

Output signal conditioner - MACX MCR-SL-IDS-I - 2865971

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Output signal conditioner, HART. Isolates and transfers 0/4-20 mA signals to a load (I/P converters, control valves, displays). Electrical 3-way isolation, wire break recognition, SIL 2 in accordance with IEC 61508, screw connection.

Your advantages

- ✓ Power supply possible via DIN rail connector
- ✓ Up to SIL 2 according to EN 61508
- ✓ Installation in zone 2, protection type "n" (EN 60079-15) permitted
- ✓ Line fault detection (LFD)
- ✓ 3-way electrical isolation
- ✓ Plug-in screw or spring-cage connection technology (Push-in technology), with integrated sockets for HART communicators
- ✓ Bidirectional transmission of digital HART communication signals
- ✓ 0/4 ... 20 mA input
- ✓ 0/4 ... 20 mA output



Key Commercial Data

| | |
|--------------------------------------|---|
| Packing unit | 1 pc |
| GTIN |  4 046356 449540 |
| GTIN | 4046356449540 |
| Weight per Piece (excluding packing) | 140.900 g |
| Custom tariff number | 85437090 |
| Country of origin | Germany |

Technical data

Dimensions

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

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Technical data

Ambient conditions

| | |
|---|--|
| Ambient temperature (operation) | -20 °C ... 60 °C (Any mounting position) |
| Ambient temperature (storage/transport) | -40 °C ... 85 °C |
| Maximum altitude | ≤ 2000 m |
| Permissible humidity (operation) | 10 % ... 95 % (non-condensing) |
| Noise immunity | EN 61000-6-2 |

Input data

| | |
|----------------------|-------------------------------------|
| Current input signal | 0 mA ... 20 mA |
| | 4 mA ... 20 mA |
| Input impedance | > 100 kΩ (If there is a line fault) |
| Voltage drop | 5.4 V (20 mA) |

Output data

| | |
|---------------------------------|------------------------|
| Signal output | Current output |
| Current output signal | 0 mA ... 20 mA |
| | 4 mA ... 20 mA |
| Transmission Behavior | 1:1 to input signal |
| Load/output load current output | < 800 Ω (20 mA) |
| | < 730 Ω (22.5 mA) |
| Output ripple | < 20 mV _{rms} |

Power supply

| | |
|--------------------------|---|
| Nominal supply voltage | 24 V DC |
| Supply voltage range | 19.2 V DC ... 30 V DC (24 V DC -20%...+25%) |
| Max. current consumption | < 46 mA (24 V DC / 20 mA) |
| Power dissipation | < 1.1 W (24 V DC / 20 mA) |

General

| | |
|---------------------------------|--------------------------------------|
| No. of channels | 1 |
| Maximum transmission error | < 0.1 % (of final value) |
| Transmission error, typical | < 0.05 % (of final value) |
| Maximum temperature coefficient | < 0.01 %/K |
| Step response (10-90%) | < 140 μs (for 4 mA ... 20 mA step) |
| Status display | Green LED (supply voltage) |
| Degree of pollution | 2 |
| Overvoltage category | II |
| Electromagnetic compatibility | Conformance with EMC directive |
| Interference emission | EN 61000-6-4 |
| Housing material | PA 6.6-FR |
| Color | gray |
| Designation | Input/output/power supply |
| Electrical isolation | 1.5 kV (50 Hz, 1 min., test voltage) |

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Technical data

General

| | |
|----------------|--|
| | 300 V _{rms} (Rated insulation voltage (overvoltage category II, degree of pollution 2)) |
| Conformance | CE-compliant, additionally EN 61326-1 |
| ATEX | # II 3 G Ex nA IIC T4 Gc X |
| UL, USA/Canada | UL 508 Listed |
| | UL 61010 Listed |
| | Class I, Div. 2, Groups A, B, C, D T4 |
| | Class I, Zone 2, Group IIC T4 |
| SIL | 2 |

