



## Triangulation sensor (BGS) OBT300-R103-2EP1-IO-0,3M-V1



- Miniature design with versatile mounting options
- Best background suppressor in its class
- Precision object detection, almost irrespective of the color
- Extended temperature range  
-40 °C ... 60 °C
- High degree of protection IP69K
- IO-Link interface for service and process data

Triangulation sensor with background suppression



### Function

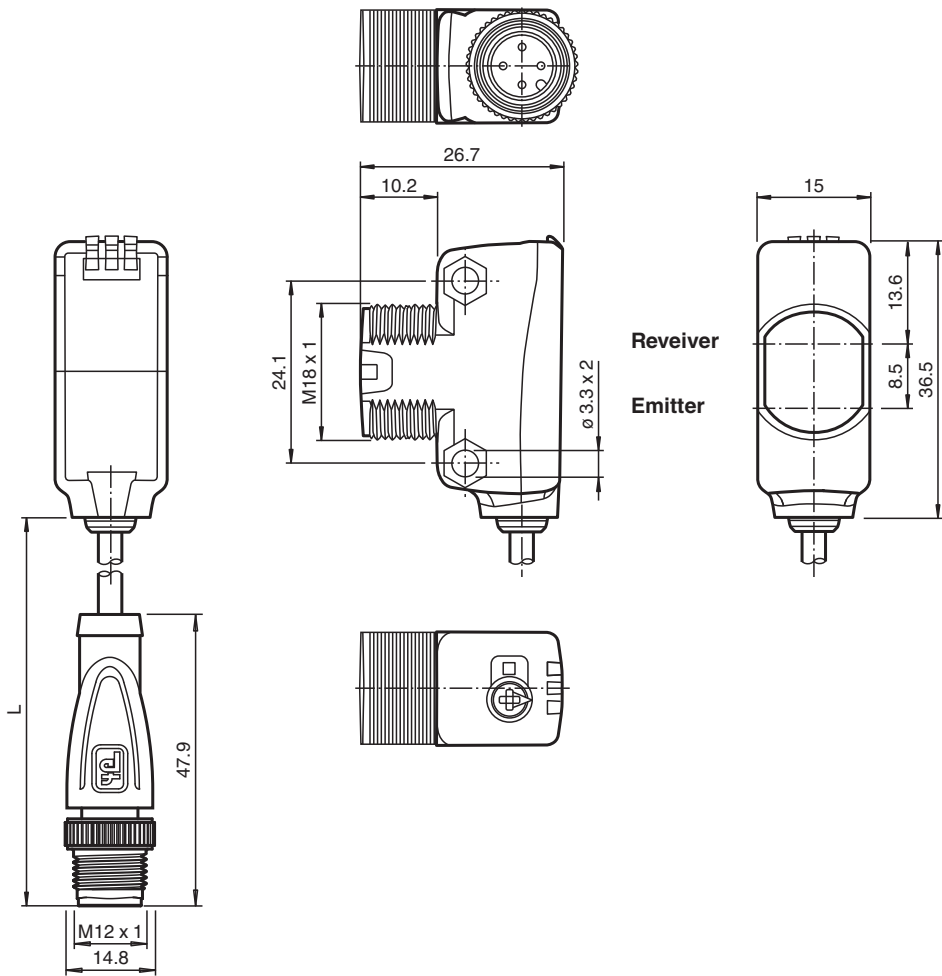
The R103 series miniature optical sensors are the first devices of their kind to offer an end-to-end solution in a small single standard design — from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation 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



Technical Data

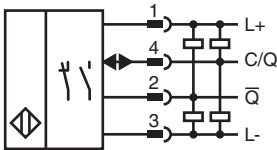
| General specifications               |  |                                                                                                                             |
|--------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------|
| Detection range                      |  | 5 ... 300 mm                                                                                                                |
| Detection range min.                 |  | 5 ... 25 mm                                                                                                                 |
| Detection range max.                 |  | 5 ... 300 mm                                                                                                                |
| Adjustment range                     |  | 25 ... 300 mm                                                                                                               |
| Reference target                     |  | standard white, 100 mm x 100 mm                                                                                             |
| Light source                         |  | LED                                                                                                                         |
| Light type                           |  | modulated visible red light                                                                                                 |
| LED risk group labelling             |  | exempt group                                                                                                                |
| Black-white difference (6 %/90 %)    |  | < 15 % at 300 mm                                                                                                            |
| Diameter of the light spot           |  | approx. 18 mm at a distance of 300 mm                                                                                       |
| Opening angle                        |  | approx. 3 °                                                                                                                 |
| Ambient light limit                  |  | EN 60947-5-2 : 40000 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 |

