

MACX MCR-EX-SL-RPSSI-I - Repeater power supply



2865340

<https://www.phoenixcontact.com/us/products/2865340>

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Ex i repeater power supply and input signal conditioner, HART-transparent. Transmits supplied or active 0/4 ... 20 mA signals from the Ex area to a load (active or passive) in the safe area. 3-way electrical isolation, SIL 2 in accordance with IEC 61508, with screw connection

Your advantages

- 0/4 mA ... 20 mA input, intrinsically safe, [Ex ia], powered and not powered
- Measuring transducer supply voltage > 16 V
- Output: 0/4 mA ... 20 mA, active up to 1000 Ω load or passive
- Bidirectional HART signal transmission
- Error indication according to NAMUR NE 43
- SIL 2 according to IEC/EN 61508
- Installation in zone 2, protection type "ec" (EN 60079-7) permitted
- 3-way electrical isolation
- Power supply possible via DIN rail connector
- Plug-in connection terminal blocks, screw connection technology, with integrated sockets for HART communicators
- Housing width: 12.5 mm
- Minimal power dissipation
- High transmission accuracy

Commercial data

| | |
|--------------------------------------|---------------|
| Item number | 2865340 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Sales key | C430 |
| Product key | DK1211 |
| GTIN | 4046356160353 |
| Weight per piece (including packing) | 182.5 g |
| Weight per piece (excluding packing) | 160 g |
| Customs tariff number | 85437090 |
| Country of origin | DE |

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Technical data

Product properties

| | |
|-----------------|-----------------------|
| Product type | Repeater power supply |
| Product family | MACX Analog |
| Application | Analog IN |
| No. of channels | 1 |

Electrical properties

| | |
|---|--|
| Electrical isolation | 3-way isolation |
| Electrical isolation between input and output | yes |
| Maximum power dissipation for nominal condition | 0.95 W (20 mA, 250 Ω) |
| Signal transmission behavior | In = Out |
| Step response (10-90%) | < 200 μs (for jump 4 mA ... 20 mA, load 600 Ω) < 600 μs (for jump 0 mA ... 20 mA, load 600 Ω) |
| Maximum temperature coefficient | < 0.01 %/K |
| Temperature coefficient, typical | < 0.004 %/K |
| Maximum transmission error | < 0.1 % (of final value 20 mA) |
| Transmission error, typical | < 0.05 % (of final value 20 mA) |
| Reverse polarity protection | yes |

Electrical isolation

| | |
|----------------------|-------------------------|
| Test voltage | 2.5 kV AC (50 Hz, 60 s) |
| Overvoltage category | II |
| Pollution degree | 2 |

Electrical isolation Input/output/power supply IEC/EN 61010-1

| | |
|--------------------------|----------------------|
| Standards/regulations | IEC/EN 61010-1 |
| Rated insulation voltage | 300 V _{rms} |
| Insulation | Safe isolation |

Electrical isolation Input/output IEC/EN 60079-11

| | |
|--------------------------|----------------------|
| Standards/regulations | IEC/EN 60079-11 |
| Rated insulation voltage | 265 V _{rms} |

Electrical isolation Input/power supply IEC/EN 60079-11

| | |
|--------------------------|----------------------|
| Standards/regulations | IEC/EN 60079-11 |
| Rated insulation voltage | 265 V _{rms} |

Electrical isolation Output/supply IEC/EN 60079-7

| | |
|--------------------------|----------------------|
| Standards/regulations | IEC/EN 60079-7 |
| Rated insulation voltage | 265 V _{rms} |

Supply

| | |
|------------------------|---------------------------------|
| Designation | Repeater power supply operation |
| Nominal supply voltage | 24 V DC -20 % ... +25 % |

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| | |
|-----------------------------------|------------------------------------|
| Supply voltage range | 19.2 V DC ... 30 V DC |
| Max. current consumption | < 76 mA (24 V DC / 20 mA / 1000 Ω) |
| | < 55 mA (24 V DC / 20 mA / 250 Ω) |
| Power dissipation | < 1.1 W (24 V DC / 20 mA / 1000 Ω) |
| | < 0.95 W (24 V DC / 20 mA / 250 Ω) |
| | < 1.2 W (24 V DC / 20 mA / 0 Ω) |
| Power consumption (Output active) | < 1.8 W (20 mA / 1000 Ω) |
| | < 1.3 W (20 mA / 250 Ω) |

