Model Number
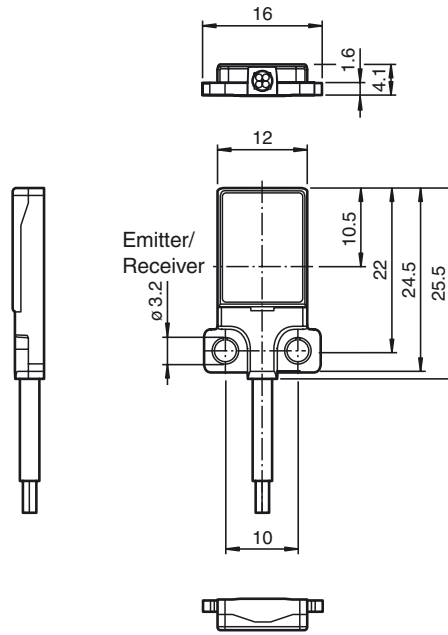
OBE1500-R3F-SE2-L

Laser thru-beam sensor

with 2 m fixed cable

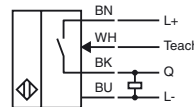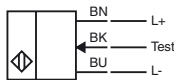## Features

- Very flat design for direct mounting without mounting bracket
- DuraBeam Laser Sensors - durable and employable like an LED
- High detection ranges achievable
- TEACH-IN
- Detection of small parts or flat objects from 0.3 mm

Dimensions

Electrical connection

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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Technical data

System components

Emitter	OBE1500-R3F-S-L
Receiver	OBE1500-R3F-E2-L

General specifications

Effective detection range	0 ... 1500 mm
Threshold detection range	2100 m
Light source	LASER LIGHT
Light type	modulated visible red light , 680 nm
Laser nominal ratings	
Note	LASER LIGHT , DO NOT STARE INTO BEAM
Laser class	1
Wave length	680 nm
Beam divergence	> 5 mrad
Pulse length	approx. 3 μs
Repetition rate	approx. 16.6 kHz
max. pulse energy	8 nJ
Angle deviation	approx. 0.5 °
Object size	typ. starts from 0.7 mm ; typ. from 0.3 mm (after teach-in)
Diameter of the light spot	approx. 20 mm at a distance of 1.5 m
Angle of divergence	approx. 1 °
Optical face	frontal
Ambient light limit	EN 60947-5-2 : 25000 Lux

Functional safety related parameters

$MTTF_d$	806 a
Mission Time (T_M)	20 a
Diagnostic Coverage (DC)	0 %

Indicators/operating means

Operation indicator	LED green, statically lit Power on , short-circuit : LED green flashing (approx. 4 Hz)
Function indicator	Receiver: LED yellow, lights up when light beam is free, flashes when falling short of the stability control ; OFF when light beam is interrupted

Electrical specifications

Operating voltage	U_B	12 ... 24 V
No-load supply current	I_0	Emitter: $\leq$ 10 mA Receiver: $\leq$ 8 mA
Protection class		III

Input

Test input	Test of switching function at 0 V
Switching threshold	Teach-In input

Output

Switching type		NO contact / dark on
Signal output		1 PNP output, short-circuit protected, reverse polarity protected, open collector
Switching voltage		max. 30 V DC
Switching current		max. 50 mA , resistive load
Voltage drop	U_d	$\leq$ 1.5 V DC
Switching frequency	f	approx. 2 kHz
Response time		250 μs

Conformity

Product standard	EN 60947-5-2
Laser safety	EN 60825-1:2007

Ambient conditions

Ambient temperature	-10 ... 60 °C (14 ... 140 °F)
Storage temperature	-20 ... 70 °C (-4 ... 158 °F)

Mechanical specifications

Housing width	16 mm
Housing height	25.5 mm
Housing depth	4.1 mm
Degree of protection	IP67
Connection	2 m fixed cable
Material	
Housing	PC (Polycarbonate) and Stainless steel
Optical face	PMMA
Cable	PUR
Mass	approx. 20 g Per sensor
Tightening torque, fastening screws	1 Nm
Cable length	2 m

Approvals and certificates

UL approval	E87056 , cULus Recognized, Class 2 Power Source
CCC approval	CCC approval / marking not required for products rated $\leq$36 V

