



## Retroreflective sensor (glass)

### OBG5000-R101-EP-IO-V3



- 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

Retroreflective sensor with polarization filter for clear object detection



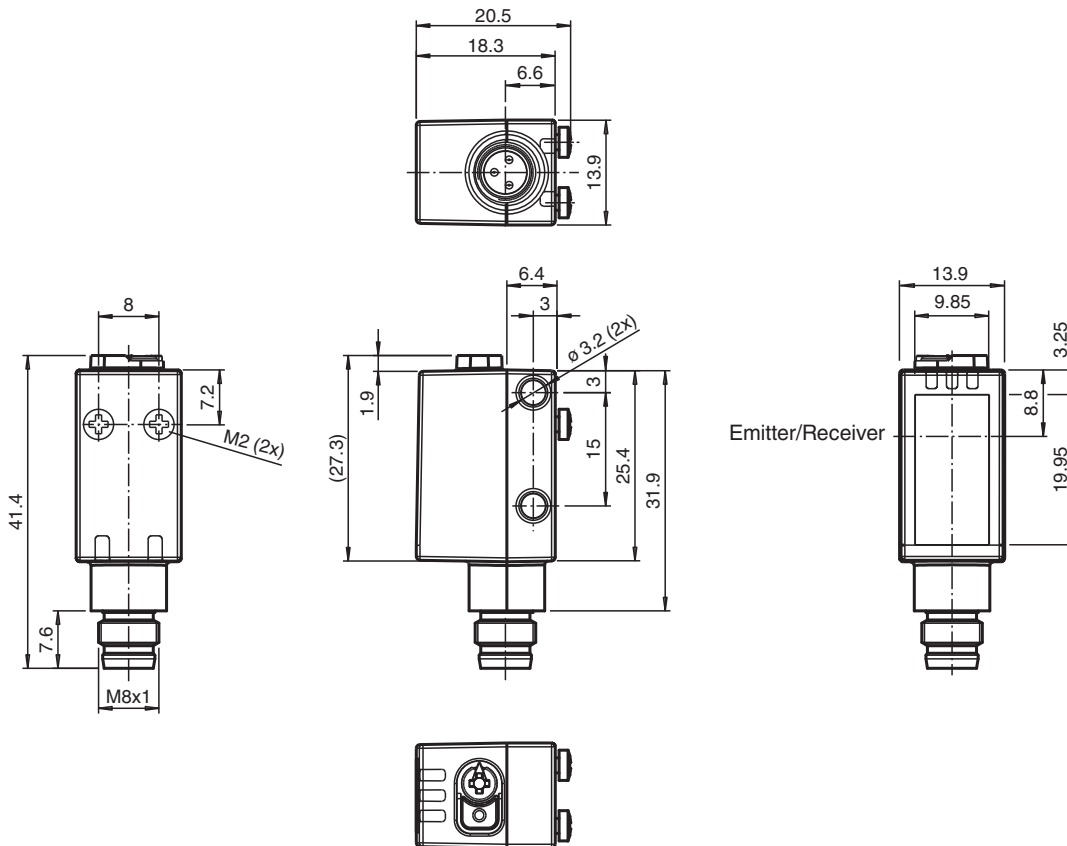
### Function

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

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## 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   |
| Opening angle                        |                | approx. 5 °   |
| Ambient light limit                  |                | EN 60947-5-2  |
| Functional safety related parameters |                |   |
| MTTF <sub>d</sub>                    |                | 600 a   |
| Mission Time (T <sub>M</sub> )       |                | 20 a  |
| Diagnostic Coverage (DC)             |                | 0 %   |
| Indicators/operating means           |                |   |
| Operation indicator                  |                | LED green:<br>constantly on - power on<br>flashing (4Hz) - short circuit<br>flashing with short break (1 Hz) - IO-Link mode                                 |
| Function indicator                   |                | Yellow LED:<br>Permanently lit - light path clear<br>Permanently off - object detected<br>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<br>18 % - clear glass bottles<br>40 % - colored glass or opaque materials<br>Adjustable via rotary switch            |
| Electrical specifications            |                |   |
| Operating voltage                    | U <sub>B</sub> | 10 ... 30 V DC  |
| Ripple                               |                | max. 10 %   |
| No-load supply current               | I <sub>0</sub> | < 25 mA at 24 V supply voltage  |
| Protection class                     |                | III   |
| Interface                            |                |   |
| Interface type                       |                | IO-Link ( via C/Q = pin 4 )   |
| IO-Link revision                     |                | 1.1   |
| Device ID                            |                | 0x110A01 (1116673)  |
| Transfer rate                        |                | COM2 (38.4 kBit/s)  |
| Min. cycle time                      |                | 2.3 ms  |
| Process data width                   |                | Process data input 2 Bit<br>Process data output 2 Bit   |
| SIO mode support                     |                | yes   |
| Compatible master port type          |                | A   |
| Output                               |                |   |
| Switching type                       |                | The switching type of the sensor is adjustable. The default setting is:<br>C/Q - Pin4: NPN normally open / dark-on, PNP normally closed / light-on, IO-Link |
| Signal output                        |                | 1 push-pull (4 in 1) output, 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 <sub>d</sub> | ≤ 1.5 V DC  |
| Switching frequency                  | f              | 500 Hz  |
| Response time                        |                | 1 ms  |
| Conformity                           |                |   |

