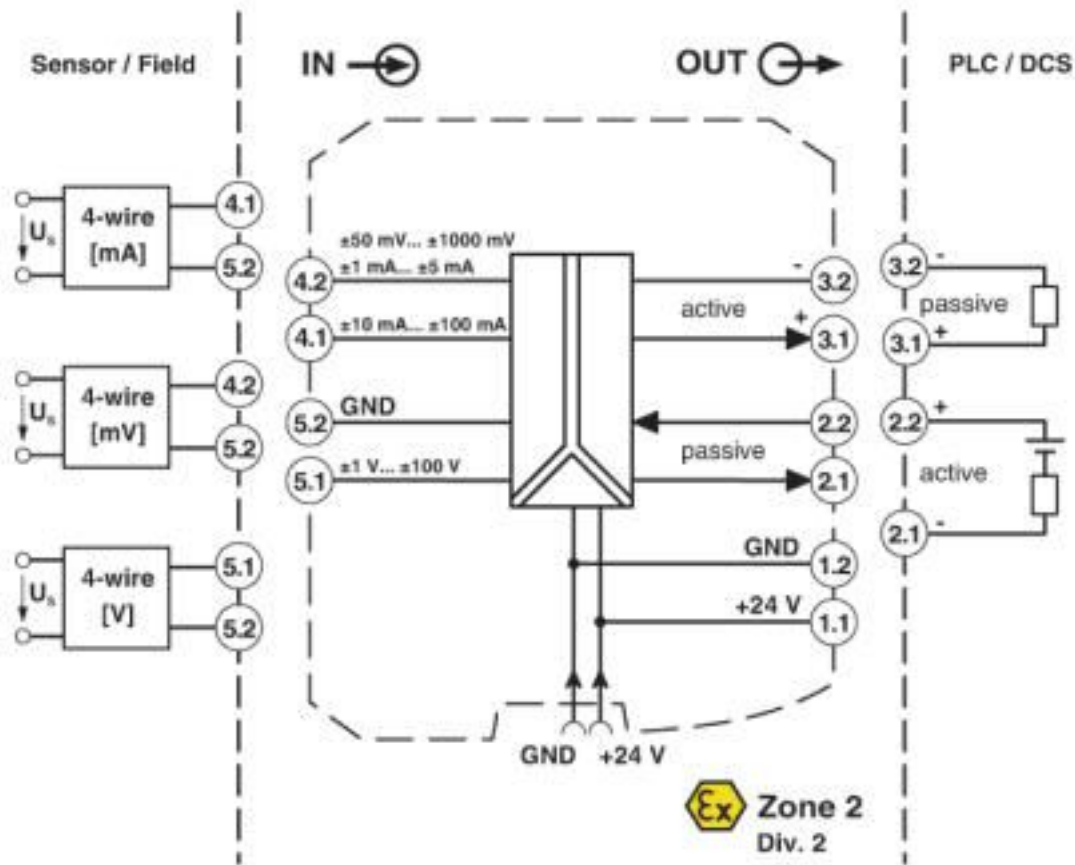
Application drawing



Shunt measurement and Inline terminal with analog input channels within an Inline station (passive input card)

