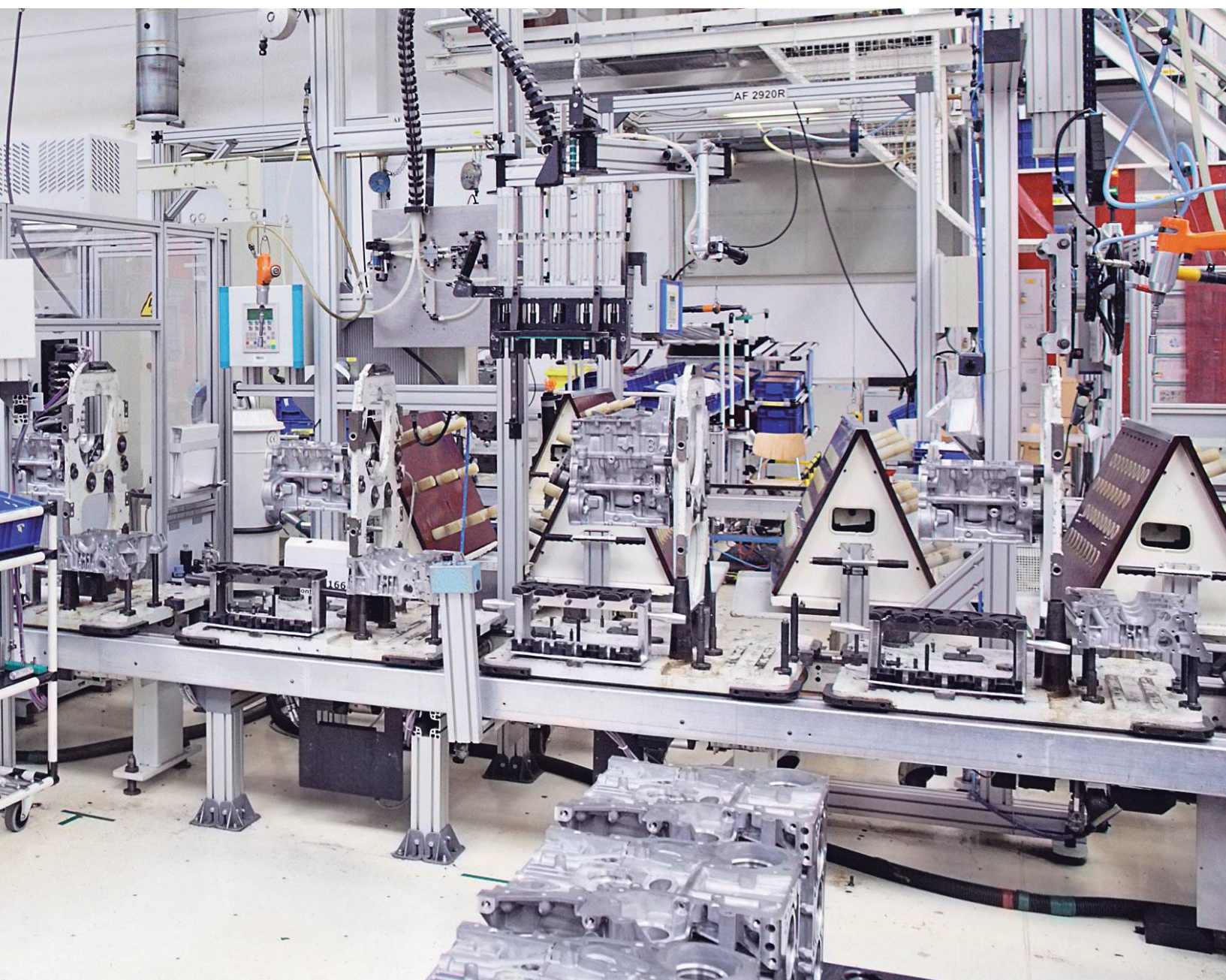


# IO-Link Catalog





## IO-Link

IO-Link is a standardized communication system for connecting intelligent sensors and actuators to an automation system. wenglor views this point-to-point connection as a solution which is fit for the future and makes it possible to fulfill the more and more complex demands placed upon sensors with regard to diagnostic capabilities and configurability. wenglor's already comprehensive range of intelligent sensors which are compatible with IO-Link is being continuously expanded, and the system concept is being further pursued with suitable IO-Link masters.

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|                                    |                |                   |                  |         |
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| Photoelectronic Sensors            |                |                   |                  | 6 - 7   |
| High-Performance Distance Sensors  |                |                   |                  | 8 - 33  |
| Range                              | Light Source   | Housing           | Housing Material |         |
| 0,05...3,05 m                      | Laser (red)    | 50 × 50 × 20 mm   | Plastic          | 8 - 9   |
| Reflex Sensors                     |                |                   |                  | 10-11   |
| Range                              | Light Source   | Housing           | Housing Material |         |
| 500 mm                             | Infrared Light | 49,1 × 27 × 16 mm | Plastic          | 10 - 11 |
| Fiber Optic Cable Sensors          |                |                   |                  | 12-17   |
| Range                              | Light Source   | Housing           | Housing Material |         |
| 500 mm                             | Infrared Light | 54,5 × 27 × 16 mm | Plastic          | 16 - 17 |
| Color Sensors                      |                |                   |                  | 18-19   |
| Range                              |                |                   |                  |         |
| Retro-Reflex Sensors               |                |                   |                  | 20-21   |
| Range                              | Light Source   | Housing           | Housing Material |         |
| 6500 mm                            | Red Light      | 54,5 × 27 × 16 mm | Plastic          | 20 - 21 |
| Light Curtains for Measuring Tasks |                |                   |                  | 22-33   |
| Range                              | Light Source   | Housing           | Housing Material |         |
| 2000 mm                            | Infrared Light | 40,2 × 47,1 mm    | Aluminum         | 22 - 25 |
| 3000 mm                            | Infrared Light | 17,6 × 31,7 mm    | Aluminum         | 26 - 33 |
| Ultrasonic Sensors                 |                |                   |                  | 34 - 39 |
| High-Performance Distance Sensors  |                |                   |                  | 34-35   |
| Range                              |                | Housing           | Housing Material |         |
| 100...6000 mm                      |                | 81 × 55 × 30 mm   | Plastic          | 34 - 35 |
|                                    |                | 81 × 55 × 47 mm   |                  |         |
| Reflex Sensors with Analog Output  |                |                   |                  | 36-39   |
| Range                              |                | Housing           | Housing Material |         |
| 50...1200 mm                       |                | M18 × 1           | Stainless Steel  | 36 - 37 |
| 50...3000 mm                       |                | M30 × 1,5         | Stainless Steel  | 38 - 39 |

## Inductive Sensors

40 - 51

### Inductive Sensors with IO-Link

40-51

| Range | Mounting    | Housing    | Housing Material    |    |
|-------|-------------|------------|---------------------|----|
| 4 mm  | quasi-flush | M8 × 1     | CuZn, nickel-plated | 42 |
| 6 mm  | non-flush   | M8 × 1     | CuZn, nickel-plated | 43 |
| 6 mm  | quasi-flush | M12 × 1    | CuZn, nickel-plated | 44 |
| 12 mm | non-flush   | M12 × 1    | CuZn, nickel-plated | 45 |
| 12 mm | quasi-flush | M18 × 1    | CuZn, nickel-plated | 46 |
| 20 mm | non-flush   | M18 × 1    | CuZn, nickel-plated | 47 |
| 22 mm | quasi-flush | M30 × 1,5  | CuZn, nickel-plated | 48 |
| 35 mm | non-flush   | M30 × 1,5  | CuZn, nickel-plated | 49 |
| 20 mm | flush       | 40 × 40 mm | Plastic             | 50 |
| 40 mm | non-flush   | 40 × 40 mm | Plastic             | 51 |

## Industrial Communication

52 - 53

### IO-Link Masters

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## Connection Diagrams

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# Technical Glossary

## I

### **IODD:**

The IO Device Description is an electronic data sheet for IO-Link products. IODD's contain specific unit setting parameters. The IODD's for IO-Link products are available at [www.wenglor.com](http://www.wenglor.com).

### **IO-Link Master:**

IO-Link products are connected with the IO-Link Master. It provides the interface for the heterodyned controller and controls the communication with the connected IO-Link products.

### **IO-Link Parameter:**

Via the IO-Link parameter, settings (e. g. NO/NC, On/Off delay) can be sent from the IO-Link Master to the connected IO-Link products and be read out. The first 12 parameters can be set via the software of the IO-Link Master.

### **IO-link port:**

A hardware interface for IO link capable components.

### **IO-Link Process Data:**

Via the IO-Link Process Data (view documentation), data (e. g. switching status, received signals) is transferred from the IO-Link products cyclic to the IO-Link Master.

### **IO-Link:**

IO-Link is a standardized communication system for the connection of intelligent sensors and actuators with an automation system. An IO-Link System consists of one -> IO-Link Master and one or several IO-Link products.





# High-Performance Distance Sensor

**0,05...3,05 m**

Range

**LASER**

WinTec

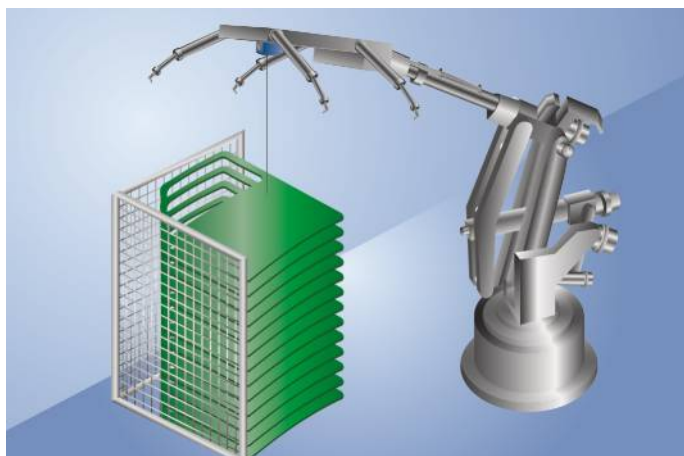


- Analog output (0...10 V/4...20 mA)
- Graphical display for easy operation
- Reliable in case of glossy objects with WinTec
- Secure detection of black objects also in extremely inclined positions with WinTec
- Two mutually independent switching outputs

These sensors have scratch-resistant optics and the emitted light can be switched off. They use the transit time measurement principle to measure the distance between the sensor and the object.

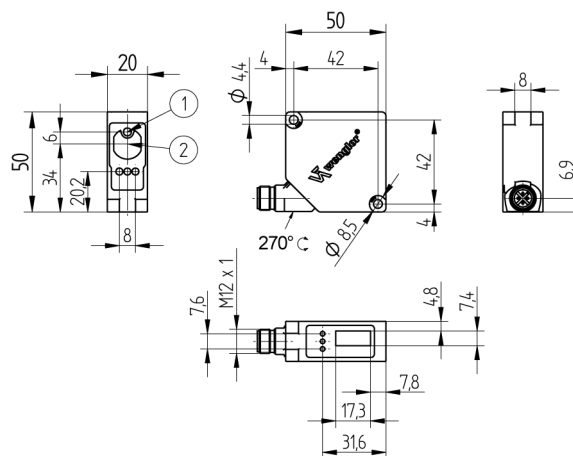
wenglor interference-free technology (WinTec) has revolutionized sensor technology:

It makes it possible to mount several sensors directly next to, or opposite each other without the sensors influencing each other. The sensors reach a very high switching frequency and use laser class 1, which is safe for the human eye.



## Technical Data

| Optical Data                                |                    |
|---------------------------------------------|--------------------|
| Working Range                               | 50...3050 mm       |
| Measuring Range                             | 3000 mm            |
| Reproducibility maximum                     | 1 mm               |
| Linearity Deviation (200...3050 mm)         | 7 mm               |
| Linearity Deviation (50...200 mm)           | 15 mm              |
| Switching Hysteresis                        | 3...20 mm          |
| Light Source                                | Laser (red)        |
| Wave Length                                 | 660 nm             |
| Service Life (T = +25 °C)                   | 100000 h           |
| Laser Class (EN 60825-1)                    | 1                  |
| Max. Ambient Light                          | 10000 Lux          |
| Beam Divergence                             | < 2 mrad           |
| Electrical Data                             |                    |
| Supply Voltage                              | 18...30 V DC       |
| Current Consumption (U <sub>b</sub> = 24 V) | < 70 mA            |
| Switching Frequency                         | 250 Hz             |
| Measurement Rate                            | 1...500 /s         |
| On-/Off-Delay                               | 0...10000 ms       |
| Temperature Drift                           | < 0,4 mm/K         |
| Temperature Range                           | -40...50 °C        |
| Switching Outputs                           | 2                  |
| Switching Output Voltage Drop               | < 2,5 V            |
| Switching Output/Switching Current          | 100 mA             |
| Analog Output                               | 0...10 V/4...20 mA |
| Short Circuit Protection                    | yes                |
| Reverse Polarity and Overload Protection    | yes                |
| Teach Mode                                  | HT, VT, FT, TP     |
| Interface                                   | IO-Link            |
| IO-Link Version                             | 1.1                |
| Protection Class                            | III                |
| Mechanical Data                             |                    |
| Adjustment                                  | Teach-In           |
| Housing Material                            | Plastic            |
| Optic Cover                                 | PMMA               |
| Degree of Protection                        | IP68               |
| Connection                                  | M12 × 1; 4-pin     |



1 = Transmitter Diode  
2 = Receiver Diode  
Screw M4 = 0,5 Nm  
All dimensions in mm (1 mm = 0.03937 Inch)

| Plug Version                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
|    <br>  | <b>Part Number</b><br><b>OY1P303P0102</b> |
| Error Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ●                                         |
| Contamination Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ●                                         |
| Configurable as PNP/NPN/Push-Pull                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ●                                         |
| Analog Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ●                                         |
| IO-Link                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ●                                         |
| Connection Diagram No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>782</b>                                |
| Control Panel No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>X2</b>                                 |
| Suitable Connection Technology No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>2</b>                                  |
| Suitable Mounting Technology No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>380</b>                                |

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## Complementary Products

Analog Evaluation Unit AW02

IO-Link Master

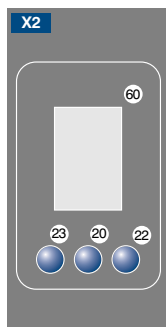
Protection Housing Set ZSP-NN-02

Protection Housing ZSV-0x-01

**Table 1**

|                            |      |      |
|----------------------------|------|------|
| <b>Working Distance</b>    | 0 m  | 3 m  |
| <b>Light Spot Diameter</b> | 5 mm | 9 mm |

## Ctrl. Panel



20 = Enter Button  
22 = UP Button  
23 = Down Button  
60 = Display

# Reflex Sensor

**500 mm**

Range

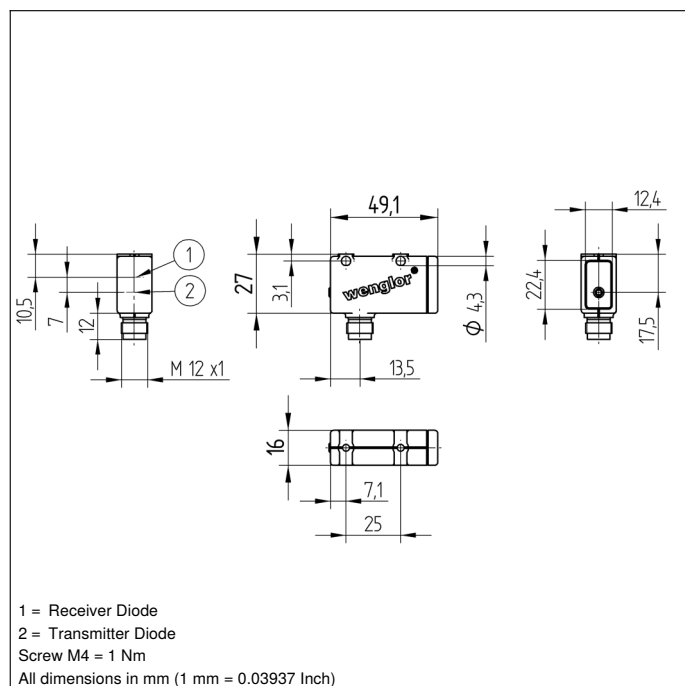
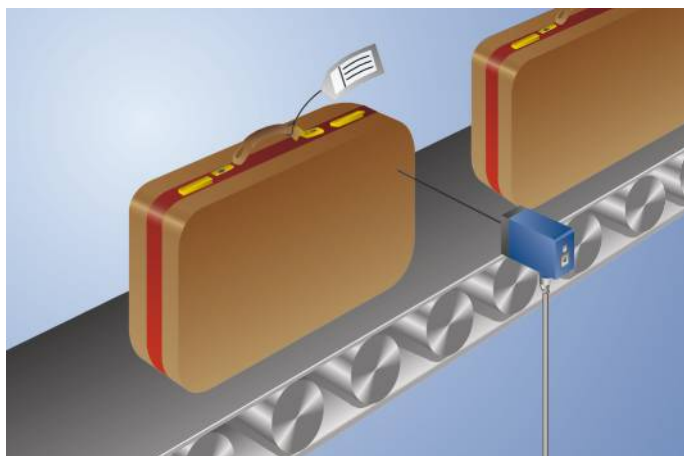


- Compact housing
- IO-Link
- Large detection range
- Teach-in, external teach-in

## Technical Data

| Optical Data                                |                |
|---------------------------------------------|----------------|
| Range                                       | 500 mm         |
| Switching Hysteresis                        | < 10 %         |
| Light Source                                | Infrared Light |
| Wave Length                                 | 875 nm         |
| Service Life (T = +25 °C)                   | 100000 h       |
| Max. Ambient Light                          | 10000 Lux      |
| Opening Angle                               | 12 °           |
| Electrical Data                             |                |
| Supply Voltage                              | 18...30 V      |
| Current Consumption (U <sub>b</sub> = 24 V) | < 30 mA        |
| Switching Frequency                         | 2500 Hz        |
| Response Time                               | 200 µs         |
| On-/Off-Delay                               | 0...60 s       |
| Temperature Drift                           | < 10 %         |
| Temperature Range                           | -25...60 °C    |
| Switching Output Voltage Drop               | < 2,5 V        |
| PNP Switching Output/Switching Current      | 100 mA         |
| Residual Current Switching Output           | < 50 µA        |
| Short Circuit Protection                    | yes            |
| Reverse Polarity Protection                 | yes            |
| Overload Protection                         | yes            |
| Lockable                                    | yes            |
| Teach Mode                                  | NT, MT         |
| Interface                                   | IO-Link        |
| IO-Link Version                             | 1.0            |
| IO-Link Parameter                           | 12             |
| Protection Class                            | III            |
| Mechanical Data                             |                |
| Adjustment                                  | Teach-In       |
| Housing Material                            | Plastic        |
| Full Encapsulation                          | yes            |
| Degree of Protection                        | IP67           |
| Connection                                  | M12 × 1; 4-pin |

The transmitter and receiver in these sensors are located in a single housing. The sensor evaluates transmitted light reflected back from the object. The output is switched as soon as an object passes the selected range. Bright objects reflect more light than dark objects, and can thus be recognized from greater distances.



| Plug Version                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
|      | <b>Part Number</b><br>OTM502C0002 |
| IO-Link                                                                                                                                                                                                                                                                                                                                                                                                                   | ●                                 |
| PNP NO/NC switchable                                                                                                                                                                                                                                                                                                                                                                                                      | ●                                 |
| Connection Diagram No.                                                                                                                                                                                                                                                                                                                                                                                                    | 179                               |
| Control Panel No.                                                                                                                                                                                                                                                                                                                                                                                                         | M3                                |
| Suitable Connection Technology No.                                                                                                                                                                                                                                                                                                                                                                                        | 2                                 |
| Suitable Mounting Technology No.                                                                                                                                                                                                                                                                                                                                                                                          | 360                               |

