



## Retroreflective sensor (glass)

### OBG8000-R200-2EP-IO



- Medium 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

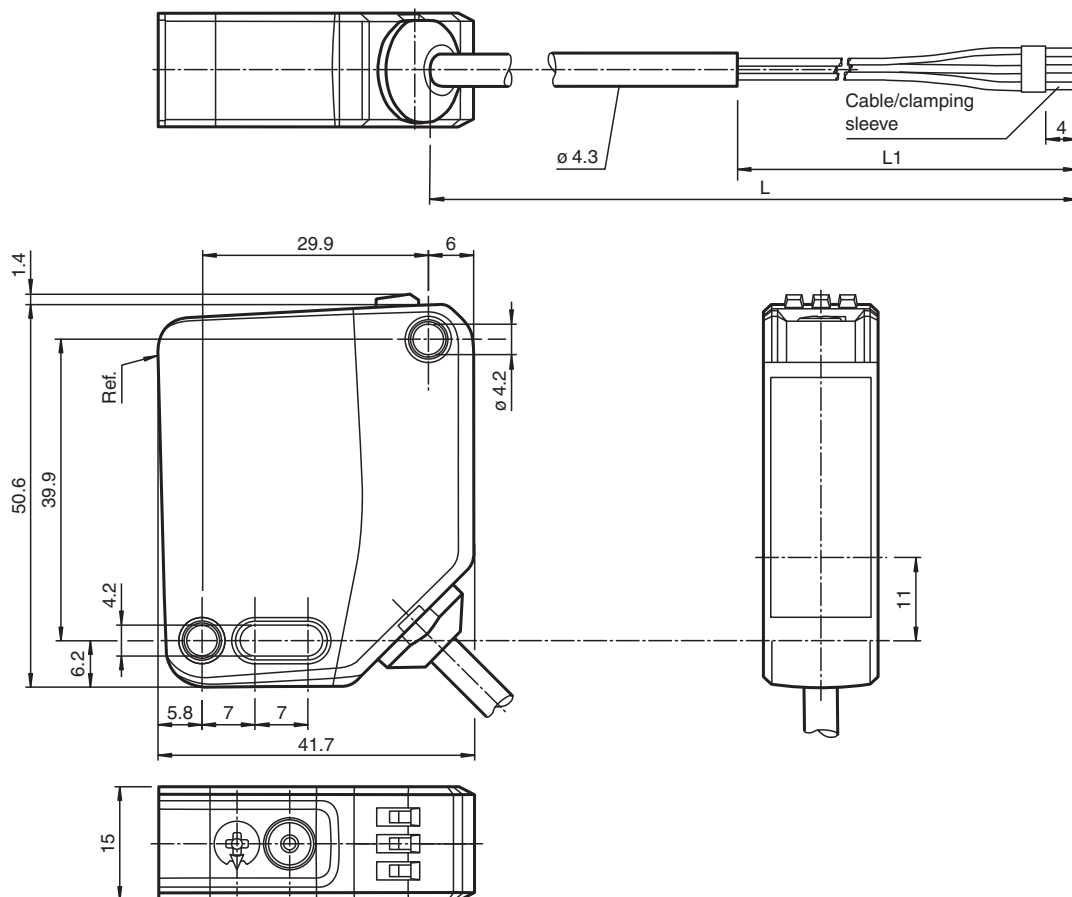
The optical sensors in the series are the first devices to offer an end-to-end solution in a medium-sized standard design – from the thru-beam sensor through to the measuring distance sensor. As a result of this design, the sensors are able to perform practically all standard automation tasks.

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.

Multi Pixel Technology (MPT) ensures that the standard sensors are flexible and can be adapted to the application environment.

