

Features

- 1-channel signal conditioner
- 24 V DC supply
- Input bipolar current and voltage sources
- Relay contact output
- Accuracy 0.1 %
- Restart inhibit
- Configurable by DIP switches and software
- Connection via screw terminals

Function

This signal conditioner provides the galvanic isolation between field circuits and control circuits.

The device supplies 2-wire and 3-wire transmitters

The device has an input for bipolar current and voltage sources.

The device actuates a relay contact output when it reaches the adjusted limit value.

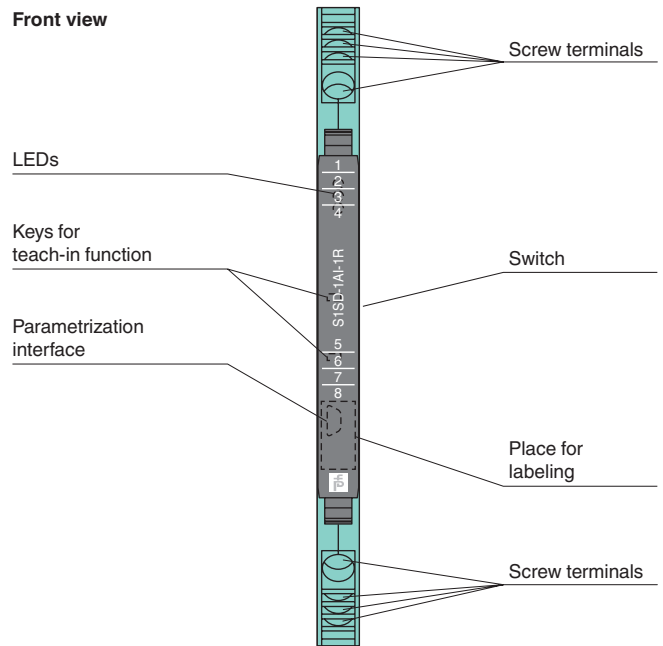
The device is easily configured by the use of DIP switches or software.

The device has an adjustable on delay, an off delay, or an one-shot function for the relay contact output.

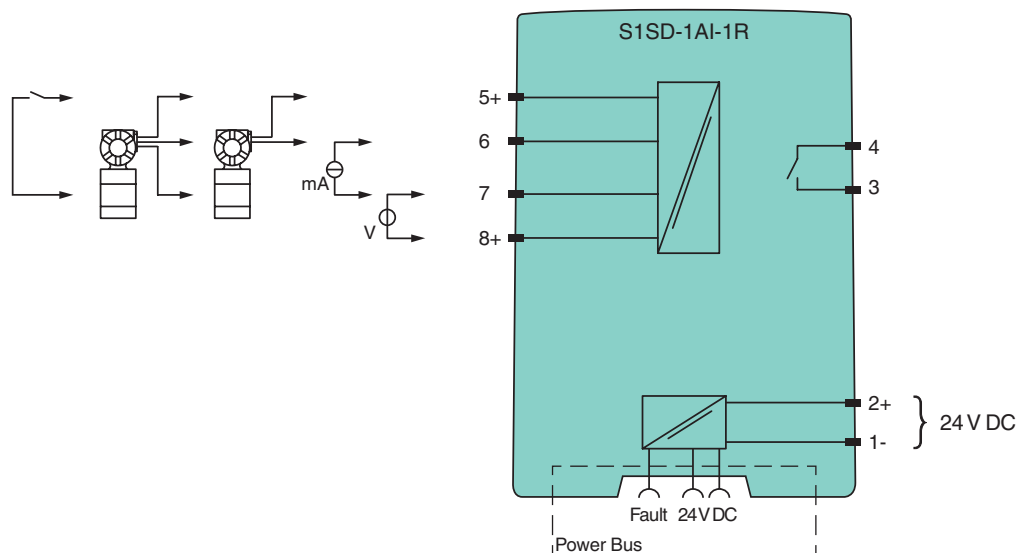
The teach-in function can be used to teach in the limit value.

The device can be powered via terminals or Power Bus.