Supply

| | |
|--------------------------|-------------------------------------|
| Designation | Signal conditioner operation |
| Nominal supply voltage | 24 V DC -20 % ... +25 % |
| Supply voltage range | 19.2 V DC ... 30 V DC |
| Max. current consumption | < 44 mA (24 V DC / 20 mA / 1000 Ω) |
| | < 27 mA (24 V DC / 20 mA / 250 Ω) |
| Power dissipation | < 0.75 W (24 V DC / 20 mA / 1000 Ω) |
| | < 0.65 W (24 V DC / 20 mA / 250 Ω) |
| | < 0.95 W (24 V DC / 20 mA / 0 Ω) |

Input data

Signal: Repeater power supply operation

| | |
|-----------------------------------|--|
| Description of the input | Active current input, intrinsically safe |
| Number of inputs | 1 |
| Input signal | Current |
| Current input signal | 4 mA ... 20 mA |
| Current limitation | 25 mA |
| Transmitter supply voltage | > 16 V (20 mA) |
| | > 15.3 V (22.5 mA) |
| Polarization and surge protection | Yes |
| Underload/overload signal range | 0 mA ... 24 mA (Extended transmission range for diagnostics) |

Signal: Signal conditioner operation

| | |
|---------------------------------|--|
| Description of the input | Passive current input, intrinsically safe |
| Current input signal | 0 mA ... 20 mA |
| | 4 mA ... 20 mA |
| Voltage drop | < 3.5 V (in input isolating amplifier operation) |
| Underload/overload signal range | 0 mA ... 24 mA (Extended transmission range for diagnostics) |

Output data

Signal: Repeater power supply operation

| | |
|-----------------------|--|
| Output description | Current output (active and passive) |
| Number of outputs | 1 |
| Current output signal | 4 mA ... 20 mA (active) |
| | 4 mA ... 20 mA (14 ... 26 V ext. source voltage) |

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| | |
|--|--|
| Load/output load current output | < 1000 Ω (20 mA) |
| | < 825 Ω (24 mA) |
| Output ripple | < 20 mV _{rms} |
| Output behavior in the event of an error | 0 mA (Cable break in the input) |
| | ≥ 22.5 mA (Cable short-circuit in the input) |
| Underload/overload signal range | 0 mA ... 24 mA (Extended transmission range for diagnostics) |

Signal: Signal conditioner operation

| | |
|--|--|
| Output description | Current output (active and passive) |
| Current output signal | 0 mA ... 20 mA (active) |
| | 4 mA ... 20 mA (active) |
| | 0 mA ... 20 mA (14 ... 26 V ext. source voltage) |
| | 4 mA ... 20 mA (14 ... 26 V ext. source voltage) |
| Load/output load current output | < 1000 Ω (20 mA) |
| | < 825 Ω (24 mA) |
| Output ripple | < 20 mV _{rms} |
| Output behavior in the event of an error | 0 mA (Cable break in the input) |
| | 0 mA (Cable short-circuit in the input) |
| Underload/overload signal range | 0 mA ... 24 mA (Extended transmission range for diagnostics) |

Connection data

| | |
|----------------------------------|---|
| Connection method | Screw connection |
| Stripping length | 7 mm |
| Screw thread | M3 |
| Conductor cross-section rigid | 0.2 mm ² ... 2.5 mm ² |
| Conductor cross-section flexible | 0.2 mm ² ... 2.5 mm ² |
| Conductor cross-section AWG | 24 ... 14 |
| Tightening torque | 0.5 Nm ... 0.6 Nm |

Test socket

| | |
|---------------|------|
| Max. diameter | 2 mm |
|---------------|------|

Ex data

| | |
|-----------------------|----------|
| Ex installation (EPL) | Gc |
| | Div. 2 |
| Ex i circuits (EPL) | [Ga] |
| | [Da] |
| | [Ma] |
| | [Div. 1] |

Safety data: Repeater power supply operation

| | |
|---|----------|
| Max. output voltage U _o | 25.2 V |
| Max. output current I _o | 93 mA |
| Max. output power P _o | 587 mW |
| Safety-related maximum voltage U _m | 253 V AC |