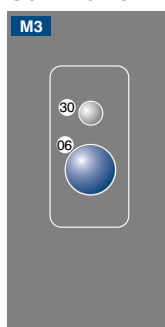
Connection Diagrams page 54

## Complementary Products

IO-Link Master

PNP-NPN Converter BG2V1P-N-2M

## Ctrl. Panel



06 = Teach Button  
30 = Switching Status/Contamination Warning

# Fiber Optic Cable Sensor



- External teach-in
- Menu-driven settings
- Recognition of transparent objects
- Reflex and barrier operation mode are possible
- Teach-in

## Technical Data

### Optical Data

|                           |           |
|---------------------------|-----------|
| Switching Hysteresis      | < 15 %    |
| Light Source              | Red Light |
| Wave Length               | 660 nm    |
| Service Life (T = +25 °C) | 100000 h  |
| Max. Ambient Light        | 10000 Lux |

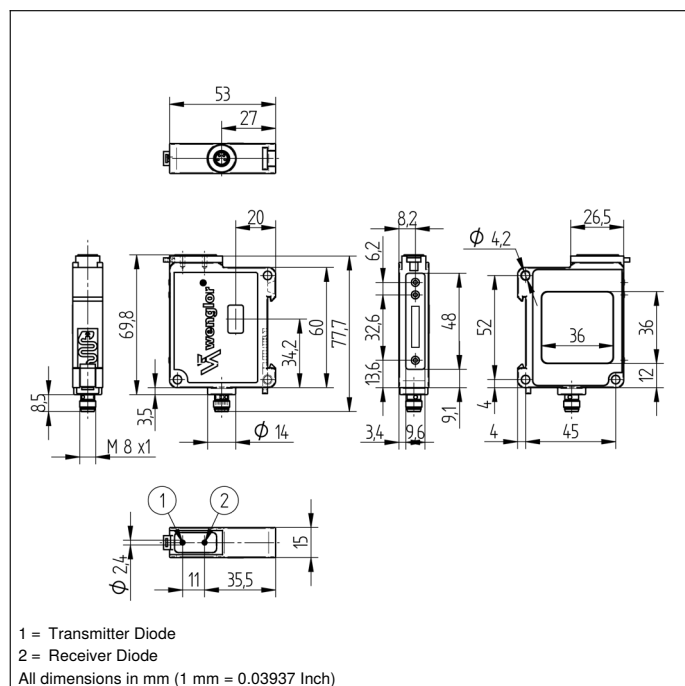
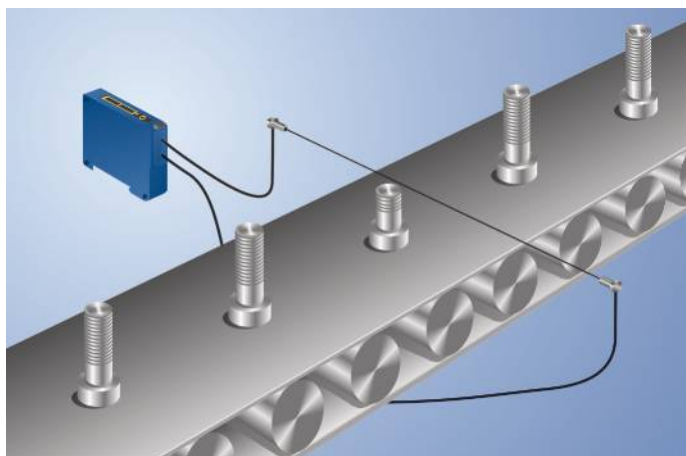
### Electrical Data

|                                             |                            |
|---------------------------------------------|----------------------------|
| Supply Voltage                              | 18...30 V DC               |
| Current Consumption (U <sub>b</sub> = 24 V) | < 40 mA                    |
| Switching Frequency                         | 4 kHz                      |
| Response Time                               | 125 µs                     |
| On-/Off-Delay                               | 0...10000 ms               |
| Temperature Drift                           | < 10 %                     |
| Temperature Range                           | -25...60 °C                |
| Switching Output Voltage Drop               | < 2,5 V                    |
| Switching Output/Switching Current          | 100 mA                     |
| Short Circuit Protection                    | yes                        |
| Reverse Polarity Protection                 | yes                        |
| Overload Protection                         | yes                        |
| Teach Mode                                  | NT, MT, ZT, DT, FT, HT, TP |
| Interface                                   | IO-Link                    |
| IO-Link Version                             | 1.0                        |
| IO-Link Parameter                           | > 12                       |
| Protection Class                            | III                        |

### Mechanical Data

|                      |               |
|----------------------|---------------|
| Adjustment           | Teach-In      |
| Housing Material     | Plastic       |
| Degree of Protection | IP65          |
| Connection           | M8 × 1; 4-pin |
| DIN-Rail mounting    | 35 mm         |

wenglor fiber optic cables are connected to these sensors. The graphic display assures easy, menu-driven sensor setup. Signal strengths and the switching threshold can be read from the display as numeric values or as a bar graph. Convenient programming and quick diagnosis is possible via the IO-Link interface.



| Plug Version                                                                                                                                                                                                                                                                                                                                                                                                              |             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
|      | Part Number |
|                                                                                                                                                                                                                                                                                                                                                                                                                           | ODX402P0007 |
| Selectable menu language                                                                                                                                                                                                                                                                                                                                                                                                  | ●           |
| Password Protection                                                                                                                                                                                                                                                                                                                                                                                                       | ●           |
| Configurable as PNP/Push-Pull                                                                                                                                                                                                                                                                                                                                                                                             | ●           |
| NO/NC switchable                                                                                                                                                                                                                                                                                                                                                                                                          | ●           |
| IO-Link                                                                                                                                                                                                                                                                                                                                                                                                                   | ●           |
| Connection Diagram No.                                                                                                                                                                                                                                                                                                                                                                                                    | 774         |
| Control Panel No.                                                                                                                                                                                                                                                                                                                                                                                                         | X4          |
| Suitable Connection Technology No.                                                                                                                                                                                                                                                                                                                                                                                        | 7           |
| Suitable Fiber Optic Cable Adapter No.                                                                                                                                                                                                                                                                                                                                                                                    | 03          |

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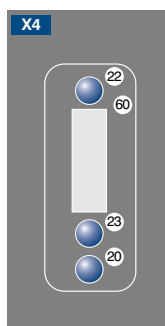
## Complementary Products

Glass Fiber Optic Cable

IO-Link Master

Plastic Fiber Optic Cable

## Ctrl. Panel



20 = Enter Button

22 = UP Button

23 = Down Button

60 = Display

# Fiber Optic Cable Sensor



- **Basic module**
- **Menu-driven settings**
- **Modular system: 12 add-on modules can be connected**
- **Recognition of transparent objects**
- **Reflex and barrier operation mode are possible**

## Technical Data

### Optical Data

|                           |           |
|---------------------------|-----------|
| Switching Hysteresis      | < 15 %    |
| Light Source              | Red Light |
| Wave Length               | 660 nm    |
| Service Life (T = +25 °C) | 100000 h  |
| Max. Ambient Light        | 10000 Lux |

### Electrical Data

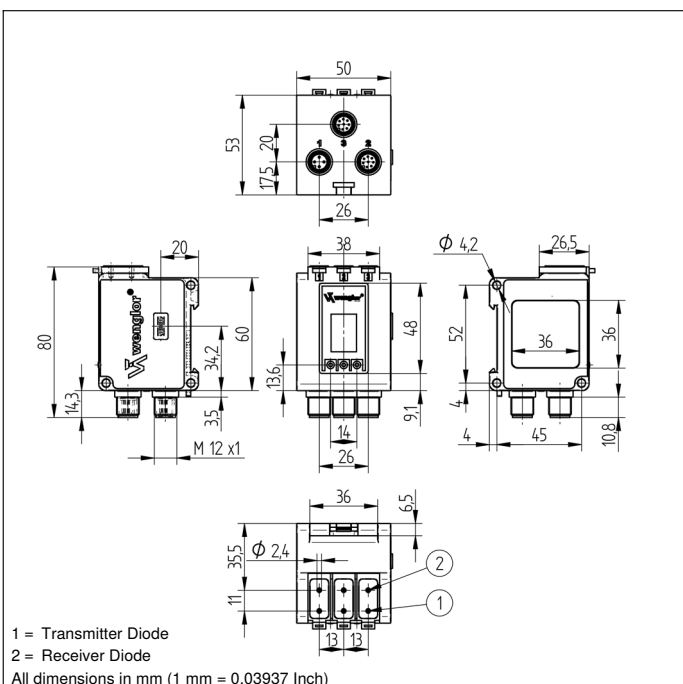
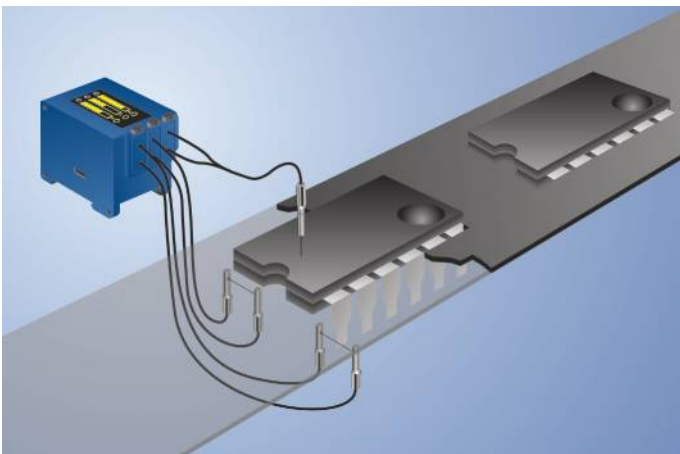
|                                             |                            |
|---------------------------------------------|----------------------------|
| Supply Voltage                              | 18...30 V DC               |
| Current Consumption (U <sub>b</sub> = 24 V) | < 70 mA                    |
| Switching Frequency                         | 2 kHz                      |
| Response Time                               | 250 µs                     |
| On-/Off-Delay                               | 0...10000 ms               |
| Temperature Drift                           | < 10 %                     |
| Temperature Range                           | -25...60 °C                |
| Switching Output Voltage Drop               | < 2,5 V                    |
| Switching Output/Switching Current          | 100 mA                     |
| Short Circuit Protection                    | yes                        |
| Reverse Polarity Protection                 | yes                        |
| Overload Protection                         | yes                        |
| Teach Mode                                  | NT, MT, ZT, DT, FT, HT, TP |
| Interface                                   | IO-Link                    |
| IO-Link Version                             | 1.0                        |
| IO-Link Parameter                           | > 12                       |
| Protection Class                            | III                        |

### Mechanical Data

|                      |                  |
|----------------------|------------------|
| Adjustment           | Teach-In         |
| Housing Material     | Plastic          |
| Degree of Protection | IP50             |
| Connection           | M12 × 1; 4+8-pin |
| DIN-Rail mounting    | 35 mm            |

Three wenglor fiber optic cables are connected to these sensors. Up to 12 add-on modules can be connected to this basic module, making 15 fiber optic cables available.

The graphic display guarantees easy, menu-driven sensor setup. Signal strengths and the switching threshold can be read from the display as numeric values or as a bar graph. Convenient programming and quick diagnosis is possible via the IO-Link interface.



| Plug Version                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
|      | <b>Part Number</b><br>ODX402P0088 |
| Speed Measurement                                                                                                                                                                                                                                                                                                                                                                                                         | ●                                 |
| Sensors can be linked with logic operations                                                                                                                                                                                                                                                                                                                                                                               | ●                                 |
| Selectable menu language                                                                                                                                                                                                                                                                                                                                                                                                  | ●                                 |
| Password Protection                                                                                                                                                                                                                                                                                                                                                                                                       | ●                                 |
| Contamination Output                                                                                                                                                                                                                                                                                                                                                                                                      | ●                                 |
| Configurable as PNP/NPN/Push-Pull                                                                                                                                                                                                                                                                                                                                                                                         | ●                                 |
| NO/NC switchable                                                                                                                                                                                                                                                                                                                                                                                                          | ●                                 |
| IO-Link                                                                                                                                                                                                                                                                                                                                                                                                                   | ●                                 |
| Connection Diagram No.                                                                                                                                                                                                                                                                                                                                                                                                    | 773 775 776                       |
| Control Panel No.                                                                                                                                                                                                                                                                                                                                                                                                         | X2                                |
| Suitable Connection Technology No.                                                                                                                                                                                                                                                                                                                                                                                        | 2 89                              |
| Suitable Fiber Optic Cable Adapter No.                                                                                                                                                                                                                                                                                                                                                                                    | 03                                |

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## Complementary Products

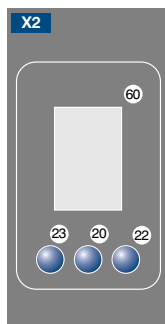
Extension Module ODX402P0099

Glass Fiber Optic Cable

IO-Link Master

Plastic Fiber Optic Cable

## Ctrl. Panel



20 = Enter Button

22 = UP Button

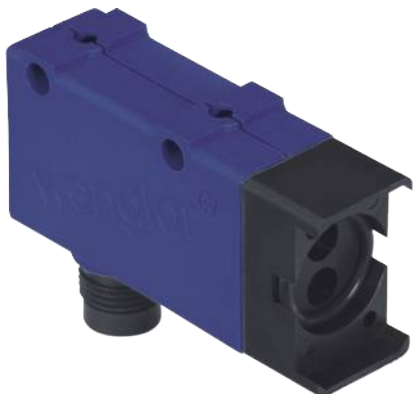
23 = Down Button

60 = Display

# Fiber Optic Cable Sensor

## 500 mm

Range

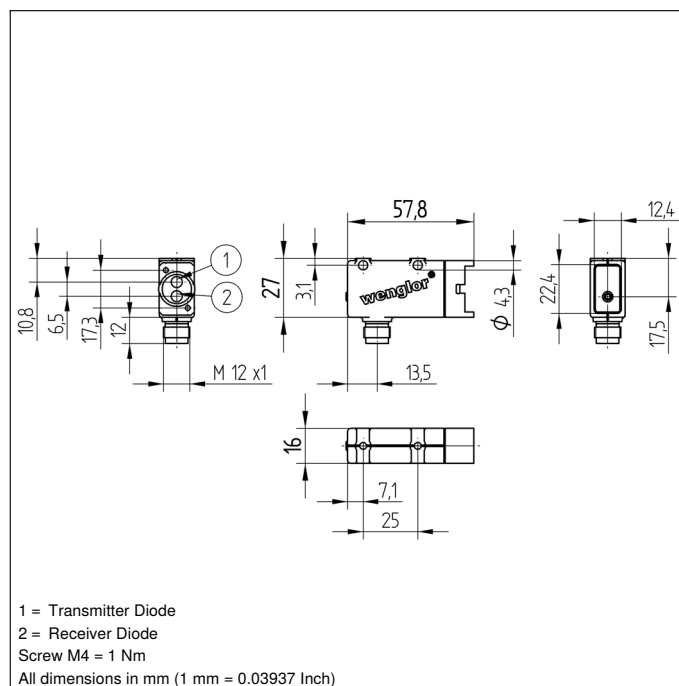
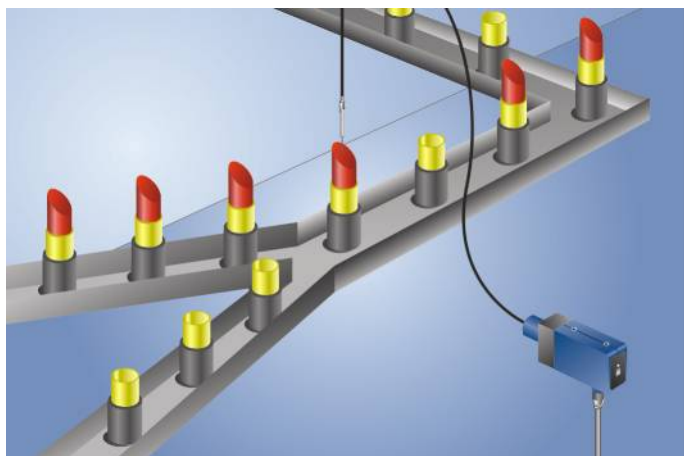


- Compact housing
- IO-Link
- Teach-in, external teach-in

### Technical Data

| Optical Data                                |                |
|---------------------------------------------|----------------|
| Range                                       | 500 mm         |
| Switching Hysteresis                        | < 10 %         |
| Light Source                                | Infrared Light |
| Wave Length                                 | 875 nm         |
| Service Life (T = +25 °C)                   | 100000 h       |
| Max. Ambient Light                          | 10000 Lux      |
| Opening Angle                               | 12 °           |
| Electrical Data                             |                |
| Supply Voltage                              | 18...30 V      |
| Current Consumption (U <sub>b</sub> = 24 V) | < 30 mA        |
| Switching Frequency                         | 2500 Hz        |
| Response Time                               | 200 µs         |
| On-/Off-Delay                               | 0...60 s       |
| Temperature Drift                           | < 10 %         |
| Temperature Range                           | -25...60 °C    |
| Switching Output Voltage Drop               | < 2,5 V        |
| PNP Switching Output/Switching Current      | 100 mA         |
| Residual Current Switching Output           | < 50 µA        |
| Short Circuit Protection                    | yes            |
| Reverse Polarity Protection                 | yes            |
| Overload Protection                         | yes            |
| Teach Mode                                  | NT, MT         |
| Interface                                   | IO-Link        |
| IO-Link Version                             | 1.0            |
| Protection Class                            | III            |
| Mechanical Data                             |                |
| Adjustment                                  | Teach-In       |
| Housing Material                            | Plastic        |
| Full Encapsulation                          | yes            |
| Degree of Protection                        | IP67           |
| Connection                                  | M12 × 1; 4-pin |

These sensors are equipped for use with glass fiber optic cables but can be used with or without one. The transmitter and receiver are located in a single housing. The sensor evaluates transmitted light reflected back from the object and the output is switched as soon as an object passes the selected range. Bright objects reflect more light than dark objects, and can thus be recognized from greater distances.



| Plug Version                                                                                                                                                                                                                                                                                                                                                                                                              |                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
|      | <b>Part Number</b><br><b>OUM502C0002</b> |
| PNP NO/NC switchable                                                                                                                                                                                                                                                                                                                                                                                                      | ●                                        |
| Connection Diagram No.                                                                                                                                                                                                                                                                                                                                                                                                    | <b>179</b>                               |
| Control Panel No.                                                                                                                                                                                                                                                                                                                                                                                                         | <b>M3</b>                                |
| Suitable Connection Technology No.                                                                                                                                                                                                                                                                                                                                                                                        | <b>2</b>                                 |
| Suitable Mounting Technology No.                                                                                                                                                                                                                                                                                                                                                                                          | <b>360</b>                               |
| Suitable Fiber Optic Cable Adapter No.                                                                                                                                                                                                                                                                                                                                                                                    | <b>02</b>                                |

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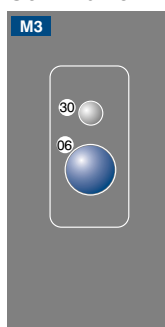
## Complementary Products

