

**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)
- Up to SIL 2 acc. to IEC 61508/IEC 61511

**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.

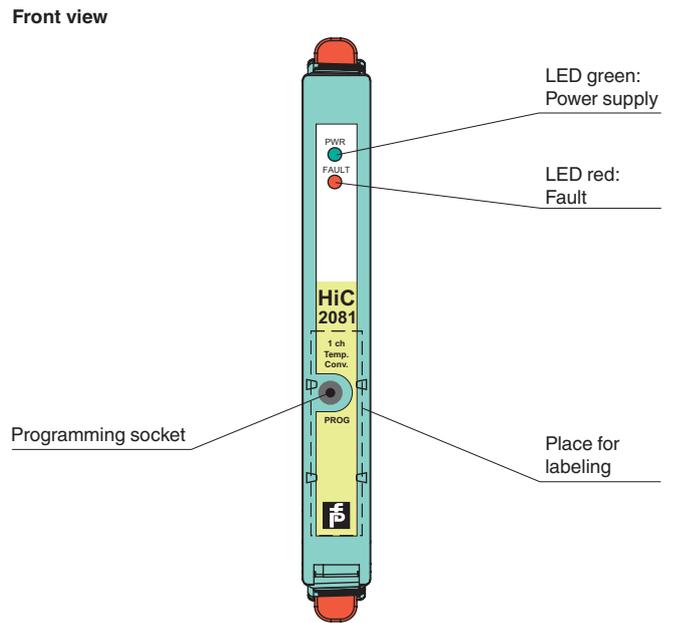
The device is easily configured by the use of the PACTware configuration software.

This device mounts on a HiC Termination Board.

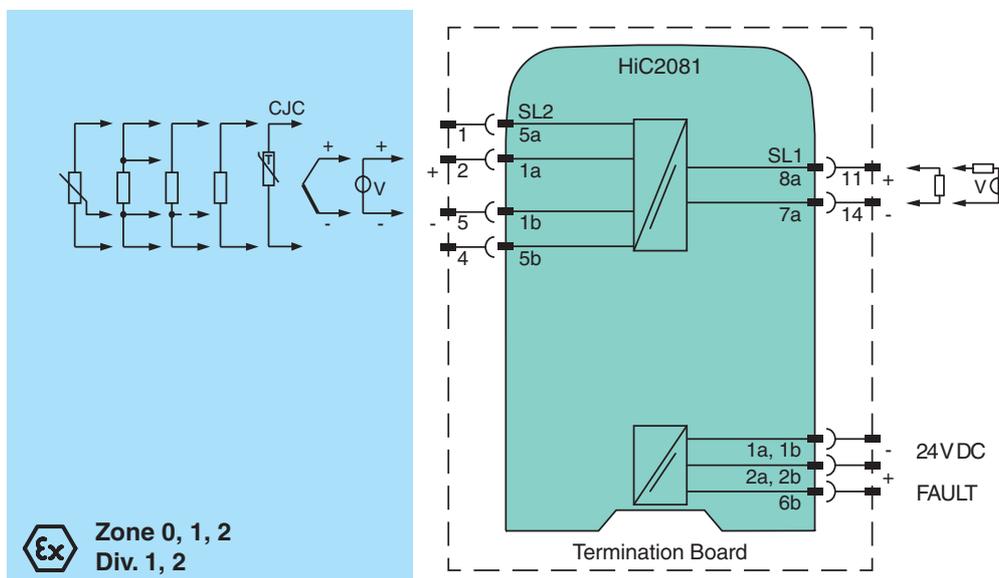
**Application**

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

**Assembly**



**Connection**



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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

