

Features

- 1-channel isolated barrier
- 24 V DC supply (bus powered)
- Analog input, digital input, analog output, digital output
- No configuration required, device is self-adapting
- HART transparency
- Low power dissipation
- 3-way isolation
- Up to SIL 2 acc. to IEC 61508

Function

This isolated barrier is used for intrinsic safety applications.

The device can transfer the following signals:

- as an analog input: 0/4 mA ... 20 mA
- as an analog output: 0/4 mA ... 20 mA
- as a digital input: signals from NAMUR sensors or dry contacts
- as a digital output: max. 45 mA

The device requires no configuration and adapts itself automatically to the function of the active input/output of the connected process control system.

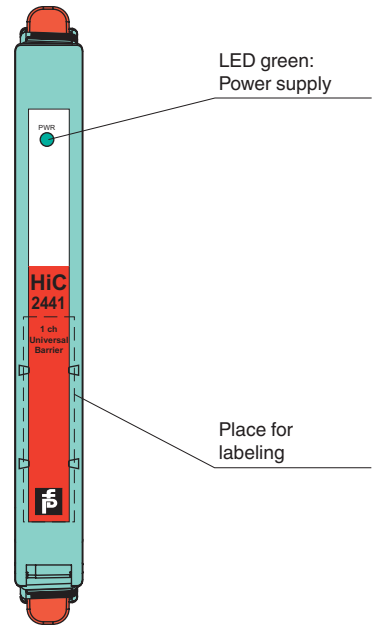
The device permits the bi-directional pass-through of the HART communication.

The device is designed primarily for use with universal I/O cards (e. g. Honeywell Universal Process IO).

This device mounts on a HiC Termination Board.