## Signal conditioner - MACX MCR-UI-UI - 2811284

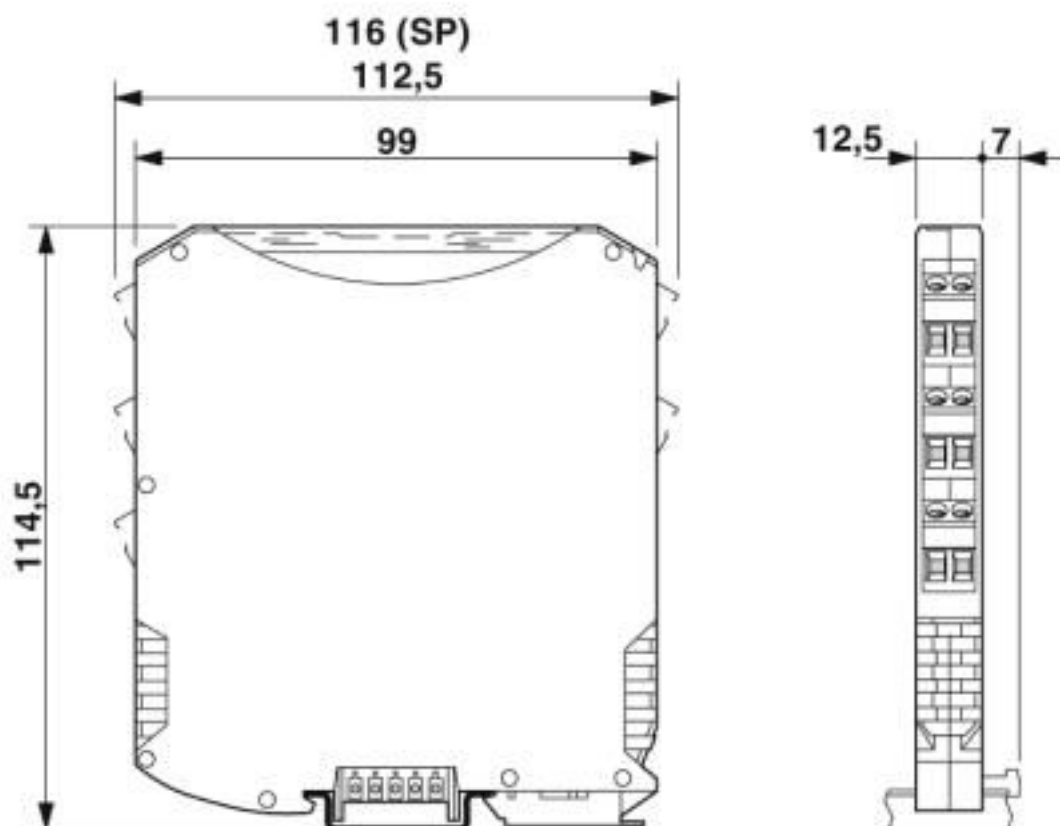
Block diagram



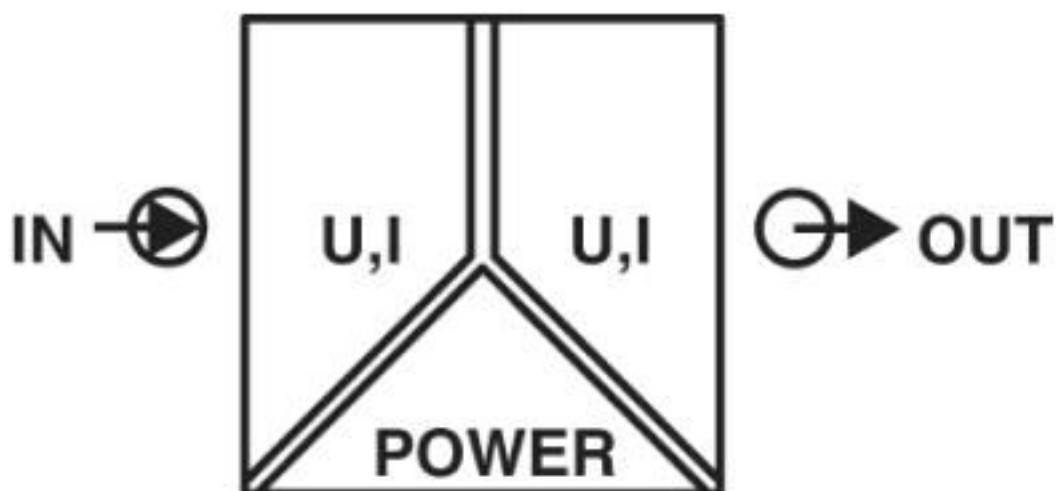


## Signal conditioner - MACX MCR-UI-UI - 2811284

Dimensional drawing



Pictogram



### Classifications

eCl@ss

eCl@ss 10.0.1

27210120

## Signal conditioner - MACX MCR-UI-UI - 2811284

### Classifications

#### eCl@ss

|            |          |
|------------|----------|
| eCl@ss 4.0 | 27210100 |
| eCl@ss 4.1 | 27210100 |
| eCl@ss 5.0 | 27210100 |
| eCl@ss 5.1 | 27210100 |
| eCl@ss 6.0 | 27210100 |
| eCl@ss 7.0 | 27210120 |
| eCl@ss 8.0 | 27210120 |
| eCl@ss 9.0 | 27210120 |

#### ETIM

|          |          |
|----------|----------|
| ETIM 4.0 | EC002653 |
| ETIM 5.0 | EC002653 |
| ETIM 6.0 | EC002653 |
| ETIM 7.0 | EC002653 |

#### UNSPSC

|               |          |
|---------------|----------|
| UNSPSC 6.01   | 30211506 |
| UNSPSC 7.0901 | 39121008 |
| UNSPSC 11     | 39121008 |
| UNSPSC 12.01  | 39121008 |
| UNSPSC 13.2   | 39121008 |
| UNSPSC 18.0   | 39121008 |
| UNSPSC 19.0   | 39121008 |
| UNSPSC 20.0   | 39121008 |
| UNSPSC 21.0   | 39121008 |

