

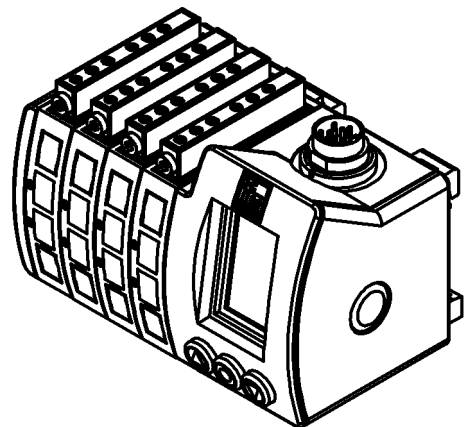
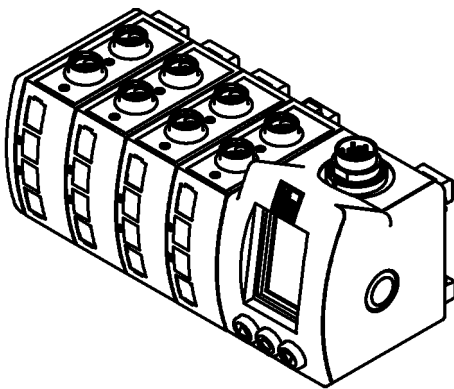
CE

Operating instructions  
Switching amplifier for fibre optics

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OOF

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# 1 Function and features

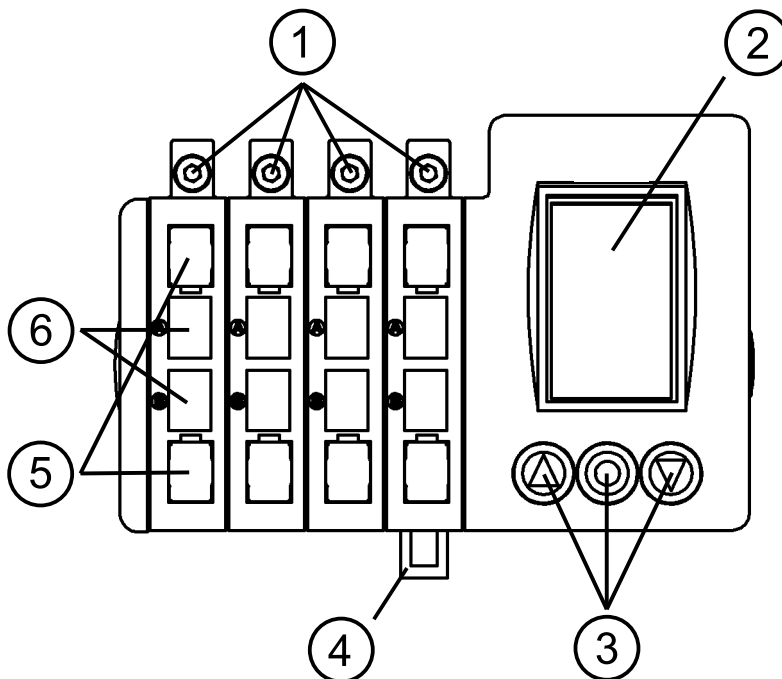
The switching amplifier detects objects without contact and indicates the result with an output signal.

- Type OOF.../KL for the connection of the ifm fibre optics types FE-11 and FT-11 (plastic fibre optics).
- Type OOF.../GL for the connection of the ifm fibre optics types FE-00 and FT-00 (glass fibre optics).
- The range is determined by the fibre optics.

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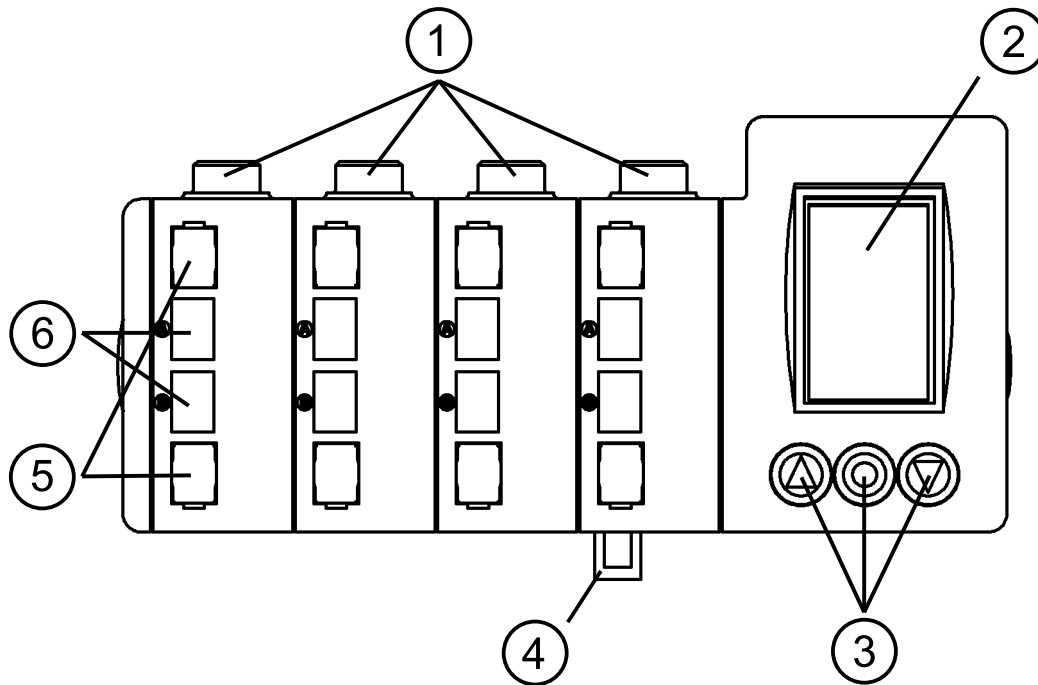
# 2 Operator interface

## Typ OOF.../KL Plastic fibre optics



- 1: fibre-optic fastening
- 2: display
- 3: pushbuttons
- 4: DIN-rail release
- 5: labels
- 6: LED

## Typ OOF.../GL Glass fibre optics



- 1: connections glass fibre optic
- 2: display
- 3: pushbuttons
- 4: DIN-rail release
- 5: labels
- 6: LED

These operating instructions show and describe the switching amplifier for 8 fibre optics as an example. The functions of the units with 2, 4 or 6 fibre optic connections are identical, except for the number of channels.

### 3 Installation

Fix the unit to a DIN rail (supplied with the unit).

#### 3.1 Attaching the fibre optics

The fibre optic connections are supplied with a protective cover.

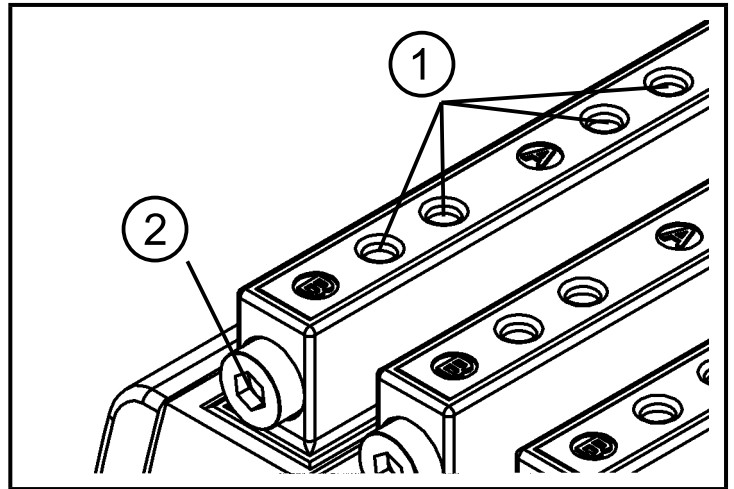
This must be removed before fitting the fibre optics.

### 3.1.1 Plastic fibre optics

Push the fibres into the sensor holes until you feel a slight resistance (O-ring). Push the fibres further until the stop (optic elements).

Turn the fastening screw to secure the fibres, **max. torque 0.3 Nm**.

When dismantling the fibres first loosen the fastening screw.

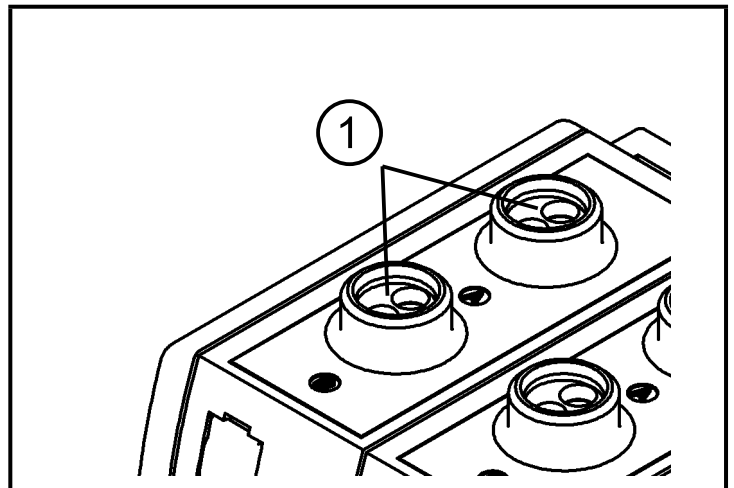


1: fibre optics connection  
2: fastening

### 3.1.2 Glass fibre optics

Push the fibre optic connection into the hole making sure that the diameters of the lugs match.

Fasten the coupling nut by hand.



1: fibre optics connection



If the fibre optics are not in contact with the optic elements, the sensing range is reduced.

For channels which are not used use the protective covers supplied to protect the optics from soiling.

## 4 Operation

You can navigate upwards and downwards in the menu or change values by pressing the pushbuttons [▲] and [▼].

The entries are selected and confirmed by means of the pushbutton [●].

Due to the simple menu navigation operation is not complicated and only requires few explanations.

If you do not activate any pushbutton for more than 5 min. the unit switches back to the operation display.

