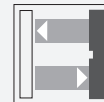




## Distance sensor

### OMR60M-R200-IEP-IO-V1-L



- Medium design with versatile mounting options
- Space-saving distance sensors in small standardized design
- Measuring method PRT (Pulse Ranging Technology)
- IO-Link interface for service and process data
- Red laser light, laser class 1
- Analog output 4 ... 20 mA

Universal distance sensor, measurement to reflector, IO-Link interface, measuring method PRT, measuring range up to 60 m, red laser light, laser class 1, push-pull output, analog output, M12 plug



# IO-Link

## 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.

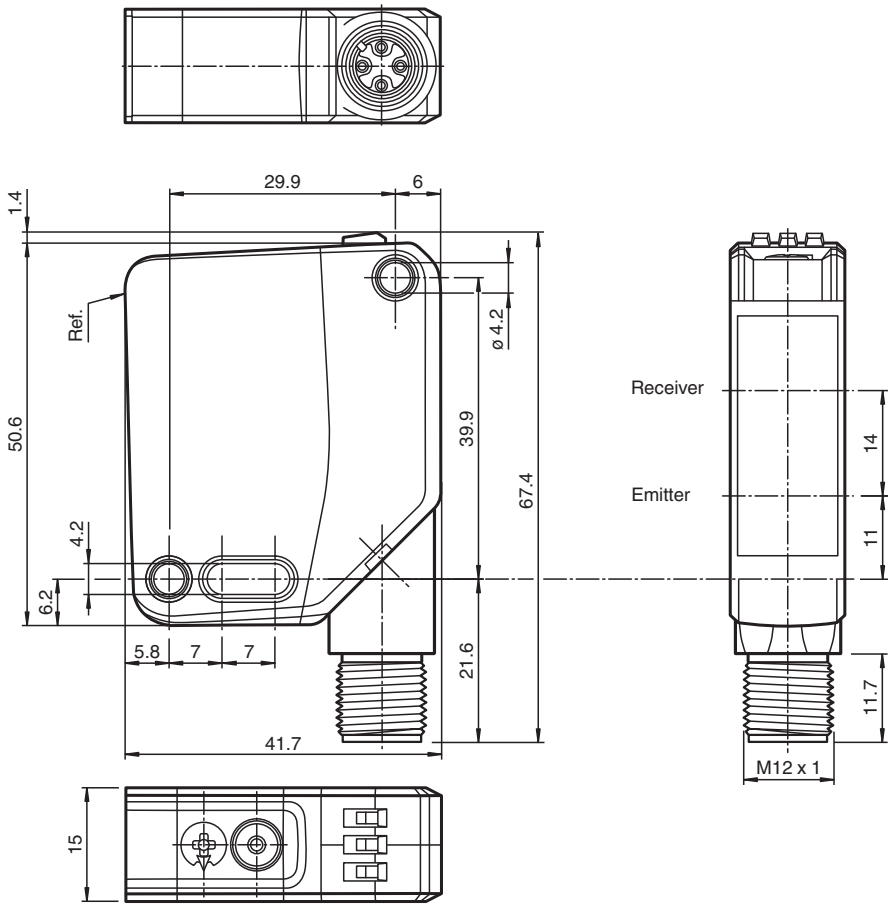
The distance sensor is based on pulse ranging technology (PRT) by Pepperl+Fuchs.

For small and large ranges, these distance sensors are very precise which makes them ideally suitable for positioning tasks. The red laser diode is clearly visible, allowing direct alignment of the device for reliable operation.

## Application

- Precise positioning of stock feeders
- Precise and rapid positioning of moving carriages
- For use on gantry cranes and lifting equipment

Dimensions



Technical Data

General specifications

|                                      |                                      |
|--------------------------------------|--------------------------------------|
| Measurement range                    | 0.2 ... 60 m                         |
| Reference target                     | OFR-500/500                          |
| Light source                         | laser diode                          |
| Light type                           | modulated visible red light          |
| Laser nominal ratings                |                                      |
| Note                                 | LASER LIGHT , DO NOT STARE INTO BEAM |
| Laser class                          | 1                                    |
| Wave length                          | 660 nm                               |
| Beam divergence                      | 2 mrad                               |
| Pulse length                         | 4 ns                                 |
| Repetition rate                      | 300 kHz                              |
| max. pulse energy                    | < 1.3 nJ                             |
| Measuring method                     | Pulse Ranging Technology (PRT)       |
| Max. Motion velocity                 | 10 m/s                               |
| Diameter of the light spot           | < 20 mm at 10 m                      |
| Ambient light limit                  | 10000 Lux                            |
| Resolution                           | 1 mm                                 |
| Temperature influence                | < 0.25 mm/K                          |
| Functional safety related parameters |                                      |
| MTTF <sub>d</sub>                    | > 300 a                              |
| Mission Time (T <sub>M</sub> )       | 20 a                                 |
| Diagnostic Coverage (DC)             | 0 %                                  |
| Indicators/operating means           |                                      |