### Approvals

#### Approvals

##### Approvals

UL Listed / cUL Listed / Functional Safety / DNV GL / cULus Listed

##### Ex Approvals

IECEX / ATEX / UL Listed / cUL Listed / EAC Ex / cULus Listed

#### Approval details

UL Listed



<http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm>

FILE E 330267

## Signal conditioner - MACX MCR-UI-UI - 2811284

### Approvals

|            |                                                                                   |                                                                                                                                                       |               |
|------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| cUL Listed |  | <a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a> | FILE E 330267 |
|------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|

|                   |              |
|-------------------|--------------|
| Functional Safety | BVS Pb 01/10 |
|-------------------|--------------|

|        |                                                                                   |                                                                                   |            |
|--------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------|
| DNV GL |  | <a href="https://approvalfinder.dnvgl.com/">https://approvalfinder.dnvgl.com/</a> | TAA000020C |
|--------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------|

|              |                                                                                   |  |  |
|--------------|-----------------------------------------------------------------------------------|--|--|
| cULus Listed |  |  |  |
|--------------|-----------------------------------------------------------------------------------|--|--|

### Accessories

#### Accessories

#### Device marking

Plastic label - UC-EMLP (11X9) - 0819291



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

Plastic label - UC-EMLP (11X9) YE - 0822602



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

Plastic label - UC-EMLP (11X9) SR - 0828094



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

## Signal conditioner - MACX MCR-UI-UI - 2811284

### Accessories

#### Plastic label - US-EMLP (11X9) - 0828789



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

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#### Plastic label - US-EMLP (11X9) YE - 0828871



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

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#### Plastic label - US-EMLP (11X9) SR - 0828872



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

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#### Device marker - LS-EMLP (11X9) WH - 0831678



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

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#### Device marker - LS-EMLP (11X9) YE - 0831732



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

## Signal conditioner - MACX MCR-UI-UI - 2811284

### Accessories

Device marker - LS-EMLP (11X9) SR - 0831705



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

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### DIN rail connector

DIN rail bus connectors - ME 6,2 TBUS-2 1,5/5-ST-3,81 GN - 2869728



DIN rail connector for DIN rail mounting. Universal for TBUS housing. Gold-plated contacts, 5-pos.

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### Insulating sleeve

Insulating sleeve - MPS-IH BK - 0201731

Insulating sleeve, color: black



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Insulating sleeve - MPS-IH GY - 0201728

Insulating sleeve, color: gray



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Insulating sleeve - MPS-IH GN - 0201702

Insulating sleeve, color: green



## Signal conditioner - MACX MCR-UI-UI - 2811284

### Accessories

Insulating sleeve - MPS-IH YE - 0201692

Insulating sleeve, color: yellow



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Insulating sleeve - MPS-IH BU - 0201689

Insulating sleeve, color: blue



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Insulating sleeve - MPS-IH RD - 0201676

Insulating sleeve, color: red



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Insulating sleeve - MPS-IH WH - 0201663

Insulating sleeve, color: white



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Labeled device marker

Plastic label - UC-EMLP (11X9) CUS - 0824547



Plastic label, can be ordered: by sheet, white, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm

## Signal conditioner - MACX MCR-UI-UI - 2811284

### Accessories

Plastic label - UC-EMLP (11X9) YE CUS - 0824548



Plastic label, can be ordered: by sheet, yellow, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm

Plastic label - UC-EMLP (11X9) SR CUS - 0828098



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

### Module carrier

Module carrier - TC-D37SUB-ADIO16-EX-P-UNI - 2924854



Universal termination carrier for connecting 16 MACX Analog Ex i signal conditioners to digital or analog I/O cards, via D-SUB connector, 37-pos. (1:1 connection)

Module carrier - TC-D37SUB-AIO16-EX-PS-UNI - 2902932



Universal termination carrier for connecting 16 MACX Analog Ex i signal conditioners to digital or analog I/O cards, via D-SUB connector, 37-pos. (1:1 connection), with HART multiplexer connection

### Power module

Power and error message module - MACX MCR-PTB - 2865625



Power and fault signaling module with screw connection, including corresponding ME 17,5 TBUS 1,5/ 5-ST-3,81 GY DIN rail connector

## Signal conditioner - MACX MCR-UI-UI - 2811284

### Accessories

Power and error message module - MACX MCR-PTB-SP - 2924184



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

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### Test plug terminal block

Test plugs - MPS-MT - 0201744



Test plugs, with solder connection up to 1 mm<sup>2</sup> conductor cross section, color: gray

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Authorized Distributor

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