Switch Amplifier

HiC2853R1

- 1-channel isolated barrier
- 24 V DC supply (bus powered)
- Input for approved dry contacts or SN/S1N sensors
- Usable as signal splitter (1 input and 2 outputs)
- Application-specific outputs
- Active voltage output
- Passive transistor output (resistive)
- Line fault detection (LFD)
- Line fault transparency (LFT)
- Up to SIL 3 acc. to IEC/EN 61508

Function

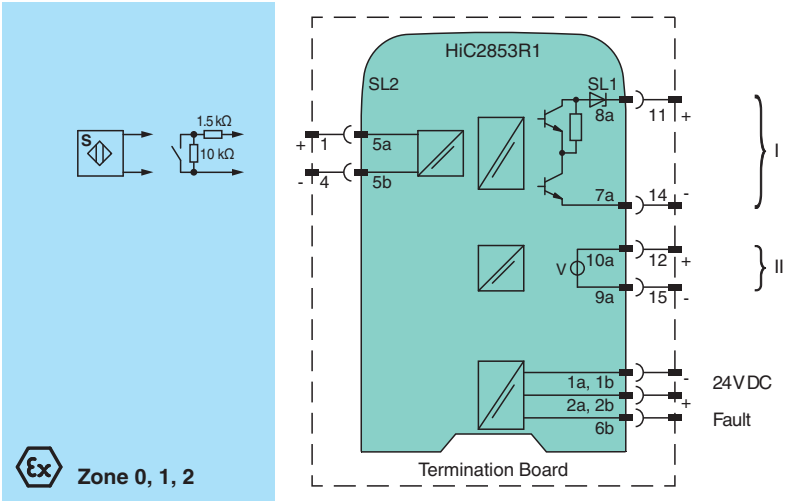
This isolated barrier is used for intrinsic safety applications.
The device transfers digital signals (SN/S1N proximity sensors or approved dry contacts) from the explosion-hazardous area to the non-explosion-hazardous area.
The input controls one active voltage output and one passive transistor output with a resistive output characteristic.
The passive transistor output has three defined states: 1-signal = 6.5 V voltage drop, 0-signal = 39 kΩ and fault > 100 kΩ.
This output characteristic offers line fault transparency on the signal lines.
During a fault state, both outputs switch to their fault state and LEDs indicate the fault according to NAMUR NE 44. A separate fault bus is available. This fault bus can be monitored if the termination board supports a module fault detection.
Unlike a SN/S1N series safety sensor, an approved dry contact requires a 10 kΩ resistor to be placed across the contact in addition to a 1.5 kΩ resistor in series.
This device mounts on a HiC termination board.

Application

This device is compatible to the control:
- Yokogawa ProSafe DI card SDV144

Compatibility check to other ESD/DCS systems on request.

Connection



Technical Data

General specifications	
Signal type	Digital Input
Functional safety related parameters	

Release date: 2023-06-05 Date of issue: 2023-06-05 Filename: 267660_eng.pdf

Technical Data

Safety Integrity Level (SIL)		SIL 3
Systematic capability (SC)		SC 3
Supply		
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	≤ 55 mA
Power dissipation		≤ 800 mW
Power consumption		≤ 1300 mW
Input		
Connection side		field side
Connection		SL2: 5a(+), 5b(-)
Open circuit voltage/short-circuit current		approx. 8.4 V DC / approx. 11.9 mA
Switching point/switching hysteresis		2.1 ... 2.8 mA / approx. 0.3 mA
Line fault detection		breakage I ≤ 0.15 mA , short-circuit I ≥ 8.5 mA
Lead resistance		max. 50 Ω , consider capacitances and inductances
Switching point		1-signal: I > 2.8 mA 0-signal: I < 2.1 mA
Response delay		≤ 1 ms
Output		
Connection side		control side
Connection		SL1: 8a(+), 7a(-); 10a(+), 9a(-)
Rated voltage	U_r	output I: 19 ... 30 V DC with external resistance > 2 kΩ, e. g. 16-channel ProSafe DI card SDV144 from Yokogawa
Output I		passive transistor output (resistive) 0-signal: 39 kΩ ± 5 % 1-signal: voltage drop 6.5 V ± 0.5 V fault: > 100 kΩ
Output II		active voltage output, short-circuit proof 0-signal: 0 V 1-signal: 20 ... 31 V DC at max. 15 mA fault: 0 V
Fault indication output		
Connection		SL1: 6b
Output type		open collector transistor (internal fault bus)
Transfer characteristics		
Switching frequency		
Output I		≤ 50 Hz
Output II		≤ 50 Hz
Galvanic isolation		
Output/power supply		functional insulation acc. to IEC 62103, rated insulation voltage 50 V_{eff}
Output/Output		functional insulation acc. to IEC 62103, rated insulation voltage 50 V_{eff}
Indicators/settings		
Display elements		LEDs
Labeling		space for labeling at the front
Directive conformity		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013 (industrial locations)
Conformity		
Electromagnetic compatibility		EN IEC 61326-3-2:2018 , NE 21:2017 For further information see system description.
Degree of protection		IEC 60529:2001
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications		
Degree of protection		IP20