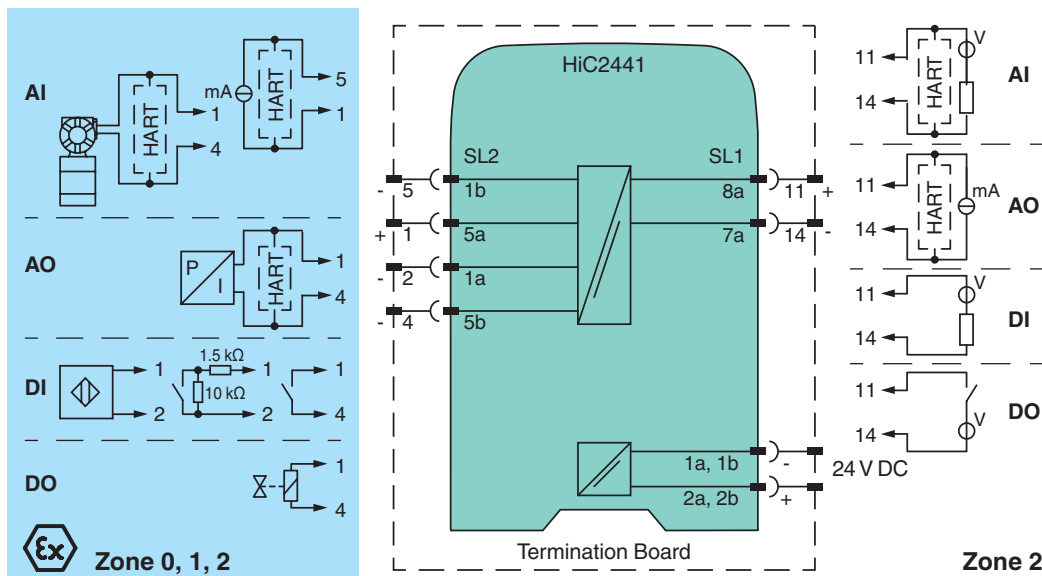
Assembly

Front view



SIL 2

Connection



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

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General specifications		
Signal type		Universal
Functional safety related parameters		
Safety Integrity Level (SIL)		SIL 2
Supply		
Connection		SL1: 1a(-), 1b(-); 2a(+), 2b(+)
Rated voltage	U_r	19 ... 30 V DC via Termination Board
Ripple		$\leq 10 \%$
Rated current	I_r	$\leq 30 \text{ mA}$
Power consumption		$\leq 700 \text{ mW}$
Analog input		
Suitable field devices		2-wire SMART transmitters, current sources
Signal		0/4 ... 20 mA , limited to approx. 40 mA (depends on control system) , reverse polarity protected
Field circuit		SL2: 5a(+), 5b(-) (2-wire SMART transmitter) SL2: 5a(+), 1b(-) (2-wire SMART transmitter with current source)
Voltage drop		approx. 4 V (current source)
Control circuit		SL1: 8a(+), 7a(-)
Supply voltage		$\geq 16 \text{ V}$ at 20 mA (2-wire SMART transmitter)
Voltage		15 ... 30 V
Signal		0/4 ... 20 mA , sink mode , working voltage 15 ... 30 V
Ripple		20 mV _{rms}
Analog output		
Suitable field devices		I/P converters (positioner), on-site-displays
Signal		0/4 ... 20 mA
Field circuit		SL2: 5a(+), 5b(-)
Load		0 ... 650 Ω
Voltage		$\geq 13 \text{ V}$ at 20 mA
Ripple		20 mV _{rms}
Control circuit		SL1: 8a(+), 7a(-)
Voltage		12 ... 30 V
Signal		0/4 ... 20 mA
Line fault detection		$> 100 \text{ k}\Omega$ at max. 30 V, with field wiring open
Digital input		
Field circuit		SL2: 5a(+), 1a(-) (NAMUR sensor) SL2: 5a(+), 5b(-) (dry contact)
Suitable field devices		NAMUR sensors according to IEC/EN 60947-5-6, dry contacts
Signal		0.1 ... 9 mA , sink mode
Open loop voltage		approx. 10 V DC , 1 k Ω series resistance
Signal		0.1 ... 9 mA
Control circuit		SL1: 8a(+), 7a(-)
Voltage		13 ... 30 V
Digital output		
Field circuit		SL2: 5a(+), 5b(-)
Suitable field devices		solenoid valves, acoustic or visual alarms
Drive capability		12 V / 40 mA at 300 Ω load
Open loop voltage	U_s	approx. 22 V
Current limit	I_{max}	45 mA
Internal resistor	R_i	$\geq 240 \Omega$
Control circuit		SL1: 8a(+), 7a(-)
Voltage		1-signal: 19 ... 30 V DC 0-signal: 0 ... 5 V DC
Current		1-signal: 0 ... 45 mA, depending on the output load 0-signal: $< 0.1 \text{ mA}$, independent of the output load
Power dissipation		1.1 W at 24 V, 300 Ω load (digital output)
Transfer characteristics		
Deviation		at 20 °C (68 °F) $\leq \pm 20 \mu\text{A}$ incl. linearity, hysteresis and supply fluctuations at 4 ... 20 mA (analog input, analog output) $\leq \pm 60 \mu\text{A}$ incl. linearity, hysteresis and supply fluctuations at 0 ... 45 mA (digital output)
Influence of ambient temperature		$< 2 \mu\text{A/K}$ (0 ... 70 °C (32 ... 158 °F)) $< 3 \mu\text{A/K}$ (-40 ... 0 °C (-40 ... 32 °F))
Switching frequency		$\leq 500 \text{ Hz}$ with 50 % duty cycle (digital input, NAMUR sensor) $\leq 5 \text{ Hz}$ (digital input, dry contact) $\leq 20 \text{ Hz}$ (digital output)
Frequency range		HART: bandwidth by 0.5 V _{pp} signal and/or 1 mA _{pp} signal 950 ... 2500 Hz (analog input, analog output)
Settling time		$\leq 20 \text{ ms}$ (analog input, analog output) $\leq 1 \text{ ms}$ (digital input, NAMUR sensor)