Glass Fiber Optic Cable

IO-Link Master

PNP-NPN Converter BG2V1P-N-2M

## Ctrl. Panel



06 = Teach Button  
30 = Switching Status/Contamination Warning

# Color Sensor

## 6 Channel Multi Spectral Sensor

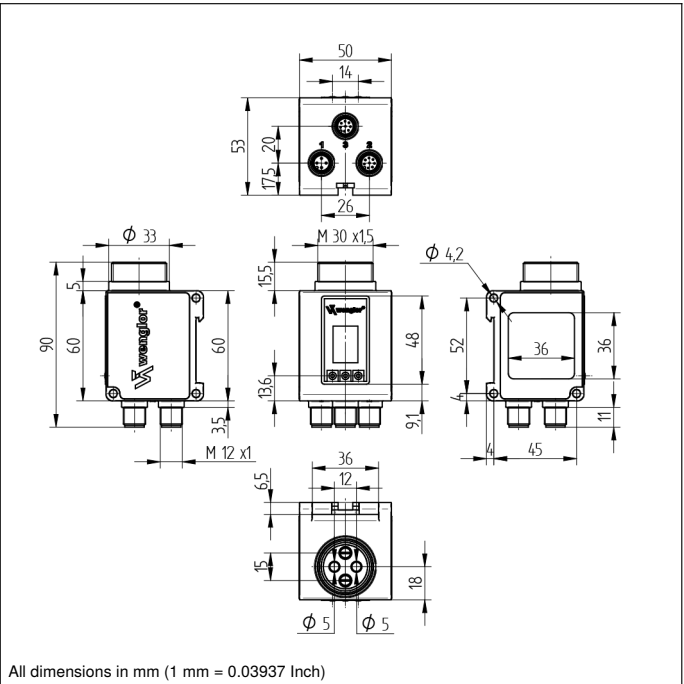
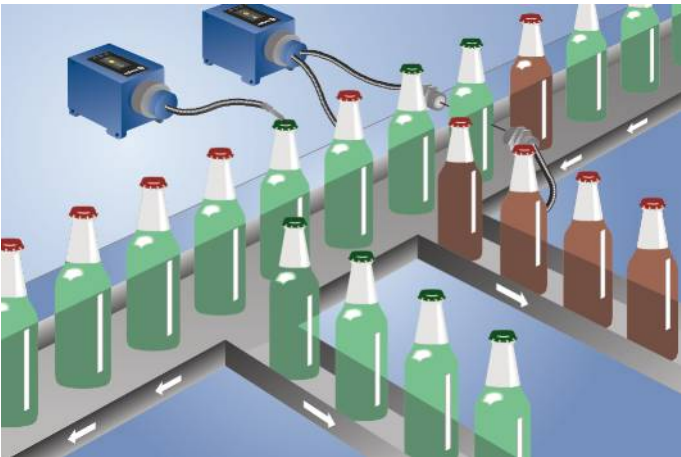
### Technical Data

| Optical Data                           |                  |
|----------------------------------------|------------------|
| Spectral Sensitivity                   | 450...700 nm     |
| Light Source                           | White Light      |
| Service Life (T = +25 °C)              | 50000 h          |
| Max. Ambient Light                     | 10000 Lux        |
| Electrical Data                        |                  |
| Supply Voltage                         | 10...30 V DC     |
| Current Consumption (Ub = 24 V)        | ~ 260 mA         |
| Switching Frequency                    | 2 kHz            |
| Response Time                          | 400 µs           |
| On-/Off-Delay                          | 0...10000 ms     |
| Temperature Range                      | -25...60 °C      |
| Switching Outputs                      | 12               |
| Switching Output Voltage Drop          | 1,5 V            |
| PNP Switching Output/Switching Current | 100 mA           |
| Short Circuit Protection               | yes              |
| Reverse Polarity Protection            | yes              |
| Overload Protection                    | yes              |
| Teach Mode                             | FT               |
| Interface                              | IO-Link/RS-232   |
| IO-Link Version                        | 1.1              |
| Digital Inputs                         | 3                |
| Protection Class                       | III              |
| Mechanical Data                        |                  |
| Adjustment                             | IO-Link          |
| Housing Material                       | Plastic          |
| Degree of Protection                   | IP67             |
| Connection                             | M12 × 1; 4+8-pin |
| DIN-Rail mounting                      | 35 mm            |



- 12 switching outputs for evaluation of detailed color analysis thanks to spectral measurement in ROYGBV color space
- Ready for Industrie 4.0 with IO-Link version 1.1
- Reliable evaluation of measured values even with distance fluctuation

The spectral composition of the colors of objects can be measured and metamerism effects can be compensated for with the 6-channel Multispectral Sensor. Innovative color chip technology divides the selected color spectrum into six spectral ranges (ROYGBV color space) with separately adjustable tolerance ranges. In combination with fiber-optic cables, the sensor adapts itself to the specific requirements of any given application and can be operated in the scanning as well as the through-beam mode. The P1XF001 is equipped with twelve switching outputs and integrated LED technology, which automatically ensures ideal adjustment of light intensity. Sensor settings can be selected directly at the graphical display (OLED), via the RS-232 port or via the IO-Link interface.



| Plug Version                                                                                                                                                                                                                                                                                                                                                                                                                 |                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
|    <br> | <b>Part Number</b><br><b>P1XF001</b> |
| NO/NC switchable                                                                                                                                                                                                                                                                                                                                                                                                             | ●                                    |
| Configurable as PNP/NPN/Push-Pull                                                                                                                                                                                                                                                                                                                                                                                            | ●                                    |
| RS-232 Interface                                                                                                                                                                                                                                                                                                                                                                                                             | ●                                    |
| IO-Link                                                                                                                                                                                                                                                                                                                                                                                                                      | ●                                    |
| Error Output                                                                                                                                                                                                                                                                                                                                                                                                                 | ●                                    |
| Contamination Output                                                                                                                                                                                                                                                                                                                                                                                                         | ●                                    |
| Connection Diagram No.                                                                                                                                                                                                                                                                                                                                                                                                       | <b>127</b>                           |
| Control Panel No.                                                                                                                                                                                                                                                                                                                                                                                                            | <b>X2</b>                            |
| Suitable Connection Technology No.                                                                                                                                                                                                                                                                                                                                                                                           | <b>2</b>   <b>89</b>                 |
| Selectable menu language                                                                                                                                                                                                                                                                                                                                                                                                     | yes                                  |

Connection Diagrams page 54

## Complementary Products

Glass Fiber Optic Cable

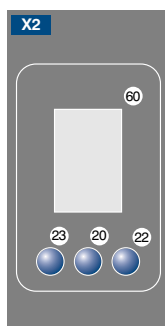
Interface Cable S232W3

IO-Link Master

Lens LA27

Plastic Fiber Optic Cable

## Ctrl. Panel



20 = Enter Button

22 = UP Button

23 = Down Button

60 = Display

# Retro-Reflex Sensor

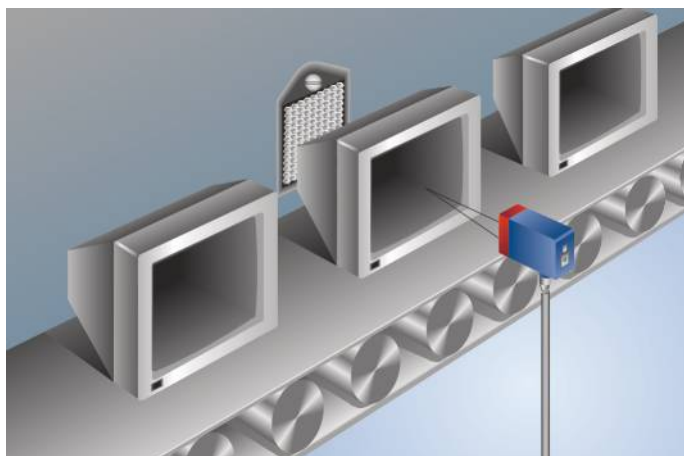
## 6500 mm

Range



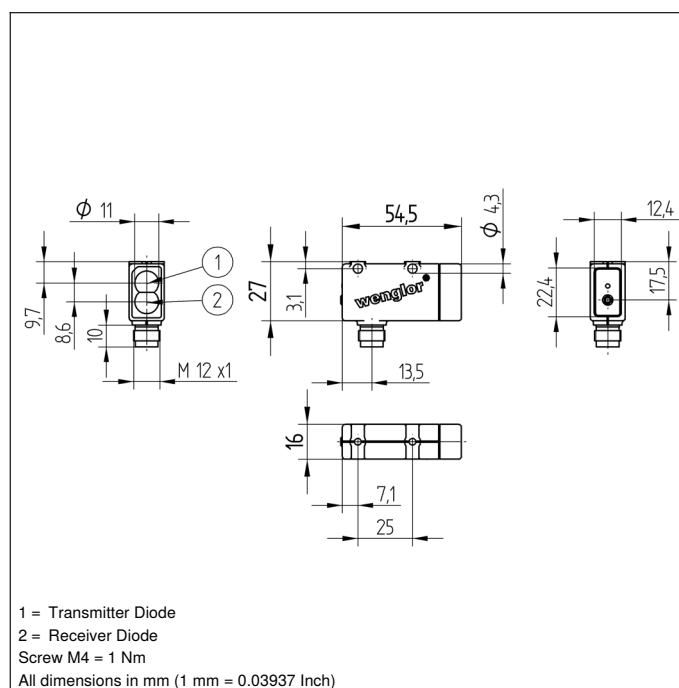
- IO-Link
- Low-cost
- Teach-in, external teach-in

A reflector must be used in combination with these sensors. They can be installed in all kinds of industrial environments thanks to ample functional reserve. Even reflective objects can be reliably recognized through the use of polarized light.



## Technical Data

| Optical Data                                |                |
|---------------------------------------------|----------------|
| Range                                       | 6500 mm        |
| Reference Reflector/Reflex Foil             | RQ100BA        |
| Switching Hysteresis                        | < 5 %          |
| Light Source                                | Red Light      |
| Wave Length                                 | 660 nm         |
| Polarization Filter                         | yes            |
| Service Life (T = +25 °C)                   | 100000 h       |
| Max. Ambient Light                          | 10000 Lux      |
| Opening Angle                               | 5 °            |
| Two-Lens Optic                              | yes            |
| Electrical Data                             |                |
| Supply Voltage                              | 18...30 V DC   |
| Current Consumption (U <sub>b</sub> = 24 V) | < 30 mA        |
| Switching Frequency                         | 2500 Hz        |
| Response Time                               | 200 µs         |
| On-/Off-Delay                               | 0...60 s       |
| Temperature Drift                           | < 5 %          |
| Temperature Range                           | -25...60 °C    |
| Switching Output Voltage Drop               | < 2,5 V        |
| PNP Switching Output/Switching Current      | 100 mA         |
| Residual Current Switching Output           | < 50 µA        |
| Short Circuit Protection                    | yes            |
| Reverse Polarity Protection                 | yes            |
| Overload Protection                         | yes            |
| Lockable                                    | yes            |
| Teach Mode                                  | NT, MT         |
| Interface                                   | IO-Link        |
| IO-Link Version                             | 1.0            |
| IO-Link Parameter                           | 12             |
| Protection Class                            | III            |
| Mechanical Data                             |                |
| Adjustment                                  | Teach-In       |
| Housing Material                            | Plastic        |
| Full Encapsulation                          | yes            |
| Degree of Protection                        | IP67           |
| Connection                                  | M12 × 1; 4-pin |



| Plug Version                                                                                                                                                                                                                                                                                                                            |             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
|     |             |
|                                                                                                                                                                                                                                                        |             |
| Part Number                                                                                                                                                                                                                                                                                                                             | OLM653C0102 |
| IO-Link                                                                                                                                                                                                                                                                                                                                 | ●           |
| PNP NO/NC switchable                                                                                                                                                                                                                                                                                                                    | ●           |
| Connection Diagram No.                                                                                                                                                                                                                                                                                                                  | 179         |
| Control Panel No.                                                                                                                                                                                                                                                                                                                       | M3          |
| Suitable Connection Technology No.                                                                                                                                                                                                                                                                                                      | 2           |
| Suitable Mounting Technology No.                                                                                                                                                                                                                                                                                                        | 360         |

Connection Diagrams page 54

## Complementary Products

IO-Link Master

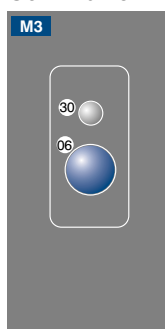
PNP-NPN Converter BG2V1P-N-2M

Protection Housing Set ZSM-NN-02

Protection Housing ZSV-0x-01

Reflector, Reflex Foil

## Ctrl. Panel



06 = Teach Button  
30 = Switching Status/Contamination Warning

## Feasible reflector distance

Reflector type, mounting distance

|           |              |           |              |
|-----------|--------------|-----------|--------------|
| RQ100BA   | 0,02...6,5 m | RR25KP    | 0,01...1,2 m |
| RE18040BA | 0,02...5 m   | RR21_M    | 0,04...1,9 m |
| RQ84BA    | 0,02...5,5 m | ZRAE02B01 | 0,02...2,9 m |
| RR84BA    | 0,02...6,5 m | ZRME01B01 | 0,04...0,9 m |
| RE9538BA  | 0,03...3 m   | ZRME03B01 | 0,02...3 m   |
| RE6151BM  | 0,04...5 m   | ZRMR02K01 | 0,04...1,3 m |
| RR50_A    | 0,02...4,3 m | ZRMS02_01 | 0,03...1,5 m |
| RE6040BA  | 0,02...4,8 m | RF505     | 0,05...2,3 m |
| RE8222BA  | 0,03...3,2 m | RF508     | 0,21...1,4 m |
| RR34_M    | 0,06...2,6 m | RF258     | 0,06...1,7 m |
| RE3220BM  | 0,05...2 m   | ZRDF03K01 | 0,05...4 m   |
| RE6210BM  | 0,05...1,7 m | ZRDF10K01 | 0,05...5,5 m |
| RR25_M    | 0,05...1,8 m |           |              |

# Light Curtain for Measuring Tasks

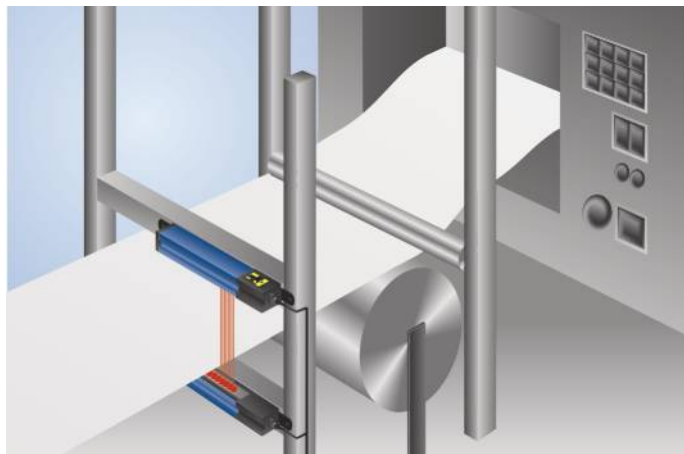
## 2000 mm

Range



- Graphical display for easy operation
- Integrated evaluation unit
- Object detection and measurement
- Recognition of small parts
- Test input

As these light curtains for measurement task are equipped with an integrated evaluation unit, external connection units are not needed. Objects are both recognized (via the digital output) and measured (via the analog output). The light curtains can be set up easily using the menu-controlled graphic display. Convenient parametrization and quick diagnosis is possible via the IO-Link interface. The adequate mounting angle BEF-SET-33 is included in the delivery.



### Technical Data

#### Optical Data

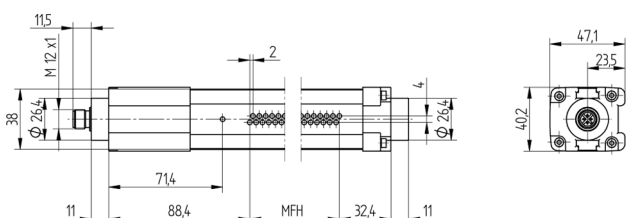
|                           |                |
|---------------------------|----------------|
| Range                     | 2000 mm        |
| Beam Distance             | 2 mm           |
| Light Source              | Infrared Light |
| Service Life (T = +25 °C) | 100000 h       |

#### Electrical Data

|                                 |              |
|---------------------------------|--------------|
| Supply Voltage                  | 18...30 V DC |
| Current Consumption (Ub = 24 V) | < 60 mA      |
| Temperature Drift               | < 10 %       |
| Temperature Range               | -25...60 °C  |
| Reverse Polarity Protection     | yes          |
| Protection Class                | III          |

#### Mechanical Data

|                      |          |
|----------------------|----------|
| Housing Material     | Aluminum |
| Degree of Protection | IP65     |



All dimensions in mm (1 mm = 0.03937 Inch)



### Plug Version

| Part Number                           | OSEI501Z0103   | OEEI501U0135       | OSEI102Z0103   | OEEI102U0135       | OSEI152Z0103   | OEEI152U0135       |
|---------------------------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|
| NO/NC switchable                      |                | ●                  |                | ●                  |                | ●                  |
| Configurable as PNP/Push-Pull         |                | ●                  |                | ●                  |                | ●                  |
| Error Output                          |                | ●                  |                | ●                  |                | ●                  |
| IO-Link                               |                | ●                  |                | ●                  |                | ●                  |
| Measurement Field Height (MFH)        | 50 mm          | 50 mm              | 100 mm         | 100 mm             | 150 mm         | 150 mm             |
| Max. Ambient Light                    |                | 10000 Lux          |                | 10000 Lux          |                | 10000 Lux          |
| Opening Angle                         |                | 10 °               |                | 10 °               |                | 10 °               |
| Sensor Type                           | Emitter        | Receiver           | Emitter        | Receiver           | Emitter        | Receiver           |
| Switching Frequency                   |                | 150 Hz             |                | 85 Hz              |                | 60 Hz              |
| Response Time                         |                | 3 ms               |                | 6 ms               |                | 8 ms               |
| On-/Off-Delay                         |                | 0...10 s           |                | 0...10 s           |                | 0...10 s           |
| Switching Outputs                     |                | 2                  |                | 2                  |                | 2                  |
| Switching Output Voltage Drop         |                | < 2,5 V            |                | < 2,5 V            |                | < 2,5 V            |
| Switching Output/Switching Current    |                | 100 mA             |                | 100 mA             |                | 100 mA             |
| Residual Current Switching Output     |                | < 50 µA            |                | < 50 µA            |                | < 50 µA            |
| Analog Output                         |                | 0...10 V/4...20 mA |                | 0...10 V/4...20 mA |                | 0...10 V/4...20 mA |
| Short Circuit and Overload Protection |                | yes                |                | yes                |                | yes                |
| Lockable                              |                | yes                |                | yes                |                | yes                |
| Interface                             |                | IO-Link            |                | IO-Link            |                | IO-Link            |
| IO-Link Version                       |                | 1.0                |                | 1.0                |                | 1.0                |
| Test input                            | yes            |                    | yes            |                    | yes            |                    |
| Adjustment                            |                | Menu (OLED)        |                | Menu (OLED)        |                | Menu (OLED)        |
| Connection                            | M12 × 1; 4-pin | M12 × 1; 4/5-pin   | M12 × 1; 4-pin | M12 × 1; 4/5-pin   | M12 × 1; 4-pin | M12 × 1; 4/5-pin   |
| Connection Diagram No.                | <b>1018</b>    | <b>188</b>         | <b>1018</b>    | <b>188</b>         | <b>1018</b>    | <b>188</b>         |
| Control Panel No.                     | <b>K3</b>      | <b>X2</b>          | <b>K3</b>      | <b>X2</b>          | <b>K3</b>      | <b>X2</b>          |
| Suitable Connection Technology No.    | <b>2</b>       | <b>2   35</b>      | <b>2</b>       | <b>2   35</b>      | <b>2</b>       | <b>2   35</b>      |
| Suitable Mounting Technology No.      | <b>700</b>     | <b>700</b>         | <b>700</b>     | <b>700</b>         | <b>700</b>     | <b>700</b>         |

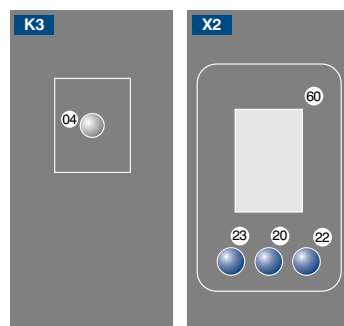
Connection Diagrams page 54

## Complementary Products

Analog Evaluation Unit AW02

IO-Link Master

## Ctrl. Panel



04 = Function Indicator    60 = Display  
20 = Enter Button  
22 = UP Button  
23 = Down Button

# Light Curtain for Measuring Tasks

## 2000 mm

Range



- Graphical display for easy operation
- Integrated evaluation unit
- Object detection and measurement
- Recognition of small parts
- Test input

### Technical Data

#### Optical Data

|                                |                |
|--------------------------------|----------------|
| Range                          | 2000 mm        |
| Measurement Field Height (MFH) | 200 mm         |
| Beam Distance                  | 2 mm           |
| Light Source                   | Infrared Light |
| Service Life (T = +25 °C)      | 100000 h       |

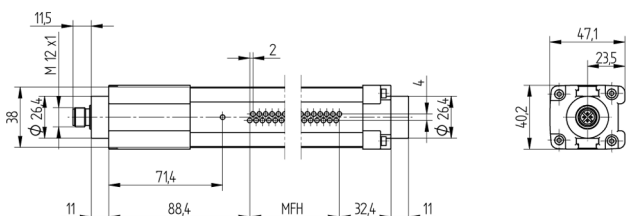
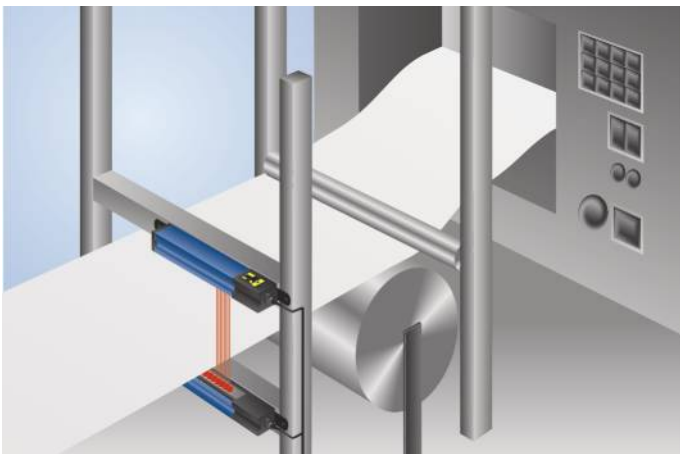
#### Electrical Data

|                                             |              |
|---------------------------------------------|--------------|
| Supply Voltage                              | 18...30 V DC |
| Current Consumption (U <sub>b</sub> = 24 V) | < 60 mA      |
| Temperature Drift                           | < 10 %       |
| Temperature Range                           | -25...60 °C  |
| Reverse Polarity Protection                 | yes          |
| Protection Class                            | III          |

#### Mechanical Data

|                      |          |
|----------------------|----------|
| Housing Material     | Aluminum |
| Degree of Protection | IP65     |

As these light curtains for measurement task are equipped with an integrated evaluation unit, external connection units are not needed. Objects are both recognized (via the digital output) and measured (via the analog output). The light curtains can be set up easily using the menu-controlled graphic display. Convenient parametrization and quick diagnosis is possible via the IO-Link interface. The adequate mounting angle BEF-SET-33 is included in the delivery.



