Triangulation sensor (SbR)
OQT150-R100-2EP-IO-IR
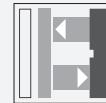
- Miniature design with versatile mounting options
- Multi Pixel Technology (MPT) - flexibility and adaptability
- Infrared light design
- Reduction of device variety - several switch points within one sensor
- Reliable detection of all surfaces, independent of color and structure
- Low sensitivity to target color
- IO-Link interface for service and process data

Switching diffuse mode sensor with measurement core technology, 150 mm detection range, red light, IO-Link, 2 x push-pull output, 2 m fixed cable

Function

The R100 series miniature optical sensors are the first devices of their kind to offer an endto- end solution in a small single standard design — from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation tasks.
The entire series enables sensors to communicate via IO-Link.
The DuraBeam laser sensors are durable and can be used in the same way as a standard sensor.
The use of Multi Pixel Technology gives the standard sensors a high level of flexibility and enables them to adapt more effectively to their operating environment.

Dimensions

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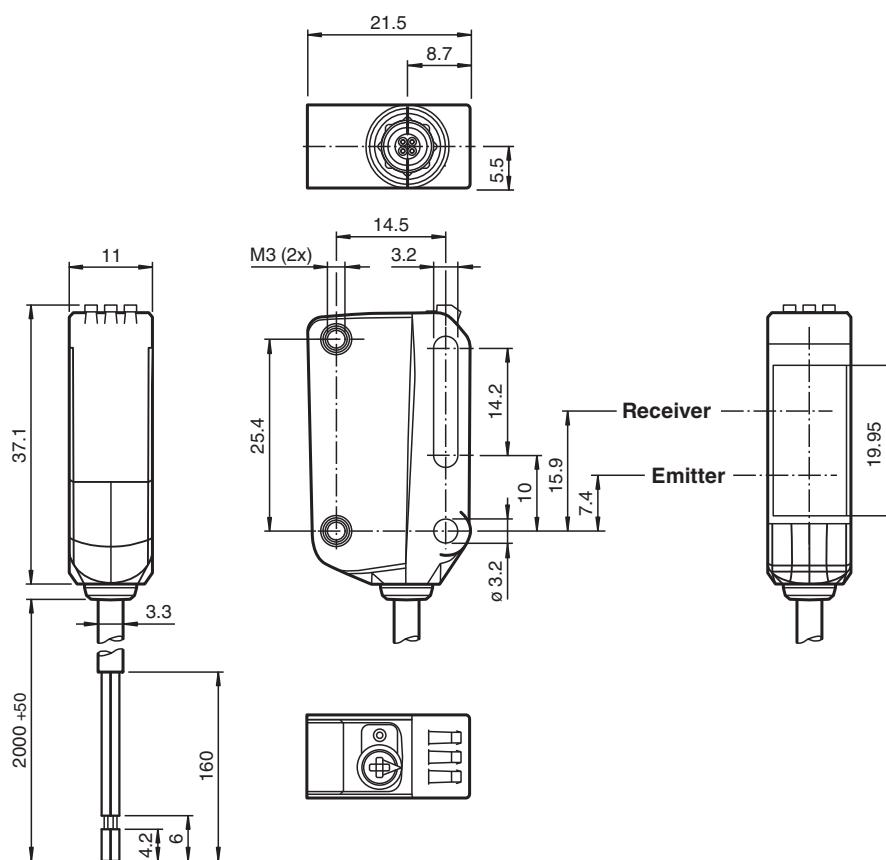
Technical Data

General specifications

Detection range	5 ... 150 mm
Detection range min.	5 ... 20 mm
Detection range max.	5 ... 150 mm
Adjustment range	20 ... 150 mm
Reference target	standard white, 100 mm x 100 mm
Light source	LED
Light type	modulated infrared light 850 nm
LED risk group labelling	exempt group
Black-white difference (6 %/90 %)	< 5 % at 150 mm
Diameter of the light spot	approx. 12 mm at a distance of 150 mm
Opening angle	approx. 4.5 °
Ambient light limit	EN 60947-5-2 : 30000 Lux

Functional safety related parameters

$MTTF_d$	600 a
Mission Time (T_M)	20 a
Diagnostic Coverage (DC)	0 %

Indicators/operating means

Operation indicator	LED green: constantly on - power on flashing (4Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode
Function indicator	LED yellow: constantly on - switch output active constantly off - switch output inactive
Control elements	Teach-In key
Control elements	5-step rotary switch for operating modes selection

Electrical specifications

Operating voltage	U_B	10 ... 30 V DC
Ripple		max. 10 %
No-load supply current	I_0	< 25 mA at 24 V supply voltage
Protection class		III

Interface

Interface type	IO-Link (via C/Q = BK)
IO-Link revision	1.1
Device profile	Smart Sensor
Device ID	0x110807 (1116167)
Transfer rate	COM2 (38.4 kBit/s)
Min. cycle time	2.3 ms
Process data width	Process data input 2 Bit Process data output 2 Bit
SIO mode support	yes
Compatible master port type	A