Assembly



Connection



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General specifications	
Signal type	Analog input
Supply	
Connection	Power Bus or terminals 1-, 2+
Rated voltage U_r	16.8 ... 31.2 V DC
Power dissipation	0.6 W
Power consumption	0.8 W
Interface	
Programming interface	programming socket
Input	
Connection side	field side
Transmission range	linearity range: unipolar -1 ... 110 % bipolar -110 ... 110 %
Input I	
Connection	terminals 5, 6, 7-
Input signal	0/4 ... 20 mA , 0/2 ... 10 mA , ± 10 mA , ± 20 mA , max. 50 mA
Input resistance	$\leq 25 \Omega$
Input II	
Connection	terminals 7-, 8+
Input signal	0/1 ... 5 V , 0/2 ... 10 V , ± 5 V , ± 10 V , max. 30 V
Input resistance	$> 1 \text{ M}\Omega$
Input III	
Connection	terminals 5+, 6-
Input signal	0/4 ... 20 mA
Available voltage	16 V at 20 mA
Open circuit voltage/short-circuit current	$\leq 22 \text{ V} / 30 \text{ mA}$
Input IV	
Connection	terminals 5, 7
Input type	reset restart inhibit
Output	
Connection side	control side
Connection	terminals 3, 4:
Output	signal, relay
Contact loading	253 V AC/2 A/cos $\phi > 0.7$; 126.5 V AC/2 A/cos $\phi > 0.7$; 30 V DC/2 A resistive load
Minimum switch current	2 mA / 24 V DC
Energized/De-energized delay	$\leq 20 \text{ ms} / \leq 20 \text{ ms}$
Mechanical life	10^7 switching cycles
Collective error message	Power Bus
Transfer characteristics	
Accuracy	$\leq 0.1 \%$ of full-scale value
Influence of ambient temperature	$< 100 \text{ ppm/K}$ of full-scale value
Galvanic isolation	
Output/power supply	safe electrical isolation by reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff} test voltage 3 kV, 50 Hz, 1 min
Input/Other circuits	safe electrical isolation by reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff} test voltage 3 kV, 50 Hz, 1 min
Indicators/settings	
Display elements	LEDs
Control elements	DIP-switch keys
Configuration	via DIP switches via keys via software
Labeling	space for labeling at the front
Directive conformity	
Electromagnetic compatibility Directive 2014/30/EU	EN 61326-1:2013 (industrial locations)
Low voltage Directive 2014/35/EU	EN 61010-1:2010
Conformity	
Degree of protection	IEC 60529:2001
Protection against electrical shock	EN 61010-1:2010
Ambient conditions	
Ambient temperature	-25 ... 70 °C (-13 ... 158 °F)

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Storage temperature	-40 ... 85 °C (-40 ... 185 °F)
Damaging gas	designed for operation in environmental conditions acc. to ISA-S71.04-1985, severity level G3
Mechanical specifications	
Degree of protection	IP20
Connection	screw terminals
Core cross-section	0.5 ... 2.5 mm ² (20 ... 14 AWG)
Mass	approx. 70 g
Dimensions	6.2 x 97 x 107 mm (0.24 x 3.82 x 4.21 inch) , housing type S1
Mounting	on 35 mm DIN mounting rail acc. to EN 60715:2001
General information	
Supplementary information	Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com .
Accessories	
Optional accessories	power feed module S1SD-2PF adapter with USB interface S-ADP-USB Power Bus POWERBUS-SETL5.*** Power Bus POWERBUS-SETH5.*** cover for DIN mounting rail POWERBUS-COV.250 end cap POWERBUS-CAP

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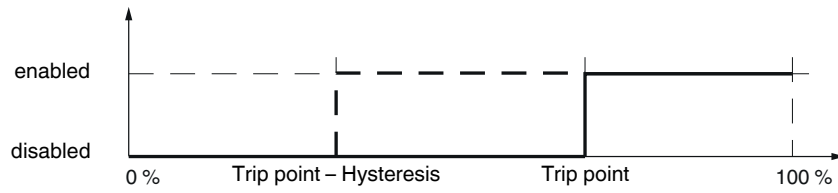
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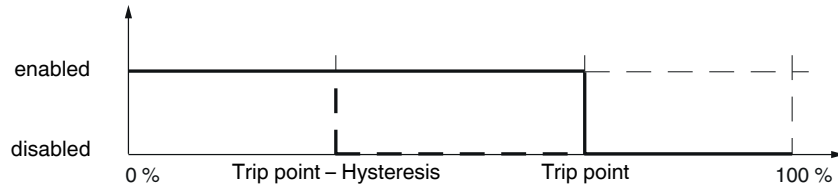
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Modes of operation

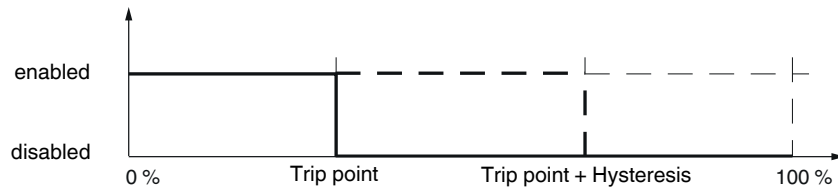
Trip mode MAX alarm, mode of operation active



