

# Operating Instructions

## **P2PY111**

## **Laser Distance Sensor Time of Flight**



EN



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# 1 General

## 1.1 Information Concerning these Instructions

- It ensures safe and efficient use of the product.
- This manual is part of the product and must be retained for the entire service life.
- In addition, local accident prevention regulations and national occupational safety regulations must be observed.
- The product is subject to technical development, so the instructions and information in these operating instructions are also subject to change. You can find the current version at [www.wenglor.com](http://www.wenglor.com) in the product's download section.



### INFORMATION

The operating instructions must be read carefully before use and kept for future reference.

## 1.2 Explanation of Symbols

- Safety precautions and warnings are emphasized by means of symbols and signal words.
- Safe use of the product is only possible if these safety precautions and warnings are adhered to.

The safety precautions and warnings are laid out in accordance with the following principle:

### SIGNAL WORD

#### Type and source of danger!

Possible consequences in the event that the hazard is disregarded.

→ Measures for averting the hazard.

The meanings of the signal words, as well as the scope of the associated hazards, are listed below:



### DANGER

This signal word indicates a hazard with a high degree of risk which, if not avoided, results in death or severe injury.



### WARNING

This signal word indicates a hazard with a medium degree of risk which, if not avoided, may result in death or severe injury.



### CAUTION

This signal word indicates a hazard with a low degree of risk which, if not avoided, may result in minor or moderate injury.



### NOTICE

This signal word draws attention to a potentially hazardous situation which, if not avoided, may result in property damage.



## INFORMATION

Information draws attention to useful tips and suggestions, as well as information on efficient, error-free use.

---

### 1.3 Limitation of Liability

- The product has been developed in consideration of the current state-of-the-art technology, as well as applicable standards and guidelines. Subject to change without notice.
- A valid declaration of conformity can be accessed at [www.wenglor.com](http://www.wenglor.com) in the product's separate download area.
- wenglor sensoric elektronische Geräte GmbH (hereinafter referred to as "wenglor") excludes all liability in the event of:
  - Non-compliance with the instructions
  - Use of the product for purposes other than those intended.
  - Use by untrained personnel.
  - Use of unapproved spare parts.
  - Unapproved modification of products.
- These operating instructions do not include any guarantees from wenglor with regard to the described procedures or specific product characteristics.
- wenglor assumes no liability for printing errors or other inaccuracies contained in these operating instructions unless wenglor was verifiably aware of such errors at the point in time at which the operating instructions were prepared.

### 1.4 Copyrights

- The contents of these instructions are protected by copyright law.
- All rights are reserved by wenglor.
- Commercial reproduction or any other commercial use of the provided content and information, in particular graphics and images, is not permitted without previous written consent from wenglor.

## 2 For Your Safety

### 2.1 Use for Intended Purpose

#### Laser Distance Sensors ToF

Laser distance sensors Time-of-Flight (ToF) work according to the principle of transit time measurement, which means that they cover large working ranges up to 10,000 mm, so that objects can be reliably detected even at great distances. The ToF sensors are extremely robust against interfering ambient light, which ensures reliable operation.

#### This Product Can Be Used in the Following Industry Sectors:

- Special-purpose mechanical engineering
- Heavy mechanical engineering
- Logistics
- Automotive industry
- Food industry
- Packaging industry
- Pharmaceuticals industry
- Plastics industry
- Woodworking industry
- Consumer goods industry
- Paper industry
- Electronics industry
- Glass industry
- Steel industry
- Aviation industry
- Chemicals industry
- Alternative energies
- Raw materials extraction

### 2.2 Use for Other than the Intended Purpose

- Not a safety component in accordance with 2006/42/EC (Machinery Directive).
- The product is not suitable for use in potentially explosive atmospheres.
- The product may be used only with accessories supplied or approved by wenglor, or in combination with approved products. A list of approved accessories and combination products can be found at [www.wenglor.com](http://www.wenglor.com) on the product detail page.



#### **DANGER**

#### **Risk of personal injury or property damage in case of use for other than the intended purpose!**

Use for other than the intended purpose may lead to hazardous situations.

→ Observe instructions regarding use for intended purpose.

### 2.3 Personnel Qualifications

- Suitable technical training is a prerequisite.
- In-house electronics training is required.
- Trained personnel who use the product must have (permanent) access to the operating instructions.



## **DANGER**

### **Risk of personal injury or property damage in case of incorrect initial start-up and maintenance!**

Personal injury and damage to equipment may occur.

→ Adequate training and qualification of personnel

## 2.4 Modification of Products



## **DANGER**

### **Risk of personal injury or property damage if the product is modified!**

Personal injury and damage to equipment may occur. Noncompliance may result in loss of the CE and/or UKCA mark and voiding of the warranty.

→ Modification of the product is not permitted

## 2.5 General Safety Precautions



## **INFORMATION**

These instructions are an integral part of the product and must be kept on hand for the entire duration of its service life.

In the event of possible changes, the current version of the operating instructions can be found at [www.wenglor.com](http://www.wenglor.com) in the product's separate download area.

Read the operating instructions carefully before using the product.

Protect the sensor against contamination and mechanical influences.

## 2.6 Laser Warnings

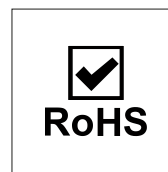
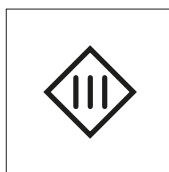


### **Laser class 1 (EN 60825-1)**

Standards and safety regulations must be observed.

Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

## 2.7 Approvals and protection classes





## 3 Technical Data

### 3.1 General Information

| Optical Data                                |                                      |
|---------------------------------------------|--------------------------------------|
| Working Range                               | 0...10000 mm                         |
| Setting Range                               | 50...10000 mm                        |
| Reproducibility maximum                     | 3 mm*                                |
| Linearity Deviation                         | 10 mm*                               |
| Switching Hysteresis                        | < 15 mm                              |
| Light Source                                | Laser (red)                          |
| Wavelength                                  | 660 nm                               |
| Service Life (T = +25 °C)                   | 100000 h                             |
| Laser Class (EN 60825-1)                    | 1                                    |
| Beam Divergence                             | < 2 mrad                             |
| Max. Ambient Light                          | 100000 Lux                           |
| Light Spot Diameter                         | see Table 1                          |
| Reflector required                          | no                                   |
| Electrical Data                             |                                      |
| Supply Voltage                              | 18...30 V DC                         |
| Current Consumption (U <sub>b</sub> = 24 V) | < 35 mA                              |
| Switching Frequency                         | 50 Hz*                               |
| Switching Frequency (max.)                  | 250 Hz*                              |
| Response Time                               | 15 ms *                              |
| Response Time (min.)                        | 4.7 ms *                             |
| Temperature Drift                           | < 0.4 mm/K                           |
| Temperature Range                           | -40...55 °C                          |
| Number of Switching Outputs                 | 2                                    |
| Switching Output Voltage Drop               | < 2.5 V                              |
| Switching Output/Switching Current          | 100 mA                               |
| Short Circuit Protection                    | yes                                  |
| Reverse Polarity Protection                 | yes                                  |
| Overload Protection                         | yes                                  |
| Interface                                   | IO-Link V1.1                         |
| IO-Link transmission speed                  | COM3                                 |
| Protection Class                            | III                                  |
| FDA Accession Number                        | 2110079-001                          |
| Mechanical Data                             |                                      |
| Setting Method                              | Teach-In                             |
| Housing Material                            | Stainless steel, V4A (1.4404 / 316L) |
| Optic Cover                                 | Plastic, PMMA                        |
| Degree of Protection                        | IP68<br>IP69K                        |
| Connection                                  | Cable; 5-wire                        |
| FDA compliant                               | yes                                  |
| Safety-relevant Data                        |                                      |
| MTTFd (EN ISO 13849-1)                      | 543.71 a                             |

| General Data      |                                                                                |
|-------------------|--------------------------------------------------------------------------------|
| Scope of delivery | 1 × BEF-SET-49 mounting set<br>1 × initial start-up instructions<br>1 × sensor |
| Approvals         | Ecolab<br>FDA compliant                                                        |
| BMECat data       |                                                                                |
| eCl@ss 5.1.4      | 27-27-08-01 Optical distance sensor                                            |
| eCl@ss 6.x        | 27-27-08-01 Optical distance sensor                                            |
| eCl@ss 7.0        | 27-27-08-01 Optical distance sensor                                            |
| eCl@ss 7.1        | 27-27-08-01 Optical distance sensor                                            |
| eCl@ss 8.x        | 27-27-08-01 Optical distance sensor                                            |
| eCl@ss 10.0.1     | 27-27-08-01 Optical distance sensor                                            |

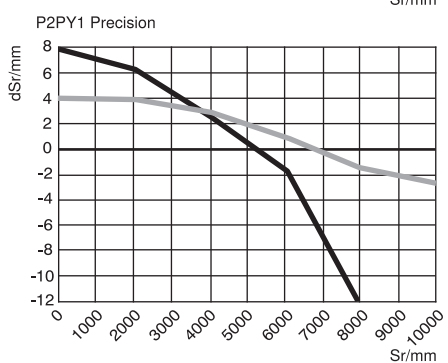
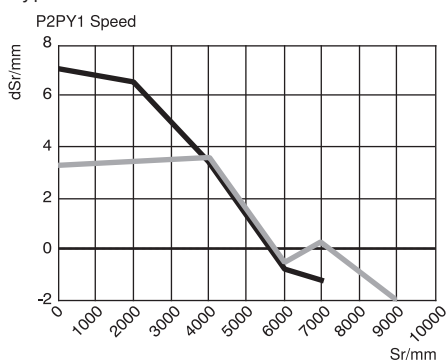
\* Depends on mode, see table 2

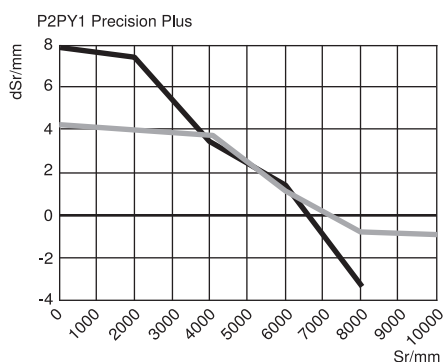
### 3.1.1 Light spot diameter

|                     |      |       |       |
|---------------------|------|-------|-------|
| Working Distance    | 0 m  | 5 m   | 10 m  |
| Light Spot Diameter | 5 mm | 10 mm | 15 mm |

### 3.1.2 Switching Distance Deviation

Typical characteristic curve based on Kodak white (90% remission).





Sr = switching distance

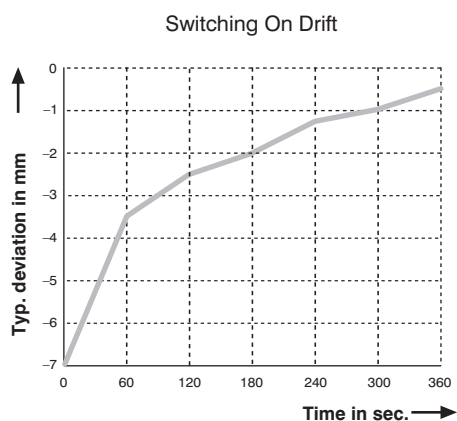
dSr = change in switching distance

Black, 6% remission

Gray, 18% remission

## 3.2 Warm-Up Phase

The warm-up phase lasts 6 minutes. The switch-on drift during this time is shown in the following diagram.



### NOTICE

Specifications correspond to measured value without load. With the analog variants, specifications may differ due to the load on the analog output.

## 3.3 Working Range

The sensor's working range is influenced by two parameters:

- Object remission
- Ambient light

The following values become typical in Precision mode (default):

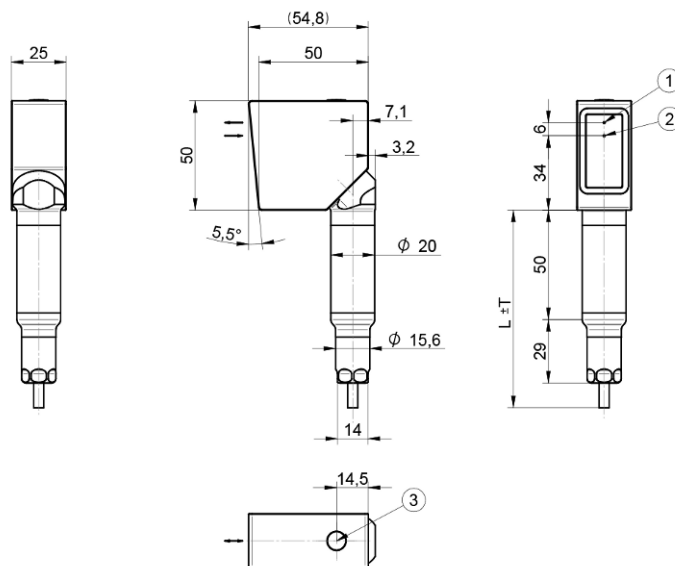
|                       | ambient light  |                |                |                |
|-----------------------|----------------|----------------|----------------|----------------|
| remission             | 100 lux        | 5,000 lux      | 20,000 lux     | 100,000 lux    |
| White (90% remission) | 50...10,000 mm | 50...10,000 mm | 50...10,000 mm | 50...10,000 mm |
| Gray (18% remission)  | 50...10,000 mm | 50...10,000 mm | 50...10,000 mm | 50...5,000 mm  |
| Black (6% remission)  | 50...8,000 mm  | 50...6,500 mm  | 50...5,500 mm  | 50...3,000 mm  |

