

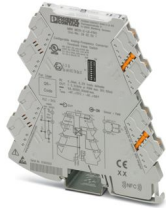
# MINI MCR-2-UI-FRO - Frequency measuring transducer



2902031

<https://www.phoenixcontact.com/us/products/2902031>

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Analog frequency transducer with limit value functionality and plug-in connection technology for converting standard signals into frequency or PWM signals. Configurable via DIP switch or software. Screw connection technology, standard configuration.

## Product description

Configurable, freely adjustable analog frequency transducer with additional switching output, limit value functionality, and plug-in connection technology for converting standard analog signals to frequency signals or to pulse width modulated signals (PWM signals). Current signals between 0 mA ... 24 mA and voltage signals between 0 V ... 12 V can be processed on the input side. Frequency signals between 0 ... 11 kHz and PWM signals between 0% ... 100% are possible on the output side. In addition, the output can also be operated as a switching output, which means that two switching thresholds can be set independently of one another. The minimum measuring span is 1 mA and 0.5 V. Full accuracy is maintained with a measuring span greater than 10 mA and 5 V. You can configure the device using one of the free software solutions. Default settings can also be made directly on the device by simply using the DIP switches (see configuration table). The measuring transducer supports fault monitoring and NFC communication.

## Commercial data

Item number	2902031
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	C404
Product key	DK1126
GTIN	4046356652032
Weight per piece (including packing)	125.2 g
Weight per piece (excluding packing)	125 g
Customs tariff number	85437090
Country of origin	DE

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## Technical data

### Notes

#### Utilization restriction

EMC note	EMC: class A product, see manufacturer's declaration in the download area
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### Product properties

Product type	Frequency value transformer
Product family	MINI Analog Pro
No. of channels	1
Configuration	DIP switches
	Software
	App

### System properties

#### Functionality

Configuration	DIP switches
	Software
	App

### Electrical properties

Electrical isolation	4-way isolation
Electrical isolation between input and output	yes
Step response (0–99%)	120 ms (15 Hz sample rate)
	35 ms (60 Hz sample rate)
	15 ms (240 Hz sample rate, can only be set via software)
	130 ms (15 Hz sample rate)
	40 ms (60 Hz sample rate)
	20 ms (240 Hz sample rate, can only be set via software)
Maximum temperature coefficient	< 0.01 %/K
Temperature coefficient, typical	0.01 %/K

#### 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 <sub>rms</sub>
Test voltage	3 kV AC (50 Hz, 60 s)
Insulation	Reinforced insulation

### Supply

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Nominal supply voltage	24 V DC
Supply voltage range	9.6 V DC ... 30 V DC (The DIN rail connector (ME 6,2 TBUS-2 1,5/5-ST-3,81 GN, item no. 2869728) can be used to bridge the supply voltage. It can be snapped onto a 35 mm DIN rail in accordance with EN 60715)
Typical current consumption	27 mA (12 V DC)
	13.5 mA (24 V DC)
Power consumption	≤ 350 mW (9.6 V DC)

## Input data

Signal: Voltage/current

Number of inputs	1
Configurable/programmable	Yes
Voltage input signal	0 V ... 10 V (via DIP switch)
	2 V ... 10 V (via DIP switch)
	0 V ... 5 V (via DIP switch)
	1 V ... 5 V (via DIP switch)
	10 V ... 0 V (via DIP switch)
	10 V ... 2 V (via DIP switch)
	5 V ... 0 V (via DIP switch)
	5 V ... 1 V (via DIP switch)
	0 V ... 12 V (can be set via software)
Max. voltage input signal	12 V
Current input signal	0 mA ... 20 mA (via DIP switch)
	4 mA ... 20 mA (via DIP switch)
	0 mA ... 10 mA (via DIP switch)
	2 mA ... 10 mA (via DIP switch)
	20 mA ... 0 mA (via DIP switch)
	20 mA ... 4 mA (via DIP switch)
	10 mA ... 0 mA (via DIP switch)
	10 mA ... 2 mA (via DIP switch)
	0 mA ... 24 mA (can be set via software)
Max. current input signal	24 mA
Input resistance of voltage input	> 120 kΩ
Input resistance current input	~ 50 Ω (+0.7 V for test diode)

## Output data

Frequency: Frequency/transistor

Frequency output	0 Hz ... 10 kHz (via DIP switch)
	0 Hz ... 5 kHz (via DIP switch)
	0 Hz ... 2.5 kHz (via DIP switch)
	0 Hz ... 1 kHz (via DIP switch)
	0 Hz ... 500 Hz (via DIP switch)
	0 Hz ... 250 Hz (via DIP switch)

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	0 Hz ... 100 Hz (via DIP switch)
	0 Hz ... 50 Hz (via DIP switch)
	0 Hz ... 10.5 kHz (can be set via software)
Load min.	$4 \text{ mA} \leq (U_L / R_L) \leq 100 \text{ mA}$
Maximum transmission error	$\leq 0.1 \%$ ( $> 7 \text{ kHz} \leq 0.2 \%$ )
Output signal PWM	15.6 kHz (10 bits, via DIP switch)
	1.9 kHz (10 bits, via DIP switch)
	3.9 kHz (12 bits, via DIP switch)
	488 Hz (12 bits, via DIP switch)
	977 Hz (14 bits, via DIP switch)
	122 Hz (14 bits, via DIP switch)
	244 Hz (16 bits, via DIP switch)
	31 Hz (16 bits, via DIP switch)
	31 Hz ... 15.6 kHz (can be set via software)
Load min.	$12 \text{ mA} \leq (U_L / R_L) \leq 100 \text{ mA}$
Maximum transmission error	$< 0.2 \%$ (PWM frequency $\leq \ominus\Downarrow\Downarrow \text{ Hz}$ )
	$< 0.5 \%$ ( $500 \text{ Hz} < \text{PWM frequency} \leq \ominus\Downarrow\Downarrow \text{ Hz}$ )
	$< 1 \%$ ( $2000 \text{ Hz} < \text{PWM frequency} \leq \square\Downarrow\Downarrow \text{ Hz}$ )
	$< 2 \%$ ( $4000 \text{ Hz} < \text{PWM frequency} \leq \Downarrow\Downarrow\Downarrow \text{ Hz}$ )
	$< 3 \%$ ( $8000 \text{ Hz} < \text{PWM frequency} \leq \Downarrow\Downarrow\Downarrow \text{ Hz}$ )
Load current maximum	100 mA
Maximum switching voltage	30 V DC
Overrange/underrange	can be set (via software)

## Switching: Transistor

Number of outputs	1
Contact switching type	1 N/O contact
Minimum switching voltage	1 V DC
Maximum switching voltage	30 V DC
Min. switching current	100 $\mu\text{A}$
Max. switching current	100 mA (30 V DC)

## Signal

Number of outputs	1
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## Connection data

Connection method	Screw connection
Stripping length	10 mm
Screw thread	M3
Conductor cross-section rigid	0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> (with ferrule)
	0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> (without ferrule)
Conductor cross-section flexible	0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section AWG	24 ... 12 (flexible)
Tightening torque	0.5 Nm ... 0.6 Nm

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## Ex data

Ex installation (EPL)	Gc
	Div. 2

## Interfaces

Data: IFS interface

Connection method	Micro USB type B
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## Signaling

Error indication	Red LED
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## Dimensions

Width	6.2 mm
Height	109.81 mm
Depth	119.2 mm

## Material specifications

Color	gray (RAL 7042)
Housing material	PBT
Fire protection for rail vehicles (DIN EN 45545-2) R22	HL 1 - HL 2
Fire protection for rail vehicles (DIN EN 45545-2) R23	HL 1 - HL 2
Fire protection for rail vehicles (DIN EN 45545-2) R24	HL 1 - HL 2

## Environmental and real-life conditions

Ambient conditions

Degree of protection	IP20 (not assessed by UL)
Ambient temperature (operation)	-40 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Altitude	≤ 2000 m
Permissible humidity (operation)	5 % ... 95 % (non-condensing)

## Approvals

CE

Certificate	CE-compliant
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ATEX

Identification	⊕ II 3 G Ex ec IIC T4 Gc
Certificate	BVS 19 ATEX E 083 X

IECEX

Identification	Ex ec IIC T4 Gc
Certificate	IECEX BVS 19.0072X

UL, USA/Canada

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Identification	UL 508 Listed
	Class I, Div. 2, Groups A, B, C, D T6
	Class I, Zone 2, Group IIC T6

## Shipbuilding approval

Certificate	DNV GL TAA000021E Rev. 1
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## EAC Ex

Identification	Ex ec IIC T4 Gc
Certificate	BY/112 02.01 TP012 103.01 00081

## 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
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## Standards and regulations

Electrical isolation	4-way isolation
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## GB Standard

Standards/regulations	GB 3836.1
	GB 3836.8

## Mounting

Mounting type	DIN rail mounting
Assembly note	The DIN rail connector can be used for bridging the supply voltage. It can be snapped onto a 35 mm EN 60715 DIN rail.
Mounting position	any

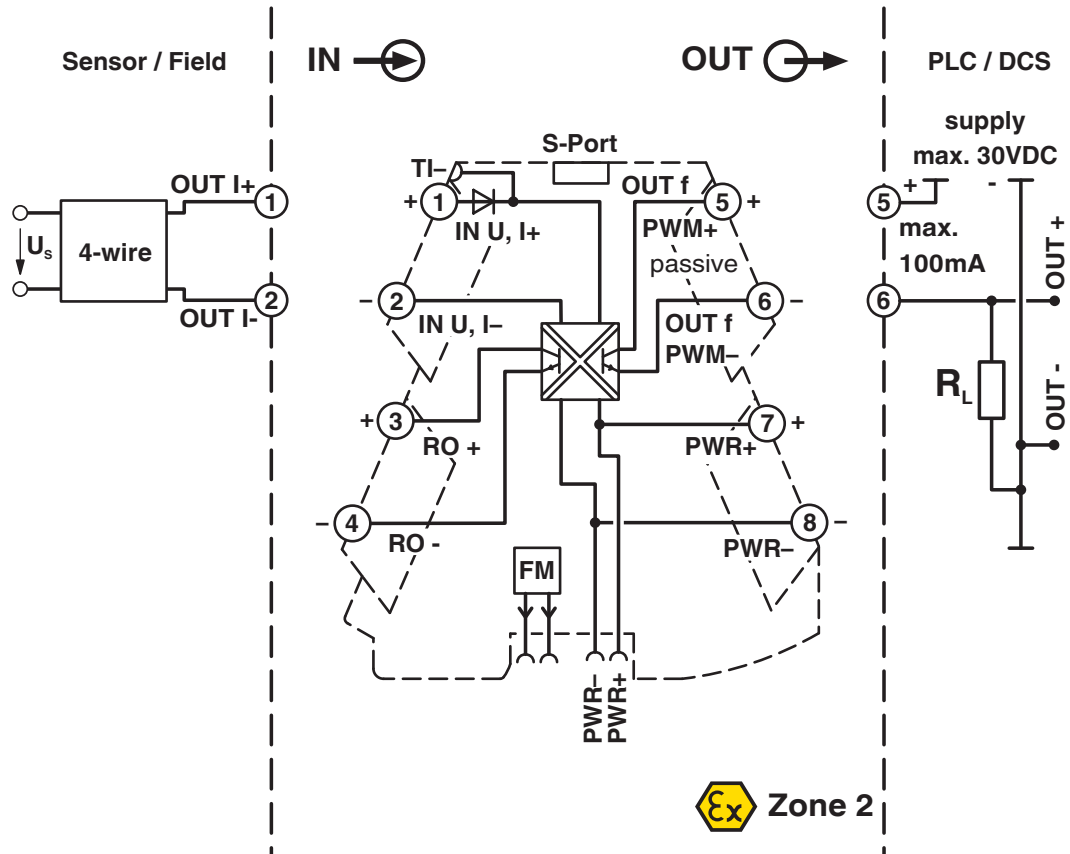
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## Drawings

Block diagram



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2902031>



**EAC**

Approval ID: RU\*DE.\*08.B.01536/19



**UL Listed**

Approval ID: E238705



**cUL Listed**

Approval ID: E238705

**DNV**

Approval ID: TAA000021E



**IECEx**

Approval ID: IECEx BVS 19.0072X



**cUL Listed**

Approval ID: E196811



**UL Listed**

Approval ID: E196811



**ATEX**

Approval ID: BVS 19 ATEX E 083 X



**EAC Ex**

Approval ID: TR TS\_S\_103.01.00081

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## Classifications

### ECLASS

ECLASS-13.0	27210128
ECLASS-15.0	27210128

### ETIM

ETIM 10.0	EC002918
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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	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	fe6e1688-fab6-481b-9b75-21f51c43dc93

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Phoenix Contact USA  
586 Fulling Mill Road  
Middletown, PA 17057, United States  
(+717) 944-1300  
[info@phoenixcon.com](mailto:info@phoenixcon.com)