SMART Transmitter Power Supply

KCD2-STC-Ex1.ES

Features

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- 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)
- Housing width 12.5 mm
- Up to SIL3 acc. to IEC 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. It transfers the analog input signal to the safe 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 fault is signalized by LEDs acc. to NAMUR NE44 and a separate collective error message output. Test sockets for the connection of HART communicators are integrated into the terminals of the device.

Application

The device supports the following SMART protocol:
- HART

Connection

Removable terminals blue
LED green: Power supply
LED red: Fault
Place for labeling
Removable terminals green

Switch 1 ... 4

Zone 0, 1, 2
Div. 1, 2

1+
2-
3+
4-
5-
6+
9+
10-

24 V DC

Power Rail

HART

mA

HART

KCD2-STC-Ex1.ES

Zone 2
Div. 2

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### General specifications
- **Signal type**: Analog input

### Supply
- **Connection**: Power Rail or terminals 9+, 10-
- **Rated voltage**: 19 ... 30 V DC
- **Ripple**: ≤ 10 %
- **Rated current**: ≤ 50 mA
- **Power loss**: ≤ 800 mW
- **Power consumption**: ≤ 1.2 W

### Input
- **Connection**: terminals 1+, 2-; 3+, 4-
- **Input signal**: 4 ... 20 mA, limited to approx. 27 mA reverse polarity protected
- **Line fault detection**: downscaling ≤ 3 mA; upscaling ≥ 22 mA
- **Voltage drop** $U_d$: approx. 5 V on terminals 3+, 4-
- **Available voltage**: ≥ 15 V at 20 mA terminals 1+, 2-

### Output
- **Connection**: terminals 5-, 6+
- **Load**: 0 ... 300 Ω (source mode)
- **Output signal**: 4 ... 20 mA or 1 ... 5 V (on 250 Ω, 0.1 % internal shunt); 4 ... 20 mA (sink mode), operating voltage 16 ... 28 V
- **Ripple**: 20 mV rms

### Error message output
- **Output type**: fault bus signal, open collector transistor

### 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)
- **Frequency range**: hazardous area to safe area: bandwidth with 1 mA peak signal 0 ... 3 kHz (-3 dB)
- **Rise time/fall time**: ≤ 200 ms
- **Settling time**: ≤ 200 ms

### Electrical 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

### Directive conformity
- **Conformity**: NE 21

### Ambient conditions
- **Ambient temperature**: -20 ... 70 °C (-4 ... 158 °F)

### Mechanical specifications
- **Protection degree**: IP20
- **Mass**: approx. 100 g
- **Dimensions**: 12.5 x 114 x 124 mm (0.5 x 4.5 x 4.9 in), housing type A2

### Data for application in connection with Ex-areas
- **EC-Type Examination Certificate**: CESI 10 ATEX 071, for additional certificates see www.pepperl-fuchs.com
- **Group, category, type of protection**: II (1)GD [Ex ia] IIC, [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22] I I (M1) [Ex ia]
- **Input**: Ex ia, Ex iaD
- **Supply**: Maximum safe voltage $U_m$: 253 V AC (Attention! $U_m$ is no rated voltage.)
- **Equipment terminals**: 1+, 2-
- **Voltage**: $U_0$: 25.2 V
- **Current**: $I_0$: 100 mA
- **Power**: $P_0$: 630 mW
- **Equipment terminals**: 3+, 4-
- **Voltage**: $U_1$: ≤ 30 V
- **Current**: $I_1$: ≤ 128 mA
- **Voltage**: $U_o$: 7.2 V
### Technical data

<table>
<thead>
<tr>
<th>Current</th>
<th>$I_0$</th>
<th>100 mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>$P_0$</td>
<td>25 mW</td>
</tr>
</tbody>
</table>

**Statement of conformity**

PF 10 CERT 1749 X, observe statement of conformity

**Group, category, type of protection, temperature classification**

II 3G Ex nA II T4

**Directive conformity**

Directive 94/9/EC

EN 60079-0, EN 60079-11, EN 60079-15, EN 60079-26, EN 61241-0, EN 61241-11

**International approvals**

IECEx approval

IECEx CES 11.0001

**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.
Factory settings: output as current source 4 mA ... 20 mA

Transfer characteristic

Accessories

Power feed module KFD2-EB2
The power feed module is used to supply the devices with 24 V DC via the Power Rail. The fuse-protected power feed module can supply up to 100 individual devices depending on the power consumption of the devices. A galvanically isolated mechanical contact uses the Power Rail to transmit collective error messages.

