



Model Number

OBG5000-R100-2EP1-IO-V31

Retroreflective sensor (glass)
with 4-pin, M8 x 1 connector

Features

- Miniature design with versatile mounting options
- Detects transparent objects, i.e., clear glass, PET and transparent films
- Two machines in one: clear object detection or reflection operating mode with long range
- High degree of protection IP69K
- IO-link interface for service and process data

Product information

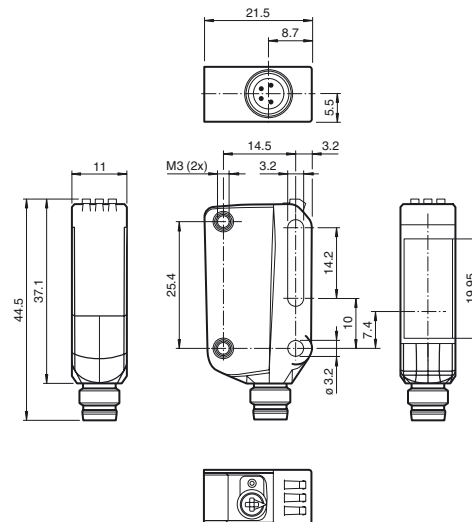
The R100 series miniature optical sensors are the first devices of their kind to offer an end-to-end solution in a small single standard design — from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation tasks.

The entire series enables sensors to communicate via IO-Link.

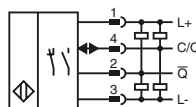
The DuraBeam laser sensors are durable and can be used in the same way as a standard sensor.

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



Electrical connection



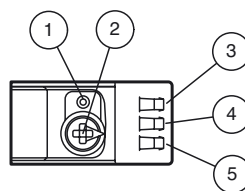
Pinout

Wire colors in accordance with EN 60947-5-2

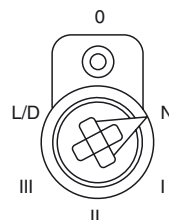


| | | |
|---|----|---------|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |

Indicators/operating means



| | |
|---|--------------------------------|
| 1 | Teach-in button |
| 2 | Mode rotary switch |
| 3 | Operating indicator / dark on |
| 4 | Signal indicator |
| 5 | Operating indicator / light on |



| | |
|-----|-------------------------|
| N | Normal mode |
| I | 10 % contrast detection |
| II | 18 % contrast detection |
| III | 40 % contrast detection |
| L/D | Switching type |
| 0 | Keylock |

Technical data**General specifications**

| | |
|----------------------------|--|
| Effective detection range | 0 ... 3.5 m in TEACH mode ; 0 ... 5 m at switch position "N" |
| Reflector distance | 0 ... 3.5 m in TEACH mode ; 0 ... 5 m at switch position "N" |
| Threshold detection range | 6 m |
| Reference target | H85-2 reflector |
| Light source | LED |
| Light type | modulated visible red light |
| LED risk group labelling | exempt group |
| Diameter of the light spot | approx. 170 mm at a distance of 3.5 m |
| Angle of divergence | approx. 5 ° |
| Ambient light limit | EN 60947-5-2 |

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 | Yellow LED: Permanently lit - light path clear Permanently off - object detected Flashing (4 Hz) - insufficient operating reserve |
| Control elements | Teach-In key |
| Control elements | 5-step rotary switch for operating modes selection |
| Contrast detection levels | 10 % - clean, water filled PET bottles 18 % - clear glass bottles 40 % - colored glass or opaque materials Adjustable via rotary switch |

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 = pin 4) |
| Transfer rate | COM 2 (38.4 kBaud) |
| IO-Link Revision | 1.1 |
| Min. cycle time | 2.3 ms |
| Process data width | Process data input 2 Bit Process data output 2 Bit |
| SIO mode support | yes |
| Device ID | 0x110A07 (1116679) |
| Compatible master port type | A |

Output

| | | |
|---------------------|---|------------|
| Switching type | The switching type of the sensor is adjustable. The default setting is: C/Q - Pin4: NPN normally closed / light-on, PNP normally open / dark-on, IO-Link /Q - Pin2: NPN normally open / dark-on, PNP normally closed / light-on | |
| 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 | 500 Hz |
| Response time | 1 ms | |

Conformity

| | |
|-------------------------|--------------|
| Communication interface | IEC 61131-9 |
| Product standard | EN 60947-5-2 |

Ambient conditions

| | |
|---------------------|--------------------------------|
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Storage temperature | -40 ... 70 °C (-40 ... 158 °F) |

Mechanical specifications

| | |
|----------------------|-------------------------|
| Housing width | 11 mm |
| Housing height | 44.5 mm |
| Housing depth | 21.5 mm |
| Degree of protection | IP67 / IP69 / IP69K |
| Connection | M8 x 1 connector, 4-pin |
| Material | |
| Housing | PC (Polycarbonate) |
| Optical face | PMMA |

