

MACX MCR-EX-SL-RPSSI-2I - Repeater power supply



2865366

<https://www.phoenixcontact.com/us/products/2865366>

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Ex i measuring transducer power supply and input signal conditioner, HART-transparent. Transfers supplied or active 0/4...20 mA electrically isolated signals from the Ex area to two loads in the safe area. 4-way electrical isolation, screw connection, SIL, PL.

Your advantages

- 0/4 mA ... 20 mA input, intrinsically safe, [Ex ia], powered and not powered
- Measuring transducer supply voltage > 16 V
- Two electrically isolated 0/4 mA ... 20 mA (active) outputs
- Bidirectional HART transmission (both outputs)
- Error indication according to NAMUR NE 43
- SIL 2 according to IEC/EN 61508
- Safe electrical isolation between input, outputs, and supply
- Power supply possible via DIN rail connector
- Installation in zone 2 permitted
- 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	2865366
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	C430
Product key	CK3111
Catalog page	Page 143 (C-5-2019)
GTIN	4046356160384
Weight per piece (including packing)	245.8 g
Weight per piece (excluding packing)	170.7 g
Customs tariff number	85437090
Country of origin	DE

Technical data

Product properties

Product type	Repeater power supplies
Product family	MACX Analog
No. of channels	1
Type	Ex i signal conditioners with SIL and PL Functional Safety

Data management status

Article revision	12
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Electrical properties

Electrical isolation	3-way isolation
Electrical isolation between input and output	yes
Signal transmission behavior	In = Out
Step response (10-90%)	1.3 ms (for jump 4 mA ... 20 mA, typical)
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

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}
Test voltage	2.5 kV AC (50 Hz, 60 s)
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 1/output 2

Test voltage	1.5 kV AC (50 Hz, 60 s)
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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	< 75 mA (24 V DC / 20 mA)

Power dissipation	< 1.45 W (24 V DC / 20 mA)
Power consumption	≤ 1.8 W

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	< 46 mA (24 V DC / 20 mA)
Power dissipation	< 1.2 W (24 V DC / 20 mA)

Input data

Signal: Repeater power supply operation

Description of the input	Repeater power supply operation
Number of inputs	1
Current input signal	4 mA ... 20 mA
Transmitter supply voltage	> 16 V (20 mA) > 15.1 V (23 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	Signal conditioner operation
Current input signal	0 mA ... 20 mA 4 mA ... 20 mA
Voltage drop	< 3.9 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	Repeater power supply operation
Number of outputs	2
Current output signal	4 mA ... 20 mA (Output 1 and output 2 active)
Load/output load current output	< 450 Ω (20 mA) < 380 Ω (23 mA)
Output ripple	< 20 mV _{rms}
Output behavior in the event of an error	0 mA (Cable break in the input) ≥ 23 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	Signal conditioner operation
Current output signal	0 mA ... 20 mA (active) 4 mA ... 20 mA (active)
Load/output load current output	< 450 Ω (20 mA)

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	< 380 Ω (23 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	2.3 mm
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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
	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/IIC (mixed circuit): Max. external inductivity L_o / Max. external capacitance C_o	16 mH / 370 nF, 1 mH / 430 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, 0.2 mH / 1.1 μ F, 10 μ H / 2.8 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

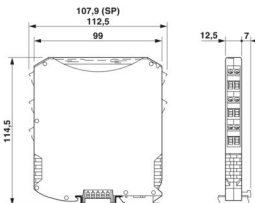
Data communication (bypass)

HART function	Yes
Protocols supported	HART-transparent

Signaling

Status display	Green LED (supply voltage)
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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)

Material specifications

Color	gray (RAL 7042)
Flammability rating according to UL 94	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

ATEX

Identification	Ex II (1) G [Ex ia Ga] IIC Ex II (1) D [Ex ia Da] IIIC Ex II 3(1) G Ex ec [ia Ga] IIC T4 Gc Ex I (M1) [Ex ia Ma] I
Certificate	BVS 10 ATEX E 143 X

IECEx

Identification	[Ex ia Ga] IIC [Ex ia Da] IIIC Ex ec [ia Ga] IIC T4 Gc [Ex ia Ma] I
Certificate	IECEx BVS 10.0097X

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CCC / China-Ex

Identification	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex ec [ia Ga] IIC T4 Gc
Certificate	2022122316115971

UL, USA/Canada

Identification	IS for Class I,II,III, Division 1 and Zone 0
	Installation in Class I, Division 2 and Zone 2
Certificate	UL C.D.-No 83104549

UL, USA/Canada

Identification	Class I Div 2; IS for Class I, II, III Div 1
Certificate	UL C.D.-No 83104549

Shipbuilding approval

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

Identification	2
Certificate	IN-AT-AS-MRL-23-00432A

Systematic Capability

Identification	3
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Performance Level (ISO 13849)