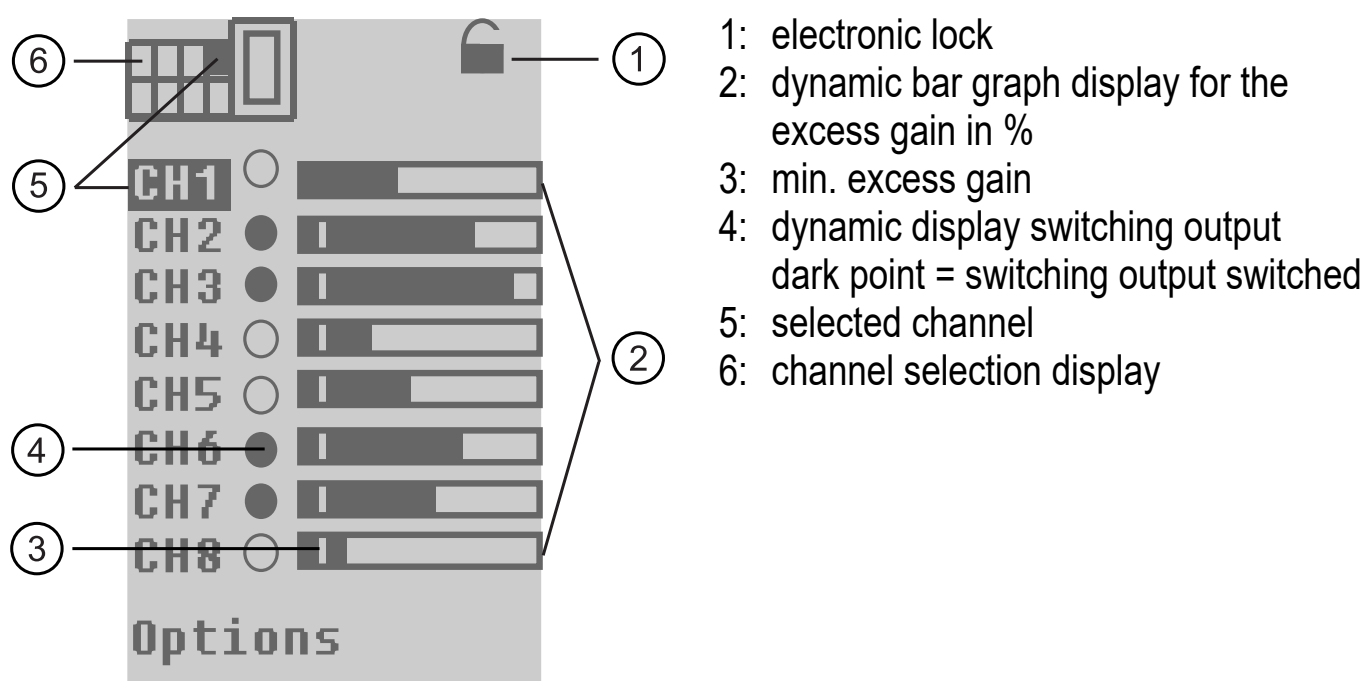
## 5 Initial setup

First select the menu language. The following languages are available: German, English and French.

Depending on the mounting position the display can be rotated by 180°.

After these basic settings have been made the unit switches to the operation display..

## 6 Operation display



## 7 Electrical connection

Disconnect power before connecting the unit (see last page or type label).

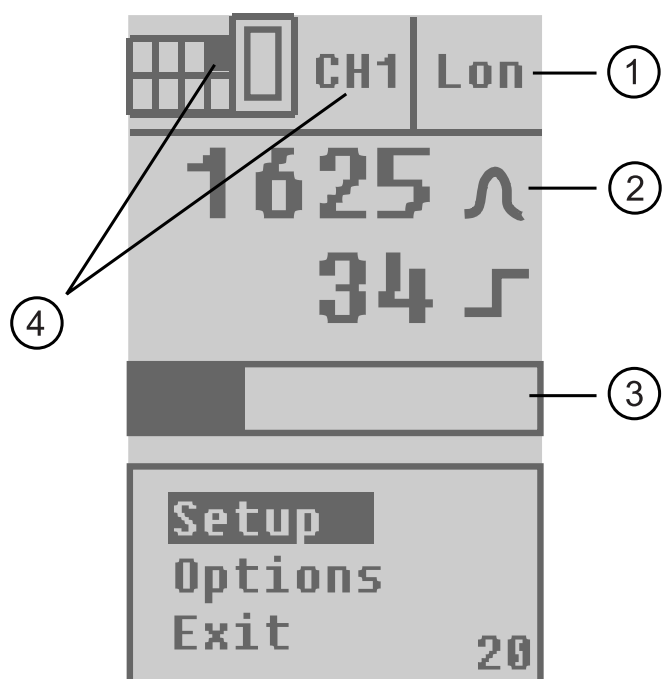
## 8 Basic settings

### 8.1 Automatic setting of the switching threshold

- Objects moving through the detection area of the optics
- Diffuse reflection optics (FT ...) and through-beam optics (FE ...)

Select the channel to be set by pressing [▲] [▼] until the required channel is highlighted. In the figure channel 1 has been selected. Confirm the selection by pressing [●].

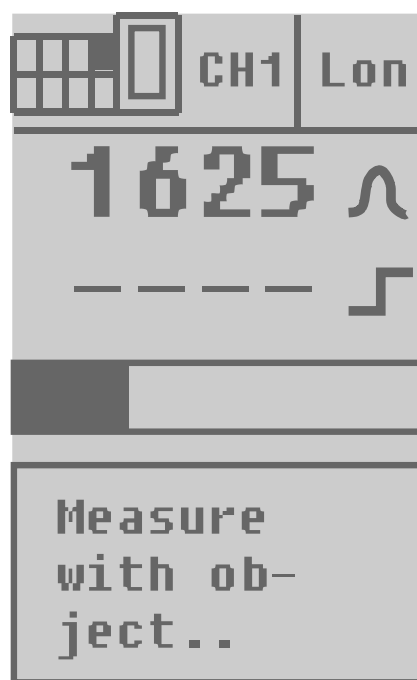
Select [Setup] from the menu and confirm the selection by pressing [●].