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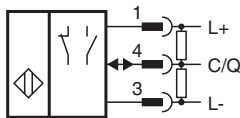
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## Technical Data

|                                   |  |
|-----------------------------------|--|
| Communication interface           | IEC 61131-9  |
| Product standard                  | EN 60947-5-2   |
| <b>Approvals and certificates</b> |  |
| UL approval                       | E87056 , cULus Listed , class 2 power supply , type rating 1 |
| <b>Ambient conditions</b>         |  |
| Ambient temperature               | -20 ... 60 °C (-4 ... 140 °F)                                |
| Storage temperature               | -40 ... 70 °C (-40 ... 158 °F)                               |
| <b>Mechanical specifications</b>  |  |
| Housing width                     | 13.9 mm  |
| Housing height                    | 41.4 mm  |
| Housing depth                     | 18.3 mm  |
| Degree of protection              | IP67 / IP69 / IP69K  |
| Connection                        | M8 x 1 connector, 3-pin                                      |
| Material                          |  |
| Housing                           | PC (Polycarbonate)   |
| Optical face                      | PMMA   |
| Mass                              | approx. 10 g   |

## Connection



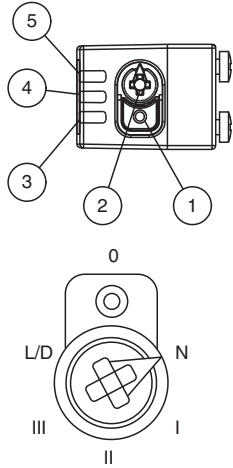
## Connection Assignment



Wire colors in accordance with EN 60947-5-2

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

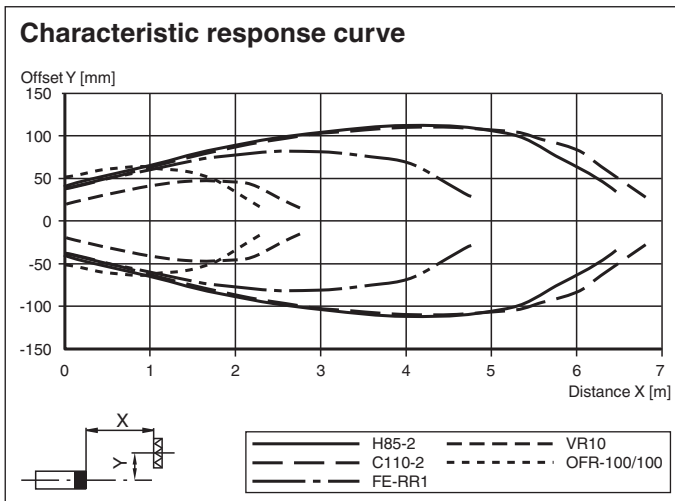
**Assembly**



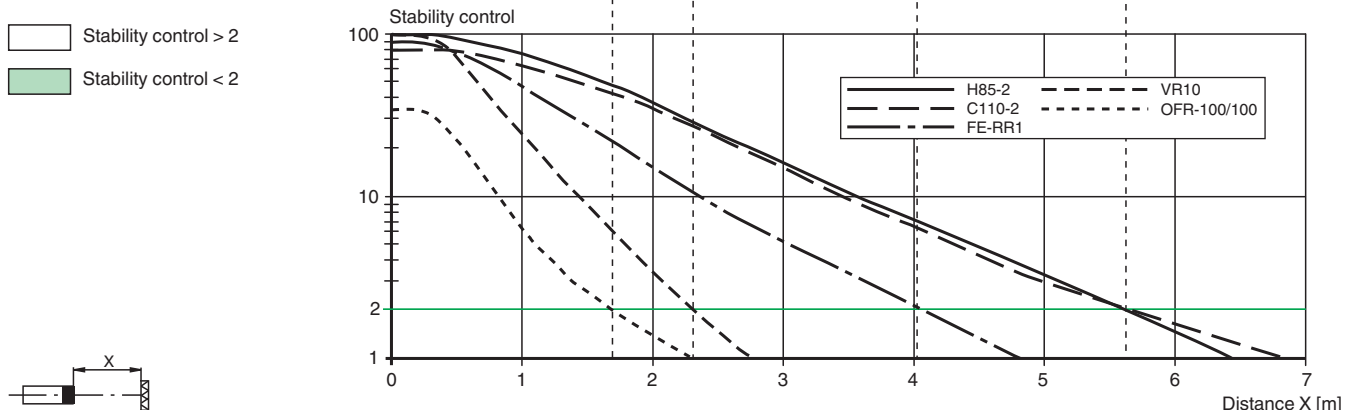
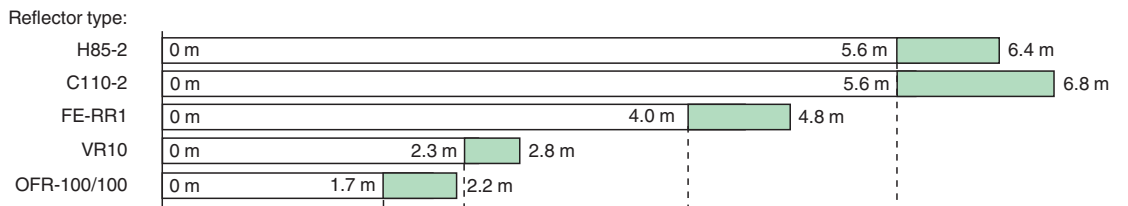
|   |                                |
|---|--------------------------------|
| 1 | Teach-in button                |
| 2 | Mode rotary switch             |
| 3 | Operating indicator / dark on  |
| 4 | Signal indicator               |
| 5 | Operating indicator / light on |

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

**Characteristic Curve**



**Relative received light strength in switch position "N"**



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## Commissioning

### 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: