



# Distance sensor OMT300-R201-EP-IO-0,3M-V3



- Medium design with versatile mounting options
- Space-saving distance sensors in small standardized design
- Multi Pixel Technology (MPT) exact and precise signal
- IO-Link interface for service and process data

### Distance sensor











#### **Function**

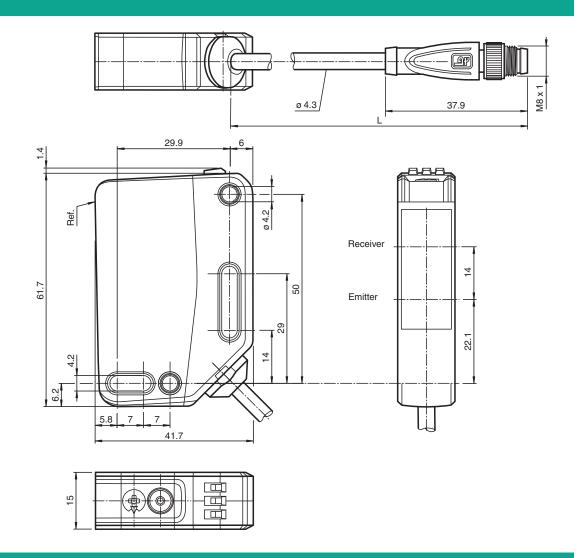
The optical sensors in the series are the first devices to offer an end-to-end solution in a medium-sized standard design – from the thru-beam sensor through to the measuring distance sensor. As a result of this design, the sensors are able to perform practically all standard automation

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**

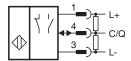
| General specifications               |  |
|--------------------------------------|--|
| Measurement range                    | 100 300 mm   |
| Reference target                     | standard white, 100 mm x 100 mm  |
| Light source                         | LED  |
| Light type                           | modulated visible red light  |
| LED risk group labelling             | exempt group   |
| Angle deviation                      | max. +/- 1.5 °   |
| Diameter of the light spot           | approx. 8 mm at a distance of 300 mm   |
| Opening angle                        | 1.8 °  |
| Ambient light limit                  | EN 60947-5-2 : 45000 Lux   |
| Resolution                           | 0.1 mm   |
| 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: constantly on - power on flashing (4Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode |
| Function indicator                   | LED yellow: constantly on - switch output active constantly off - switch output inactive                           |

Release date: 2023-01-16 Date of issue: 2023-01-16 Filename: 295670-100180\_eng.pdf