- 1: light-on mode activated  
(NO for diffuse reflection fibre optics  
and NC for through-beam fibre optics)
- 2: display signal strength from 0 ... 4095
- 3: bar graph display for signal strength
- 4: channel selection CH1

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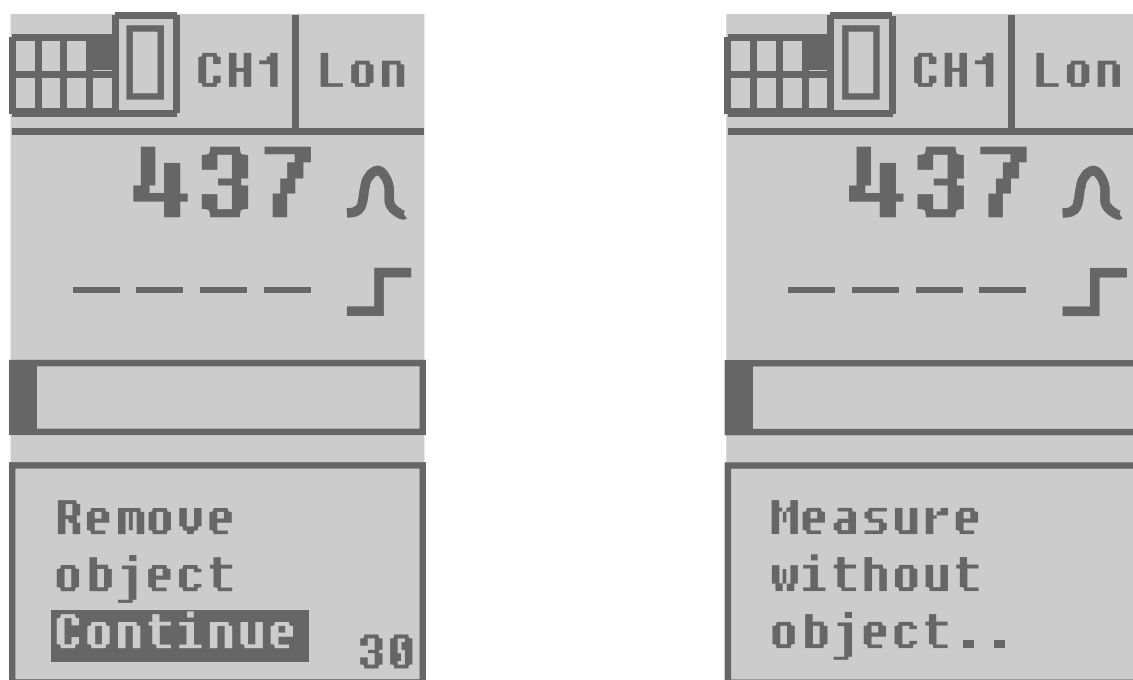
### 8.1.1 Setting with object



When you have placed the object in the detection area of the optics or if objects are moving through the detection area, press [●] once.

Now the measurement is carried out for approx. 2 s.

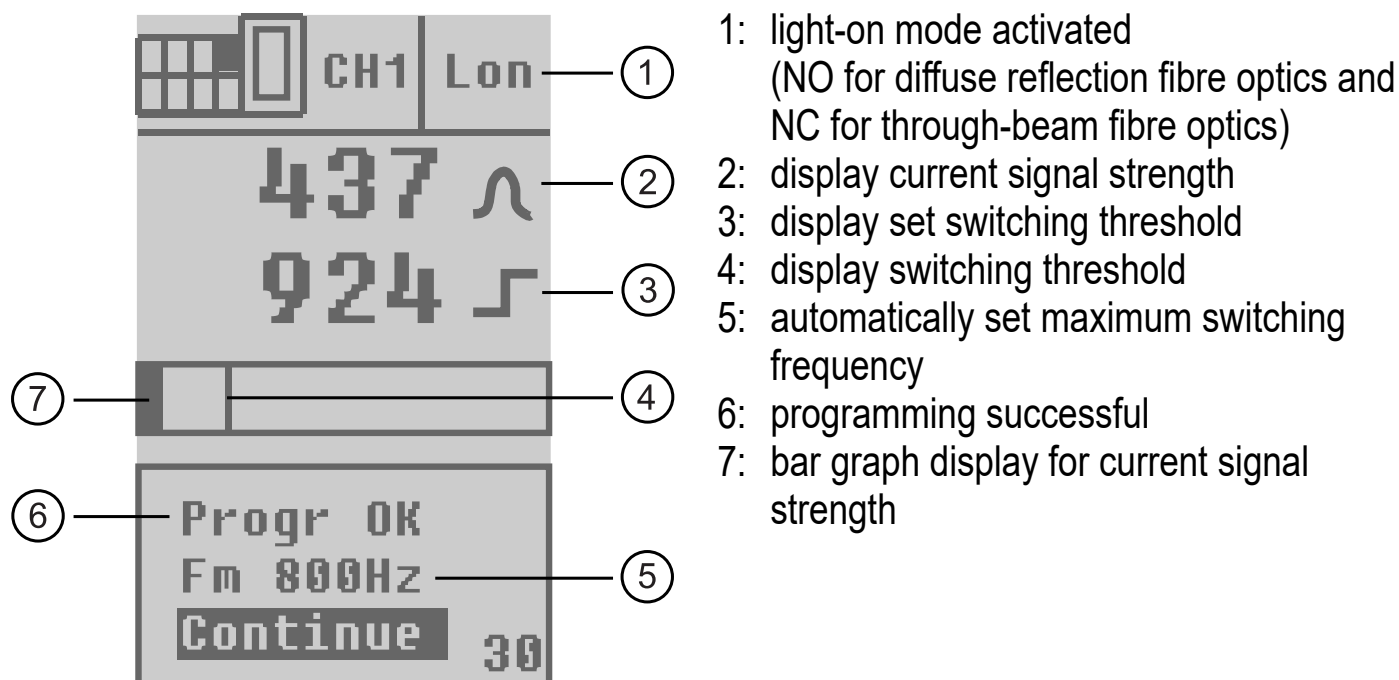
## 8.1.2 Setting without object



When you have removed the object from the detection area of the optics or if objects are moving through the detection area, press [●] once.