All dimensions in mm (1 mm = 0.03937 Inch)

|                                       | Plug Version   |                      |
|---------------------------------------|----------------|----------------------|
|                                       | Part Number    |                      |
|                                       | OSEI202Z0103   | OEEI202U0135         |
| NO/NC switchable                      |                | ●                    |
| Configurable as PNP/Push-Pull         |                | ●                    |
| Error Output                          |                | ●                    |
| IO-Link                               |                | ●                    |
| Max. Ambient Light                    |                | 10000 Lux            |
| Opening Angle                         |                | 10 °                 |
| Sensor Type                           | Emitter        | Receiver             |
| Switching Frequency                   |                | 45 Hz                |
| Response Time                         |                | 11 ms                |
| On-/Off-Delay                         |                | 0...10 s             |
| Switching Outputs                     |                | 2                    |
| Switching Output Voltage Drop         |                | < 2,5 V              |
| Switching Output/Switching Current    |                | 100 mA               |
| Residual Current Switching Output     |                | < 50 µA              |
| Analog Output                         |                | 0...10 V/4...20 mA   |
| Short Circuit and Overload Protection |                | yes                  |
| Lockable                              |                | yes                  |
| Interface                             |                | IO-Link              |
| IO-Link Version                       |                | 1.0                  |
| Test input                            | yes            |                      |
| Adjustment                            |                | Menu (OLED)          |
| Connection                            | M12 × 1; 4-pin | M12 × 1; 4/5-pin     |
| Connection Diagram No.                | <b>1018</b>    | <b>188</b>           |
| Control Panel No.                     | <b>K3</b>      | <b>X2</b>            |
| Suitable Connection Technology No.    | <b>2</b>       | <b>2</b>   <b>35</b> |
| Suitable Mounting Technology No.      | <b>700</b>     | <b>700</b>           |

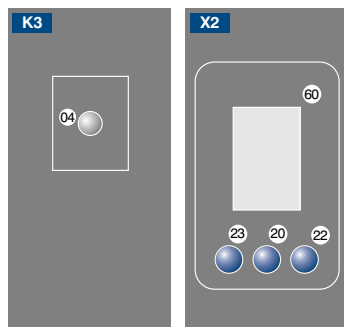
Connection Diagrams page 54

## Complementary Products

Analog Evaluation Unit AW02

IO-Link Master

## Ctrl. Panel



04 = Function Indicator    60 = Display

20 = Enter Button

22 = UP Button

23 = Down Button

# Light Curtain for Measuring Tasks

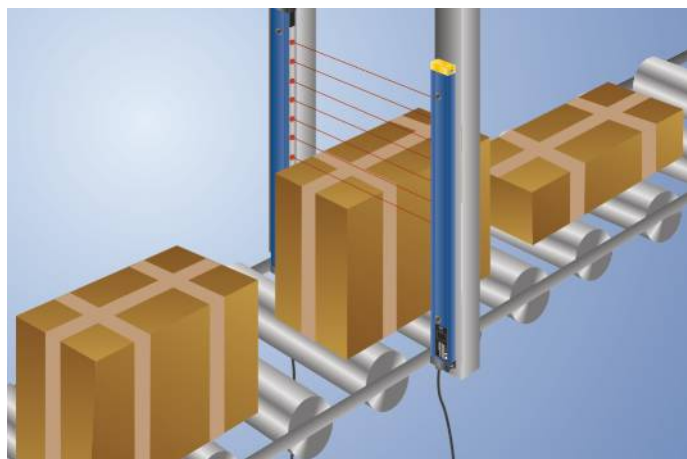
## 3000 mm

Range



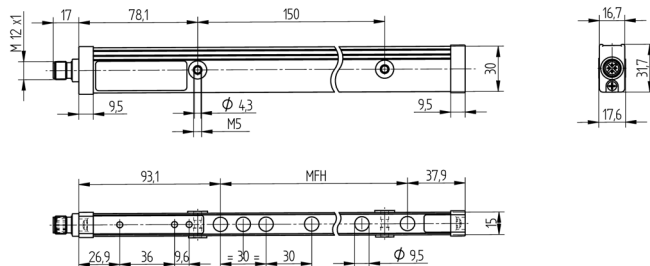
- 360° visible switching status display
- Graphical display for easy operation
- Integrated evaluation unit
- Object detection and measurement
- Test input

As these light curtains for measurement tasks are equipped with an integrated evaluation unit, external connection units are not needed. Objects are both recognized (via the digital output) and measured (via the analog output). The light curtains can be set up easily using the menu-controlled graphic display. Convenient parametrization and quick diagnosis is possible via the IO-Link interface.



### Technical Data

| Optical Data                |                |
|-----------------------------|----------------|
| Range                       | 3000 mm        |
| Beam Distance               | 30 mm          |
| Light Source                | Infrared Light |
| Service Life (T = +25 °C)   | 100000 h       |
| Electrical Data             |                |
| Supply Voltage              | 18...30 V DC   |
| Temperature Drift           | < 10 %         |
| Temperature Range           | -25...60 °C    |
| Reverse Polarity Protection | yes            |
| Protection Class            | III            |
| Mechanical Data             |                |
| Housing Material            | Aluminum       |
| Degree of Protection        | IP65           |



All dimensions in mm (1 mm = 0.03937 Inch)



### Plug Version

| Part Number                                 | OSEB152Z0103   | OEEB152U0135       | OSEB302Z0103   | OEEB302U0135       | OSEB452Z0103   | OEEB452U0135       |
|---------------------------------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|
| NO/NC switchable                            |                | ●                  |                | ●                  |                | ●                  |
| Configurable as PNP/Push-Pull               |                | ●                  |                | ●                  |                | ●                  |
| Error Output                                |                | ●                  |                | ●                  |                | ●                  |
| IO-Link                                     |                | ●                  |                | ●                  |                | ●                  |
| Measurement Field Height (MFH)              | 150 mm         | 150 mm             | 300 mm         | 300 mm             | 450 mm         | 450 mm             |
| Max. Ambient Light                          |                | 10000 Lux          |                | 10000 Lux          |                | 10000 Lux          |
| Opening Angle                               |                | 10 °               |                | 10 °               |                | 10 °               |
| Sensor Type                                 | Emitter        | Receiver           | Emitter        | Receiver           | Emitter        | Receiver           |
| Current Consumption (U <sub>b</sub> = 24 V) | < 50 mA        | < 40 mA            | < 50 mA        | < 40 mA            | < 50 mA        | < 40 mA            |
| Switching Frequency                         |                | 69 Hz              |                | 41 Hz              |                | 29 Hz              |
| Response Time                               |                | 7 ms               |                | 12 ms              |                | 17 ms              |
| On-/Off-Delay                               |                | 0...10 s           |                | 0...10 s           |                | 0...10 s           |
| Switching Outputs                           |                | 2                  |                | 2                  |                | 2                  |
| Switching Output Voltage Drop               |                | < 2,5 V            |                | < 2,5 V            |                | < 2,5 V            |
| Switching Output/Switching Current          |                | 100 mA             |                | 100 mA             |                | 100 mA             |
| Residual Current Switching Output           |                | < 50 µA            |                | < 50 µA            |                | < 50 µA            |
| Analog Output                               |                | 0...10 V/4...20 mA |                | 0...10 V/4...20 mA |                | 0...10 V/4...20 mA |
| Short Circuit and Overload Protection       |                | yes                |                | yes                |                | yes                |
| Lockable                                    |                | yes                |                | yes                |                | yes                |
| Interface                                   |                | IO-Link            |                | IO-Link            |                | IO-Link            |
| IO-Link Version                             |                | 1.0                |                | 1.0                |                | 1.0                |
| Test input                                  | yes            |                    | yes            |                    | yes            |                    |
| Adjustment                                  |                | Menu (OLED)        |                | Menu (OLED)        |                | Menu (OLED)        |
| Connection                                  | M12 × 1; 4-pin | M12 × 1; 4/5-pin   | M12 × 1; 4-pin | M12 × 1; 4/5-pin   | M12 × 1; 4-pin | M12 × 1; 4/5-pin   |
| Connection Diagram No.                      | <b>1018</b>    | <b>188</b>         | <b>1018</b>    | <b>188</b>         | <b>1018</b>    | <b>188</b>         |
| Control Panel No.                           | <b>EB2</b>     | <b>EB3</b>         | <b>EB2</b>     | <b>EB3</b>         | <b>EB2</b>     | <b>EB3</b>         |
| Suitable Connection Technology No.          | <b>2</b>       | <b>2 35</b>        | <b>2</b>       | <b>2 35</b>        | <b>2</b>       | <b>2 35</b>        |

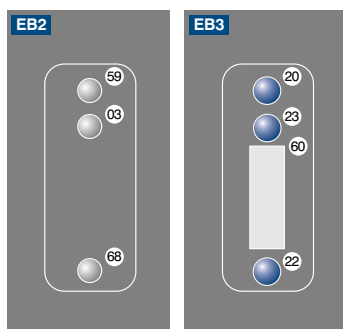
Connection Diagrams page 54

## Complementary Products

Analogue Evaluation Unit AW02

IO-Link Master

## Ctrl. Panel



03 = Error Indicator    59 = Calibration  
20 = Enter Button    60 = Display  
22 = UP Button    68 = Supply Voltage Indicator  
23 = Down Button

# Light Curtain for Measuring Tasks

## 3000 mm

Range



### Technical Data

#### Optical Data

|                           |                |
|---------------------------|----------------|
| Range                     | 3000 mm        |
| Beam Distance             | 30 mm          |
| Light Source              | Infrared Light |
| Service Life (T = +25 °C) | 100000 h       |

#### Electrical Data

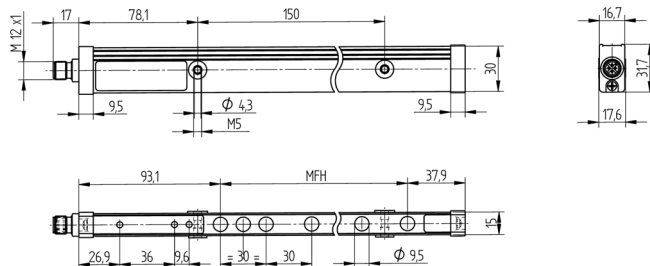
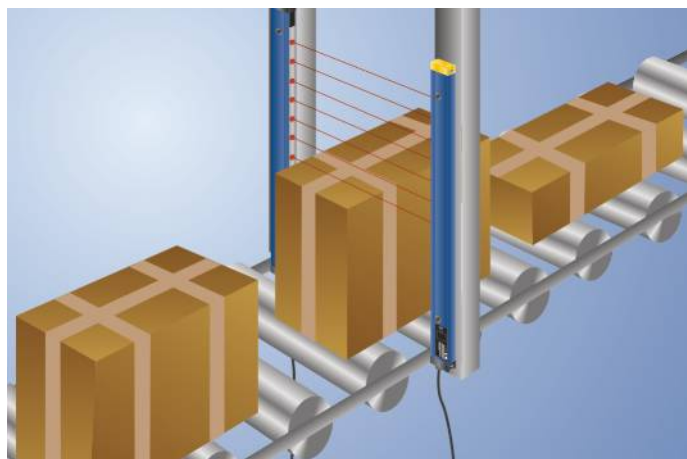
|                             |              |
|-----------------------------|--------------|
| Supply Voltage              | 18...30 V DC |
| Temperature Drift           | < 10 %       |
| Temperature Range           | -25...60 °C  |
| Reverse Polarity Protection | yes          |
| Protection Class            | III          |

#### Mechanical Data

|                      |          |
|----------------------|----------|
| Housing Material     | Aluminum |
| Degree of Protection | IP65     |

- 360° visible switching status display
- Graphical display for easy operation
- Integrated evaluation unit
- Object detection and measurement
- Test input

As these light curtains for measurement tasks are equipped with an integrated evaluation unit, external connection units are not needed. Objects are both recognized (via the digital output) and measured (via the analog output). The light curtains can be set up easily using the menu-controlled graphic display. Convenient parametrization and quick diagnosis is possible via the IO-Link interface.



All dimensions in mm (1 mm = 0.03937 Inch)



### Plug Version

| Part Number                                 | OSEB602Z0103   | OEEB602U0135       | OSEB752Z0103   | OEEB752U0135       | OSEB902Z0103   | OEEB902U0135       |
|---------------------------------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|
| NO/NC switchable                            |                | ●                  |                | ●                  |                | ●                  |
| Configurable as PNP/Push-Pull               |                | ●                  |                | ●                  |                | ●                  |
| Error Output                                |                | ●                  |                | ●                  |                | ●                  |
| IO-Link                                     |                | ●                  |                | ●                  |                | ●                  |
| Measurement Field Height (MFH)              | 600 mm         | 600 mm             | 750 mm         | 750 mm             | 900 mm         | 900 mm             |
| Max. Ambient Light                          |                | 10000 Lux          |                | 10000 Lux          |                | 10000 Lux          |
| Opening Angle                               |                | 10 °               |                | 10 °               |                | 10 °               |
| Sensor Type                                 | Emitter        | Receiver           | Emitter        | Receiver           | Emitter        | Receiver           |
| Current Consumption (U <sub>b</sub> = 24 V) | < 50 mA        | < 40 mA            | < 50 mA        | < 40 mA            | < 50 mA        | < 40 mA            |
| Switching Frequency                         |                | 22 Hz              |                | 18 Hz              |                | 16 Hz              |
| Response Time                               |                | 22 ms              |                | 27 ms              |                | 32 ms              |
| On-/Off-Delay                               |                | 0...10 s           |                | 0...10 s           |                | 0...10 s           |
| Switching Outputs                           |                | 2                  |                | 2                  |                | 2                  |
| Switching Output Voltage Drop               |                | < 2,5 V            |                | < 2,5 V            |                | < 2,5 V            |
| Switching Output/Switching Current          |                | 100 mA             |                | 100 mA             |                | 100 mA             |
| Residual Current Switching Output           |                | < 50 µA            |                | < 50 µA            |                | < 50 µA            |
| Analog Output                               |                | 0...10 V/4...20 mA |                | 0...10 V/4...20 mA |                | 0...10 V/4...20 mA |
| Short Circuit and Overload Protection       |                | yes                |                | yes                |                | yes                |
| Lockable                                    |                | yes                |                | yes                |                | yes                |
| Interface                                   |                | IO-Link            |                | IO-Link            |                | IO-Link            |
| IO-Link Version                             |                | 1.0                |                | 1.0                |                | 1.0                |
| Test input                                  | yes            |                    | yes            |                    | yes            |                    |
| Adjustment                                  |                | Menu (OLED)        |                | Menu (OLED)        |                | Menu (OLED)        |
| Connection                                  | M12 × 1; 4-pin | M12 × 1; 4/5-pin   | M12 × 1; 4-pin | M12 × 1; 4/5-pin   | M12 × 1; 4-pin | M12 × 1; 4/5-pin   |
| Connection Diagram No.                      | <b>1018</b>    | <b>188</b>         | <b>1018</b>    | <b>188</b>         | <b>1018</b>    | <b>188</b>         |
| Control Panel No.                           | <b>EB2</b>     | <b>EB3</b>         | <b>EB2</b>     | <b>EB3</b>         | <b>EB2</b>     | <b>EB3</b>         |
| Suitable Connection Technology No.          | <b>2</b>       | <b>2 35</b>        | <b>2</b>       | <b>2 35</b>        | <b>2</b>       | <b>2 35</b>        |

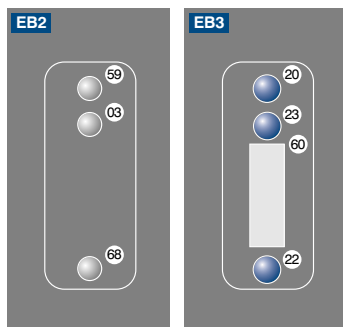
Connection Diagrams page 54

## Complementary Products

Analog Evaluation Unit AW02

IO-Link Master

## Ctrl. Panel



03 = Error Indicator    59 = Calibration  
20 = Enter Button    60 = Display  
22 = UP Button    68 = Supply Voltage Indicator  
23 = Down Button

# Light Curtain for Measuring Tasks

## 3000 mm

Range



### Technical Data

#### Optical Data

|                           |                |
|---------------------------|----------------|
| Range                     | 3000 mm        |
| Beam Distance             | 30 mm          |
| Light Source              | Infrared Light |
| Service Life (T = +25 °C) | 100000 h       |

#### Electrical Data

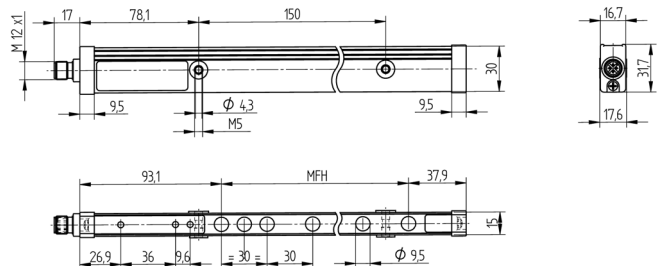
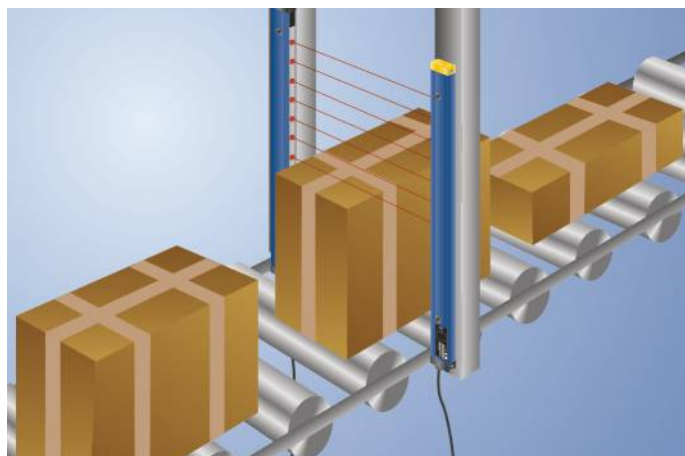
|                             |              |
|-----------------------------|--------------|
| Supply Voltage              | 18...30 V DC |
| Temperature Drift           | < 10 %       |
| Temperature Range           | -25...60 °C  |
| Reverse Polarity Protection | yes          |
| Protection Class            | III          |

#### Mechanical Data

|                      |          |
|----------------------|----------|
| Housing Material     | Aluminum |
| Degree of Protection | IP65     |

- 360° visible switching status display
- Graphical display for easy operation
- Integrated evaluation unit
- Object detection and measurement
- Test input

As these light curtains for measurement tasks are equipped with an integrated evaluation unit, external connection units are not needed. Objects are both recognized (via the digital output) and measured (via the analog output). The light curtains can be set up easily using the menu-controlled graphic display. Convenient parametrization and quick diagnosis is possible via the IO-Link interface.