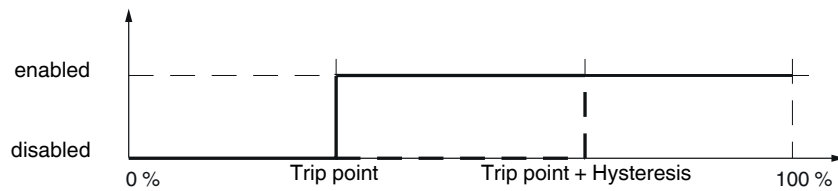
Trip mode MAX alarm, mode of operation passive



Trip mode MIN alarm, mode of operation active



Trip mode MIN alarm, mode of operation passive



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Configuration

Configuration using DIP switches

Use the DIP switches to configure the device. The following options are available:

DIP switches	S1									
	1	2	3	4	5	6	7	8	9	10
Input										
PC setting										
0 ... 20 mA	ON									
4 ... 20 mA		ON								
- 20 ... 20 mA	ON	ON								
ABS (-20 ... 20 mA)			ON							
0 ... 10 mA	ON		ON							
2 ... 10 mA		ON	ON							
-10 ... 10 mA	ON	ON	ON							
4 ... 20 mA (NE 43)				ON						
0 ... 10 V	ON			ON						
2 ... 10 V		ON		ON						
-10 ... 10 V	ON	ON		ON						
ABS (-10 ... 10 V)			ON	ON						
0 ... 5 V	ON		ON	ON						
1 ... 5 V		ON	ON	ON						
- 5 ... 5 V	ON	ON	ON	ON						
Output										
MIN alarm										
MAX alarm					ON					
Mode of operation active										
Mode of operation passive						ON				
Time function										
Off										
On delay								ON		
Off delay							ON			
One-shot function							ON	ON		
0,5 s										
1 s										ON
5 s									ON	
10 s									ON	ON

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DIP switches	S2									
	1	2	3	4	5	6	7	8	9	10
Hysteresis										
0,1 %										
1 %		ON								
2 %		ON	ON							
5 %	ON									
10 %	ON		ON							
20 %	ON	ON								
30 %	ON	ON	ON							

DIP switches		S2									
Unipolar limit value	Bipolar limit value	1	2	3	4	5	6	7	8	9	10
-5 %	-110 %										
-4 %	-108 %										ON
-3 %	-106 %									ON	
-2 %	-104 %									ON	ON
-1 %	-102 %								ON		
0 %	-100 %								ON		ON
1 %	-98 %								ON	ON	
2 %	-96 %								ON	ON	ON
3 %	-94 %							ON			
4 %	-92 %							ON			ON
5 %	-90 %							ON		ON	
6 %	-88 %							ON		ON	ON
7 %	-86 %							ON	ON		
8 %	-84 %							ON	ON		ON
9 %	-82 %							ON	ON	ON	
10 %	-80 %							ON	ON	ON	ON
11 %	-78 %						ON				
12 %	-76 %						ON				ON
13 %	-74 %						ON			ON	
14 %	-72 %						ON			ON	ON
15 %	-70 %						ON		ON		
16 %	-68 %						ON		ON		ON
17 %	-66 %						ON		ON	ON	
18 %	-64 %						ON		ON	ON	ON
19 %	-62 %						ON	ON			
20 %	-60 %						ON	ON			ON
21 %	-58 %						ON	ON		ON	
22 %	-56 %						ON	ON		ON	ON
23 %	-54 %						ON	ON	ON		
24 %	-52 %						ON	ON	ON		ON
25 %	-50 %						ON	ON	ON	ON	
26 %	-48 %						ON	ON	ON	ON	ON
27 %	-46 %					ON					
28 %	-44 %					ON					ON
29 %	-42 %					ON				ON	
30 %	-40 %					ON				ON	ON
31 %	-38 %					ON			ON		
32 %	-36 %					ON			ON		ON
33 %	-34 %					ON			ON	ON	
34 %	-32 %					ON			ON	ON	ON
35 %	-30 %					ON		ON			
36 %	-28 %					ON		ON			ON
37 %	-26 %					ON		ON		ON	
38 %	-24 %					ON		ON		ON	ON
39 %	-22 %					ON		ON	ON		
40 %	-20 %					ON		ON	ON		ON
41 %	-18 %					ON		ON	ON	ON	
42 %	-16 %					ON		ON	ON	ON	ON
43 %	-14 %					ON	ON				
44 %	-12 %					ON	ON				ON