Release date: 2023-09-27 Date of issue: 2023-09-27 Filename: 267075-100585\_eng.pdf

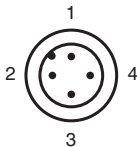
## Technical Data

|                                   |       |                                                                                                                                                                                                                                       |
|-----------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function indicator                |       | LED yellow:<br>constantly on - object detected<br>constantly off - object not detected                                                                                                                                                |
| Control elements                  |       | Light-on/dark-on changeover switch                                                                                                                                                                                                    |
| Control elements                  |       | Sensing range adjuster                                                                                                                                                                                                                |
| <b>Electrical specifications</b>  |       |                                                                                                                                                                                                                                       |
| 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                                                                                                                                                                                                                                   |
| <b>Interface</b>                  |       |                                                                                                                                                                                                                                       |
| Interface type                    |       | IO-Link ( via C/Q = pin 4 )                                                                                                                                                                                                           |
| IO-Link revision                  |       | 1.1                                                                                                                                                                                                                                   |
| Device profile                    |       | Smart Sensor                                                                                                                                                                                                                          |
| Device ID                         |       | 0x110607 (1115655)                                                                                                                                                                                                                    |
| Transfer rate                     |       | COM2 (38.4 kBit/s)                                                                                                                                                                                                                    |
| Min. cycle time                   |       | 2.3 ms                                                                                                                                                                                                                                |
| Process data width                |       | Process data input 1 Bit<br>Process data output 2 Bit                                                                                                                                                                                 |
| SIO mode support                  |       | yes                                                                                                                                                                                                                                   |
| Compatible master port type       |       | A                                                                                                                                                                                                                                     |
| <b>Output</b>                     |       |                                                                                                                                                                                                                                       |
| Switching type                    |       | The switching type of the sensor is adjustable. The default setting is:<br>C/Q - Pin4: NPN normally closed / dark-on, PNP normally open / light-on, IO-Link<br>/Q - Pin2: NPN normally open / light-on, PNP normally closed / 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                      | $U_d$ | $\leq 1.5$ V DC                                                                                                                                                                                                                       |
| 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                                                                                                                                                                          |
| <b>Ambient conditions</b>         |       |                                                                                                                                                                                                                                       |
| Ambient temperature               |       | -40 ... 60 °C (-40 ... 140 °F) , fixed cable<br>-25 ... 60 °C (-13 ... 140 °F) , movable cable not appropriate for conveyor chains                                                                                                    |
| Storage temperature               |       | -40 ... 70 °C (-40 ... 158 °F)                                                                                                                                                                                                        |
| <b>Mechanical specifications</b>  |       |                                                                                                                                                                                                                                       |
| Housing width                     |       | 15 mm                                                                                                                                                                                                                                 |
| Housing height                    |       | 36.5 mm                                                                                                                                                                                                                               |
| Housing depth                     |       | 26.7 mm                                                                                                                                                                                                                               |
| Degree of protection              |       | IP67 / IP69 / IP69K                                                                                                                                                                                                                   |
| Connection                        |       | 300 mm fixed cable with M12 x 1, 4-pin connector                                                                                                                                                                                      |
| Material                          |       |                                                                                                                                                                                                                                       |
| Housing                           |       | PC (Polycarbonate)                                                                                                                                                                                                                    |
| Optical face                      |       | PMMA                                                                                                                                                                                                                                  |
| Mass                              |       | approx. 23 g                                                                                                                                                                                                                          |
| Cable length                      |       | 0.3 m                                                                                                                                                                                                                                 |