| Switching type         The default setting is: C/O - Pin4: MPN normally open, PNP normally closed, IO-Link           Signal output         1 push-pull (4 in 1) output, short-circuit protected, reverse polarity protected, overvoitage 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           Response time         2 ms, see table 1           Conformity         Communication interface           Product standard         EIC 61131-9           Product standard         EN 60947-5-2           Measurement accuracy         EN 60947-5-2           Marm up time         5 min           Repeat accuracy         < 0.5 % (See table 1           Linearity error         0.5 %           Approvals and certificates         E87056 (ULus Listed , class 2 power supply , type rating 1           CCC approval         CCC approval / marking not required for products rated ≤36 V           Ambient conditions         CCC approval / marking not required for products rated ≤36 V           Ambient stemperature         10 60 °C (50 140 °F)           Storage temperature         2 -0 70 °C (-40 158 °F)           Mechanical specifications         15 mm  | Technical Data              |                |   |
|--|-----------------------------|----------------|---|
| Control elements   | Control elements            |                | Teach-In key  |
| Deprice   Depr |                             |                | -   |
| Operating voltage         Us         1000 V DC           Ripple         max. 10 %           No-load supply current         ls         <25 mA at 24 V supply voltage           Protection class         III           Interface by permission         III           Incertage         III           Device profile         Identification and diagnosis Smart Sensor type 0/type 3.3           Device ID         Cut 11914 (190532)           Transfer rate         IC OCM (38.4 kB/w)           Min. cycle fime         3 ms           Process data width         Process data input 4 byte           Process data width         Process data width Imput 4 byte           SIO mode support         yes           Compatible master port type         Jana Process data width Imput 4 byte           Si (Compatible master port type)         Yes           Switching type         The default setting is:           Ci (Co-Pink: NPN normally open, PNP normally closed, IO-Link           Signal output         1 push-puil (4 in 1) output, short-circuit protected, reverse polarity protected, overvollage protected           Switching voltage         max. 10 or M.           Switching current         max. 10 or M.           Value         1 push-puil (4 in 1) output, short-circuit protected, reverse polarity protected   |                             |                | o stop rotally officer to operating mouse estection       |
| Ripple   |                             | Un             | 10 30 V DC  |
| No-load supply current   Ig  | , , ,                       | ОВ             |   |
| Protection class   III   Interface   Int |                             | l <sub>o</sub> |   |
| Interface type   | ** *                        | 10             |   |
| Interface type   |                             |                | III   |
| Device profile   Clambridge   Comment   Comm |                             |                | 10  Link (via C/O - pin A)                                |
| Device profile   |                             |                |   |
| Smart Sensor type 0 flype 9.3   Process of the p  |                             |                |   |
| Transfer rate         COM2 (38.4 kBit/s)           Min. cycle time         3 ms           Process data width         Process data input 4 byte Process data output 2 bits           SIO mode support         yes           Compatible master port type         A           Dutput         The default setting is: C/Q - Pin4: NPN normally open, PNP normally closed, 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. 30 V DC           Switching current         max. 30 V DC           Switching current         max. 50 DC-13           Usage category         DC-12 and DC-13           Voltage drop         U <sub>3</sub> ≤ 1.5 V DC           Response time         Em. 60947-5-2           Conformity         Em. 60947-5-2           Communication interface         Em. 60947-5-2           Measurement accuracy         5 min           Response accuracy         5 min           Repeat accuracy         0.5 %, see table 1           Ucaptroval         Em. 67056, cULus Listed, class 2 power supply, type rating 1           CCC approval         CCC approval / marking not required for products rated ≤36 V           Ambient tempera  | Device profile              |                |   |
| Min. cycle time         3 ms           Process data width         Process data output 2 bits           SIO mode support         yes           Compatible master port type         A           The default setting is:  | Device ID                   |                | 0x111914 (1120532)  |
| Process data width         Process data input 4 byte           SIO mode support         yes           Compatible master port type         A           Dutput         The default setting is:   | Transfer rate               |                | COM2 (38.4 kBit/s)  |
| Process data output 2 bits   | Min. cycle time             |                | 3 ms  |