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DIP switches		S2									
Unipolar limit value	Bipolar limit value	1	2	3	4	5	6	7	8	9	10
45 %	-10 %					ON	ON			ON	
46 %	-8 %					ON	ON			ON	ON
47 %	-6 %					ON	ON		ON		
48 %	-4 %					ON	ON		ON		ON
49 %	-2 %					ON	ON		ON	ON	
50 %	0 %					ON	ON		ON	ON	ON
51 %	2 %					ON	ON	ON			
52 %	4 %					ON	ON	ON			ON
53 %	6 %					ON	ON	ON		ON	
54 %	8 %					ON	ON	ON		ON	ON
55 %	10 %					ON	ON	ON	ON		
56 %	12 %					ON	ON	ON	ON		ON
57 %	14 %					ON	ON	ON	ON	ON	
58 %	16 %					ON	ON	ON	ON	ON	ON
59 %	18 %				ON						
60 %	20 %				ON						ON
61 %	22 %				ON					ON	
62 %	24 %				ON					ON	ON
63 %	26 %				ON				ON		
64 %	28 %				ON				ON		ON
65 %	30 %				ON				ON	ON	
66 %	32 %				ON				ON	ON	ON
67 %	34 %				ON			ON			
68 %	36 %				ON			ON			ON
69 %	38 %				ON			ON		ON	
70 %	40 %				ON			ON		ON	ON
71 %	42 %				ON			ON	ON		
72 %	44 %				ON			ON	ON		ON
73 %	46 %				ON			ON	ON	ON	
74 %	48 %				ON			ON	ON	ON	ON
75 %	50 %				ON		ON				
76 %	52 %				ON		ON				ON
77 %	54 %				ON		ON			ON	
78 %	56 %				ON		ON			ON	ON
79 %	58 %				ON		ON		ON		
80 %	60 %				ON		ON		ON		ON
81 %	62 %				ON		ON		ON	ON	
82 %	64 %				ON		ON		ON	ON	ON
83 %	66 %				ON		ON	ON			
84 %	68 %				ON		ON	ON			ON
85 %	70 %				ON		ON	ON		ON	
86 %	72 %				ON		ON	ON		ON	ON
87 %	74 %				ON		ON	ON	ON		
88 %	76 %				ON		ON	ON	ON		ON
89 %	78 %				ON		ON	ON	ON	ON	
90 %	80 %				ON		ON	ON	ON	ON	ON
91 %	82 %				ON	ON					
92 %	84 %				ON	ON					ON
93 %	86 %				ON	ON				ON	
94 %	88 %				ON	ON				ON	ON
95 %	90 %				ON	ON			ON		
96 %	92 %				ON	ON			ON		ON
97 %	94 %				ON	ON			ON	ON	
98 %	96 %				ON	ON			ON	ON	ON
99 %	98 %				ON	ON		ON			
100 %	100 %				ON	ON		ON			ON
101 %	102 %				ON	ON		ON		ON	
102 %	104 %				ON	ON		ON		ON	ON
103 %	106 %				ON	ON		ON	ON		
104 %	108 %				ON	ON		ON	ON		ON

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DIP switches		S2									
Unipolar limit value	Bipolar limit value	1	2	3	4	5	6	7	8	9	10
105 %	110 %				ON	ON		ON	ON	ON	
106 %	112 %				ON	ON		ON	ON	ON	ON
107 %	114 %				ON	ON	ON				
108 %	116 %				ON	ON	ON				ON
109 %	118 %				ON	ON	ON				ON
110 %	120 %				ON	ON	ON				ON
Teach-In (limit value)					ON	ON	ON	ON	ON	ON	

Configuration using software

Use software to configure the device. Enable the configuration by setting the DIP switches S1.1 to S1.4 to OFF.

The device is equipped with a programming socket on the front. A corresponding adapter is available as an accessory. This adapter can be used to configure the device. The software is available to download from www.pepperl-fuchs.com.

Factory Settings

In the delivery state the DIP switches on the device side are in the OFF position. This setting corresponds to the "PC setting" option. The following values are preset with this setting.

Function	Setting
Input	0 ... 20 mA
Trip mode	MIN alarm
Mode of operation	active
Limit value	50 %
Hysteresis	1 %
Time function	Off

Status Displays

The following status displays are provided on the front of the device.