Power Rail UPR-03
The Power Rail UPR-03 is a complete unit consisting of the electrical inset and an aluminium profile rail 35 mm x 15 mm. To make electrical contact, the devices are simply engaged.

Profile Rail K-DUCT with Power Rail
The profile rail K-DUCT is an aluminum profile rail with Power Rail insert and two integral cable ducts for system and field cables. Due to this assembly no additional cable guides are necessary.

Power Rail and Profile Rail must not be fed via the device terminals of the individual devices!
Features

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- 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 SIL3 acc. to IEC 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.

It transfers the analog input signal to the safe 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 fault is signaled by LEDs acc. to NAMUR NE44 and a separate collective error message output.

Test sockets for the connection of HART communicators are integrated into the terminals of the device.

Application

The device supports the following SMART protocol:

- HART

Connection

Removable terminals blue
Removable terminals green
LED green: Power supply
LED red: Fault
Switch 1 ... 4

Zone 0, 1, 2 Div. 1, 2

Zone 2 Div. 2

Power Rail
EPR 24 VDC
24 V DC

mA

KFD2-STC4-Ex1.ES

Zone 2, Div. 2
### General specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal type</td>
<td>Analog input</td>
</tr>
</tbody>
</table>

### Supply

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>Power Rail or terminals 14+, 15-</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>19 ... 30 V DC</td>
</tr>
<tr>
<td>Ripple</td>
<td>≤ 10 %</td>
</tr>
<tr>
<td>Rated current</td>
<td>≤ 50 mA</td>
</tr>
<tr>
<td>Power loss</td>
<td>≤ 800 mW</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 1.2 W</td>
</tr>
</tbody>
</table>

### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>terminals 1+, 3-, 6+, 5-</td>
</tr>
<tr>
<td>Input signal</td>
<td>4 ... 20 mA, limited to approx. 27 mA reverse polarity protected</td>
</tr>
<tr>
<td>Line fault detection</td>
<td>downscaling ≤ 3 mA; upscaling ≥ 22 mA</td>
</tr>
<tr>
<td>Voltage drop</td>
<td>( U_d \approx 5 \text{ V on terminals 5-, 6+} )</td>
</tr>
<tr>
<td>Available voltage</td>
<td>≥ 15 V at 20 mA terminals 1+, 3-</td>
</tr>
</tbody>
</table>

### Output

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>terminals 7-, 8+</td>
</tr>
<tr>
<td>Load</td>
<td>0 ... 300 Ω (source mode)</td>
</tr>
<tr>
<td>Output signal</td>
<td>4 ... 20 mA or 1 ... 5 V (on 250 Ω, 0.1 % internal shunt)</td>
</tr>
<tr>
<td>Ripple</td>
<td>20 mV (_\text{rms})</td>
</tr>
</tbody>
</table>

### Error message output

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output type</td>
<td>fault bus signal, open collector transistor</td>
</tr>
</tbody>
</table>

### Transfer characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deviation</td>
<td>at 20 °C (68 °F) ( ± 20 \mu\text{A incl. calibration, linearity, hysteresis, loads and supply voltage fluctuations (source mode and sink mode 4 ... 20 mA)} )</td>
</tr>
<tr>
<td></td>
<td>≤ 10 \text{mV incl. calibration, linearity, hysteresis and fluctuations of supply voltage (source mode 1 ... 5 V)}</td>
</tr>
<tr>
<td>Influence of ambient temperature</td>
<td>(&lt; 2 \mu\text{A/K (0 ... 70 °C (32 ... 158 °F));} &lt; 4 \mu\text{A/K (-20 ... 0 °C (-4 ... 32 °F)) (source mode and sink mode 4 ... 20 mA)} )</td>
</tr>
<tr>
<td></td>
<td>(&lt; 0.5 \text{mV/K (0 ... 70 °C (32 ... 158 °F));} &lt; 1 \text{mV/K (-20 ... 0 °C (-4 ... 32 °F)) (source mode 1 ... 5 V)} )</td>
</tr>
<tr>
<td>Frequency range</td>
<td>hazardous area to safe area: bandwidth with 1 mA  (_\text{pp} ) signal 0 ... 3 kHz (-3 dB)</td>
</tr>
<tr>
<td></td>
<td>safe area into the hazardous area: bandwidth with 0.5 V  (_\text{pp} ) signal 0 ... 3 kHz (-3 dB)</td>
</tr>
<tr>
<td>Setting time</td>
<td>≤ 200 ms</td>
</tr>
<tr>
<td>Rise time/fall time</td>
<td>10 to 90 % ≤ 20 ms</td>
</tr>
</tbody>
</table>

