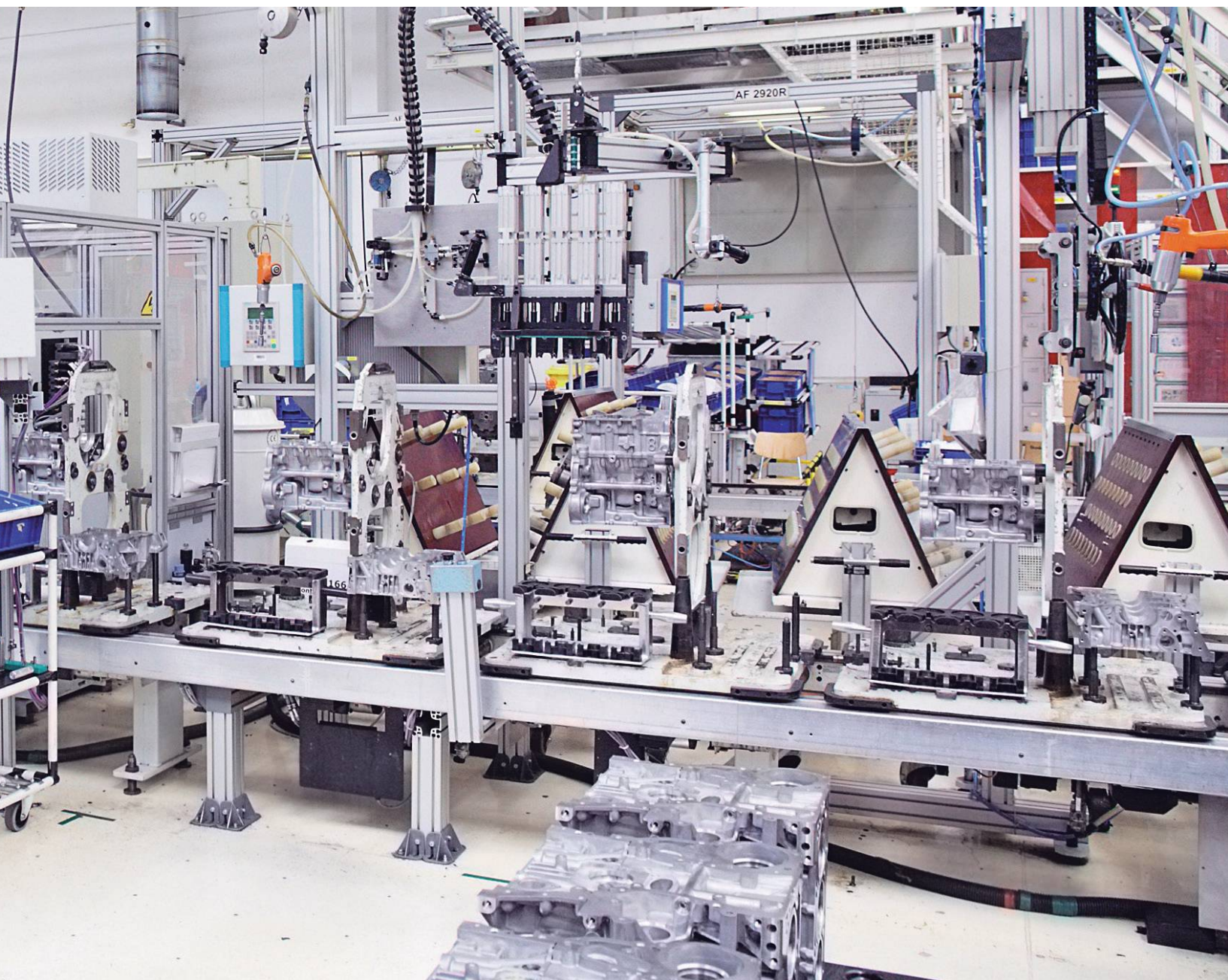


IO-Link Catalog





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.

Introduction				Page 2 - 3
Index				4 - 7
Technical Glossary				8 - 9
Photoelectronic Sensors				10 - 81
High-Performance Distance Sensors				10-13
Range	Light Source	Housing	Housing Material	
0...1500 mm	Laser (infrared)	32 × 16 × 12 mm (1K)	Plastic	10 - 11
0,05...3,05 m	Laser (red)	50 × 50 × 20 mm (P)	Plastic	12 - 13
Reflex Sensors				14-19
Range	Light Source	Housing	Housing Material	
100 mm	Red Light (Line)	32 × 16 × 12 mm (1K)	Plastic	14 - 15
500 mm	Infrared Light	49,1 × 27 × 16 mm (M)	Plastic	16 - 17
700 mm	Red Light	32 × 16 × 12 mm (1K)	Plastic	18 - 19
Reflex Sensors with Background Suppression				20-37
Range	Light Source	Housing	Housing Material	
120 mm	Laser (red)	32 × 16 × 12 mm (1K)	Plastic	20 - 23
150 mm	Blue Light	32 × 16 × 12 mm (1K)	Plastic	24 - 27
	Laser (red)			
120 mm	Red Light	32 × 16 × 12 mm (1K)	Plastic	28 - 33
200 mm	Red Light	32 × 16 × 12 mm (1K)	Plastic	34 - 35
300 mm	Red Light	32 × 16 × 12 mm (1K)	Plastic	36 - 37
Fiber-Optic Cable Sensors				38-43
Range	Light Source	Housing	Housing Material	
500 mm	Infrared Light	57,8 × 27 × 16 mm (M)	Plastic	42 - 43
Color Sensors				44-45
Range				
Retro-Reflex Sensors				46-55
Range	Light Source	Housing	Housing Material	
3000 mm	Laser (red)	32 × 16 × 12 mm (1K)	Plastic	46 - 47
12000 mm	Laser (red)	32 × 16 × 12 mm (1K)	Plastic	48 - 49
5000 mm	Red Light	32 × 16 × 12 mm (1K)	Plastic	50 - 53
6500 mm	Red Light	54,5 × 27 × 16 mm (M)	Plastic	54 - 55
Retro-Reflex Sensors for Clear Glass Recognition				56-59
Range	Light Source	Housing	Housing Material	
1500 mm	Red Light	32 × 16 × 12 mm (1K)	Plastic	56 - 57
2000 mm	Red Light	32 × 16 × 12 mm (1K)	Plastic	58 - 59

Photoelectronic Sensors

10 - 81

Light Curtains for Measuring Tasks

60-71

Range	Light Source	Housing	Housing Material	
2000 mm	Infrared Light	40,2 × 47,1 mm (EI)	Aluminum	60 - 63
3000 mm	Infrared Light	17,6 × 31,7 mm (EB)	Aluminum	64 - 71

Through-Beam Sensors

72-81

Range	Light Source	Housing	Housing Material	
10000 mm	Laser (red)	32 × 16 × 12 mm (1K)	Plastic	72 - 73
6000 mm	Red Light	32 × 16 × 12 mm (1K)	Plastic	74 - 81

Ultrasonic Sensors

82 - 89

High-Performance Distance Sensors

82-83

Range	Housing	Housing Material	
100...6000 mm	81 × 55 × 30 mm (S) 81 × 55 × 47 mm (S)	Plastic	82 - 83

Reflex Sensors with Analog Output

84-87

Range	Housing	Housing Material	
50...1200 mm	M18 × 1	Stainless Steel	84 - 85
50...3000 mm	M30 × 1,5	Stainless Steel; Plastic	86 - 87

Reflex Sensors

88-89

Range	Housing	Housing Material	
30...400 mm	32 × 16 × 12 mm (1K)	Plastic	88 - 89

Inductive Sensors

90 - 101

Inductive Sensors with IO-Link

90-101

Range	Mounting	Housing	Housing Material	
4 mm	semi-flush	M8 × 1	CuZn, nickel-plated	92
6 mm	non-flush	M8 × 1	CuZn, nickel-plated	93
6 mm	semi-flush	M12 × 1	CuZn, nickel-plated	94
12 mm	non-flush	M12 × 1	CuZn, nickel-plated	95
12 mm	semi-flush	M18 × 1	CuZn, nickel-plated	96
20 mm	non-flush	M18 × 1	CuZn, nickel-plated	97
22 mm	semi-flush	M30 × 1,5	CuZn, nickel-plated	98
35 mm	non-flush	M30 × 1,5	CuZn, nickel-plated	99
20 mm	flush	40 × 40 × 55 mm (1Q)	Plastic	100
40 mm	non-flush	40 × 40 × 55 mm (1Q)	Plastic	101

Fluid Sensors

102 - 111

Flow Sensors

102-107

Range	Process Connection	Housing	Housing Material	
10...400 cm/s	Clamp diameter: 50,5 mm Cutting/locking ring Sealing cone M18 × 1,5	Ø 27 mm	1.4404	102 - 107

Fluid Sensors**102 - 111****Temperature Sensors****108-111**

Range	Process Connection	Housing	Housing Material	
-50...150 °C	Cutting/locking ring Sealing cone M18 × 1,5	Ø 27 mm	1.4404	108 - 111

Industrial Communication**112 - 115****IO-Link Masters****112-115****Connection Diagrams****116 - 119****Index alphabetical****120 - 121**

Technical Glossary

I

IODD:

The IO Device Description (IODD) 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.

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. All parameters can be set via the software of the IO-Link Master.

IO-link Port:

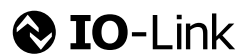
A hardware interface for IO link capable components.

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 connecting intelligent sensors and actuators to an automation system via point-to-point connection.



High-Performance Distance Sensor

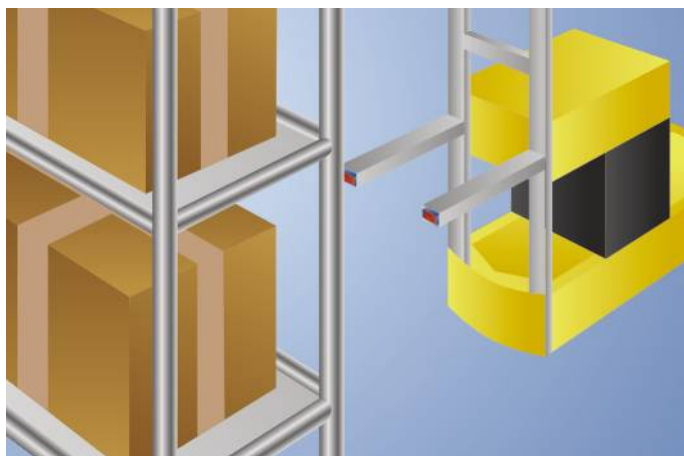
0...1500 mm **LASER**

Range



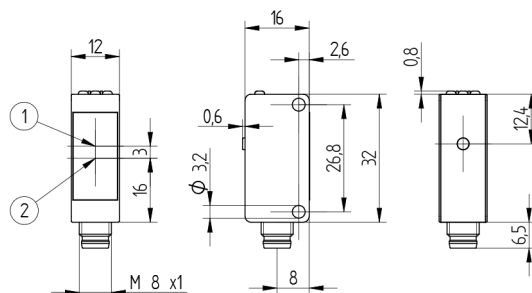
- 2 mutually independent switching outputs
- IO-Link interface
- Large working range
- Miniature design

The high-performance distance sensor with compact format accurately determines distance between the sensor and the object on the basis of transit time measurement. Two mutually independent switching outputs and the intelligent IO-Link interface permit multifunctional use for precisely ascertaining distance to an object, or for detecting the object at any two switching points. A large working range of 0 to 1500 mm ensures top performance with a miniature format and flexibility where range is concerned. Thanks to laser class 1, the sensor's laser beam is harmless for the human eye.



Technical Data

Optical Data	
Working Range	0...1500 mm
Adjustable Range	50...1500 mm
Switching Hysteresis	< 30 mm
Light Source	Laser (infrared)
Wave Length	940 nm
Service Life (T = +25 °C)	100000 h
Laser Class (EN 60825-1)	1
Max. Ambient Light	10000 Lux
Spot Diameter	see Table 1
Electrical Data	
Supply Voltage	10...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	< 15 mA
Switching Frequency	10 Hz
Response Time	< 36 ms
Temperature Drift	< 2,5 %
Temperature Range	-30...50 °C
Switching Outputs	2
Switching Output Voltage Drop	< 2,5 V
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
Interface	IO-Link V1.1
Protection Class	III
FDA Accession Number	1720547-000
Mechanical Data	
Setting Method	Teach-In
Housing Material	Plastic
Optic Cover	PMMA
Degree of Protection	IP67/IP68
Safety-relevant Data	
MTTFd (EN ISO 13849-1)	2266,52 a



1 = Receiver Diode
 2 = Transmitter Diode
 Screw M3 = 0,5 Nm
 All dimensions in mm (1 mm = 0.03937 Inch)

		Plug Version				
 		Part Number	P1KY101	P1KY102	P1KY103	P1KY104
PNP NO			●	●		
NPN NO					●	●
IO-Link			●	●	●	●
Connection			M8 × 1; 4-pin	M12 × 1; 4-pin	M8 × 1; 4-pin	M12 × 1; 4-pin
Cable Length				200 mm		200 mm
Connection Diagram No.			223	223		
Control Panel No.			A23	A23	A23	A23
Suitable Connection Technology No.			7	2	7	2
Suitable Mounting Technology No.			400	400	400	400

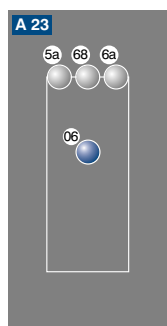
Connection Diagrams page 116

Complementary Products

IO-Link Master

Software

Ctrl. Panel



06 = Teach Button

5a = Switching Status Display, O1

68 = Supply Voltage Indicator

6a = Switching Status Display, O2

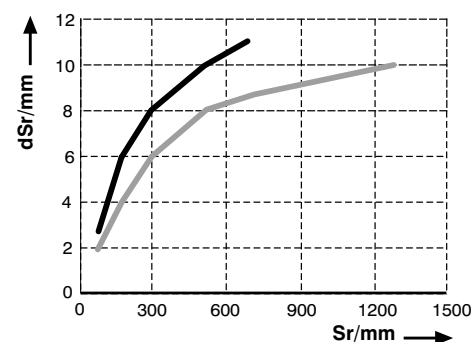
Table 1

Working Distance	350 mm	700 mm	1500 mm
Spot Diameter	14 mm	25 mm	42 mm

Switching Distance Deviation

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

P1KY1



Sr = Switching Distance

dSr = Switching Distance Change

— black 6 % remission

— grey 18 % remission

High-Performance Distance Sensor

0,05...3,05 m

Range

LASER

WinTec

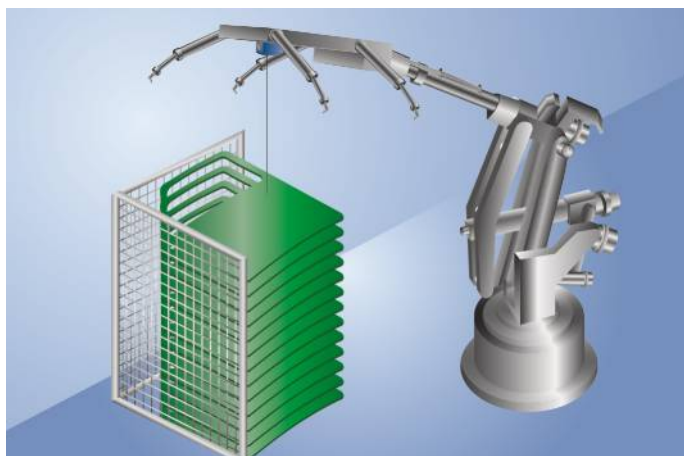


- 2 mutually independent switching outputs
- Analog output (0...10 V/4...20 mA)
- Graphical display for easy operation
- Reliable in case of glossy objects with WinTec
- Secure detection of black objects also in extremely inclined positions with WinTec

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.

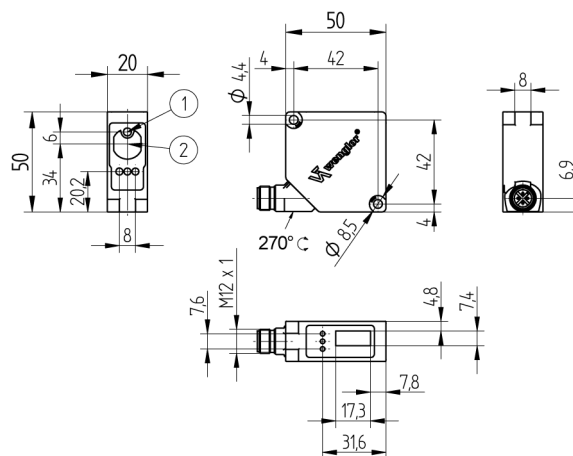
wenglor interference-free technology (WinTec) has revolutionized sensor technology:

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 _b = 24 V)	< 70 mA
Switching Frequency	250 Hz
Measuring 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 V1.1
Protection Class	III
Mechanical Data	
Setting Method	Menu (OLED)
Housing Material	Plastic
Optic Cover	PMMA
Degree of Protection	IP68
Connection	M12 x 1; 4-pin
Safety-relevant Data	
MTTFd (EN ISO 13849-1)	349,73 a



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

Display brightness may decrease with age. This does not result in any impairment of the sensor function.



Plug Version	
Part Number	
	OY1P303P0102
Error Output	●
Contamination Output	●
Configurable as PNP/NPN/Push-Pull	●
Analog Output	●
IO-Link	●
Connection Diagram No.	782
Control Panel No.	X2
Suitable Connection Technology No.	21
Suitable Mounting Technology No.	380

Connection Diagrams page 116

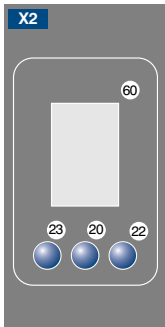
Complementary Products

Analog Evaluation Unit AW02
IO-Link Master
Protective Housing ZSV-0x-01
Set Protective Housing ZSP-NN-02
Software

Table 1

Working Distance	0 m	3 m
Spot Diameter	5 mm	9 mm

Ctrl. Panel



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

Reflex Sensor

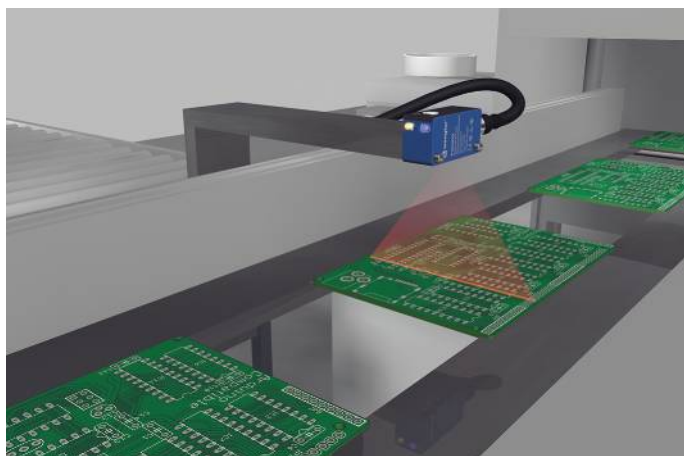
100 mm

Range



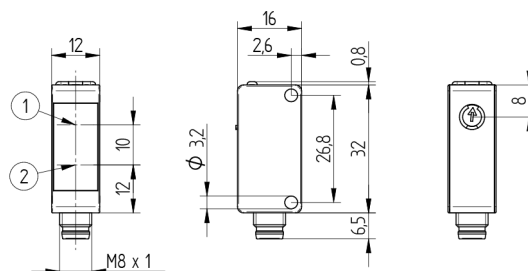
- Condition monitoring
- Detection of objects with variable position
- IO-Link 1.1
- Red light line for perforated or stamped objects

The reflex sensor makes use of a red light line in accordance with the energetic principle and is suitable for detecting objects without any background. It's suitable for reliable detection of objects with stamped or perforated surfaces such as PCBs and perforated sheet metal. Furthermore, objects can be detected on the light line regardless of position. The IO-Link interface can be used to configure the reflex sensor (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and distance values.



Technical Data

Optical Data	
Range	100 mm
Switching Hysteresis	< 10 %
Light Source	Red Light (Line)
Service Life (T = +25 °C)	100000 h
Max. Ambient Light	10000 Lux
Spot Diameter	see Table 1
Electrical Data	
Supply Voltage	10...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	< 20 mA
Switching Frequency	500 Hz
Switching frequency (speed mode)	750 Hz
Response Time	1 ms
Response time (speed mode)	0,67 ms
Temperature Drift	< 5 %
Temperature Range	-40...60 °C
Switching Output Voltage Drop	< 2 V
Switching Output/Switching Current	100 mA
Residual Current Switching Output	< 50 µA
Short Circuit and Overload Protection	yes
Reverse Polarity Protection	yes
Lockable	yes
Interface	IO-Link V1.1
Protection Class	III
Mechanical Data	
Setting Method	Potentiometer
Housing Material	Plastic
Degree of Protection	IP67/IP68
Connection	M8 × 1; 4-pin
Optic Cover	PMMA
Safety-relevant Data	
MTTFd (EN ISO 13849-1)	1718,95 a



1 = Transmitter Diode
 2 = Receiver Diode
 Screw M3 = 0,5 Nm
 All dimensions in mm (1 mm = 0.03937 Inch)

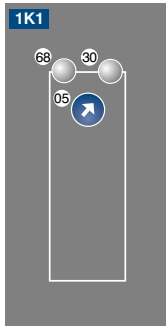
	Plug Version	
	Part Number	
	P1KT002	P1KT004
PNP NO/NC antivalent	●	
NPN NO/NC antivalent		●
IO-Link	●	●
Connection Diagram No.	215	213
Control Panel No.	1K1	1K1
Suitable Connection Technology No.	7	7
Suitable Mounting Technology No.	400	400

Connection Diagrams page 116

Complementary Products

IO-Link Master
Software

Ctrl. Panel



05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

Table 1

Detection Range	30 mm	65 mm	100 mm
Spot Diameter	10 x 35 mm	11 x 70 mm	12 x 100 mm

Reflex Sensor

500 mm

Range

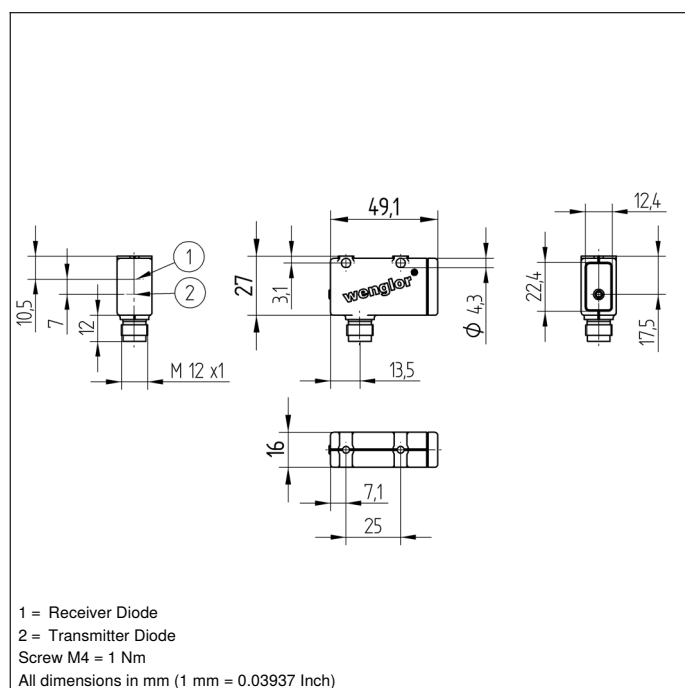
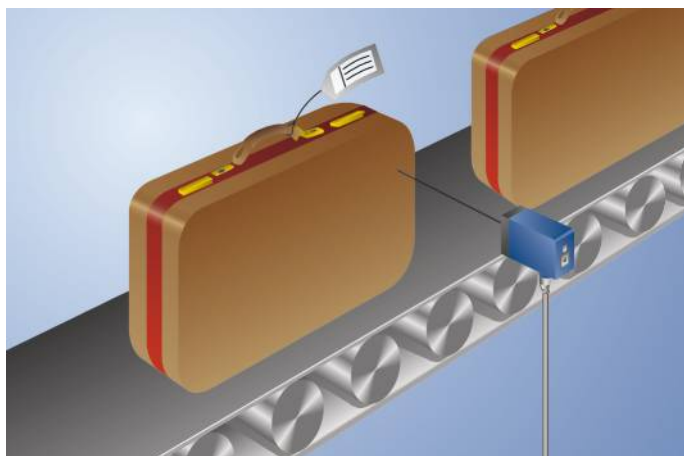


- Compact housing
- IO-Link interface
- Large detection range
- Teach-in, external teach-in

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 _b = 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 V1.0
IO-Link Parameter	12
Protection Class	III
Mechanical Data	
Setting Method	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	
    	Part Number 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 116

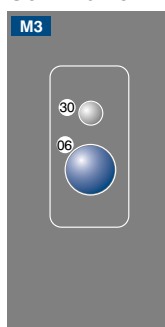
Complementary Products

IO-Link Master

PNP-NPN Converter BG2V1P-N-2M

Software

Ctrl. Panel



06 = Teach Button
30 = Switching Status/Contamination Warning

Reflex Sensor

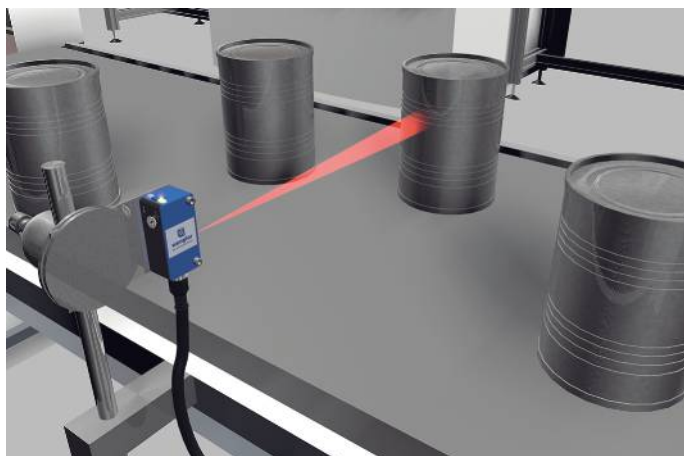
700 mm

Range



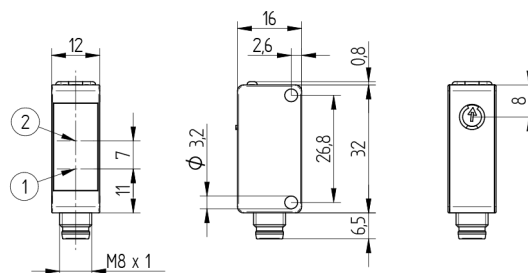
- Condition monitoring
- High switching frequency
- IO-Link 1.1
- Large detection range

The reflex sensor works with red light according to the principle of energy and is designed to detect objects without a background. The switching distance is set for a given object. Note that: Bright objects reflect transmitted light better than dark objects. Dark (matte) objects can also be differentiated from bright (glossy) objects. This means that presence or stack height checks can be conducted or counting tasks carried out. The IO-Link interface can be used to configure the reflex sensors (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and distance values.