## Dimensions



## Technical Data

### General specifications

|                            |                                                              |
|----------------------------|--------------------------------------------------------------|
| Effective detection range  | 0 ... 5.6 m in TEACH mode ; 0 ... 8 m at switch position "N" |
| Reflector distance         | 0 ... 5.6 m in TEACH mode ; 0 ... 8 m at switch position "N" |
| Threshold detection range  | 9 m                                                          |
| Reference target           | H85-2 reflector                                              |
| Light source               | LED                                                          |
| Light type                 | modulated visible red light                                  |
| LED risk group labelling   | exempt group                                                 |
| Polarization filter        | yes                                                          |
| 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 : 18000 Lux                                     |

### 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 = BK )                              |
| IO-Link revision            |  | 1.1                                                   |
| Device profile              |  | Identification and diagnosis<br>Smart Sensor type 2.4 |
| Device ID                   |  | 0x111A01 (1120769)                                    |
| 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

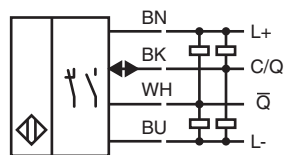
|                   |                |                                                                                                                                                                                                                                   |
|-------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Switching type    |                | The switching type of the sensor is adjustable. The default setting is:<br>C/Q - BK: NPN normally open / dark-on, PNP normally closed / light-on, IO-Link<br>/Q - WH: NPN normally closed / light-on, PNP normally open / dark-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 <sub>d</sub> | ≤ 1.5 V DC                                                                                                                                                                                                                        |

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Technical Data

|                                   |   |                                                              |
|-----------------------------------|---|--------------------------------------------------------------|
| Switching frequency               | f | 500 Hz                                                       |
| Response time                     |   | 1 ms                                                         |
| <b>Conformity</b>                 |   |                                                              |
| 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 |
| CCC approval                      |   | CCC approval / marking not required for products rated ≤36 V |
| <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                     |   | 15 mm                                                        |
| Housing height                    |   | 50.6 mm                                                      |
| Housing depth                     |   | 41.7 mm                                                      |
| Degree of protection              |   | IP67 / IP69 / IP69K                                          |
| Connection                        |   | 2 m fixed cable                                              |
| <b>Material</b>                   |   |                                                              |
| Housing                           |   | PC (Polycarbonate)                                           |
| Optical face                      |   | PMMA                                                         |
| Mass                              |   | approx. 73 g                                                 |
| Cable length                      |   | 2 m                                                          |

Connection



Wire colors in accordance with EN 60947-5-2

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

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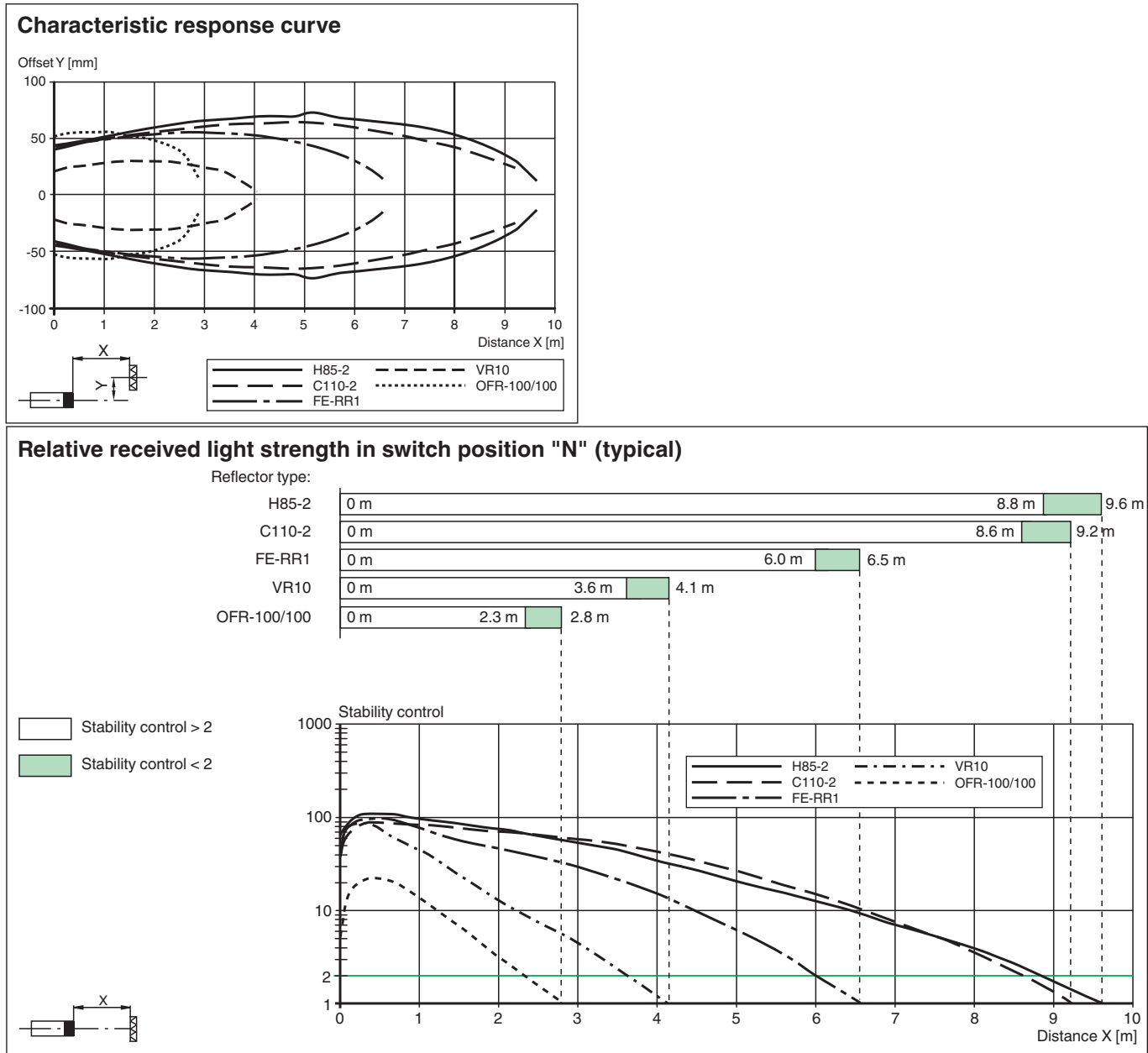
Assembly

