



SMART Universal Barrier HiC2441

- 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/EN 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.

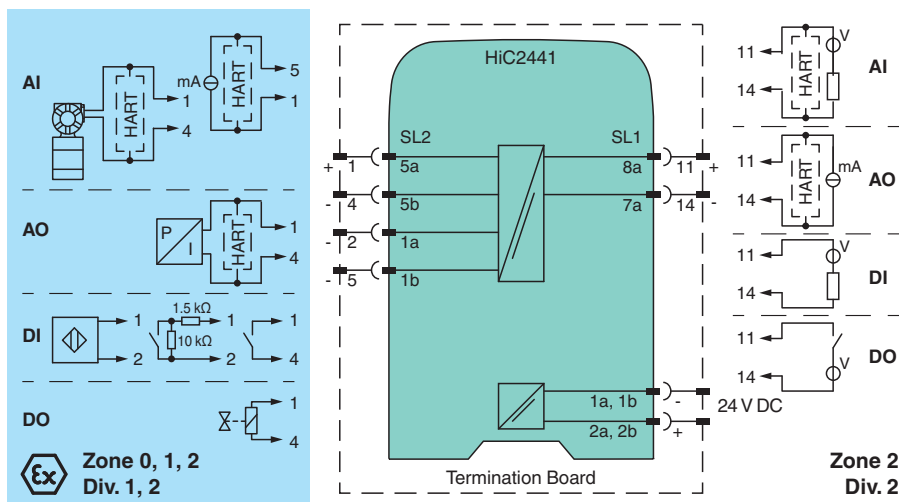
The device is designed primarily for use with universal I/O cards (e. g. Honeywell Universal Process IO).

This device mounts on a HiC Termination Board.

Application

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

Connection



Technical Data

General specifications

Signal type Universal

Functional safety related parameters

Safety Integrity Level (SIL) SIL 2

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

Pepperl+Fuchs Group
www.pepperl-fuchs.com

USA: +1 330 486 0002
pa-info@us.pepperl-fuchs.com

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pa-info@sg.pepperl-fuchs.com

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Technical Data

Systematic capability (SC)		SC 2
Supply		
Connection		SL1: 1a, 1b(-); 2a, 2b(+)
Rated voltage	U_r	19 ... 30 V DC bus powered 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		min. 16 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 Valve , audible alarm , visual alarm
Drive capability		12 V / 40 mA at 300 Ω load
Internal resistor	R_i	min. 240 Ω
Current	I_e	40 mA
Voltage	U_e	12 V
Current limit	I_{max}	45 mA
Open loop voltage	U_s	approx. 22 V
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		

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Deviation		at 20 °C (68 °F) ≤ ±20 µA incl. linearity, hysteresis and supply fluctuations at 4 ... 20 mA (analog input, analog output) ≤ ±60 µA incl. linearity, hysteresis and supply fluctuations at 0 ... 45 mA (digital output)
Influence of ambient temperature		< 2 µA/K (0 ... 70 °C (32 ... 158 °F)) < 3 µA/K (-40 ... 0 °C (-40 ... 32 °F))
Switching frequency		≤ 500 Hz with 50 % duty cycle (digital input, NAMUR sensor) ≤ 5 Hz (digital input, dry contact) ≤ 20 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		≤ 20 ms (analog input, analog output) ≤ 1 ms (digital input, NAMUR sensor)
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}
Indicators/settings		
Display elements		LED
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 For further information see system description.
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. 105 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 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
Internal capacitance	C _i	5.7 nF
Internal inductance	L _i	0 mH
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

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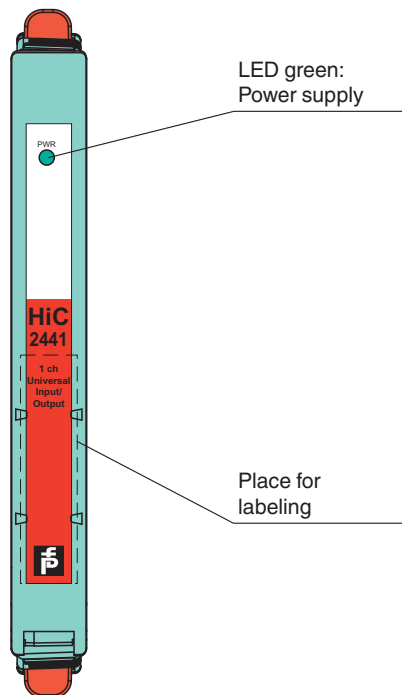
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Technical Data