## 3.4 Mode-Dependent Data

Some technical data depend on the mode set. Depending on the setting, the following data are obtained:

| Mode                   | Working range<br>White<br>(90% re-<br>mission) | Working range<br>Gray (18% re-<br>mission) | Working range<br>Black (6% re-<br>mission) | Switching<br>frequency | Response<br>time | Maximum<br>repro-<br>ducibility | Linearity<br>deviation | Low sig-<br>nal detec-<br>tion |
|------------------------|------------------------------------------------|--------------------------------------------|--------------------------------------------|------------------------|------------------|---------------------------------|------------------------|--------------------------------|
| Speed                  | 0...<br>10,000 m<br>m                          | 0...<br>9,000 mm                           | 0...<br>7,000 mm                           | 250 Hz                 | 4.7 ms           | 5 mm                            | 15 mm                  | +                              |
| Precision<br>(default) | 0...<br>10,000 m<br>m                          | 0...<br>10,000 m<br>m                      | 0...<br>8,000 mm                           | 50 Hz                  | 15 ms            | 3 mm                            | 10 mm                  | ++                             |
| Precision<br>Plus      | 0...<br>10,000 m<br>m                          | 0...<br>10,000 m<br>m                      | 0...<br>8,000 mm                           | 25 Hz                  | 28.7 ms          | 3 mm                            | 10 mm                  | +++                            |

## 3.5 Housing Dimensions

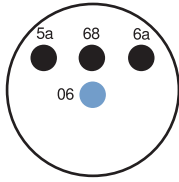


- ① Transmitter Diode
- ② Receiver Diode

Dimensions in mm (1 mm = 0.03937 inch)

## 3.6 Control panel

II6



06 = Teach Button

68 = Power LED

5a = Switching Status Indicator, O1

6a = Switching Status Indicator, O2

## 3.7 Complementary Products

wenglor offers you the right connection and mounting technology as well as other accessories for your product. You can find this at [www.wenglor.com](http://www.wenglor.com) on the product details page at the bottom.

## 4 Transport and Storage

### 4.1 Transport

Upon receipt of shipment, the goods must be inspected for damage in transit. In the case of damage, conditionally accept the package and notify the manufacturer of the damage. Then return the device, making reference to damage in transit.

### 4.2 Storage

The following points must be taken into consideration with regard to storage:

- Do not store the product outdoors.
- Store the product in a dry, dust-free place.
- Protect the product against mechanical impacts.
- Protect the product against exposure to direct sunlight.



#### NOTICE

##### **Risk of property damage in case of improper storage!**

The product may be damaged.

→ Storage instructions must be complied with.

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## 5 Installation and Electrical Connection

### 5.1 Installation

- Protect the product from contamination during installation.
- Relevant electrical and mechanical regulations, standards, and safety rules must be observed.
- Protect the product from mechanical impact.
- Ensure that the sensor is mechanically secure.
- Torque values must be observed (see section Technical Data [► 9]).



#### NOTICE

##### **Risk of property damage in case of improper installation!**

The product may be damaged!

→ Comply with installation instructions.



#### CAUTION

##### **Risk of personal injury or property damage during installation!**

Personal injury and damage to the product may occur.

→ Ensure a safe installation environment.

### 5.2 Electrical Connection

- Wire the sensor in accordance with the connection diagram.
- Switch on the supply voltage (see section Technical Data [► 9])

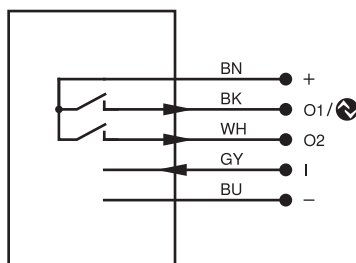


#### DANGER

##### **Risk of personal injury or property damage due to electric current.**

Voltage-conducting parts may cause personal injury or damage to equipment.

→ The electric device may be connected by appropriately qualified personnel only.



| Legend                                                                            |                                            |       |                                |                                        |                     |
|-----------------------------------------------------------------------------------|--------------------------------------------|-------|--------------------------------|----------------------------------------|---------------------|
| +                                                                                 | Supply Voltage +                           | PT    | Platinum measuring resistor    | ENARs422                               | Encoder A/Ā (TTL)   |
| –                                                                                 | Supply Voltage 0 V                         | nc    | Not connected                  | ENBRs422                               | Encoder B/B̄ (TTL)  |
| ~                                                                                 | Supply Voltage (AC Voltage)                | U     | Test Input                     | ENA                                    | Encoder A           |
| A                                                                                 | Switching Output (NO)                      | Ū     | Test Input inverted            | ENb                                    | Encoder B           |
| Ā                                                                                 | Switching Output (NC)                      | W     | Trigger Input                  | AMIN                                   | Digital output MIN  |
| V                                                                                 | Contamination/Error Output (NO)            | W–    | Ground for the Trigger Input   | AMAX                                   | Digital output MAX  |
| Ṽ                                                                                 | Contamination/Error Output (NC)            | O     | Analog Output                  | AOK                                    | Digital output OK   |
| E                                                                                 | Input (analog or digital)                  | O–    | Ground for the Analog Output   | SY In                                  | Synchronization In  |
| T                                                                                 | Teach Input                                | BZ    | Block Discharge                | SY OUT                                 | Synchronization OUT |
| R                                                                                 | Reset input                                | AMV   | Valve Output                   | OLT                                    | Brightness output   |
| Z                                                                                 | Time Delay (activation)                    | a     | Valve Control Output +         | M                                      | Maintenance         |
| S                                                                                 | Shielding                                  | b     | Valve Control Output 0 V       | rsv                                    | Reserved            |
| RxD                                                                               | Interface Receive Path                     | SY    | Synchronization                | Wire Colors according to DIN IEC 60757 |                     |
| TxD                                                                               | Interface Send Path                        | SY–   | Ground for the Synchronization |                                        |                     |
| RDY                                                                               | Ready                                      | E+    | Receiver-Line                  | BK                                     | Black               |
| GND                                                                               | Ground                                     | S+    | Emitter-Line                   | BN                                     | Brown               |
| CL                                                                                | Clock                                      | ⊥     | Grounding                      | RD                                     | Red                 |
| E/A                                                                               | Output/Input programmable                  | SnR   | Switching Distance Reduction   | OG                                     | Orange              |
|  | IO-Link                                    | Rx+/- | Ethernet Receive Path          | YE                                     | Yellow              |
| PoE                                                                               | Power over Ethernet                        | Tx+/- | Ethernet Send Path             | GN                                     | Green               |
| IN                                                                                | Safety Input                               | Bus   | Interfaces-Bus A(+)/B(-)       | BU                                     | Blue                |
| OSSD                                                                              | Safety Output                              | La    | Emitted Light disengageable    | VT                                     | Violet              |
| Signal                                                                            | Signal Output                              | Mag   | Magnet activation              | GY                                     | Grey                |
| BI_D+/-                                                                           | Ethernet Gigabit bidirect. data line (A-D) | RES   | Input confirmation             | WH                                     | White               |
| EN0 RS422                                                                         | Encoder 0-pulse 0/0̄ (TTL)                 | EDM   | Contacting Monitoring          | PK                                     | Pink                |
|                                                                                   |                                            |       |                                | GNYE                                   | Green/Yellow        |