Identification	d / KAT 2
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INMETRO

Identification	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex ec [ia Ga] IIC T4 Gc
	[Ex ia Ma] I
Certificate	DNV 18.0139 X

DNV GL 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

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

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Noise emission	EN 61000-6-4
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Standards and regulations

Electrical isolation	3-way isolation
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GB Standard

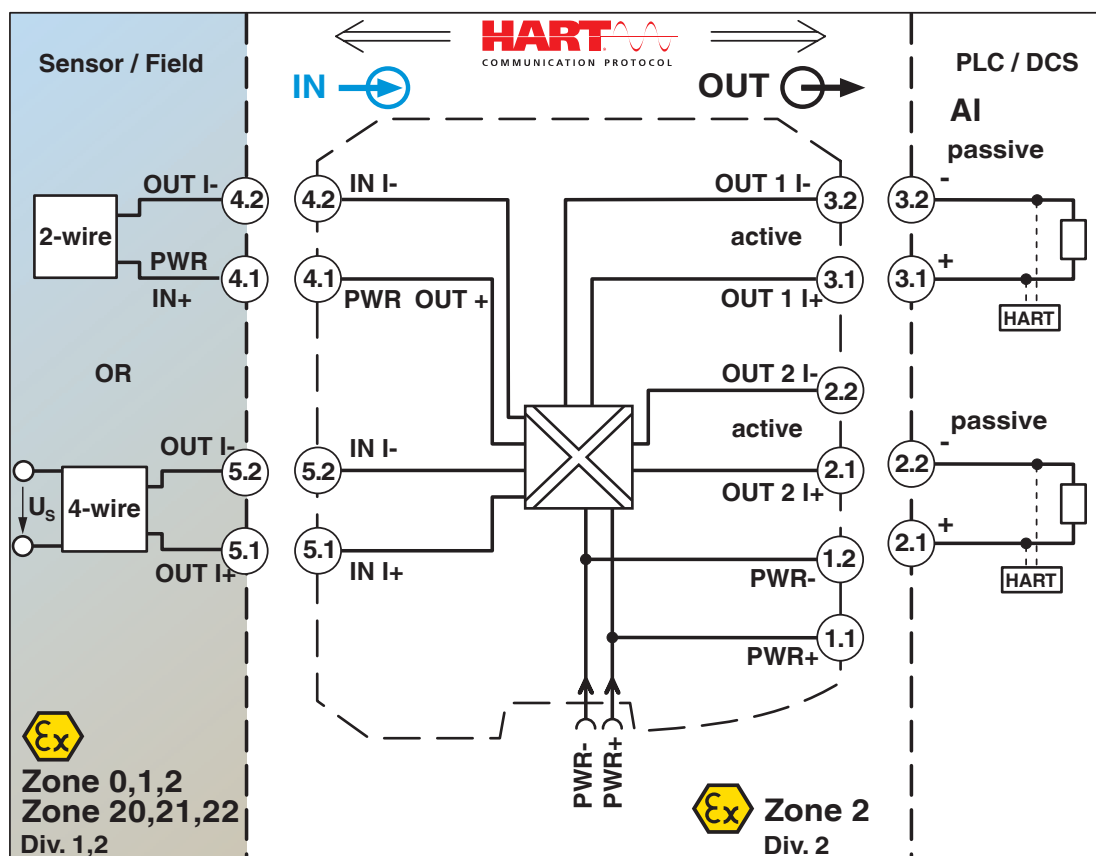
Standards/regulations	GB/T 3836.1
	GB/T 3836.3
	GB/T 3836.4

Mounting

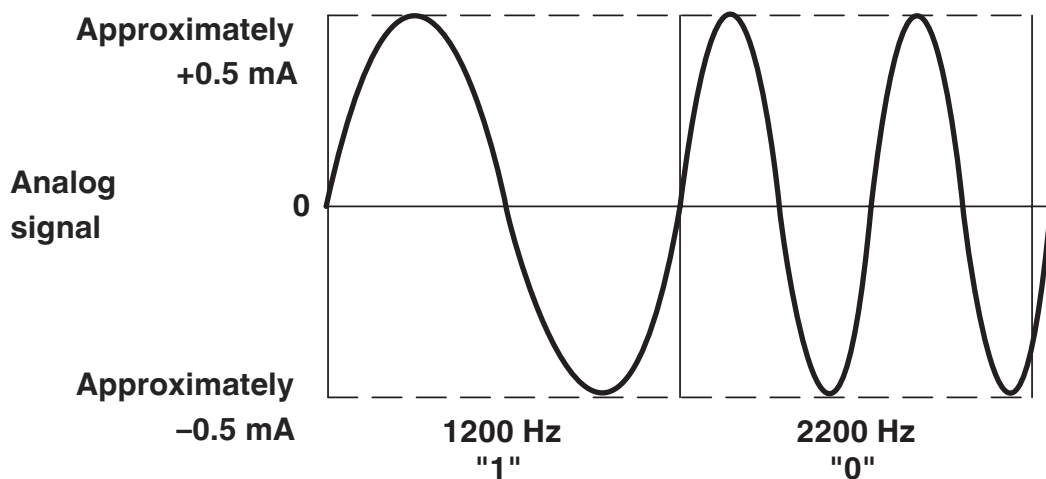
Mounting type	DIN rail mounting
Thread type	()

