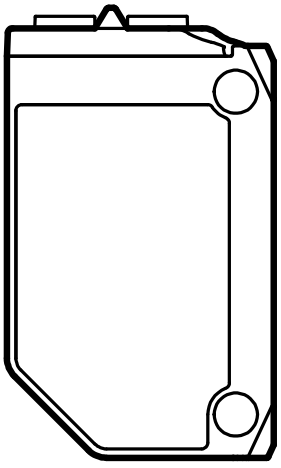
Operating instructions
Diffuse reflection sensor with background suppression

O6H7xx

UK

706457 / 00 11 / 2017



Contents

1 Preliminary note

1.1 Symbols used

▶ Instruction

> Reaction, result

[…] Designation of pushbuttons, buttons or indications

→ Cross-reference

Information
Supplementary note.

Important note
Non-compliance can result in malfunctions or interference.

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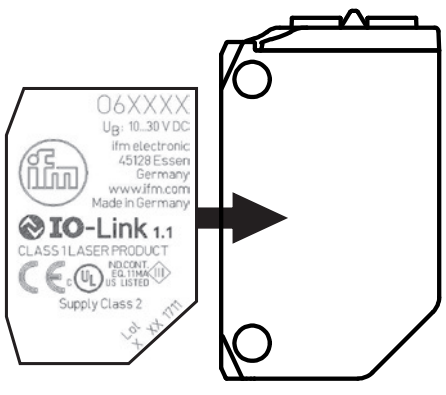
2 Safety instructions

According to the cULus approval

Caution - Use of controls or adjustments or procedures other than those specified herein may result in hazardous radiation exposure.

Visible laser light; CLASS 1 LASER PRODUCT.
IEC 60825-1 : 2007 and IEC 60825-1 : 2014
Complies with 21 CFR 1040.10 except for deviations pursuant to Laser Notice No. 50, dated June 2007.

Position of the product label	Additional label
	

3 Functions and features

The diffuse reflection sensor detects objects and materials without contact and indicates their presence by a switching signal.

4 Installation

▶ Align the diffuse reflection sensor to the object to be detected (Fig. 1).

> For exact alignment, use the accessories for fine adjustment.

▶ Secure it to a bracket.

Fig. 1

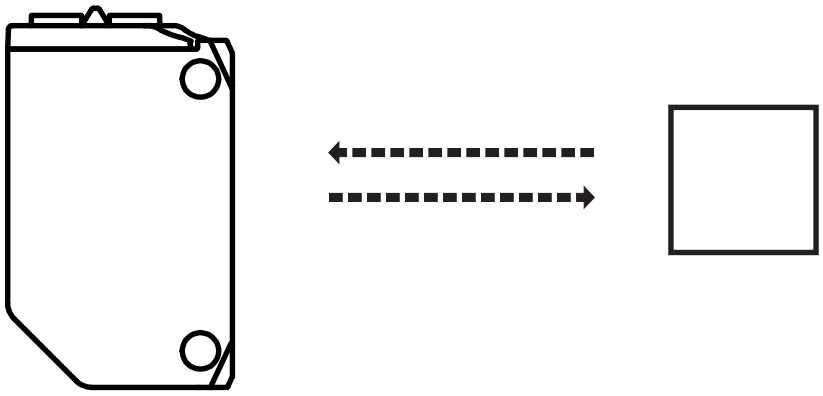


Fig. 2

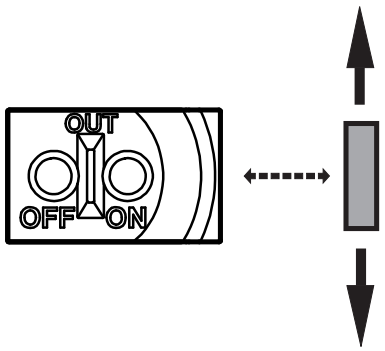
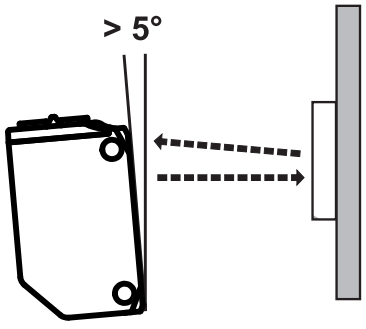


Fig. 3



Note

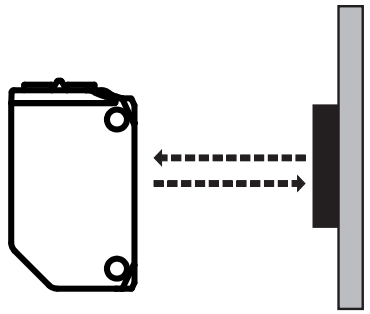
The objects to be detected are to move transversely to the lens of the sensor.