Output

Switching type		The default setting is: C/Q - BK: NPN normally open, PNP normally closed, IO-Link Q2 - WH: NPN normally open, PNP normally closed
Signal output		2 push-pull (4 in 1) outputs, short-circuit protected, reverse polarity protected, overvoltage protected
Switching voltage		max. 30 V DC
Switching current		max. 100 mA , resistive load
Usage category		DC-12 and DC-13
Voltage drop	U_d	≤ 1.5 V DC
Switching frequency	f	217 Hz
Response time		2.3 ms

Conformity

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Release date: 2025-01-30 Date of issue: 2025-01-30 Filename: 267075-100440_eng.pdf

Technical Data

Communication interface	IEC 61131-9
Product standard	EN 60947-5-2
Approvals and certificates	
UL approval	E87056 , cULus Listed , class 2 power supply , type rating 1
Ambient conditions	
Ambient temperature	-40 ... 60 °C (-40 ... 140 °F) , cable, fixed installation -25 ... 60 °C (-13 ... 140 °F) , movable cable not appropriate for conveyor chains
Storage temperature	-40 ... 70 °C (-40 ... 158 °F)
Mechanical specifications	
Degree of protection	IP67 / IP69 / IP69K
Connection	2 m fixed cable
Material	
Housing	PC (Polycarbonate)
Optical face	PMMA
Mass	approx. 36 g
Dimensions	
Height	37.1 mm
Width	11 mm
Depth	21.5 mm
Cable length	2 m

Connection
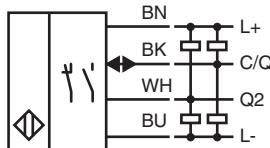
Assembly
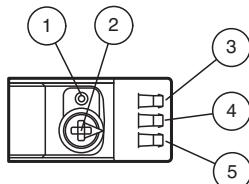
1	Teach-in button
2	Mode rotary switch
3	Switch output indicator Q2
4	Switch output indicator Q1
5	Operating indicator
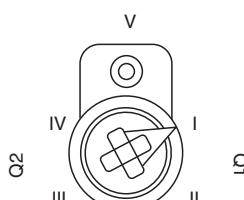
I	Switch output 1 / switch point B
II	Switch output 1 / switch point A
III	Switch output 2 / switch point A
IV	Switch output 2 / switch point B
V	Keylock

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Characteristic Curve

Characteristic response curve

Offset Y [mm]

——————	white 90 %
— — — —	grey 18 %
—·—·—·—	black 6 %

Distance X [mm]
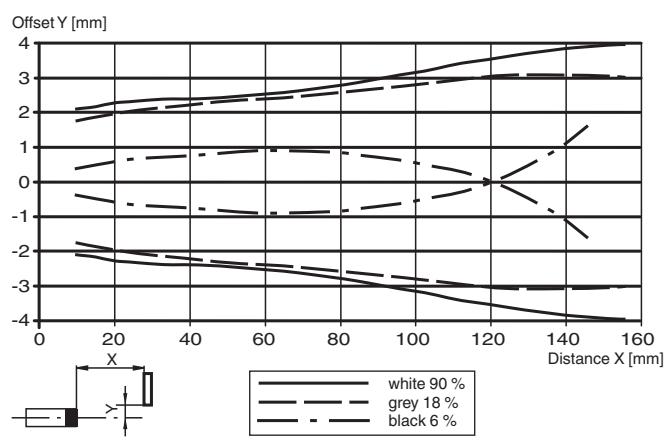
Detection ranges

Object colour

Distance X [mm]
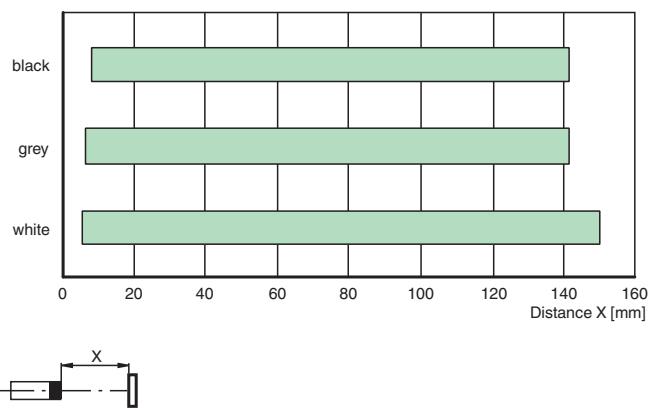
Light spot diameter

Diameter in mm

Distance in mm

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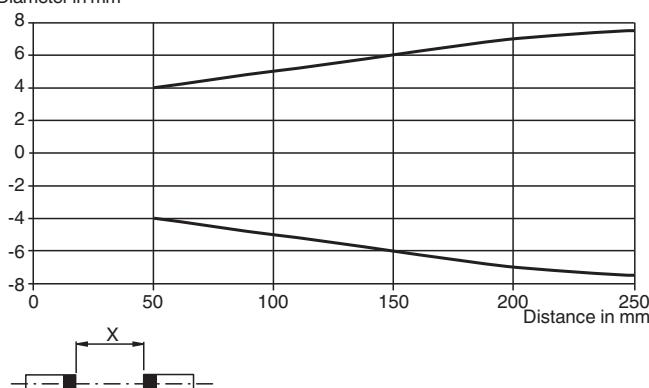
Teach-In

You can use the rotary switch to select the relevant switching threshold A and/or B for teaching in for switch signal **Q1 or Q2**. The yellow LEDs indicate the current state of the selected output.