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

## Technical Data

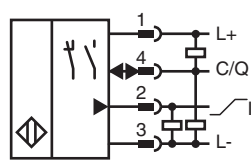
|                                  |       |                                                                                                                                                                                                                                                                                                       |
|----------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 - switch output active<br>constantly off - switch output inactive                                                                                                                                                                                                        |
| Teach-in indicator               |       | Teach-In : LED yellow/green; equiphase flashing; 2,5 Hz<br>Teach Error: LED green/yellow non equiphase flashing; 8.0 Hz                                                                                                                                                                               |
| Control elements                 |       | Teach-In key                                                                                                                                                                                                                                                                                          |
| Control elements                 |       | 5-step rotary switch for operating modes selection                                                                                                                                                                                                                                                    |
| <b>Electrical specifications</b> |       |                                                                                                                                                                                                                                                                                                       |
| Operating voltage                | $U_B$ | 18 ... 30 V DC                                                                                                                                                                                                                                                                                        |
| Ripple                           |       | 10 % within the supply tolerance                                                                                                                                                                                                                                                                      |
| No-load supply current           | $I_0$ | < 25 mA at 24 V Operating voltage                                                                                                                                                                                                                                                                     |
| Protection class                 |       | III                                                                                                                                                                                                                                                                                                   |
| Time delay before availability   | $t_v$ | < 900 ms                                                                                                                                                                                                                                                                                              |
| <b>Interface</b>                 |       |                                                                                                                                                                                                                                                                                                       |
| Interface type                   |       | IO-Link ( via C/Q = pin 4 )                                                                                                                                                                                                                                                                           |
| IO-Link revision                 |       | 1.1                                                                                                                                                                                                                                                                                                   |
| Device profile                   |       | Identification and Diagnosis - I&D<br>Smart Sensor - SSP 4.2.1                                                                                                                                                                                                                                        |
| Process data                     |       | Input 6 Byte<br>- measurement value 4 Byte<br>- scaling factor 8 Bit<br>- signal quality 2 Bit<br>- switching signal 1 1 Bit<br>- switching signal 2 1 Bit<br>- diagnosis signals n Bit<br>- additional signals n Bit<br>Output 2 Bit<br>- sensor control function 1 Bit<br>- evaluation freeze 1 Bit |
| Vendor ID                        |       | 1 (0x0001)                                                                                                                                                                                                                                                                                            |
| Device ID                        |       | 1121042 (0x111B12)                                                                                                                                                                                                                                                                                    |
| Transfer rate                    |       | COM2 (38.4 kBit/s)                                                                                                                                                                                                                                                                                    |
| Min. cycle time                  |       | 4 ms                                                                                                                                                                                                                                                                                                  |
| SIO mode support                 |       | yes                                                                                                                                                                                                                                                                                                   |
| <b>Output</b>                    |       |                                                                                                                                                                                                                                                                                                       |
| Switching type                   |       | The default setting is:<br>C/Q - Pin4: NPN normally open, PNP normally closed, IO-Link<br>I—Pin2: analog output 4...20 mA                                                                                                                                                                             |
| Signal output                    |       | 1 push-pull output , 1 analog output , 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                     | $U_d$ | ≤ 1.5 V DC                                                                                                                                                                                                                                                                                            |
| Response time                    |       | 3 ms                                                                                                                                                                                                                                                                                                  |
| <b>Analog output</b>             |       |                                                                                                                                                                                                                                                                                                       |
| Output type                      |       | 1 current output: 4 ... 20 mA                                                                                                                                                                                                                                                                         |
| Load resistor                    |       | > 1 kΩ voltage output ; ≤ 470 Ω current output                                                                                                                                                                                                                                                        |
| Recovery time                    |       | 2 ms                                                                                                                                                                                                                                                                                                  |
| <b>Conformity</b>                |       |                                                                                                                                                                                                                                                                                                       |
| Communication interface          |       | IEC 61131-9 / IO-Link V1.1.3                                                                                                                                                                                                                                                                          |
| Product standard                 |       | EN 61000-6-2, EN 61000-6-3                                                                                                                                                                                                                                                                            |
| Laser safety                     |       | EN 60825-1:2014                                                                                                                                                                                                                                                                                       |
| <b>Measurement accuracy</b>      |       |                                                                                                                                                                                                                                                                                                       |
| Warm up time                     |       | 5 min                                                                                                                                                                                                                                                                                                 |
| Measured value output            |       | 1 ms                                                                                                                                                                                                                                                                                                  |
| Average data age                 |       | 3 ms (default), 6 ms , 12 ms , 25 ms , 50 ms , 100 ms , adjustable                                                                                                                                                                                                                                    |