Technical Data

Optical Data	
Range	700 mm
Switching Hysteresis	< 10 %
Light Source	Red Light
Service Life (T = +25 °C)	100000 h
Max. Ambient Light	10000 Lux
Spot Diameter	see Table 1
Electrical Data	
Supply Voltage	10...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	< 20 mA
Switching Frequency	500 Hz
Switching frequency (speed mode)	1000 Hz
Response Time	1 ms
Response time (speed mode)	0,5 ms
Temperature Drift	< 10 %
Temperature Range	-40...60 °C
Switching Output Voltage Drop	< 2 V
Switching Output/Switching Current	100 mA
Residual Current Switching Output	< 50 µA
Short Circuit and Overload Protection	yes
Reverse Polarity Protection	yes
Lockable	yes
Interface	IO-Link V1.1
Protection Class	III
Mechanical Data	
Setting Method	Potentiometer
Housing Material	Plastic
Degree of Protection	IP67/IP68
Connection	M8 × 1; 4-pin
Optic Cover	PMMA
Safety-relevant Data	
MTTFd (EN ISO 13849-1)	2630,72 a



1 = Transmitter Diode
 2 = Receiver Diode
 Screw M3 = 0,5 Nm
 All dimensions in mm (1 mm = 0.03937 Inch)

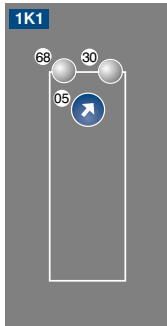
	Plug Version	
	Part Number	
	P1KT001	P1KT003
IO-Link	●	●
PNP NO/NC antivalent	●	
NPN NO/NC antivalent		●
Connection Diagram No.	215	213
Control Panel No.	1K1	1K1
Suitable Connection Technology No.	7	7
Suitable Mounting Technology No.	400	400

Connection Diagrams page 116

Complementary Products

IO-Link Master
Software

Ctrl. Panel



05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

Table 1

Detection Range	100 mm	300 mm	700 mm
Spot Diameter	20 mm	40 mm	80 mm

Reflex Sensor

with Background Suppression

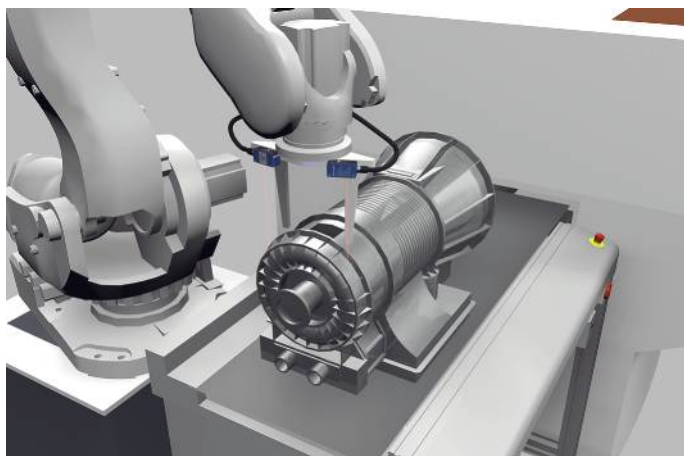
120 mm LASER

Range



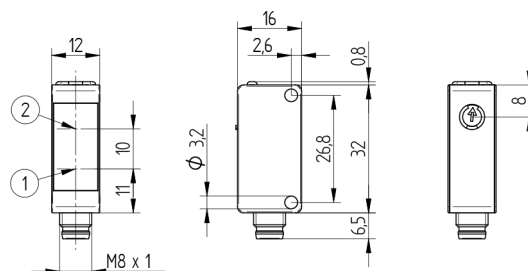
- Condition monitoring
- Detect extremely small parts starting at 0.1 mm
- High switching frequency
- IO-Link 1.1
- Laser class 1

The reflex sensor with background suppression works with laser light according to the angle measurement principle and is designed to detect objects against any background. The sensor always has the same switching distance, regardless of the color, shape and surface of the objects. The fine laser beam means that even the smallest parts, starting at 0.1 mm in size, can be reliably detected. The IO-Link interface can be used to configure the reflex sensors (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and distance values.



Technical Data

Optical Data	
Range	120 mm
Adjustable Range	30...120 mm
Switching Hysteresis	< 10 %
Light Source	Laser (red)
Wave Length	655 nm
Service Life (T = +25 °C)	100000 h
Max. Ambient Light	10000 Lux
Spot Diameter	see Table 1
Electrical Data	
Supply Voltage	10...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	< 15 mA
Temperature Drift	< 5 %
Temperature Range	-40...60 °C
Switching Output Voltage Drop	< 2 V
Switching Output/Switching Current	100 mA
Residual Current Switching Output	< 50 µA
Short Circuit and Overload Protection	yes
Reverse Polarity Protection	yes
Lockable	yes
Interface	IO-Link V1.1
Protection Class	III
Mechanical Data	
Setting Method	Potentiometer
Housing Material	Plastic
Degree of Protection	IP67/IP68
Optic Cover	PMMA



1 = Transmitter Diode
 2 = Receiver Diode
 Screw M3 = 0,5 Nm
 All dimensions in mm (1 mm = 0.03937 Inch)

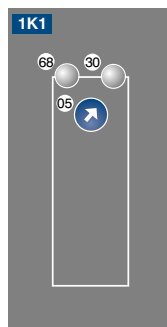
 	Plug Version			
	Part Number	P1KH006	P1KH008	P1KH009
PNP NO		●		
PNP NO/NC antivalent	●		●	●
IO-Link	●	●	●	●
Laser Class (EN 60825-1)	1	1	2	1
Switching Frequency	1000 Hz	1000 Hz	2000 Hz	1000 Hz
Switching Frequency (interference-free mode)	500 Hz	500 Hz	1000 Hz	500 Hz
Response Time	0,5 ms	0,5 ms	0,25 ms	0,5 ms
Response time (interference-free mode)	1 ms	1 ms	0,5 ms	1 ms
FDA Accession Number	1710976-001	1710976-001	1710987-000	1710976-001
Connection	M8 × 1; 4-pin	M8 × 1; 3-pin	M8 × 1; 4-pin	M12 × 1; 4-pin
Cable Length				20 cm
MTTFd (EN ISO 13849-1)	1641,23 a	1647,45 a	1641,23 a	1641,23 a
Connection Diagram No.	215	216	215	215
Control Panel No.	1K1	1K1	1K1	1K1
Suitable Connection Technology No.	7	8	7	2
Suitable Mounting Technology No.	400	400	400	400

Connection Diagrams page 116

Complementary Products

IO-Link Master
Software

Ctrl. Panel



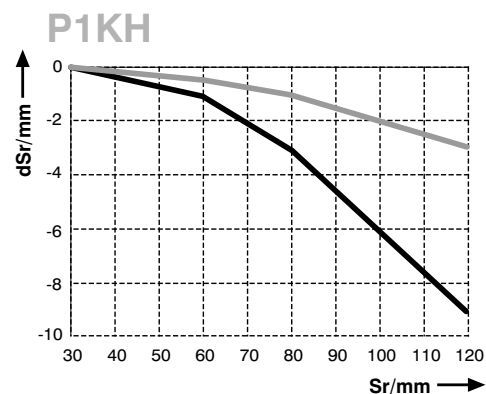
05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

Table 1

Detection Range	40 mm	80 mm	120 mm
Spot Diameter	2,5 mm	1,5 mm	1 mm

Switching Distance Deviation

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



Sr = Switching Distance

dSr = Switching Distance Change

Reflex Sensor

with Background Suppression

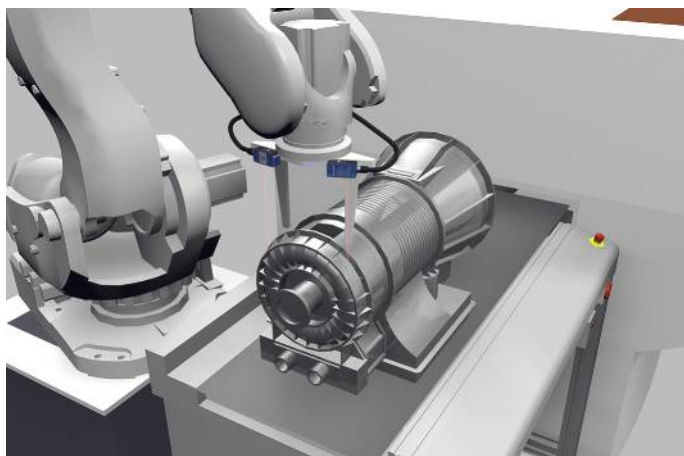
120 mm LASER

Range



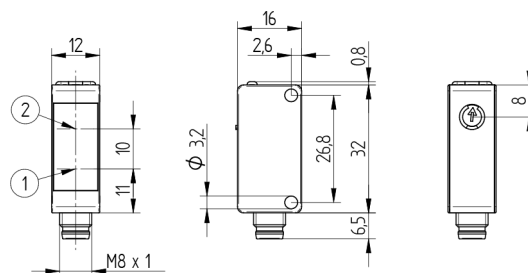
- Condition monitoring
- Detect extremely small parts starting at 0.1 mm
- High switching frequency
- IO-Link 1.1
- Laser class 1

The reflex sensor with background suppression works with laser light according to the angle measurement principle and is designed to detect objects against any background. The sensor always has the same switching distance, regardless of the color, shape and surface of the objects. The fine laser beam means that even the smallest parts, starting at 0.1 mm in size, can be reliably detected. The IO-Link interface can be used to configure the reflex sensors (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and distance values.



Technical Data

Optical Data	
Range	120 mm
Adjustable Range	30...120 mm
Switching Hysteresis	< 10 %
Light Source	Laser (red)
Wave Length	655 nm
Service Life (T = +25 °C)	100000 h
Max. Ambient Light	10000 Lux
Spot Diameter	see Table 1
Electrical Data	
Supply Voltage	10...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	< 15 mA
Temperature Drift	< 5 %
Temperature Range	-40...60 °C
Switching Output Voltage Drop	< 2 V
Switching Output/Switching Current	100 mA
Residual Current Switching Output	< 50 µA
Short Circuit and Overload Protection	yes
Reverse Polarity Protection	yes
Lockable	yes
Interface	IO-Link V1.1
Protection Class	III
Mechanical Data	
Setting Method	Potentiometer
Housing Material	Plastic
Degree of Protection	IP67/IP68
Optic Cover	PMMA



1 = Transmitter Diode
 2 = Receiver Diode
 Screw M3 = 0,5 Nm
 All dimensions in mm (1 mm = 0.03937 Inch)

		Plug Version				
		Part Number	P1KH015	P1KH028	P1KH029	P1KH030
NPN NO					●	
NPN NO/NC antivalent			●	●		●
IO-Link			●	●	●	●
Laser Class (EN 60825-1)			1	1	1	2
Switching Frequency			1000 Hz	1000 Hz	1000 Hz	2000 Hz
Switching Frequency (interference-free mode)			500 Hz	500 Hz	500 Hz	1000 Hz
Response Time			0,5 ms	0,5 ms	0,5 ms	0,25 ms
Response time (interference-free mode)			1 ms	1 ms	1 ms	0,5 ms
FDA Accession Number			1710976-001	1710976-001	1710976-001	1710987-000
Connection			M8 × 1; 4-pin	M12 × 1; 4-pin	M8 × 1; 3-pin	M8 × 1; 4-pin
Cable Length				20 cm		
MTTFd (EN ISO 13849-1)			1641,23 a	1641,23 a	1647,45 a	1641,23 a
Connection Diagram No.			213	213	171	213
Control Panel No.			1K1	1K1	1K1	1K1
Suitable Connection Technology No.			7	2	8	7
Suitable Mounting Technology No.			400	400	400	400

Connection Diagrams page 116

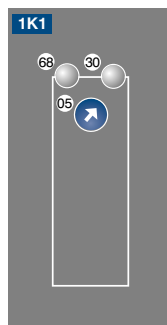
Table 1

Detection Range	40 mm	80 mm	120 mm
Spot Diameter	2,5 mm	1,5 mm	1 mm

Complementary Products

IO-Link Master
Software

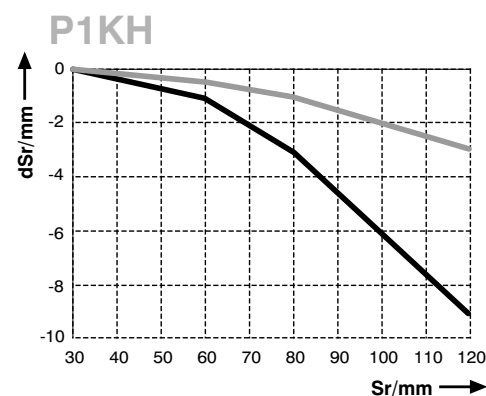
Ctrl. Panel



05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

Switching Distance Deviation

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



Sr = Switching Distance

dSr = Switching Distance Change

Reflex Sensor

with Background Suppression

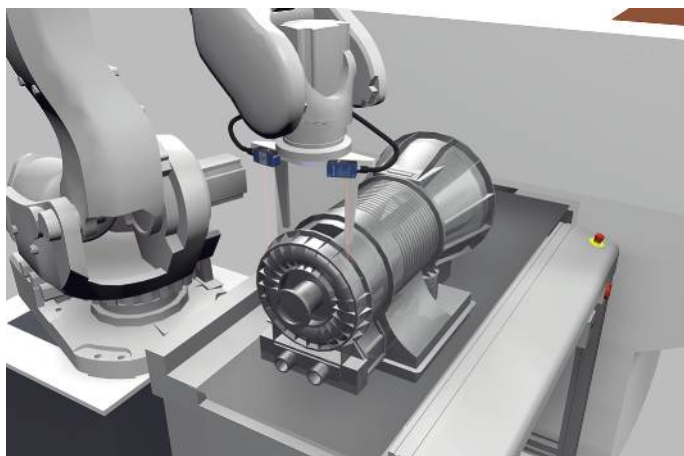
150 mm LASER

Range



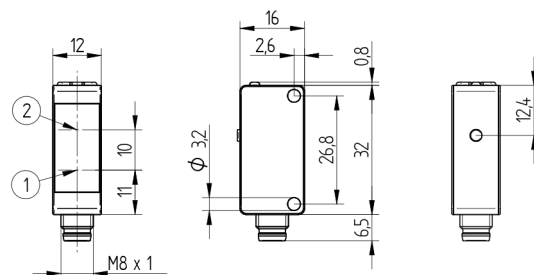
- Condition monitoring
- Detect extremely small parts starting at 0.1 mm
- High-end
- IO-Link 1.1
- Laser class 1

The reflex sensor with background suppression works with laser light according to the angle measurement principle. It has a IO-Link interface with a data storage function as well as additional configuration and diagnostic options. The interface can also be used to configure the sensors (PNP/NPN, NC/NO, switching distance, error output), as well as for reading out switching statuses and distance values. The teach-in function also provides another configuration option. Two independent switching outputs can be used, for instance, to monitor minimum and maximum values of distances or fill levels and stack heights.



Technical Data

Optical Data	
Range	120 mm
Adjustable Range	30...120 mm
Switching Hysteresis	< 10 %
Light Source	Laser (red)
Wave Length	655 nm
Service Life (T = +25 °C)	100000 h
Laser Class (EN 60825-1)	1
Max. Ambient Light	10000 Lux
Spot Diameter	see Table 1
Electrical Data	
Supply Voltage	15...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Switching Frequency	100 Hz
Switching Frequency (1 Switching Output)	1000 Hz
Response Time	5 ms
Response time (1 switching output)	0,5 ms
Temperature Drift	< 5 %
Temperature Range	-40...60 °C
Switching Outputs	2
Switching Output Voltage Drop	< 2 V
Switching Output/Switching Current	100 mA
Residual Current Switching Output	< 50 µA
Short Circuit and Overload Protection	yes
Reverse Polarity Protection	yes
Lockable	yes
Interface	IO-Link V1.1
Data Storage	yes
Protection Class	III
FDA Accession Number	1710976-001
Mechanical Data	
Setting Method	Teach-In
Housing Material	Plastic
Degree of Protection	IP67/IP68
Connection	M8 × 1; 4-pin
Optic Cover	PMMA



1 = Transmitter Diode
 2 = Receiver Diode
 Screw M3 = 0,5 Nm
 All dimensions in mm (1 mm = 0.03937 Inch)

	Plug Version	
	Part Number	
	P1KH017	P1KH031
PNP NO	●	
NPN NO		●
IO-Link	●	●
Current Consumption (U _b = 24 V)	< 15 mA	< 20 mA
MTTFd (EN ISO 13849-1)	1480,59 a	
Connection Diagram No.	221	221
Control Panel No.	A23	A23
Suitable Connection Technology No.	7	7
Suitable Mounting Technology No.	400	400

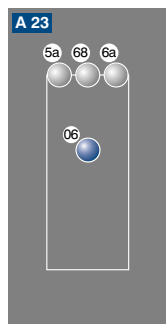
Connection Diagrams page 116

Complementary Products

IO-Link Master

Software

Ctrl. Panel



06 = Teach Button

30 = Switching Status/Contamination Warning

5a = Switching Status Display, O1

68 = Supply Voltage Indicator

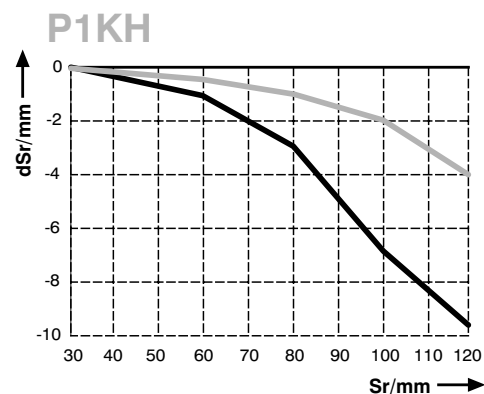
6a = Switching Status Display, O2

Table 1

Detection Range	40 mm	80 mm	120 mm
Spot Diameter	2,5 mm	1,5 mm	1 mm

Switching Distance Deviation

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



Sr = Switching Distance

dSr = Switching Distance Change

Reflex Sensor

with Background Suppression

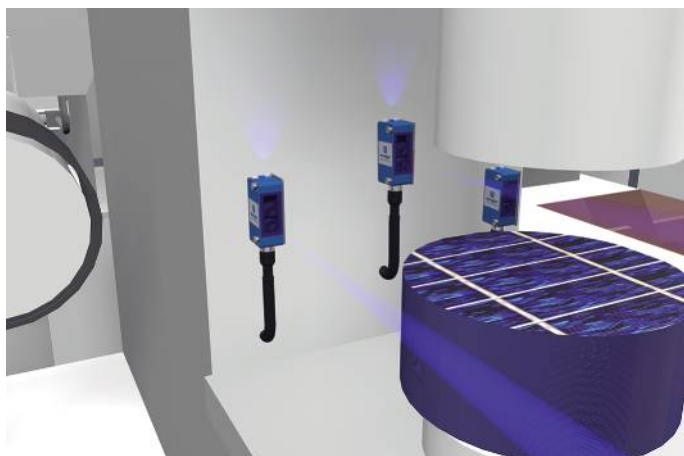
150 mm

Range



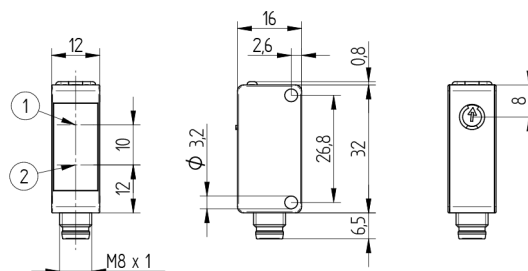
- Blue light for dark, shiny objects
- Condition monitoring
- IO-Link 1.1
- Reliably detect objects against any background

The reflex sensor with background suppression works with blue light according to the angle measurement principle and is designed to detect objects against any background. The sensor always has the same switching distance, regardless of the color, shape and surface of the objects. The reflect sensor with blue light is specially designed for applications with dark shiny objects, such as when manufacturing solar wafers. The IO-Link interface can be used to configure the reflex sensors (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and distance values.



Technical Data

Optical Data	
Range	150 mm
Adjustable Range	30...150 mm
Switching Hysteresis	< 10 %
Light Source	Blue Light
Service Life (T = +25 °C)	100000 h
Risk Group (EN 62471)	1
Max. Ambient Light	10000 Lux
Spot Diameter	see Table 1
Electrical Data	
Supply Voltage	10...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	< 20 mA
Switching Frequency	1000 Hz
Switching Frequency (interference-free mode)	500 Hz
Response Time	0,5 ms
Response time (interference-free mode)	1 ms
Temperature Drift	< 5 %
Temperature Range	-40...60 °C
Switching Output Voltage Drop	< 2 V
Switching Output/Switching Current	100 mA
Residual Current Switching Output	< 50 µA
Short Circuit and Overload Protection	yes
Reverse Polarity Protection	yes
Lockable	yes
Interface	IO-Link V1.1
Protection Class	III
Mechanical Data	
Setting Method	Potentiometer
Housing Material	Plastic
Degree of Protection	IP67/IP68
Connection	M8 × 1; 4-pin
Optic Cover	PMMA
Safety-relevant Data	
MTTFd (EN ISO 13849-1)	1717,03 a



1 = Transmitter Diode
 2 = Receiver Diode
 Screw M3 = 0,5 Nm
 All dimensions in mm (1 mm = 0.03937 Inch)

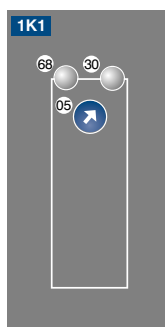
	Plug Version	
	Part Number	
	P1KH019	P1KH022
PNP NO/NC antivalent	●	
NPN NO/NC antivalent		●
IO-Link	●	●
Connection Diagram No.	215	213
Control Panel No.	1K1	1K1
Suitable Connection Technology No.	7	7
Suitable Mounting Technology No.	400	400

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Complementary Products

IO-Link Master
Software

Ctrl. Panel



05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

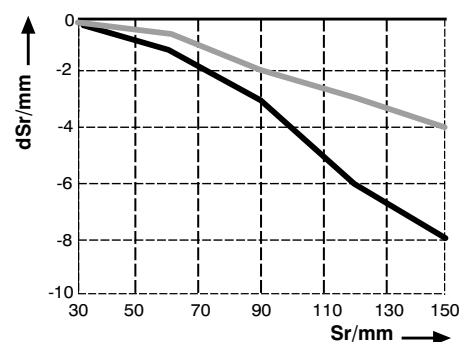
Table 1

Detection Range	50 mm	100 mm	150 mm
Spot Diameter	4 mm	6 mm	10 mm

Switching Distance Deviation

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

P1KH BLUE



Sr = Switching Distance

dSr = Switching Distance Change

— black 6 % remission

— grey 18 % remission

Reflex Sensor

with Background Suppression

120 mm

Range



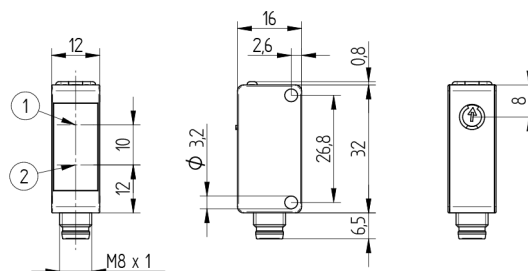
- Condition monitoring
- IO-Link 1.1
- Low switching distance deviation for black/white
- Reliably detect objects against any background

The reflex sensor with background suppression works with red light according to the angle measurement principle and is designed to detect objects against any background. The sensor always has the same switching distance, regardless of the color, shape and surface of the objects. They can even reliably differentiate between bright and dark objects on the smallest of parts. This means that minimal height differences can be detected, for example, when differentiating various components from one another. The IO-Link interface can be used to configure the reflex sensors (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and distance values.



Technical Data

Optical Data	
Range	150 mm
Adjustable Range	30...150 mm
Switching Hysteresis	< 10 %
Light Source	Red Light
Service Life (T = +25 °C)	100000 h
Max. Ambient Light	10000 Lux
Spot Diameter	see Table 1
Electrical Data	
Supply Voltage	10...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	< 20 mA
Switching Frequency	1000 Hz
Switching Frequency (interference-free mode)	500 Hz
Response Time	0,5 ms
Response time (interference-free mode)	1 ms
Temperature Drift	< 5 %
Temperature Range	-40...60 °C
Switching Output Voltage Drop	< 2 V
Switching Output/Switching Current	100 mA
Residual Current Switching Output	< 50 µA
Short Circuit and Overload Protection	yes
Reverse Polarity Protection	yes
Lockable	yes
Interface	IO-Link V1.1
Protection Class	III
Mechanical Data	
Setting Method	Potentiometer
Housing Material	Plastic
Degree of Protection	IP67/IP68
Connection	M8 × 1; 3-pin
Optic Cover	PMMA
Safety-relevant Data	
MTTFd (EN ISO 13849-1)	1725,77 a



1 = Transmitter Diode
 2 = Receiver Diode
 Screw M3 = 0,5 Nm
 All dimensions in mm (1 mm = 0.03937 Inch)



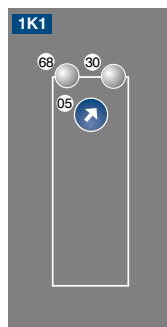
Plug Version						
     		Part Number	P1KH004	P1KH005	P1KH018	P1KH020
PNP NO			●			
PNP NC				●		
NPN NO					●	
NPN NC						●
IO-Link			●	●	●	●
Connection Diagram No.			216	217	171	218
Control Panel No.			1K1	1K1	1K1	1K1
Suitable Connection Technology No.			8	8	8	8
Suitable Mounting Technology No.			400	400	400	400

Connection Diagrams page 116

Complementary Products

IO-Link Master
Software

Ctrl. Panel



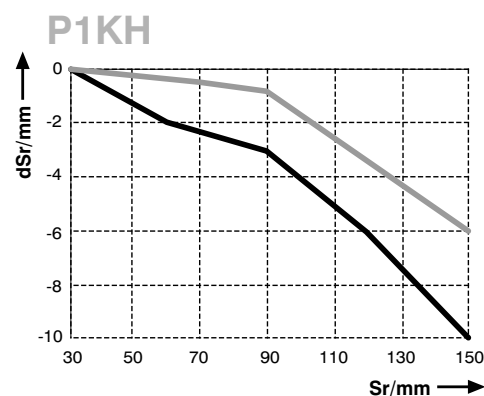
05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

Table 1

Detection Range	50 mm	100 mm	150 mm
Spot Diameter	5 mm	7 mm	10 mm

Switching Distance Deviation

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



Sr = Switching Distance

dSr = Switching Distance Change

— black 6 % remission

— grey 18 % remission

Reflex Sensor with Background Suppression

120 mm

Range



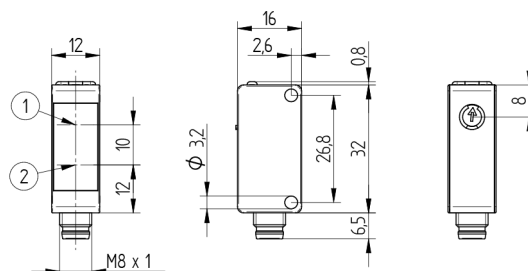
- Condition monitoring
- IO-Link 1.1
- Low switching distance deviation for black/white
- Reliably detect objects against any background

The reflex sensor with background suppression works with red light according to the angle measurement principle and is designed to detect objects against any background. The sensor always has the same switching distance, regardless of the color, shape and surface of the objects. They can even reliably differentiate between bright and dark objects on the smallest of parts. This means that minimal height differences can be detected, for example, when differentiating various components from one another. The IO-Link interface can be used to configure the reflex sensors (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and distance values.



Technical Data

Optical Data	
Range	150 mm
Adjustable Range	30...150 mm
Switching Hysteresis	< 10 %
Light Source	Red Light
Service Life (T = +25 °C)	100000 h
Max. Ambient Light	10000 Lux
Spot Diameter	see Table 1
Electrical Data	
Supply Voltage	10...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	< 20 mA
Switching Frequency	1000 Hz
Switching Frequency (interference-free mode)	500 Hz
Response Time	0,5 ms
Response time (interference-free mode)	1 ms
Temperature Drift	< 5 %
Temperature Range	-40...60 °C
Switching Output Voltage Drop	< 2 V
Switching Output/Switching Current	100 mA
Residual Current Switching Output	< 50 µA
Short Circuit and Overload Protection	yes
Reverse Polarity Protection	yes
Lockable	yes
Interface	IO-Link V1.1
Protection Class	III
Mechanical Data	
Setting Method	Potentiometer
Housing Material	Plastic
Degree of Protection	IP67/IP68
Optic Cover	PMMA
Safety-relevant Data	
MTTFd (EN ISO 13849-1)	1718,95 a



1 = Transmitter Diode
2 = Receiver Diode
Screw M3 = 0,5 Nm
All dimensions in mm (1 mm = 0.03937 Inch)



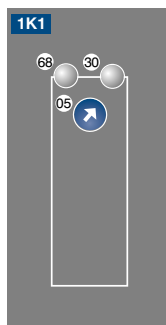
 		Plug Version			
		Part Number	P1KH002	P1KH013	P1KH003
PNP NO/NC antivalent		●		●	
NPN NO/NC antivalent			●		●
IO-Link		●	●	●	●
Connection		M8 × 1; 4-pin	M8 × 1; 4-pin	M12 × 1; 4-pin	M12 × 1; 4-pin
Cable Length				20 cm	20 cm
Connection Diagram No.		215	213	215	213
Control Panel No.		1K1	1K1	1K1	1K1
Suitable Connection Technology No.		7	7	2	2
Suitable Mounting Technology No.		400	400	400	400

Connection Diagrams page 116

Complementary Products

IO-Link Master
Software

Ctrl. Panel



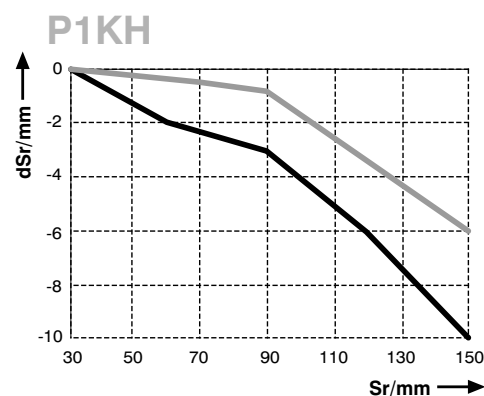
05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

Table 1

Detection Range	50 mm	100 mm	150 mm
Spot Diameter	5 mm	7 mm	10 mm

Switching Distance Deviation

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



Sr = Switching Distance

dSr = Switching Distance Change

— black 6 % remission

— grey 18 % remission

Reflex Sensor with Background Suppression

120 mm

Range



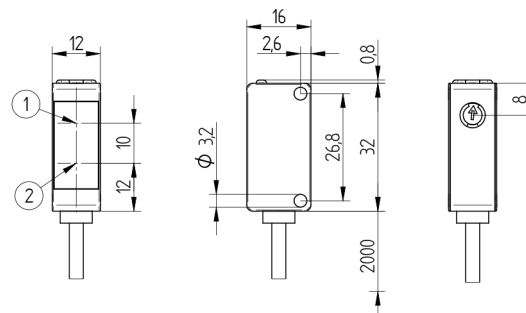
- Condition monitoring
- IO-Link 1.1
- Low switching distance deviation for black/white
- Reliably detect objects against any background

The reflex sensor with background suppression works with red light according to the angle measurement principle and is designed to detect objects against any background. The sensor always has the same switching distance, regardless of the color, shape and surface of the objects. They can even reliably differentiate between bright and dark objects on the smallest of parts. This means that minimal height differences can be detected, for example, when differentiating various components from one another. The IO-Link interface can be used to configure the reflex sensors (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and distance values.



Technical Data

Optical Data	
Range	150 mm
Adjustable Range	30...150 mm
Switching Hysteresis	< 10 %
Light Source	Red Light
Service Life (T = +25 °C)	100000 h
Max. Ambient Light	10000 Lux
Spot Diameter	see Table 1
Electrical Data	
Supply Voltage	10...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	< 20 mA
Switching Frequency	1000 Hz
Switching Frequency (interference-free mode)	500 Hz
Response Time	0,5 ms
Response time (interference-free mode)	1 ms
Temperature Drift	< 5 %
Temperature Range	-40...60 °C
Switching Output Voltage Drop	< 2 V
Switching Output/Switching Current	100 mA
Residual Current Switching Output	< 50 µA
Short Circuit and Overload Protection	yes
Reverse Polarity Protection	yes
Lockable	yes
Interface	IO-Link V1.1
Protection Class	III
Mechanical Data	
Setting Method	Potentiometer
Housing Material	Plastic
Degree of Protection	IP67/IP68
Connection	Cable, 4-wire, 2 m
Optic Cover	PMMA
Safety-relevant Data	
MTTFd (EN ISO 13849-1)	1718,95 a



1 = Transmitter Diode
2 = Receiver Diode
Screw M3 = 0,5 Nm
All dimensions in mm (1 mm = 0.03937 Inch)

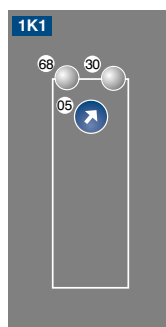
	Prewired Version	
	Part Number	
	P1KH001	P1KH014
PNP NO/NC antivalent	●	
NPN NO/NC antivalent		●
IO-Link	●	●
Connection Diagram No.	214	212
Control Panel No.	1K1	1K1
Suitable Mounting Technology No.	400	400

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Complementary Products

IO-Link Master
Software

Ctrl. Panel



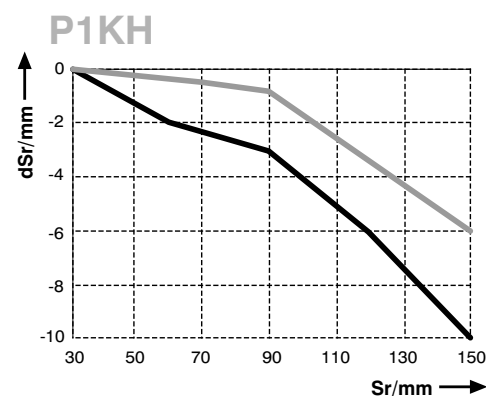
05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

Table 1

Detection Range	50 mm	100 mm	150 mm
Spot Diameter	5 mm	7 mm	10 mm

Switching Distance Deviation

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



Sr = Switching Distance

dSr = Switching Distance Change

— black 6 % remission

— grey 18 % remission

Reflex Sensor with Background Suppression

200 mm

Range



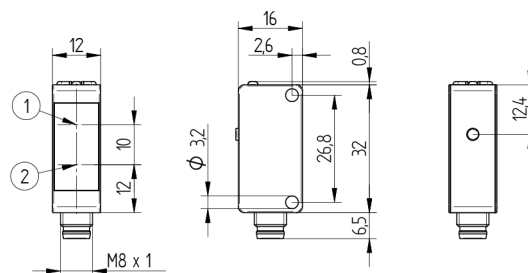
- Data storage
- High-end
- IO-Link 1.1
- Teach-in
- Two independent switching outputs

The reflex sensor with background suppression works with red light according to the angle measurement principle. It has a IO-Link interface with a data storage function as well as additional configuration and diagnostic options. The interface can also be used to configure the sensors (PNP/NPN, NC/NO, switching distance, error output), as well as for reading out switching statuses and distance values. The teach-in function also provides another configuration option. Two independent switching outputs can be used, for instance, to monitor minimum and maximum values of distances or fill levels and stack heights.



Technical Data

Optical Data	
Range	200 mm
Adjustable Range	30...200 mm
Switching Hysteresis	< 10 %
Light Source	Red Light
Service Life (T = +25 °C)	100000 h
Max. Ambient Light	10000 Lux
Spot Diameter	see Table 1
Electrical Data	
Supply Voltage	15...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	< 20 mA
Switching Frequency	100 Hz
Switching Frequency (1 Switching Output)	1000 Hz
Response Time	5 ms
Response time (1 switching output)	0,5 ms
Temperature Drift	< 5 %
Temperature Range	-40...60 °C
Switching Outputs	2
Switching Output Voltage Drop	< 2 V
Switching Output/Switching Current	100 mA
Residual Current Switching Output	< 50 µA
Short Circuit and Overload Protection	yes
Reverse Polarity Protection	yes
Lockable	yes
Interface	IO-Link V1.1
Data Storage	yes
Protection Class	III
Mechanical Data	
Setting Method	Teach-In
Housing Material	Plastic
Degree of Protection	IP67/IP68
Connection	M8 × 1; 4-pin
Optic Cover	PMMA
Safety-relevant Data	
MTTFd (EN ISO 13849-1)	1511,45 a



1 = Transmitter Diode
2 = Receiver Diode
Screw M3 = 0,5 Nm
All dimensions in mm (1 mm = 0.03937 Inch)

	Plug Version	
	Part Number	
	P1KH016	P1KH024
PNP NO	●	
NPN NO		●
IO-Link	●	●
Connection Diagram No.	221	221
Control Panel No.	A23	A23
Suitable Connection Technology No.	7	7
Suitable Mounting Technology No.	400	400

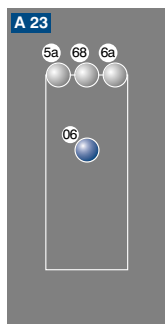
Connection Diagrams page 116

Complementary Products

IO-Link Master

Software

Ctrl. Panel



06 = Teach Button

5a = Switching Status Display, O1

68 = Supply Voltage Indicator

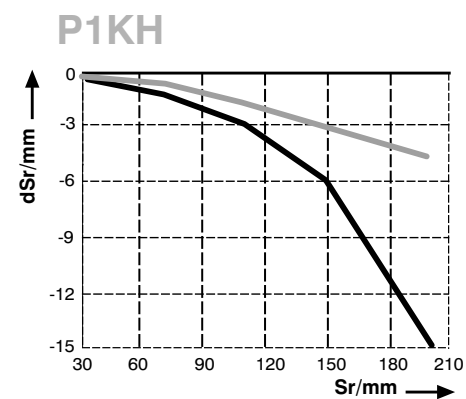
6a = Switching Status Display, O2

Table 1

Detection Range	30 mm	120 mm	200 mm
Spot Diameter	9 mm	7 mm	10 mm

Switching Distance Deviation

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



Sr = Switching Distance

dSr = Switching Distance Change

— black 6 % remission

— grey 18 % remission

Reflex Sensor with Background Suppression

300 mm

Range



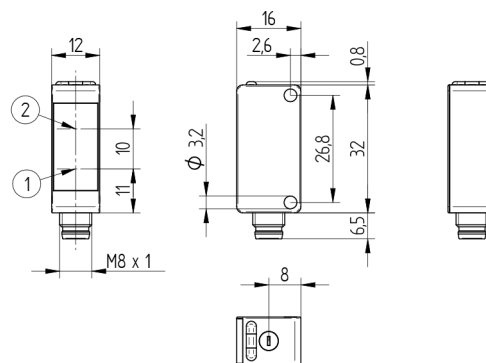
- Condition monitoring
- IO-Link 1.1
- Low switching distance deviation for black/white
- Reliably detect objects against any background

The reflex sensor with background suppression works with red light according to the angle measurement principle and is designed to detect objects against any background. The sensor always has the same switching distance, regardless of the color, shape and surface of the objects. They can even reliably differentiate between bright and dark objects on the smallest of parts. This means that minimal height differences can be detected, for example, when differentiating various components from one another. The IO-Link interface can be used to configure the reflex sensors (PNP/NPN, NC/NO), as well as for reading out switching statuses.



Technical Data

Optical Data	
Range	300 mm
Adjustable Range	30...300 mm
Switching Hysteresis	< 5 %
Light Source	Red Light
Service Life (T = +25 °C)	100000 h
Max. Ambient Light	10000 Lux
Spot Diameter	see Table 1
Electrical Data	
Supply Voltage	10...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	< 20 mA
Switching Frequency	1000 Hz
Switching Frequency (interference-free mode)	500 Hz
Response Time	0,5 ms
Response time (interference-free mode)	1 ms
Temperature Drift (0 °C < T _u < 40 °C)	< 5 %
Temperature Range	-40...60 °C
Switching Output Voltage Drop	< 2 V
Switching Output/Switching Current	100 mA
Residual Current Switching Output	< 50 µA
Short Circuit and Overload Protection	yes
Reverse Polarity Protection	yes
Lockable	yes
Interface	IO-Link V1.1
Protection Class	III
Mechanical Data	
Setting Method	Multi-turn
Housing Material	Plastic
Degree of Protection	IP67/IP68
Optic Cover	PMMA



1 = Transmitter Diode
2 = Receiver Diode
Screw M3 = 0,5 Nm
All dimensions in mm (1 mm = 0.03937 Inch)


Plug Version

Part Number	P1KH010	P1KH011	P1KH012	P1KH025	P1KH026	P1KH027
PNP NO			●			
PNP NO/NC antivalent	●	●				
NPN NO						●
NPN NO/NC antivalent				●	●	
IO-Link	●	●	●	●	●	●
Connection	M8 × 1; 4-pin	M12 × 1; 4-pin	M8 × 1; 3-pin	M8 × 1; 4-pin	M12 × 1; 4-pin	M8 × 1; 3-pin
Cable Length		20 cm			20 cm	
MTTFd (EN ISO 13849-1)	2035,82 a	2035,82 a	2045,4 a	2035,82 a	2035,82 a	2045,4 a
Connection Diagram No.	215	215	216	213	213	171
Control Panel No.	1K3	1K3	1K3	1K3	1K3	1K3
Suitable Connection Technology No.	7	2	8	7	2	8
Suitable Mounting Technology No.	400	400	400	400	400	400

Connection Diagrams page 116

Complementary Products

IO-Link Master
Software

Ctrl. Panel

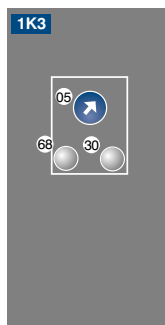
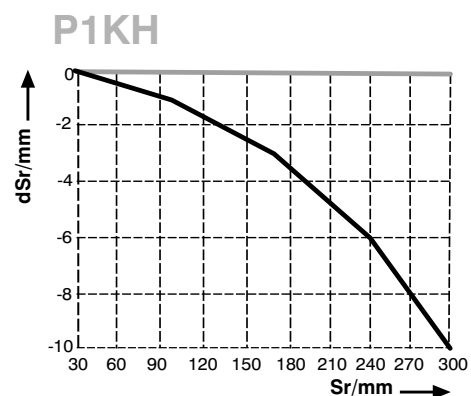

05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

Table 1

Detection Range	30 mm	130 mm	300 mm
Spot Diameter	8 mm	7 mm	18 mm

Switching Distance Deviation

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



Sr = Switching Distance

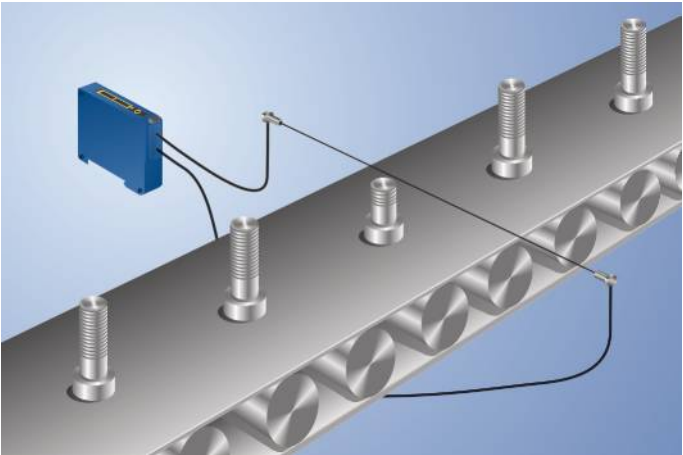
dSr = Switching Distance Change

Fiber-Optic Cable Sensor



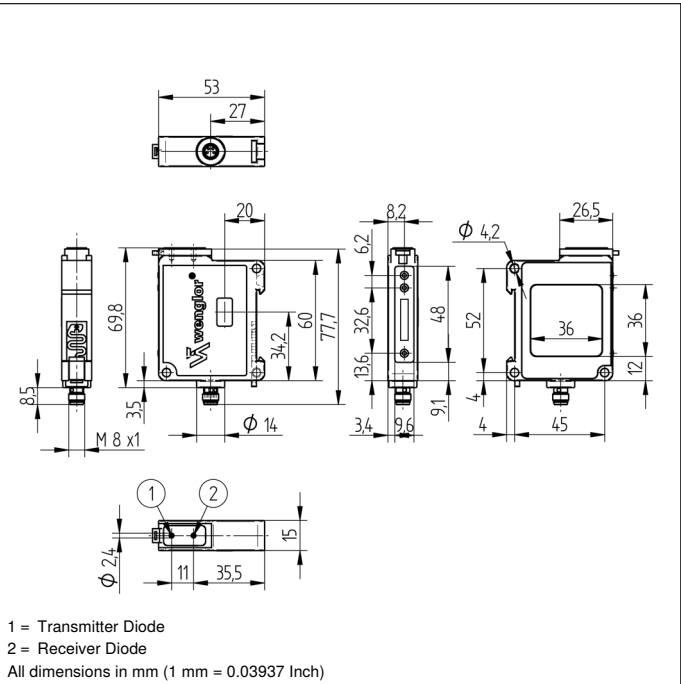
- External teach-in
- Menu-driven settings
- Recognition of transparent objects
- Reflex and through-beam operation mode are possible
- Teach-in

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.



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 (Ub = 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 V1.0
IO-Link Parameter	> 12
Protection Class	III
Mechanical Data	
Setting Method	Menu (OLED)
Housing Material	Plastic
Degree of Protection	IP65
Connection	M8 × 1; 4-pin
DIN-Rail mounting	35 mm
Safety-relevant Data	
MTTFd (EN ISO 13849-1)	849,77 a



Display brightness may decrease with age. This does not result in any impairment of the sensor function.



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

Connection Diagrams page 116

Complementary Products

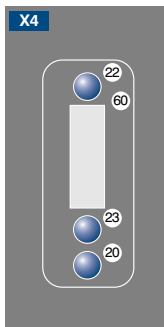
Glass Fiber-Optic Cable

IO-Link Master

Plastic Fiber-Optic Cable

Software

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 through-beam 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 _b = 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 V1.0
IO-Link Parameter	> 12
Protection Class	III

Mechanical Data

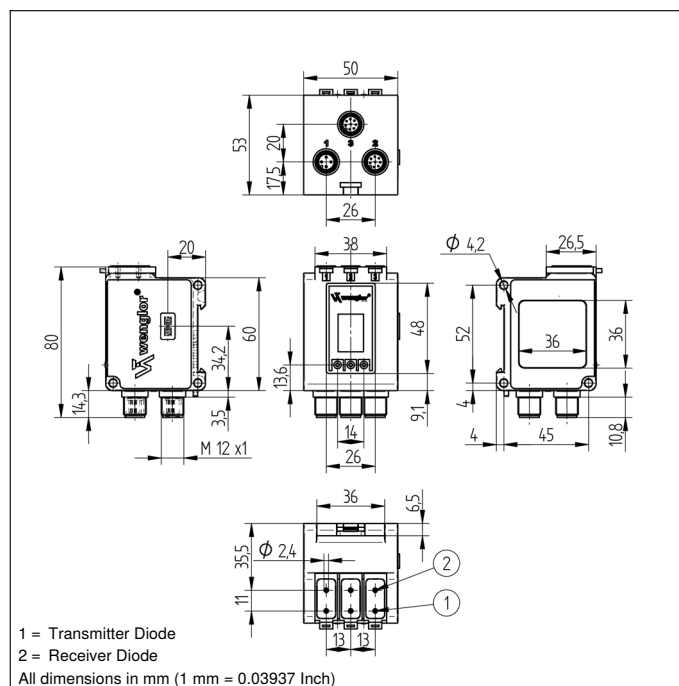
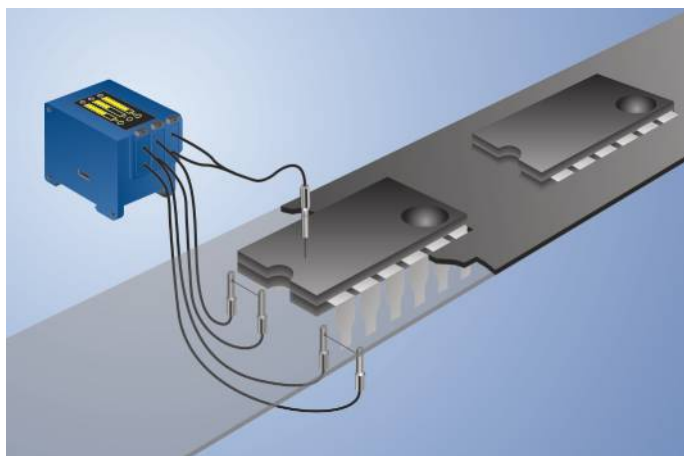
Setting Method	Menu (OLED)
Housing Material	Plastic
Degree of Protection	IP50
Connection	M12 × 1; 4+8-pin
DIN-Rail mounting	35 mm

Safety-relevant Data

MTTFd (EN ISO 13849-1)	347,83 a
------------------------	----------

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.



Display brightness may decrease with age. This does not result in any impairment of the sensor function.



Plug Version

Part Number	ODX402P0088
Speed Measurement	●
Selectable menu language	●
Password Protection	●
Logic Output	AND / OR
Contamination Output	●
Configurable as PNP/NPN/Push-Pull	●
Switchable to NC/NO	●
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

Connection Diagrams page 116

Complementary Products

Add-on Module ODX402P0099

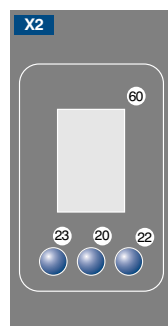
Glass Fiber-Optic Cable

IO-Link Master

Plastic Fiber-Optic Cable

Software

Ctrl. Panel



20 = Enter Button

22 = UP Button

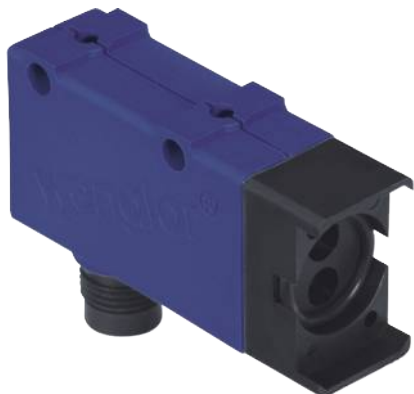
23 = Down Button

60 = Display

Fiber-Optic Cable Sensor

500 mm

Range



- Compact housing
- IO-Link interface
- 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 °

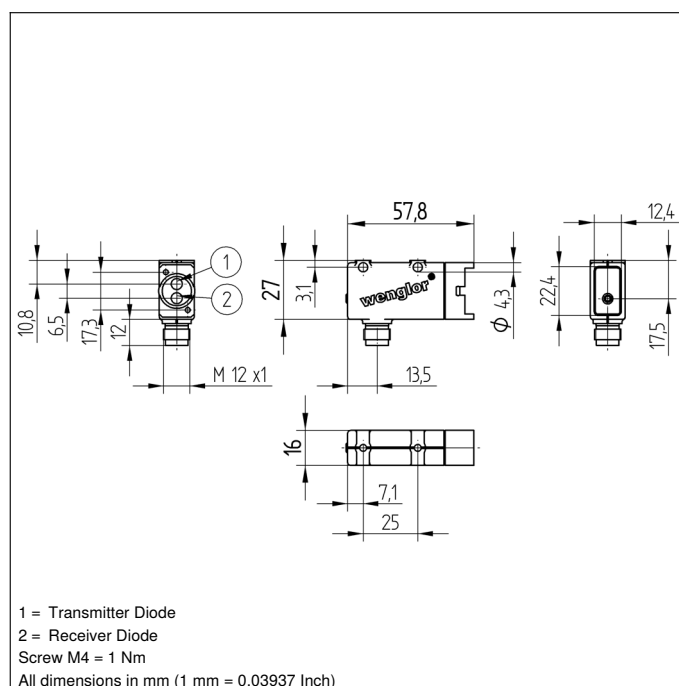
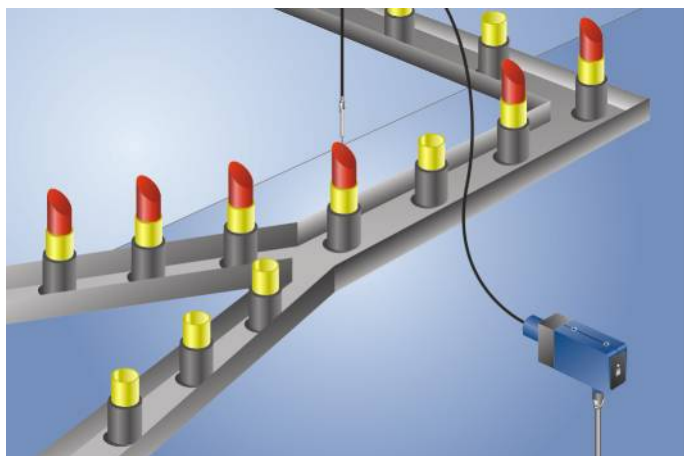
Electrical Data

Supply Voltage	18...30 V
Current Consumption (U _b = 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 V1.0
Protection Class	III

Mechanical Data

Setting Method	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.