### Electrical isolation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input/Output</td>
<td>safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V</td>
</tr>
<tr>
<td>Input/p Power supply</td>
<td>safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V</td>
</tr>
<tr>
<td>Output/p Power supply</td>
<td>Basic isolation acc. to EN 61010-1 rated insulation voltage ≤ 50 V</td>
</tr>
</tbody>
</table>

### Directive conformity

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conformity</td>
<td>EN 61326-1:2006</td>
</tr>
</tbody>
</table>

### Ambient conditions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-20 ... 70 °C (-4 ... 158 °F)</td>
</tr>
</tbody>
</table>

### Mechanical specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection degree</td>
<td>IP20</td>
</tr>
<tr>
<td>Mass</td>
<td>approx. 150 g</td>
</tr>
<tr>
<td>Dimensions</td>
<td>20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in) , housing type B2</td>
</tr>
</tbody>
</table>

### Data for application in connection with Ex-areas

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC-Type Examination Certificate</td>
<td>CESI 10 ATEX 076 , for additional certificates see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a></td>
</tr>
<tr>
<td>Group, category, type of protection</td>
<td>Ex ia II (1)GD [Ex ia] IIC, [Ex iaD] [circuit(s) in zone 0/1/2/20/21/22]</td>
</tr>
<tr>
<td>Input</td>
<td>Ex ia, Ex iaD</td>
</tr>
<tr>
<td>Supply</td>
<td>Maximum safe voltage ( U_m ) 253 V AC (Attention! ( U_m ) is no rated voltage.)</td>
</tr>
<tr>
<td></td>
<td>Equipment terminals 1+, 3-</td>
</tr>
<tr>
<td>Voltage</td>
<td>( U_0 ) 25.2 V</td>
</tr>
<tr>
<td>Current</td>
<td>( I_0 ) 100 mA</td>
</tr>
<tr>
<td>Power</td>
<td>( P_0 ) 630 mW</td>
</tr>
<tr>
<td>Supply</td>
<td>terminals 5-, 6+</td>
</tr>
<tr>
<td>Voltage</td>
<td>( U_1 ) ≤ 30 V</td>
</tr>
<tr>
<td>Current</td>
<td>( I_1 ) &lt; 128 mA</td>
</tr>
<tr>
<td>Voltage</td>
<td>( U_o ) 7.2 V</td>
</tr>
<tr>
<td>Subject</td>
<td>Content</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Current</td>
<td>$I_o$ 100 mA</td>
</tr>
<tr>
<td>Power</td>
<td>$P_o$ 25 mW</td>
</tr>
<tr>
<td>Statement of conformity</td>
<td>PF 10 CERT 1750 X, observe statement of conformity</td>
</tr>
<tr>
<td>Group, category, type of protection, temperature classification</td>
<td>$II$ $3G$ $Ex$ $nA$ $II$ $T4$</td>
</tr>
<tr>
<td>Directive conformity</td>
<td>Directive 94/9/EC</td>
</tr>
<tr>
<td>International approvals</td>
<td>EN 60079-0, EN 60079-11, EN 60079-15, EN 60079-26, EN 61241-0, EN 61241-11</td>
</tr>
<tr>
<td>IECEx approval</td>
<td>IECEx CES 11.005</td>
</tr>
<tr>
<td>Supplementary information</td>
<td>EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a>.</td>
</tr>
</tbody>
</table>
**Technical data**

**KFD2-STC4-Ex1.ES**

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**Configuration**

![Configuration Diagram]

**Operating mode**

- **Output as current source**
  - 4 mA ... 20 mA

- **Output as voltage source**
  - 1 V ... 5 V

- **Output as current sink**
  - 4 mA ... 20 mA

Factory settings: output as current source 4 mA ... 20 mA

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**Transfer characteristic**

![Transfer Characteristic Diagram]

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**Accessories**

**Power feed module KFD2-EB2**

The power feed module is used to supply the devices with 24 V DC via the Power Rail. The fuse-protected power feed module can supply up to 100 individual devices depending on the power consumption of the devices. A galvanically isolated mechanical contact uses the Power Rail to transmit collective error messages.

**Power Rail UPR-03**

The Power Rail UPR-03 is a complete unit consisting of the electrical inset and an aluminium profile rail 35 mm x 15 mm. To make electrical contact, the devices are simply engaged.