## 5.3 Diagnosis

| display                              | Status                                                                              | Meaning                                |
|--------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------|
| supply voltage indicator<br>P        |    | Sensor ready for operation             |
|                                      |    | No voltage supply available            |
| switching status indicator<br>O1, O2 |  | Switching output active                |
|                                      |  | Warning                                |
|                                      |  | Error                                  |
|                                      |  | Switching output not active            |
| Analog display AO                    |  | Object within the set measuring range  |
|                                      |  | Object outside the set measuring range |
|                                      |  | Warning                                |
|                                      |  | Error                                  |

|                                                                                     |            |
|-------------------------------------------------------------------------------------|------------|
|  | = Not lit  |
|  | = Flashing |
|  | = Steady   |

## 5.4 Troubleshooting

| Error   | Possible cause    | Elimination                                                                                                                                                                                             |
|---------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Warning | Warning signal    | <ul style="list-style-type: none"> <li>Reduce distance between sensor and object</li> <li>Adjust angle of sensor to object</li> </ul>                                                                   |
|         | Undervoltage      | <ul style="list-style-type: none"> <li>Increase voltage supply to min. 18 V DC</li> </ul>                                                                                                               |
| Error   | Short circuit     | <ul style="list-style-type: none"> <li>Check the electrical wiring and eliminate the short circuit</li> </ul>                                                                                           |
|         | Temperature error | <ul style="list-style-type: none"> <li>Disconnect the sensor from the supply voltage and allow it to cool</li> <li>Mount the mounting bracket as a heat sink</li> <li>Reduce load on outputs</li> </ul> |

| Error | Possible cause | Elimination                                                                                                                                    |
|-------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------|
|       | Device error   | <ul style="list-style-type: none"> <li>• Disconnect the sensor from the supply voltage and restart it</li> <li>• Replace the sensor</li> </ul> |



## INFORMATION

### Action in case of error:

1. Take the machine out of service.
2. Analyze and rectify the cause of the error using the diagnostic information.
3. If the fault cannot be rectified, contact wenglor support.
4. Do not operate the machine if the error behavior is unclear.
5. The machine must be taken out of service if the error cannot be clearly identified or reliably rectified.



## DANGER

### Risk of personal injury or property damage if not observed!

The safety function of the system is disabled. Damage to personnel and equipment.

→ Behavior in case of error as specified.

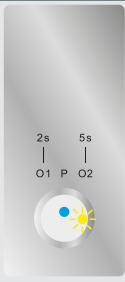
## 6 Settings

The sensor can be set via the control, IO-Link and wTeach2. The different setting options are outlined below.

### 6.1 Configuration with Push of Button / Teach-In

This section describes the settings that can be configured directly on the sensor using the button.

Three different teach-in modes are available. These can be set via IO-Link. The default setting is foreground teach-in.

|                                                                                    |                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | <b>Teach-in for O1</b> <ol style="list-style-type: none"><li>1. Adjust the sensor so that the light spot hits the object to be taught.</li><li>2. Hold down the teach-in key for 2 seconds until LED A1 starts to flash.</li><li>3. Release the teach-in key.</li><li>4. The distance is programmed, and LED O1 flashes to confirm successful programming.</li></ol>         |
|  | <b>Teach-in for O2</b> <ol style="list-style-type: none"><li>1. Adjust the sensor so that the light spot hits the object to be programmed.</li><li>2. Press and hold the teach-in key for 5 seconds until LED A2 starts to flash.</li><li>3. Release the teach-in key.</li><li>4. The distance is programmed and LED A2 flashes to confirm successful programming.</li></ol> |



## INFORMATION

### Note

If the sensor is taught without an object or if an object is too far away from the sensor, the switching distance is set to the end of the setting range and LED O1/O2 flashes at 8 Hz. The same applies if an object is too close; in this case, the switching distance is set to the beginning of the setting range.

## 7 Function Description

The functions described in the following section can be set via wTeach or IODD via IO-Link.

### 7.1 Sensor Functions

| Function       | Possible settings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Default       |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Measuring mode | <p><b>Speed</b><br/>The sensor is optimized for fast applications.</p> <p><b>Precision</b><br/>The sensor is optimized for high-accuracy applications.</p> <p><b>Precision Plus</b><br/>The sensor is optimized for high-accuracy applications and even higher sensitivity to low signals.</p> <p><b>Note!</b><br/>The technical data resulting from the various modes are specified in Mode-Dependent Data [► 12].</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Precision     |
| Detection mode | <p><b>First Object</b><br/>The signal reflected by an object that is within the working range and closest to the sensor is used.</p> <p><b>Last Object</b><br/>The signal reflected by an object that is within the working range and farthest from the sensor is used.</p> <p><b>Highest Intensity</b><br/>The signal with the highest signal strength is used.</p> <p><b>Note!</b><br/>If an object is hidden by this function, a blind spot directly behind the object results. The sensor cannot detect any objects within this blind spot. The size of the blind spot depends on the reflectance of the interfering object.</p>                                                                                                                                                                                                                                                                                                                                                                                      | First object  |
| Distance range | <p>A distance range in which signals are to be evaluated can be defined within the working range. Signals outside the set distance range are ignored and are not included in the signal evaluation. This means that ranges for which no usable signals are expected can be completely hidden.</p> <p>This function can be used to suppress interfering signals, such as those produced by a glass disk, for instance. Depending on the set mode and the resulting working range, the distance range can be set within it.</p> <p><b>Min. distance: working range</b></p> <p><b>Max. distance: working range</b></p> <p><b>Note!</b></p> <ul style="list-style-type: none"> <li>• Objects outside the set distance range are evaluated as “No signal”.</li> <li>• If a distance range is set, a blind spot directly behind this range results. The sensor cannot detect any objects within the blind spot. The size of the blind spot depends on the reflectance of the interfering objects in the hidden area.</li> </ul> | Setting range |