Data communication (bypass)

| | |
|---------------------|------|
| HART function | Yes |
| Protocols supported | HART |

Safety characteristic data

| | |
|--|--|
| Integrity requirement | IEC 61508 - Low demand |
| Equipment type | Type A |
| Safety Integrity Level (SIL) | 2 |
| Safe Failure Fraction (SFF) | 94.68 % |
| λ_{SU} | 4.965×10^{-7} (496.5 FIT) |
| λ_{SD} | 0 |
| λ_{DU} | 2.79×10^{-8} (27.9 FIT) |
| λ_{DD} | 0 |
| Probability of a hazardous failure on demand (PFD _{AVG}) | 1.22×10^{-4} (1 year) |
| | 6.1×10^{-4} (5 years) |
| | 12.2×10^{-4} (10 years) |
| Diagnostic coverage (DC) | DC _S =0 %, DC _D =0 % |
| Integrity requirement | IEC 61508 - High demand |
| Equipment type | Type A |
| Safety Integrity Level (SIL) | 2 |
| Safe Failure Fraction (SFF) | 94.68 % |
| λ_{SU} | 4.965×10^{-7} (496.5 FIT) |
| λ_{SD} | 0 |
| λ_{DU} | 2.79×10^{-8} (27.9 FIT) |
| λ_{DD} | 0 |
| Probability of a hazardous failure per hour (PFH _D) | $2,79 \times 10^{-8}$ |
| Diagnostic coverage (DC) | DC _S =0 %, DC _D =0 % |

EMC data

| | |
|-----------------------|--------------------------|
| Designation | Electromagnetic RF field |
| Standards/regulations | EN 61000-4-3 |

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Technical data

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 |
| Conformance | CE-compliant, additionally EN 61326-1 |
| ATEX | # II 3 G Ex nA IIC T4 Gc X |
| UL, USA/Canada | UL 508 Listed |
| | UL 61010 Listed |
| | Class I, Div. 2, Groups A, B, C, D T4 |
| | Class I, Zone 2, Group IIC T4 |
| DNV GL-Temperature | B |
| DNV GL-Humidity | B |
| DNV GL-Vibration | A |
| DNV GL-EMC | B |
| DNV GL-Enclosure | Required protection according to the Rules shall be provided upon installation on board |