Now the measurement is carried out for approx. 2 s.

## 8.1.3 Switching threshold set automatically



To activate the settings confirm by pressing [●].

If the programming was not successful this is displayed in the menu [Refused]



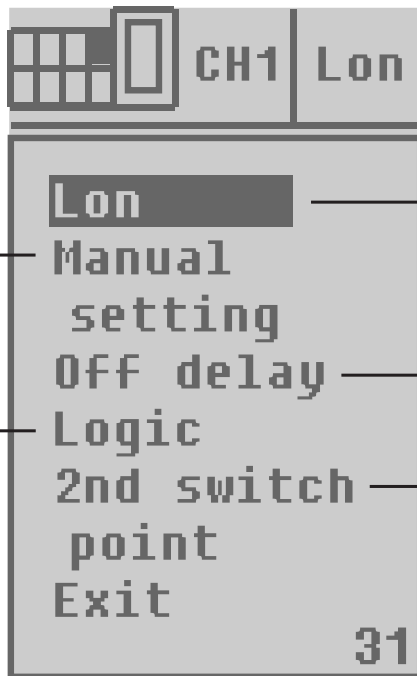
For lower values the resolution of the switch point is finer. In that case the threshold value is displayed accordingly with two decimal places..



# 9 Extended setting options

## 9.1 Setting of options

Select the menu point [Options] in the channel display and confirm the selection by pressing [●].



- 1: selection light-on/dark-on mode
- 2: off-delay can be set from 0 ... 100 ms
- 3: 2<sup>nd</sup> switch point for the activated channel (only available for channels 1, 3, 5, 7)
- 4: logic functions of the channels [and] , [or]
- 5: manual setting of the switching threshold

Select the required option by means of [▲] or [▼] and press [●] to confirm.

## 9.2 Programming of the output function

Select the function [Lon / Don] from the options.

Lon = NO for diffuse reflection fibre optics and NC for through-beam fibre optics

Don = NC for diffuse reflection fibre optics and NO for through-beam fibre optics



Select the required output function [Light on] for light-on mode or [Dark on] for dark-on mode and confirm the selection by pressing [●].

## 9.3 Manual setting of the switching threshold

Select the function [Manual setting] from the options.



The switching threshold can be modified by pressing [▲] or [▼].

Store the value by pressing [●].



For lower values the resolution of the switch point is finer. In that case the threshold value is displayed accordingly with two decimal places..

## 9.4 Setting the pulse stretching

Input signals shorter than the set time are extended to the set time (0...100 ms).  
Input signals longer than the set time are not extended.

Select the function [Off delay] from the options.

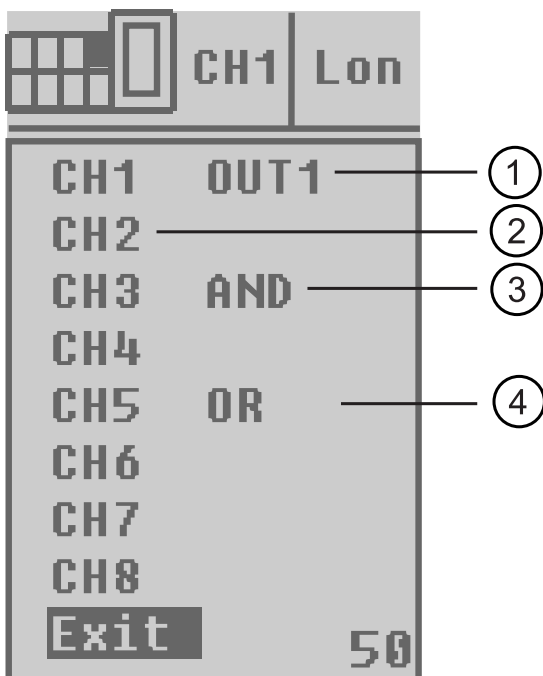


Set the required pulse stretching by pressing [▲] or [▼] and press [●] to confirm.

## 9.5 Logic functions

After selecting the menu point [Logic] further selection options are displayed in a new window.

Select the menu point [Set] for setting.



- 1: channel which is combined with the others
- 2: channel not combined
- 3: switching output channel 1 is combined AND with switching output channel 3t
- 4: switching output channel 1 is combined OR with switching output channel 5

Note: In this example switching output 1 is not combined with the switching outputs 2, 4, 6, 7, and 8.

A channel overview is now displayed in which you can select the required channel by pressing [▲] or [▼].

By pressing [●] you can now change between the functions [AND], [OR] or [empty field] = no logic function.

The functions always refer to the active channel (in the figure channel 1).

To delete all functions of this channel select „Delete“ from the menu.

By selecting the menu point „Exit“ you leave the selection window.

Explanation of the example:

The display shows that the switching output of channel 1 is logically combined AND with the switching output of channel 3 and that it is logically combined OR with the switching output of channel 5. All outputs are switched as usual, only output 1 switches depending on the selected logic function between outputs 1, 3 and 5.