To store a threshold value, press and hold the "TI" button until the yellow and green LEDs flash in phase (approx. 1 s). Teach-In starts when the "TI" button is released.

Successful Teach-In is indicated by alternating flashing (2.5 Hz) of the yellow and green LEDs.

An unsuccessful Teach-In is indicated by rapidly alternating flashing (8 Hz) of the yellow and green LEDs.

After an unsuccessful Teach-In, the sensor continues to operate with the previous valid setting after the relevant visual fault signal is issued.

Different switching modes can be defined by teaching in the relevant distance measured values
for the switching thresholds A and B:

Single point mode:
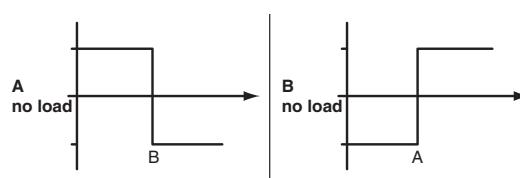
Window mode:
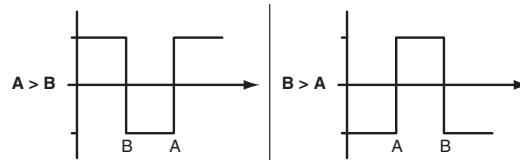
Every taught-in switching threshold can be retaught (overwritten) by pressing the „TI" button
again.

Pressing and holding the "TI" button for > 4 s completely deletes the taught-in value. The yellow and green LEDs go out simultaneously to indicate that this procedure has been completed. Successful resetting is indicated by alternating flashing (2.5 Hz) of the yellow and green LEDs.

Resetting to Factory Default Settings

Press the „TI" button for > 10 s in rotary switch position ‚O' to reset to factory default settings. The yellow and green LEDs go out simultaneously to indicate the resetting.

Resetting process starts when the "TI" button is released and is indicated by the yellow LED. After the process the sensor works with factory default settings, immediately.

OMT:
- Factory default settings switch signal Q1:
  Switch signal active, window mode
- Factory default settings switch signal Q2:
  Switch signal active, window mode

OQT:
- Factory default settings switch signal Q1:
  Switch signal active, BGS mode (background suppression)
- Factory default settings switch signal Q2:
  Switch signal active, BGS mode (background suppression)

Configuration

Configuring different operating modes via the IO-Link interface

The devices are equipped with an IO-Link interface as standard for diagnostics and parameterization tasks to ensure optimum adjustment of the sensors to the relevant application. Four different operating modes can be set, among other features:

Background suppression operating mode (one switch point):
- Detection of objects irrespective of type and color in a defined detection range. Objects in the background are suppressed.

active detection range

Background
suppression

Background evaluation operating mode (one switch point):
- Detection of objects irrespective of type and color against a defined background. Reliable detection of objects at close range

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(detection range >= 0 mm). The background serves as reference.

active detection range

Background evaluation

Single point mode operating mode (one switch point):
- Detection of objects irrespective of type and color in a defined detection range. Objects in the background are suppressed.
- The switch point corresponds exactly to the set point.

active detection range

Background
suppression

Window mode operating mode (two switch points):
- Detection of objects irrespective of type and color in a defined detection range. Reliable detection when object leaves the detection range.
- Window mode with two switch points.

active detection range

Foreground suppression   Background suppression

Center window mode operating mode (one switch point):
- Detection of objects irrespective of type and color in a defined detection range. Sets a defined window around a given object. Objects outside this window are not detected.
- Window mode with one switch point.

active detection range

Foreground suppression   Background suppression

Two point mode operating mode (hysteresis operating mode):
- Detection of objects irrespective of type and color between a defined switch-on and switch-off point.

active detection range

Output

Hysteresis

Output
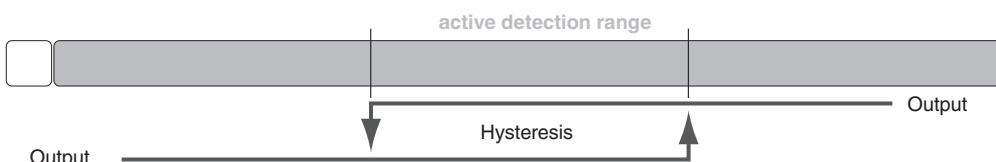
Inactive operating mode:
- Evaluation of switching signals is deactivated.

The associated IODD device description file can be found in the download area at **www.pepperl-fuchs.com**.

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