| Function            | Possible settings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Default   |                |  |  |        |       |           |                |     |   |   |   |   |      |       |       |   |      |       |       |   |      |       |       |   |       |       |        |   |       |        |        |   |       |        |        |   |       |        |        |   |        |        |          |   |        |          |          |     |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------|--|--|--------|-------|-----------|----------------|-----|---|---|---|---|------|-------|-------|---|------|-------|-------|---|------|-------|-------|---|-------|-------|--------|---|-------|--------|--------|---|-------|--------|--------|---|-------|--------|--------|---|--------|--------|----------|---|--------|----------|----------|-----|
| Sensitivity         | <p>The sensor has very high sensitivity and can detect objects with very weak signals and measure distances to them. Constant interferences in the measured section, e.g., due to fog or dust, can result in incorrect measurements. Such interfering influences can be suppressed by reducing the sensitivity. Reducing the sensitivity also reduces the working range.</p> <p><b>Maximum</b></p> <p>In this setting, the working range corresponds to the values specified in the data sheet.</p> <p><b>Medium</b></p> <p>With this setting, the working range changes to:</p> <p>white (90% remission): , gray (18% remission): , black (6% remission):</p> <p><b>Low</b></p> <p>With this setting, the working range changes to:</p> <p>white (90% remission): , gray (18% remission): , black (6% remission):</p> <p><b>Minimum</b></p> <p>With this setting, the working range changes to:</p> <p>white (90% remission): , gray (18% remission): , black (6% remission):</p> <p>The technical data relating to reproducibility and linearity correspond to the typical data sheet values in the various settings.</p>                                                                                                                                                                                                                                                                                | Maximum   |                |  |  |        |       |           |                |     |   |   |   |   |      |       |       |   |      |       |       |   |      |       |       |   |       |       |        |   |       |        |        |   |       |        |        |   |       |        |        |   |        |        |          |   |        |          |          |     |
| Interference filter | <p>The interference filter can be used to increase measurement reliability in the case of brief interferences in the measured section. Interferences such as rain, snow or chips in the air generate brief signals, which can result in incorrect measurements. A higher filter level allows the interfering signals to be ignored for a defined period. If the distance changes suddenly, the response time is extended. This extension of the response time depends on the filter level and the mode used. If the distance changes continuously, the response time remains unchanged when the filter is activated.</p> <table><tr><th></th><th colspan="3">Mode</th></tr><tr><th>Filter</th><th>Speed</th><th>Precision</th><th>Precision Plus</th></tr><tr><td>Off</td><td>-</td><td>-</td><td>-</td></tr><tr><td>1</td><td>2 ms</td><td>10 ms</td><td>20 ms</td></tr><tr><td>2</td><td>4 ms</td><td>20 ms</td><td>40 ms</td></tr><tr><td>3</td><td>6 ms</td><td>30 ms</td><td>60 ms</td></tr><tr><td>4</td><td>10 ms</td><td>50 ms</td><td>100 ms</td></tr><tr><td>5</td><td>20 ms</td><td>100 ms</td><td>200 ms</td></tr><tr><td>6</td><td>40 ms</td><td>200 ms</td><td>400 ms</td></tr><tr><td>7</td><td>60 ms</td><td>300 ms</td><td>600 ms</td></tr><tr><td>8</td><td>100 ms</td><td>500 ms</td><td>1,000 ms</td></tr><tr><td>9</td><td>200 ms</td><td>1,000 ms</td><td>2,000 ms</td></tr></table> |           | Mode           |  |  | Filter | Speed | Precision | Precision Plus | Off | - | - | - | 1 | 2 ms | 10 ms | 20 ms | 2 | 4 ms | 20 ms | 40 ms | 3 | 6 ms | 30 ms | 60 ms | 4 | 10 ms | 50 ms | 100 ms | 5 | 20 ms | 100 ms | 200 ms | 6 | 40 ms | 200 ms | 400 ms | 7 | 60 ms | 300 ms | 600 ms | 8 | 100 ms | 500 ms | 1,000 ms | 9 | 200 ms | 1,000 ms | 2,000 ms | Off |
|                     | Mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |                |  |  |        |       |           |                |     |   |   |   |   |      |       |       |   |      |       |       |   |      |       |       |   |       |       |        |   |       |        |        |   |       |        |        |   |       |        |        |   |        |        |          |   |        |          |          |     |
| Filter              | Speed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Precision | Precision Plus |  |  |        |       |           |                |     |   |   |   |   |      |       |       |   |      |       |       |   |      |       |       |   |       |       |        |   |       |        |        |   |       |        |        |   |       |        |        |   |        |        |          |   |        |          |          |     |
| Off                 | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -         | -              |  |  |        |       |           |                |     |   |   |   |   |      |       |       |   |      |       |       |   |      |       |       |   |       |       |        |   |       |        |        |   |       |        |        |   |       |        |        |   |        |        |          |   |        |          |          |     |
| 1                   | 2 ms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 10 ms     | 20 ms          |  |  |        |       |           |                |     |   |   |   |   |      |       |       |   |      |       |       |   |      |       |       |   |       |       |        |   |       |        |        |   |       |        |        |   |       |        |        |   |        |        |          |   |        |          |          |     |
| 2                   | 4 ms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 20 ms     | 40 ms          |  |  |        |       |           |                |     |   |   |   |   |      |       |       |   |      |       |       |   |      |       |       |   |       |       |        |   |       |        |        |   |       |        |        |   |       |        |        |   |        |        |          |   |        |          |          |     |
| 3                   | 6 ms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 30 ms     | 60 ms          |  |  |        |       |           |                |     |   |   |   |   |      |       |       |   |      |       |       |   |      |       |       |   |       |       |        |   |       |        |        |   |       |        |        |   |       |        |        |   |        |        |          |   |        |          |          |     |
| 4                   | 10 ms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 50 ms     | 100 ms         |  |  |        |       |           |                |     |   |   |   |   |      |       |       |   |      |       |       |   |      |       |       |   |       |       |        |   |       |        |        |   |       |        |        |   |       |        |        |   |        |        |          |   |        |          |          |     |
| 5                   | 20 ms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 100 ms    | 200 ms         |  |  |        |       |           |                |     |   |   |   |   |      |       |       |   |      |       |       |   |      |       |       |   |       |       |        |   |       |        |        |   |       |        |        |   |       |        |        |   |        |        |          |   |        |          |          |     |
| 6                   | 40 ms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 200 ms    | 400 ms         |  |  |        |       |           |                |     |   |   |   |   |      |       |       |   |      |       |       |   |      |       |       |   |       |       |        |   |       |        |        |   |       |        |        |   |       |        |        |   |        |        |          |   |        |          |          |     |
| 7                   | 60 ms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 300 ms    | 600 ms         |  |  |        |       |           |                |     |   |   |   |   |      |       |       |   |      |       |       |   |      |       |       |   |       |       |        |   |       |        |        |   |       |        |        |   |       |        |        |   |        |        |          |   |        |          |          |     |
| 8                   | 100 ms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 500 ms    | 1,000 ms       |  |  |        |       |           |                |     |   |   |   |   |      |       |       |   |      |       |       |   |      |       |       |   |       |       |        |   |       |        |        |   |       |        |        |   |       |        |        |   |        |        |          |   |        |          |          |     |
| 9                   | 200 ms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1,000 ms  | 2,000 ms       |  |  |        |       |           |                |     |   |   |   |   |      |       |       |   |      |       |       |   |      |       |       |   |       |       |        |   |       |        |        |   |       |        |        |   |       |        |        |   |        |        |          |   |        |          |          |     |
| Emitted light       | <p>The sensor's laser can be switched on or off.</p> <p><b>On</b></p> <p>Laser on</p> <p><b>Off</b></p> <p>Laser off</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | On        |                |  |  |        |       |           |                |     |   |   |   |   |      |       |       |   |      |       |       |   |      |       |       |   |       |       |        |   |       |        |        |   |       |        |        |   |       |        |        |   |        |        |          |   |        |          |          |     |