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| | |
|--|--|
| | 125 V DC |
| I (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o | 40 mH / 4.8 μ F |
| IIA (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o | 26 mH / 2.9 μ F |
| IIB (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o | 14 mH / 820 nF |
| IIC (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o | 3 mH / 107 nF |
| IIA (mixed circuit): Max. external inductivity L_o / Max. external capacitance C_o | 26 mH / 470 nF, 20 mH / 570 nF, 1 mH / 630 nF, 0.5 mH / 720 nF, 0.1 mH / 1.1 μ F, 0.005 mH / 2.9 μ F |
| IIB/III (mixed circuit): Max. external inductivity L_o / Max. external capacitance C_o | 16 mH / 370 nF, 500 μ H / 510 nF, 200 μ H / 660 nF, 100 μ H / 820 nF |
| IIC (mixed circuit): Max. external inductivity L_o / Max. external capacitance C_o | 2.2 mH / 47 nF, 2 mH / 49 nF, 1 mH / 63 nF, 500 μ H / 80 nF, 200 μ H / 107 nF |
| I (mixed circuit): Max. external inductivity L_o / Max. external capacitance C_o | 37 mH / 0.54 μ F, 0.35 mH / 1 μ F, 0.009 mH / 2.9 μ F, 0.001 mH / 4.15 μ F |

Safety data: Signal conditioner operation

| | |
|--------------------------------------|---------------|
| Input voltage U_i | ≤ 30 V |
| Input current I_i | ≤ 150 mA |
| Max. internal inductance L_i | negligible |
| Max. internal capacitance C_i | negligible |
| Safety-related maximum voltage U_m | 253 V AC |
| | 125 V DC |

Interfaces

Data communication (bypass)

| | |
|---------------------|-------------------|
| HART function | HART transparency |
| Protocols supported | HART |

Signaling

| | |
|----------------|----------------------------|
| Status display | Green LED (supply voltage) |
|----------------|----------------------------|

Dimensions

| | |
|---------------------|--|
| Dimensional drawing | |
| Width | 12.5 mm |
| Height | 112.5 mm |
| Depth | 113.7 mm |
| Depth NS 35/7,5 | 114.5 mm (Snapped onto DIN rail NS 35/7,5 in accordance with EN 60715) |

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Material specifications

| | |
|--|-----------------|
| Color | gray (RAL 7042) |
| Flammability rating according to UL 94 (Housing) | V0 (Housing) |
| Housing material | PA 6.6-FR |

Environmental and real-life conditions

Ambient conditions

| | |
|---|---|
| Degree of protection | IP20 (not assessed by UL) |
| Ambient temperature (operation) | -40 °C ... 60 °C (Any mounting position) -40 °C ... 70 °C (Derating) |
| Ambient temperature (storage/transport) | -40 °C ... 80 °C |
| Permissible humidity (operation) | 10 % ... 95 % (non-condensing) |

Altitude range (≤ 2000 m)

| | |
|---------------------------------|--|
| Altitude | ≤ 2000 m (The technical data refers to altitudes ≤2000 m above mean sea level. For altitudes >2000 m above mean sea level, refer to the data sheet.) |
| Ambient temperature (operation) | -40 °C ... 60 °C -40 °C ... 70 °C (Derating) |
| Rated insulation voltage | 375 V _{PP} (Power supply, input / output) |

Altitude range (≤ 3000 m)

| | |
|---------------------------------|--|
| Height range | > 2000 m ... 3000 m |
| Ambient temperature (operation) | -40 °C ... 54 °C -40 °C ... 63 °C (Derating) |
| Rated insulation voltage | 190 V AC (Power supply, input / output) 110 V DC (Power supply, input / output) |

Altitude range (≤ 4000 m)

| | |
|---------------------------------|---|
| Height range | > 3000 m ... 4000 m |
| Ambient temperature (operation) | -40 °C ... 48 °C -40 °C ... 56 °C (Derating) |
| Rated insulation voltage | 60 V AC/DC (Power supply, input / output) |

Altitude range (≤ 5000 m)

| | |
|---------------------------------|---|
| Height range | > 4000 m ... 5000 m |
| Ambient temperature (operation) | -40 °C ... 42 °C -40 °C ... 49 °C (Derating) |
| Rated insulation voltage | 60 V AC/DC (Power supply, input / output) |

Approvals

CE

| | |
|-------------|--------------|
| Certificate | CE-compliant |
| Note | and EN 61326 |

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ATEX

| | |
|----------------|-------------------------------------|
| Identification | ⊕ II (1) G [Ex ia Ga] IIC |
| | ⊕ II (1) D [Ex ia Da] IIIC |
| | ⊕ II 3(1) G Ex ec [ia Ga] IIC T4 Gc |
| | ⊕ I (M1) [Ex ia Ma] I |
| Certificate | BVS 08 ATEX E 054X |