| Compatible master port type         A           Dutput           Switching type         "The default setting is: C/Q - Pind: NPN normally open, PNP normally closed, 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         Ug ≤ 1.5 V DC           Response time         2 ms, see table 1           Communication interface         IEC 61131-9           Product standard         160947-5-2           Measurement accuracy         6 5 min           Temperature drift         0.05 %/K           Warm up time         5 min           Repeat accuracy         0.5 % see table 1           Linearly error         0.5 %           Approvals and certificates         E87056, cULus Listed, class 2 power supply, type rating 1           CCC approval         CCC approval/marking not required for products rated ≤36 V           Ambient temperature         1060 °C (50 140 °F)           Storage temperature         1060 °C (50 140 °F)           Storage temperature         40  | Process data width          |                |   |
| Dutput           Switching type         The default setting is:  | SIO mode support            |                | yes   |
| Switching type         The default setting is: C/O - Pin4: MPN normally open, PNP normally closed, IO-Link           Signal output         1 push-pull (4 in 1) output, short-circuit protected, reverse polarity protected, overvoitage 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           Response time         2 ms, see table 1           Conformity         Communication interface           Product standard         EIC 61131-9           Product standard         EN 60947-5-2           Measurement accuracy         EN 60947-5-2           Marm up time         5 min           Repeat accuracy         < 0.5 % (See table 1  | Compatible master port type |                | A   |
| C/Q - Pin4: NPN riormally open, PNP normally closed, IO-Link   | Output                      |                |   |
| Switching voltage         overvoltage protected           Switching current         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           Response time         2 ms, see table 1           Conformity         Communication interface         IEC 61131-9           Product standard         EN 60947-5-2           Measurement accuracy         EN 60947-5-2           Measurement accuracy         1 5 min           Warm up time         5 min           Repeat accuracy         < 0.5 %/K           Varyous and certificates         E87056, cULus Listed, class 2 power supply, type rating 1           CCC approval         E87056, cULus Listed, class 2 power supply, type rating 1           CCC approval from conditions         CC approval / marking not required for products rated ≤36 V           Ambient temperature         10 60 °C (50 140 °F)           Storage temperature         10 60 °C (50 140 °F)           Mostanical specifications         15 mm           Housing width         15 mm           Housing depth         41.7 mm           Degree of protection         167 / IP69 / IP69 K           Connection         200 mm fixed c  | Switching type              |                |   |
| Switching current         max. 100 mA , resistive load           Usage category         DC-12 and DC-13           Voltage drop         Ug ≤ 1.5 V DC           Response time         2 ms , see table 1           Conformity           Communication interface         IEC 61131-9           Product standard         EN 60947-5-2           Measurement accuracy         Warm up time           Repeat accuracy         < 0.5 %/K           Warm up time         5 min           Repeat accuracy         < 0.5 % see table 1           Linearity error         < 0.5 %           Approvals and certificates         E87056 , cULus Listed , class 2 power supply , type rating 1           CCC approval         CCC approval / marking not required for products rated ≤36 V           Ambient conditions         Ambient temperature         10 60 °C (50 140 °F)           Storage temperature         10 60 °C (50 140 °F)         Conditions           Mechanical specifications         Housing width         15 mm           Housing depth         41.7 mm           Usegree of protection         1967 / IP69 / IP69K           Connection         300 mm fixed cable with M8 x 1, 3-pin connector           Material         Housing         PC (Polycarbonate)           <   | Signal output               |                |   |
| Usage category         Ud         DC-12 and DC-13           Voltage drop         Ud         ≤ 1.5 V DC           Response time         2 ms, see table 1           Conformity         Communication interface         IEC 61131-9           Product standard         EN 60947-5-2           Measurement accuracy         EN 60947-5-2           Measurement accuracy         5 min           Repeat accuracy         0.05 %/K           Warm up time         5 min           Repeat accuracy         0.5 %, see table 1           Linearity error         0.5 %           Approvals and certificates         E87056, cULus Listed, class 2 power supply, type rating 1           CCC approval         CCC approval / marking not required for products rated ≤36 V           Ambient conditions         CCC approval / marking not required for products rated ≤36 V           Ambient temperature         10 60 °C (50 140 °F)           Storage temperature         10 60 °C (50 140 °F)           Storage temperature         15 mm           Housing width         15 mm           Housing height         61.7 mm           Housing depth         41.7 mm           Degree of protection         1867 (IP69 / IP69 K           Connection         200 mm (ixed cable with M8 x   | Switching voltage           |                | max. 30 V DC  |