|                     |                                                                                                                                                                                                                                                                                                                                              |            |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
|                     | <p>The sensor no longer supplies a measured value.</p> <p><b>Note!</b></p> <ul style="list-style-type: none"> <li>• If an input is set as a laser-off input, the emitted light can also be switched on and off via the input.</li> <li>• If the laser is switched off, the sensor behavior corresponds to the status “No signal.”</li> </ul> |            |
| Localization        | <p>The sensor's supply voltage indicator can be set to flash blue. This makes it easy to locate the sensor in a system.</p> <p><b>On</b></p> <p>The LED supply voltage indicator flashes blue.</p> <p><b>Off</b></p> <p>LEDs in normal operation.</p>                                                                                        | Off        |
| Measured value unit | <p>The measured distance can be read out in millimeters or inches.</p> <p><b>Millimeter</b></p> <p>Distance values read out in mm</p> <p><b>Inch</b></p> <p>Distance values read out in 1/10 inch</p>                                                                                                                                        | Millimeter |

## 7.2 Pin Function

The pin function is used to define the function of pins I/O1, I/O2, and I3, as these can be used for different functions.

| pin  | Possible settings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Default          |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| I/O1 | <p><b>switching output</b></p> <p>The switching output is assigned to switching point SSC1.</p> <p><b>error output</b></p> <p>The error output switches when one of the assigned errors occurs; see the Status Messages table.</p> <p><b>Warning output</b></p> <p>The warning output switches when one of the assigned warnings occurs; see the Status Messages table.</p> <p><b>Laser-off input</b></p> <p>For explanation, see I3</p> <p><b>teach-in input</b></p> <p>For explanation, see I3</p> <p><b>Speed measurement Reset input</b></p> <p>See I3 for explanation</p> <p><b>Disabled</b></p> <p>The pin is disabled.</p> | switching output |
| I/O2 | <p><b>switching output</b></p> <p>The switching point SSC2 is assigned to the switching output.</p> <p><b>Antivalent switching output</b></p> <p>The switching output switches antivalent to switching output O1.</p> <p><b>error output</b></p> <p>The error output switches when one of the assigned errors occurs, see table Status messages.</p> <p><b>Warning output</b></p>                                                                                                                                                                                                                                                 | switching output |

| pin | Possible settings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Default         |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
|     | <p>The warning output switches when one of the assigned warnings occurs, see Status Messages table.</p> <p><b>Laser off input</b></p> <p>For explanation, see I3</p> <p><b>teach-in input</b></p> <p>For explanation, see I3</p> <p><b>Speed measurement reset input</b></p> <p>See I3 for explanation</p> <p><b>Deactivated</b></p> <p>The pin is deactivated.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                 |
| I3  | <p><b>Laser off input</b></p> <p>The sensor's transmission light is deactivated as long as the input is activated. The sensor then does not provide a measured value and sets the status to "No signal."</p> <p><b>teach-in input</b></p> <p>teach-in</p> <p>The outputs can be set using the same procedure as with the teach-in key (see section Configuration with Push of Button / Teach-In [► 18]). An activated input corresponds to a pressed teach-in key.</p> <p><b>Locking</b></p> <p>If the teach-in input is permanently set to 18...30 V DC, the teach-in key is locked and protected against unintentional adjustment as long as the input signal is present.</p> <p><b>Speed measurement Reset input</b></p> <p>The "Speed" status message is reset.</p> <p><b>Deactivated</b></p> <p>The pin is deactivated.</p> | Laser off input |

## 7.2.1 Output Functions

The output functions are used to set the physical outputs.