▶ In case of other directions of movement it should be tested before whether safe switching is guaranteed.

Shiny object

▶ In case of shiny object surfaces and less shiny background surfaces the sensor should be mounted at an angle of appox. 5 - 10°.

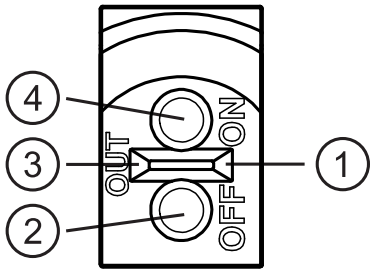
Fig. 4



Shiny background

▶ In case of shiny background surfaces and less shiny object surfaces the sensor should be mounted vertically to the background surface.

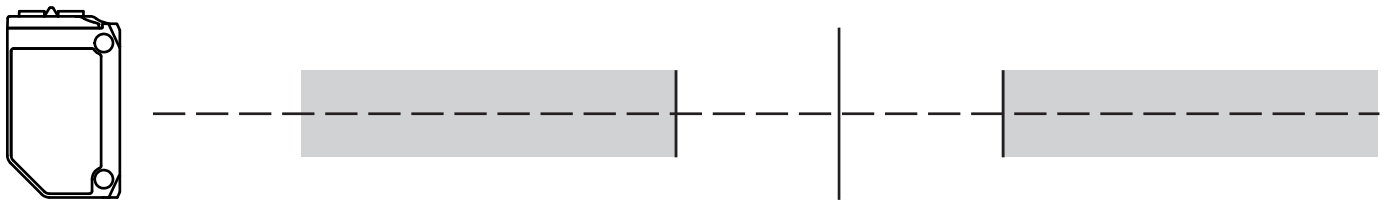
5 Operating and display elements



1: LED green - operation, stability indication
2: OUT OFF button
3: LED yellow - switching output active
4: OUT ON button

5.1 Stability indication

The green LED is lit when the supply voltage is applied and the sensor signal is stable.

	stable signal	switch point		stable signal
				
Light-on mode				
LED green	on	off	off	on
LED yellow	on	on	off	off
Dark-on mode				
LED green	on	off	off	on
LED yellow	off	off	on	on

6 Electrical connection

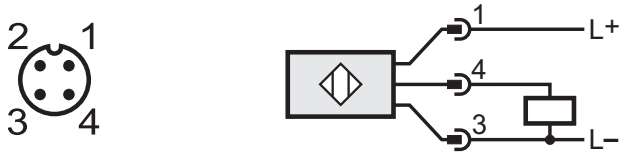
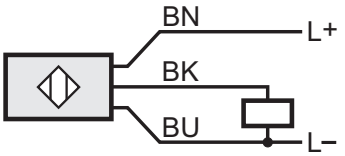
The unit must be connected by a qualified electrician.

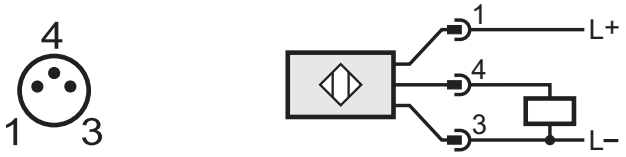
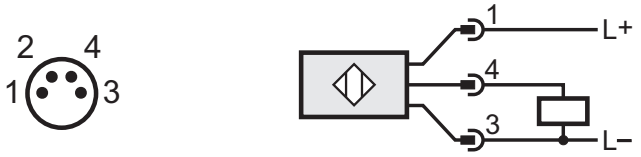
- ▶ The national and international regulations for the installation of electrical equipment must be adhered to.
- ▶ Ensure voltage supply to EN 50178.

▶ Disconnect power.