Laserlabel

CLASS 1
LASER
PRODUCT

CLASS 1
LASER PRODUCT
IEC 60825-1: 2007 certified.
Complies with 21 CFR
1040.10 and 1040.11 except
for deviations pursuant to
Laser Notice No. 50,
dated June 24, 2007

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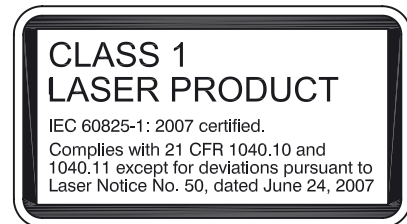
Other suitable accessories can be found at www.pepperl-fuchs.com

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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PEPPERL+FUCHS

FDA approval | IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

Curves/Diagrams

Characteristic response curve

Offset Y [mm]

Distance X [mm]

Relative received light strength

Excess gain

Distance X [mm]

Light spot diameter

Diameter in mm

Distance in mm
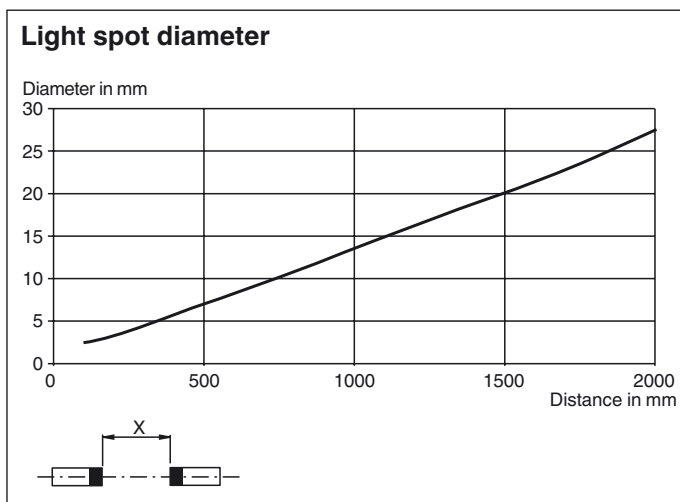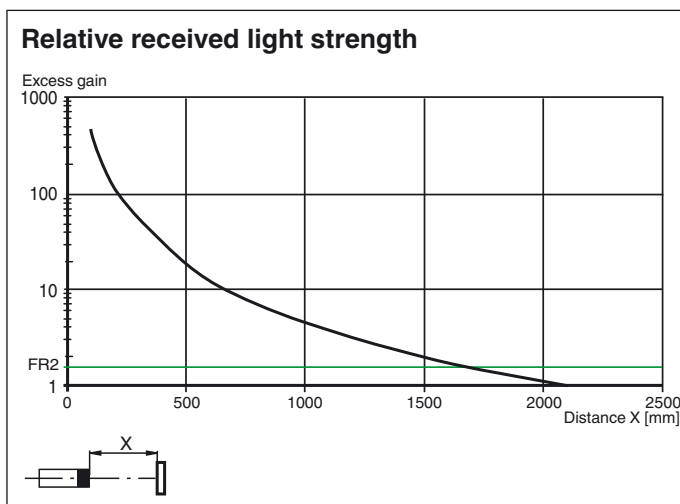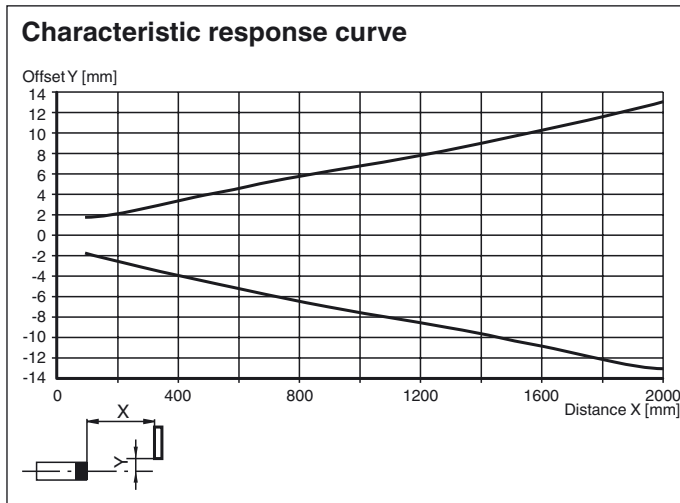
Teach-In Methods