### Digital Outputs

| Function  | Possible settings                                                                                                                                                                                                                                                                                                                                                     | Default |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| Polarity  | <p><b>PNP</b></p> <p><b>NPN</b></p> <p><b>Push-pull</b></p>                                                                                                                                                                                                                                                                                                           | PNP     |
| Circuit   | <p><b>NO</b></p> <p>Light switching (Normally Open)</p> <p>The output is high when the condition has been satisfied, depending on settings (switching point, warning, error).</p> <p><b>NC</b></p> <p>Dark switching (normally closed)</p> <p>The output is low when the condition has been fulfilled depending on the setting (switching point, warning, error).</p> | NO      |
| On-delay  | <b>0...10,000 ms</b>                                                                                                                                                                                                                                                                                                                                                  | 0 ms    |
| Off-delay | <b>0...10,000 ms</b>                                                                                                                                                                                                                                                                                                                                                  | 0 ms    |

## 7.2.2 Input Functions

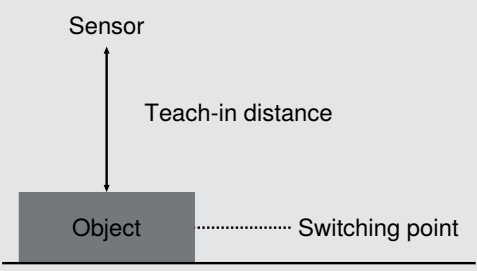
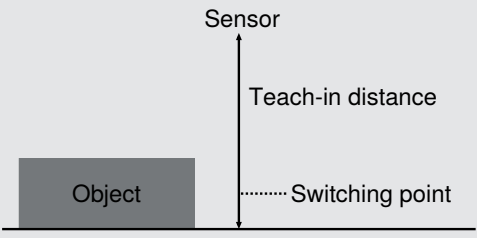
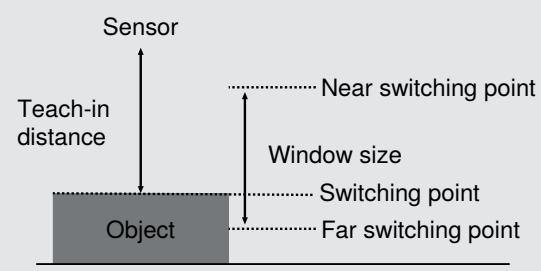
The input functions are used to set the physical inputs.

| Function   | Possible settings                                                                                                                                                                                                                      | Default               |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Input mode | <b>Supply voltage active</b><br>Function is triggered as soon as supply voltage is applied to the input.<br><br><b>Supply voltage inactive</b><br>Function is triggered as soon as 0 V is applied to the input or the input is opened. | Supply voltage active |

## 7.2.3 Switching Point Functions (SSC1/SSC2)

The two switching points, SSC1 and SSC2, are set using the switching point functions.

SSC1 is assigned to output O1 and SSC2 is assigned to output O2.

| Function        | Possible settings                                                                                                                                                                                                                                                                                                                                | Default             |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Teach-in        | Starts the teach-in process.                                                                                                                                                                                                                                                                                                                     |                     |
| teach-in-mode   | <b>foreground teach-in</b> <br><b>background teach-in</b> <br><b>window teach-in</b>  | foreground teach-in |
| switching point | 50...10,000 mm<br><b>Note!</b>                                                                                                                                                                                                                                                                                                                   | 5,000 mm            |

| Function                     | Possible settings                                                                                                                                                                                                                                                                                                                              | Default |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|                              | If a distance range has been set, the switching point can only be set within the specified distance range.                                                                                                                                                                                                                                     |         |
| Hysteresis                   | Hysteresis is the difference between the switch-on and switch-off point.<br>5...1,000 mm                                                                                                                                                                                                                                                       | 15 mm   |
| Close Switching Point Window | In teach-in mode window teach-in<br>Distance from the set window center to the sensor-side switching point of the window.<br>The window can be set so that it extends from the minimum setting range to the maximum setting range of the sensor. The minimum and maximum possible settings are determined by the respective set window center. | 30 mm   |
| Window Switching Point Far   | In window teach-in mode<br>Distance from the set window center to the window's switching point far from the sensor.<br>The window can be set to extend from the minimum setting range to the maximum setting range of the sensor. The minimum and maximum possible settings are determined by the respective set window center.                | 30 mm   |

## 7.2.4 Condition Monitoring Functions

### 7.2.4.1 Status Message Function

The sensor provides various status messages. Due to the process data structure, four status messages can be transmitted as individual process data.

These parameters can be used to set the status messages that are transmitted via the process data.

| Function  | Available settings | Default             |
|-----------|--------------------|---------------------|
| Message 1 | See table          | Warning signal      |
| Message 2 | See table          | Optics contaminated |
| Message 3 | See table          | ambient light       |
| Message 4 | See table          | Accelerometer       |

### 7.2.4.2 Warning/Error Output Function

The status messages used to trigger the collective message can be defined for the warning output and the error output respectively. The status messages are OR-linked so that the output is activated when one of the defined status messages is activated.

| Function       | Possible settings           | Default                                                                                                                                 |
|----------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Warning output | See table "Status Messages" | Signal warning, optics dirty, ambient light, temperature too high, temperature too low, undervoltage, interference in the working range |
| Error output   | See table "Status Messages" | Object too close, object too far, no signal, device error, over-temperature, short circuit                                              |

#### Status messages

| Warning        |                                       |
|----------------|---------------------------------------|
| Undervoltage   | The supply voltage is too low.        |
| Warning signal | The object reflects too little light. |

| Warning                           |                                                                                                                                                                                        |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contaminated optics               | The sensor detects when the optic cover is dirty, and the signal deteriorates as a result                                                                                              |
| Ambient light                     | Object detection is impeded by ambient light.                                                                                                                                          |
| Interference in the working range | When using the interference filter, the sensor detects whether a brief interfering event has occurred in the measuring range. This could be chips, water droplets, etc., for instance. |
| Temperature too high              | The sensor's internal temperature is high.                                                                                                                                             |
| Temperature too low               | The sensor's internal temperature is low.                                                                                                                                              |
| Device warning                    | An internal device error has occurred.                                                                                                                                                 |
| Emitted light off                 | The sensor's emitted light is switched off.                                                                                                                                            |

| Error            |                                                                                                  |
|------------------|--------------------------------------------------------------------------------------------------|
| Short circuit    | A short circuit has occurred on at least one pin.                                                |
| No signal        | The sensor is not receiving a signal.                                                            |
| Object too close | The object is below the setting range or the set measuring range.                                |
| Object too far   | The object is above the setting range or the set measuring range.                                |
| Over-temperature | The over-temperature has been exceeded. To protect the emitting unit, the laser is switched off. |
| Device error     | A hardware error has occurred. For safety reasons, the emitted light is switched off.            |

| Accelerometer         |                                                                                              |
|-----------------------|----------------------------------------------------------------------------------------------|
| Acceleration detected | The sensor has detected acceleration above the set threshold via the internal accelerometer. |