| Voltage drop         U <sub>d</sub> ≤ 1.5 V DC           Response time         2 ms , see table 1           Conformity         EC 61131-9         Fermulation interface           Product standard         EN 60947-5-2           Measurement accuracy         EN 60947-5-2           Temperature drift         0.05 %/K           Warm up time         5 min           Repeat accuracy         < 0.5 %, see table 1           Linearity error         0.5 %           Approvals and certificates         UL approval           UL approval         E87056, cULus Listed, class 2 power supply, type rating 1           CCC approval         CCC approval / marking not required for products rated ≤36 V           Ambient conditions         CCC approval / marking not required for products rated ≤36 V           Ambient temperature         10 60 °C (50 140 °F)           Storage temperature         1-40 70 °C (-40 158 °F)           Mechanical specifications         Image: specifications           Housing width         1 5 mm           Housing depth         41.7 mm           Degree of protection         1967 (IP69 / IP69 K           Connection         300 mm fixed cable with M8 x 1, 3-pin connector           Material         PMMA           Housing         PMMA </td <td>Switching current</td> <td></td> <td>max. 100 mA, resistive load</td>  | Switching current           |                | max. 100 mA, resistive load                               |
| Response time         2 ms , see table 1           Conformity           Communication interface         IEC 61131-9           Product standard         EN 60947-5-2           Measurement accuracy         Image: Common accuracy           Temperature drift         0.05 %/K           Warm up time         5 min           Repeat accuracy         < 0.5 % see table 1  | Usage category              |                | DC-12 and DC-13   |
| Commonity         IEC 61131-9           Product standard         EN 60947-5-2           Measurement accuracy           Temperature drift         0.05 %/K           Warm up time         5 min           Repeat accuracy         < 0.5 %, see table 1  | Voltage drop                | U <sub>d</sub> | ≤ 1.5 V DC  |
| December   December  | Response time               |                | 2 ms , see table 1  |
| Product standard         EN 60947-5-2           Measurement accuracy         0.05 %/K           Warm up time         5 min           Repeat accuracy         < 0.5 %, see table 1  | Conformity                  |                |   |
| Temperature drift 0.05 %/K Warm up time 5 min  Repeat accuracy < 0.5 %, see table 1 Linearity error 0.5 %  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 ≤36 V  Ambient conditions  Ambient temperature 10 60 °C (50 140 °F) Storage temperature 10 70 °C (-40 158 °F)  Mechanical specifications  Housing width 15 mm Housing depth 41.7 mm  Degree of protection 1P67 / IP69 / IP69K Connection 300 mm fixed cable with M8 x 1, 3-pin connector  Material  Housing PC (Polycarbonate) Optical face PMMA Mass approx. 41 g  | Communication interface     |                | IEC 61131-9   |
| Temperature drift         0.05 %/K           Warm up time         5 min           Repeat accuracy         < 0.5 %, see table 1   | Product standard            |                | EN 60947-5-2  |
| Warm up time 5 min   Repeat accuracy < 0.5 %, see table 1  | Measurement accuracy        |                |   |
| Repeat accuracy < 0.5 %, see table 1   | Temperature drift           |                | 0.05 %/K  |
| Linearity error  Approvals and certificates  UL approval  CCC approval  CCC approval  CCC approval  Ambient conditions  Ambient temperature  Ambient temperature  10 60 °C (50 140 °F)  Storage temperature  40 70 °C (-40 158 °F)  Mechanical specifications  Housing width  Housing height  Housing depth  Degree of protection  Degree of protection  Material  Housing  Detical face  PMMA  Mass   10 60 °C (50 140 °F)  Amaking not required for products rated ≤36 V  CCC approval / marking not required for products rated ≤36 V  Ambient supply (100 140 °F)  CCC approval / marking not required for products rated ≤36 V  Ambient supply (100 140 °F)  FC (FO (50 140 °F)  FC (   | Warm up time                |                | 5 min   |
| Approvals and certificates  UL approval  CCC approval  CCC approval  Ambient conditions  Ambient temperature  10 60 °C (50 140 °F)  Storage temperature  10 60 °C (-40 158 °F)  Mechanical specifications  Housing width  15 mm  Housing height  Housing depth  41.7 mm  Degree of protection  1P67 / IP69 / IP69 / IP69K  Connection  Material  Housing  PC (Polycarbonate)  PC (Polycarbonate)  Optical face  PMMA  Mass  E87056 , cULus Listed , class 2 power supply , type rating 1  CCC approval / marking not required for products rated ≤36 V  Action 1   | Repeat accuracy             |                | < 0.5 % , see table 1                                     |
| UL approval E87056 , cULus Listed , class 2 power supply , type rating 1 CCC approval CCC approval / marking not required for products rated ≤36 V  Ambient conditions  Ambient temperature 10 60 °C (50 140 °F) 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 300 mm fixed cable with M8 x 1, 3-pin connector  Material  Housing PC (Polycarbonate)  Optical face PMMA  Mass approx. 41 g   | Linearity error             |                | 0.5 %   |
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| Storage temperature  -40 70 °C (-40 158 °F)  Mechanical specifications  Housing width  15 mm  61.7 mm  Housing depth  41.7 mm  Degree of protection  IP67 / IP69 / IP69K  Connection  Material  Housing  PC (Polycarbonate)  Optical face  PMMA  Mass  approx. 41 g  | Ambient temperature         |                | 10 60 °C (50 140 °F)                                      |
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| MaterialHousingPC (Polycarbonate)Optical facePMMAMassapprox. 41 g  | -                           |                |   |
| Housing PC (Polycarbonate) Optical face PMMA Mass approx. 41 g   |                             |                |   |
| Optical face PMMA Mass approx. 41 g  |                             |                | PC (Polycarbonate)  |
| Mass approx. 41 g  | *                           |                |   |
|  |                             |                |   |
|  | Cable length                |                | 0.3 m   |