Power	P _o	0 mW
Internal capacitance	C _i	5.7 nF
Internal inductance	L _i	0 mH
Equipment		SL2: 5a(+), 1a(-)
Voltage	U _o	12.6 V
Current	I _o	13 mA
Power	P _o	41 mW
Internal capacitance	C _i	5.7 nF
Internal inductance	L _i	0 mH
Certificate		TÜV 14 ATEX 153523 X
Marking		Ⓜ II 3G Ex ec IIC T4 Gc
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 IEC 60079-0:2018+AC:2020 , EN 60079-11:2012 , EN 60079-7:2015+A1:2018
International approvals		
UL approval		E106378
Control drawing		116-0408 (cULus)
IECEX approval		
IECEX certificate		IECEX TUN 15.0004X
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 .

Assembly

Front view



Safety Information

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

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Configuration

No user configuration available for this device.

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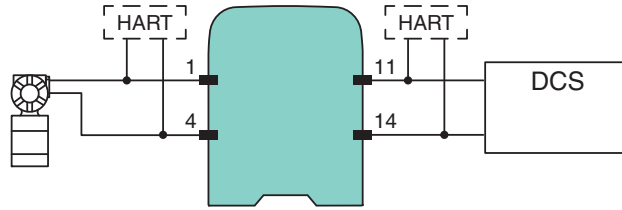
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Application

Examples

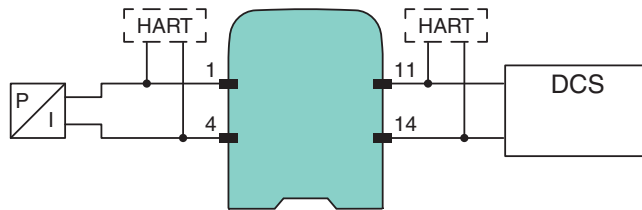
Analog input

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



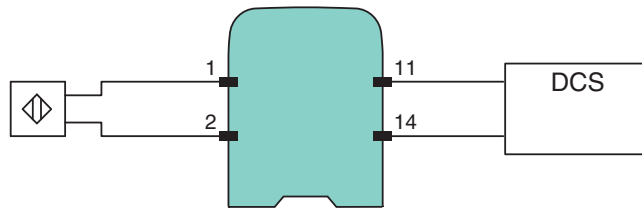
Analog output

The control system must be parameterized to a current output.



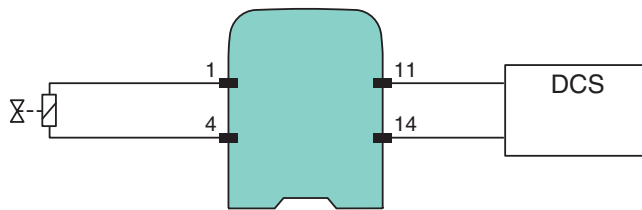
Digital input

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.

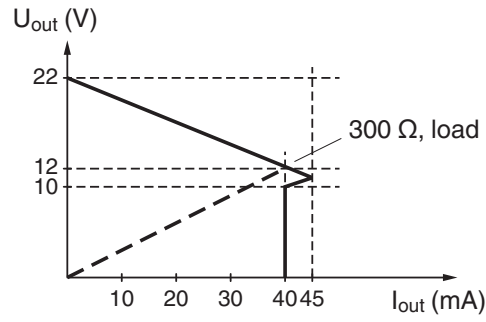


This section does not show all connection options. For further connection options see "Connection" section.

Characteristic Curve

Fallback characteristic for digital output

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Characteristic Curve

Derating