## 9.6 Second switch point for a selected channel (only for channels 1, 3, 5, 7)

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Select the function [2<sup>nd</sup> switch point] from the options.

The second switch point enables the function of a fibre optic channel being evaluated at two switch points. The respective output signals are available at two switching outputs.



The second switch point is shown in the bar graph display. Like in the case of automatic setting of the switching threshold (page 6 and the following) the pushbutton [●] is pressed once with and once without the object also for the second switch point. The output for the second fibre optic on the activated unit (1-2, 3-4, 5-6 or 7-8) is used as output for the switching signal.

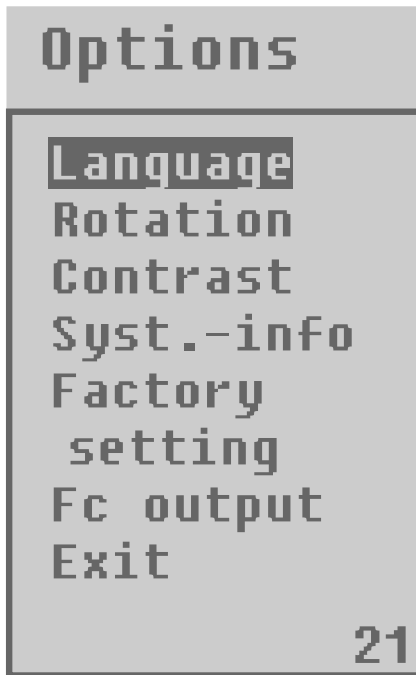
The function is deleted in the respective assigned channel (1,3,5,7) in the options of the channel display.



Example: If the second switch point of channel 1 is used the connection for the fibre optics cannot be used with channel 2.

## 10 Unit options

If you select the menu point [Options] in the operation display and confirm by means of the [•] button, you get to the following menu points:



[Language]

Here you can select the menu language: German, English or French

[Rotation]

Depending on the mounting position the display can be rotated by 180°.

[Contrast]

Here you can adjust the display contrast in steps.

[System info]

Here you can request the current firmware version.

[Factory setting]

Select this menu point if you want to cancel all settings you have made. The original factory settings are restored.

[Fc output]

Here you can select whether the switching output of the function check output is [Active high] or [Active low] in case of a fault.

[Exit]

Here you return to the operating mode.

## 11 Electronic lock

The electronic lock is activated by simultaneously pressing [▲] [▼] for 10 s in the operating display mode.

The electronic lock can be deactivated by simultaneously pressing [▲] [▼] for 10 s again in the operating display mode.

You can see the current status of the electronic lock (lock open - lock closed) in the operation display.

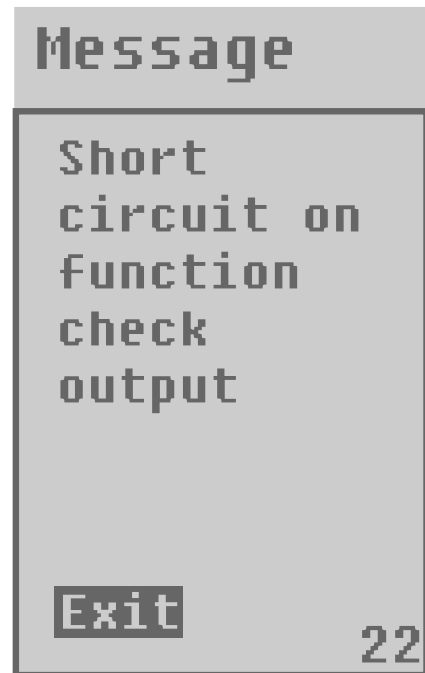
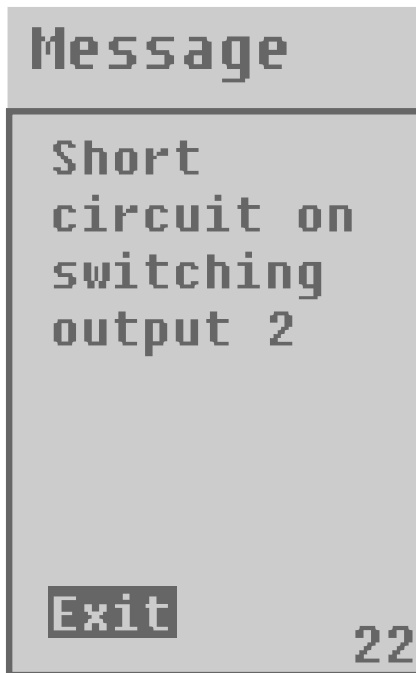
## 12 Function check output

- Switches in the case of incorrect object detection (error in object detection, maladjustment, soiling of the lenses) after approx. 4 s, it switches back approx. 4 s after the object is again correctly detected.
- Immediately switches in the case of a short circuit of the switching output, it switches back approx. 4 s after the fault has been rectified.
- Immediately switches in the case of an internal fault, it is only switched back by turning off the operating voltage and then on again.

## 13 Error messages

The error messages are reset automatically if the fault has been removed.

The error message can be suppressed by selecting [Exit] - confirm. After about 2.5 min. the message appears again.