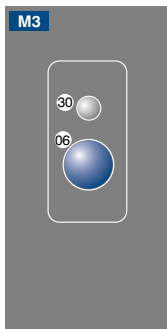
Plug Version	
    	Part Number OUM502C0002
IO-Link	●
PNP NO/NC switchable	●
Connection Diagram No.	179
Control Panel No.	M3
Suitable Connection Technology No.	2
Suitable Mounting Technology No.	360
Suitable Fiber-Optic Cable Adapter No.	02

Connection Diagrams page 116

Complementary Products

- Glass Fiber-Optic Cable
- IO-Link Master
- PNP-NPN Converter BG2V1P-N-2M
- Software

Ctrl. Panel



06 = Teach Button
30 = Switching Status/Contamination Warning

Color Sensor

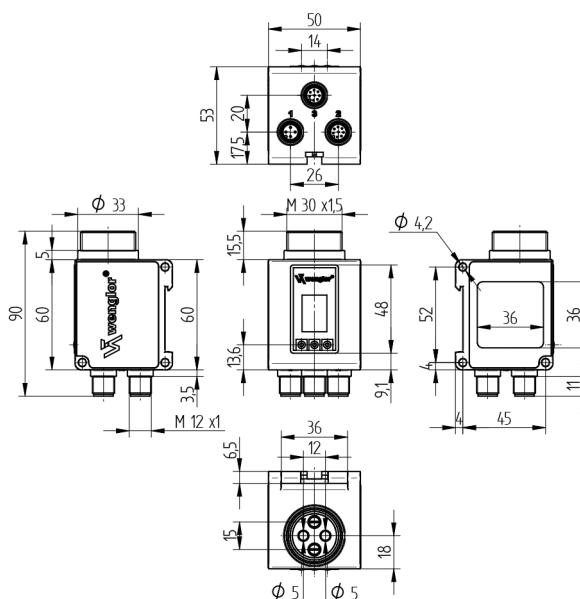
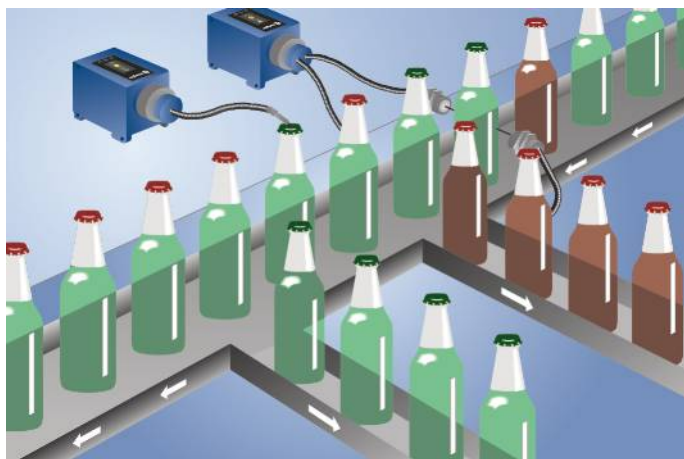
6 Channel Multi Spectral Sensor

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
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	~ 260 mA
Switching Frequency	2 kHz
Response Time	~ 500 µs × filter
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 V1.1/RS-232
Digital Inputs	3
Protection Class	III
Mechanical Data	
Setting Method	Menu (OLED)
Housing Material	Plastic
Degree of Protection	IP67
Connection	M12 × 1; 4+8-pin
DIN-Rail mounting	35 mm
Safety-relevant Data	
MTTfd (EN ISO 13849-1)	345,43 a

- 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.



All dimensions in mm (1 mm = 0.03937 Inch)

Display brightness may decrease with age. This does not result in any impairment of the sensor function.



Plug Version

Part Number	P1XF001
Switchable to NC/NO	●
Configurable as PNP/NPN/Push-Pull	●
RS-232 Interface	●
IO-Link	●
Error Output	●
Contamination Output	●
Connection Diagram No.	127
Control Panel No.	X2
Suitable Connection Technology No.	2 89
Selectable menu language	yes

Connection Diagrams page 116

Complementary Products

Glass Fiber-Optic Cable

Interface Cable S232W3

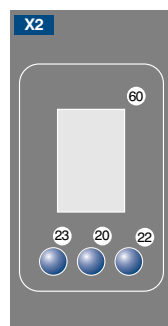
IO-Link Master

Lens LA27

Plastic Fiber-Optic Cable

Software

Ctrl. Panel



20 = Enter Button

22 = UP Button

23 = Down Button

60 = Display

Range

When the following fiber-optic cable is used

FL200_	600 mm	161-256-10_	0...25 mm
FL210_	50 mm	301-251-10_	0...50 mm
FL30/50	0...50 mm	Z96D001	0...10 mm
FL330_	18 mm	Z96D001+LA27	0...30 mm
FL340_	100 mm		

Retro-Reflex Sensor

3000 mm **LASER**

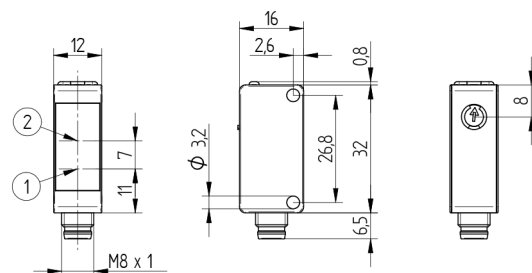
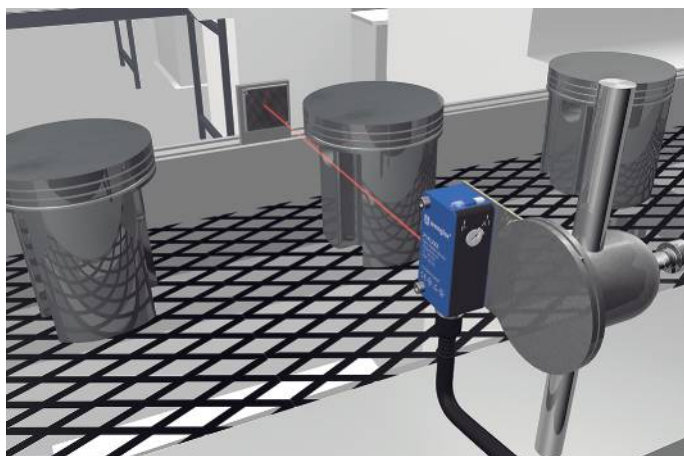
Range



- Condition monitoring
- High switching frequency
- IO-Link 1.1

Technical Data

Optical Data	
Range	3000 mm
Reference Reflector/Reflex Foil	RE6151BM
Smallest Recognizable Part	0,15 mm
Switching Hysteresis	< 15 %
Light Source	Laser (red)
Wave Length	655 nm
Polarization Filter	yes
Service Life (T = +25 °C)	100000 h
Laser Class (EN 60825-1)	1
Max. Ambient Light	10000 Lux
Spot Diameter	0,5 mm
Focus Distance	180...220 mm
Two-Lens Optic	yes
Electrical Data	
Supply Voltage	10...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	< 15 mA
Switching Frequency	2000 Hz
Switching frequency (speed mode)	4000 Hz
Response Time	0,25 ms
Response time (speed mode)	0,125 ms
Temperature Drift	< 10 %
Temperature Range	-40...60 °C
Switching Output Voltage Drop	< 2 V
Switching Output/Switching Current	100 mA
Residual Current Switching Output	< 50 µA
Short Circuit and Overload Protection	yes
Reverse Polarity Protection	yes
Lockable	yes
Interface	IO-Link V1.1
Protection Class	III
FDA Accession Number	1710976-001
Mechanical Data	
Setting Method	Potentiometer
Housing Material	Plastic
Degree of Protection	IP67/IP68
Optic Cover	PMMA
Safety-relevant Data	
MTTfd (EN ISO 13849-1)	2617,62 a



1 = Transmitter Diode
 2 = Receiver Diode
 Screw M3 = 0,5 Nm
 All dimensions in mm (1 mm = 0.03937 Inch)

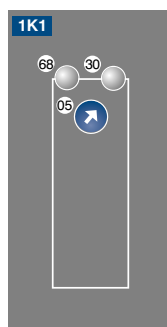
					Plug Version			
      					Part Number	P1KL017	P1KL018	P1KL019
IO-Link						●	●	●
PNP NO								●
PNP NC							●	
PNP NO/NC antivalent						●		
Connection					M8 × 1; 4-pin	M8 × 1; 3-pin	M8 × 1; 3-pin	
Connection Diagram No.					215	217	216	
Control Panel No.					1K1	1K1	1K1	
Suitable Connection Technology No.					7	8	8	
Suitable Mounting Technology No.					400	400	400	

Connection Diagrams page 116

Complementary Products

IO-Link Master
Reflector, Reflector Foil
Software

Ctrl. Panel



05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

Table 1

Working Distance	0,1 m	1 m	3 m
Spot Diameter	1 mm	8 mm	28 mm

Feasible reflector distance

Reflector type, mounting distance

RQ100BA	0,4...3 m	RR25KP	0,35...0,9 m
RE18040BA	0,4...3 m	RR21_M	0,35...2 m
RQ84BA	0,4...3 m	ZRAE02B01	0,4...2,5 m
RR84BA	0,4...3 m	ZRME01B01	0,35...1,2 m
RE9538BA	0,4...2,4 m	ZRME03B01	0,35...1,7 m
RE6151BM	0,35...3 m	ZRMR02K01	0,35...1,5 m
RR50_A	0,4...3 m	ZRMS02_01	0,35...1,9 m
RE6040BA	0,4...3 m	RF505	0,35...1,2 m
RE8222BA	0,4...3 m	RF508	0,35...1,1 m
RR34_M	0,35...3 m	RF258	0,35...1,1 m
RE3220BM	0,35...2 m	ZRDF03K01	0,3...3 m
RE6210BM	0,35...1,9 m	ZRDF10K01	0,3...3 m
RR25_M	0,35...2,2 m		

Retro-Reflex Sensor

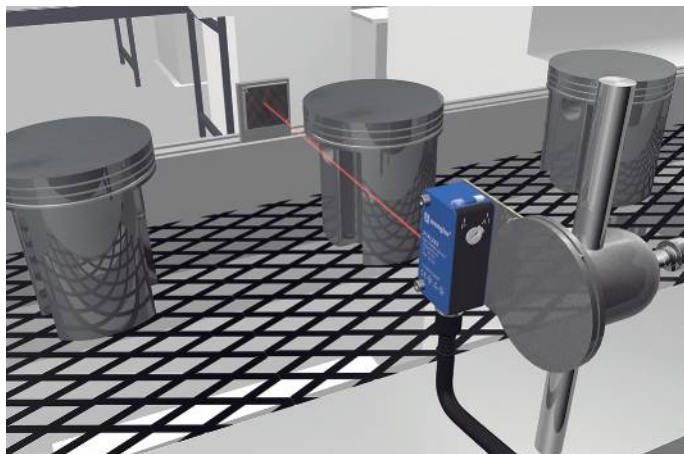
12000 mm **LASER**

Range



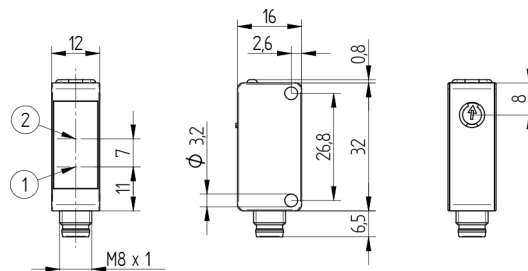
- Condition monitoring
- Detect extremely small parts starting at 1 mm
- High switching frequency
- IO-Link 1.1

The retro-reflex sensor works with a fine laser beam and a reflector. The collimated laser beam of laser class 1 detects objects, for instance, when conducting installation, feed or presence controls, starting at a size of one millimeter over the entire range. The IO-Link interface can be used to configure retro-reflective barriers (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and signal values.



Technical Data

Optical Data	
Range	12000 mm
Reference Reflector/Reflex Foil	RE6151BM
Smallest Recognizable Part	see Table 2
Switching Hysteresis	< 15 %
Light Source	Laser (red)
Wave Length	655 nm
Polarization Filter	yes
Service Life (T = +25 °C)	100000 h
Laser Class (EN 60825-1)	1
Max. Ambient Light	10000 Lux
Spot Diameter	see Table 1
Two-Lens Optic	yes
Electrical Data	
Supply Voltage	10...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	< 15 mA
Switching Frequency	2000 Hz
Switching frequency (speed mode)	4000 Hz
Response Time	0,25 ms
Response time (speed mode)	0,125 ms
Temperature Drift	< 10 %
Temperature Range	-40...60 °C
Switching Output Voltage Drop	< 2 V
Switching Output/Switching Current	100 mA
Residual Current Switching Output	< 50 µA
Short Circuit and Overload Protection	yes
Reverse Polarity Protection	yes
Lockable	yes
Interface	IO-Link V1.1
Protection Class	III
FDA Accession Number	1710976-001
Mechanical Data	
Setting Method	Potentiometer
Housing Material	Plastic
Degree of Protection	IP67/IP68
Optic Cover	PMMA



1 = Transmitter Diode
 2 = Receiver Diode
 Screw M3 = 0,5 Nm
 All dimensions in mm (1 mm = 0.03937 Inch)

 		Plug Version					
		Part Number	P1KL006	P1KL007	P1KL008	P1KL014	P1KL015
IO-Link		●	●	●	●	●	●
PNP NO			●				
PNP NC				●			
PNP NO/NC antivalent		●					
NPN NO					●		
NPN NC							●
NPN NO/NC antivalent				●			
Connection		M8 × 1; 4-pin	M8 × 1; 3-pin	M8 × 1; 3-pin	M8 × 1; 4-pin	M8 × 1; 3-pin	M8 × 1; 3-pin
MTTFd (EN ISO 13849-1)		2617,62 a	2633,47 a	2633,47 a	2617,62 a	2633,47 a	2633,47 a
Connection Diagram No.		215	216	217	213	171	218
Control Panel No.		1K1	1K1	1K1	1K1	1K1	1K1
Suitable Connection Technology No.		7	8	8	7	8	8
Suitable Mounting Technology No.		400	400	400	400	400	400

Connection Diagrams page 116

Table 1

Working Distance	0,1 m	5 m	12 m
Spot Diameter	4 mm	11 mm	22 mm

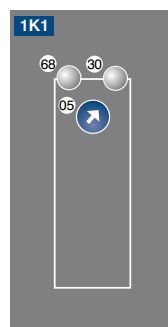
Table 2

Distance, Sensor to Reflector	2 m	4 m	12 m
Smallest Recognizable Part	1,5 mm	1 mm	2,5 mm

Complementary Products

IO-Link Master
Reflector, Reflector Foil
Software

Ctrl. Panel



05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

Feasible reflector distance

Reflector type, mounting distance

RQ100BA	0,1...16 m	RR25KP	0,1...2,5 m
RE18040BA	0,1...12 m	RR21_M	0,1...7 m
RQ84BA	0,1...16 m	ZRAE02B01	0,1...7 m
RR84BA	0,1...16 m	ZRME01B01	0,1...3 m
RE9538BA	0,1...4,5 m	ZRME03B01	0,1...4,5 m
RE6151BM	0,1...12 m	ZRMR02K01	0,1...5 m
RR50_A	0,1...16 m	ZRMS02_01	0,1...7 m
RE6040BA	0,1...15 m	RF505	0,1...2 m
RE8222BA	0,1...10 m	RF508	0,1...2 m
RR34_M	0,1...2,5 m	RF258	0,1...2 m
RE3220BM	0,1...7 m	ZRDF03K01	0,1...4 m
RE6210BM	0,1...4,5 m	ZRDF10K01	0,1...4 m
RR25_M	0,1...7 m		

Retro-Reflex Sensor

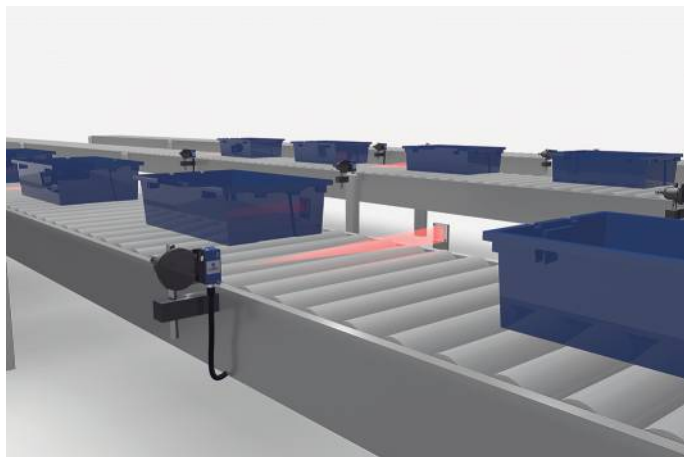
5000 mm

Range



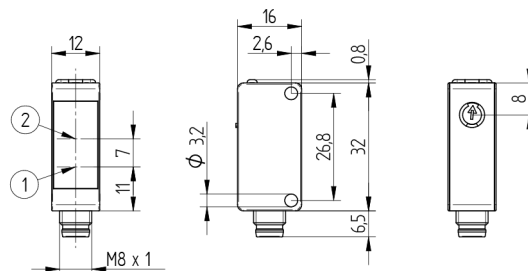
- Also suitable for glossy and reflective objects
- Condition monitoring
- High switching frequency
- IO-Link 1.1

The retro-reflex sensor works with red light and a reflector. It also reliably detects objects with reflective or glossy surfaces at high speeds. Thanks to its great range, the sensor can, for example, be used to manage feed and presence controls as well as to detect objects on wide feed belts. The IO-Link interface can be used to configure retro-reflective barriers (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and signal values.



Technical Data

Optical Data	
Range	5000 mm
Reference Reflector/Reflex Foil	RQ100BA
Smallest Recognizable Part	see Table 2
Light Source	Red Light
Polarization Filter	yes
Service Life (T = +25 °C)	100000 h
Max. Ambient Light	10000 Lux
Spot Diameter	see Table 1
Two-Lens Optic	yes
Electrical Data	
Supply Voltage	10...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	< 20 mA
Temperature Drift	< 10 %
Temperature Range	-40...60 °C
Switching Output Voltage Drop	< 2 V
Switching Output/Switching Current	100 mA
Residual Current Switching Output	< 50 µA
Short Circuit and Overload Protection	yes
Reverse Polarity Protection	yes
Lockable	yes
Interface	IO-Link V1.1
Protection Class	III
Mechanical Data	
Setting Method	Potentiometer
Housing Material	Plastic
Degree of Protection	IP67/IP68
Optic Cover	PMMA



1 = Transmitter Diode
 2 = Receiver Diode
 Screw M3 = 0,5 Nm
 All dimensions in mm (1 mm = 0.03937 Inch)


Plug Version

Part Number	P1KL002	P1KL009	P1KL010	P1KL004	P1KL005	P1KL013
IO-Link	●	●	●	●	●	●
PNP NO				●		
PNP NC					●	
PNP NO/NC antivalent	●					
NPN NO						●
NPN NC			●			
NPN NO/NC antivalent		●				
Switching Hysteresis	< 10 %	< 15 %	< 15 %	< 10 %	< 10 %	< 10 %
Switching Frequency	2000 Hz	1 kHz	1 kHz	2000 Hz	2000 Hz	2000 Hz
Switching frequency (speed mode)	3500 Hz			3500 Hz	3500 Hz	3500 Hz
Response Time	0,25 ms	500 μs	500 μs	0,25 ms	0,25 ms	0,25 ms
Response time (speed mode)	0,14 ms			0,14 ms	0,14 ms	0,14 ms
Connection	M8 × 1; 4-pin	M8 × 1; 4-pin	M8 × 1; 3-pin	M8 × 1; 3-pin	M8 × 1; 3-pin	M8 × 1; 3-pin
MTTFd (EN ISO 13849-1)	2808,97 a	2808,97 a	2827,23 a	2827,23 a	2827,23 a	2827,23 a
Connection Diagram No.	215	213	218	216	217	171
Control Panel No.	1K1	1K1	1K1	1K1	1K1	1K1
Suitable Connection Technology No.	7	7	8	8	8	8
Suitable Mounting Technology No.	400	400	400	400	400	400

Connection Diagrams page 116

Table 1

Working Distance	0,2 m	2 m	5 m
Spot Diameter	30 mm	180 mm	400 mm

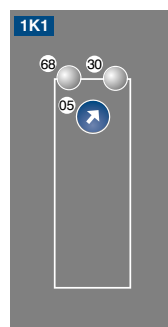
Complementary Products

IO-Link Master
Reflector, Reflector Foil
Software

Table 2

Distance, Sensor to Reflector	1 m	2,5 m	5 m
Smallest Recognizable Part	10 mm	20 mm	30 mm

Ctrl. Panel



05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

Feasible reflector distance

Reflector type, mounting distance

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

Retro-Reflex Sensor

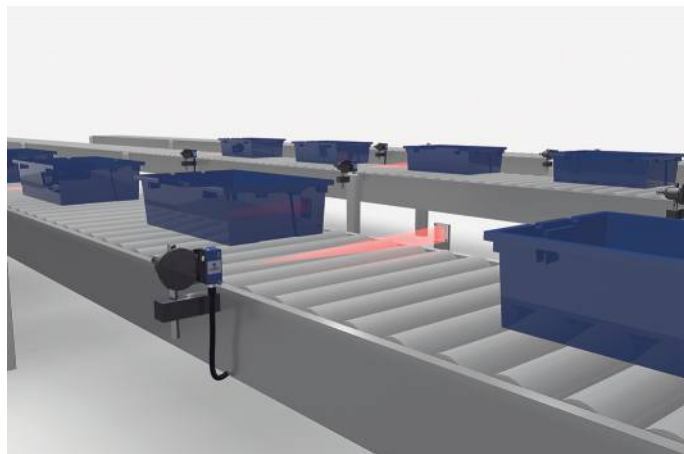
5000 mm

Range



- Also suitable for glossy and reflective objects
- Condition monitoring
- High switching frequency
- IO-Link 1.1

The retro-reflex sensor works with red light and a reflector. It also reliably detects objects with reflective or glossy surfaces at high speeds. Thanks to its great range, the sensor can, for example, be used to manage feed and presence controls as well as to detect objects on wide feed belts. The IO-Link interface can be used to configure retro-reflective barriers (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and signal values.



Technical Data

Optical Data

Range	5000 mm
Reference Reflector/Reflex Foil	RQ100BA
Smallest Recognizable Part	see Table 2
Switching Hysteresis	< 10 %
Light Source	Red Light
Polarization Filter	yes
Service Life (T = +25 °C)	100000 h
Max. Ambient Light	10000 Lux
Spot Diameter	see Table 1
Two-Lens Optic	yes

Electrical Data

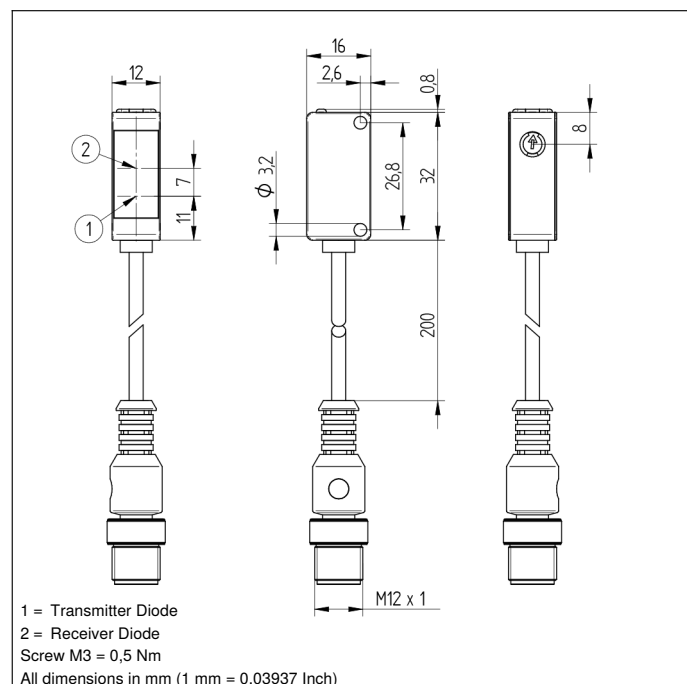
Supply Voltage	10...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	< 20 mA
Switching Frequency	2000 Hz
Switching frequency (speed mode)	3500 Hz
Response Time	0,25 ms
Response time (speed mode)	0,14 ms
Temperature Drift	< 10 %
Temperature Range	-40...60 °C
Switching Output Voltage Drop	< 2 V
Switching Output/Switching Current	100 mA
Residual Current Switching Output	< 50 µA
Short Circuit and Overload Protection	yes
Reverse Polarity Protection	yes
Lockable	yes
Interface	IO-Link V1.1
Protection Class	III

Mechanical Data

Setting Method	Potentiometer
Housing Material	Plastic
Degree of Protection	IP67/IP68
Optic Cover	PMMA

Safety-relevant Data

MTTFd (EN ISO 13849-1)	2808,97 a
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	Plug Version		Prewired Version	
Part Number	P1KL003	P1KL012	P1KL001	P1KL011
IO-Link	●	●	●	●
PNP NO/NC antivalent	●		●	
NPN NO/NC antivalent		●		●
Connection	M12 × 1; 4-pin	M12 × 1; 4-pin	Cable, 4-wire, 2 m	Cable, 4-wire, 2 m
Cable Length	20 cm	20 cm		
Connection Diagram No.	215	213	214	212
Control Panel No.	1K1	1K1	1K1	1K1
Suitable Connection Technology No.	2	2		
Suitable Mounting Technology No.	400	400	400	400

Connection Diagrams page 116

Table 1

Working Distance	0,2 m	2 m	5 m
Spot Diameter	30 mm	180 mm	400 mm

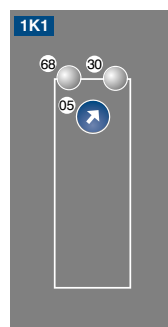
Complementary Products

IO-Link Master
Reflector, Reflector Foil
Software

Table 2

Distance, Sensor to Reflector	1 m	2,5 m	5 m
Smallest Recognizable Part	10 mm	20 mm	30 mm

Ctrl. Panel



05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

Feasible reflector distance

Reflector type, mounting distance

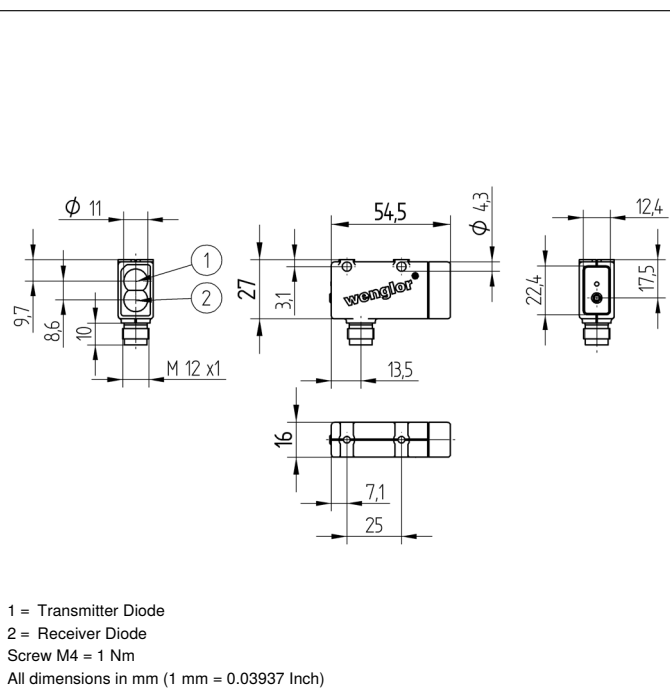
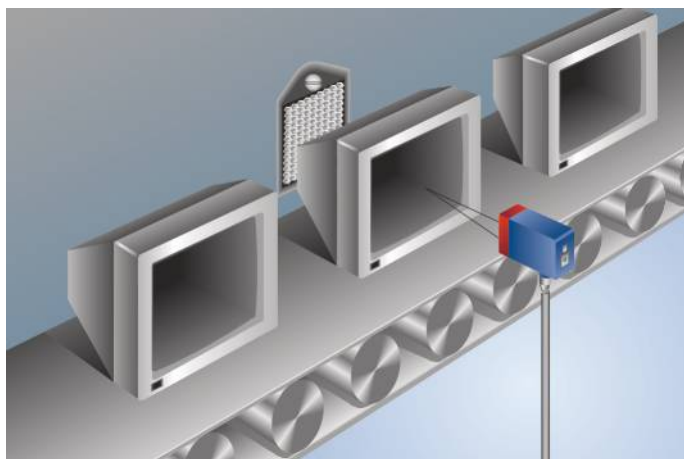
RQ100BA	0,01...5 m	RR25KP	0,01...0,8 m
RE18040BA	0,01...4,5 m	RR21_M	0,01...1,1 m
RQ84BA	0,01...4,5 m	ZRAE02B01	0,01...2 m
RR84BA	0,01...4,5 m	ZRME01B01	0,01...0,9 m
RE9538BA	0,01...2 m	ZRME03B01	0,01...1,6 m
RE6151BM	0,01...3,5 m	ZRMR02K01	0,01...1 m
RR50_A	0,01...3 m	ZRMS02_01	0,01...1 m
RE6040BA	0,01...3,5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

Range



- IO-Link interface
- 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.