IECEX

| | |
|----------------|-------------------------|
| Identification | [Ex ia Ga] IIC |
| | [Ex ia Da] IIIC |
| | Ex ec [ia Ga] IIC T4 Gc |
| | [Ex ia Ma] I |
| Certificate | IECEX BVS 08.0016X |

CCC / China-Ex

| | |
|----------------|-------------------------|
| Identification | [Ex ia Ga] IIC |
| | [Ex ia Da] IIIC |
| | Ex ec [ia Ga] IIC T4 Gc |
| Certificate | 2022122316115973 |

UL, USA/Canada

| | |
|----------------|---|
| Identification | UL 61010 Listed |
| | Class I, Div. 2, Groups A, B, C, D T4 |
| | Class I, Div. 2, Groups IIC, IIB, IIA T4 |
| | Associated apparatus for use in Class I, Division 1, Groups A,B,C,D |
| | Associated apparatus for use in Class II, Div.1 Groups E,F,G |
| | Associated apparatus for use in Class III, Division 1 |
| | Associated apparatus for use in Class I, Zone 0,1,2, Groups IIC,IIB,IIA |
| Certificate | ⓈⓈ C.D.-No 83104549 |

Shipbuilding approval

| | |
|-------------|-------------------|
| Certificate | DNV GL TAA000020C |
|-------------|-------------------|

Safety Integrity Level (SIL, IEC 61508)

| | |
|----------------|----------------------|
| Identification | 2 |
| Certificate | IN-AT-AS-MRL-2300149 |

Systematic Capability

| | |
|----------------|---|
| Identification | 3 |
|----------------|---|

KC-s

| | |
|----------------|-----------------|
| Identification | [Ex ia] IIC/IIB |
| Certificate | 17-KA4BO-0400X |

INMETRO

| | |
|--|----------------|
| | [Ex ia Ga] IIC |
|--|----------------|

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| | |
|----------------|-------------------------|
| Identification | [Ex ia Da] IIC |
| | Ex ec [ia Ga] IIC T4 Gc |
| | [Ex ia Ma] I |
| Certificate | DNV 18.0136 X |

Shipbuilding data

| | |
|-------------|---|
| Temperature | B |
| Humidity | B |
| Vibration | A |
| EMC | A |
| Enclosure | Required protection according to the Rules shall be provided upon installation on board |

EMC data

| | |
|-------------------------------|--|
| Electromagnetic compatibility | Conformance with EMC directive |
| Noise immunity | EN 61000-6-2 |
| Note | When being exposed to interference, there may be minimal deviations. |

Noise emission

| | |
|-----------------------|--------------|
| Standards/regulations | EN 61000-6-4 |
|-----------------------|--------------|

Electromagnetic HF field

| | |
|--|--------------------------|
| Designation | Electromagnetic RF field |
| Standards/regulations | EN 61000-4-3 |
| Typical deviation from the measuring range final value | 1 % |

Fast transients (burst)

| | |
|--|-------------------------|
| Designation | Fast transients (burst) |
| Standards/regulations | EN 61000-4-4 |
| Typical deviation from the measuring range final value | 1 % |

Conducted interference

| | |
|--|-------------------------|
| Designation | Conducted interferences |
| Standards/regulations | EN 61000-4-6 |
| Typical deviation from the measuring range final value | 1 % |

Standards and regulations

| | |
|----------------------|-----------------|
| Electrical isolation | 3-way isolation |
|----------------------|-----------------|

GB Standard

| | |
|-----------------------|-------------|
| Standards/regulations | GB/T 3836.1 |
| | GB/T 3836.3 |
| | GB/T 3836.4 |

Mounting

| | |
|---------------|-------------------|
| Mounting type | DIN rail mounting |
|---------------|-------------------|