All dimensions in mm (1 mm = 0.03937 Inch)



#### Plug Version

| Part Number                                 | OSEB103Z0103   | OEEB103U0135       | OSEB123Z0103   | OEEB123U0135       | OSEB133Z0103   | OEEB133U0135       |
|---------------------------------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|
| NO/NC switchable                            |                | ●                  |                | ●                  |                | ●                  |
| Configurable as PNP/Push-Pull               |                | ●                  |                | ●                  |                | ●                  |
| Error Output                                |                | ●                  |                | ●                  |                | ●                  |
| IO-Link                                     |                | ●                  |                | ●                  |                | ●                  |
| Measurement Field Height (MFH)              | 1050 mm        | 1050 mm            | 1200 mm        | 1200 mm            | 1350 mm        | 1350 mm            |
| Max. Ambient Light                          |                | 10000 Lux          |                | 10000 Lux          |                | 10000 Lux          |
| Opening Angle                               |                | 10 °               |                | 10 °               |                | 10 °               |
| Sensor Type                                 | Emitter        | Receiver           | Emitter        | Receiver           | Emitter        | Receiver           |
| Current Consumption (U <sub>b</sub> = 24 V) | < 50 mA        | < 40 mA            | < 50 mA        | < 40 mA            | < 50 mA        | < 40 mA            |
| Switching Frequency                         |                | 13 Hz              |                | 12 Hz              |                | 11 Hz              |
| Response Time                               |                | 37 ms              |                | 42 ms              |                | 47 ms              |
| On-/Off-Delay                               |                | 0...10 s           |                | 0...10 s           |                | 0...10 s           |
| Switching Outputs                           |                | 2                  |                | 2                  |                | 2                  |
| Switching Output Voltage Drop               |                | < 2,5 V            |                | < 2,5 V            |                | < 2,5 V            |
| Switching Output/Switching Current          |                | 100 mA             |                | 100 mA             |                | 100 mA             |
| Residual Current Switching Output           |                | < 50 µA            |                | < 50 µA            |                | < 50 µA            |
| Analog Output                               |                | 0...10 V/4...20 mA |                | 0...10 V/4...20 mA |                | 0...10 V/4...20 mA |
| Short Circuit and Overload Protection       |                | yes                |                | yes                |                | yes                |
| Lockable                                    |                | yes                |                | yes                |                | yes                |
| Interface                                   |                | IO-Link            |                | IO-Link            |                | IO-Link            |
| IO-Link Version                             |                | 1.0                |                | 1.0                |                | 1.0                |
| Test input                                  | yes            |                    | yes            |                    | yes            |                    |
| Adjustment                                  |                | Menu (OLED)        |                | Menu (OLED)        |                | Menu (OLED)        |
| Connection                                  | M12 × 1; 4-pin | M12 × 1; 4/5-pin   | M12 × 1; 4-pin | M12 × 1; 4/5-pin   | M12 × 1; 4-pin | M12 × 1; 4/5-pin   |
| Connection Diagram No.                      | <b>1018</b>    | <b>188</b>         | <b>1018</b>    | <b>188</b>         | <b>1018</b>    | <b>188</b>         |
| Control Panel No.                           | <b>EB2</b>     | <b>EB3</b>         | <b>EB2</b>     | <b>EB3</b>         | <b>EB2</b>     | <b>EB3</b>         |
| Suitable Connection Technology No.          | <b>2</b>       | <b>2 35</b>        | <b>2</b>       | <b>2 35</b>        | <b>2</b>       | <b>2 35</b>        |

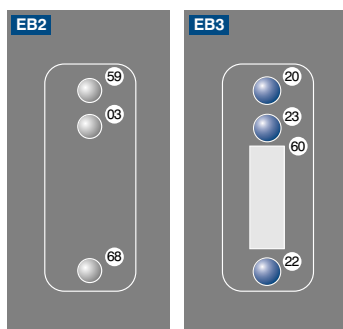
Connection Diagrams page 54

### Complementary Products

Analog Evaluation Unit AW02

IO-Link Master

### Ctrl. Panel



03 = Error Indicator    59 = Calibration  
20 = Enter Button    60 = Display  
22 = UP Button    68 = Supply Voltage Indicator  
23 = Down Button

# Light Curtain for Measuring Tasks

## 3000 mm

Range



### Technical Data

#### Optical Data

|                           |                |
|---------------------------|----------------|
| Range                     | 3000 mm        |
| Beam Distance             | 30 mm          |
| Light Source              | Infrared Light |
| Service Life (T = +25 °C) | 100000 h       |

#### Electrical Data

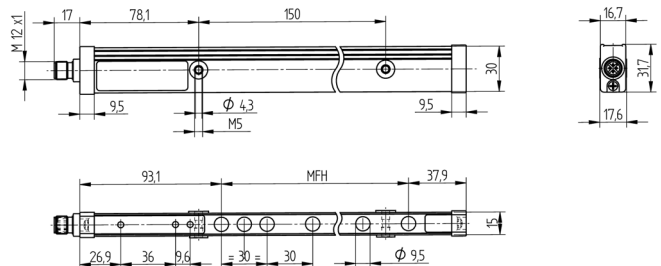
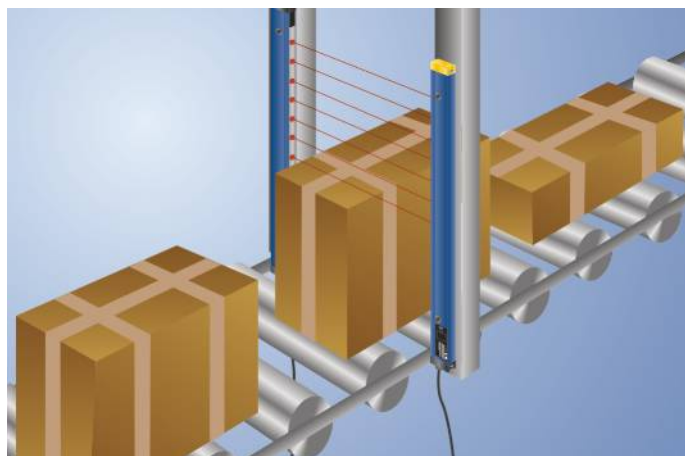
|                             |              |
|-----------------------------|--------------|
| Supply Voltage              | 18...30 V DC |
| Temperature Drift           | < 10 %       |
| Temperature Range           | -25...60 °C  |
| Reverse Polarity Protection | yes          |
| Protection Class            | III          |

#### Mechanical Data

|                      |          |
|----------------------|----------|
| Housing Material     | Aluminum |
| Degree of Protection | IP65     |

- 360° visible switching status display
- Graphical display for easy operation
- Integrated evaluation unit
- Object detection and measurement
- Test input

As these light curtains for measurement tasks are equipped with an integrated evaluation unit, external connection units are not needed. Objects are both recognized (via the digital output) and measured (via the analog output). The light curtains can be set up easily using the menu-controlled graphic display. Convenient parametrization and quick diagnosis is possible via the IO-Link interface.



All dimensions in mm (1 mm = 0.03937 Inch)



### Plug Version

| Part Number                                 | OSEB153Z0103   | OEEB153U0135       | OSEB163Z0103   | OEEB163U0135       | OSEB183Z0103   | OEEB183U0135       |
|---------------------------------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|
| NO/NC switchable                            |                | ●                  |                | ●                  |                | ●                  |
| Configurable as PNP/Push-Pull               |                | ●                  |                | ●                  |                | ●                  |
| Error Output                                |                | ●                  |                | ●                  |                | ●                  |
| IO-Link                                     |                | ●                  |                | ●                  |                | ●                  |
| Measurement Field Height (MFH)              | 1500 mm        | 1500 mm            | 1650 mm        | 1650 mm            | 1800 mm        | 1800 mm            |
| Max. Ambient Light                          |                | 10000 Lux          |                | 10000 Lux          |                | 10000 Lux          |
| Opening Angle                               |                | 10 °               |                | 10 °               |                | 10 °               |
| Sensor Type                                 | Emitter        | Receiver           | Emitter        | Receiver           | Emitter        | Receiver           |
| Current Consumption (U <sub>b</sub> = 24 V) | < 50 mA        | < 40 mA            | < 50 mA        | < 40 mA            | < 50 mA        | < 40 mA            |
| Switching Frequency                         |                | 10 Hz              |                | 9 Hz               |                | 8 Hz               |
| Response Time                               |                | 52 ms              |                | 57 ms              |                | 62 ms              |
| On-/Off-Delay                               |                | 0...10 s           |                | 0...10 s           |                | 0...10 s           |
| Switching Outputs                           |                | 2                  |                | 2                  |                | 2                  |
| Switching Output Voltage Drop               |                | < 2,5 V            |                | < 2,5 V            |                | < 2,5 V            |
| Switching Output/Switching Current          |                | 100 mA             |                | 100 mA             |                | 100 mA             |
| Residual Current Switching Output           |                | < 50 µA            |                | < 50 µA            |                | < 50 µA            |
| Analog Output                               |                | 0...10 V/4...20 mA |                | 0...10 V/4...20 mA |                | 0...10 V/4...20 mA |
| Short Circuit and Overload Protection       |                | yes                |                | yes                |                | yes                |
| Lockable                                    |                | yes                |                | yes                |                | yes                |
| Interface                                   |                | IO-Link            |                | IO-Link            |                | IO-Link            |
| IO-Link Version                             |                | 1.0                |                | 1.0                |                | 1.0                |
| Test input                                  | yes            |                    | yes            |                    | yes            |                    |
| Adjustment                                  |                | Menu (OLED)        |                | Menu (OLED)        |                | Menu (OLED)        |
| Connection                                  | M12 × 1; 4-pin | M12 × 1; 4/5-pin   | M12 × 1; 4-pin | M12 × 1; 4/5-pin   | M12 × 1; 4-pin | M12 × 1; 4/5-pin   |
| Connection Diagram No.                      | <b>1018</b>    | <b>188</b>         | <b>1018</b>    | <b>188</b>         | <b>1018</b>    | <b>188</b>         |
| Control Panel No.                           | <b>EB2</b>     | <b>EB3</b>         | <b>EB2</b>     | <b>EB3</b>         | <b>EB2</b>     | <b>EB3</b>         |
| Suitable Connection Technology No.          | <b>2</b>       | <b>2 35</b>        | <b>2</b>       | <b>2 35</b>        | <b>2</b>       | <b>2 35</b>        |

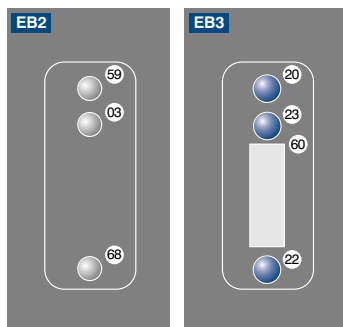
Connection Diagrams page 54

## Complementary Products

Analog Evaluation Unit AW02

IO-Link Master

## Ctrl. Panel



03 = Error Indicator    59 = Calibration  
20 = Enter Button    60 = Display  
22 = UP Button    68 = Supply Voltage Indicator  
23 = Down Button

# High-Performance Distance Sensor

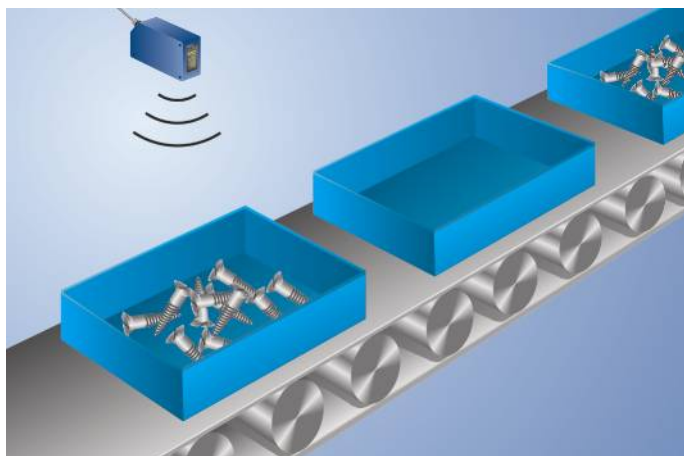
**100...6000 mm**

Range



- Digital and analog output
- Menu-driven settings
- Synchronous and multiplex mode
- Temperature drift eliminable

These ultrasonic sensors evaluate the sound reflected by the object. They detect almost every object and are suited especially for the filling level monitoring of fluids or bulk material or the detection of transparent objects. The sensor detects objects independent from their material, aggregate state, color or transparency. The graphic display enables easy, menu-driven sensor setup. Convenient programming and quick diagnosis is possible via the IO-Link interface.



## Technical Data

### Ultrasonic Data

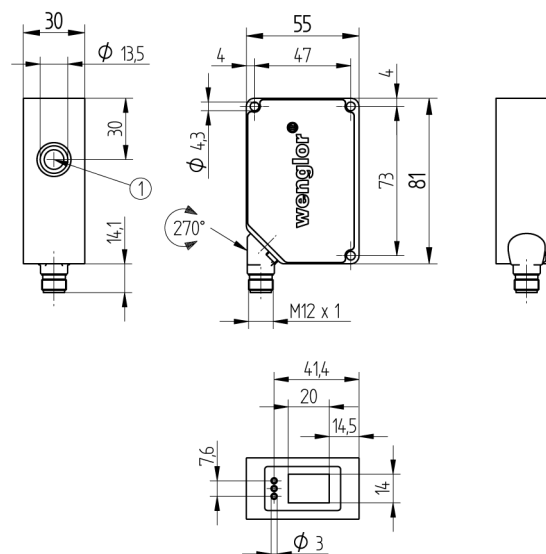
|                           |          |
|---------------------------|----------|
| Service Life (T = +25 °C) | 100000 h |
|---------------------------|----------|

### Electrical Data

|                                        |                    |
|----------------------------------------|--------------------|
| Supply Voltage                         | 18...30 V DC       |
| Temperature Range                      | -25...60 °C        |
| Switching Outputs                      | 2                  |
| Switching Output Voltage Drop          | < 2,5 V            |
| PNP Switching Output/Switching Current | 100 mA             |
| Analog Output                          | 0...10 V/4...20 mA |
| Synchronous Mode                       | up to 40 sensors   |
| Multiplex Mode                         | up to 16 sensors   |
| Short Circuit Protection               | yes                |
| Reverse Polarity Protection            | yes                |
| Overload Protection                    | yes                |
| Interface                              | IO-Link            |
| IO-Link Version                        | 1.0                |
| Protection Class                       | III                |

### Mechanical Data

|                      |                  |
|----------------------|------------------|
| Adjustment           | Teach-In         |
| Housing Material     | Plastic          |
| Degree of Protection | IP67             |
| Connection           | M12 × 1; 4/5-pin |



1 = Sensing Face  
Screw M4 = 0,5 Nm  
All dimensions in mm (1 mm = 0.03937 Inch)

| <div></div> |  | Plug Version               |                            |                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------|----------------------------|----------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | Part Number                | UMS123U035                 | UMS303U035                 |
| Error Output                                                                                                                                                                                                                                                                                                                                                                                                                     |  | ●                          | ●                          | ●                          |
| PNP NO/NC switchable                                                                                                                                                                                                                                                                                                                                                                                                             |  | ●                          | ●                          | ●                          |
| IO-Link                                                                                                                                                                                                                                                                                                                                                                                                                          |  | ●                          | ●                          | ●                          |
| Analog Output                                                                                                                                                                                                                                                                                                                                                                                                                    |  | ●                          | ●                          | ●                          |
| Working Range                                                                                                                                                                                                                                                                                                                                                                                                                    |  | 100...1200 mm              | 200...3000 mm              | 300...6000 mm              |
| Measuring Range                                                                                                                                                                                                                                                                                                                                                                                                                  |  | 1100 mm                    | 2800 mm                    | 5700 mm                    |
| Reproducibility maximum                                                                                                                                                                                                                                                                                                                                                                                                          |  | 1 mm                       | 2 mm                       | 5 mm                       |
| Linearity Deviation                                                                                                                                                                                                                                                                                                                                                                                                              |  | 4 mm                       | 4 mm                       | 20 mm                      |
| Resolution                                                                                                                                                                                                                                                                                                                                                                                                                       |  | 0,2 mm                     | 0,3 mm                     | 1 mm                       |
| Ultrasonic Frequency                                                                                                                                                                                                                                                                                                                                                                                                             |  | 225 kHz                    | 120 kHz                    | 75 kHz                     |
| Opening Angle                                                                                                                                                                                                                                                                                                                                                                                                                    |  | < 12 °                     | < 14 °                     | < 14 °                     |
| Switching Hysteresis                                                                                                                                                                                                                                                                                                                                                                                                             |  | 5 mm                       | 15 mm                      | 30 mm                      |
| Current Consumption (Ub = 24 V)                                                                                                                                                                                                                                                                                                                                                                                                  |  | < 30 mA                    | < 50 mA                    | < 50 mA                    |
| Switching Frequency                                                                                                                                                                                                                                                                                                                                                                                                              |  | 7 Hz                       | 3 Hz                       | 1,5 Hz                     |
| Response Time                                                                                                                                                                                                                                                                                                                                                                                                                    |  | < 72 ms                    | < 167 ms                   | < 334 ms                   |
| Connection Diagram No.                                                                                                                                                                                                                                                                                                                                                                                                           |  | <div>183</div>             | <div>183</div>             | <div>183</div>             |
| Control Panel No.                                                                                                                                                                                                                                                                                                                                                                                                                |  | <div>X2</div>              | <div>X2</div>              | <div>X2</div>              |
| Suitable Connection Technology No.                                                                                                                                                                                                                                                                                                                                                                                               |  | <div>2</div> <div>35</div> | <div>2</div> <div>35</div> | <div>2</div> <div>35</div> |
| Suitable Mounting Technology No.                                                                                                                                                                                                                                                                                                                                                                                                 |  | <div>340</div>             | <div>340</div>             | <div>340</div>             |
| Selectable menu language                                                                                                                                                                                                                                                                                                                                                                                                         |  | yes                        | yes                        | yes                        |
| Password Protection                                                                                                                                                                                                                                                                                                                                                                                                              |  | yes                        | yes                        | yes                        |

