



## Model Number

**OBT650-R201-2EP-IO-0,3M-V31-1T**

Triangulation sensor (BGE)  
with 4-pin, M8 x 1 connector

## Features

- Medium design with versatile mounting options
- Secure and gapless detection, even near the surface through background evaluation
- 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

## Product information

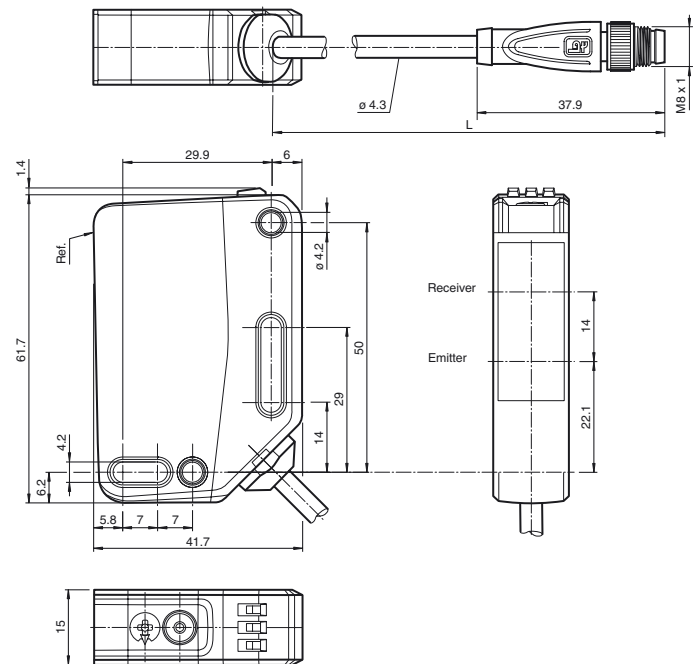
The optical sensors in the series are the first devices to offer an end-to-end solution in a medium-sized standard design—from the thru-beam sensor through to the measuring distance sensor. As a result of this design, the sensors are able to perform practically all standard automation tasks.

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

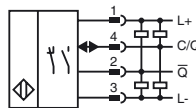
The DuraBeam laser sensors are durable and can be used in the same way as a standard sensor.

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

## Dimensions



## Electrical connection



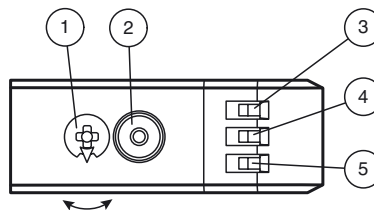
## Pinout

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 | Sensitivity adjustment               |    |
| 2 | Light-on / dark-on changeover switch |    |
| 3 | Operating indicator / dark on        | GN |
| 4 | Signal indicator                     | YE |
| 5 | Operating indicator / light on       | GN |

**Technical data****General specifications**

|                                   |   |
|-----------------------------------|---|
| Detection range                   | 10 ... 650 mm                                 |
| Detection range min.              | 10 ... 100 mm                                 |
| Detection range max.              | 10 ... 650 mm                                 |
| Adjustment range                  | 100 ... 650 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 %) | < 6 % at 650 mm                               |
| Diameter of the light spot        | approx. 20 mm x 20 mm at a distance of 650 mm |
| Angle of divergence               | approx. 2 °                                   |
| Ambient light limit               | EN 60947-5-2 : 70000 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  | LED yellow:<br>constantly on - background detected (object not detected)<br>constantly off - object detected                |
| Control elements    | Light-on/dark-on changeover switch  |
| Control elements    | Sensing range adjuster  |

**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 )                           |
| Device profile              | Identification and diagnosis<br>Smart Sensor type 2.4 |
| Transfer rate               | COM 2 (38.4 kBaud)                                    |
| IO-Link Revision            | 1.1   |
| Min. cycle time             | 2.3 ms  |
| Process data width          | Process data input 1 Bit<br>Process data output 2 Bit |
| SIO mode support            | yes   |
| Device ID                   | 0x111711 (1120017)                                    |
| 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<br>/Q - Pin2: 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 |
| 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 | -40 ... 60 °C (-40 ... 140 °F) , fixed cable<br>-20 ... 60 °C (-4 ... 140 °F) , movable cable not appropriate for conveyor chains |
| Storage temperature | -40 ... 70 °C (-40 ... 158 °F)  |

**Mechanical specifications**

|                      |  |
|----------------------|--|
| Housing width        | 15 mm  |
| Housing height       | 61.7 mm  |
| Housing depth        | 41.7 mm  |
| Degree of protection | IP67 / IP69 / IP69K                                  |
| Connection           | fixed cable 300 mm with M8 x 1 male connector; 4-pin |
| Material             |  |
| Housing              | PC (Polycarbonate)                                   |
| Optical face         | PMMA   |

**Accessories****IO-Link-Master02-USB**

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

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

Female cordset, M8, 4-pin, PUR cable

**V31-GM-2M-PUR**

Female cordset, M8, 4-pin, PUR cable

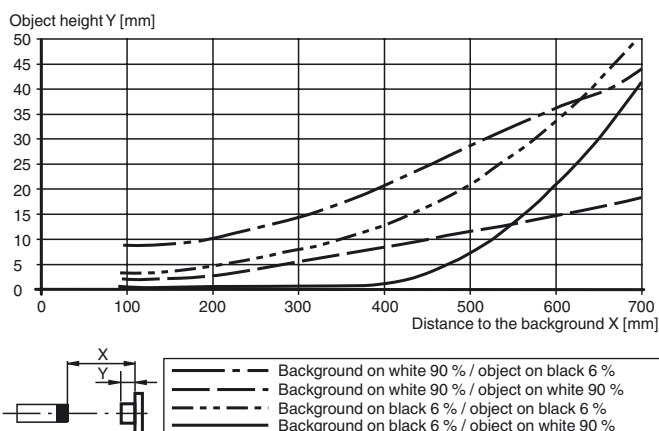
Other suitable accessories can be found at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

|              |              |
|--------------|--------------|
| Mass         | approx. 52 g |
| Cable length | 0.3 m        |

#### Approvals and certificates

|              |  |
|--------------|--|
| UL approval  | E87056 , cULus Listed , class 2 power supply , type rating 1       |
| CCC approval | CCC approval / marking not required for products rated $\leq 36$ V |

#### Minimum object height



To unlock the adjustment functions, rotate the sensing range/sensitivity adjuster by more than 180°.

#### Sensing Range/Sensitivity

To increase the sensing range/sensitivity, rotate the sensing range/sensitivity adjuster clockwise.

To reduce the sensing range/sensitivity, rotate the sensing range/sensitivity adjuster counter-clockwise.

As soon as the end of the adjustment range is reached, the signal indicator flashes at 8 Hz.

#### Configuring Light On/Dark On

Press the light-on/dark-on changeover switch for more than 1 second (but less than 4 seconds). "Light on/dark on" mode changes and the relevant operating indicator lights up.

If you press the light-on/dark-on changeover switch for longer than 4 seconds, the "light on/dark on" mode will switch back to the original setting. The current status is activated when the light-on/dark-on changeover switch is released.

#### Restoring Factory Settings

Press the light-on/dark-on changeover switch for more than 10 seconds (but less than 30 seconds) until all LEDs go out. When the light-on/dark-on changeover switch is released, the signal indicator lights up. After 5 seconds, the sensor resumes operation with the factory settings.

The adjustment functions are locked after 5 minutes of inactivity. To unlock the adjustment functions, rotate the sensing range/sensitivity adjuster again by more than 180°.