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 116

Complementary Products

IO-Link Master

PNP-NPN Converter BG2V1P-N-2M

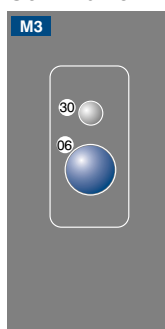
Protective Housing ZSV-0x-01

Reflector, Reflector Foil

Set Protective Housing ZSM-NN-02

Software

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		

Retro-Reflex Sensor for Clear Glass Recognition

1500 mm

Range



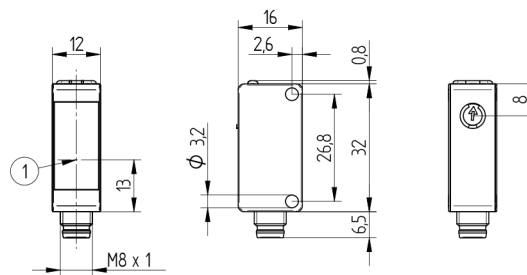
- Condition monitoring
- IO-Link 1.1
- No blind spot from single-lens optics
- Special for glass, PET and films

The retro-reflex sensor for clear glass recognition works with red light and a reflector. Where conventional retro-reflex light barriers reach their limits, this retro-reflective barrier for clear glass recognition ensures that extremely shiny objects like glass, PET bottles, trays or film can be detected. Via the single-lens optic without blind spots, the sensor can detect objects even through small holes and gaps. The IO-Link interface can be used to configure retro-reflective barriers (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and signal values.



Technical Data

Optical Data	
Range	1500 mm
Reference Reflector/Reflex Foil	RQ100BA
Clear Glass Recognition	yes
Smallest Recognizable Part	see Table 2
Switching Hysteresis	< 5 %
Light Source	Red Light
Polarization Filter	yes
Service Life (T = +25 °C)	100000 h
Max. Ambient Light	10000 Lux
Spot Diameter	see Table 1
Single-Lens Optic	yes
Electrical Data	
Supply Voltage	10...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	< 20 mA
Switching Frequency	2000 Hz
Switching frequency (speed mode)	3500 Hz
Response Time	0,25 ms
Response time (speed mode)	0,14 ms
Temperature Drift	< 5 %
Temperature Range	-40...60 °C
Switching Output Voltage Drop	< 2 V
Switching Output/Switching Current	100 mA
Residual Current Switching Output	< 50 µA
Short Circuit and Overload Protection	yes
Reverse Polarity Protection	yes
Lockable	yes
Interface	IO-Link V1.1
Protection Class	III
Mechanical Data	
Setting Method	Potentiometer
Housing Material	Plastic
Degree of Protection	IP67/IP68
Connection	M8 × 1; 4-pin
Optic Cover	PMMA
Safety-relevant Data	
MTTFd (EN ISO 13849-1)	2414 a



1 = optical axle
Screw M3 = 0,5 Nm
All dimensions in mm (1 mm = 0.03937 Inch)

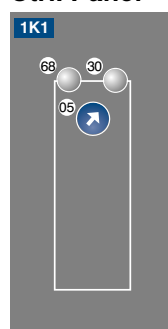
	Plug Version	
	Part Number	
	P1KK001	P1KK003
IO-Link	●	●
PNP NO/NC antivalent	●	
NPN NO/NC antivalent		●
Connection Diagram No.	215	213
Control Panel No.	1K1	1K1
Suitable Connection Technology No.	7	7
Suitable Mounting Technology No.	400	400

Connection Diagrams page 116

Complementary Products

IO-Link Master
Reflector, Reflector Foil
Software

Ctrl. Panel



05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

Table 1

Working Distance	0,2 m	1 m	1,5 m
Spot Diameter	20 mm	90 mm	130 mm

Table 2

Distance, Sensor to Reflector	0,2 m	1 m	1,5 m
Smallest Recognizable Part	0,7 mm	6 mm	10 mm

Feasible reflector distance

Reflector type, mounting distance

RQ100BA	0...1,5 m	RR25KP	0...0,25 m
RE18040BA	0...1,5 m	RR21_M	0...0,6 m
RQ84BA	0...1,5 m	ZRAE02B01	0...0,6 m
RR84BA	0...1,5 m	ZRME01B01	0...0,25 m
RE9538BA	0...0,7 m	ZRME03B01	0...0,65 m
RE6151BM	0...1,3 m	ZRMR02K01	0...0,4 m
RR50_A	0...1,5 m	ZRMS02_01	0...0,55 m
RE6040BA	0...1,4 m	RF505	0...0,5 m
RE8222BA	0...1 m	RF508	0...0,5 m
RR34_M	0...1 m	RF258	0...0,45 m
RE3220BM	0...0,6 m	ZRDF03K01	0...1,1 m
RE6210BM	0...0,6 m	ZRDF10K01	0...1,2 m
RR25_M	0...0,7 m		

Retro-Reflex Sensor for Clear Glass Recognition

2000 mm

Range



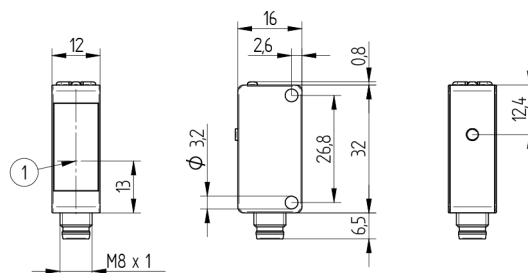
- Condition monitoring
- Dynamic readjustment of the switching threshold
- High-end
- IO-Link 1.1
- Special for glass, PET and films

The retro-reflex sensor for clear glass recognition works with red light and a reflector. It has a IO-Link interface with a data storage function as well as additional configuration and diagnostic options. The interface can also be used to configure the sensors (PNP/NPN, NC/NO, switching distance, error output), as well as for reading out switching statuses and signal values. The dynamic readjustment of the switching threshold function automatically adjusts this for contamination, aging or temperature deviations, meaning that these factors have almost no effect on functionality.



Technical Data

Optical Data	
Range	2000 mm
Reference Reflector/Reflex Foil	RQ100BA
Clear Glass Recognition	yes
Smallest Recognizable Part	see Table 2
Switching Hysteresis	< 5 %
Light Source	Red Light
Polarization Filter	yes
Service Life (T = +25 °C)	100000 h
Max. Ambient Light	10000 Lux
Spot Diameter	see Table 1
Single-Lens Optic	yes
Electrical Data	
Supply Voltage	10...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 24 V)	< 20 mA
Switching Frequency	1000 Hz
Switching frequency (speed mode)	2000 Hz
Response Time	0,5 ms
Response time (speed mode)	0,25 ms
Temperature Drift	< 5 %
Temperature Range	-40...60 °C
Switching Output Voltage Drop	< 2 V
Switching Output/Switching Current	100 mA
Residual Current Switching Output	< 50 µA
Short Circuit and Overload Protection	yes
Reverse Polarity Protection	yes
Lockable	yes
Teach Mode	NT, MT
Interface	IO-Link V1.1
Data Storage	yes
Protection Class	III
Mechanical Data	
Setting Method	Teach-In
Housing Material	Plastic
Degree of Protection	IP67/IP68
Connection	M8 × 1; 4-pin
Optic Cover	PMMA
Safety-relevant Data	
MTTFd (EN ISO 13849-1)	2207,95 a



1 = optical axle
Screw M3 = 0,5 Nm
All dimensions in mm (1 mm = 0.03937 Inch)

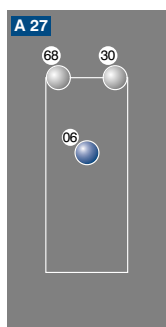
	Plug Version	
	Part Number	
	P1KK002	P1KK004
IO-Link	●	●
PNP NO	●	
NPN NO		●
Connection Diagram No.	221	221
Control Panel No.	A27	A27
Suitable Connection Technology No.	7	7
Suitable Mounting Technology No.	400	400

Connection Diagrams page 116

Complementary Products

IO-Link Master
Reflector, Reflector Foil
Software

Ctrl. Panel



06 = Teach Button
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

Table 1

Working Distance	0,5 m	1,3 m	2 m
Spot Diameter	30 mm	100 mm	150 mm

Table 2

Distance, Sensor to Reflector	0,4 m	1 m	2 m
Smallest Recognizable Part	2 mm	5 mm	8 mm

Feasible reflector distance

Reflector type, mounting distance

RQ100BA	0...2 m	RR25KP	0...0,4 m
RE18040BA	0...1,9 m	RR21_M	0...0,85 m
RQ84BA	0...2 m	ZRAE02B01	0...0,85 m
RR84BA	0...2 m	ZRME01B01	0...0,4 m
RE9538BA	0...0,95 m	ZRME03B01	0...0,85 m
RE6151BM	0...1,7 m	ZRMR02K01	0...0,55 m
RR50_A	0...2 m	ZRMS02_01	0...0,75 m
RE6040BA	0...1,8 m	RF505	0...0,65 m
RE8222BA	0...1,35 m	RF508	0...0,65 m
RR34_M	0...1,3 m	RF258	0...0,55 m
RE3220BM	0...0,8 m	ZRAF08K01	0...0,65 m
RE6210BM	0...0,8 m	ZRDF03K01	0...1,5 m
RR25_M	0...0,9 m	ZRDF10K01	0...1,55 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

Technical Data

Optical Data

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

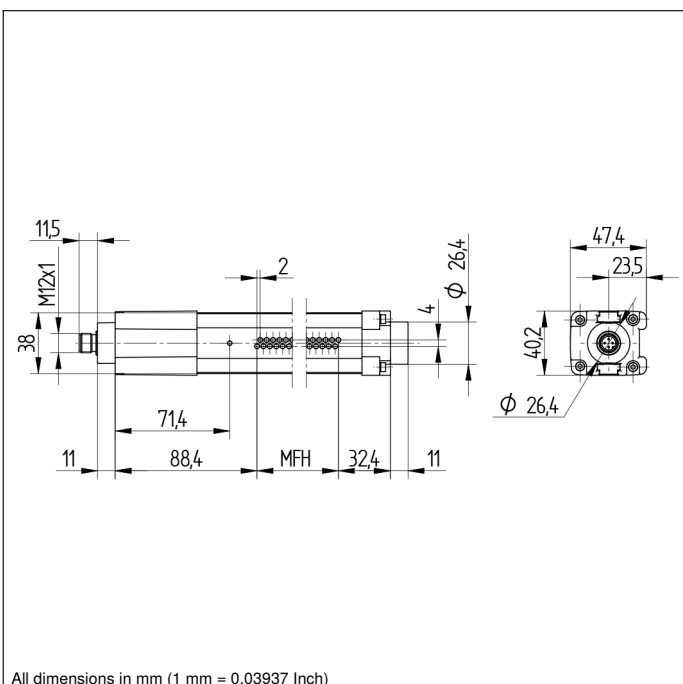
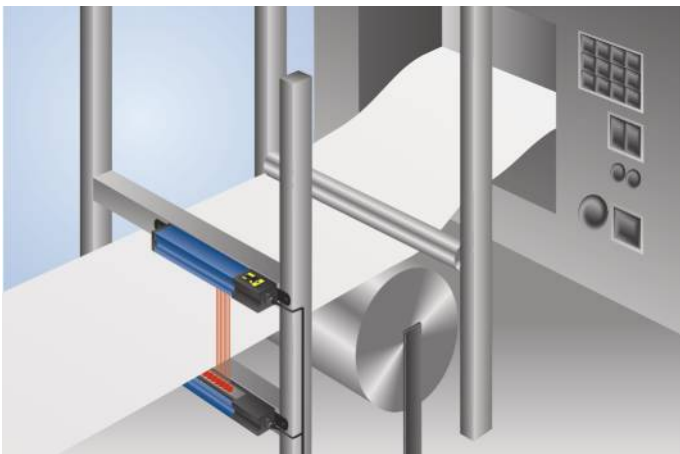
Electrical Data

Supply Voltage	18...30 V DC
Current Consumption (U _b = 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.



Display brightness may decrease with age. This does not result in any impairment of the sensor function.



Plug Version

Part Number	OSEI501Z0103	OEEI501U0135	OSEI102Z0103	OEEI102U0135	OSEI152Z0103	OEEI152U0135
Switchable to NC/NO		●		●		●
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 V1.0		IO-Link V1.0		IO-Link V1.0
Test input	yes		yes		yes	
Setting Method		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.	1018	188	1018	188	1018	188
Control Panel No.	K3	X2	K3	X2	K3	X2
Suitable Connection Technology No.	2	2 35	2	2 35	2	2 35
Suitable Mounting Technology No.	700	700	700	700	700	700

Connection Diagrams page 116

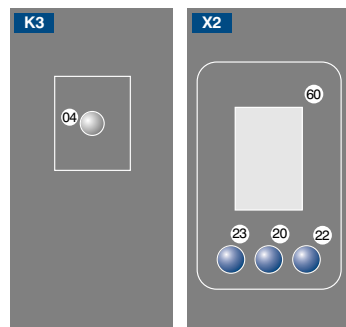
Complementary Products

Analog Evaluation Unit AW02

IO-Link Master

Software

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

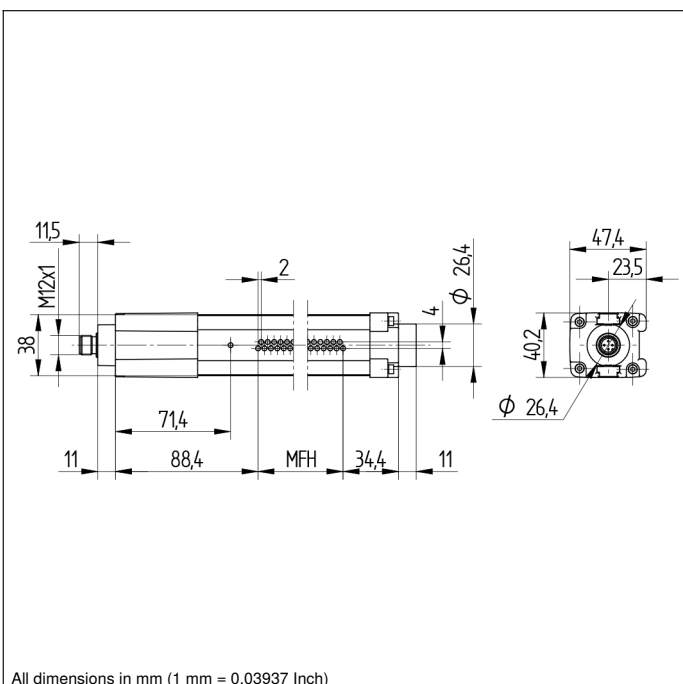
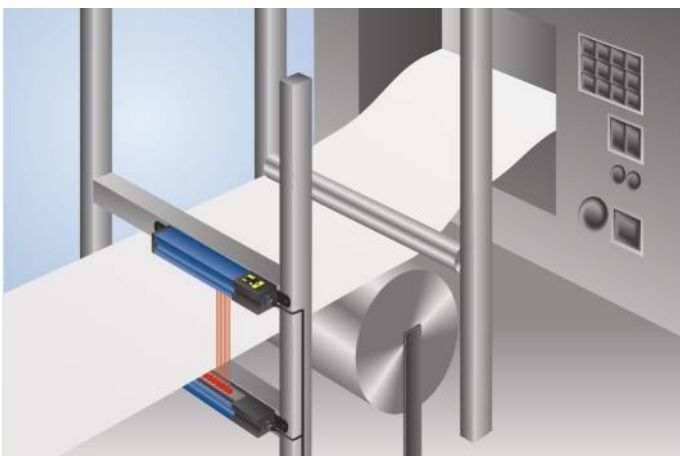
Electrical Data

Supply Voltage	18...30 V DC
Current Consumption (U _b = 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.



Display brightness may decrease with age. This does not result in any impairment of the sensor function.



Plug Version

Part Number	Plug Version	
	OSEI202Z0103	OEEI202U0135
Switchable to NC/NO		●
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 V1.0
Test input	yes	
Setting Method		Menu (OLED)
Connection	M12 × 1; 4-pin	M12 × 1; 4/5-pin
Connection Diagram No.	1018	188
Control Panel No.	K3	X2
Suitable Connection Technology No.	2	2 35
Suitable Mounting Technology No.	700	700

Connection Diagrams page 116

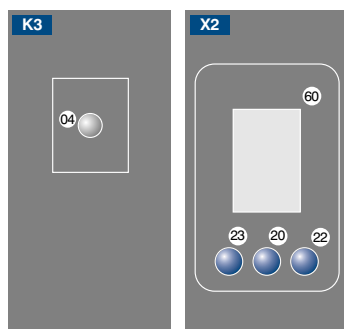
Complementary Products

Analog Evaluation Unit AW02

IO-Link Master

Software

Ctrl. Panel



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

Light Curtain for Measuring Tasks

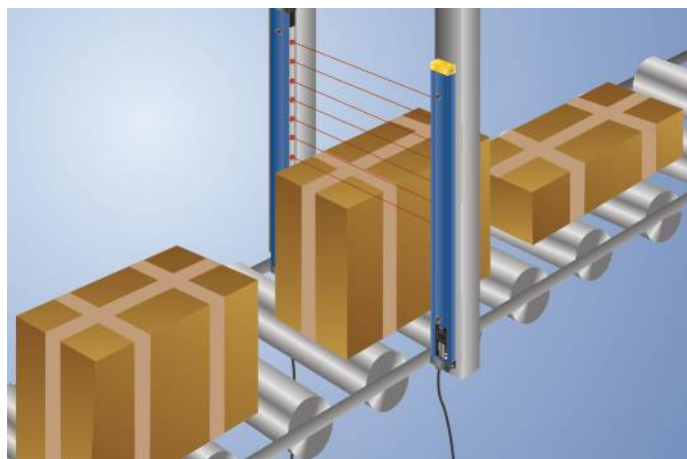
3000 mm

Range



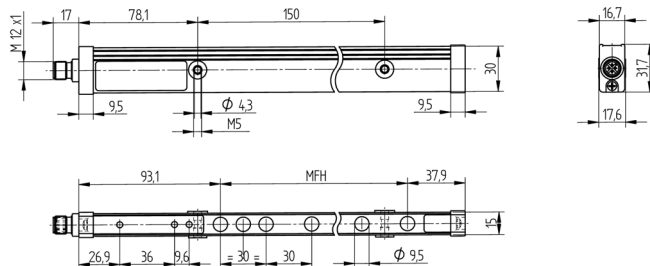
- 360° visible switching status display
- Graphical display for easy operation
- Integrated evaluation unit
- Object detection and measurement
- Test input

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



Display brightness may decrease with age. This does not result in any impairment of the sensor function.



Plug Version

Part Number	OSEB152Z0103	OEEB152U0135	OSEB302Z0103	OEEB302U0135	OSEB452Z0103	OEEB452U0135
Switchable to NC/NO		●		●		●
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 _b = 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 V1.0		IO-Link V1.0		IO-Link V1.0
Test input	yes		yes		yes	
Setting Method		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.	1018	188	1018	188	1018	188
Control Panel No.	EB2	EB3	EB2	EB3	EB2	EB3
Suitable Connection Technology No.	2	2 35	2	2 35	2	2 35

Connection Diagrams page 116

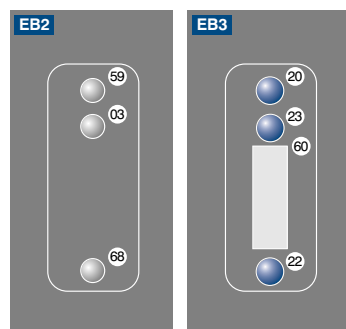
Complementary Products

Analog Evaluation Unit AW02

IO-Link Master

Software

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

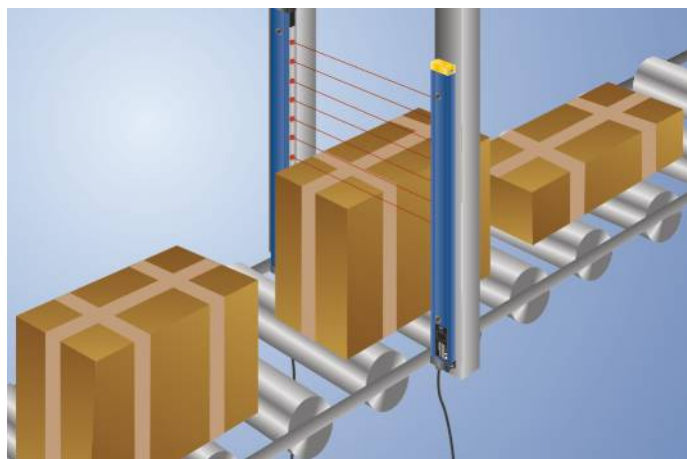
3000 mm

Range



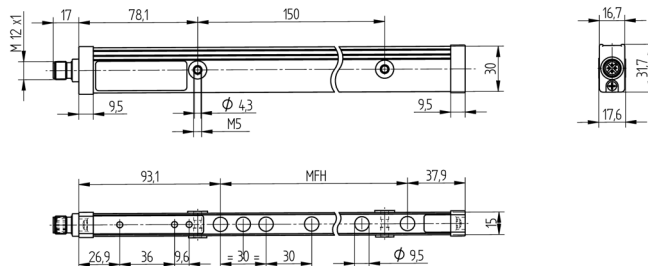
- 360° visible switching status display
- Graphical display for easy operation
- Integrated evaluation unit
- Object detection and measurement
- Test input

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)

Display brightness may decrease with age. This does not result in any impairment of the sensor function.



Plug Version

Part Number	OSEB602Z0103	OEEB602U0135	OSEB752Z0103	OEEB752U0135	OSEB902Z0103	OEEB902U0135
Switchable to NC/NO		●		●		●
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 _b = 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 V1.0		IO-Link V1.0		IO-Link V1.0
Test input	yes		yes		yes	
Setting Method		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.	1018	188	1018	188	1018	188
Control Panel No.	EB2	EB3	EB2	EB3	EB2	EB3
Suitable Connection Technology No.	2	2 35	2	2 35	2	2 35

Connection Diagrams page 116

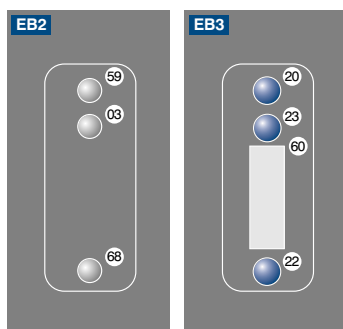
Complementary Products

Analog Evaluation Unit AW02

IO-Link Master

Software

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

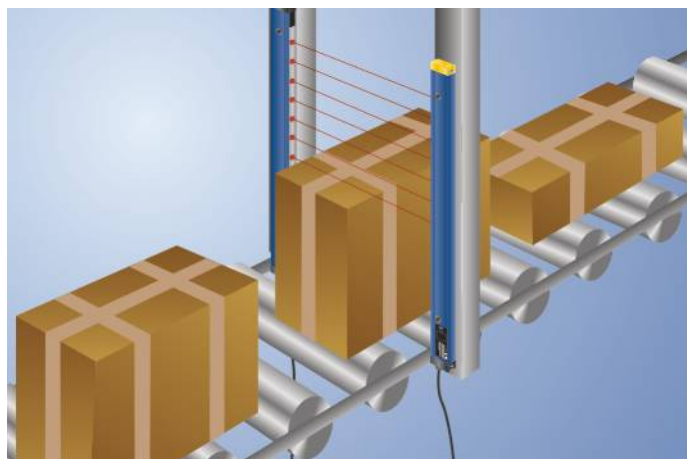
3000 mm

Range



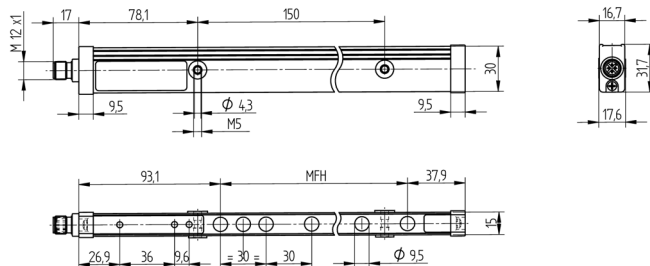
- 360° visible switching status display
- Graphical display for easy operation
- Integrated evaluation unit
- Object detection and measurement
- Test input

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)

Display brightness may decrease with age. This does not result in any impairment of the sensor function.



Plug Version

Part Number	OSEB103Z0103	OEEB103U0135	OSEB123Z0103	OEEB123U0135	OSEB133Z0103	OEEB133U0135
Switchable to NC/NO		●		●		●
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 _b = 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 V1.0		IO-Link V1.0		IO-Link V1.0
Test input	yes		yes		yes	
Setting Method		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.	1018	188	1018	188	1018	188
Control Panel No.	EB2	EB3	EB2	EB3	EB2	EB3
Suitable Connection Technology No.	2	2 35	2	2 35	2	2 35

Connection Diagrams page 116

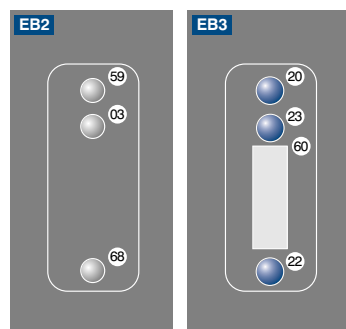
Complementary Products

Analog Evaluation Unit AW02

IO-Link Master

Software

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

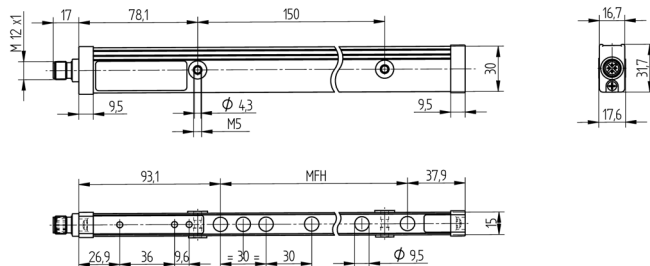
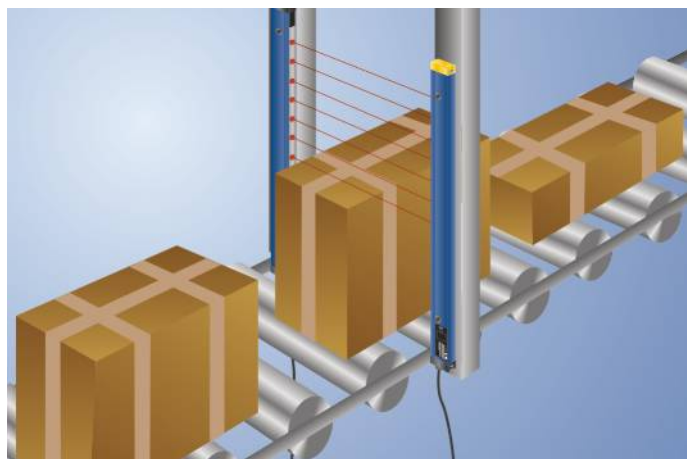
Supply Voltage	18...30 V DC
Temperature Drift	< 10 %
Temperature Range	-25...60 °C
Reverse Polarity Protection	yes
Protection Class	III

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)

Display brightness may decrease with age. This does not result in any impairment of the sensor function.



