Features

- 1-channel isolated barrier
- 24 V DC supply (bus powered)
- Thermocouple, RTD, potentiometer or voltage input
- Linearized output 4 mA ... 20 mA, sink/source
- Sensor breakage detection
- Configurable by **PACTware**
- Line fault detection (LFD)

Function

This isolated barrier is used for intrinsic safety applications.

This device accepts thermocouples (TC), millivolts, potentiometers, or resistance temperature detectors (RTD) from a hazardous area and converts them to an isolated, linearized analog output in the safe area.

The output can be selected as a current source or current sink with a switch.

Line fault detection of the field circuit is indicated by a red LED and an output on the fault bus. The fault conditions are monitored via a Fault Indication Board.

The device is easily configured by the use of the PACTware configuration software.

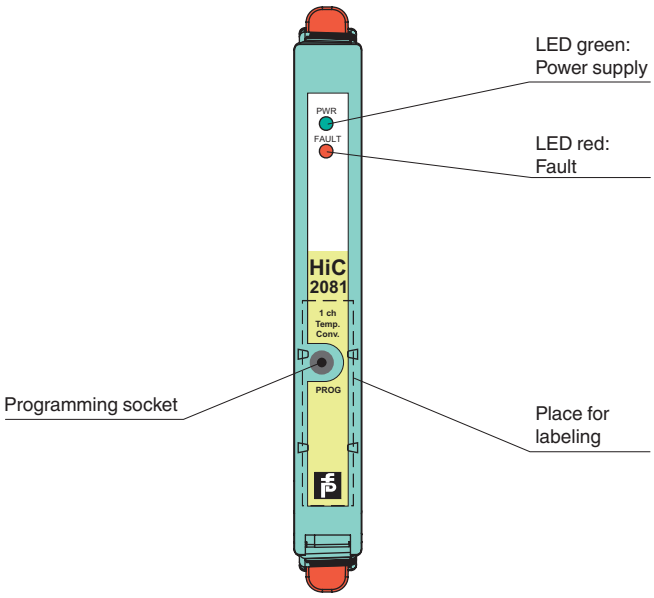
This device mounts on a HiC Termination Board.

Application

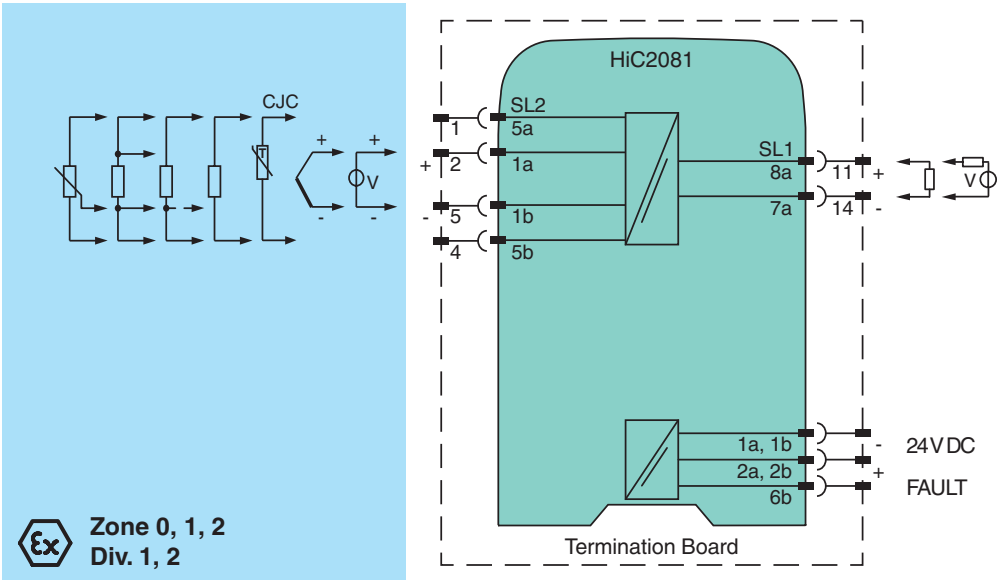
The resistance thermometer for cold junction compensation H-CJC-**-8 is available as an accessory for temperature measurements with thermocouples.