Release date: 2023-06-05 Date of issue: 2023-06-05 Filename: 267660_eng.pdf

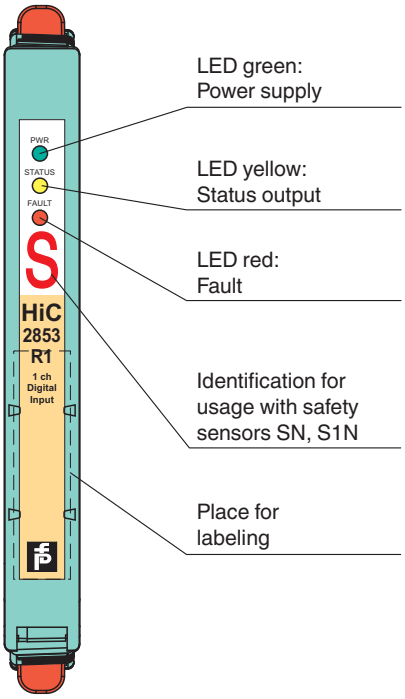
Technical Data

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 2 trimmed For further information see system description.
Data for application in connection with hazardous areas		
EU-type examination certificate		BASEEFA 07 ATEX 0302X
Marking		⟨Ex⟩ II (1)G [Ex ia] IIC , ⟨Ex⟩ II (1) D [Ex ia] IIIC , ⟨Ex⟩ I (M1) [Ex ia] I
Input		Ex ia
Voltage	U_o	10.5 V
Current	I_o	17.1 mA
Power	P_o	45 mW (linear characteristic)
Supply		
Maximum safe voltage	U_m	253 V AC (Attention! U_m is no rated voltage.)
Output		
Maximum safe voltage	U_m	253 V AC (Attention! U_m is no rated voltage.)
Certificate		PF 09 CERT 1440 X
Marking		⟨Ex⟩ II 3G Ex nA IIC T4 Gc
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
Directive conformity		
Directive 2014/34/EU		EN IEC 60079-0:2018+AC:2020 , EN 60079-11:2012 , EN 60079-15:2010
International approvals		
UL approval		E106378
Control drawing		116-0364
IECEx approval		
IECEx certificate		IECEx BAS 07.0097X
IECEx marking		[Ex ia Ga] IIC, [Ex ia] IIIC , [Ex ia] I
General information		
Supplementary information		Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com.

Release date: 2023-06-05 Date of issue: 2023-06-05 Filename: 267660_eng.pdf

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.

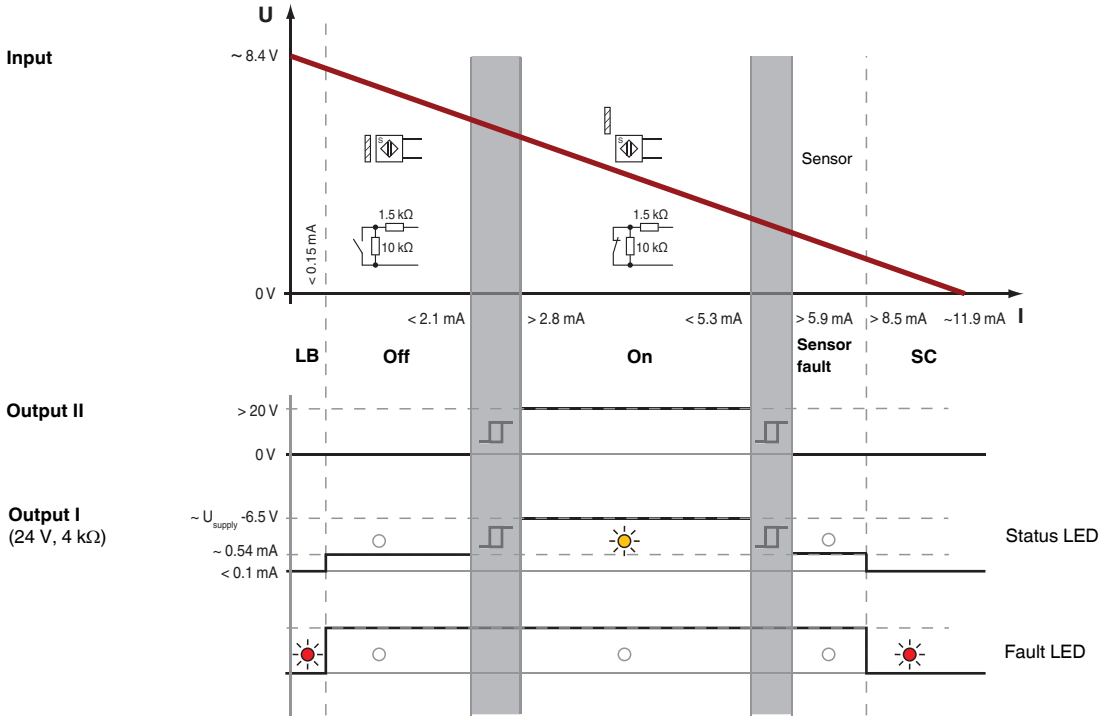
Configuration

No user configuration available for this device.

Release date: 2023-06-05 Date of issue: 2023-06-05 Filename: 267660_eng.pdf

Characteristic Curve

Switch points



Release date: 2023-06-05 Date of issue: 2023-06-05 Filename: 267660_eng.pdf