Plug Version

Part Number	OSEB153Z0103	OEEB153U0135	OSEB163Z0103	OEEB163U0135	OSEB183Z0103	OEEB183U0135
Switchable to NC/NO		●		●		●
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 _b = 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 V1.0		IO-Link V1.0		IO-Link V1.0
Test input	yes		yes		yes	
Setting Method		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.	1018	188	1018	188	1018	188
Control Panel No.	EB2	EB3	EB2	EB3	EB2	EB3
Suitable Connection Technology No.	2	2 35	2	2 35	2	2 35

Connection Diagrams page 116

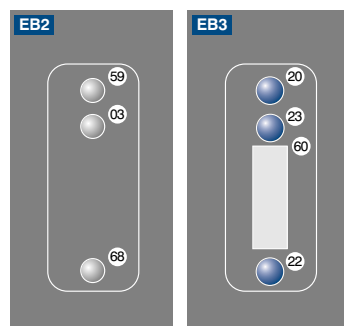
Complementary Products

Analog Evaluation Unit AW02

IO-Link Master

Software

Ctrl. Panel



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

Through-Beam Sensor

10000 mm **LASER**

Range

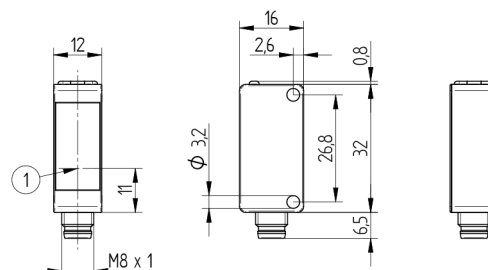
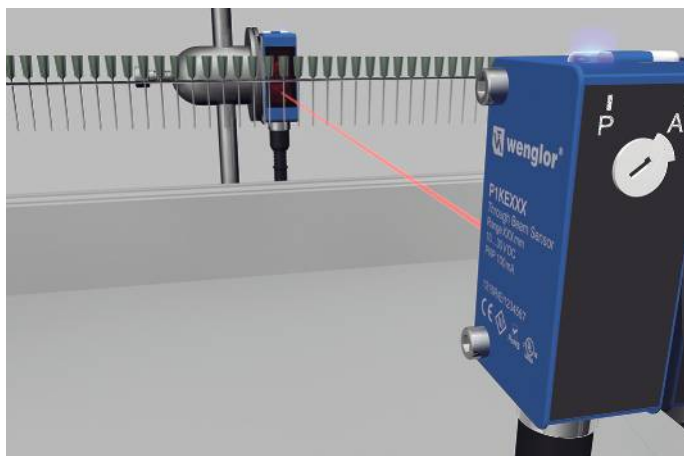


Technical Data

Optical Data	
Range	10000 mm
Light Source	Laser (red)
Service Life (T = +25 °C)	100000 h
Laser Class (EN 60825-1)	1
Electrical Data	
Supply Voltage	10...30 V DC
Current Consumption (U _b = 24 V)	< 15 mA
Temperature Drift	< 10 %
Temperature Range	-40...60 °C
Reverse Polarity Protection	yes
Protection Class	III
Mechanical Data	
Housing Material	Plastic
Degree of Protection	IP67/IP68
Connection	M8 × 1; 3-pin
Optic Cover	PMMA

- Detect smallest parts until 0,6 mm
- IO-Link 1.1
- Test input for high operational reliability
- Very high switching frequency

The through-beam sensor works with a fine laser beam as well as a transmitter and a receiver. The collimated laser beam of laser class 1 detects objects, for instance, when conducting installation, feed or presence controls, starting at a size of just 0,6 millimeters. The transmitter can be deactivated using test input in order to test the functionality of the through-beam sensor. The IO-Link interface can be used to configure the sensor (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and signal values.



1 = Transmitter Diode
Screw M3 = 0,5 Nm
All dimensions in mm (1 mm = 0.03937 Inch)

Plug Version				
	Part Number	P1KS003	P1KE007	P1KE010
PNP NC			●	
NPN NC				●
IO-Link			●	●
Smallest Recognizable Part			see Table 1	see Table 1
Switching Hysteresis			< 15 %	< 15 %
Max. Ambient Light			10000 Lux	10000 Lux
Spot Diameter		see Table 1		
Sensor Type		Emitter	Receiver	Receiver
Supply Voltage with IO-Link			18...30 V DC	18...30 V DC
Switching Frequency			4500 Hz	4500 Hz
Switching Frequency (interference-free mode)			2000 Hz	2000 Hz
Response Time			0,11 ms	0,11 ms
Response time (interference-free mode)			0,25 ms	0,25 ms
Switching Output Voltage Drop			< 2 V	< 2 V
Switching Output/Switching Current			100 mA	100 mA
Residual Current Switching Output			< 50 μA	< 50 μA
Short Circuit and Overload Protection			yes	yes
Interface			IO-Link V1.1	IO-Link V1.1
Test input		yes		
FDA Accession Number		1710976-001		
Setting Method			Potentiometer	Potentiometer
MTTFd (EN ISO 13849-1)		3278,87 a	1945,13 a	1945,13 a
Connection Diagram No.		703	217	218
Control Panel No.		1K2	1K1	1K1
Suitable Connection Technology No.		8	8	8
Suitable Mounting Technology No.		400	400	400

Connection Diagrams page 116

Complementary Products

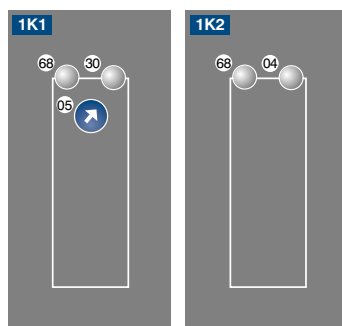
IO-Link Master

Software

Table 1

Working Distance	1 m	6 m	10 m
Spot Diameter	2,5 mm	25 mm	40 mm

Ctrl. Panel



04 = Function Indicator
05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

Through-Beam Sensor

6000 mm

Range



Technical Data

Optical Data

Range	6000 mm
Light Source	Red Light
Service Life (T = +25 °C)	100000 h

Electrical Data

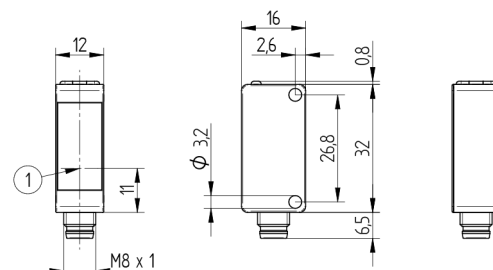
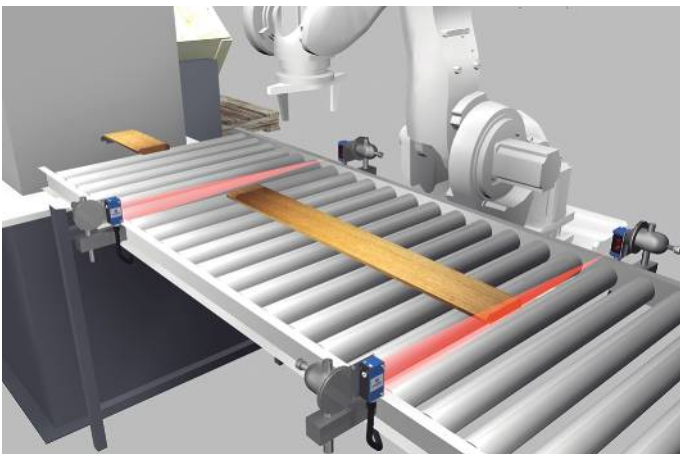
Supply Voltage	10...30 V DC
Current Consumption (U _b = 24 V)	< 20 mA
Temperature Drift	< 10 %
Temperature Range	-40...60 °C
Reverse Polarity Protection	yes
Lockable	yes
Protection Class	III

Mechanical Data

Housing Material	Plastic
Degree of Protection	IP67/IP68
Connection	M8 × 1; 3-pin
Optic Cover	PMMA

- Condition monitoring
- High light intensity with large switching reserve
- IO-Link 1.1
- Test input for high operational reliability

The through-beam sensor works with red light as well as a transmitter and a receiver. Thanks to their high light intensity, the sensor provides a high degree of operational reliability even with interferences like steam, fog or dust. The transmitter can be deactivated using test input in order to test the functionality of the through-beam sensor. The IO-Link interface can be used to configure the sensor (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and signal values.



1 = Transmitter Diode
Screw M3 = 0,5 Nm
All dimensions in mm (1 mm = 0.03937 Inch)

Plug Version			
     RoHS	Part Number		
		P1KS002	P1KE002
PNP NO		●	
PNP NC			●
IO-Link		●	●
Smallest Recognizable Part		see Table 1	see Table 1
Switching Hysteresis		< 15 %	< 10 %
Max. Ambient Light		10000 Lux	10000 Lux
Spot Diameter	see Table 1		
Sensor Type	Emitter	Receiver	Receiver
Supply Voltage with IO-Link		18...30 V DC	18...30 V DC
Switching Frequency		1000 Hz	1000 Hz
Switching Frequency (interference-free mode)		500 Hz	500 Hz
Response Time		0,5 ms	0,5 ms
Response time (interference-free mode)		1 ms	1 ms
Switching Output Voltage Drop		< 2 V	< 2 V
Switching Output/Switching Current		100 mA	100 mA
Residual Current Switching Output		< 50 µA	< 50 µA
Short Circuit and Overload Protection		yes	yes
Interface		IO-Link V1.1	IO-Link V1.1
Test input	yes		
Setting Method		Potentiometer	Potentiometer
MTTFd (EN ISO 13849-1)	3758,07 a	2111,25 a	2111,25 a
Connection Diagram No.	703	216	217
Control Panel No.	1K2	1K1	1K1
Suitable Connection Technology No.	8	8	8
Suitable Mounting Technology No.	400	400	400

Connection Diagrams page 116

Complementary Products

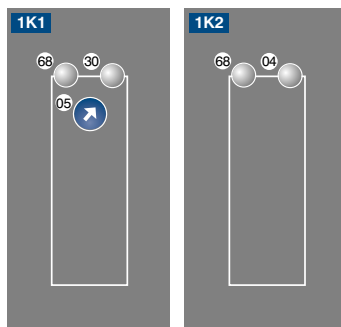
IO-Link Master

Software

Table 1

Working Distance	1 m	2 m	6 m
Spot Diameter	70 mm	140 mm	500 mm

Ctrl. Panel



04 = Function Indicator
05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

Through-Beam Sensor

6000 mm

Range



Technical Data

Optical Data

Range	6000 mm
Light Source	Red Light
Service Life (T = +25 °C)	100000 h

Electrical Data

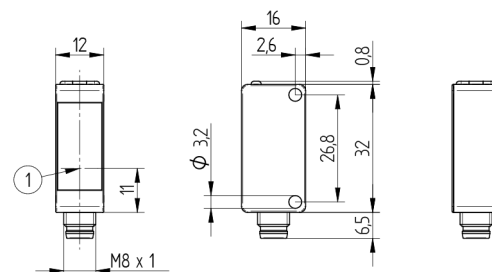
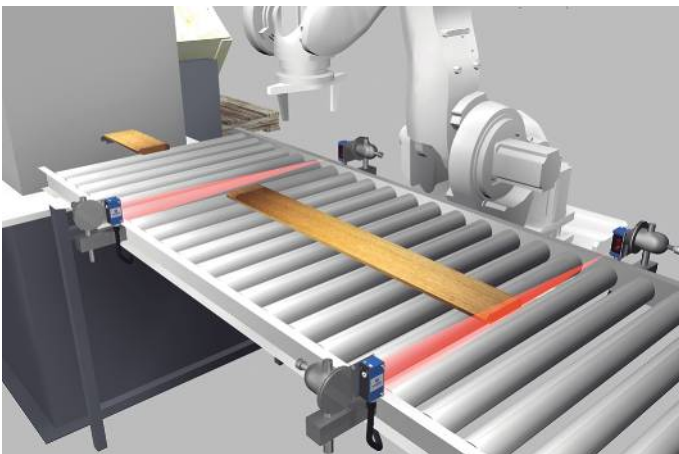
Supply Voltage	10...30 V DC
Current Consumption (U _b = 24 V)	< 20 mA
Temperature Drift	< 10 %
Temperature Range	-40...60 °C
Reverse Polarity Protection	yes
Lockable	yes
Protection Class	III

Mechanical Data

Housing Material	Plastic
Degree of Protection	IP67/IP68
Connection	M8 × 1; 3-pin
Optic Cover	PMMA

- Condition monitoring
- High light intensity with large switching reserve
- IO-Link 1.1
- Test input for high operational reliability

The through-beam sensor works with red light as well as a transmitter and a receiver. Thanks to their high light intensity, the sensor provides a high degree of operational reliability even with interferences like steam, fog or dust. The transmitter can be deactivated using test input in order to test the functionality of the through-beam sensor. The IO-Link interface can be used to configure the sensor (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and signal values.



1 = Transmitter Diode
Screw M3 = 0,5 Nm
All dimensions in mm (1 mm = 0.03937 Inch)

Plug Version				
	Part Number	P1KS002	P1KE006	P1KE009
NPN NO			●	
NPN NC				●
IO-Link			●	●
Smallest Recognizable Part			see Table 1	see Table 1
Switching Hysteresis			< 15 %	< 10 %
Max. Ambient Light			10000 Lux	10000 Lux
Spot Diameter		see Table 1		
Sensor Type		Emitter	Receiver	Receiver
Supply Voltage with IO-Link			18...30 V DC	18...30 V DC
Switching Frequency			1000 Hz	1000 Hz
Switching Frequency (interference-free mode)			500 Hz	500 Hz
Response Time			0,5 ms	0,5 ms
Response time (interference-free mode)			1 ms	1 ms
Switching Output Voltage Drop			< 2 V	< 2 V
Switching Output/Switching Current			100 mA	100 mA
Residual Current Switching Output			< 50 μA	< 50 μA
Short Circuit and Overload Protection			yes	yes
Interface			IO-Link V1.1	IO-Link V1.1
Test input		yes		
Setting Method			Potentiometer	Potentiometer
MTTFd (EN ISO 13849-1)		3758,07 a	2111,25 a	2111,25 a
Connection Diagram No.		703	171	218
Control Panel No.		1K2	1K1	1K1
Suitable Connection Technology No.		8	8	8
Suitable Mounting Technology No.		400	400	400

Connection Diagrams page 116

Complementary Products

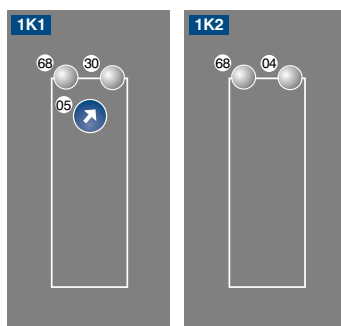
IO-Link Master

Software

Table 1

Working Distance	1 m	2 m	6 m
Spot Diameter	70 mm	140 mm	500 mm

Ctrl. Panel



04 = Function Indicator
05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

Through-Beam Sensor

6000 mm

Range



Technical Data

Optical Data

Range	6000 mm
Light Source	Red Light
Service Life (T = +25 °C)	100000 h

Electrical Data

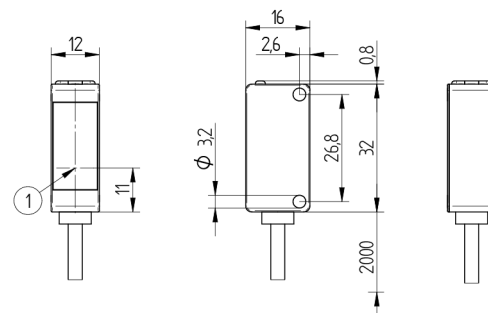
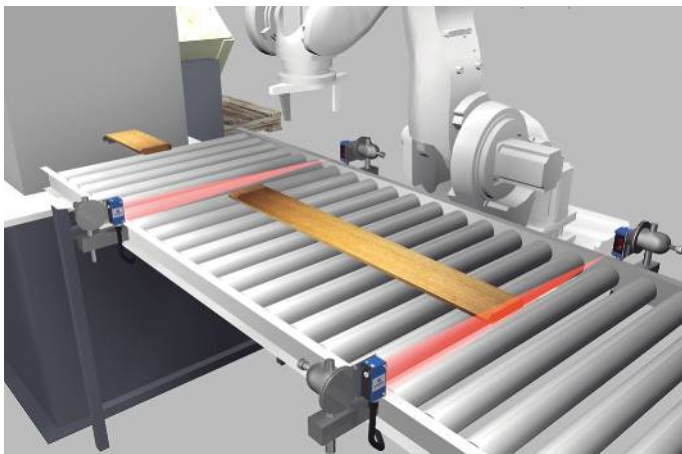
Supply Voltage	10...30 V DC
Current Consumption (U _b = 24 V)	< 20 mA
Temperature Drift	< 10 %
Temperature Range	-40...60 °C
Reverse Polarity Protection	yes
Lockable	yes
Protection Class	III

Mechanical Data

Housing Material	Plastic
Degree of Protection	IP67/IP68
Connection	Cable, 3-wire, 2 m
Optic Cover	PMMA

- Condition monitoring
- High light intensity with large switching reserve
- IO-Link 1.1
- Test input for high operational reliability

The through-beam sensor works with red light as well as a transmitter and a receiver. Thanks to their high light intensity, the sensor provides a high degree of operational reliability even with interferences like steam, fog or dust. The transmitter can be deactivated using test input in order to test the functionality of the through-beam sensor. The IO-Link interface can be used to configure the sensor (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and signal values.



1 = Transmitter Diode
Screw M3 = 0,5 Nm
All dimensions in mm (1 mm = 0.03937 Inch)


**Prewired
Version**

Part Number	P1KS001	P1KE001	P1KE003	P1KE005	P1KE008
PNP NO		●			
PNP NC			●		
NPN NO				●	
NPN NC					●
IO-Link		●	●	●	●
Smallest Recognizable Part		see Table 1	see Table 1	see Table 1	see Table 1
Switching Hysteresis		< 10 %	< 10 %	< 10 %	< 10 %
Max. Ambient Light		10000 Lux	10000 Lux	10000 Lux	10000 Lux
Spot Diameter	see Table 1				
Sensor Type	Emitter	Receiver	Receiver	Receiver	Receiver
Supply Voltage with IO-Link		18...30 V DC	18...30 V DC	18...30 V DC	18...30 V DC
Switching Frequency		1000 Hz	1000 Hz	1000 Hz	1000 Hz
Switching Frequency (interference-free mode)		500 Hz	500 Hz	500 Hz	500 Hz
Response Time		0,5 ms	0,5 ms	0,5 ms	0,5 ms
Response time (interference-free mode)		1 ms	1 ms	1 ms	1 ms
Switching Output Voltage Drop		< 2 V	< 2 V	< 2 V	< 2 V
Switching Output/Switching Current		100 mA	100 mA	100 mA	100 mA
Residual Current Switching Output		< 50 µA	< 50 µA	< 50 µA	< 50 µA
Short Circuit and Overload Protection		yes	yes	yes	yes
Interface		IO-Link V1.1	IO-Link V1.1	IO-Link V1.1	IO-Link V1.1
Test input	yes				
Setting Method		Potentiometer	Potentiometer	Potentiometer	Potentiometer
MTTFd (EN ISO 13849-1)	3758,07 a	2111,25 a	2111,25 a	2111,25 a	2111,25 a
Connection Diagram No.	803	219	220	197	198
Control Panel No.	1K2	1K1	1K1	1K1	1K1
Suitable Mounting Technology No.	400	400	400	400	400

Connection Diagrams page 116

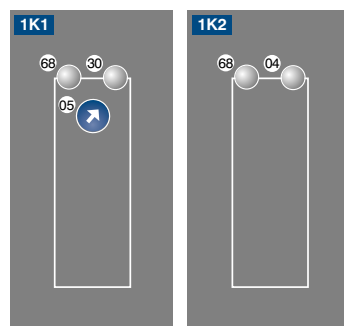
Complementary Products

IO-Link Master

Software

Table 1

Working Distance	1 m	2 m	6 m
Spot Diameter	70 mm	140 mm	500 mm

Ctrl. Panel


04 = Function Indicator
05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

Through-Beam Sensor

6000 mm

Range



Technical Data

Optical Data

Range	6000 mm
Light Source	Red Light
Service Life (T = +25 °C)	100000 h

Electrical Data

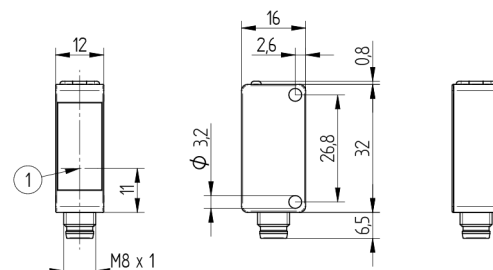
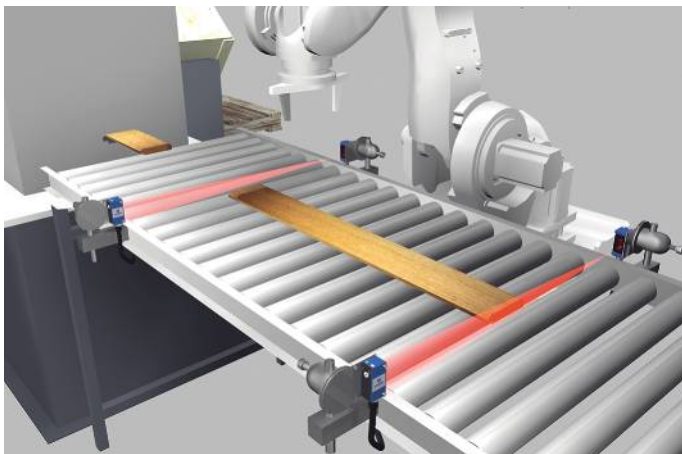
Supply Voltage	10...30 V DC
Current Consumption (U _b = 24 V)	< 20 mA
Temperature Drift	< 10 %
Temperature Range	-40...60 °C
Reverse Polarity Protection	yes
Lockable	yes
Protection Class	III

Mechanical Data

Housing Material	Plastic
Degree of Protection	IP67/IP68
Connection	M8 × 1; 4-pin
Optic Cover	PMMA

- Condition monitoring
- High light intensity with large switching reserve
- IO-Link 1.1
- Test input for high operational reliability

The through-beam sensor works with red light as well as a transmitter and a receiver. Thanks to their high light intensity, the sensor provides a high degree of operational reliability even with interferences like steam, fog or dust. The transmitter can be deactivated using test input in order to test the functionality of the through-beam sensor. The IO-Link interface can be used to configure the sensor (PNP/NPN, NC/NO, switching distance), as well as for reading out switching statuses and signal values.



1 = Transmitter Diode
Screw M3 = 0,5 Nm
All dimensions in mm (1 mm = 0.03937 Inch)

	Plug Version	
	Part Number	
	P1KS005	P1KE012
PNP NO/NC antivalent		●
IO-Link		●
Smallest Recognizable Part		see Table 1
Switching Hysteresis		< 10 %
Max. Ambient Light		10000 Lux
Spot Diameter	see Table 1	
Sensor Type	Emitter	Receiver
Supply Voltage with IO-Link		18...30 V DC
Switching Frequency		1000 Hz
Switching Frequency (interference-free mode)		500 Hz
Response Time		0,5 ms
Response time (interference-free mode)		1 ms
Switching Output Voltage Drop		< 2 V
Switching Output/Switching Current		100 mA
Residual Current Switching Output		< 50 µA
Short Circuit and Overload Protection		yes
Interface		IO-Link V1.1
Test input	yes	
Setting Method		Potentiometer
MTTFd (EN ISO 13849-1)	3758,07 a	2111,25 a
Connection Diagram No.	1018	215
Control Panel No.	1K2	1K1
Suitable Connection Technology No.	7	7
Suitable Mounting Technology No.	400	400

Connection Diagrams page 116

Complementary Products

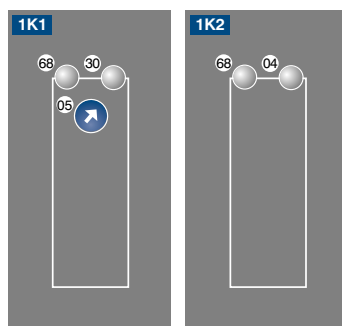
IO-Link Master

Software

Table 1

Working Distance	1 m	2 m	6 m
Spot Diameter	70 mm	140 mm	500 mm

Ctrl. Panel



04 = Function Indicator
05 = Switching Distance Adjuster
30 = Switching Status/Contamination Warning
68 = Supply Voltage Indicator

High-Performance Distance Sensor

100...6000 mm

Range



Technical Data

Ultrasonic Data

Service Life (T = +25 °C) 100000 h

Electrical Data

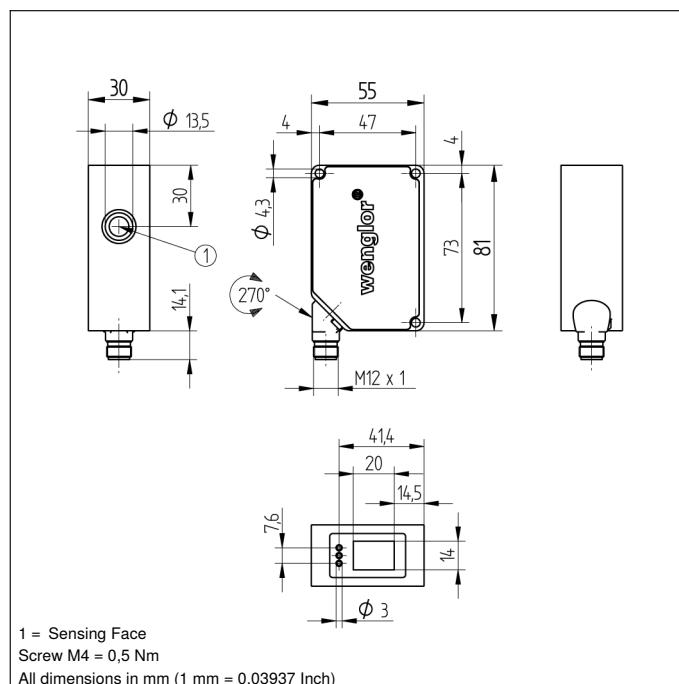
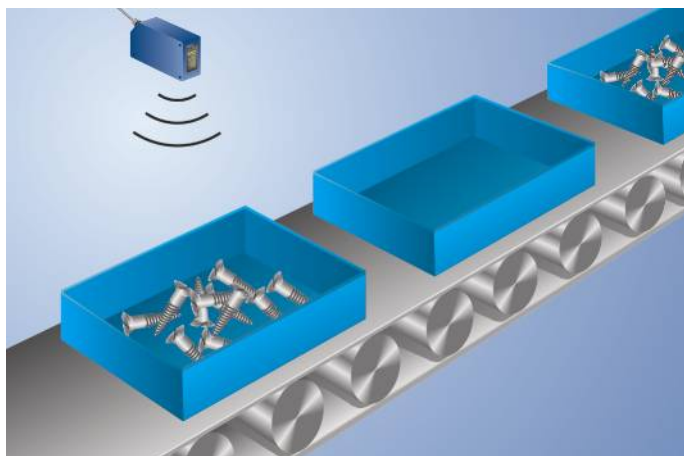
Supply Voltage	18...30 V DC
Temperature Range	-25...60 °C
Switching Outputs	2
Switching Output Voltage Drop	< 2,5 V
PNP Switching Output/Switching Current	100 mA
Analog Output	0...10 V/4...20 mA
Synchronous Mode	up to 40 sensors
Multiplex Mode	up to 16 sensors
Short Circuit Protection	yes
Reverse Polarity Protection	yes
Overload Protection	yes
Interface	IO-Link V1.0
Protection Class	III

Mechanical Data

Setting Method	Menu (OLED)
Housing Material	Plastic
Degree of Protection	IP67
Connection	M12 x 1; 4/5-pin

- 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.