<b>General specifications</b>	
Signal type	Analog input
<b>Functional safety related parameters</b>	
Safety Integrity Level (SIL)	SIL 2
<b>Supply</b>	
Connection	SL1: 1a(-), 1b(-); 2a(+), 2b(+)
Rated voltage $U_r$	20 ... 30 V DC bus powered via Termination Board
Ripple	within the supply tolerance
Power dissipation/power consumption	$\leq 0.98 \text{ W} / 0.98 \text{ W}$
<b>Interface</b>	
Programming interface	programming socket
<b>Input</b>	
Connection side	field side
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 $\mu\text{A}$ with RTD
Types of measuring	2-, 3-, 4-wire connection
Lead resistance	$\leq 50 \Omega$ per line
Measurement loop 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
Measurement loop monitoring	sensor breakage
Potentiometer	0 ... 20 k $\Omega$ (2-wire connection), 0.8 ... 20 k $\Omega$ (3-wire connection)
Types of measuring	3-wire connection
Voltage	selectable within the range -100 ... 100 mV
Input resistance	$\geq 1 \text{ M}\Omega$ (-100 ... 100 mV)
<b>Output</b>	
Connection side	control side
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 $\Omega$ open-circuit voltage $\leq 18 \text{ V}$
Sink	Voltage across terminals 5 ... 30 V. If the current is supplied from a source $> 25 \text{ V}$ , series resistance of $\geq (V - 25)/0.0215 \Omega$ is needed, where V is the source voltage. The maximum value of the resistance is $(V - 5)/0.0215 \Omega$ .
<b>Fault indication output</b>	
Connection	SL1: 6b
Output type	open collector transistor (internal fault bus)
<b>Transfer characteristics</b>	
Deviation	
After calibration	<u>Pt100</u> : $\pm (0.06 \%$ of measurement value in K + 0.1 % of span + 0.1 K (4-wire connection)) <u>thermocouple</u> : $\pm (0.05 \%$ of measurement value in $^{\circ}\text{C}$ + 0.1 % of span + 1 K (1.2 K for types R and S)) this includes $\pm 0.8 \text{ K}$ error of the cold junction compensation <u>mV</u> : $\pm (50 \mu\text{V} + 0.1 \%$ of span) <u>potentiometer</u> : $\pm (0.05 \%$ of full scale + 0.1 % of span, (excludes errors due to lead resistance))
Influence of ambient temperature	deviation of CJC included: <u>Pt100</u> : $\pm (0.0015 \%$ of measurement value in K + 0.006 % of span)/K $\Delta T_{\text{amb}}^{\text{*)}$ <u>thermocouple</u> : $\pm (0.02 \text{ K} + 0.005 \%$ of measurement value in $^{\circ}\text{C}$ + 0.006 % of span)/K $\Delta T_{\text{amb}}^{\text{*)}$ <u>mV</u> : $\pm (0.01 \%$ of measurement value + 0.006 % of span)/K $\Delta T_{\text{amb}}^{\text{*)}$ <u>potentiometer</u> : $\pm 0.006 \%$ of span/K $\Delta T_{\text{amb}}^{\text{*)}$ $\text{*) } \Delta T_{\text{amb}}$ = ambient temperature change referenced to 23 $^{\circ}\text{C}$ (296 K)
Influence of supply voltage	$< 0.01 \%$ of span
Influence of load	$\leq 0.001 \%$ of output value per 100 $\Omega$
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
<b>Galvanic isolation</b>	
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.
<b>Indicators/settings</b>	

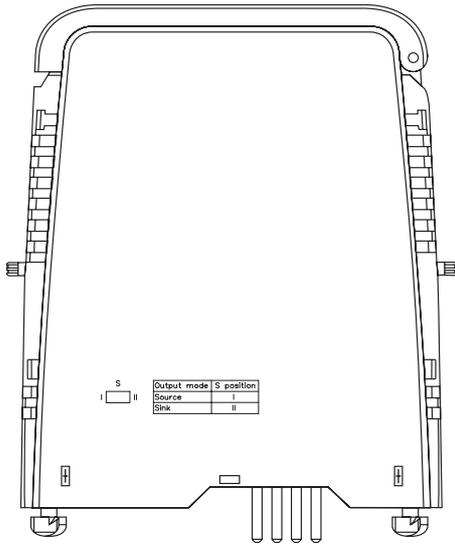
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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

Display elements	LEDs
Control elements	DIP-switch
Configuration	via DIP switches via PACTware
Labeling	space for labeling at the front
<b>Directive conformity</b>	
Electromagnetic compatibility	
Directive 2014/30/EU	EN 61326-1:2013 (industrial locations)
<b>Conformity</b>	
Electromagnetic compatibility	NE 21:2011
Degree of protection	IEC 60529:2001
Protection against electrical shock	UL 61010-1:2012
<b>Ambient conditions</b>	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Relative humidity	5 ... 90 %, non-condensing up to 35 °C (95 °F)
<b>Mechanical specifications</b>	
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.
<b>Data for application in connection with hazardous areas</b>	
EU-Type Examination Certificate	BASEEFA 14 ATEX 0129 X
Marking	⊕ II (1)G [Ex ia Ga] IIC ⊕ II (1)D [Ex ia Da] IIIC ⊕ 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	
Marking	⊕ 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
<b>International approvals</b>	
UL approval	
Control drawing	116-0391 (cULus)
IECEX approval	
Approved for	[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I Ex nA IIC T4 Gc
<b>General information</b>	
Supplementary information	Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .
<b>Accessories</b>	
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.*