Connection



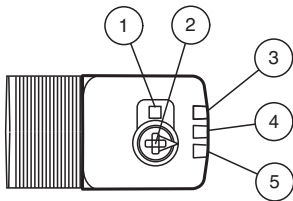
Connection Assignment



Wire colors in accordance with EN 60947-5-2

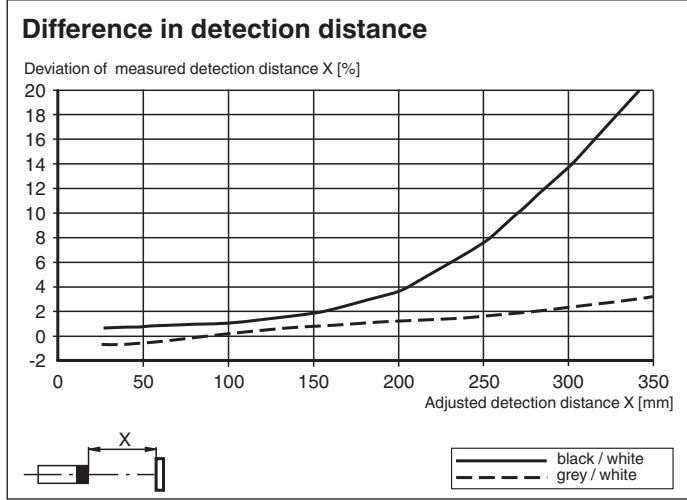
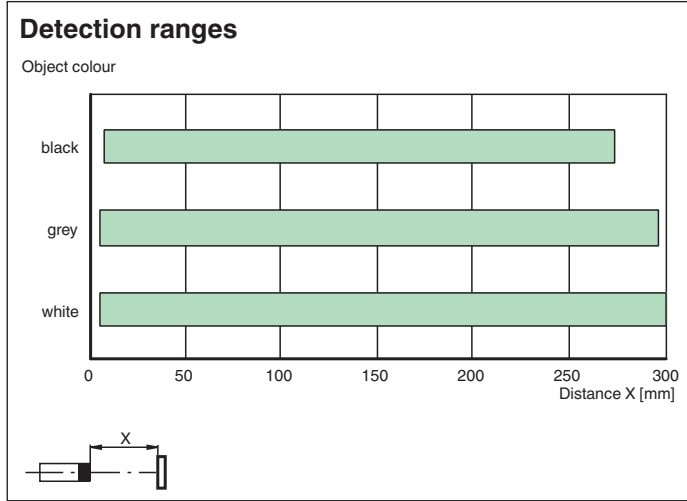
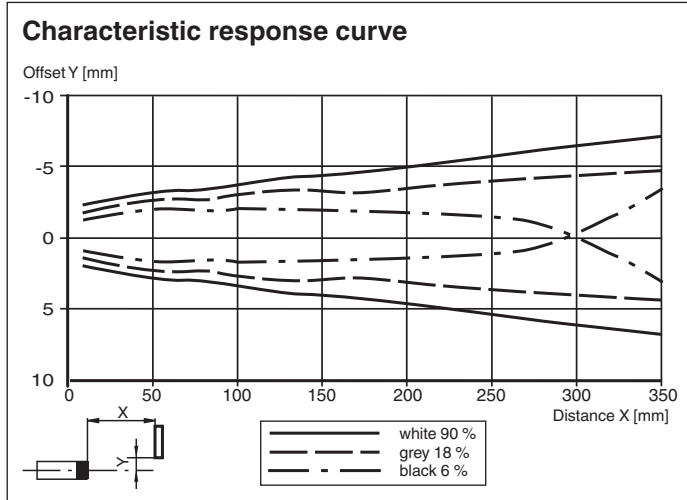
|   |    |         |
|---|----|---------|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue)  |
| 4 | BK | (black) |

Assembly



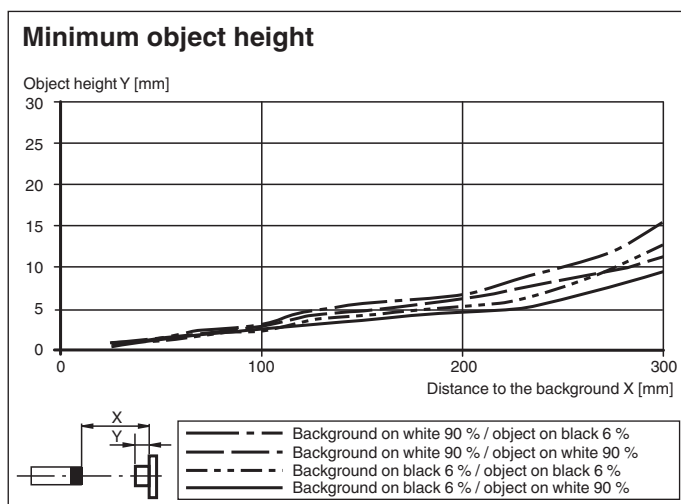
|   |                                    |
|---|------------------------------------|
| 1 | Light-on/dark-on changeover switch |
| 2 | Sensing range adjuster             |
| 3 | Operating indicator / dark on      |
| 4 | Function indicator                 |
| 5 | Operating indicator / light on     |