# 14 Socket

M12 connector 2 - 4 channels Order No E11231			
Connection			
2 channels		4 channels	
BN	L+	BN	L+
BU	L-	BU	L-
BK	out 1	BK	out 1
WH	out 2	WH	out 2
GY		GY	out 3
PK		PK	out 4
VT	fc	VT	fc
OG		OG	

M16 connector 6 - 8 channels Order No E11645			
Connection			
6 channels		8 channels	
BN	L+	BN	L+
BU	L-	BU	L-
BK	out 1	BK	out 1
WH	out 2	WH	out 2
GY	out 3	GY	out 3
PK	out 4	PK	out 4
GY/PK	out 5	GY/PK	out 5
YE	out 6	YE	out 6
RD/BU		RD/BU	out 7
GN		GN	out 8
VT	fc	VT	fc
RD		RD	

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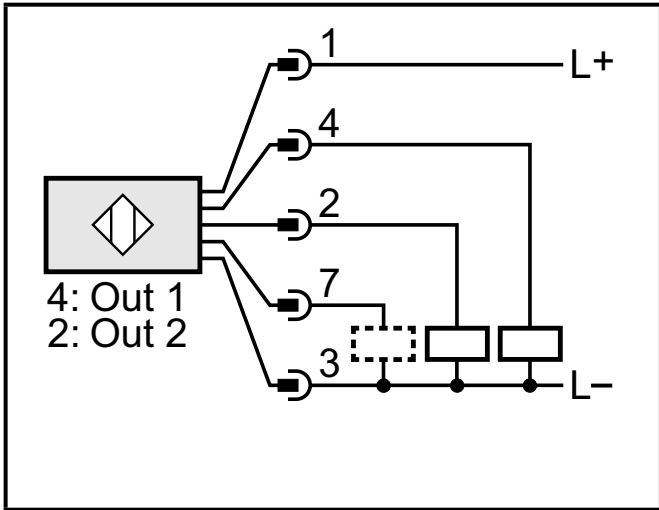
## Core colours

- BK black
- BN brown
- BU blue
- GN green
- GY grey
- PK pink
- OG orange
- RD red
- VT lilac
- WH white
- YE yellow