Release date: 2024-09-10 Date of issue: 2024-09-10 Filename: 295670-100389\_eng.pdf

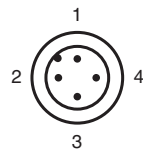
Technical Data

|                            |                                                                                                                                      |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Absolute accuracy          | typ. ± 20 mm (including influence of temperature)                                                                                    |
| Repeat accuracy            | < 6 mm                                                                                                                               |
| 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                                                                         |
| FDA approval               | IEC 60825-1:2014 Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007 |
| Ambient conditions         |                                                                                                                                      |
| Ambient temperature        | -30 ... 60 °C (-22 ... 140 °F)                                                                                                       |
| Storage temperature        | -40 ... 70 °C (-40 ... 158 °F)                                                                                                       |
| Mechanical specifications  |                                                                                                                                      |
| Degree of protection       | IP67 / IP69 / IP69K                                                                                                                  |
| Connection                 | 4-pin, M12 x 1 connector, 90° rotatable                                                                                              |
| Material                   |                                                                                                                                      |
| Housing                    | PC (Polycarbonate)                                                                                                                   |
| Optical face               | PMMA                                                                                                                                 |
| Mass                       | approx. 35 g                                                                                                                         |
| Dimensions                 |                                                                                                                                      |
| Height                     | 50.6 mm                                                                                                                              |
| Width                      | 15 mm                                                                                                                                |
| Depth                      | 41.7 mm                                                                                                                              |
| Factory settings           |                                                                                                                                      |
| Switching output 1         | Q1: switching signal high-active , Window mode 6000 ... 9000 mm                                                                      |
| Switching output 2         | Q2: Window mode ( rising ramp ) 200 ... 5000 mm                                                                                      |

Connection



Connection Assignment

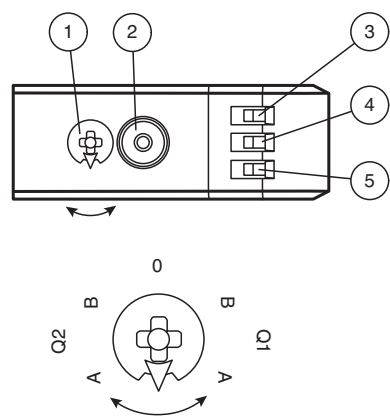


Wire colors in accordance with EN 60947-5-2

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

Release date: 2024-09-10 Date of issue: 2024-09-10 Filename: 295670-100389\_eng.pdf

Assembly



|   |                             |    |
|---|-----------------------------|----|
| 1 | Mode rotary switch          |    |
| 2 | Teach-in button             |    |
| 3 | Switching output display Q2 | YE |
| 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                           |

Safety Information

**Laser Class 1 Information**  
The irradiation can lead to irritation especially in a dark environment. Do not point at people!  
Maintenance and repairs should only be carried out by authorized service personnel!  
Attach the device so that the warning is clearly visible and readable.  
Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

## 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.

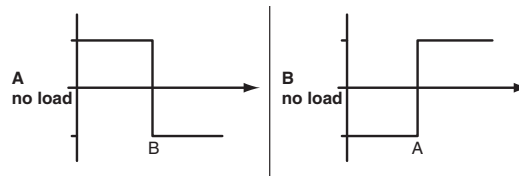
To teach in a switching threshold, press and hold the "TI" button for approximately 1 s, until the yellow and green LEDs flash in phase. Teach-in starts when the "TI" button is released.

- 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.

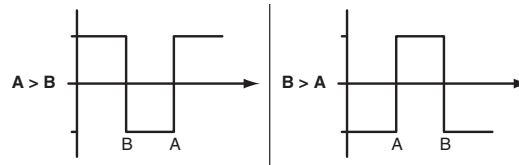
After an unsuccessful Teach-in, the sensor continues to operate with the previous valid setting after the relevant visual fault signal is issued.

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.

## Analog output

The analog output type can be configured as voltage or current output via IO-Link.