Accessories**V31-WM-2M-PUR**

Female cordset, M8, 4-pin, PUR cable

V31-GM-2M-PUR

Female cordset, M8, 4-pin, PUR cable

REF-H85-2

Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes

REF-H50

Reflector, rectangular 51 mm x 61 mm, mounting holes, fixing strap

REF-H33

Reflector with screw fixing

IO-Link-Master02-USB

IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

OFR-100/100

Reflective tape 100 mm x 100 mm

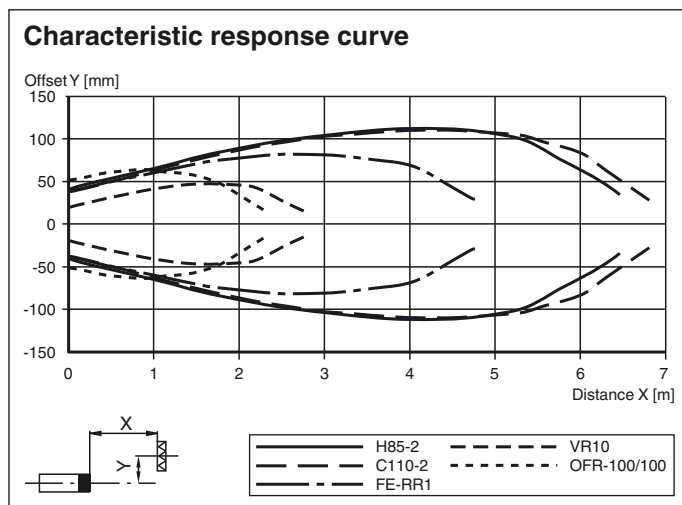
Other suitable accessories can be found at www.pepperl-fuchs.com

Mass approx. 10 g

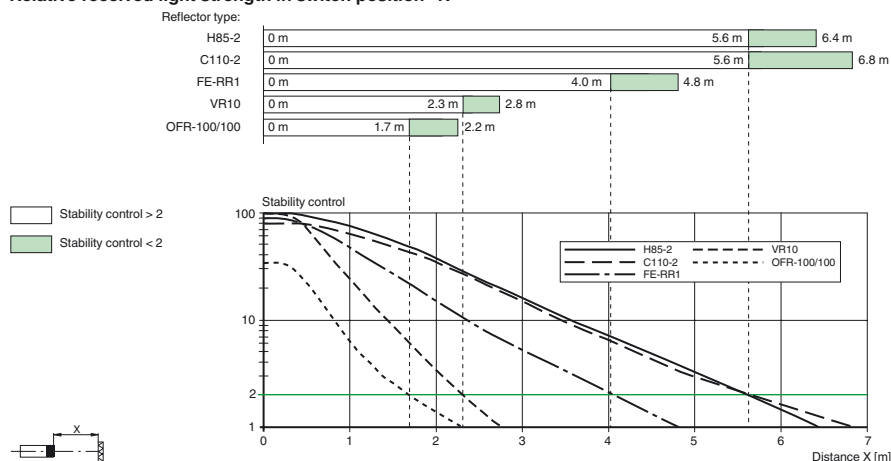
Approvals and certificates

UL approval E87056, cULus Listed, class 2 power supply, type rating 1

Curves/Diagrams



Relative received light strength in switch position "N"



Settings

Teach-in:

Use the rotary switch to select the required operating mode: Normal mode (N) or contrast level I – III.

To teach in a threshold or activate an operating mode, press the "TI" button until the yellow and green LEDs flash in phase (approx. 1 s).

Release the "TI" button. Teach-in starts.

Successful teach-in is indicated by alternating flashing (2.5 Hz) of the yellow and green LEDs. The sensor will now operate in the selected operating mode with the taught-in threshold.

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.

Every taught-in switching threshold can be re-taught (overwritten) by pressing the "TI" button again.

Note: To ensure that the device functions reliably in Contrast mode, the device must be powered on at least 30 s before Teach-in.

Setting the Device to Maximum Sensitivity

Use the rotary switch to select the Normal mode (N) position.

Press the "TI" button for > 4 s. The yellow and green LEDs will go out.

Release the "TI" button.

The settings will be reset to maximum sensitivity. After successfully resetting, the yellow and green LEDs will flash alternately (2.5 Hz).

Switching between light on/dark on

Use the rotary switch to select the light on/dark on (L/D) position.

Press the "TI" button for > 1 s.

The respective operating indicator LED (L/D) will illuminate green and the switching type will change.

To reset the switching type, press the "TI" button for > 4 s.

The respective operating indicator LED (L/D) will illuminate green and the operating indicator will be reset to the most recently active switching type.

**Reset to Default Settings**

Use the rotary switch to select the O position.

Press the "TI" button for > 10 s. The yellow and the green LEDs will both switch off.

Release the "TI" button. The yellow LED is on.

After resetting, the sensor will operate with the following default settings:

- Normal mode (N)
- Maximum sensitivity adjustment
- Dark on
- Pin 2 (white core): antivalent switching output