# 15 Wiring

## 15.1 DC PNP

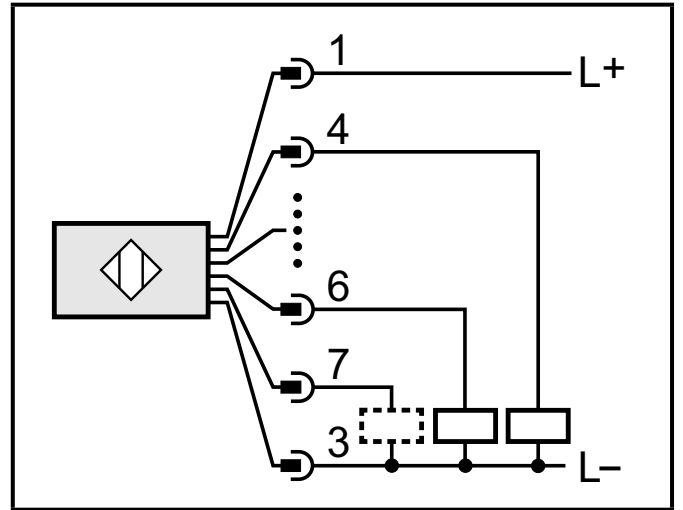
### 2 channels



4: Out 1  
2: Out 2

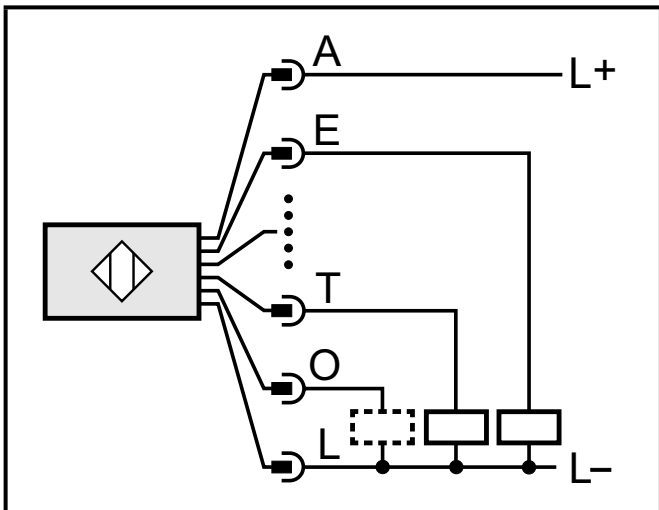
7: Function check output

### 4 channels



4: Out 1  
2: Out 2  
5: Out 3  
6: Out 4

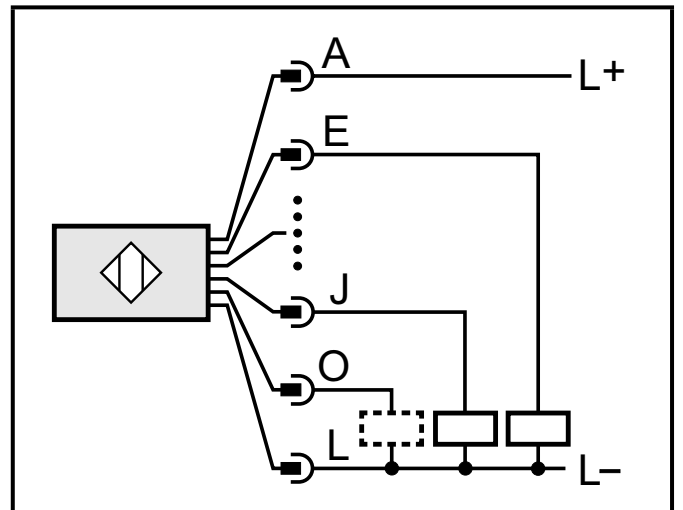
### 6 channels



E: Out 1  
P: Out 2  
S: Out 3  
G: Out 4  
C: Out 5  
T: Out 6

O: Function check output

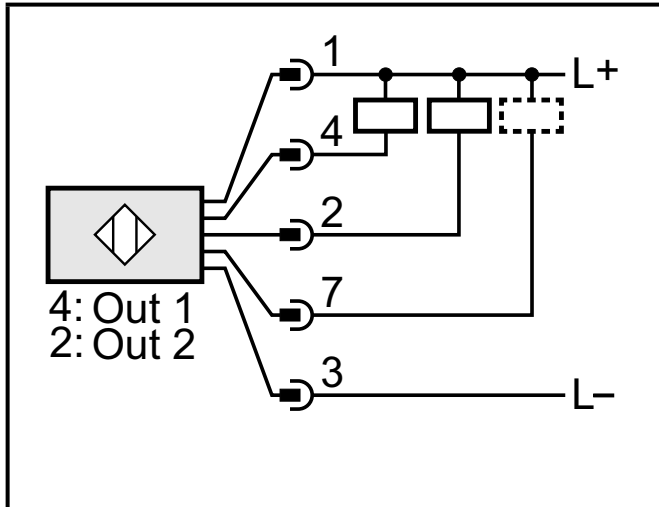
### 8 channels



E: Out 1  
P: Out 2  
S: Out 3  
G: Out 4  
C: Out 5  
T: Out 6  
N: Out 7  
J: Out 8

## 15.2 DC NPN

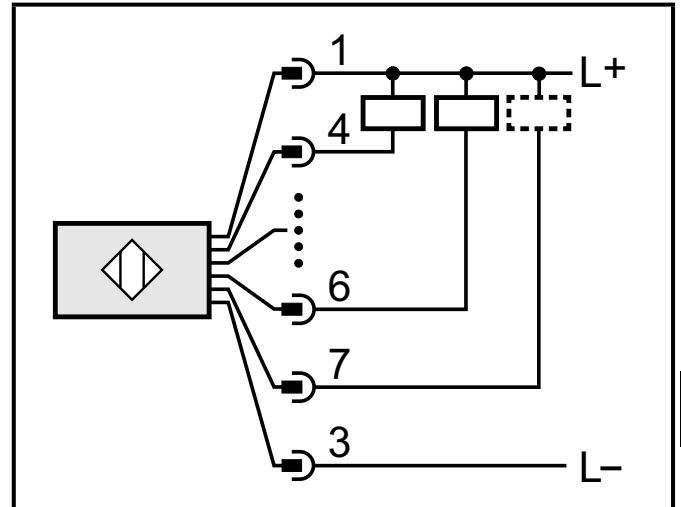
### 2 channels



4: Out 1  
2: Out 2

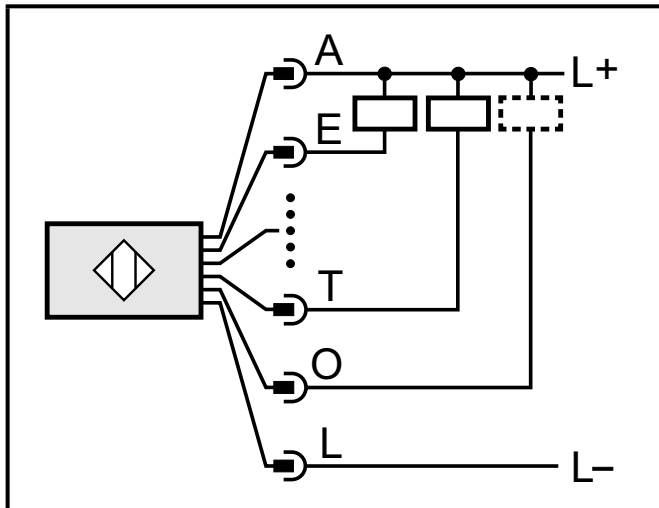
7: Function check output

### 4 channels



4: Out 1  
2: Out 2  
5: Out 3  
6: Out 4

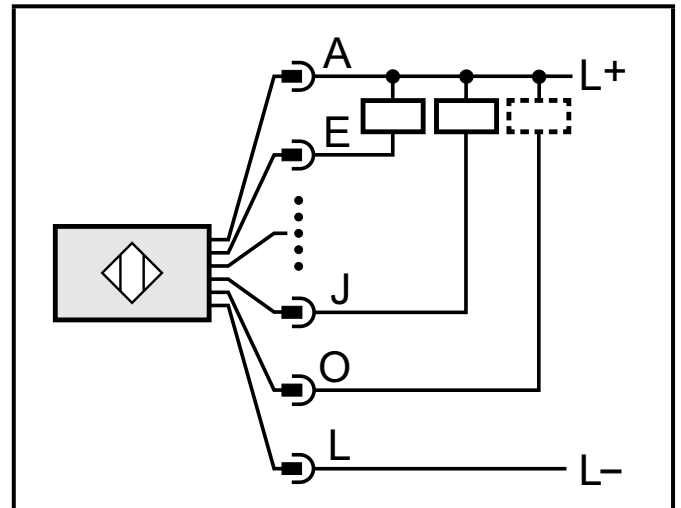
### 6 channels



E: Out 1  
P: Out 2  
S: Out 3  
G: Out 4  
C: Out 5  
T: Out 6

O: Function check output

### 8 channels



E: Out 1  
P: Out 2  
S: Out 3  
G: Out 4  
C: Out 5  
T: Out 6  
N: Out 7  
J: Out 8

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