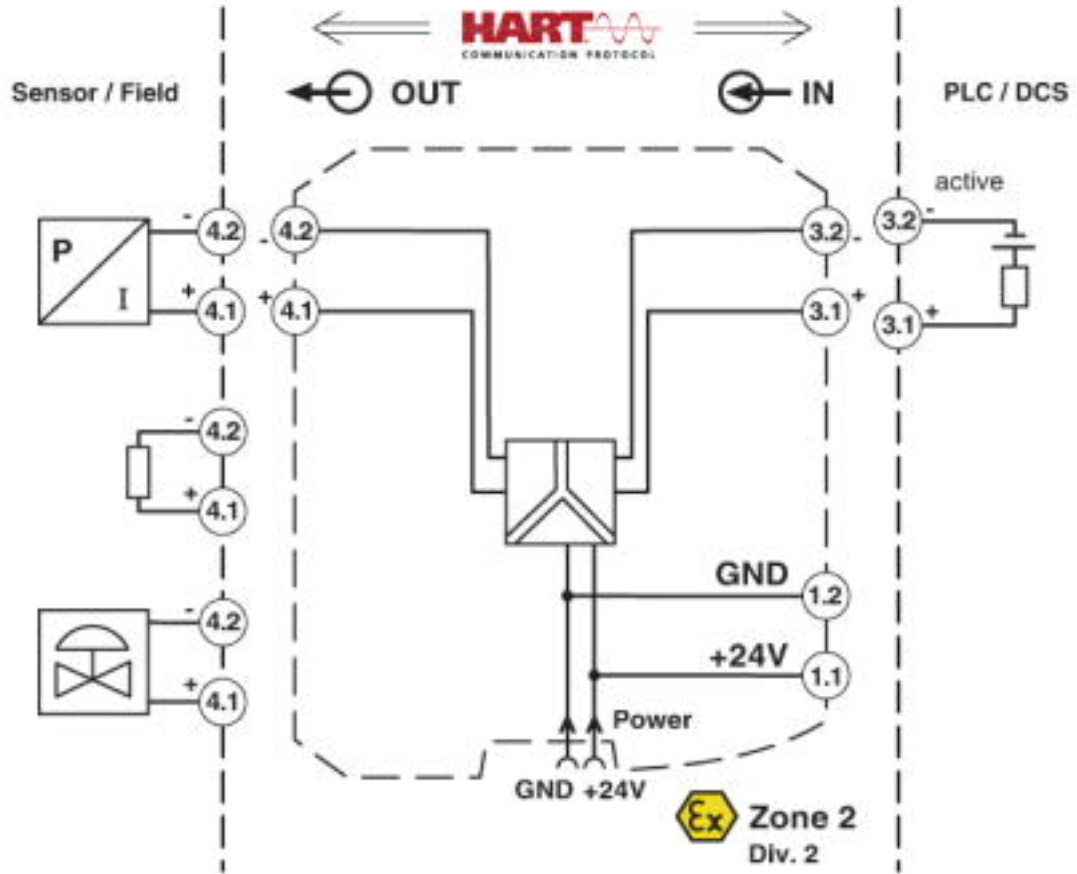
Environmental Product Compliance

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

Drawings

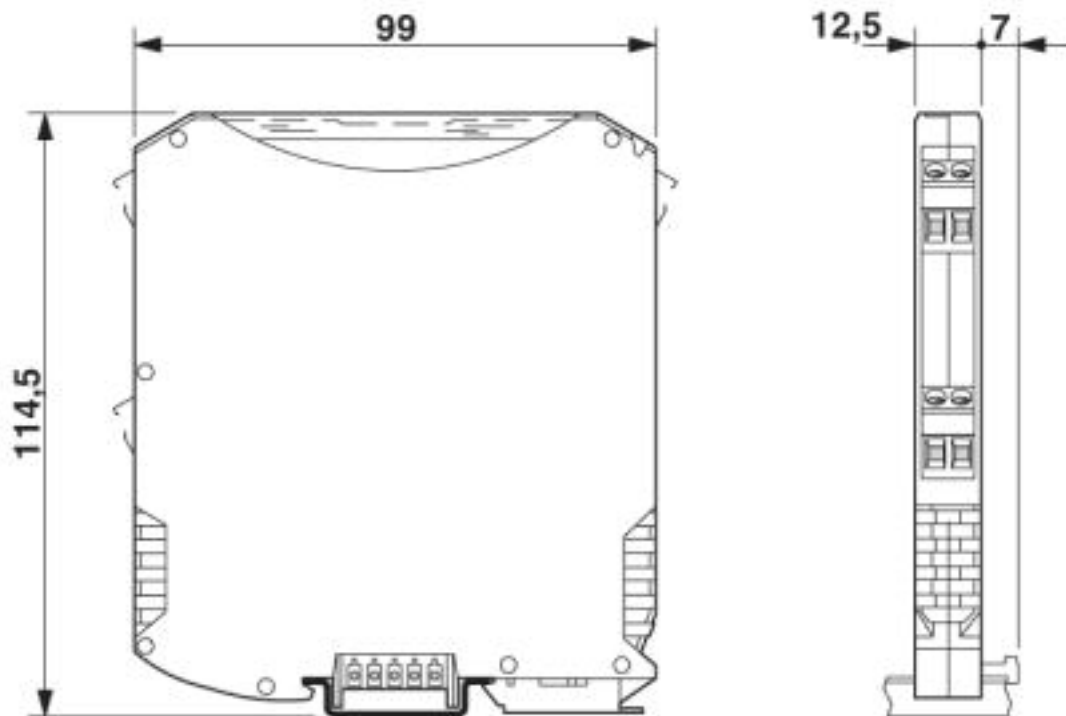
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Block diagram