The thru-beam sensor enables the switching points to be taught in for optimum adaptation to specific applications. This eliminates the need for additional components such as apertures.
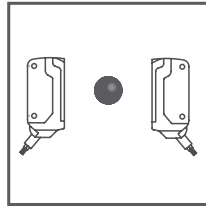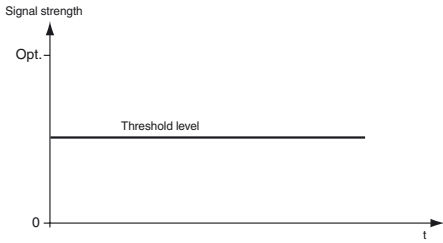
The sensitivity of the thru-beam sensor can be adjusted using three Teach-in methods:

Position Teach

When using this Teach-in method, the following settings are made on the thru-beam sensor:
• The gain is set to an optimum value
• The signal threshold is set to a minimum

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Recommended application:

This method enables minuscule particles in the beam path to be detected, and provides exceptional positioning accuracy.

Make sure that there are no objects in the beam path and that the sensor is connected to the power supply.

1. Connect the white cable on the receiver (WH/IN) to the blue cable (BU/0 V) on the receiver.
   The green and yellow LED indicators flash simultaneously at 2.5 Hz

2. Disconnect the white cable on the receiver (WH/IN) from the blue cable (BU/0 V) on the receiver.
   The green and yellow LED indicators flash alternately at 2.5 Hz

3. The end of the Teach-in process is indicated when the green LED indicator lights up static and yellow LED blinks.

Two-Point Teach-In

When using this Teach-in method, the following settings are made on the thru-beam sensor:
- The gain is set to an optimum value
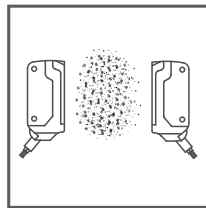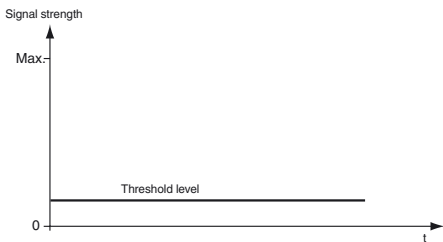- The signal threshold is set in the center between the two taught signal values
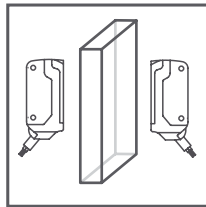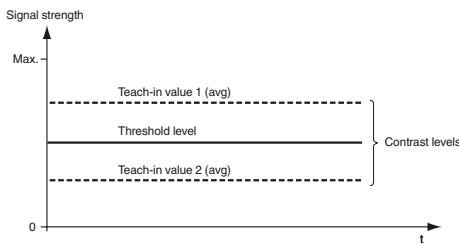
1. Make sure that there are no objects in the beam path and that the sensor is connected to the power supply.

2. Connect the white cable on the receiver (WH/IN) to the blue cable (BU/0 V) on the receiver.
   The green and yellow LED indicators flash simultaneously at 2.5 Hz

3. Position the object in the beam path.

4. Disconnect the white cable on the receiver (WH/IN) from the blue cable (BU/0 V) on the receiver.
   The green and yellow LED indicators flash alternately at 2.5 Hz

5. The end of the Teach-in process is indicated when the green LED indicator lights up static.

Maximum Teach-In

When using this Teach-in method, the following settings are made on the thru-beam sensor:
- The gain is set to a maximum
- The signal threshold is set to a minimum

Recommended application:

Enables an object to be detected with a high excess gain. This can be useful if there is severe environmental contamination or to achieve long operating times.

Make sure that there are no objects in the beam path and that the sensor is connected to the power supply.

6. Cover the receiver or transmitter.

7. Connect the white cable on the receiver (WH/IN) to the blue cable (BU/0 V) on the receiver.
   The green and yellow LED indicators flash simultaneously at 2.5 Hz

8. Disconnect the white cable on the receiver (WH/IN) from the blue cable (BU/0 V) on the receiver.
   The green and yellow LED indicators flash alternately at 2.5 Hz

9. The end of the Teach-in process is indicated when the green LED indicator lights up static.

Laser notice laser class 1

- The irradiation can lead to irritation especially in a dark environment. Do not point at people!
- Maintenance and repairs should only be carried out by authorized service personnel!
- Attach the device so that the warning is clearly visible and readable.
- The warning accompanies the device and should be attached in immediate proximity to the device.
- Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

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