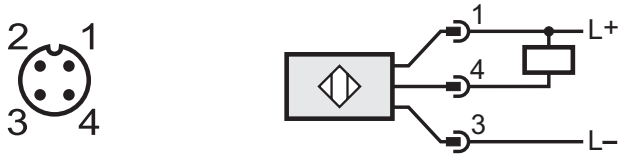
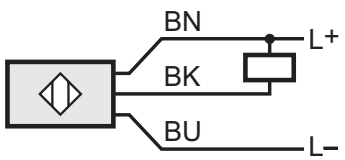
▶ Connect the unit as follows:

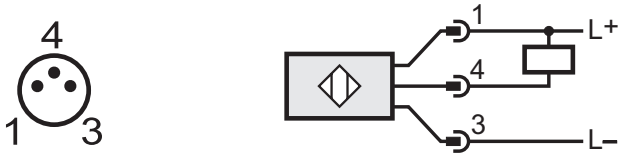
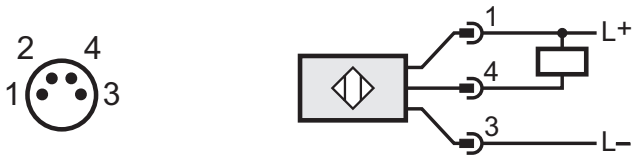
6.1 PNP

Connector M12 pigtail	Cable
	BK: black BN: brown BU: blue  Colours to DIN EN 60947-5-2

Connector M8 3-pin	Connector M8 4-pin
	

6.2 NPN

Connector M12 pigtail	Cable
	BK: black BN: brown BU: blue  Colours to DIN EN 60947-5-2

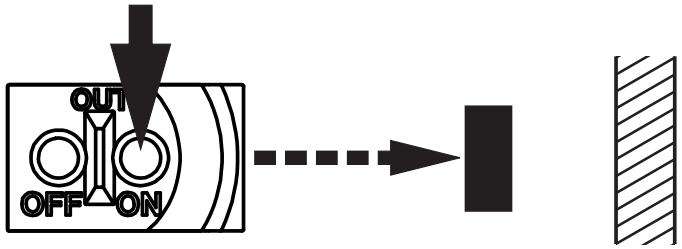
Connector M8 3-pin	Connector M8 4-pin
	

7 Settings

7.1 Settings on the sensor

7.1.1 The sensor is to switch when the object is detected

Fig. 1



▶ Position the object.

▶ Press [OUT ON] for > 2 s.

> The yellow LED flashes.

> The setting of the range with object is made by releasing [OUT ON].

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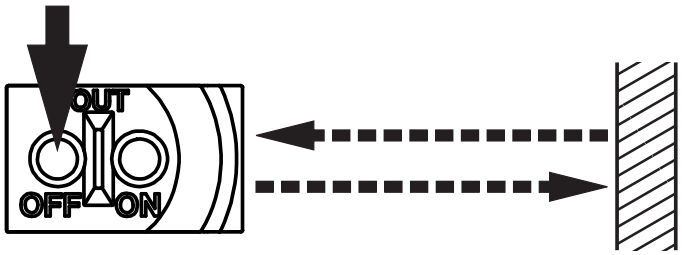
Fig. 2



▶ Remove the object

▶ Press [OUT OFF].

> The setting of the range without object is made by releasing [OUT OFF].

> The yellow LED goes out. Programming is finished.

7.1.2 The sensor is not to switch when the object is detected

▶ Position the object (see figure 1) and press [OUT OFF] for > 2 s.

▶ Remove the object (see figure 2) and press [OUT ON].

The setting can also be carried out first without object and then with object.

7.1.3 Set maximum range

▶ Align the sensor so that no light is reflected.

1. The sensor is to switch when the object is detected

▶ Press [OUT ON] for > 2 s, then [OUT OFF].

2. The sensor is not to switch when the object is detected

▶ Press [OUT OFF] for > 2 s, then [OUT ON].

7.1.4 Programming unsuccessful

> The LED flashes quickly, 8 Hz.

- Measured value difference too small
- Max. programming time (15 min.) exceeded.

7.1.5 Electronic lock

Lock or unlock the buttons

▶ Press [OUT ON] and [OUT OFF] simultaneously for 10 s.

> Acknowledgement is indicated by a brief change of the LED switching status.

7.2 Setting via IO-Link

This unit has an IO-Link communication interface which enables direct access to process and diagnostic data. In addition it is possible to set the parameters of the unit during operation. Operation of the unit via IO-Link interface requires an IO-Link master.

With a PC, suitable IO-Link software and an IO-Link adapter cable communication is possible when the system is not in operation.

