SMART Transmitter Power Supply

HiC2025ES

- 1-channel isolated barrier
- 24 V DC supply (bus powered)
- Input for 2-wire SMART transmitters and current sources
- Output for 4 mA ... 20 mA or 1 V ... 5 V
- Sink or source mode
- Line fault detection (LFD)
- Up to SIL 3 acc. to IEC/EN 61508

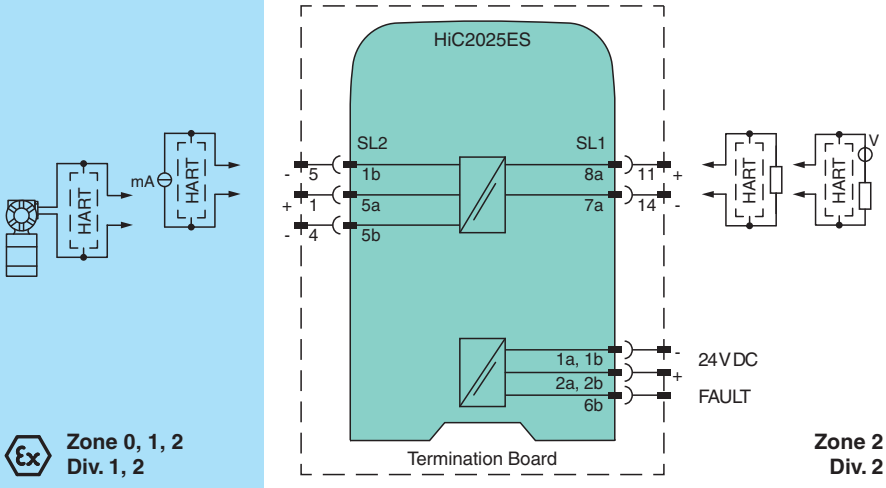
Function

This isolated barrier is used for intrinsic safety applications.
The device supplies 2-wire transmitters in the hazardous area, and can also be used with current sources.
The device transfers the analog input signal to the non-hazardous area as an isolated current value.
Bi-directional communication is supported for SMART transmitters that use current modulation to transmit data and voltage modulation to receive data.
The output is selected as a current source, current sink, or voltage source via DIP switches.
A separate fault output on the bus is signaled, if the input signal is outside the range of 3 mA ... 22 mA.
This device mounts on a HiC termination board.

Application

The device supports the following SMART protocols:
- HART

Connection



Technical Data

General specifications	
Signal type	Analog input
Functional safety related parameters	
Safety Integrity Level (SIL)	SIL 3
Systematic capability (SC)	SC 3
Supply	

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Technical Data

Connection		SL1: 1a(-), 1b(-); 2a(+), 2b(+)
Rated voltage	U_r	19 ... 30 V DC bus powered via Termination Board
Ripple		≤ 10 %
Rated current	I_r	≤ 50 mA
Power dissipation		≤ 800 mW
Power consumption		≤ 1.2 W
Input		
Connection side		field side
Connection		SL2: 5a(+), 1b(-); 5a(+), 5b(-)
Input signal		4 ... 20 mA , limited to approx. 27 mA reverse polarity protected
Line fault detection		downscaling ≤ 3 mA ; upscaling ≥ 22 mA
Voltage drop		approx. 5 V on SL2: 5a(+), 1b(-)
Available voltage		≥ 15 V at 20 mA on SL2: 5a(+), 5b(-)
Output		
Connection side		control side
Connection		SL1: 8a(+), 7a(-)
Load		0 ... 300 Ω (source mode)
Output signal		source mode: 4 ... 20 mA or 1 ... 5 V (internal resistor: 250 Ω, 0.1 %) sink mode: 4 ... 20 mA, operating voltage 16 ... 28 V For additional internal or external loads the voltage drop has to be considered, e. g. 250 Ω x 20 mA = 5 V.
Ripple		20 mV_{rms}
Fault indication output		
Connection		SL1: 6b
Output type		open collector transistor (internal fault bus)
Transfer characteristics		
Deviation		at 20 °C (68 °F) ≤ ± 20 µA incl. calibration, linearity, hysteresis, loads and supply voltage fluctuations (source mode and sink mode 4 ... 20 mA) ≤ 10 mV incl. calibration, linearity, hysteresis and fluctuations of supply voltage (source mode 1 ... 5 V)
Influence of ambient temperature		< 2 µA/K (0 ... 70 °C (32 ... 158 °F)); < 4 µA/K (-20 ... 0 °C (-4 ... 32 °F)) (source mode and sink mode 4 ... 20 mA) < 0.5 mV/K (0 ... 70 °C (32 ... 158 °F)); < 1 mV/K (-20 ... 0 °C (-4 ... 32 °F)) (source mode 1 ... 5 V)
Frequency range		field side into the control side: bandwidth with 1 mA_{pp} signal 0 ... 3 kHz (-3 dB) control side into the field side: bandwidth with 0.5 V_{pp} signal 0 ... 3 kHz (-3 dB)
Settling time		≤ 200 ms
Rise time/fall time		≤ 20 ms
Galvanic isolation		
Input/Output		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Input/power supply		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Output/power supply		Basic isolation acc. to EN 61010-1 rated insulation voltage ≤ 50 V
Indicators/settings		
Display elements		LEDs
Control elements		DIP switch
Configuration		via DIP switches
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 21:2017 For further information see system description.
Degree of protection		IEC 60529:2001
Ambient conditions		
Ambient temperature		-20 ... 70 °C (-4 ... 158 °F)