LED	Display	Meaning
Green LED	On	Power supply OK
	Off	Insufficient power supply, device not functioning
Yellow LED	On	Relay energized
	Off	Relay de-energized
Red LED	On	Internal device fault, replace device
	Flashing	Line fault
Blue LEDs	Upper LED on	Positive correction value active
	Lower LED on	Negative correction value active
	One LED flashing briefly	Correction value stored
	Both LEDs flashing briefly	Teach-in value stored

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Additional Functions

Teach-in function

The limit value can be taught-in via the buttons on the front panel.

1. Activate the teach-in function via DIP switches S2.4 to S2.9.
2. The output functions MIN/MAX alarm, hysteresis and active/passive mode can remain unchanged.
3. Teach-in the limit value with one of the buttons. Press the button for more than 3 seconds.

Both blue LEDs flash briefly. The value is stored.

The new limit value can be read or changed via the software.

Correction function

The limit value can be shifted manually via the buttons on the front panel.

Use the upper button to shift up the limit value. Press the button for about 1 second. The limit value is shifted upwards by 0.5 %.

The upper blue LED flashes briefly. The value is stored. Then the upper blue LED lights up.

Use the lower button to shift down the limit value. Press the button for about 1 second. The limit value is shifted downwards by 0.5 %.

The lower blue LED flashes briefly. The value is stored. Then the lower blue LED lights up.

The new limit value can be read or changed via the software.

Restart inhibit

The restart inhibit is used to prevent the momentary exceedance of a switch point or faults from not being noticed by operating personnel. Faults can be caused by a lead breakage, lead short circuit, or insufficient supply voltage.

If the restart inhibit is active, the new status is retained after an output has been switched until one of the following events occurs.

- The device is restarted
- There is a reset signal on terminals 8 and 5

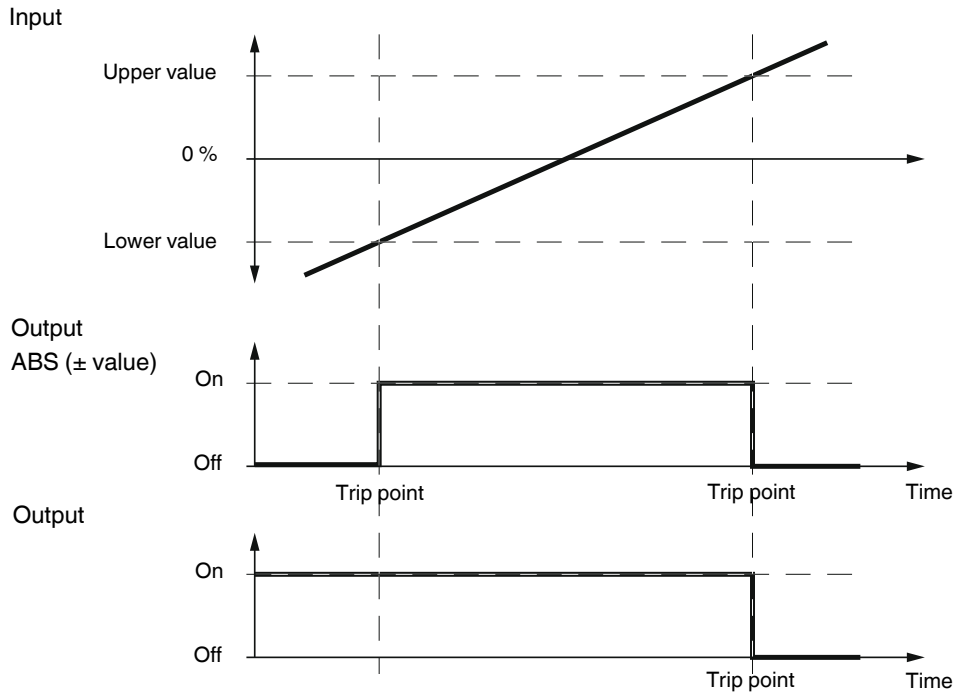
If one of these events occurs, the output is reset. The status is retained only in the following exceptional cases:

- The switch point continues to be exceeded.
- The fault continues to be present.

The restart inhibit cannot be used for 2-wire and 3-wire sensors.

Limit value function for bipolar signals

The limit values of bipolar signals can be set in the range from -100 % to +100 %. Bipolar signals can also be monitored with the additional limit value function ABS (\pm value). The limit values can be set in the range between 0 % and 100 %. The amount is calculated from the bipolar signal and monitored for limit value exceedances.



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