Drawings

Block diagram



Diagram

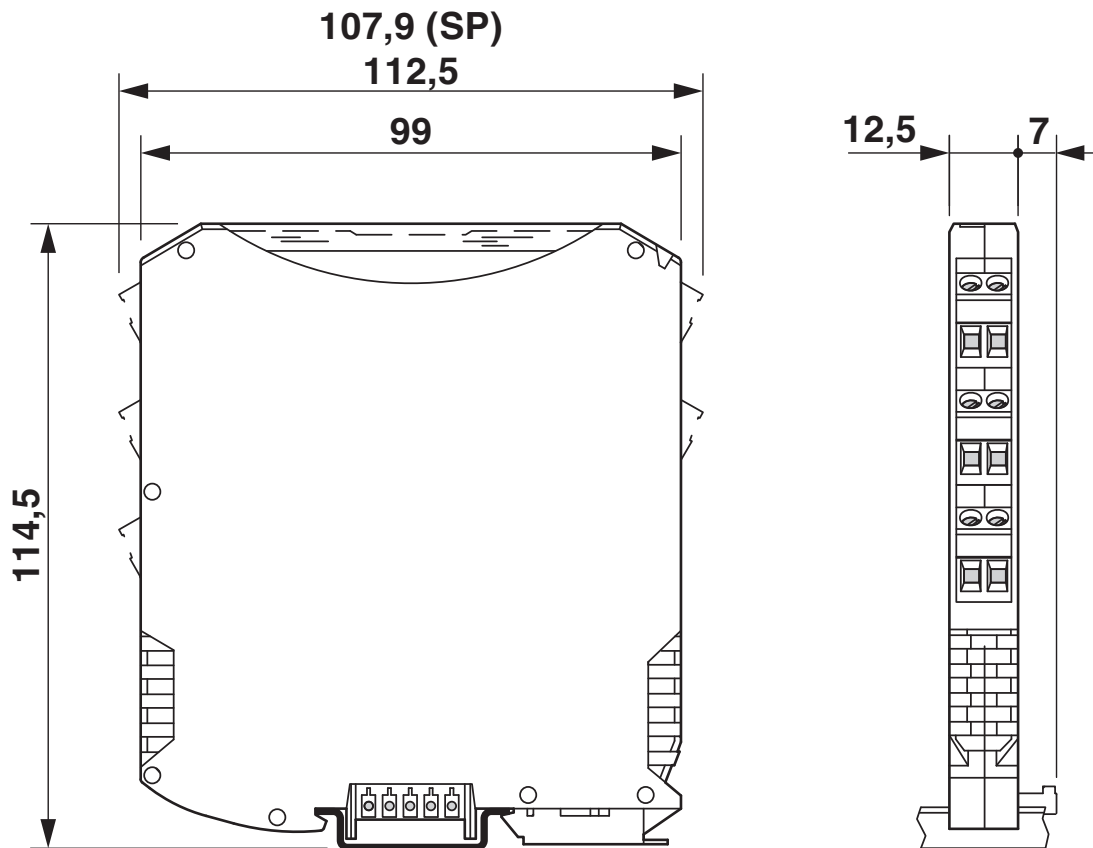


Signal transmission analog and digital at the same time

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Dimensional drawing



Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2865366>



DNV GL

Approval ID: TAA000020C



UL Listed

Approval ID: E330267



cUL Listed

Approval ID: E330267

Functional Safety

Approval ID: BVS PB 13-10-04



EAC Ex

Approval ID: RU C-DE.AB72.B.00093



IECEX

Approval ID: IECEX BVS 10.0097X



cUL Listed

Approval ID: E199827



UL Listed

Approval ID: E199827



ATEX

Approval ID: BVS 10 ATEX E143 X

INMETRO

Approval ID: DNV 18.0139 X



ATEX

Approval ID: BVS 10 ATEX E143 X

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IECEx
Approval ID: IECEx BVS 10.0097X



CCC
Approval ID: 2022122316115971

cULus Listed

cULus Listed

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Classifications

ECLASS

ECLASS-11.0	27210120
ECLASS-12.0	27210120
ECLASS-13.0	27210120
ECLASS-14.0 ASSET	27250101

ETIM

ETIM 9.0	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)
SCIP	7763beb8-0e3e-4035-ba01-67afccd2bddd