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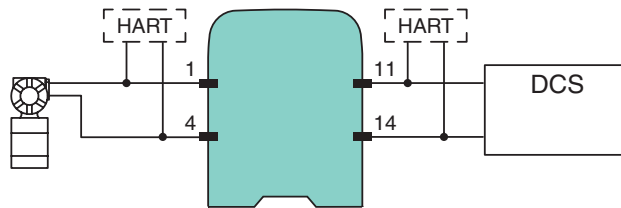
Reaction time	≤ 5 ms , turn-on/turn-off time (digital output)	
Galvanic isolation		
Control/power supply	basic insulation according to IEC/EN 61010-1, rated insulation voltage 60 V _{eff}	
Directive conformity		
Electromagnetic compatibility		
Directive 2014/30/EU	EN 61326-1:2013 (industrial locations)	
Conformity		
Electromagnetic compatibility	NE 21:2011	
Degree of protection	IEC 60529:2001	
Protection against electrical shock	IEC 61010-1:2010	
Input	EN 60947-5-6:2000	
Ambient conditions		
Ambient temperature	-40 ... 70 °C (-40 ... 158 °F) Observe the temperature range limited by derating, see section derating.	
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)	
Relative humidity	95 % non-condensing	
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 and 4 trimmed For further information see system description.	
Data for application in connection with hazardous areas		
EU-Type Examination Certificate	TÜV 14 ATEX 153522 X	
Marking	⊕ II (1)G [Ex ia Ga] IIC , ⊕ II (1)D [Ex ia Da] IIIC , ⊕ I (M1) [Ex ia Ma] I	
Supply		
Maximum safe voltage	U _m	250 V (Attention! The rated voltage can be lower.)
Equipment	SL2: 5a(+), 5b(-)	
Voltage	U _o	25.2 V
Current	I _o	110 mA
Power	P _o	693 mW
Equipment	SL2: 5a(+), 1b(-)	
Voltage	U _i	< 28 V
Current	I _i	< 115 mA
Voltage	U _o	7.2 V
Current	I _o	0 mA
Power	P _o	0 mW
Equipment	SL2: 5a(+), 1a(-)	
Voltage	U _o	12.6 V
Current	I _o	13 mA
Power	P _o	41 mW
Certificate	TÜV 14 ATEX 153523 X	
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		
IECEX approval	IECEX TUN 15.0004X	
Approved for	[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I Ex nA II 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.	

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Application examples

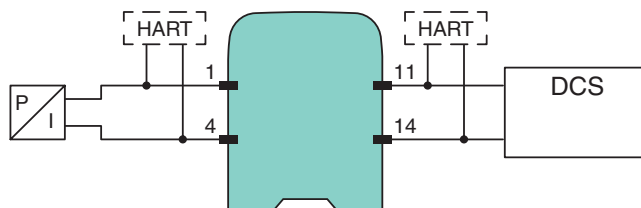
Analog input

The control system must be parameterized to an active current input.



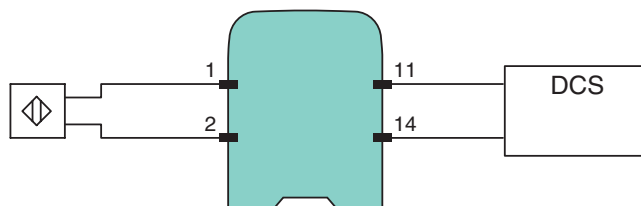
Analog output

The control system must be parameterized to a current output.



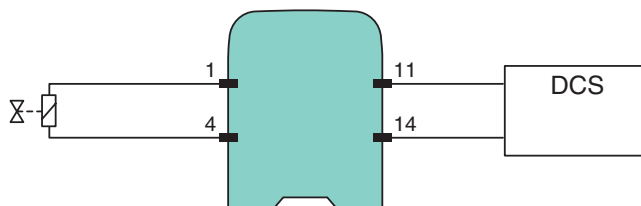
Digital input

The digital input of the control system must evaluate the level of a current signal.



Digital output

The digital output of the control system must be parameterized in a way that the digital output powers actively a valve. The current which is provided by the control system is transferred directly to the valve.

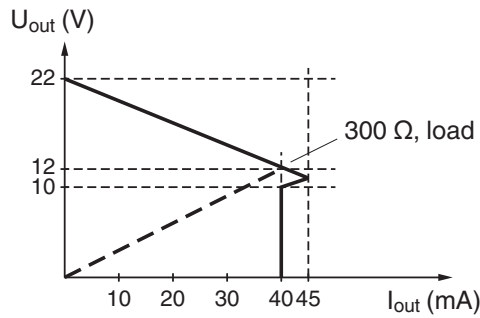


This section does not show all connection options. For further connection options see "Connection" section.

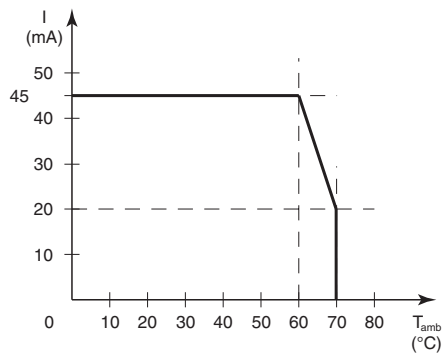
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Characteristic

Fallback characteristic for digital output



Derating



Notes

Application

The device is designed as intrinsically safe interface for Universal Process IO (or Universal Safety IO) by Honeywell.

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