Characteristic Curve



Release date: 2023-09-27 Date of issue: 2023-09-27 Filename: 267075-100585\_eng.pdf

## Characteristic Curve



## Accessories

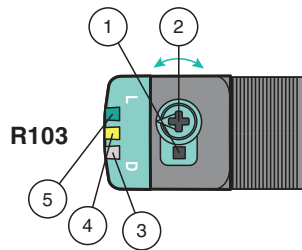
|  |                           |                                                                                |
|--|---------------------------|--------------------------------------------------------------------------------|
|  | <b>OMH-ML100-09</b>       | Mounting aid for round steel $\varnothing$ 12 mm or sheet 1.5 mm ... 3 mm      |
|  | <b>OMH-R103-01</b>        | Mounting bracket                                                               |
|  | <b>V31-GM-2M-PUR</b>      | Female cordset single-ended M8 straight A-coded, 4-pin, PUR cable grey         |
|  | <b>V31-WM-2M-PUR</b>      | Female cordset single-ended M8 angled A-coded, 4-pin, PUR cable grey           |
|  | <b>OMH-ML6</b>            | Mounting bracket                                                               |
|  | <b>OMH-ML6-U</b>          | Mounting bracket                                                               |
|  | <b>OMH-ML6-Z</b>          | Mounting bracket                                                               |
|  | <b>OMH-R10X-01</b>        | Mounting bracket                                                               |
|  | <b>OMH-R10X-04</b>        | Mounting bracket                                                               |
|  | <b>OMH-R10X-10</b>        | Mounting bracket                                                               |
|  | <b>OMH-ML100-031</b>      | Mounting aid for round steel $\varnothing$ 10 ... 14 mm or sheet 1 mm ... 5 mm |
|  | <b>OMH-ML100-03</b>       | Mounting aid for round steel $\varnothing$ 12 mm or sheet 1.5 mm ... 3 mm      |
|  | <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                               |

Release date: 2023-09-27 Date of issue: 2023-09-27 Filename: 267075-100585\_eng.pdf

## 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                               |
|   | <b>V1-G-2M-PUR</b>          | Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable grey                                      |
|  | <b>V1-W-2M-PUR</b>          | Female cordset single-ended M12 angled A-coded, 4-pin, PUR cable grey                                        |

## Configuration



- 1 - Light-on / dark-on changeover switch
- 2 - Sensing range / sensitivity adjuster
- 3 - Operating indicator / dark on
- 4 - Signal indicator
- 5 - Operating indicator / light on

To unlock the adjustment functions turn the sensing range adjuster / sensitivity adjuster for more than 180 degrees.

### Sensing Range/ Sensitivity

Turn sensing range / sensitivity adjuster clockwise to increase sensing range / sensitivity.

Turn sensing range / sensitivity adjuster counter clockwise to decrease sensing range / sensitivity.

If the end of the adjustment range is reached, the signal indicator starts flashing with 8 Hz.

### Light-on / Dark-on Configuration

Press the light-on / dark-on changeover switch for more than 1 second (less than 4 seconds). The light-on / dark-on mode changes and the operating indicators are activated accordingly.

If you press the light-on / dark-on changeover switch for more than 4 seconds, the light-on / dark-on mode changes back to the original setting. On release of the light-on / dark-on changeover switch the current state is activated.

### Restore Factory Settings

Press the light-on / dark-on changeover switch for more than 10 seconds (less than 30 seconds) until all LEDs turn off. On release of the light-on / dark-on changeover switch the signal indicator turns on. After 5 seconds the sensor resumes operation with factory default settings.

After 5 minutes of inactivity the sensing range / sensitivity adjustment is locked. In order to reactivate the sensing range / sensitivity adjustment, turn the sensing range / sensitivity adjuster for more than 180 degrees.