



Temperature Converter HiC2081

SIL 2

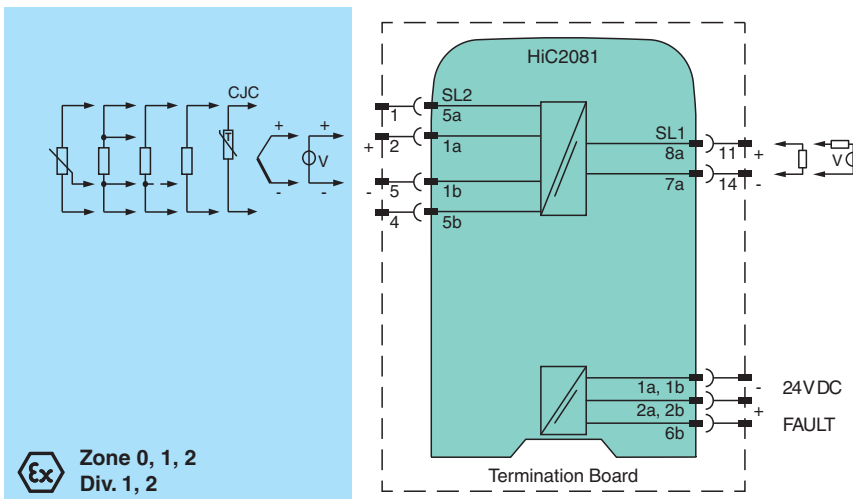
- 1-channel isolated barrier
- 24 V DC supply (bus powered)
- Thermocouple, RTD, potentiometer or voltage input
- Linearized output 4 mA ... 20 mA, sink/source
- Sensor breakage detection
- Configurable by PACTware
- Line fault detection (LFD)
- Up to SIL 2 acc. to IEC 61508/IEC 61511



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.

Connection



Technical Data

General specifications	
Signal type	Analog input
Functional safety related parameters	
Safety Integrity Level (SIL)	SIL 2
Supply	
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	$\leq 0.98 \text{ W} / 0.98 \text{ W}$

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

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Technical Data

Interface	
Programming interface	programming socket
Input	
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 μ A with RTD
Types of measuring	2-, 3-, 4-wire connection
Lead resistance	max. 50 Ω 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 Ω (2-wire connection), 0.8 ... 20 k Ω (3-wire connection)
Types of measuring	3-wire connection
Voltage	selectable within the range -100 ... 100 mV
Input resistance	\geq 1 M Ω (-100 ... 100 mV)
Output	
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 Ω open-circuit voltage \leq 18 V
Sink	Voltage across terminals 5 ... 30 V. If the current is supplied from a source $>$ 25 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 $(V - 5)/0.0215 \Omega$.
Fault indication output	
Connection	SL1: 6b
Output type	open collector transistor (internal fault bus)
Transfer characteristics	
Deviation	
After calibration	Pt100: \pm (0.06 % of measurement value in K + 0.1 % of span + 0.1 K (4-wire connection)) thermocouple: \pm (0.05 % of measurement value in $^{\circ}$ C + 0.1 % of span + 1 K (1.2 K for types R and S)) this includes \pm 0.8 K error of the cold junction compensation mV: \pm (50 μ V + 0.1 % of span) potentiometer: \pm (0.05 % of full scale + 0.1 % of span, (excludes errors due to lead resistance))
Influence of ambient temperature	deviation of CJC included: Pt100: \pm (0.0015 % of measurement value in K + 0.006 % of span)/K $\Delta T_{amb}^{*)}$ thermocouple: \pm (0.02 K + 0.005 % of measurement value in $^{\circ}$ C + 0.006 % of span)/K $\Delta T_{amb}^{*)}$ mV: \pm (0.01 % of measurement value + 0.006 % of span)/K $\Delta T_{amb}^{*)}$ potentiometer: \pm 0.006 % of span/K $\Delta T_{amb}^{*)}$ *) ΔT_{amb} = ambient temperature change referenced to 23 $^{\circ}$ C (296 K)
Influence of supply voltage	$<$ 0.01 % of span
Influence of load	\leq 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.

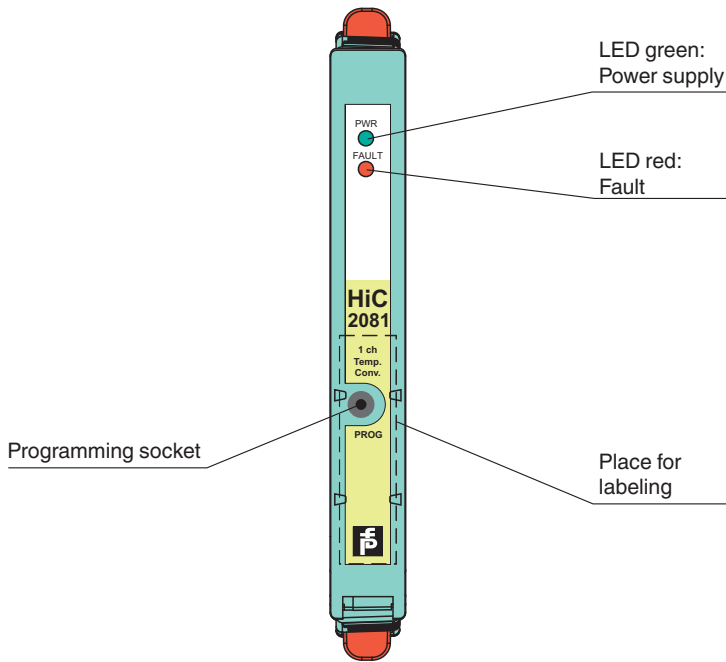
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Technical Data




Indicators/settings	
Display elements	LEDs
Control elements	DIP-switch
Configuration	via DIP switches via PACTware
Labeling	space for labeling at the front
Directive conformity	
Electromagnetic compatibility	
Directive 2014/30/EU	EN 61326-1:2013 (industrial locations)
Conformity	
Electromagnetic compatibility	NE 21:2012 EN 61326-3-2:2008
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)
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	Ⓜ 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
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	Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com .

Assembly

Front view



Accessories

	H-CJC-Pt100	
	K-ADP-USB	
	DTM Interface Technology	
	PACTware 5.X	FDT Framework

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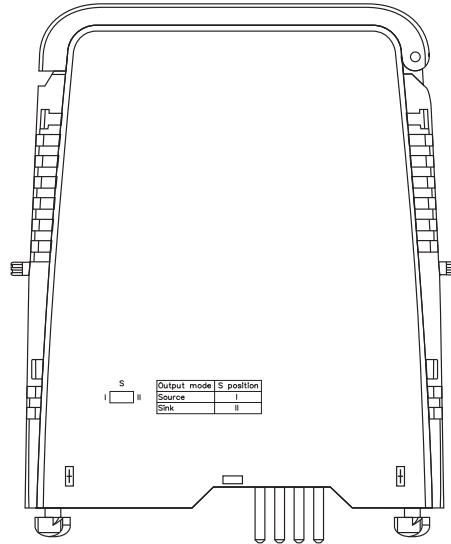
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Application

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

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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