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

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

Characteristic Curve



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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:

## Accessories

|                                                                                     |                             |                                                               |
|-------------------------------------------------------------------------------------|-----------------------------|---------------------------------------------------------------|
|    | <b>REF-ORR50G-2</b>         | Reflector                                                     |
|   | <b>REF-H85-2</b>            | Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes      |
|  | <b>REF-C110-2</b>           | Reflector, round ø 84 mm, central mounting hole               |
|  | <b>FE-RR1</b>               | Reflector, round ø 80.87 mm, central mounting hole            |
|  | <b>REF-VR10</b>             | Reflector, rectangular 60 mm x 19 mm, mounting holes          |
|  | <b>OFR-100/100</b>          | Reflective tape 100 mm x 100 mm                               |
|  | <b>REF-H32G-2</b>           | Reflector                                                     |
|  | <b>OMH-MLV12-HWG</b>        | Mounting bracket for series MLV12 sensors                     |
|  | <b>OMH-R200-01</b>          | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |
|  | <b>OMH-MLV12-HWK</b>        | Mounting bracket for series MLV12 sensors                     |
|  | <b>OMH-R20x-Quick-Mount</b> | Quick mounting accessory                                      |
|  | <b>ICE2-8IOL-G65L-V1D</b>   | EtherNet/IP IO-Link master with 8 inputs/outputs              |
|  | <b>ICE3-8IOL-G65L-V1D</b>   | PROFINET IO IO-Link master with 8 inputs/outputs              |

## Accessories

|                                                                                   |                             |                                                                                                              |
|-----------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------|
|  | <b>ICE2-8IOL-K45S-RJ45</b>  | EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal                                   |
|  | <b>ICE3-8IOL-K45P-RJ45</b>  | PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals                                |
|  | <b>ICE3-8IOL-K45S-RJ45</b>  | PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal                                   |
|  | <b>IO-Link-Master02-USB</b> | IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection |
|  | <b>ICE1-8IOL-G30L-V1D</b>   | Ethernet IO-Link module with 8 inputs/outputs                                                                |
|  | <b>ICE1-8IOL-G60L-V1D</b>   | Ethernet IO-Link module with 8 inputs/outputs                                                                |
|  | <b>ICE2-8IOL-K45P-RJ45</b>  | EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors                               |