Assembly

Front view



Connection



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General specifications	
Signal type	Analog input
Supply	
Connection	SL1: 1a(-), 1b(-); 2a(+), 2b(+)
Rated voltage U_r	20 ... 30 V via Termination Board
Ripple	within the supply tolerance
Power dissipation/power consumption	≤ 0.98 W / 0.98 W
Input	
Connection	SL2: 5a(+), 1a(+), 1b(-), 5b(-)
RTD	type Pt10, Pt50, Pt100, Pt500, Pt1000 (EN 60751: 1995) type Pt10GOST, Pt50GOST, Pt100GOST, Pt500GOST, Pt1000GOST (6651-94) type Cu10, Cu50, Cu100 (P50353-92) type Ni100 (DIN 43760)
Measuring current	approx. 200 µA with RTD
Types of measuring	2-, 3-, 4-wire connection
Lead resistance	≤ 50 Ω per line
Measuring circuit monitoring	sensor breakage, sensor short-circuit
Thermocouples	type B, E, J, K, N, R, S, T (IEC 584-1: 1995) type L (DIN 43710: 1985) type TXK, TXKH, TXA (P8.585-2001)
Cold junction compensation	external and internal
Measuring circuit monitoring	sensor breakage
Potentiometer	0 ... 20 kΩ (2-wire connection), 0.8 ... 20 kΩ (3-wire connection)
Types of measuring	3-wire connection
Voltage	selectable within the range -100 ... 100 mV
Input resistance	≥ 1 MΩ (-100 ... 100 mV)
Output	
Connection	SL1: 8a(+), 7a(-)
Output	Analog current output
Current range	0 ... 20 mA or 4 ... 20 mA
Fault signal	downscale 0 or 2 mA, upscale 21.5 mA (acc. NAMUR NE43)
Source	load 0 ... 550 Ω open-circuit voltage ≤ 18 V
Sink	Voltage across terminals 5 ... 30 V. If the current is supplied from a source > 16.5 V, series resistance of ≥ (V - 16.5)/0.0215 Ω is needed, where V is the source voltage. The maximum value of the resistance is (V - 5)/0.0215 Ω.
Transfer characteristics	
Deviation	
After calibration	Pt100: ± (0.06 % of measurement value in K + 0.1 % of span + 0.1 K (4-wire connection)) thermocouple: ± (0.05 % of measurement value in °C + 0.1 % of span + 1 K (1.2 K for types R and S)) this includes ± 0.8 K error of the cold junction compensation mV: ± (50 µV + 0.1 % of span) potentiometer: ± (0.05 % of full scale + 0.1 % of span, (excludes errors due to lead resistance))
Influence of ambient temperature	deviation of CJC included: Pt100: ± (0.0015 % of measurement value in K + 0.006 % of span)/K ΔT_{amb} *) thermocouple: ± (0.02 K + 0.005 % of measurement value in °C + 0.006 % of span)/K ΔT_{amb} *) mV: ± (0.01 % of measurement value + 0.006 % of span)/K ΔT_{amb} *) potentiometer: ± 0.006 % of span/K ΔT_{amb} *) *) ΔT_{amb} = ambient temperature change referenced to 23 °C (296 K)
Influence of supply voltage	< 0.01 % of span
Influence of load	≤ 0.001 % of output value per 100 Ω
Reaction time	worst case value (sensor breakage and/or sensor short circuit detection enabled) mV: 1 s, thermocouples with CJC: 1.1 s, thermocouples with fixed reference temperature: 1.1 s, 3- or 4-wire RTD: 920 ms, 2-wire RTD: 800 ms, Potentiometer: 2.05 s
Galvanic isolation	
Output/supply, programming input	functional insulation, rated insulation voltage 50 V AC There is no electrical isolation between the programming input and the supply. The programming cable provides galvanic isolation so that ground loops are avoided.
Directive conformity	
Electromagnetic compatibility	
Directive 2014/30/EU	EN 61326-1:2013 (industrial locations)
Conformity	
Electromagnetic compatibility	NE 21:2011
Degree of protection	IEC 60529:2001
Protection against electrical shock	UL 61010-1:2012
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Relative humidity	5 ... 90 %, non-condensing up to 35 °C (95 °F)

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Mechanical specifications		
Degree of protection		IP20
Mass		approx. 100 g
Dimensions		12.5 x 128 x 106 mm (0.5 x 5.1 x 4.2 inch)
Mounting		on Termination Board
Coding		pin 1, 2 and 4 trimmed For further information see system description.
Data for application in connection with hazardous areas		
EU-Type Examination Certificate		BASEEFA 14 ATEX 0129 X
Marking		Ex II (1)G [Ex ia Ga] IIC , Ex II (1)D [Ex ia Da] IIIC , Ex I (M1) [Ex ia Ma] I
Input		[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I
Voltage	U_o	9 V
Current	I_o	13.1 mA
Power	P_o	30 mW
Analog outputs, power supply, collective error		
Maximum safe voltage	U_m	250 V (Attention! This is not the rated voltage.)
Interface		
Maximum safe voltage	U_m	250 V (Attention! The rated voltage is lower.), RS 232
Certificate of Compliance		BASEEFA 14 ATEX 0130 X
Marking		Ex II 3G Ex nA II T4 Gc [device in zone 2]
Galvanic isolation		
Input/Other circuits		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Directive conformity		
Directive 2014/34/EU		EN 60079-0:2012+A11:2013 , EN 60079-11:2012 , EN 60079-15:2010
International approvals		
UL approval		
Control drawing		116-0391 (cULus)
IECEx approval		IECEx BAS 14.0071X IECEx BAS 16.0003X
Approved for		[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I Ex nA IIC T4 Gc
General information		
Supplementary information		EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see www.pepperl-fuchs.com.
Accessories		
Designation		optional accessories: - resistance thermometer for cold junction compensation H-CJC-PT100-8 - FDT framework PACTware - adapter with USB Interface K-ADP-USB

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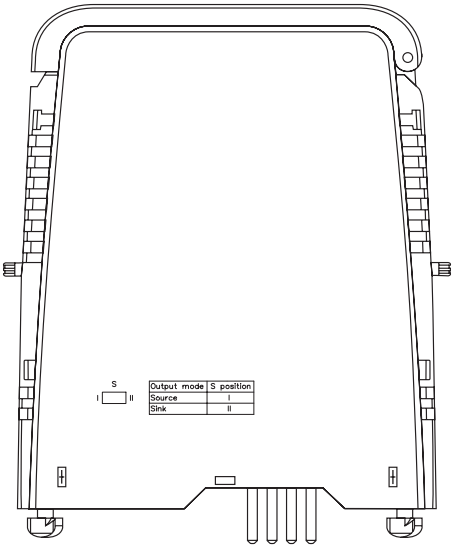
Configuration



Switch position

Output mode	Switch position
Source	I
Sink	II

Configure the device in the following way:

- Push the red Quick Lok Bars on each side of the device in the upper position.
- Remove the device from Termination Board.
- Set the switches according to the figure.

The pins for this device are trimmed to polarize it according to its safety parameters. Do not change! For further information see system description.

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