Connection Diagrams page 54

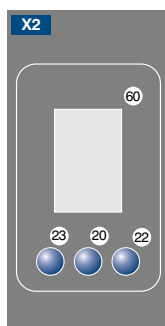
## Complementary Products

Analog Evaluation Unit AW02

IO-Link Master

PNP-NPN Converter BG2V1P-N-2M

## Ctrl. Panel



20 = Enter Button

22 = UP Button

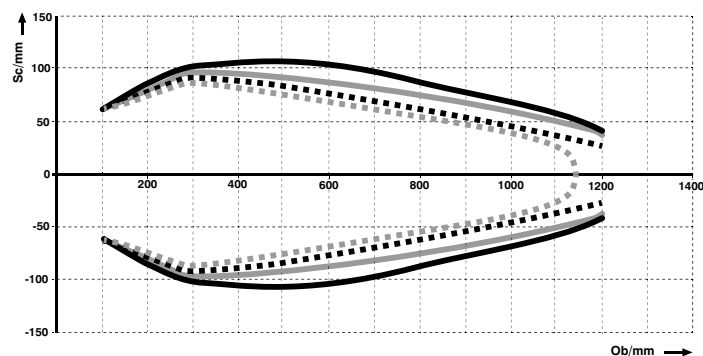
23 = Down Button

60 = Display

## Characteristic response curve

Measurement of the sonic cone on a 100 × 100 mm plate

### UMS123U035



Ob = Object

Sc = Sonic cone width

— Standard

- - - Medium-width

... Narrow

- . - Extra-narrow

# Reflex Sensor with Analog Output

## 50...1200 mm

Range



- Digital and analog output
- Stainless steel housing
- Synchronous mode
- Temperature drift eliminable

### Technical Data

#### Ultrasonic Data

|                           |          |
|---------------------------|----------|
| Opening Angle             | < 12 °   |
| Service Life (T = +25 °C) | 100000 h |

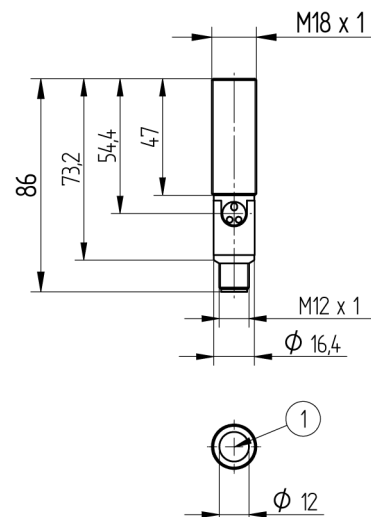
#### Electrical Data

|                                             |                  |
|---------------------------------------------|------------------|
| Supply Voltage                              | 18...30 V DC     |
| Current Consumption (U <sub>b</sub> = 24 V) | < 30 mA          |
| Temperature Range                           | -25...60 °C      |
| Switching Outputs                           | 1                |
| Switching Output Voltage Drop               | < 2,5 V          |
| PNP Switching Output/Switching Current      | 100 mA           |
| Analog Output                               | 0...10 V         |
| Synchronous Mode                            | up to 40 sensors |
| Short Circuit Protection                    | yes              |
| Reverse Polarity Protection                 | yes              |
| Overload Protection                         | yes              |
| Lockable                                    | yes              |
| Interface                                   | IO-Link          |
| IO-Link Version                             | 1.0              |
| Protection Class                            | III              |

#### Mechanical Data

|                      |                  |
|----------------------|------------------|
| Adjustment           | Teach-In         |
| Housing Material     | Stainless Steel  |
| Full Encapsulation   | yes              |
| Degree of Protection | IP67             |
| Connection           | M12 x 1; 4/5-pin |

These ultrasonic sensors evaluate the sound reflected by the object. They detect almost every object and are suited especially for the filling level monitoring of fluids or bulk material or the detection of transparent objects. The sensor detects objects independent from their material, aggregate state, color or transparency. Convenient programming and quick diagnosis is possible via the IO-Link interface.



1 = Sensing Face  
All dimensions in mm (1 mm = 0.03937 Inch)

|                                    | Plug Version |               |
|------------------------------------|--------------|---------------|
|                                    | Part Number  |               |
|                                    | UMD402U035   | UMD123U035    |
| CE                                 |              |               |
| RoHS                               |              |               |
| UL LISTED                          |              |               |
| PNP NO/NC switchable               | ●            | ●             |
| IO-Link                            | ●            | ●             |
| Analog Output                      | ●            | ●             |
| Working Range                      | 50...400 mm  | 100...1200 mm |
| Measuring Range                    | 350 mm       | 1100 mm       |
| Reproducibility maximum            | 1 mm         | 2 mm          |
| Linearity Deviation                | 5 mm         | 7 mm          |
| Resolution                         | 0,1 mm       | 0,2 mm        |
| Ultrasonic Frequency               | 300 kHz      | 225 kHz       |
| Switching Hysteresis               | 2 mm         | 10 mm         |
| Switching Frequency                | 20 Hz        | 7 Hz          |
| Response Time                      | 25 ms        | 72 ms         |
| Connection Diagram No.             | 182          | 182           |
| Control Panel No.                  | D12          | D12           |
| Suitable Connection Technology No. | 2 35         | 2 35          |
| Suitable Mounting Technology No.   | 150          | 150           |

Connection Diagrams page 54

## Complementary Products

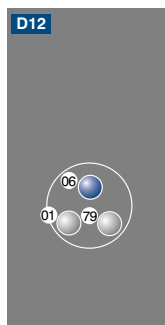
Analog Evaluation Unit AW02

Deflection plate Z0021, Z0022

IO-Link Master

PNP-NPN Converter BG2V1P-N-2M

## Ctrl. Panel



01 = Switching Status Indicator

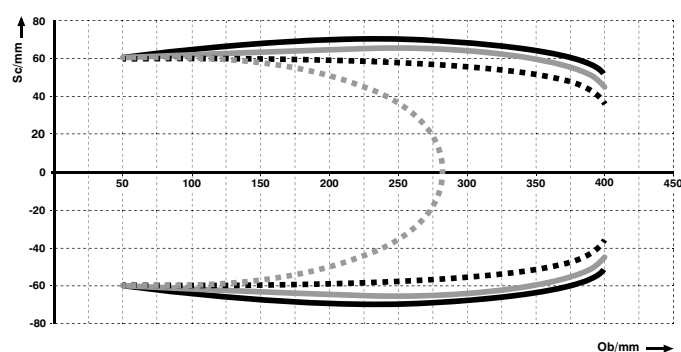
06 = Teach Button

79 = Run/Error Indicator

## Characteristic response curve

Measurement of the sonic cone on a 100 × 100 mm plate

### UMD402U035



Ob = Object

Sc = Sonic cone width

— Standard

— Medium-width

- - - Narrow

... Extra-narrow

# Reflex Sensor with Analog Output

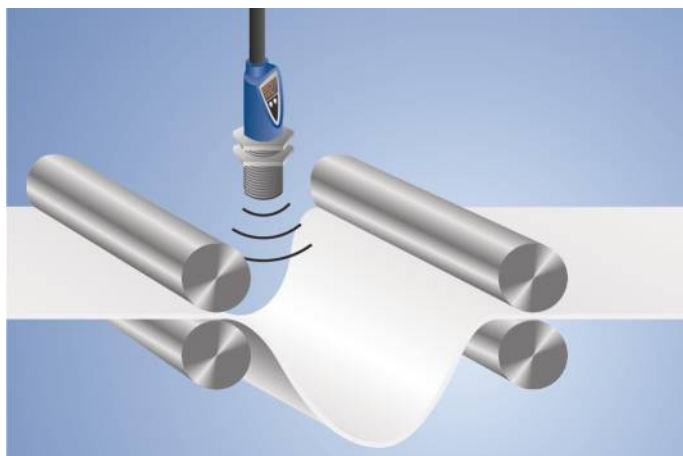
## 50...3000 mm

Range



- Digital and analog output
- Stainless steel housing
- Synchronous and multiplex mode
- Temperature drift eliminable

These ultrasonic sensors evaluate the sound reflected by the object. They detect almost every object and are suited especially for the filling level monitoring of fluids or bulk material or the detection of transparent objects. The sensor detects objects independent from their material, aggregate state, color or transparency. The sensors can be adjusted easily by the 4-digit 7-segment display. Convenient programming and quick diagnosis is possible via the IO-Link interface.



### Technical Data

#### Ultrasonic Data

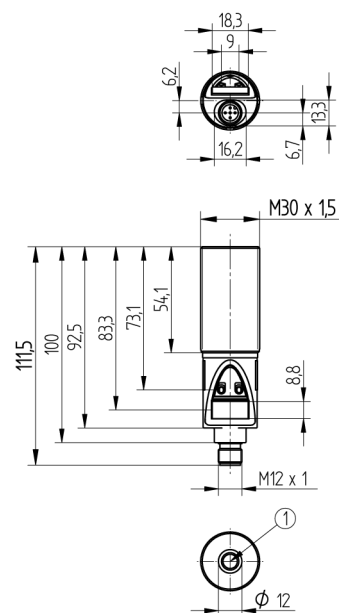
|                           |          |
|---------------------------|----------|
| Service Life (T = +25 °C) | 100000 h |
|---------------------------|----------|

#### Electrical Data

|                                             |                    |
|---------------------------------------------|--------------------|
| Supply Voltage                              | 18...30 V DC       |
| Current Consumption (U <sub>b</sub> = 24 V) | < 40 mA            |
| Temperature Range                           | -25...60 °C        |
| Switching Outputs                           | 1                  |
| Switching Output Voltage Drop               | < 2,5 V            |
| PNP Switching Output/Switching Current      | 100 mA             |
| Analog Output                               | 0...10 V/4...20 mA |
| Synchronous Mode                            | up to 40 sensors   |
| Multiplex Mode                              | up to 16 sensors   |
| Short Circuit Protection                    | yes                |
| Reverse Polarity Protection                 | yes                |
| Overload Protection                         | yes                |
| Lockable                                    | yes                |
| Interface                                   | IO-Link            |
| IO-Link Version                             | 1.0                |
| Protection Class                            | III                |

#### Mechanical Data

|                      |                  |
|----------------------|------------------|
| Adjustment           | Teach-In         |
| Housing Material     | Stainless Steel  |
| Degree of Protection | IP67             |
| Connection           | M12 × 1; 4/5-pin |



1 = Sensing Face  
All dimensions in mm (1 mm = 0.03937 Inch)

|                                    | Plug Version |               |
|------------------------------------|--------------|---------------|
|                                    | Part Number  | Part Number   |
|                                    | UMF402U035   | UMF303U035    |
| Error Output                       | ●            | ●             |
| PNP NO/NC switchable               | ●            | ●             |
| IO-Link                            | ●            | ●             |
| Analog Output                      | ●            | ●             |
| Working Range                      | 50...400 mm  | 200...3000 mm |
| Measuring Range                    | 350 mm       | 2800 mm       |
| Reproducibility maximum            | 1 mm         | 4 mm          |
| Linearity Deviation                | 3 mm         | 4 mm          |
| Resolution                         | 0,1 mm       | 0,3 mm        |
| Ultrasonic Frequency               | 300 kHz      | 120 kHz       |
| Opening Angle                      | < 12 °       | < 14 °        |
| Switching Hysteresis               | 2 mm         | 30 mm         |
| Switching Frequency                | 20 Hz        | 3 Hz          |
| Response Time                      | 25 ms        | 167 ms        |
| Connection Diagram No.             | 184          | 184           |
| Control Panel No.                  | U1           | U1            |
| Suitable Connection Technology No. | 2 35         | 2 35          |
| Suitable Mounting Technology No.   | 130          | 130           |

Connection Diagrams page 54

## Complementary Products

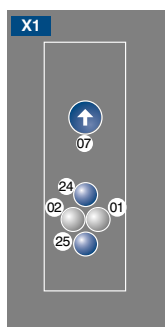
Analog Evaluation Unit AW02

Deflection plate Z0023, Z0024

IO-Link Master

PNP-NPN Converter BG2V1P-N-2M

## Ctrl. Panel



60 = Display

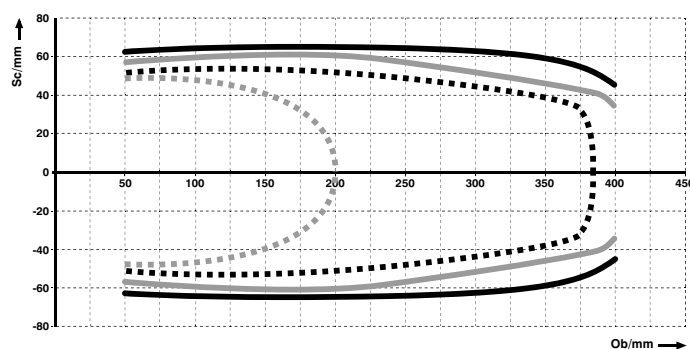
80 = Mode Button/Switching Status Indicator

81 = Plus Button/Error Warning

## Characteristic response curve

Measurement of the sonic cone on a 100 × 100 mm plate

### UMF402U035



Ob = Object

Sc = Sonic cone width

— Standard

— Medium-width

- - - Narrow

... Extra-narrow



## Inductive Sensors with IO-Link

**Inductive Sensors with IO-Link** permit uninterrupted data communication from the controller all the way down to the field level. Diagnostic information for preventive maintenance measures can thus be queried continuously from the sensor's error output and increases system availability. Three selectable switching distances and selection of either high or low frequency offer additional flexibility, and decrease the number of variants thus reducing inventory costs. Furthermore, a broad range of configuration options is made available via IO-Link. For example, the sensor's output function can be programmed as normally closed (NC), normally open (NO) or antivalent (NO and NC). The switching output can be configured as either PNP or NPN.

Application examples:

- End-position detection
- Position detection
- Material tracking
- Part recognition

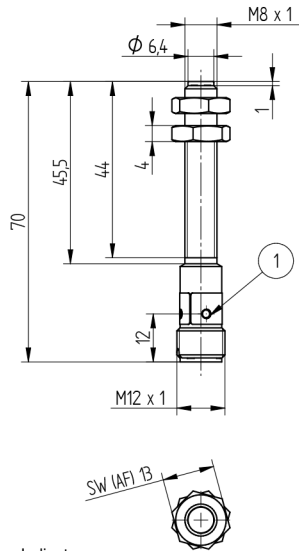
# Inductive Sensor with IO-Link

**4 mm**

M8 x 1

Range  
**quasi-flush**

**weproTec**



1 = Switching Status Indicator  
Sleeve M8x1 = 4 Nm  
All dimensions in mm (1 mm = 0.03937 Inch)



## Technical Data

### Inductive Data

|                                |                |
|--------------------------------|----------------|
| Switching Distance             | 4 mm           |
| Standard Target                | 12 x 12 mm     |
| Correction Factors V2A/CuZn/Al | 1,07/0,50/0,48 |
| Mounting                       | quasi-flush    |
| Mounting A/B/C/D in mm         | 8/17/12/3      |
| Mounting B1 in mm              | 0..6           |
| Switching Hysteresis           | < 10 %         |

### Electrical Data

|                                             |              |
|---------------------------------------------|--------------|
| Supply Voltage                              | 10...30 V DC |
| Current Consumption (U <sub>b</sub> = 24 V) | < 12 mA      |
| Switching Frequency                         | 760 Hz       |
| Temperature Drift                           | < 10 %       |
| Temperature Range                           | -40...80 °C  |
| Switching Output Voltage Drop               | < 1 V        |
| Switching Output/Switching Current          | 100 mA       |
| Residual Current Switching Output           | < 100 µA     |
| Short Circuit Protection                    | yes          |
| Reverse Polarity and Overload Protection    | yes          |
| Interface                                   | IO-Link      |
| IO-Link Version                             | 1.0          |
| Protection Class                            | III          |

### Mechanical Data

|                      |                     |
|----------------------|---------------------|
| Housing Material     | CuZn, nickel-plated |
| Degree of Protection | IP67                |
| Connection           | M12 x 1; 4-pin      |

## Plug Version

| Part Number                        | IO8H025    |
|------------------------------------|------------|
| IO-Link                            | ●          |
| NO/NC switchable                   | ●          |
| Configurable as PNP/NPN/Push-Pull  | ●          |
| Programmable error output          | ●          |
| Connection Diagram No.             | 704        |
| Suitable Connection Technology No. | 2          |
| Suitable Mounting Technology No.   | 200 202    |
| Error Indicator                    | yes        |
| Programmable switching distance    | 2,5/3/4 mm |
| Programmable switching frequency   | yes        |

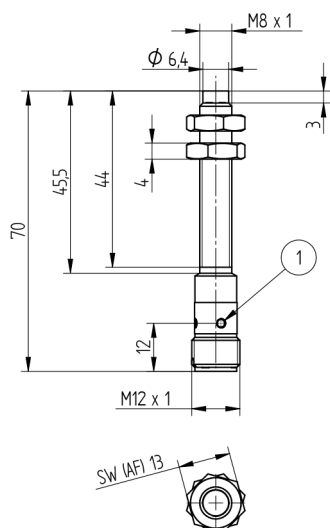
Connection Diagrams page 54

## Complementary Products

IO-Link Master

**M8 x 1**

A stainless steel gas valve assembly, featuring a threaded body with a hexagonal nut and a blue cap at the end. The assembly is shown against a white background.



1 = Switching Status Indicator  
Sleeve M8×1 = 4 Nm  
All dimensions in mm (1 mm = 0.03937 Inch)



**weproTec**

## Inductive Data

|                                |                |
|--------------------------------|----------------|
| Switching Distance             | 6 mm           |
| Standard Target                | 18 × 18 mm     |
| Correction Factors V2A/CuZn/Al | 1,01/0,59/0,55 |
| Mounting                       | non-flush      |
| Mounting A/B/C/D in mm         | 8/25/18/12     |
| Mounting B1 in mm              | 0...7          |
| Switching Hysteresis           | < 10 %         |

### Electrical Data

|                                             |              |
|---------------------------------------------|--------------|
| Supply Voltage                              | 10...30 V DC |
| Current Consumption (U <sub>b</sub> = 24 V) | < 11 mA      |
| Switching Frequency                         | 750 Hz       |
| Temperature Drift                           | < 10 %       |
| Temperature Range                           | -40...80 °C  |
| Switching Output Voltage Drop               | < 1 V        |
| Switching Output/Switching Current          | 100 mA       |
| Residual Current Switching Output           | < 100 μA     |
| Short Circuit Protection                    | yes          |
| Reverse Polarity and Overload Protection    | yes          |
| Interface                                   | IO-Link      |
| IO-Link Version                             | 1.0          |
| Protection Class                            | III          |

### Mechanical Data

|                      |                     |
|----------------------|---------------------|
| Housing Material     | CuZn, nickel-plated |
| Degree of Protection | IP67                |
| Connection           | M12 x 1; 4-pin      |

### Plug Version

|                                    | Part Number | 108H026  |
|------------------------------------|-------------|----------|
| IO-Link                            |             | ●        |
| NO/NC switchable                   |             | ●        |
| Configurable as PNP/NPN/Push-Pull  |             | ●        |
| Error Output                       |             | ●        |
| Connection Diagram No.             |             | 704      |
| Suitable Connection Technology No. |             | 2        |
| Suitable Mounting Technology No.   |             | 200 203  |
| Error Indicator                    |             | yes      |
| Programmable switching distance    |             | 4/5/6 mm |
| Programmable switching frequency   |             | yes      |

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Connection Diagrams page 54

## Complementary Products

IO-Link Master

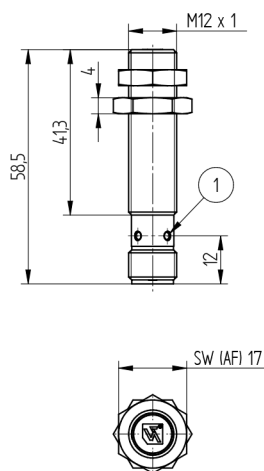
# Inductive Sensor with IO-Link

**6 mm**

M12 × 1

Range  
quasi-flush

weproTec



1 = Switching Status Indicator  
Sleeve M12×1 = 12 Nm  
All dimensions in mm (1 mm = 0.03937 Inch)



