# Switch Amplifier

## HiC2832R2

- 2-channel isolated barrier
- 24 V DC supply (bus powered)
- Dry contact or NAMUR inputs
- Application-specific outputs
- 2 passive transistor outputs (resistive)
- Line fault detection (LFD)
- Line fault transparency (LFT)
- Reversible mode of operation
- Up to SIL 2 (SC 3) acc. to IEC/EN 61508

## Function

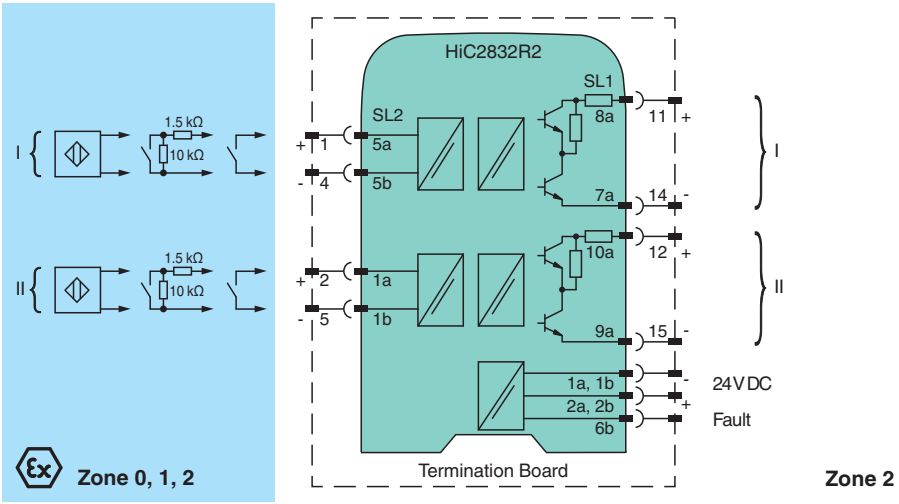
This isolated barrier is used for intrinsic safety applications.
The device transfers digital signals (NAMUR sensors/mechanical contacts) from the explosion-hazardous area to the non-explosion-hazardous area.
Each input controls a passive transistor output with a resistive output characteristic.
The outputs have three defined states: 1-signal = 5 kΩ, 0-signal = 15 kΩ and fault > 100 kΩ.
This output characteristic offers line fault transparency on the signal lines.
Via switches the mode of operation can be reversed and the line fault detection can be switched off.
During a fault state, the passive transistor 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.
This device mounts on a HiC termination board.

## Application

This device is compatible to the control:
- Honeywell Safety Manager RIO I.S.

Compatibility check to other ESD/ DCS systems on request.

## Wiring Diagram




## Technical Data

| | |
|---|---|
| **General specifications** | |
| Signal type | Digital Input |
| **Functional safety related parameters** | |
| Safety Integrity Level (SIL) | SIL 2 |