Display brightness may decrease with age. This does not result in any impairment of the sensor function.



Plug Version

Part Number	Plug Version		
	UMS123U035	UMS303U035	UMS603U035
Error Output	●	●	●
PNP NO/NC switchable	●	●	●
Analog Output	●	●	●
IO-Link	●	●	●
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.	183	183	183
Control Panel No.	X2	X2	X2
Suitable Connection Technology No.	2 35	2 35	2 35
Suitable Mounting Technology No.	340	340	340
Selectable menu language	yes	yes	yes
Password Protection	yes	yes	yes

Connection Diagrams page 116

Complementary Products

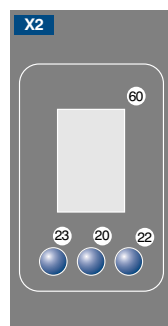
Analog Evaluation Unit AW02

IO-Link Master

PNP-NPN Converter BG2V1P-N-2M

Software

Ctrl. Panel



20 = Enter Button

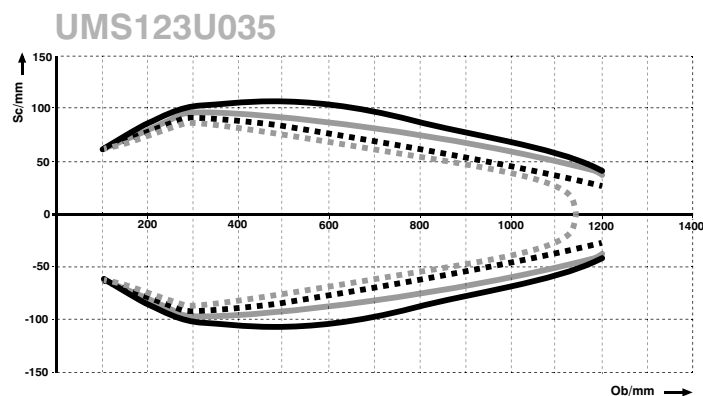
22 = UP Button

23 = Down Button

60 = Display

Characteristic response curve

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



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

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.



Technical Data

Ultrasonic Data

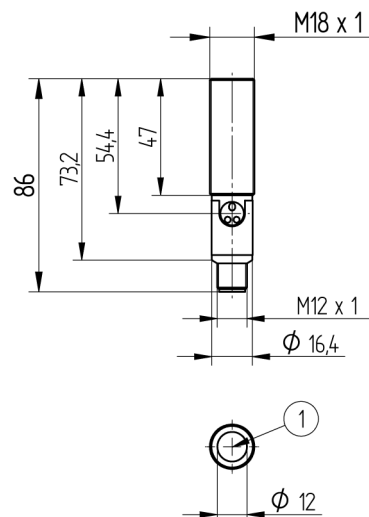
Opening Angle	< 12 °
Service Life (T = +25 °C)	100000 h

Electrical Data

Supply Voltage	18...30 V DC
Current Consumption (U _b = 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 V1.0
Protection Class	III

Mechanical Data

Setting Method	Teach-In
Housing Material	Stainless Steel
Full Encapsulation	yes
Degree of Protection	IP67
Connection	M12 × 1; 4/5-pin



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

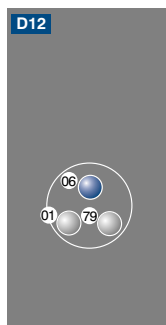
	Plug Version	
	Part Number	
	UMD402U035	UMD123U035
PNP NO/NC switchable	●	●
Analog Output	●	●
IO-Link	●	●
Working Range	50...400 mm	100...1200 mm
Measuring Range	350 mm	1100 mm
Reproducibility maximum	1 mm	2 mm
Linearity Deviation	5 mm	7 mm
Resolution	0,1 mm	0,2 mm
Ultrasonic Frequency	300 kHz	225 kHz
Switching Hysteresis	2 mm	10 mm
Switching Frequency	20 Hz	7 Hz
Response Time	25 ms	72 ms
MTTFd (EN ISO 13849-1)	828,67 a	829,12 a
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 116

Complementary Products

Analog Evaluation Unit AW02
Baffle Plate Z0021, Z0022
IO-Link Master
PNP-NPN Converter BG2V1P-N-2M
Software

Ctrl. Panel

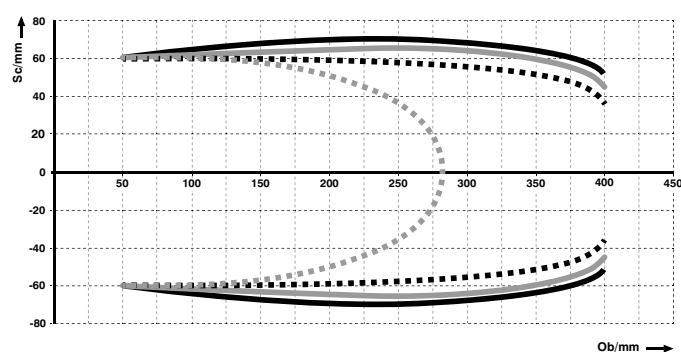


01 = Switching Status Indicator
06 = Teach Button
79 = Run/Error Indicator

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

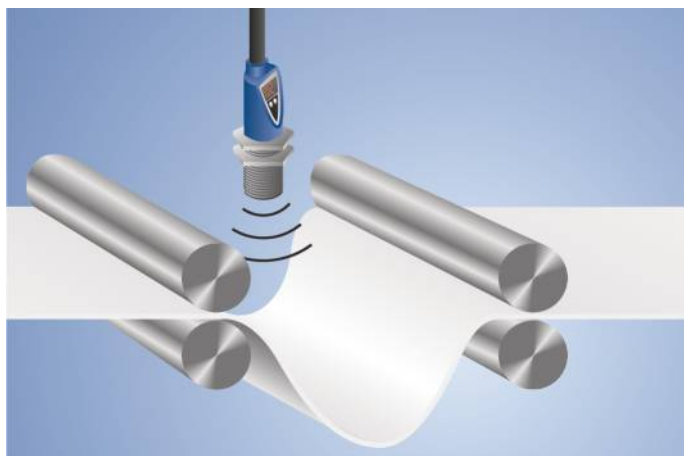
50...3000 mm

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

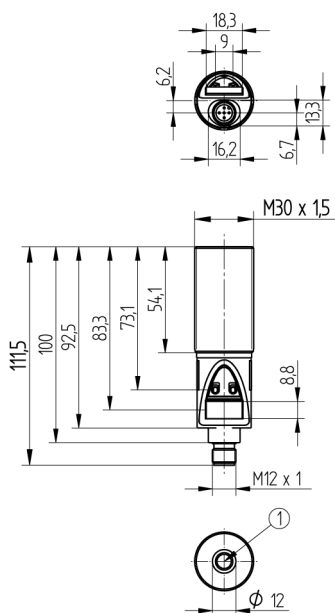
Service Life (T = +25 °C)	100000 h
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Electrical Data

Supply Voltage	18...30 V DC
Current Consumption (U _b = 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 V1.0
Protection Class	III

Mechanical Data

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



1 = Sensing Face

All dimensions in mm (1 mm = 0.03937 Inch)

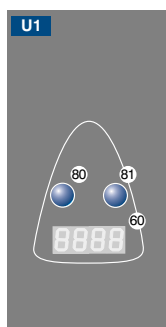
	Plug Version	
	Part Number	
	UMF402U035	UMF303U035
Error Output	●	●
PNP NO/NC switchable	●	●
Analog Output	●	●
IO-Link	●	●
Working Range	50...400 mm	200...3000 mm
Measuring Range	350 mm	2800 mm
Reproducibility maximum	1 mm	4 mm
Linearity Deviation	3 mm	4 mm
Resolution	0,1 mm	0,3 mm
Ultrasonic Frequency	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
MTTFd (EN ISO 13849-1)	727,87 a	725,66 a
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 116

Complementary Products

Analog Evaluation Unit AW02
Baffle Plate Z0023, Z0024
IO-Link Master
PNP-NPN Converter BG2V1P-N-2M
Software

Ctrl. Panel

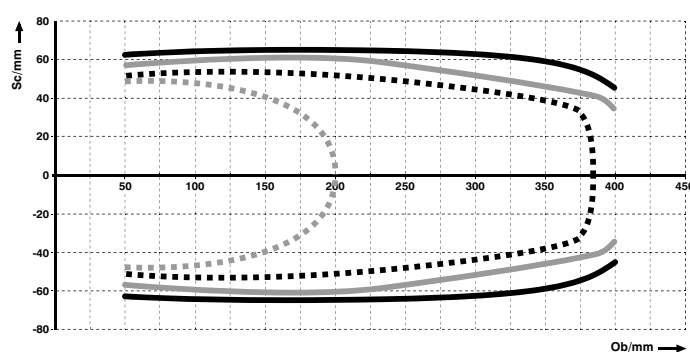


60 = Display
80 = Mode Button/Switching Status Indicator
81 = Plus Button/Error Warning

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

Reflex Sensor

30...400 mm

Range

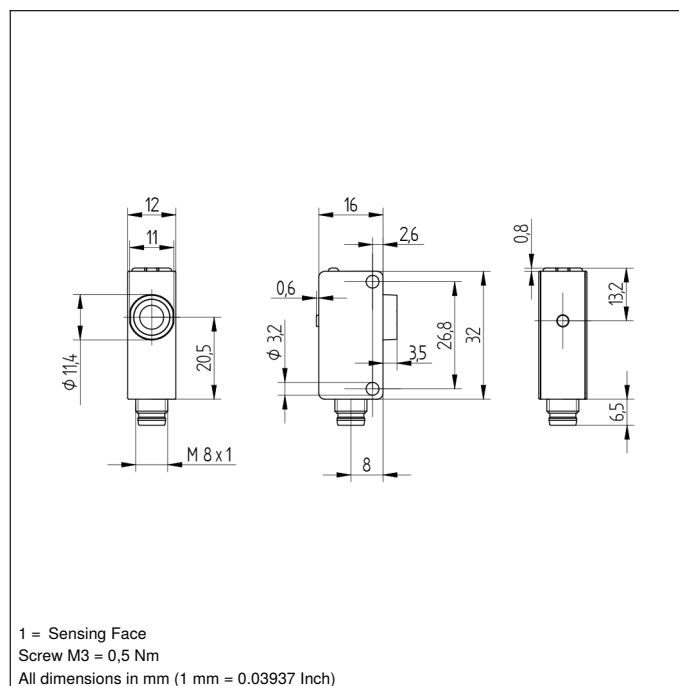
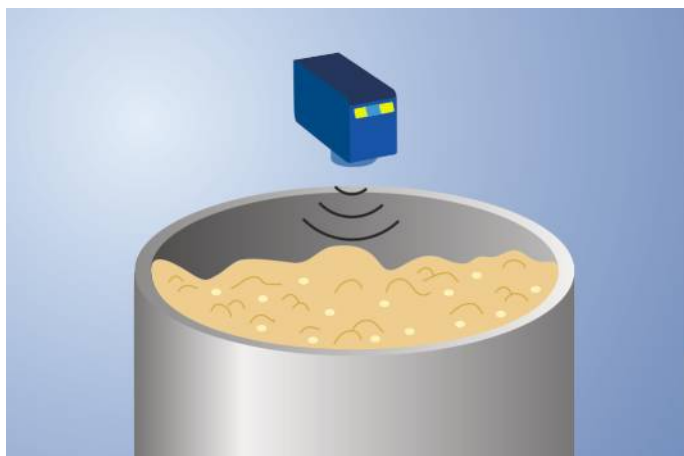


- 2 mutually independent switching outputs
- Miniature design
- Ready for Industrie 4.0 with IO-Link version 1.1
- Reflex and through-beam operation mode are possible

Technical Data

Ultrasonic Data	
Working range, reflex sensor	30...400 mm
Working range, through-beam sensor	1...800 mm
Resolution	0,5 mm
Ultrasonic Frequency	325 kHz
Opening Angle	< 12 °
Service Life (T = +25 °C)	100000 h
Switching Hysteresis	1 % *
Electrical Data	
Supply Voltage	18...30 V DC
Current Consumption (U _b = 24 V)	< 20 mA
Switching frequency, reflex sensor	30 Hz
Switching frequency, through-beam sensor	70 Hz
Response time, reflex sensor	17 ms
Response time, through-beam sensor	8 ms
Temperature Range	-30...60 °C
Switching Outputs	2
Switching Output Voltage Drop	< 2,5 V
Switching Output/Switching Current	100 mA
Synchronous Mode	up to 40 sensors
Short Circuit Protection	yes
Reverse Polarity Protection	yes
Overload Protection	yes
Lockable	yes
Interface	IO-Link V1.1
Data Storage	yes
Protection Class	III
Mechanical Data	
Setting Method	Teach-In
Housing Material	Plastic
Degree of Protection	IP68
Connection	M8 × 1; 4-pin
Safety-relevant Data	
MTTFd (EN ISO 13849-1)	1106,71 a

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.



* Referring to the switching distance, at least 2 mm.



	Plug Version	
	Part Number	
	U1KT001	U1KT002
Programmable error output	●	●
Configurable as PNP/NPN	●	●
Programmable as NC/NO	●	●
IO-Link	●	●
Connection Diagram No.	162	162
Control Panel No.	A23	A23
Suitable Connection Technology No.	7	7
Suitable Mounting Technology No.	400	400

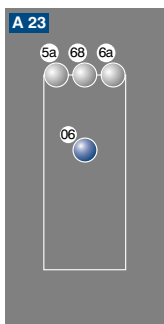
Connection Diagrams page 116

Complementary Products

IO-Link Master

Software

Ctrl. Panel



06 = Teach Button

5a = Switching Status Display, O1

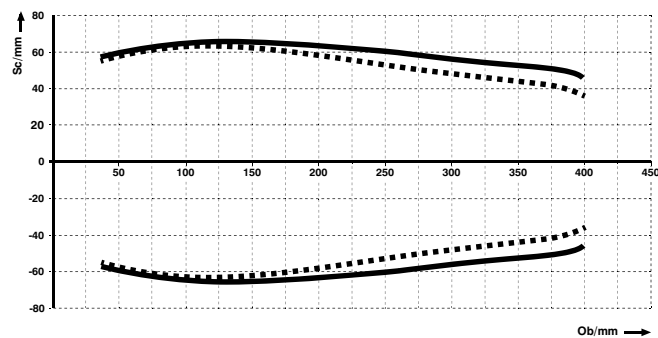
68 = Supply Voltage Indicator

6a = Switching Status Display, O2

Characteristic response curve

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

U1KT001



Ob = Object

Sc = Sonic cone width

— Standard

- - - 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

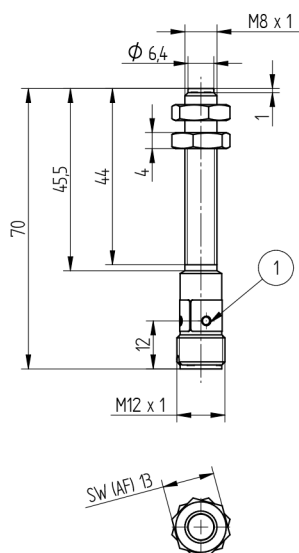
Inductive Sensor with IO-Link

4 mm

M8 x 1

Range
semi-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 Stainless Steel V2A/CuZn/Al	1,07/0,50/0,48
Mounting	semi-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
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 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	150 mA
Residual Current Switching Output	< 100 µA
Short Circuit Protection	yes
Reverse Polarity and Overload Protection	yes
Interface	IO-Link V1.0
Protection Class	III

Mechanical Data

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

Safety-relevant Data

MTTFd (EN ISO 13849-1)	3706,54 a
------------------------	-----------

Plug Version

Part Number	IO8H025
IO-Link	●
Switchable to NC/NO	●
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 116

Complementary Products

IO-Link Master
Software

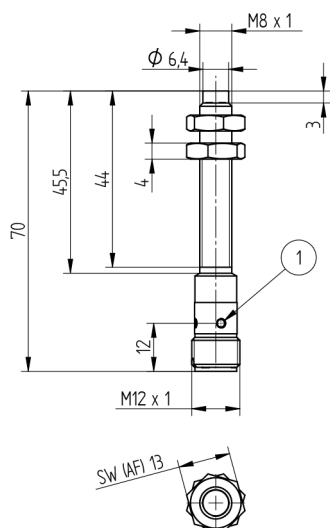


Inductive Sensor with IO-Link

6 mm

M8 x 1

Range
non-flush



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



Technical Data

Inductive Data

Switching Distance	6 mm
Standard Target	18 x 18 mm
Correction Factors Stainless Steel 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
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 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	150 mA
Residual Current Switching Output	< 100 µA
Short Circuit Protection	yes
Reverse Polarity and Overload Protection	yes
Interface	IO-Link V1.0
Protection Class	III

Mechanical Data

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

Safety-relevant Data

MTTFd (EN ISO 13849-1)	3706,54 a
------------------------	-----------

Plug Version

Part Number	108H026
IO-Link	●
Switchable to NC/NO	●
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

Connection Diagrams page 116

Complementary Products

IO-Link Master
Software

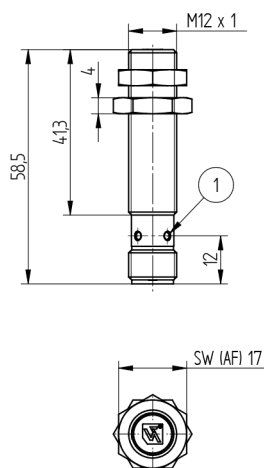
Inductive Sensor with IO-Link

6 mm

M12 x 1

Range
semi-flush

weproTec



1 = Switching Status Indicator
Sleeve M12x1 = 12 Nm
All dimensions in mm (1 mm = 0.03937 Inch)



Technical Data

Inductive Data

Switching Distance	6 mm
Standard Target	18 x 18 mm
Correction Factors Stainless Steel V2A/CuZn/Al	1,11/0,53/0,50
Mounting	semi-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
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 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	150 mA
Residual Current Switching Output	< 100 µA
Short Circuit Protection	yes
Reverse Polarity and Overload Protection	yes
Interface	IO-Link V1.0
Protection Class	III

Mechanical Data

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

Safety-relevant Data

MTTFd (EN ISO 13849-1)	3706,54 a
------------------------	-----------

Plug Version

Part Number	112H019
IO-Link	●
Switchable to NC/NO	●
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 116

Complementary Products

IO-Link Master
Software

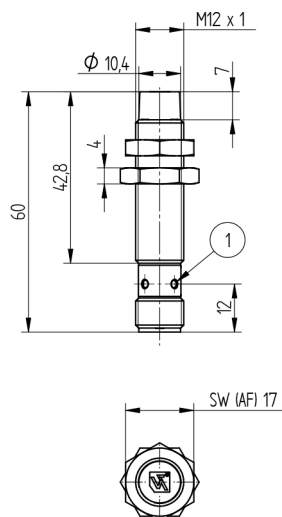


Inductive Sensor with IO-Link

12 mm

M12 x 1

Range
non-flush



1 = Switching Status Indicator
Sleeve M12x1 = 12 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 Stainless Steel 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
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 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	150 mA
Residual Current Switching Output	< 100 µA
Short Circuit Protection	yes
Reverse Polarity and Overload Protection	yes
Interface	IO-Link V1.0
Protection Class	III

Mechanical Data

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

Safety-relevant Data

MTTFd (EN ISO 13849-1)	3706,54 a
------------------------	-----------

Plug Version

Part Number	112H020
IO-Link	●
Switchable to NC/NO	●
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 116

Complementary Products

IO-Link Master
Software

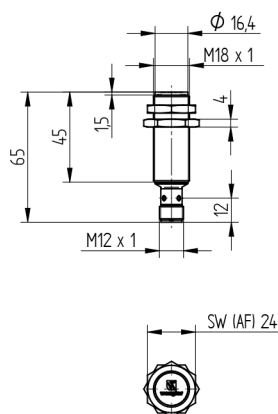
Inductive Sensor with IO-Link

12 mm

M18 x 1

Range
semi-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 Stainless Steel V2A/CuZn/Al	0,97/0,47/0,43
Mounting	semi-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
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 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	150 mA
Residual Current Switching Output	< 100 µA
Short Circuit Protection	yes
Reverse Polarity and Overload Protection	yes
Interface	IO-Link V1.0
Protection Class	III

Mechanical Data

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

Safety-relevant Data

MTTFd (EN ISO 13849-1)	3706,54 a
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Plug Version

Part Number	118H013
IO-Link	●
Switchable to NC/NO	●
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 116

Complementary Products

IO-Link Master
Software



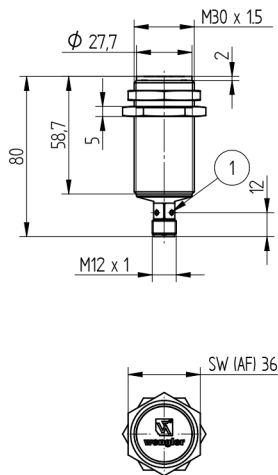
Inductive Sensor with IO-Link

22 mm

M30 × 1,5

Range
semi-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 Stainless Steel V2A/CuZn/Al	0,85/0,35/0,34
Mounting	semi-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
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 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	150 mA
Residual Current Switching Output	< 100 µA
Short Circuit Protection	yes
Reverse Polarity and Overload Protection	yes
Interface	IO-Link V1.0
Protection Class	III
Mechanical Data	
Housing Material	CuZn, nickel-plated
Degree of Protection	IP67
Connection	M12 × 1; 4-pin
Safety-relevant Data	
MTTFd (EN ISO 13849-1)	3706,54 a

Plug Version

Part Number	130H013
IO-Link	●
Switchable to NC/NO	●
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 116

Complementary Products

IO-Link Master
Software

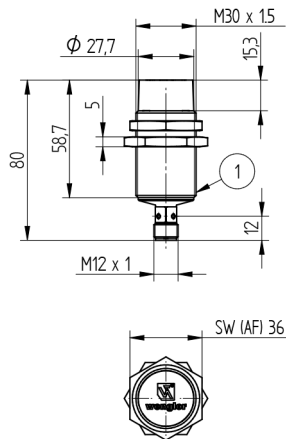


Inductive Sensor with IO-Link

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 Stainless Steel 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
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 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	150 mA
Residual Current Switching Output	< 100 µA
Short Circuit Protection	yes
Reverse Polarity and Overload Protection	yes
Interface	IO-Link V1.0
Protection Class	III

Mechanical Data

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

Safety-relevant Data

MTTFd (EN ISO 13849-1)	3706,54 a
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Plug Version

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

Connection Diagrams page 116

Complementary Products

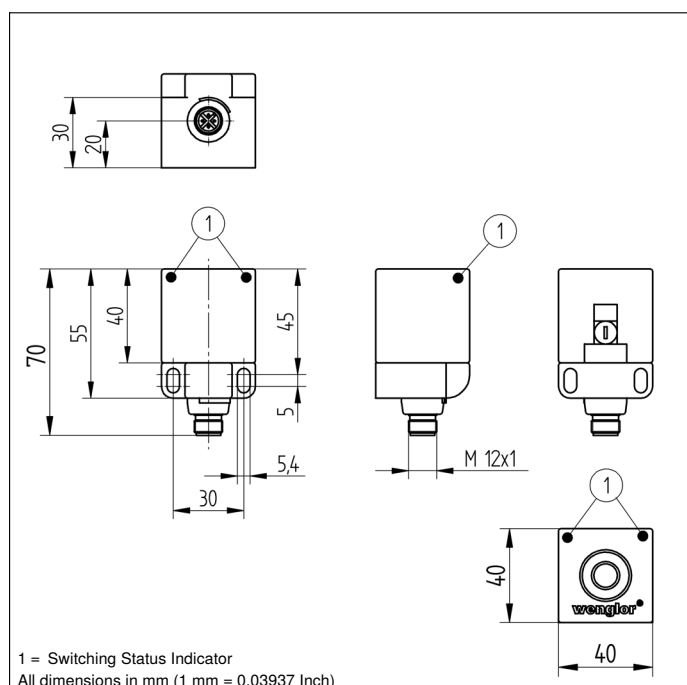
IO-Link Master
Software

Inductive Sensor with IO-Link

20 mm

40 × 40 × 55 mm (1Q)

Range
flush



Technical Data

Inductive Data	
Switching Distance	20 mm
Standard Target	60 × 60 mm
Correction Factors Stainless Steel 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
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 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	150 mA
Residual Current Switching Output	< 100 µA
Short Circuit Protection	yes
Reverse Polarity and Overload Protection	yes
Interface	IO-Link V1.0
Protection Class	III
Mechanical Data	
Housing Material	Plastic
Full Encapsulation	yes
Degree of Protection	IP67
Connection	M12 × 1; 4-pin
Safety-relevant Data	
MTTFd (EN ISO 13849-1)	3706,54 a



Plug Version

Part Number	11QH005
IO-Link	●
Switchable to NC/NO	●
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 116

Complementary Products

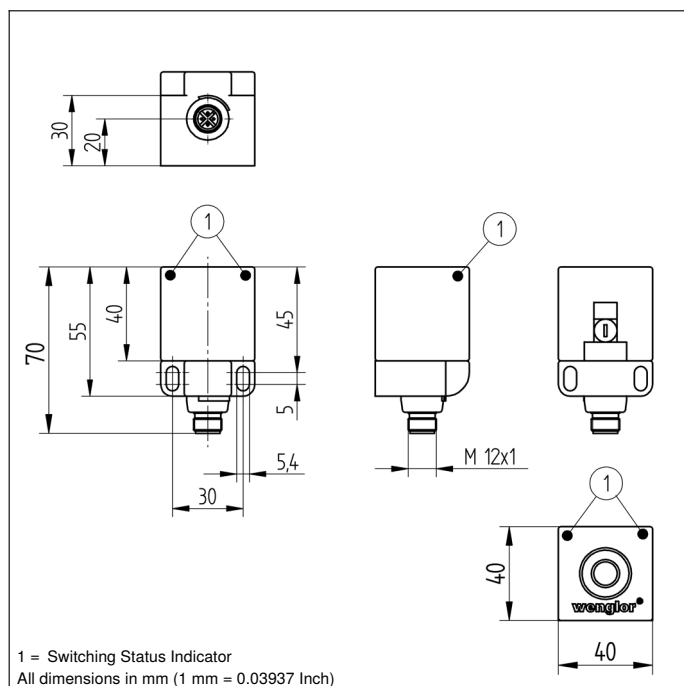
IO-Link Master
Software

Inductive Sensor with IO-Link

40 mm

40 × 40 × 55 mm (1Q)

Range
non-flush



Technical Data

Inductive Data

Switching Distance	40 mm
Standard Target	120 × 120 mm
Correction Factors Stainless Steel 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
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (U _b = 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	150 mA
Residual Current Switching Output	< 100 µA
Short Circuit Protection	yes
Reverse Polarity and Overload Protection	yes
Interface	IO-Link V1.0
Protection Class	III

Mechanical Data

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

Safety-relevant Data

MTTFd (EN ISO 13849-1)	3706,54 a
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Plug Version

Part Number	11QH006
IO-Link	●
Switchable to NC/NO	●
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 116

Complementary Products

IO-Link Master
Software

Flow Sensor

10...400 cm/s

Range

weFlux² InoxSens



- A single sensor for flow and temperature
- FDA compliant
- Measurement independent of flow direction and installation position
- Ready for Industry 4.0 with IO-Link 1.1

weFlux² Flow Sensors simultaneously measure flow velocity and the temperature of aqueous liquids regardless of position and direction of flow. Advantage: The number of measuring points and the diversity of sensor variants are cut in half, and greatest possible flexibility is assured for installation in closed piping systems. Either 2 switching outputs or 1 switching output and 1 analog output are available depending on application requirements. The outputs can be configured as desired via IO-Link in order to flexibly adapt the sensors to the respective application.