The following output types are available:

- Analog output 0 mA ... 20 mA
- Analog output 4 mA ... 20 mA
- Analog output 0 V ... 10 V

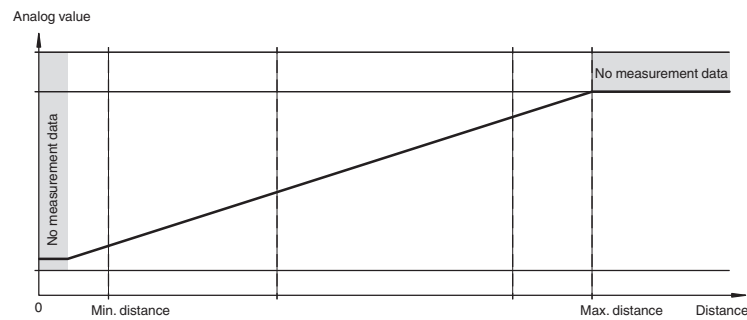
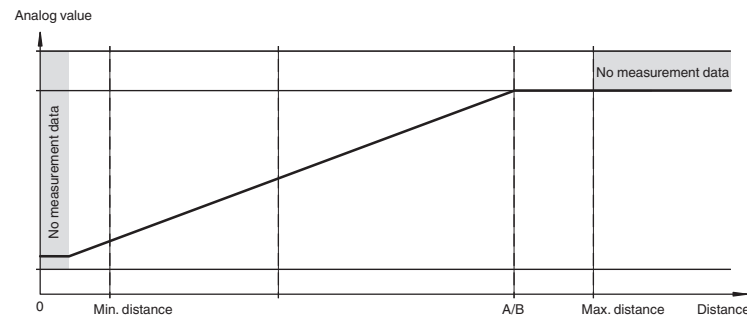
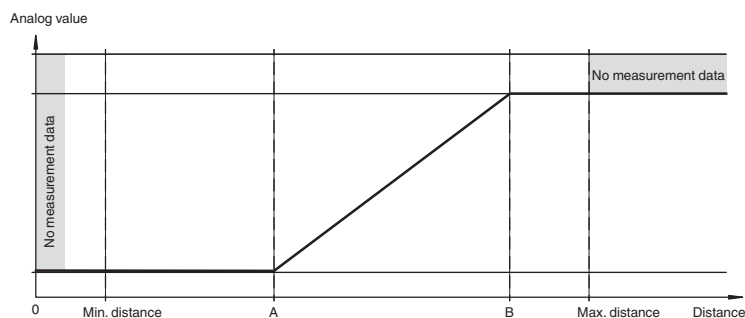
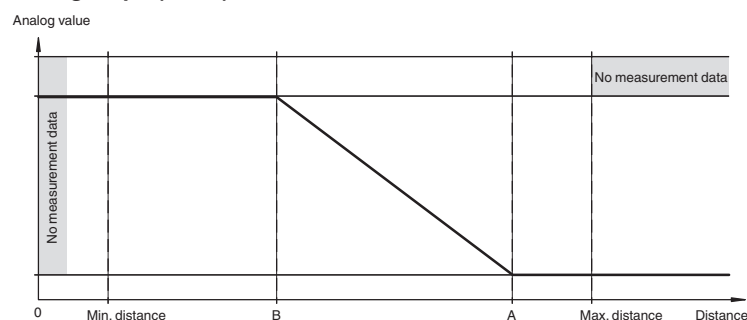
The following operating modes are available:

- Absolute mode (default setting)
- Normalized mode
- Rising slope
- Falling slope

The following substitute values can optionally be configured:

- No substitute values used (default setting)
- Substitute value for "no measured value" used
- Substitute value for "no measured value" and "Measuring overrange" used

The sensor's tolerances are based on the digital process data.

**Absolute mode (default setting, A and B = deleted)****Normal mode (A and B without teach-in / deleted)****Rising slope (A < B)****Falling slope (A > B)**

## 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 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.

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

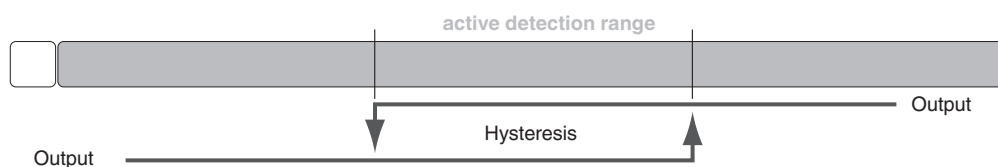
- Detection of objects irrespective of type and color in a defined detection range. Reliable detection when object leaves the detection range.
- Window mode with two switch points.

**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](http://www.pepperl-fuchs.com).