## Technical Data

### Inductive Data

|                                |                |
|--------------------------------|----------------|
| Switching Distance             | 6 mm           |
| Standard Target                | 18 × 18 mm     |
| Correction Factors V2A/CuZn/Al | 1,11/0,53/0,50 |
| Mounting                       | quasi-flush    |
| Mounting A/B/C/D in mm         | 12/26/18/4     |
| Mounting B1 in mm              | 0...13         |
| Switching Hysteresis           | < 10 %         |

### Electrical Data

|                                             |              |
|---------------------------------------------|--------------|
| Supply Voltage                              | 10...30 V DC |
| Current Consumption (U <sub>b</sub> = 24 V) | < 12 mA      |
| Switching Frequency                         | 770 Hz       |
| Temperature Drift                           | < 10 %       |
| Temperature Range                           | -40...80 °C  |
| Switching Output Voltage Drop               | < 1 V        |
| Switching Output/Switching Current          | 100 mA       |
| Residual Current Switching Output           | < 100 µA     |
| Short Circuit Protection                    | yes          |
| Reverse Polarity and Overload Protection    | yes          |
| Interface                                   | IO-Link      |
| IO-Link Version                             | 1.0          |
| Protection Class                            | III          |

### Mechanical Data

|                      |                     |
|----------------------|---------------------|
| Housing Material     | CuZn, nickel-plated |
| Degree of Protection | IP67                |
| Connection           | M12 × 1; 4-pin      |

## Plug Version

| Part Number                        | 112H019  |
|------------------------------------|----------|
| IO-Link                            | ●        |
| NO/NC switchable                   | ●        |
| Configurable as PNP/NPN/Push-Pull  | ●        |
| Programmable error output          | ●        |
| Connection Diagram No.             | 704      |
| Suitable Connection Technology No. | 2        |
| Suitable Mounting Technology No.   | 170 172  |
| Error Indicator                    | yes      |
| Programmable switching distance    | 4/5/6 mm |
| Programmable switching frequency   | yes      |

Connection Diagrams page 54

## Complementary Products

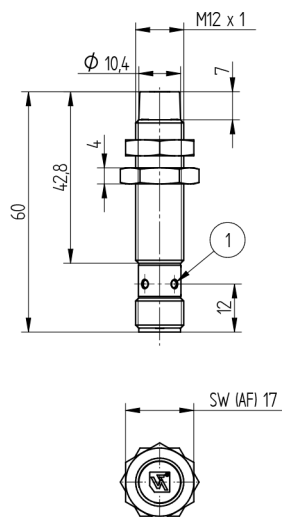
IO-Link Master

# Inductive Sensor with IO-Link

## 12 mm

M12 × 1

Range  
non-flush



1 = Switching Status Indicator  
Sleeve M12×1 = 12 Nm  
All dimensions in mm (1 mm = 0.03937 Inch)



## Technical Data

| Inductive Data                              |                     |
|---------------------------------------------|---------------------|
| Switching Distance                          | 12 mm               |
| Standard Target                             | 36 × 36 mm          |
| Correction Factors V2A/CuZn/Al              | 1,05/0,54/0,52      |
| Mounting                                    | non-flush           |
| Mounting A/B/C/D in mm                      | 20/40/36/14         |
| Mounting B1 in mm                           | 0...14              |
| Switching Hysteresis                        | < 10 %              |
| Electrical Data                             |                     |
| Supply Voltage                              | 10...30 V DC        |
| Current Consumption (U <sub>b</sub> = 24 V) | < 14 mA             |
| Switching Frequency                         | 360 Hz              |
| Temperature Drift                           | < 10 %              |
| Temperature Range                           | -40...80 °C         |
| Switching Output Voltage Drop               | < 1 V               |
| Switching Output/Switching Current          | 100 mA              |
| Residual Current Switching Output           | < 100 µA            |
| Short Circuit Protection                    | yes                 |
| Reverse Polarity and Overload Protection    | yes                 |
| Interface                                   | IO-Link             |
| IO-Link Version                             | 1.0                 |
| Protection Class                            | III                 |
| Mechanical Data                             |                     |
| Housing Material                            | CuZn, nickel-plated |
| Degree of Protection                        | IP67                |
| Connection                                  | M12 × 1; 4-pin      |

## Plug Version

| Part Number                        |            |
|------------------------------------|------------|
|                                    | 112H020    |
| IO-Link                            | ●          |
| NO/NC switchable                   | ●          |
| Configurable as PNP/NPN/Push-Pull  | ●          |
| Programmable error output          | ●          |
| Connection Diagram No.             | 704        |
| Suitable Connection Technology No. | 2          |
| Suitable Mounting Technology No.   | 170 173    |
| Error Indicator                    | yes        |
| Programmable switching distance    | 8/10/12 mm |

Connection Diagrams page 54

## Complementary Products

IO-Link Master

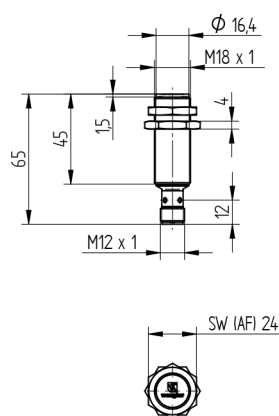
# Inductive Sensor with IO-Link

## 12 mm

M18 x 1

Range  
quasi-flush

weproTec



1 = Switching Status Indicator  
Sleeve M18x1 = 30 Nm  
All dimensions in mm (1 mm = 0.03937 Inch)



## Technical Data

### Inductive Data

|                                |                |
|--------------------------------|----------------|
| Switching Distance             | 12 mm          |
| Standard Target                | 36 x 36 mm     |
| Correction Factors V2A/CuZn/Al | 0,97/0,47/0,43 |
| Mounting                       | quasi-flush    |
| Mounting A/B/C/D in mm         | 18/46/36/5     |
| Mounting B1 in mm              | 0...28         |
| Switching Hysteresis           | < 10 %         |

### Electrical Data

|                                             |              |
|---------------------------------------------|--------------|
| Supply Voltage                              | 10...30 V DC |
| Current Consumption (U <sub>b</sub> = 24 V) | < 12 mA      |
| Switching Frequency                         | 600 Hz       |
| Temperature Drift                           | < 10 %       |
| Temperature Range                           | -40...80 °C  |
| Switching Output Voltage Drop               | < 1 V        |
| Switching Output/Switching Current          | 100 mA       |
| Residual Current Switching Output           | < 100 µA     |
| Short Circuit Protection                    | yes          |
| Reverse Polarity and Overload Protection    | yes          |
| Interface                                   | IO-Link      |
| IO-Link Version                             | 1.0          |
| Protection Class                            | III          |

### Mechanical Data

|                      |                     |
|----------------------|---------------------|
| Housing Material     | CuZn, nickel-plated |
| Degree of Protection | IP67                |
| Connection           | M12 x 1; 4-pin      |

### Plug Version

| Part Number                        | 118H013    |
|------------------------------------|------------|
| IO-Link                            | ●          |
| NO/NC switchable                   | ●          |
| Configurable as PNP/NPN/Push-Pull  | ●          |
| Programmable error output          | ●          |
| Connection Diagram No.             | 704        |
| Suitable Connection Technology No. | 2          |
| Suitable Mounting Technology No.   | 150 152    |
| Error Indicator                    | yes        |
| Programmable switching distance    | 8/10/12 mm |
| Programmable switching frequency   | yes        |

Connection Diagrams page 54

## Complementary Products

IO-Link Master

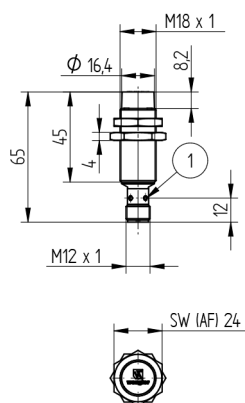


# Inductive Sensor with IO-Link

## 20 mm

M18 x 1

Range  
non-flush



1 = Switching Status Indicator  
Sleeve M18x1 = 30 Nm  
All dimensions in mm (1 mm = 0.03937 Inch)



## Technical Data

### Inductive Data

|                                |                |
|--------------------------------|----------------|
| Switching Distance             | 20 mm          |
| Standard Target                | 60 x 60 mm     |
| Correction Factors V2A/CuZn/Al | 0,92/0,47/0,46 |
| Mounting                       | non-flush      |
| Mounting A/B/C/D in mm         | 24/60/60/20    |
| Mounting B1 in mm              | 2...40         |
| Switching Hysteresis           | < 10 %         |

### Electrical Data

|                                             |              |
|---------------------------------------------|--------------|
| Supply Voltage                              | 10...30 V DC |
| Current Consumption (U <sub>b</sub> = 24 V) | < 11 mA      |
| Switching Frequency                         | 670 Hz       |
| Temperature Drift                           | < 10 %       |
| Temperature Range                           | -40...80 °C  |
| Switching Output Voltage Drop               | < 1 V        |
| Switching Output/Switching Current          | 100 mA       |
| Residual Current Switching Output           | < 100 µA     |
| Short Circuit Protection                    | yes          |
| Reverse Polarity and Overload Protection    | yes          |
| Interface                                   | IO-Link      |
| IO-Link Version                             | 1.0          |
| Protection Class                            | III          |

### Mechanical Data

|                      |                     |
|----------------------|---------------------|
| Housing Material     | CuZn, nickel-plated |
| Degree of Protection | IP67                |
| Connection           | M12 x 1; 4-pin      |

### Plug Version

| Part Number                        | 118H014     |
|------------------------------------|-------------|
| IO-Link                            | ●           |
| NO/NC switchable                   | ●           |
| Configurable as PNP/NPN/Push-Pull  | ●           |
| Programmable error output          | ●           |
| Connection Diagram No.             | 704         |
| Suitable Connection Technology No. | 2           |
| Suitable Mounting Technology No.   | 150 153     |
| Error Indicator                    | yes         |
| Programmable switching distance    | 12/15/20 mm |
| Programmable switching frequency   | yes         |

Connection Diagrams page 54

## Complementary Products

IO-Link Master

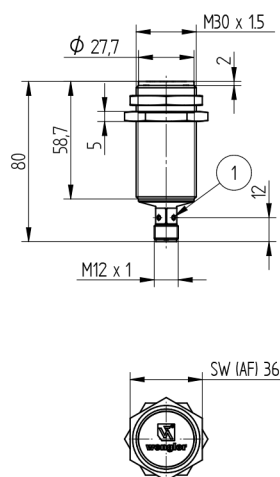
# Inductive Sensor with IO-Link

## 22 mm

M30 × 1,5

Range  
quasi-flush

weproTec



1 = Switching Status Indicator  
Sleeve M30×1,5 = 50 Nm  
All dimensions in mm (1 mm = 0.03937 Inch)



## Technical Data

### Inductive Data

|                                |                |
|--------------------------------|----------------|
| Switching Distance             | 22 mm          |
| Standard Target                | 66 × 66 mm     |
| Correction Factors V2A/CuZn/Al | 0,85/0,35/0,34 |
| Mounting                       | quasi-flush    |
| Mounting A/B/C/D in mm         | 35/49/66/7     |
| Mounting B1 in mm              | 0...40         |
| Switching Hysteresis           | < 10 %         |

### Electrical Data

|                                             |              |
|---------------------------------------------|--------------|
| Supply Voltage                              | 10...30 V DC |
| Current Consumption (U <sub>b</sub> = 24 V) | < 15 mA      |
| Switching Frequency                         | 480 Hz       |
| Temperature Drift                           | < 10 %       |
| Temperature Range                           | -40...80 °C  |
| Switching Output Voltage Drop               | < 1 V        |
| Switching Output/Switching Current          | 100 mA       |
| Residual Current Switching Output           | < 100 µA     |
| Short Circuit Protection                    | yes          |
| Reverse Polarity and Overload Protection    | yes          |
| Interface                                   | IO-Link      |
| IO-Link Version                             | 1.0          |
| Protection Class                            | III          |

### Mechanical Data

|                      |                     |
|----------------------|---------------------|
| Housing Material     | CuZn, nickel-plated |
| Degree of Protection | IP67                |
| Connection           | M12 × 1; 4-pin      |

## Plug Version

| Part Number                        | 130H013     |
|------------------------------------|-------------|
| IO-Link                            | ●           |
| NO/NC switchable                   | ●           |
| Configurable as PNP/NPN/Push-Pull  | ●           |
| Programmable error output          | ●           |
| Connection Diagram No.             | 704         |
| Suitable Connection Technology No. | 2           |
| Suitable Mounting Technology No.   | 130 132     |
| Error Indicator                    | yes         |
| Programmable switching distance    | 15/20/22 mm |
| Programmable switching frequency   | yes         |

Connection Diagrams page 54

## Complementary Products

IO-Link Master

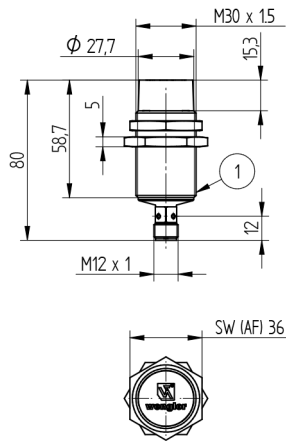


# Inductive Sensor with IO-Link

## 35 mm

M30 × 1,5

Range  
non-flush



1 = Switching Status Indicator  
Sleeve M30×1,5 = 50 Nm  
All dimensions in mm (1 mm = 0.03937 Inch)



## Technical Data

### Inductive Data

|                                |                |
|--------------------------------|----------------|
| Switching Distance             | 35 mm          |
| Standard Target                | 105 × 105 mm   |
| Correction Factors V2A/CuZn/Al | 1,00/0,42/0,39 |
| Mounting                       | non-flush      |
| Mounting A/B/C/D in mm         | 55/82/105/35   |
| Mounting B1 in mm              | 0...80         |
| Switching Hysteresis           | < 10 %         |

### Electrical Data

|                                             |              |
|---------------------------------------------|--------------|
| Supply Voltage                              | 10...30 V DC |
| Current Consumption (U <sub>b</sub> = 24 V) | < 15 mA      |
| Switching Frequency                         | 210 Hz       |
| Temperature Drift                           | < 10 %       |
| Temperature Range                           | -40...80 °C  |
| Switching Output Voltage Drop               | < 1 V        |
| Switching Output/Switching Current          | 100 mA       |
| Residual Current Switching Output           | < 100 µA     |
| Short Circuit Protection                    | yes          |
| Reverse Polarity and Overload Protection    | yes          |
| Interface                                   | IO-Link      |
| IO-Link Version                             | 1.0          |
| Protection Class                            | III          |

### Mechanical Data

|                      |                     |
|----------------------|---------------------|
| Housing Material     | CuZn, nickel-plated |
| Degree of Protection | IP67                |
| Connection           | M12 × 1; 4-pin      |

### Plug Version

| Part Number                        | 130H014     |
|------------------------------------|-------------|
| IO-Link                            | ●           |
| NO/NC switchable                   | ●           |
| Configurable as PNP/NPN/Push-Pull  | ●           |
| Programmable error output          | ●           |
| Connection Diagram No.             | 704         |
| Suitable Connection Technology No. | 2           |
| Suitable Mounting Technology No.   | 130 133     |
| Error Indicator                    | yes         |
| Programmable switching distance    | 20/30/35 mm |
| Programmable switching frequency   | yes         |

Connection Diagrams page 54

## Complementary Products

IO-Link Master

# Inductive Sensor with IO-Link

**20 mm**

40 × 40 mm

Range  
flush

weproTec



## Technical Data

### Inductive Data

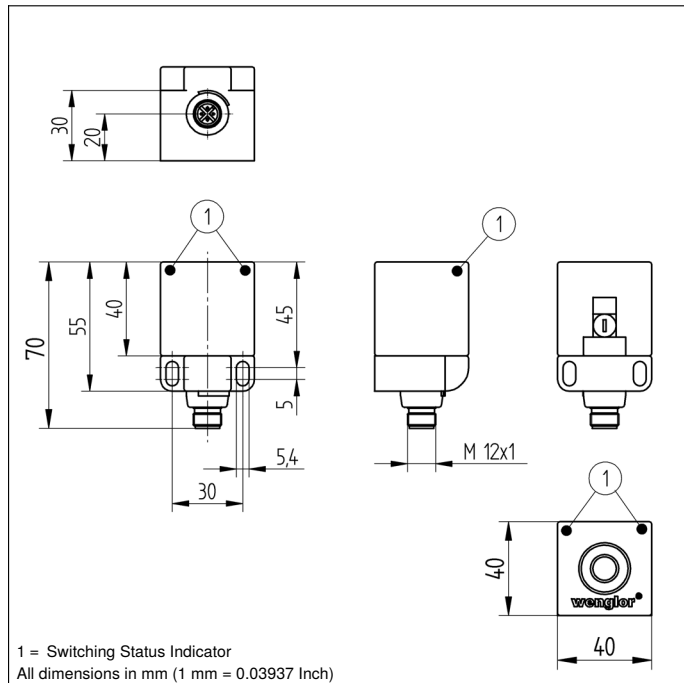
|                                |                |
|--------------------------------|----------------|
| Switching Distance             | 20 mm          |
| Standard Target                | 60 × 60 mm     |
| Correction Factors V2A/CuZn/Al | 0,83/0,32/0,31 |
| Mounting                       | flush          |
| Mounting A/B/C/D in mm         | 0/40/60/0      |
| Mounting B1 in mm              | 6...35         |
| Switching Hysteresis           | < 10 %         |

### Electrical Data

|                                             |              |
|---------------------------------------------|--------------|
| Supply Voltage                              | 10...30 V DC |
| Current Consumption (U <sub>b</sub> = 24 V) | < 15 mA      |
| Switching Frequency                         | 620 Hz       |
| Temperature Drift                           | < 10 %       |
| Temperature Range                           | -40...80 °C  |
| Switching Output Voltage Drop               | < 1 V        |
| Switching Output/Switching Current          | 100 mA       |
| Residual Current Switching Output           | < 100 µA     |
| Short Circuit Protection                    | yes          |
| Reverse Polarity and Overload Protection    | yes          |
| Interface                                   | IO-Link      |
| IO-Link Version                             | 1.0          |
| Protection Class                            | III          |

### Mechanical Data

|                      |                |
|----------------------|----------------|
| Housing Material     | Plastic        |
| Full Encapsulation   | yes            |
| Degree of Protection | IP67           |
| Connection           | M12 × 1; 4-pin |



### Plug Version

| Part Number                        | 11QH005     |
|------------------------------------|-------------|
| IO-Link                            | ●           |
| NO/NC switchable                   | ●           |
| Configurable as PNP/NPN/Push-Pull  | ●           |
| Programmable error output          | ●           |
| Connection Diagram No.             | 704         |
| Suitable Connection Technology No. | 2           |
| Error Indicator                    | yes         |
| Programmable switching distance    | 12/15/20 mm |
| Programmable switching frequency   | yes         |

Connection Diagrams page 54

## Complementary Products

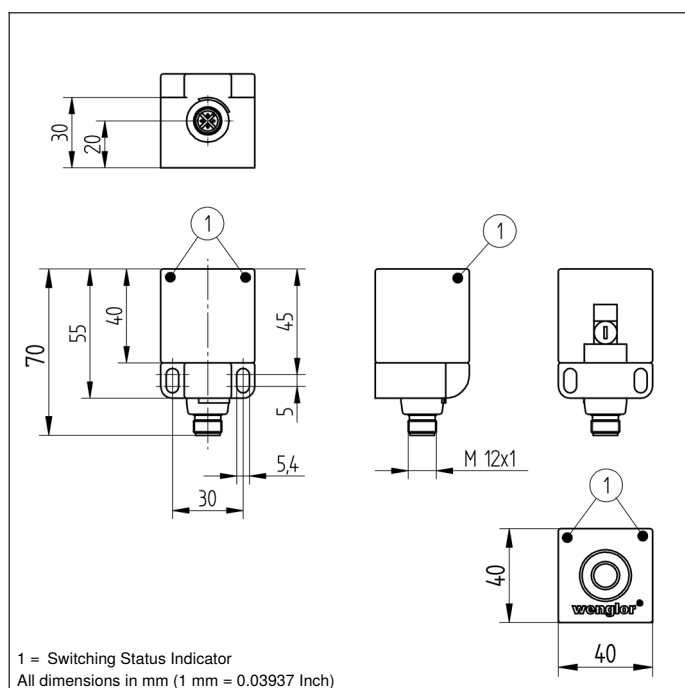
IO-Link Master

# Inductive Sensor with IO-Link

## 40 mm

40 × 40 mm

Range  
non-flush



## Technical Data

### Inductive Data

|                                |                |
|--------------------------------|----------------|
| Switching Distance             | 40 mm          |
| Standard Target                | 120 × 120 mm   |
| Correction Factors V2A/CuZn/Al | 0,75/0,32/0,33 |
| Mounting                       | non-flush      |
| Mounting A/B/C/D in mm         | 90/110/120/40  |
| Mounting B1 in mm              | 0...60         |
| Switching Hysteresis           | < 10 %         |