# Connection



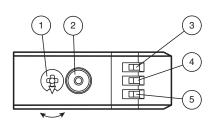
# **Connection Assignment**



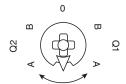
Wire colors in accordance with EN 60947-5-2

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

# **Assembly**



| 1 | Mode rotary switch          |    |
|---|-----------------------------|----|
| 2 | Teach-in button             |    |
| 3 | Switching output display Q2 | ΥE |
| 4 | Switching output display Q1 | YE |
| 5 | Operating indicator         | GN |



| Q1B | Switching output 1/switch point B |
|-----|-----------------------------------|
| Q1A | Switching output 1/switch point A |
| Q2A | Switching output 2/switch point A |
| Q2B | Switching output 2/switch point B |
| 0   | Keylock                           |

# **Accessories**

| OMH-RL31-02     | Mounting bracket narrow                                   |
|-----------------|---|
| OMH-RL31-03     | Mounting bracket narrow                                   |
| <br>OMH-RL31-04 | Mounting aid for round steel ø 12 mm or sheet 1.5 mm 3 mm |

# **Accessories** OMH-RL31-07 Mounting bracket including adjustment OMH-R20x-Quick-Mount Quick mounting accessory ICE2-8IOL-G65L-V1D EtherNet/IP IO-Link master with 8 inputs/outputs ICE3-8IOL-G65L-V1D PROFINET IO IO-Link master with 8 inputs/outputs ICE2-8IOL-K45S-RJ45 EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal ICE3-8IOL-K45P-RJ45 PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals ICE3-8IOL-K45S-RJ45 PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal IO-Link-Master02-USB IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection ICE1-8IOL-G30L-V1D Ethernet IO-Link module with 8 inputs/outputs ICE1-8IOL-G60L-V1D Ethernet IO-Link module with 8 inputs/outputs ICE2-8IOL-K45P-RJ45 EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors V3-GM-2M-PUR Female cordset single-ended M8 straight A-coded, 3-pin, PUR cable grey V3-WM-2M-PUR Female cordset single-ended M8 angled A-coded, 3-pin, PUR cable grey

#### **Technical Features**

Table 1: Information on Measured Value Filters

| Measured v | alue filter |
|------------|-------------|
|------------|-------------|

| Filter             | 1-way | 2-way   | 4-way | 16-way | 64-way | 256-way |
|--------------------|-------|---------|-------|--------|--------|---------|
| Response time (ms) | 2     | 4       | 8     | 32     | 128    | 512     |
| Reneatability (%)  |       | < 0.5 % |       |        |        |         |

# Commissioning

#### Teach-In (TI)

Use the rotary switch for switching signal Q1 or Q2 to select the relevant switching threshold A and/or B to teach in.

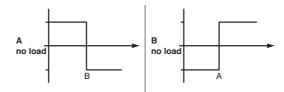
· The yellow LEDs indicate the current state of the selected output.

To teach in a switching threshold, press and hold the "TI" button for approximately 1 s, until the yellow and green LEDs flash in phase. Teach-in starts when the "TI" button is released.

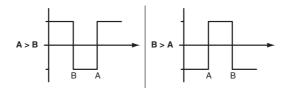
- Teach-in successful: the yellow and green LEDs flash alternately at 2.5 Hz.
- Teach-in unsuccessful: the yellow and green LEDs quickly flash alternately at 8 Hz.
   After an unsuccessful Teach-in, the sensor continues to operate with the previous valid setting after the relevant visual fault signal is issued.

Set switching mode: you can define different switching modes by teaching in the relevant distance data for switching thresholds A and B.

1. Single point mode:



2. Window mode:



Teach in switching thresholds: you can teach in or overwrite a taught-in switching threshold at any time. To do this, press the "TI" button again.

Reset a value: you can reset a taught-in value. To do this, press the "TI" button for > 4 s, until the yellow and green LEDs go out. The reset process itself starts when the "TI" button is released.

• Reset successful: the yellow and green LEDs flash alternately at 2.5 Hz.

#### **Resetting to Factory Settings**

To revert back to factory settings, press the "TI" button for > 10 s with the rotary switch set to position "O," until the yellow and green LEDs go out at the same time. The reset process itself starts when the "TI" button is released.

Reset to factory settings successful: the yellow and green LEDs light up at the same time. The sensor then continues to
operate with factory settings.

#### OMT

- Factory setting for switching signal Q1:
   Switching signal is high active, window mode
- Factory setting for switching signal Q2:
   Switching signal is high active, window mode

### Configuration

#### Setting different operating modes via the IO-Link interface

The devices are equipped with an IO-Link interface as standard for diagnostics and parameterization tasks to ensure optimum

#### Distance sensor

adjustment of the sensors to the relevant application.

#### Single point mode operating mode (one switch point):

- "Detection of objects irrespective of type and color in a defined detection range. Objects in the background are suppressed.
- "The switch point corresponds exactly to the set point.

Background suppression

#### Window mode operating mode (two switch points):

- Detection of objects irrespective of type and color in a defined detection range. Reliable detection when object leaves the
  detection range.
- · Window mode with two switch points.

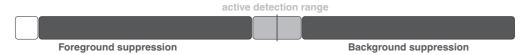
active detection range

Foreground suppression

Background suppression

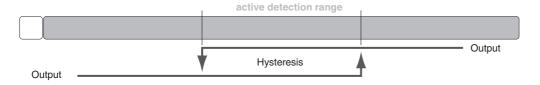
#### Center window mode operating mode (one switch point):

- Detection of objects irrespective of type and color in a defined detection range. Sets a defined window around a given object.
   Objects outside this window are not detected.
- · Window mode with one switch point.



#### Two point mode operating mode (hysteresis operating mode):

Detection of objects irrespective of type and color between a defined switch-on and switch-off point.



#### Inactive operating mode:

Evaluation of switching signals is deactivated.

The associated IODD device description file can be found in the download area at www.pepperl-fuchs.com.