The IODDs necessary for the configuration of the unit, detailed information about process data structure, diagnostic information, parameter addresses and the necessary information about the required IO-Link hardware and software can be found at www.ifm.com.

7.2.1 Adjustable parameters

Among others, the following parameters can be set via IO-Link.

A table of all adjustable parameters can be found at www.ifm.com.

Parameter name	Values	Description	Default setting
SSC1 Param. SP1	17 mm ... 100 mm	Setting of the switch point with a step increment of 1 mm. After a teach the value resulting from this teach is displayed.	Please refer to the datasheet value "range"
Teach SP1 TP1		Teach sequence to set switch point SP1. Part one (TP1): teach on object. Both parts of the teach sequence, TP1 and TP2, have to be executed, in order to place switch point SP1 between the object and the background (TP = teach point).	N. A.
Teach SP1 TP2		Teach sequence to set switch point SP1. Part two (TP2): teach on background. Both parts of the teach sequence, TP1 and TP2, have to be executed (TP = teach point).	N. A.
Teach Custom SP1 without target		Teach on background only, the switch point will be defined slightly in front of the background. Choose this setting as an alternative to Teach SP1 if no target is available.	N. A.

Parameter name	Values	Description	Default setting
TI Result.State	- Idle - SP1 Success - Wait for command - Busy - Error - Custom	Teach-in state, after a successful teach the value 'SP1 success' will be indicated.	N. A.
Sequence modulation	- OFF - AUTo	OFF: Anti-Crosstalk function off AUTo: Anti-Crosstalk function on	OFF
SSC1 Config. Logic	High active Low active	Setpoint logic, state for target detected (High: light-on mode / NO, Low: dark-on mode / NC)	Please refer to the datasheet value "output function"
SSC1 Switch-On delay	0 ... 2	Switch-On Delay; increment 0.1 s	0
SSC1 Switch-Off delay	0 ... 2	Switch-Off Delay; increment 0.1 s	0
Transmitter configuration	- On - Off	Configuration transmitter light On / Off	On
Number of power cycles	0 ... 65535	Number of power cycles	N. A.
Operating hours	0 ... 65535	Operating hours	N. A.

7.2.2 Setting the range by means of background and object

▶ Start the LR DEVICE software.

▶ Align the diffuse reflection sensor to the object (Fig. 1).

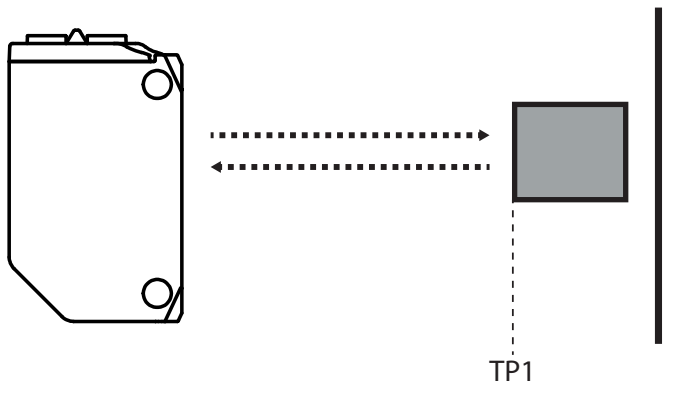
▶ Press button [Teach SP1 TP1] in the LR DEVICE software.

▶ Align the diffuse reflection sensor to the background (Fig. 2).

▶ Press button [Teach SP1 TP2] in the LR DEVICE software.

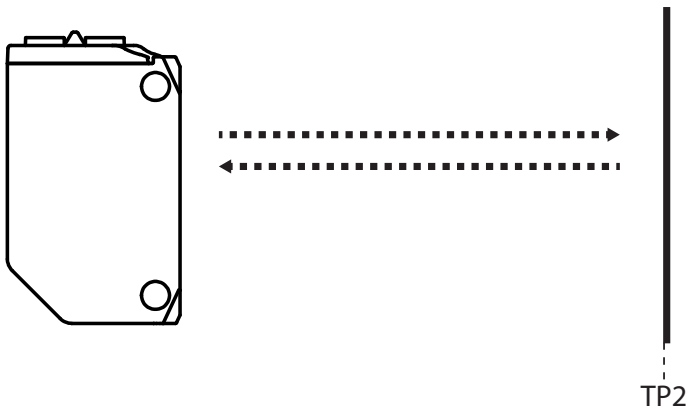
> The switch point SP1 is between object and background (Fig. 3).