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Technical Data

Mechanical specifications		
Degree of protection		IP20
Mass		approx. 100 g
Dimensions		12.5 x 106 x 128 mm (0.5 x 4.2 x 5.1 inch) (W x H x D)
Mounting		on termination board
Coding		pin 1 and 3 trimmed For further information see system description.
Data for application in connection with hazardous areas		
EU-type examination certificate		CESI 10 ATEX 063
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
Supply		
Maximum safe voltage	U_m	253 V AC (Attention! U_m is no rated voltage.)
Equipment		SL2: 5a(+), 5b(-)
Voltage	U_o	25.2 V
Current	I_o	100 mA
Power	P_o	630 mW
Internal capacitance	C_i	5.7 nF
Internal inductance	L_i	negligible
Equipment		SL2: 5a(+), 1b(-)
Voltage	U_i	< 30 V
Current	I_i	< 128 mA
Voltage	U_o	7.2 V
Current	I_o	100 mA
Power	P_o	25 mW
Internal capacitance	C_i	5.7 nF
Internal inductance	L_i	negligible
Certificate		CESI 19 ATEX 016 X
Marking		Ex II 3G Ex ec IIC T4 Gc
Directive conformity		
Directive 2014/34/EU		EN 60079-0:2012+A11:2013 , EN 60079-11:2012 , EN 60079-7:2015
International approvals		
UL approval		E106378
Control drawing		116-0376 (cULus)
IECEx approval		
IECEx certificate		IECEx CES 10.0021X
IECEx marking		[Ex ia Ga] IIC , [Ex ia Da] IIIC , [Ex ia Ma] I Ex ec 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.

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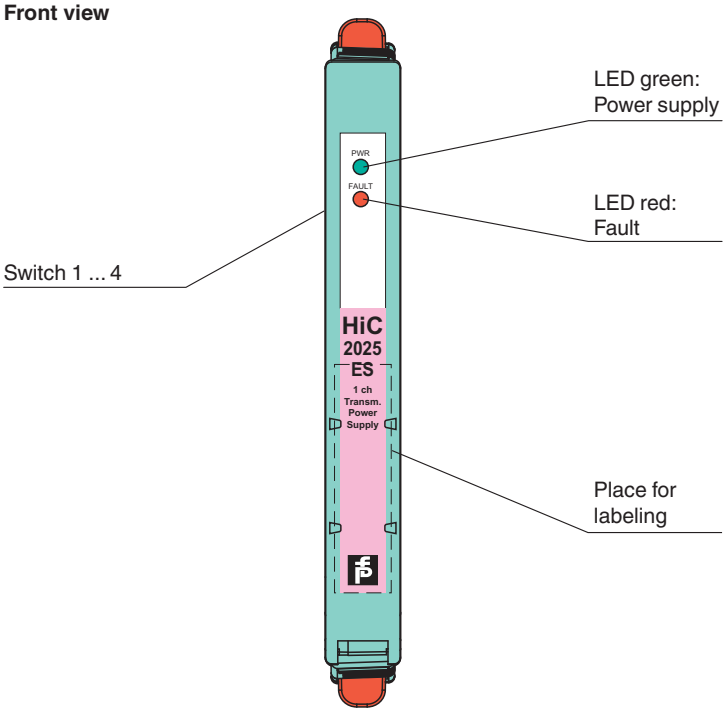
Assembly

Front view



Configuration

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 in the **Configuration** section.

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

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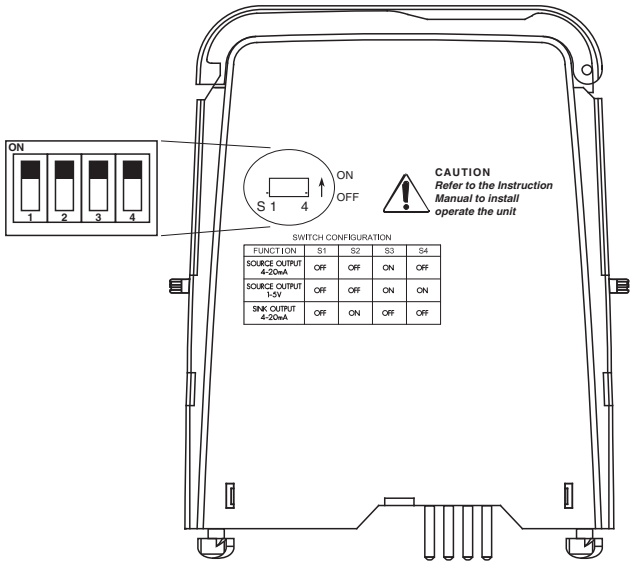
Configuration



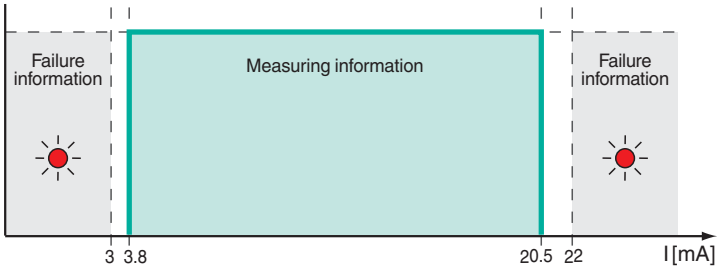
Switch position

Function	S1	S2	S3	S4
Current source 4 mA ... 20 mA	OFF	OFF	ON	OFF
Voltage source 1 V ... 5 V	OFF	OFF	ON	ON
Current sink 4 mA ... 20 mA	OFF	ON	OFF	OFF

Factory setting: current source 4 mA ... 20 mA

Characteristic Curve

Transfer characteristic



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