### 7.2.4.3 Accelerometer

The sensor features a built-in accelerometer. This detects acceleration and can therefore identify impacts or shock loads.

| Function               | Possible settings                                                                                                                                                                                                                                                      | Default setting |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Accelerometer          | <b>On</b><br>Accelerometer enabled<br><br><b>Off</b><br>Acceleration sensor deactivated<br><br>The status message remains active until it is acknowledged.<br>This ensures that even messages occurring in intervals shorter than the cycle time are reliably detected | On              |
| Acceleration Threshold | The threshold defines how sensitive the acceleration sensor is<br><br><b>0...100 %</b>                                                                                                                                                                                 | 50              |
| Counter                | The Counter counts the number of times the set threshold has been exceeded.                                                                                                                                                                                            | 0               |

### 7.2.4.4 Signal Monitoring

The sensor can detect up to four objects within its working range. It determines the distance and signal strength for each of these objects.

| Function          | Possible settings | Default setting |
|-------------------|-------------------|-----------------|
| Signal monitoring | <b>On</b>         | Off             |

| Function                | Possible settings                                                                  | Default setting |
|-------------------------|------------------------------------------------------------------------------------|-----------------|
|                         | Signal monitoring enabled<br><b>Off</b><br>Signal monitoring disabled              |                 |
| Object detection status | Indicates which object is used for signal evaluation.<br><b>Object 1-4</b>         | —               |
| Object Distance         | Displays the respective distance of up to four objects.<br>50...10,000 mm          | —               |
| Object Signal           | Displays the respective signal strength of up to four objects.<br><b>1...1,000</b> | —               |

## 7.2.5 Simulation Functions

This function simulates the behavior of the sensor regardless of its current status and measured value. This allows you to check whether a system in which the sensor is integrated responds correctly to the data supplied by the sensor and processes it accordingly.

If a measured value is specified, the sensor behaves as if the specified measured value corresponds to the actual measured value. This means that the behavior of the outputs and status messages is simulated according to the specified measured value.

In addition, the individual outputs and status messages can be simulated separately from the measured value.

| Function             | Possible settings                                                                               | Default                     |
|----------------------|-------------------------------------------------------------------------------------------------|-----------------------------|
| Simulation mode      | <b>On</b><br><b>Off</b>                                                                         | Off                         |
| Test measured value  | Current measured value<br>min...max. measuring range                                            | Current measured value      |
| SSC1 Test            | According to the measured value<br><b>On</b><br><b>Off</b>                                      | According to measured value |
| SSC2 Test            | According to the measured value<br><b>On</b><br><b>Off</b>                                      | According to measured value |
| Status messages test | Tests the individual status messages according to the measured value<br><b>On</b><br><b>Off</b> | According to measured value |



### INFORMATION

The O1 output is used for IO-Link communication in this function and cannot be simulated. Simulation mode is automatically terminated as soon as the voltage supply is interrupted.

## 7.3 Condition Monitoring/Process Data

The data described in the following section can be read or written cyclically via IO-Link/process data.

### 7.3.1 Process Data In

| Data           | Meaning                                                                                                                                                                                                                                                            |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measured value | Measured distance in mm or 1/10 inch<br>As the sensor cannot determine a measured value in the following error cases, substitute values are read out:<br>No signal: 0x7FFC / 32764 mm<br>Object too close: 0x8008 / -32760 mm<br>Object too far: 0x7FF8 / 32760 mm |
| Scale          | Scaling of the measured value to the base length unit; -3 corresponds to mm.                                                                                                                                                                                       |
| SSC1           | Switching point 1                                                                                                                                                                                                                                                  |
| SSC2           | Switching point 2                                                                                                                                                                                                                                                  |
| Warning        | Collective warning in the event of one of the warning status messages (see table "Status messages") in the error output function)                                                                                                                                  |
| Error          | Collective warning in the event of one of the error status messages (see table "Status messages") in error output function.                                                                                                                                        |
| Message 1      | Status message 1 read out see Status Message Function [► 24]                                                                                                                                                                                                       |
| Message 2      | Status message 2 read out see Status Message Function [► 24]                                                                                                                                                                                                       |
| Message 3      | Status message 3 read out see Status Message Function [► 24]                                                                                                                                                                                                       |
| Message 4      | Status message 4 read out see Status Message Function [► 24]                                                                                                                                                                                                       |

### 7.3.2 Process Data Out

| Data                | Meaning                                 |
|---------------------|-----------------------------------------|
| Emitted light       | Transmit signal on/off                  |
| Localization        | Sensor flashes for easy sensor location |
| Teach-in SSC1       | Starts the teach-in process for SSC1    |
| Teach-in SSC2       | Starts the teach-in process for SSC2    |
| Reset Accelerometer | Status message "Accelerometer" is reset |

### 7.3.3 Events

Events are diagnostic information that is standardized by IO-Link and exchanged between the IO-Link master and the device. The following events are supported:

| Name                                             | Event code | Type         | Specification    |
|--------------------------------------------------|------------|--------------|------------------|
| Maintenance required - Cleaning                  | 0x8C40     | Notification | IO-Link          |
| Device error – Unknown error                     | 0x1000     | Error        | IO-Link          |
| Short circuit – Check installation               | 0x7710     | Error        | IO-Link          |
| Device temperature too high – Remove heat source | 0x4210     | Warning      | IO-Link          |
| Device temperature too low - Isolate the device  | 0x4220     | Warning      | IO-Link          |
| Temperature error - Overload                     | 0x4000     | Error        | IO-Link          |
| Supply voltage too low – check tolerances        | 0x5111     | Warning      | IO-Link          |
| Acceleration sensor                              | 0x1801     | Warning      | wenglor specific |

## 8 **wTeach2 Configuration Software**

For information on installing and connecting the wTeach2 software and its structure, as well as information on the general functions, see the wTeach2 operating instructions. They can be found online in the download area at [www.wenglor.com](http://www.wenglor.com) under order number DNNF005.

## 9 Maintenance Instructions



### NOTICE

This wenglor product is maintenance-free.

Cleaning and inspection of the plug connections at regular intervals are advisable.

Do not clean the product with solvents or cleaning agents that could damage the product.

The product must be protected against contamination during initial start-up.

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## 10 Proper Disposal

wenglor sensoric GmbH does not accept the return of unusable or irreparable products. Respectively valid national waste disposal regulations apply to product disposal.

# 11      **Declarations of Conformity**

Declarations of conformity can be found on our website at [www.wenglor.com](http://www.wenglor.com) in the product's separate download area.