**Profile Rail K-DUCT with Power Rail**

The profile rail K-DUCT is an aluminum profile rail with Power Rail insert and two integral cable ducts for system and field cables. Due to this assembly no additional cable guides are necessary.

---

*Power Rail and Profile Rail must not be fed via the device terminals of the individual devices!*

---

**Subject to reasonable modifications due to technical advances.**

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SMART Transmitter Power Supply

Features

- 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
- Low power dissipation
- Line fault detection (LFD)
- Up to SIL3 acc. to IEC 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. It transfers the analog input signal to the safe 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 protocol:
- HART

Connection

Assembly

Connection diagram showing the power supply and fault detection components.

SMART Transmitter Power Supply

HIC2025ES

 Zones 0, 1, 2 Div. 1, 2

 Zones 2 Div. 2
### General specifications

| Signal type | Analog input |

### Supply

| Connection | SL1: 1a - 1b (-); 2a - 2b (+) |
| Rated voltage | 19 ... 30 V DC via Termination Board |
| Ripple | ≤ 10 % |
| Rated current | ≤ 50 mA |
| Power loss | ≤ 800 mW |
| Power consumption | ≤ 1.2 W |

### Input

| Connection | SL2: 5a (+), 5b (-) or 5a (+), 1b (-) |
| Input signal | 4 ... 20 mA, limited to approx. 27 mA reverse polarity protected |
| Line fault detection | downsizing ≤ 3 mA; upscaling ≥ 22 mA |
| Voltage drop | \( U_d \approx 5 \text{ V} \) on SL2: 5a (+), 1b (-) |
| Available voltage | ≥ 15 V at 20 mA on SL2: 5a (+), 5b (-) |

### Output

| Connection | SL1: 8a (+), 7a (-) |
| Load | 0 ... 300 Ω (source mode) |
| Output signal | 4 ... 20 mA or 1 ... 5 V (on 250 Ω, 0.1 % internal shunt) |
| Ripple | 20 mV rms |

### Error message output

Output type: fault bus signal, open collector transistor

### 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 \( V_{pp} \) signal 0 ... 3 kHz (-3 dB) control side into the field side: bandwidth with 0.5 \( V_{pp} \) signal 0 ... 3 kHz (-3 dB) |
| Setting time | ≤ 200 ms |
| Rise time/fall time | 10 to 90 % ≤ 20 ms |

### Electrical isolation

Input/Output: safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V

### Directive conformity


### Ambient conditions

| Ambient temperature | -20 ... 70 °C (-4 ... 158 °F) |

### Mechanical specifications

| Protection degree | IP20 |
| Mass | approx. 100 g |
| Dimensions | 12.5 x 128 x 106 mm (0.5 x 5.1 x 4.2 in) |

### Data for application in connection with Ex-areas

| EC-Type Examination Certificate | CESI 10 ATEX 063, for additional certificates see www.pepperl-fuchs.com |

| Group, category, type of protection | \( \mathbb{II} (1) \mathbb{GD} [\text{Ex ia}] \mathbb{lIC}, [\text{Ex iaD}] [\text{circuit(s) in zone 0/1/2/20/21/22}] \mathbb{I} (\mathbb{M1}) [\text{Ex iaD}] \) |
| Input | Ex ia, Ex iaD |

### Maximum safe voltage

| \( U_m \) | 253 V AC (Attention! \( U_m \) is no rated voltage.) |

### Equipment

| Voltage | \( U_o \) 25.2 V |
| Current | \( I_o \) 100 mA |
| Power | \( P_o \) 630 mW |

### Equipment

| Voltage | \( U_i \) 30 V |
| Current | \( I_i \) 128 mA |
| Voltage | \( U_o \) 7.2 V |
The configuration is performed in the following way:

- Remove the module from termination board, pulling-up the tab on each side of the module.
- Set the DIP switches according to the figure.

### Configuration

#### Switch position

<table>
<thead>
<tr>
<th>Function</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current source 4 mA ... 20 mA</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>Voltage source 1 V ... 5 V</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>Current sink 4 mA ... 20 mA</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>

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

The configuration is performed in the following way:

- Remove the module from termination board, pulling-up the tab on each side of the module.
- Set the DIP switches according to the figure.

### Transfer characteristic

- **Failure information**
- **Measuring information**
- **Failure information**

<table>
<thead>
<tr>
<th>I [mA]</th>
<th>3</th>
<th>3.8</th>
<th>20.5</th>
<th>22</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The pins for this device are trimmed to polarize it according to its safety parameter. Do not change!
Features

- 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 SIL3 acc. to IEC 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. It transfers the analog input signal to the safe 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 HiD Termination Board.