Fig. 1:



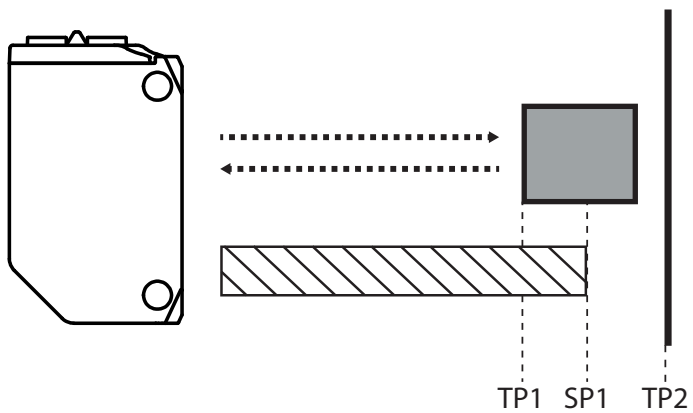
TP1: Teach Point 1

Fig. 2:



TP2: Teach Point 2

Fig. 3



Zone "object recognised"

Either the object can be set first and then the background, or the other way around.

7.2.3 Setting the range by means of background

If the object is not available, the range can be set using only the background.

The switching characteristics of the diffuse reflection sensor are the most reliable if the range is set using the background and the object (→ 7.2.2).

▶ Start the LR DEVICE software.

▶ Align the diffuse reflection sensor to the background (Fig. 4).

▶ Press button [Teach Custom - SP1 without target] in the LR DEVICE software.

> The switch point SP1 is just in front of the background (Fig. 5).

Fig. 4:

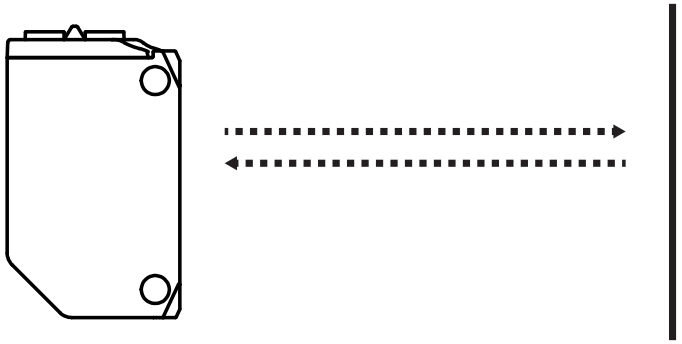
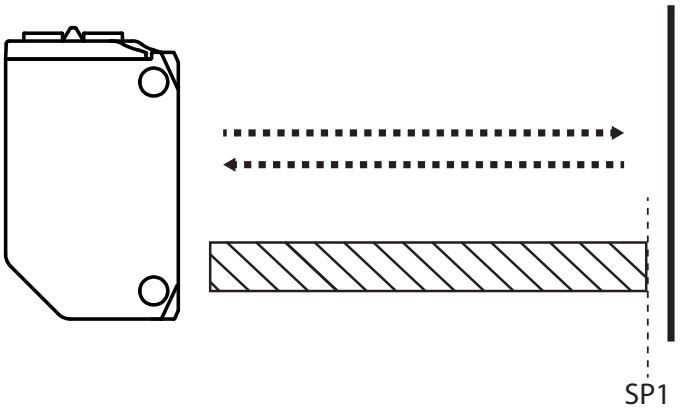


Fig. 5:



Zone "object recognised"

7.2.4 Setting the maximum range

▶ Start the LR DEVICE software.

▶ Align the diffuse reflection sensor to an empty area without object or background.

> The diffuse reflection sensor must not receive any light from the object or the background.

▶ Press button [Teach Custom - SP1 without target] in the LR DEVICE software.

8 Operation

▶ Check whether the unit operates correctly.

> The green LED is lit when the sensor is ready for operation.

> Dark-on mode: the output is switched / the yellow LED is lit when no object is detected.

> Light-on mode: the output is switched / the yellow LED is lit when an object is detected.

9 Maintenance, repair, disposal

▶ Keep the lens of the sensor free from soiling.

▶ For cleaning do not use any solvents or cleaning agents which could damage the plastic parts.

▶ After use dispose of the unit in an environmentally friendly way in accordance with the applicable national regulations.

Faulty sensors must only be repaired by the manufacturer.