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## Technical Data

| | | |
|---|---|---|
| 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 | $I_r$ | ≤ 30 mA |
| Power dissipation | | ≤ 600 mW |
| Power consumption | | ≤ 700 mW |
| **Input** | | |
| Connection side | | field side |
| Connection | | SL2: 5a(+), 5b(-); 1a(+), 1b(-) |
| Rated values | | acc. to EN 60947-5-6 (NAMUR), see manual for electrical data |
| Open circuit voltage/short-circuit current | | approx. 10 V DC / approx. 8 mA |
| Switching point/switching hysteresis | | 1.2 ... 2.1 mA / approx. 0.2 mA |
| Line fault detection | | breakage I ≤ 0.1 mA , short-circuit I ≥ 6.5 mA |
| Pulse/Pause ratio | | min. 100 µs / min. 100 µs |
| **Output** | | |
| Connection side | | control side |
| Connection | | SL1: 8a(+), 7a(-); 10a(+), 9a(-) |
| Rated voltage | $U_r$ | 19 ... 30 V DC |
| Response time | | ≤ 200 µs |
| Output I, II | | signal or fault message, passive transistor output (resistive)<br>0-signal: 15 kΩ ± 5 %<br>1-signal: 5 kΩ ± 5 %<br>fault: > 100 kΩ |
| **Fault indication output** | | |
| Connection | | SL1: 6b |
| Output type | | open collector transistor (internal fault bus) |
| **Transfer characteristics** | | |
| Switching frequency | | ≤ 5 kHz |
| **Galvanic isolation** | | |
| Output/power supply | | basic insulation according to IEC/EN 61010-1, rated insulation voltage 60 $V_{eff}$ |
| Output/Output | | basic insulation according to IEC/EN 61010-1, rated insulation voltage 60 $V_{eff}$ |
| **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 | | EN IEC 61326-3-2:2018 , NE 21:2017<br>For further information see system description. |
| Degree of protection | | IEC 60529:2001 |
| Protection against electrical shock | | IEC 61010-1 |
| **Ambient conditions** | | |
| Ambient temperature | | -40 ... 70 °C (-40 ... 158 °F) |
| **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 2 trimmed<br>For further information see system description. |

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## Technical Data

| | | |
|---|---|---|
| **Data for application in connection with hazardous areas** | | |
| EU-type examination certificate | | BVS 11 ATEX E 026 |
| Marking | | ⟨Ex⟩ II (1)G [Ex ia Ga] IIC<br>⟨Ex⟩ II (1)D [Ex ia Da] IIIC<br>⟨Ex⟩ I (M1) [Ex ia Ma] 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 | | KIWA 15 ATEX 0037 X |
| Marking | | ⟨Ex⟩ II 3G Ex ec 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 60079-7:2015+A1:2018 , EN 50303:2000 |
| **International approvals** | | |
| FM approval | | |
| Control drawing | | 116-0430 (cFMus) |
| UL approval | | E106378 |
| Control drawing | | 116-0331 |
| IECEx approval | | |
| IECEx certificate | | IECEx BVS 11.0040<br>IECEx KIWA 15.0019X |
| 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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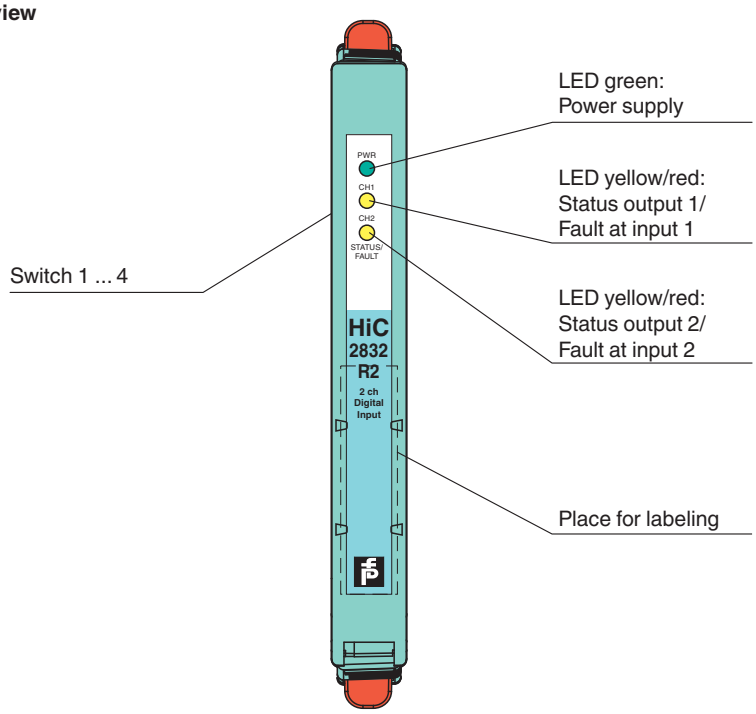
## Assembly