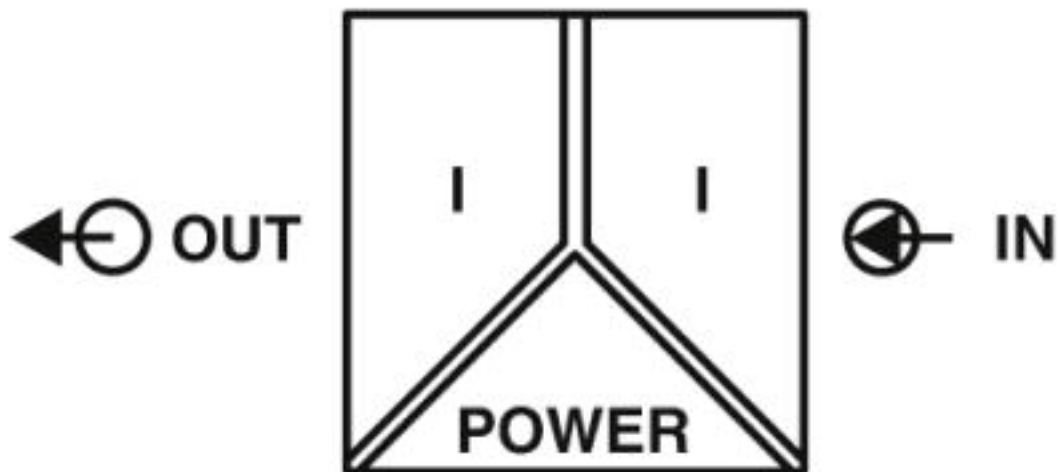


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Dimensional drawing



Pictogram



Classifications

eCl@ss

| | |
|------------|----------|
| eCl@ss 4.0 | 27210100 |
| eCl@ss 4.1 | 27210100 |
| eCl@ss 5.0 | 27210100 |
| eCl@ss 5.1 | 27210100 |

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Classifications

eCl@ss

| | |
|------------|----------|
| 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

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

Ex Approvals

ATEX / UL Listed / cUL Listed / cULus Listed

Approval details

| | | | |
|--------|--|---|------------|
| DNV GL | | https://approvalfinder.dnvgl.com/ | TAA00000AG |
|--------|--|---|------------|

| | | | |
|-----------|--|---|---------------|
| UL Listed | | http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm | FILE E 330267 |
|-----------|--|---|---------------|

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Approvals

| | | | |
|------------|--|---|---------------|
| cUL Listed | | http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm | FILE E 330267 |
|------------|--|---|---------------|

| | |
|-------------------|--------------|
| Functional Safety | BVS Pb 05/08 |
|-------------------|--------------|

| | |
|--------------|--|
| 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

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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Accessories

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

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

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

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

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

DIN rail connector

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Accessories

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.

Insulating sleeve

Insulating sleeve - MPS-IH BK - 0201731

Insulating sleeve, color: black



Insulating sleeve - MPS-IH GY - 0201728

Insulating sleeve, color: gray



Insulating sleeve - MPS-IH GN - 0201702

Insulating sleeve, color: green



Insulating sleeve - MPS-IH YE - 0201692

Insulating sleeve, color: yellow



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Accessories

Insulating sleeve - MPS-IH BU - 0201689

Insulating sleeve, color: blue



Insulating sleeve - MPS-IH RD - 0201676

Insulating sleeve, color: red



Insulating sleeve - MPS-IH WH - 0201663

Insulating sleeve, color: white



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

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

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Accessories

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

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

Programming cable

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Accessories

Cable adapter - GW HART USB MODEM - 1003824



USB HART modem cable for communication between a PC and HART devices, cable length: 1m.

Test plug terminal block

Test plugs - MPS-MT - 0201744



Test plugs, with solder connection up to 1 mm² conductor cross section, color: gray