Application

The device supports the following SMART protocol:

- HART

Connection
## Technical data

### General specifications

**Signal type**
Analog input

**Supply**

**Connection**
SL1: 1a - 1b (-); 2a - 2b (+) via Termination Board

**Rated voltage**
19 ... 30 V DC via Termination Board

**Ripple**
≤ 10 %

**Rated current**
≤ 50 mA

**Power loss**
≤ 800 mW

**Power consumption**
≤ 1.2 W

**Input**

**Connection**
SL2: 5a (+), 5b (-) or 5a (+), 1b (-)

**Input signal**
4 ... 20 mA , limited to approx. 27 mA reverse polarity protected

**Line fault detection**
downscaling ≤ 3 mA; upscaling ≥ 22 mA

**Voltage drop Ud**
approx. 5 V on SL2: 5a (+), 1b (-)

**Available voltage**
≥ 15 V at 20 mA on SL2: 5a (+), 5b (-)

### Output

**Connection**
SL1: 8a (+), 7a (-)

**Load**
0 ... 300 Ω (source mode)

**Output signal**
4 ... 20 mA or 1 ... 5 V (on 250 Ω, 0.1 % internal shunt)
4 ... 20 mA (sink mode), operating voltage 16 ... 28 V

**Ripple**
20 mV rms

**Error message output**

**Output type**
fault bus signal, open collector transistor

### 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**
hazardous area to safe area: bandwidth with 1 mA signal 0 ... 3 kHz (-3 dB)
safe area into the hazardous area: bandwidth with 0.5 Vpp signal 0 ... 3 kHz (-3 dB)

**Setting time**

≤ 200 ms

**Rise time/fall time**

10 to 90 % ≤ 20 ms

### Electrical 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

### Directive conformity

**Electromagnetic compatibility**

**Directive 2004/108/EC**
EN 61326-1:2006

**Conformity**

**Protection degree IEC 60079-11**

<table>
<thead>
<tr>
<th>Group, category, type of protection</th>
<th>Ex ia, Ex iaD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ambient conditions</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Ambient temperature</strong></td>
<td>-20 ... 70 °C (-4 ... 158 °F)</td>
</tr>
</tbody>
</table>

### Mechanical specifications

**Protection degree**
IP20

**Mass**
approx. 140 g

**Dimensions**
18 x 106 x 128 mm (0.7 x 4.2 x 5 in)

### Data for application in connection with Ex-areas

**EC-Type Examination Certificate**
CESI 10 ATEX 063 , for additional certificates see www.pepperl-fuchs.com

**Group, category, type of protection**

<table>
<thead>
<tr>
<th>Ex ia</th>
<th>IIC</th>
<th>[Ex iaD] [circuit(s) in zone 0/1/2/20/21/22]</th>
<th>(M1)</th>
<th>[Ex iaD]</th>
<th>(M1)</th>
</tr>
</thead>
</table>

**Input**
Ex ia, Ex iaD

**Maximum safe voltage**

<table>
<thead>
<tr>
<th>Supply</th>
<th>253 V AC (Attention! U_m is no rated voltage.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>SL2: 5a (+), 5b (-)</td>
</tr>
<tr>
<td>Voltage</td>
<td>U_m</td>
</tr>
<tr>
<td>Current</td>
<td>I_m</td>
</tr>
<tr>
<td>Power</td>
<td>P_m</td>
</tr>
<tr>
<td>Equipment</td>
<td>SL2: 5a (+), 1b (-)</td>
</tr>
<tr>
<td>Voltage</td>
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<tr>
<td>Voltage</td>
<td>U_0</td>
</tr>
</tbody>
</table>
**Technical data**

### Factory settings:
- Output as current source: 4 mA ... 20 mA

#### Configuration

The configuration is performed in the following way:
- Remove the module from termination board, pulling-up the tab on each side of the module.
- Set the DIP switches according to the figure.

#### Device coding

**Termination Board**

- **Top view**
  - Hazardous area
  - Safe area
  - Insert polarizing pin
  - Don't insert polarizing pin

**Module**

- **Bottom view**
  - Hazardous area
  - Safe area
  - Pin to be trimmed
  - Pin untrimmed
Transfer characteristic

![Graph showing transfer characteristic with failure and measuring information areas labeled.](image-url)