### Electrical Data

|                                             |              |
|---------------------------------------------|--------------|
| Supply Voltage                              | 10...30 V DC |
| Current Consumption (U <sub>b</sub> = 24 V) | < 15 mA      |
| Switching Frequency                         | 170 Hz       |
| Temperature Drift                           | < 10 %       |
| Temperature Range                           | -40...80 °C  |
| Switching Output Voltage Drop               | < 1 V        |
| Switching Output/Switching Current          | 100 mA       |
| Residual Current Switching Output           | < 100 µA     |
| Short Circuit Protection                    | yes          |
| Reverse Polarity and Overload Protection    | yes          |
| Interface                                   | IO-Link      |
| IO-Link Version                             | 1.0          |
| Protection Class                            | III          |

### Mechanical Data

|                      |                |
|----------------------|----------------|
| Housing Material     | Plastic        |
| Full Encapsulation   | yes            |
| Degree of Protection | IP67           |
| Connection           | M12 × 1; 4-pin |

### Plug Version

| Part Number                        |             |
|------------------------------------|-------------|
| 11QH006                            |             |
| IO-Link                            | ●           |
| NO/NC switchable                   | ●           |
| Configurable as PNP/NPN/Push-Pull  | ●           |
| Error Output                       | ●           |
| Connection Diagram No.             | 704         |
| Suitable Connection Technology No. | 2           |
| Error Indicator                    | yes         |
| Programmable switching distance    | 30/35/40 mm |
| Programmable switching frequency   | yes         |

Connection Diagrams page 54

## Complementary Products

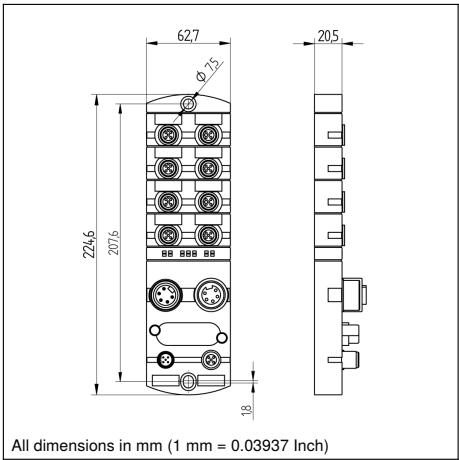
IO-Link Master

# IO-Link Master

## IO-Link Master Profibus Part Number ZAI72AN01



PROFIBUS



| Electrical Data                             |                 |
|---------------------------------------------|-----------------|
| Supply Voltage                              | 18...30 V DC    |
| max. total current of the digital I/O ports | 1,6 A           |
| Temperature Range                           | 0...55 °C       |
| Short Circuit Protection                    | yes             |
| Overload Protection                         | yes             |
| Number of IO-link ports                     | 4               |
| Number of digital I/O ports                 | 4               |
| Interface                                   | PROFIBUS DP     |
| Communication Mode IO-Link                  | SIO, COM2, COM3 |
| IO-Link Version                             | 1.0             |
| IO-link port                                | Class A         |
| Baud Rate                                   | > 12 MBd        |
| Feldbus Diagnosis                           | LED             |
| IO-Link Parameter                           | > 12            |
| Protection Class                            | III             |
| Mechanical Data                             |                 |
| Material                                    | Zinc diecasting |
| Weight                                      | 822 g           |
| Degree of Protection                        | IP67            |
| Connection Mode Supply Voltage              | 2 × 7/8", 5-pin |
| Connection Bus Side                         | M12 × 1; 4-pin  |
| Type of connection digital I/O ports        | M12 × 1; 4-pin  |
| IO-Link                                     |                 |
| Suitable Connection Technology No.          | 78              |

## IO-Link Master USB Part Number EFBL001



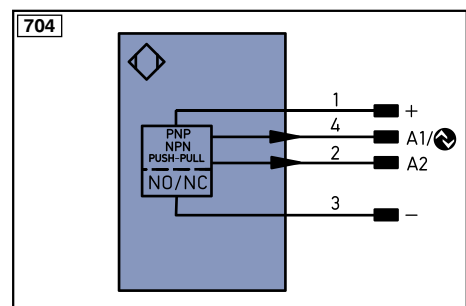
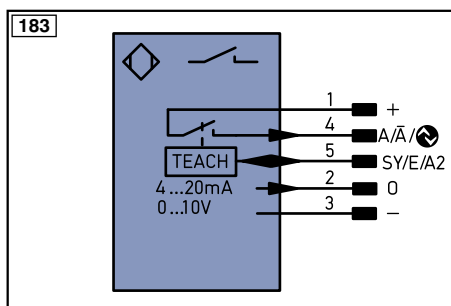
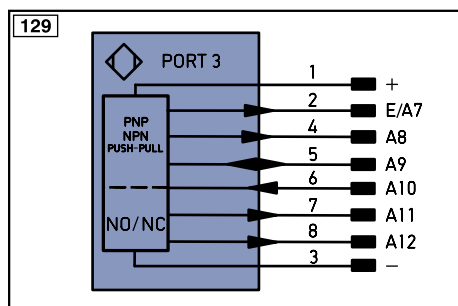
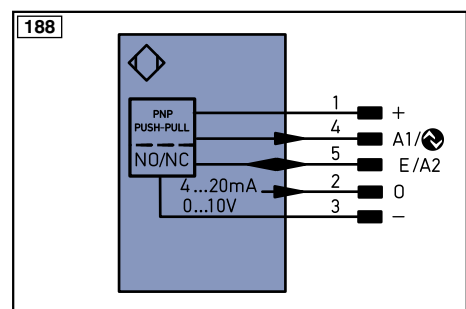
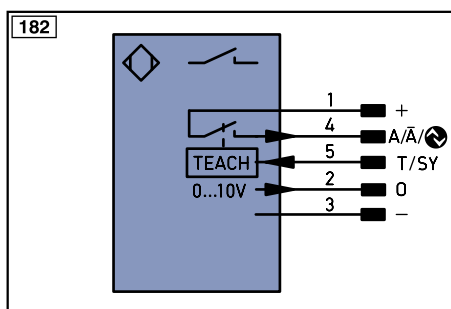
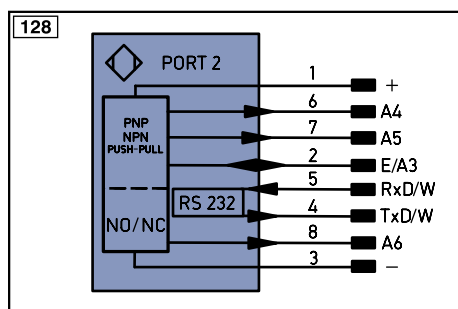
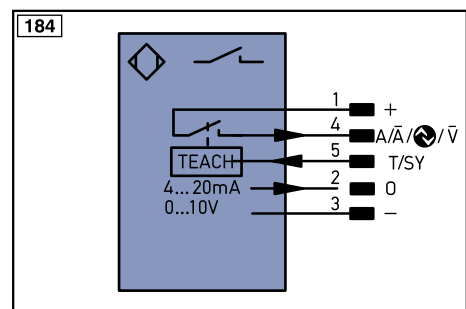
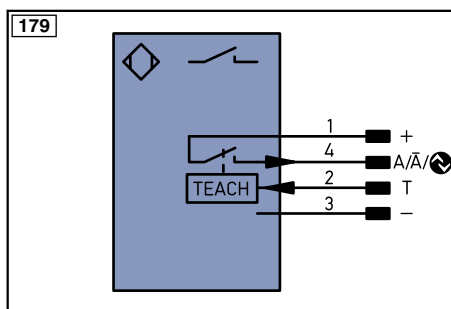
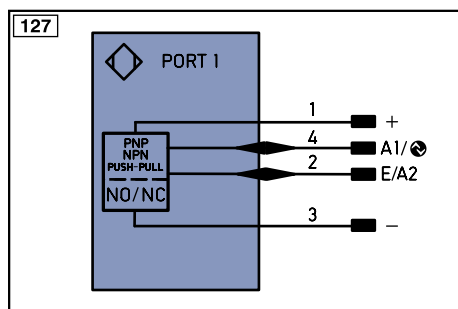
| Electrical Data                      |                                |
|--------------------------------------|--------------------------------|
| Supply Voltage                       | 24 V                           |
| Temperature Range                    | 0...45 °C                      |
| Number of IO-link ports              | 1                              |
| Interface                            | USB                            |
| Communication Mode IO-Link           | SIO, COM1, COM2, COM3          |
| IO-Link Version                      | 1.1                            |
| Protection Class                     | III                            |
| Mechanical Data                      |                                |
| Material                             | Aluminum                       |
| Weight                               | 80 g                           |
| Degree of Protection                 | IP54                           |
| Type of connection digital I/O ports | M12 × 1; 4-pin                 |
| Scope of delivery                    | Plug power pack, USB-A-B-Cable |
| IO-Link                              |                                |
| Suitable Connection Technology No.   | 2s                             |

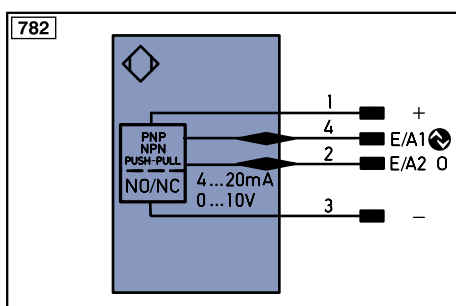
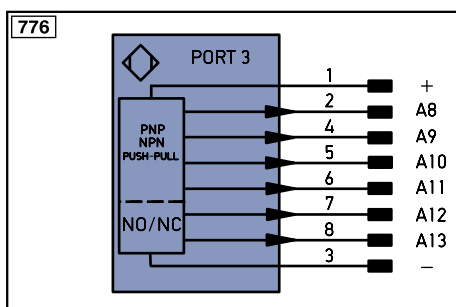
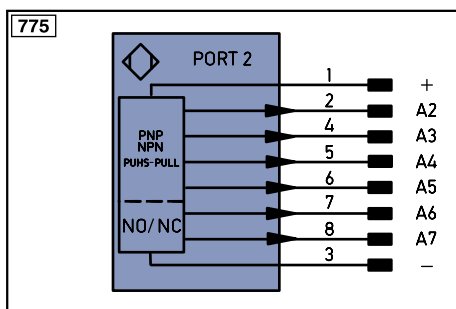
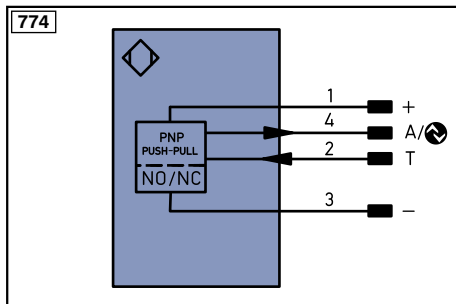
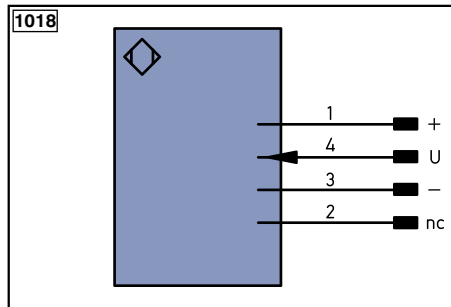
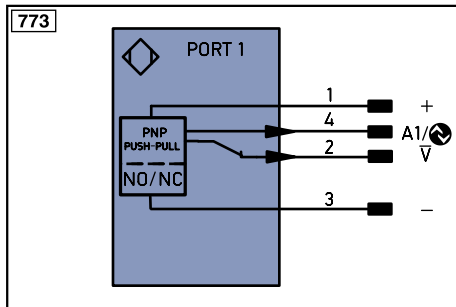


# Connection Diagrams

## Legend

|         |                                 |        |                              |                                                 |                     |
|---------|---------------------------------|--------|------------------------------|-------------------------------------------------|---------------------|
| +       | Supply Voltage +                | PT     | Platinum measuring resistor  | ENa                                             | Encoder A           |
| -       | Supply Voltage 0 V              | nc     | not connected                | ENb                                             | Encoder B           |
| ~       | Supply Voltage (AC Voltage)     | U      | Test Input                   | Am N                                            | Digital output MIN  |
| A       | Switching Output (NO)           | Ū      | Test Input inverted          | AMax                                            | Digital output MAX  |
| Ā       | Switching Output (NC)           | W      | Trigger Input                | AOk                                             | Digital output OK   |
| V       | Contamination/Error Output (NO) | O      | Analog Output                | SY In                                           | Synchronization In  |
| Ṽ       | Contamination/Error Output (NC) | O-     | Ground for the Analog Output | SY OUT                                          | Synchronization OUT |
| E       | Input (analog or digital)       | BZ     | Block Discharge              | OLt                                             | Brightness output   |
| T       | Teach Input                     | AWV    | Valve Output                 |                                                 |                     |
| Z       | Time Delay (activation)         | a      | Valve Control Output +       | <b>Wire Colors according to<br/>DIN IEC 757</b> |                     |
| S       | Shielding                       | b      | Valve Control Output 0 V     |                                                 |                     |
| RxD     | Interface Receive Path          | SY     | Synchronization              | BK                                              | Black               |
| TxD     | Interface Send Path             | E+     | Receiver-Line                | BN                                              | Brown               |
| RDY     | Ready                           | S+     | Emitter-Line                 | RD                                              | Red                 |
| GND     | Ground                          | ≡      | Grounding                    | OG                                              | Orange              |
| CL      | Clock                           | SnR    | Switching Distance Reduction | YE                                              | Yellow              |
| E/A     | Output/Input programmable       | Rx +/— | Ethernet Receive Path        | GN                                              | Green               |
| IO-Link | IO-Link                         | Tx +/— | Ethernet Send Path           | BU                                              | Blue                |
| PoE     | Power over Ethernet             | Bus    | Interfaces-Bus A(+)/B(-)     | VT                                              | Violet              |
| IN      | Safety Input                    | La     | Emitted Light disengageable  | GY                                              | Grey                |
| QSSD    | Safety Output                   | Mag    | Magnet activation            | WH                                              | White               |
| Signal  | Signal Output                   | RES    | Input confirmation           | PK                                              | Pink                |
| M       | Maintenance                     | EDM    | Contactor Monitoring         | GNYE                                            | Green Yellow        |





| Part Number         |                          | Page      |
|---------------------|--------------------------|-----------|
| <b>EFBL001</b>      | IO-Link Master           | <b>52</b> |
| <b>I08H025</b>      | Inductive Sensor         | <b>42</b> |
| <b>I08H026</b>      | Inductive Sensor         | <b>43</b> |
| <b>I12H019</b>      | Inductive Sensor         | <b>44</b> |
| <b>I12H020</b>      | Inductive Sensor         | <b>45</b> |
| <b>I18H013</b>      | Inductive Sensor         | <b>46</b> |
| <b>I18H014</b>      | Inductive Sensor         | <b>47</b> |
| <b>I1QH005</b>      | Inductive Sensor         | <b>50</b> |
| <b>I1QH006</b>      | Inductive Sensor         | <b>51</b> |
| <b>I30H013</b>      | Inductive Sensor         | <b>48</b> |
| <b>I30H014</b>      | Inductive Sensor         | <b>49</b> |
| <b>ODX402P0007</b>  | Fiber Optic Cable Sensor | <b>13</b> |
| <b>ODX402P0088</b>  | Fiber Optic Cable Sensor | <b>15</b> |
| <b>OEEB103U0135</b> | Light Curtain            | <b>31</b> |
| <b>OEEB123U0135</b> | Light Curtain            | <b>31</b> |
| <b>OEEB133U0135</b> | Light Curtain            | <b>31</b> |
| <b>OEEB152U0135</b> | Light Curtain            | <b>27</b> |
| <b>OEEB153U0135</b> | Light Curtain            | <b>33</b> |
| <b>OEEB163U0135</b> | Light Curtain            | <b>33</b> |
| <b>OEEB183U0135</b> | Light Curtain            | <b>33</b> |
| <b>OEEB302U0135</b> | Light Curtain            | <b>27</b> |
| <b>OEEB452U0135</b> | Light Curtain            | <b>27</b> |
| <b>OEEB602U0135</b> | Light Curtain            | <b>29</b> |
| <b>OEEB752U0135</b> | Light Curtain            | <b>29</b> |
| <b>OEEB902U0135</b> | Light Curtain            | <b>29</b> |
| <b>OEEI102U0135</b> | Light Curtain            | <b>23</b> |
| <b>OEEI152U0135</b> | Light Curtain            | <b>23</b> |
| <b>OEEI202U0135</b> | Light Curtain            | <b>25</b> |
| <b>OEEI501U0135</b> | Light Curtain            | <b>23</b> |
| <b>OLM653C0102</b>  | Retro-Reflex Sensor      | <b>21</b> |
| <b>OSEB103Z0103</b> | Light Curtain            | <b>31</b> |
| <b>OSEB123Z0103</b> | Light Curtain            | <b>31</b> |
| <b>OSEB133Z0103</b> | Light Curtain            | <b>31</b> |
| <b>OSEB152Z0103</b> | Light Curtain            | <b>27</b> |
| <b>OSEB153Z0103</b> | Light Curtain            | <b>33</b> |
| <b>OSEB163Z0103</b> | Light Curtain            | <b>33</b> |
| <b>OSEB183Z0103</b> | Light Curtain            | <b>33</b> |
| <b>OSEB302Z0103</b> | Light Curtain            | <b>27</b> |
| <b>OSEB452Z0103</b> | Light Curtain            | <b>27</b> |
| <b>OSEB602Z0103</b> | Light Curtain            | <b>29</b> |
| <b>OSEB752Z0103</b> | Light Curtain            | <b>29</b> |
| <b>OSEB902Z0103</b> | Light Curtain            | <b>29</b> |
| <b>OSEI102Z0103</b> | Light Curtain            | <b>23</b> |
| <b>OSEI152Z0103</b> | Light Curtain            | <b>23</b> |
| <b>OSEI202Z0103</b> | Light Curtain            | <b>25</b> |
| <b>OSEI501Z0103</b> | Light Curtain            | <b>23</b> |
| <b>OTM502C0002</b>  | Reflex Sensor            | <b>11</b> |
| <b>OUM502C0002</b>  | Fiber Optic Cable Sensor | <b>17</b> |

| Part Number         |                                  | Page      |
|---------------------|----------------------------------|-----------|
| <b>OY1P303P0102</b> | High-Performance Distance Sensor | <b>9</b>  |
| <b>P1XF001</b>      | Color Sensor                     | <b>19</b> |
| <b>UMD123U035</b>   | Reflex Sensor                    | <b>37</b> |
| <b>UMD402U035</b>   | Reflex Sensor                    | <b>37</b> |
| <b>UMF303U035</b>   | Reflex Sensor                    | <b>39</b> |
| <b>UMF402U035</b>   | Reflex Sensor                    | <b>39</b> |
| <b>UMS123U035</b>   | High-Performance Distance Sensor | <b>35</b> |
| <b>UMS303U035</b>   | High-Performance Distance Sensor | <b>35</b> |
| <b>UMS603U035</b>   | High-Performance Distance Sensor | <b>35</b> |
| <b>ZAI72AN01</b>    | IO-Link Master                   | <b>52</b> |