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Drawings

Dimensional drawing



Diagram



Signal transmission analog and digital at the same time

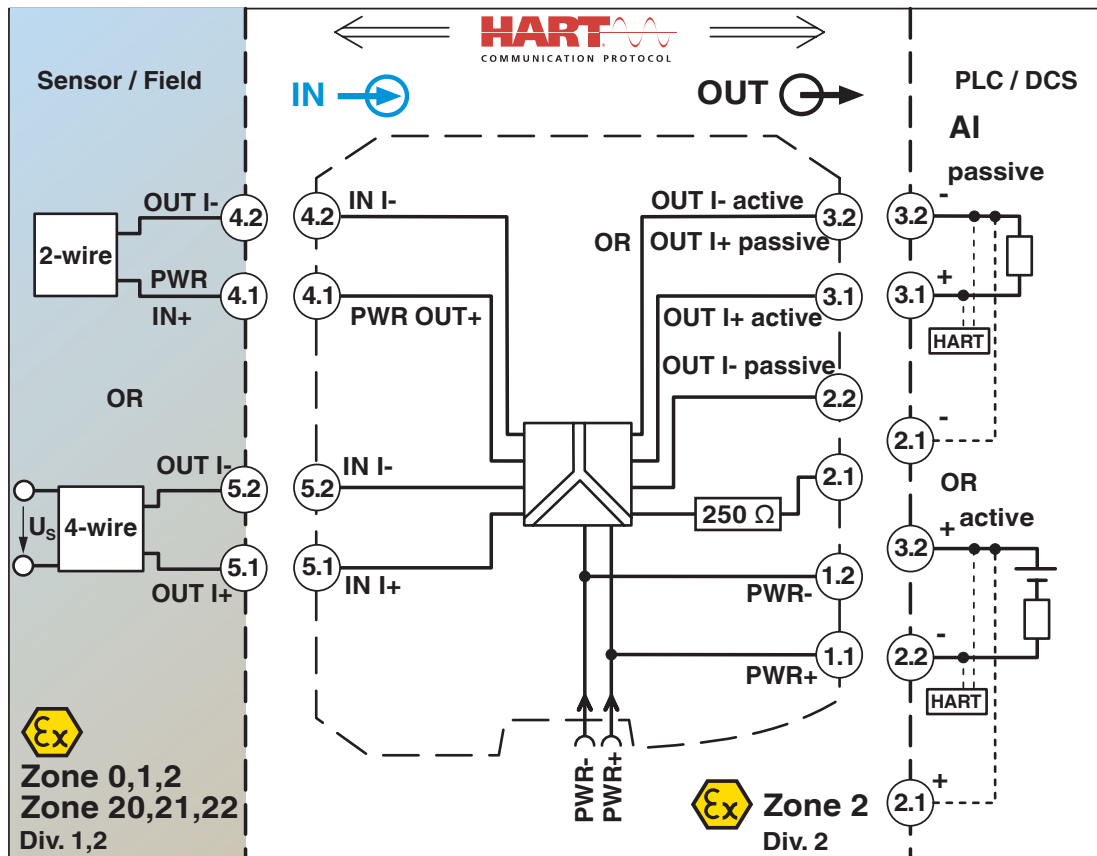
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Block diagram



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Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2865340>

DNV

Approval ID: TAA000020C



UL Listed

Approval ID: E330267



cUL Listed

Approval ID: E330267

TUEV Austria FS

Approval ID: IN-AT-AS-MRL-23-0149



IECEx

Approval ID: IECEx BVS 08.0016X



CCC

Approval ID: 2022122316115973



cUL Listed

Approval ID: E199827



UL Listed

Approval ID: E199827



ATEX

Approval ID: BVS 08 ATEX E 054X

INMETRO

Approval ID: DNV 18.0136 X



KC-s

Approval ID: 17-KA4BO-0400X

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Classifications

ECLASS

| | |
|-------------------|----------|
| ECLASS-13.0 | 27210120 |
| ECLASS-14.0 ASSET | 27250101 |
| ECLASS-15.0 | 27210120 |
| ECLASS-15.0 ASSET | 27250101 |

ETIM

| | |
|-----------|----------|
| ETIM 10.0 | EC002653 |
|-----------|----------|

UNSPSC

| | |
|-------------|----------|
| UNSPSC 21.0 | 39121000 |
|-------------|----------|

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Environmental product compliance

EU RoHS

| | |
|---|--------------------|
| Fulfills EU RoHS substance requirements | Yes |
| Exemption | 6(c), 7(a), 7(c)-I |

China RoHS

| | |
|--|---|
| Environment friendly use period (EFUP) | EFUP-50 |
| | An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required. |

EU REACH SVHC

| | |
|-------------------------------------|--|
| REACH candidate substance (CAS No.) | Lead(CAS: 7439-92-1) |
| | 2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol(CAS: 79-94-7) |
| SCIP | 3b111f6c-b897-4a2c-b6d8-b819c21a1ebd |

EF3.1 Climate Change

| | |
|---------|---------------|
| CO2e kg | 6.088 kg CO2e |
|---------|---------------|

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