

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



2924207

<https://www.phoenixcontact.com/us/products/2924207>

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Repeater power supply and input signal conditioner, HART-transparent. Transmits supplied or active 0/4 ... 20 mA signals to a load (active or passive). 3-way electrical isolation, SIL 2 in accordance with IEC 61508.

Your advantages

- Power supply possible via DIN rail connector
- Up to SIL 2 in accordance with EN 61508
- Installation in zone 2, protection type "n" (EN 60079-15) permitted
- Input: 0/4 mA ... 20 mA (powered or not powered)
- Output: 0/4 mA ... 20 mA (active or passive)
- Terminal point with 250 Ω resistor to increase HART impedance for low-resistance systems
- 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

Commercial data

Item number	2924207
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	C402
Product key	DK1111
GTIN	4046356448338
Weight per piece (including packing)	174.6 g
Weight per piece (excluding packing)	132.206 g
Customs tariff number	85437090
Country of origin	DE

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
Signal transmission behavior	In = Out
Step response (10-90%)	< 200 μ s (for jump 4 mA ... 20 mA, load 600 Ω) < 600 μ s (for jump 0 mA ... 20 mA, load 600 Ω)
Maximum temperature coefficient	< 0.01 %/K
Maximum transmission error	< 0.1 % (of final value 20 mA)
Transmission error, typical	< 0.05 % (of final value 20 mA)

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 %
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)

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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
Number of inputs	1
Input signal	Current
Current input signal	4 mA ... 20 mA
Current limitation	25 mA
Transmitter supply voltage	> 21.5 V (20 mA)
	> 20.8 V (24 mA)
Underload/overload signal range	0 mA ... 24 mA (Extended transmission range for diagnostics)

Signal: Signal conditioner operation

Description of the input	Passive current input
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)
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)

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	≥ 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	Push-in connection
Stripping length	10 mm
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 flexible (2 conductors with same cross section)	0.25 mm ² ... 0.34 mm ² (TWIN ferrule without plastic sleeve)
	0.5 mm ² ... 1.5 mm ² (TWIN ferrule with plastic sleeve)
Conductor cross-section AWG	24 ... 14
	24 ... 22 (TWIN ferrule without plastic sleeve)
	20 ... 16 (TWIN ferrule with plastic sleeve)

Ex data

Ex installation (EPL)	Gc
	Div. 2

Interfaces

Data communication (bypass)

HART function	HART transparency
Protocols supported	HART

Signaling

Status display	Green LED (supply voltage)
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Dimensions

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Dimensional drawing	
Width	12.5 mm
Height	107.9 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)

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)

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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

ATEX

Identification	Ⓜ II 3 G Ex ec IIC T4 Gc
Certificate	PxCIF08ATEX2865955X

UKCA Ex (UKEX)

Identification	Ⓜ II 3 G Ex nA IIC T4 Gc X
Certificate	PxCIF21UKEX2865955X

IECEX

Identification	Ex ec IIC T4 Gc
Certificate	IECEX BVS 08.0016X

CCC / China-Ex

Identification	Ex ec IIC T4 Gc
Certificate	2022122304115127

UL, USA/Canada

Identification	UL 61010 Listed
	UL 508 Listed
	Class I, Div. 2, Groups A, B, C, D T4
	Class I, Zone 2, Group IIC T4

Shipbuilding approval

Certificate	DNV GL TAA000020C
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Safety Integrity Level (SIL, IEC 61508)

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

Systematic Capability

Identification	3
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INMETRO

Identification	Ex ec IIC T4 Gc
Certificate	DNV 18.0136 X

Shipbuilding data

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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
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Standards and regulations

Electrical isolation	3-way isolation
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GB Standard

Standards/regulations	GB/T 3836.1
	GB/T 3836.3

Mounting

Mounting type	DIN rail mounting
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Drawings

Dimensional drawing



Diagram



Signal transmission analog and digital at the same time

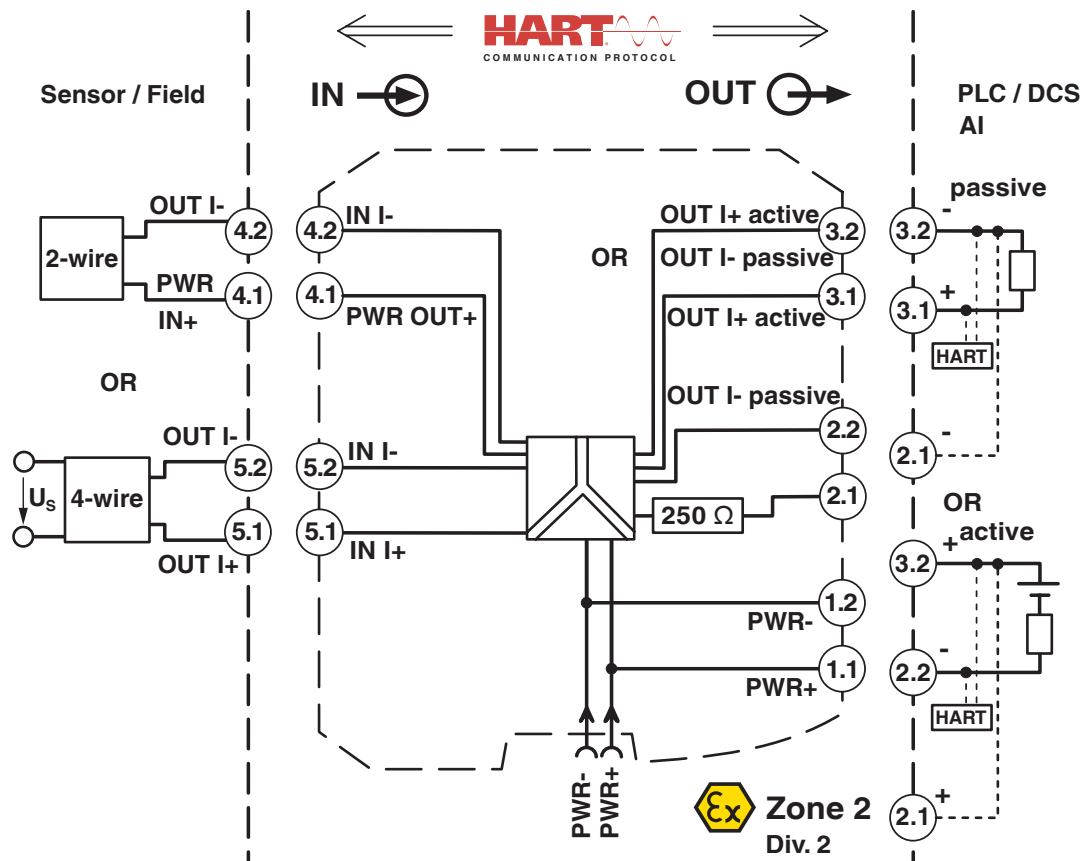
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Block diagram



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Approvals

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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



EAC Ex

Approval ID: TP012 103.01 00078



IECEX

Approval ID: IECEX BVS 08.0016X



CCC

Approval ID: 2022122304115127



cUL Listed

Approval ID: E199827



UL Listed

Approval ID: FILE E 199827

INMETRO

Approval ID: DNV 18.0136 X

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Classifications

ECLASS

ECLASS-13.0	27210120
ECLASS-15.0	27210120

ETIM

ETIM 10.0	EC002653
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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	dc3fc5a0-54dc-43ad-b12a-1d53b6980339

EF3.1 Climate Change

CO2e kg	5.916 kg CO2e
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