**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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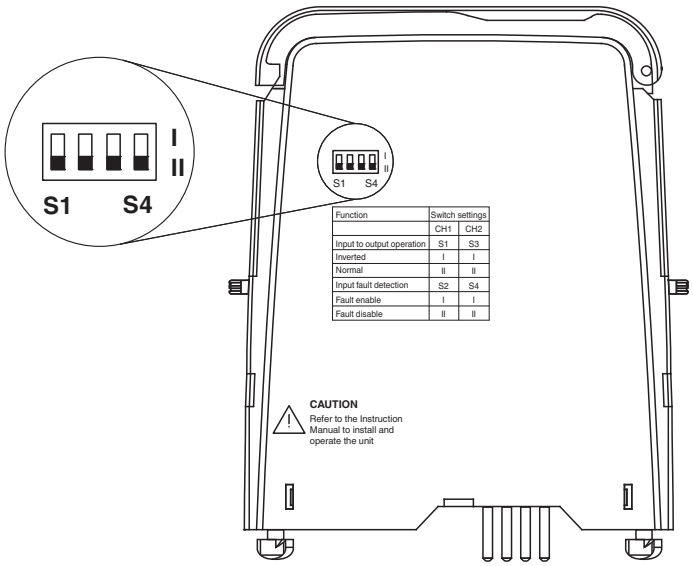
## Configuration

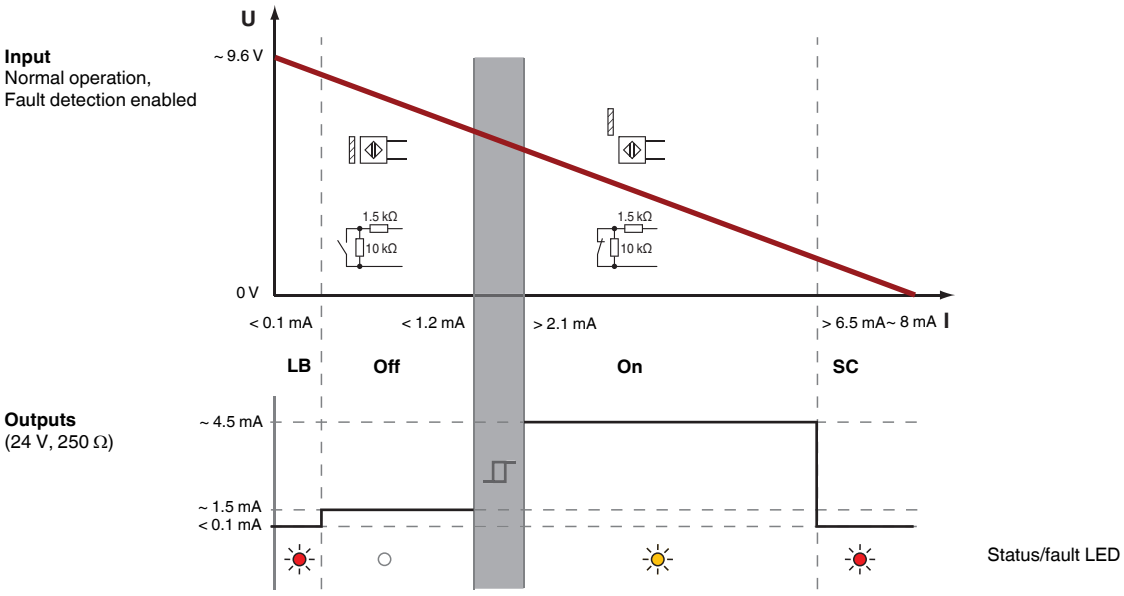



### Switch settings

| S | Channel | Function | | Position |
|---|---|---|---|---|
| 1 | I | Mode of operation | Inverted | I |
| | | | Normal | II |
| 2 | I | Input line fault detection | ON | I |
| | | | OFF | II |
| 3 | II | Mode of operation | Inverted | I |
| | | | Normal | II |
| 4 | II | Input line fault detection | ON | I |
| | | | OFF | II |

## Characteristic Curve

### Switch points

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