Technical Data

Sensor-specific data

Measuring Range	10...400 cm/s
Temperature of the medium, flow measurement	-25...125 °C
Temperature of the medium, temperature measurement	-25...150 °C
Adjustable Range	10...400 cm/s
Medium	Water
Measuring error	2 %
Response time in case of temperature jump	10 s

Environmental conditions

Ambient temperature	-25...80 °C
Storage temperature	-25...80 °C
Mechanical Strength	100 bar
EMC	DIN EN 61326-1
Shock resistance per DIN IEC 68-2-27	30 g / 11 ms
Vibration resistance per DIN IEC 60068-2-6	5 g (10...2000 Hz)

Electrical Data

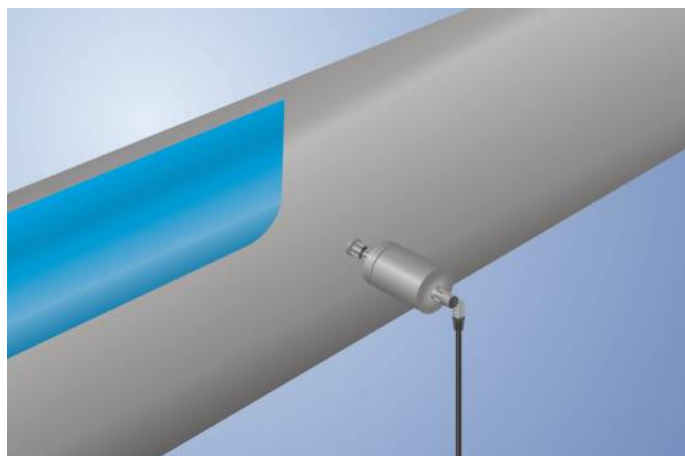
Supply Voltage	12...32 V DC
Current Consumption (U _b = 24 V)	< 40 mA
Switching Outputs	2
Analog Outputs	1
Analog Output	0...10 V/4...20 mA
Response Time	1...5 s
Switching Output/Switching Current	± 100 mA
Switching Output Voltage Drop	< 2 V
Current Output Load Resistance	(U _b -U _{bmin})/0,02A
Current Load Voltage Output	≤ 20 mA
Short Circuit Protection	yes
Reverse Polarity Protection	yes
Protection Class	III
Interface	IO-Link V1.1

Mechanical Data

Setting Method	IO-Link
Housing Material	1.4404
Material in contact with media	1.4404
Degree of Protection	IP68/IP69K *
Connection	M12 × 1; 4-pin
Process Connection	Cutting/locking ring

Safety-relevant Data

MTTFd (EN ISO 13849-1)	1210,41 a
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* Tested by wenglor



	Plug Version	
	Part Number	
	FXFF001	FXFF002
Analog output switchable to flow or temperature	●	●
Switching output switchable to flow or temperature	●	●
Switchable to NC/NO	●	●
Configurable as PNP/NPN/Push-Pull	●	●
IO-Link	●	●
Process Connection Length (PCL)	59 mm	109 mm
Probe Length (PL)	50 mm	100 mm
Connection Diagram No.	139	139
Suitable Connection Technology No.	21	21
Suitable Mounting Technology No.	907 908	907 908

Connection Diagrams page 116

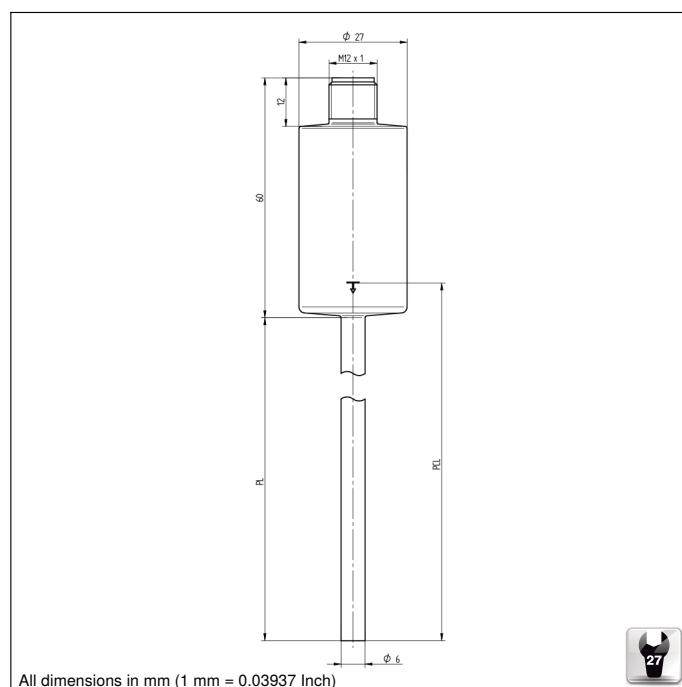
The complete product range of flow sensors can be found at www.wenglor.com.
An overview of this can be found in the table of contents.

Complementary Products

IO-Link Master

Software

ZH6C00x Adapter to G1/4"



Flow Sensor

10...400 cm/s

Range

weFlux² InoxSens

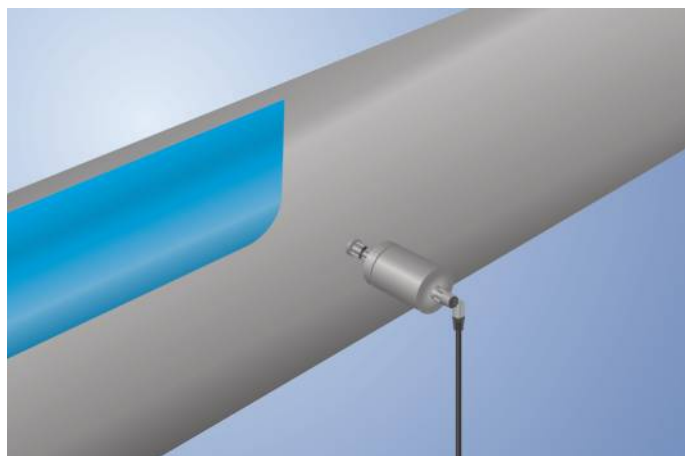


- A single sensor for flow and temperature
- FDA compliant
- Measurement independent of flow direction and installation position
- Ready for Industry 4.0 with IO-Link 1.1

weFlux² Flow Sensors simultaneously measure flow velocity and the temperature of aqueous liquids regardless of position and direction of flow. Advantage: The number of measuring points and the diversity of sensor variants are cut in half, and greatest possible flexibility is assured for installation in closed piping systems. Either 2 switching outputs or 1 switching output and 1 analog output are available depending on application requirements. The outputs can be configured as desired via IO-Link in order to flexibly adapt the sensors to the respective application.

Technical Data

Sensor-specific data	
Measuring Range	10...400 cm/s
Temperature of the medium, flow measurement	-25...125 °C
Temperature of the medium, temperature measurement	-25...150 °C
Adjustable Range	10...400 cm/s
Medium	Water
Measuring error	2 %
Response time in case of temperature jump	10 s
Environmental conditions	
Ambient temperature	-25...80 °C
Storage temperature	-25...80 °C
Mechanical Strength	100 bar
EMC	DIN EN 61326-1
Shock resistance per DIN IEC 68-2-27	30 g / 11 ms
Vibration resistance per DIN IEC 60068-2-6	5 g (10...2000 Hz)
Electrical Data	
Supply Voltage	12...32 V DC
Current Consumption (U _b = 24 V)	< 40 mA
Switching Outputs	2
Analog Outputs	1
Analog Output	0...10 V/4...20 mA
Response Time	1...5 s
Switching Output/Switching Current	± 100 mA
Switching Output Voltage Drop	< 2 V
Current Output Load Resistance	(U _b -U _{bmin})/0,02A
Current Load Voltage Output	≤ 20 mA
Short Circuit Protection	yes
Reverse Polarity Protection	yes
Protection Class	III
Interface	IO-Link V1.1
Mechanical Data	
Setting Method	IO-Link
Housing Material	1.4404
Material in contact with media	1.4404
Degree of Protection	IP68/IP69K *
Connection	M12 × 1; 4-pin
Process Connection	Sealing cone M18 × 1.5
Safety-relevant Data	
MTTFd (EN ISO 13849-1)	1210,41 a



* Tested by wenglor



	Plug Version	
	Part Number	
	FXFF003	FXFF004
Analog output switchable to flow or temperature	●	●
Switching output switchable to flow or temperature	●	●
Switchable to NC/NO	●	●
Configurable as PNP/NPN/Push-Pull	●	●
IO-Link	●	●
Process Connection Length (PCL)	82 mm	132 mm
Probe Length (PL)	50 mm	100 mm
Connection Diagram No.	139	139
Suitable Connection Technology No.	21	21
Suitable Mounting Technology No.	900 901	900 901

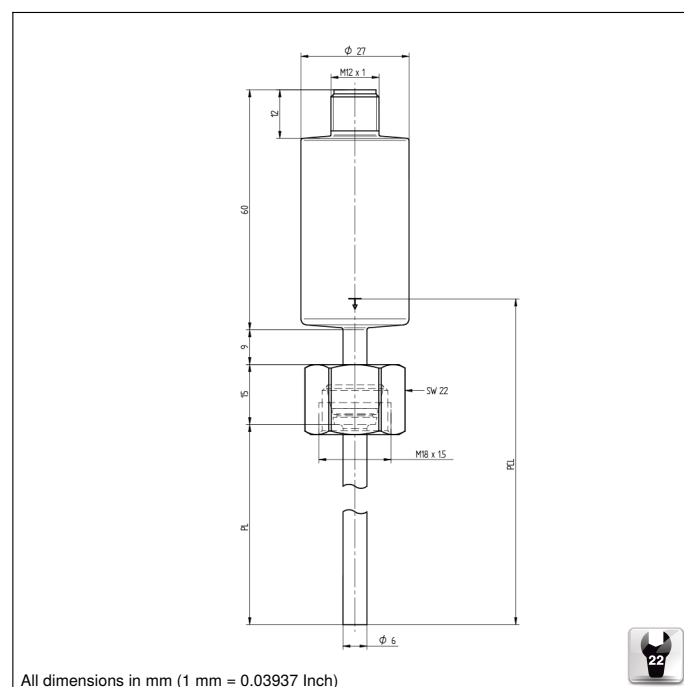
Connection Diagrams page 116

The complete product range of flow sensors can be found at www.wenglor.com.
An overview of this can be found in the table of contents.

Complementary Products

IO-Link Master

Software



Flow Sensor

10...400 cm/s

Range

weFlux² InoxSens

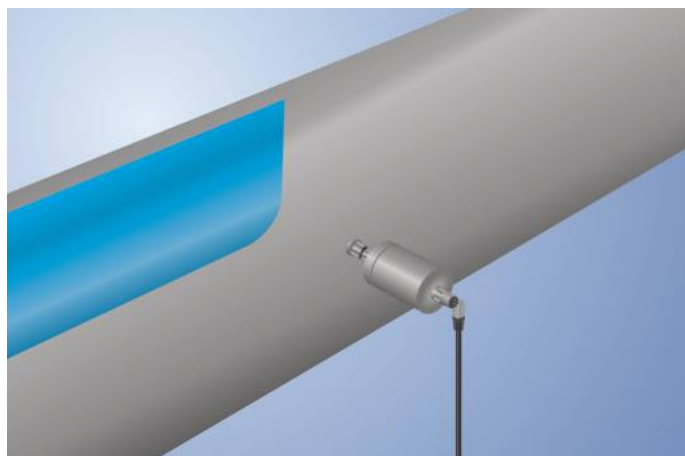


- A single sensor for flow and temperature
- FDA compliant
- Measurement independent of flow direction and installation position
- Ready for Industry 4.0 with IO-Link 1.1

weFlux² Flow Sensors simultaneously measure flow velocity and the temperature of aqueous liquids regardless of position and direction of flow. Advantage: The number of measuring points and the diversity of sensor variants are cut in half, and greatest possible flexibility is assured for installation in closed piping systems. Either 2 switching outputs or 1 switching output and 1 analog output are available depending on application requirements. The outputs can be configured as desired via IO-Link in order to flexibly adapt the sensors to the respective application.

Technical Data

Sensor-specific data	
Measuring Range	10...400 cm/s
Temperature of the medium, flow measurement	-25...125 °C
Temperature of the medium, temperature measurement	-25...150 °C
Adjustable Range	10...400 cm/s
Medium	Water
Measuring error	2 %
Response time in case of temperature jump	10 s
Environmental conditions	
Ambient temperature	-25...80 °C
Storage temperature	-25...80 °C
Mechanical Strength	25 bar
EMC	DIN EN 61326-1
Shock resistance per DIN IEC 68-2-27	30 g / 11 ms
Vibration resistance per DIN IEC 60068-2-6	5 g (10...2000 Hz)
Electrical Data	
Supply Voltage	12...32 V DC
Current Consumption (U _b = 24 V)	< 40 mA
Switching Outputs	2
Analog Outputs	1
Analog Output	0...10 V/4...20 mA
Response Time	1...5 s
Switching Output/Switching Current	± 100 mA
Switching Output Voltage Drop	< 2 V
Current Output Load Resistance	(U _b -U _{bmin})/0,02A
Current Load Voltage Output	≤ 20 mA
Short Circuit Protection	yes
Reverse Polarity Protection	yes
Protection Class	III
Interface	IO-Link V1.1
Mechanical Data	
Setting Method	IO-Link
Housing Material	1.4404
Material in contact with media	1.4404
Degree of Protection	IP68/IP69K *
Connection	M12 × 1; 4-pin
Process Connection	Clamp diameter: 50,5 mm
Process Connection Length (PCL)	49 mm
Probe Length (PL)	32 mm



* Tested by wenglor



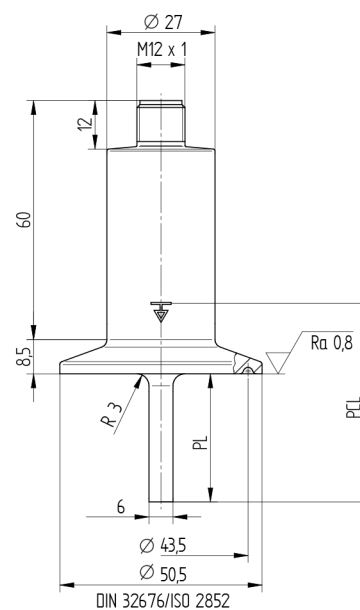
Plug Version	
Part Number	FXFF005
Analog output switchable to flow or temperature	●
Switching output switchable to flow or temperature	●
Switchable to NC/NO	●
Configurable as PNP/NPN/Push-Pull	●
IO-Link	●
Connection Diagram No.	139
Suitable Connection Technology No.	21

Connection Diagrams page 116

The complete product range of flow sensors can be found at www.wenglor.com.
An overview of this can be found in the table of contents.

Complementary Products

IO-Link Master
Software



All dimensions in mm (1 mm = 0.03937 Inch)

Temperature Sensor

-50...150 °C

Range

weFlux² InoxSens



- **FDA compliant**
- **Ready for Industry 4.0 with IO-Link 1.1**
- **Response time T90: < 2 seconds**
- **Temperature measuring range: -50 ... +150° C**

weFlux² Temperature Sensors ensure precise temperature measurement of liquids and gases in closed piping systems. Either 2 switching outputs, 1 switching output and 1 analog output or one 2-wire analog output is available depending on settings and connection configuration. The outputs can be configured as desired via IO-Link in order to flexibly adapt the sensors to the respective application.

Technical Data

Sensor-specific data

Temperature Measurement Range	-50...150 °C
Adjustable Range	-50...150 °C
Medium	Liquids, gases
Measuring error	± 0,5 °C
Resolution	0,01 °C
Response Time	< 2 s

Environmental conditions

Temperature of medium	-50...150 °C
Ambient temperature	-25...80 °C
Storage temperature	-25...80 °C
Mechanical Strength	100 bar
EMC	DIN EN 61326-1
Shock Resistance	IEC 60751
Vibration resistance	IEC 60751

Electrical Data

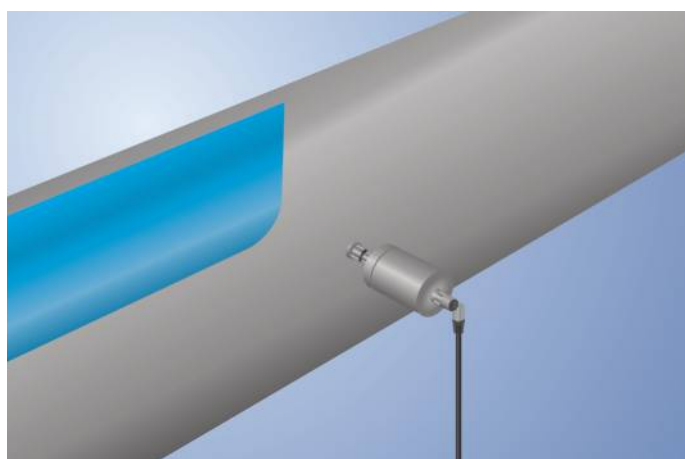
2-wire supply power	12...32 V DC
3-wire supply power	12...32 V DC
Current Consumption (U _b = 24 V)	< 15 mA
Switching Outputs	2
Switching Output/Switching Current	± 100 mA
Switching Output Voltage Drop	< 1,5 V DC
Analog Output	0...10 V/4...20 mA
Current Output Load Resistance	(U _b -U _{bmin})/0,02A
Short Circuit Protection	yes
Reverse Polarity Protection	yes
Protection Class	III
Interface	IO-Link V1.1

Mechanical Data

Setting Method	IO-Link
Housing Material	1.4404
Material in contact with media	1.4404
Degree of Protection	IP68/IP69K *
Connection	M12 × 1; 4-pin
Process Connection	Cutting/locking ring

Safety-relevant Data

MTTFd (EN ISO 13849-1)	1198,4 a
------------------------	----------



* Tested by wenglor



	Plug Version	
	Part Number	
	FXTT001	FXTT002
Analog Output	●	●
Configurable as PNP/NPN/Push-Pull	●	●
Switchable to NC/NO	●	●
IO-Link	●	●
Process Connection Length (PCL)	109 mm	209 mm
Probe Length (PL)	100 mm	200 mm
Connection Diagram No.	139	139
Suitable Connection Technology No.	21	21
Suitable Mounting Technology No.	907 908	907 908

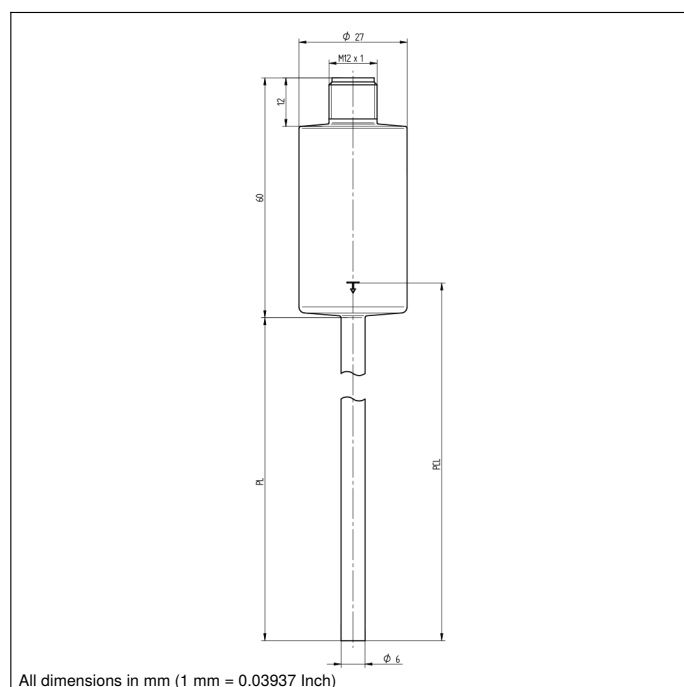
Connection Diagrams page 116

The complete product range of temperature sensors can be found at www.wenglor.com.
An overview of this can be found in the table of contents.

Complementary Products

IO-Link Master

Software



All dimensions in mm (1 mm = 0.03937 Inch)

Temperature Sensor

-50...150 °C

Range

weFlux² InoxSens



- FDA compliant
- Ready for Industry 4.0 with IO-Link 1.1
- Response time T90: < 2 seconds
- Temperature measuring range: -50 ... +150° C

weFlux² Temperature Sensors ensure precise temperature measurement of liquids and gases in closed piping systems. Either 2 switching outputs, 1 switching output and 1 analog output or one 2-wire analog output is available depending on settings and connection configuration. The outputs can be configured as desired via IO-Link in order to flexibly adapt the sensors to the respective application.

Technical Data

Sensor-specific data

Temperature Measurement Range	-50...150 °C
Adjustable Range	-50...150 °C
Medium	Liquids, gases
Measuring error	± 0,5 °C
Resolution	0,01 °C
Response Time	< 2 s

Environmental conditions

Temperature of medium	-50...150 °C
Ambient temperature	-25...80 °C
Storage temperature	-25...80 °C
Mechanical Strength	100 bar
EMC	DIN EN 61326-1
Shock Resistance	IEC 60751
Vibration resistance	IEC 60751

Electrical Data

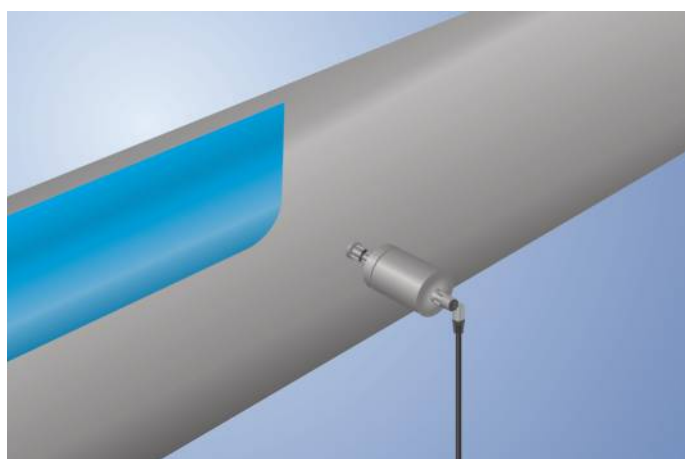
2-wire supply power	12...32 V DC
3-wire supply power	12...32 V DC
Current Consumption (U _b = 24 V)	< 15 mA
Switching Outputs	2
Switching Output/Switching Current	± 100 mA
Switching Output Voltage Drop	< 1,5 V DC
Analog Output	0...10 V/4...20 mA
Current Output Load Resistance	(U _b -U _{bmin})/0,02A
Short Circuit Protection	yes
Reverse Polarity Protection	yes
Protection Class	III
Interface	IO-Link V1.1

Mechanical Data

Setting Method	IO-Link
Housing Material	1.4404
Material in contact with media	1.4404
Degree of Protection	IP68/IP69K *
Connection	M12 × 1; 4-pin
Process Connection	Sealing cone M18 × 1,5

Safety-relevant Data

MTTFd (EN ISO 13849-1)	1198,4 a
------------------------	----------



* Tested by wenglor



	Plug Version	
	Part Number	
	FXTT003	FXTT004
Analog Output	●	●
Configurable as PNP/NPN/Push-Pull	●	●
Switchable to NC/NO	●	●
IO-Link	●	●
Process Connection Length (PCL)	132 mm	232 mm
Probe Length (PL)	100 mm	200 mm
Connection Diagram No.	139	139
Suitable Connection Technology No.	21	21
Suitable Mounting Technology No.	900 901	900 901

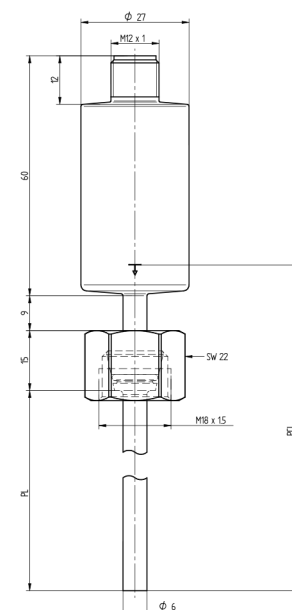
Connection Diagrams page 116

The complete product range of temperature sensors can be found at www.wenglor.com.
An overview of this can be found in the table of contents.

Complementary Products

IO-Link Master

Software



All dimensions in mm (1 mm = 0.03937 Inch)



- 8 IO-Link ports
- Protection mode IP69K
- Robust zinc diecasting housing

Technical Data

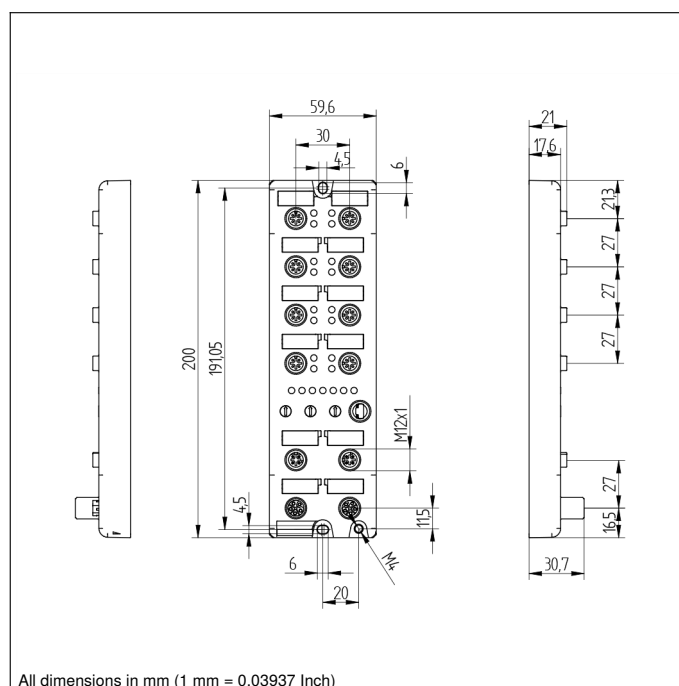
Electrical Data

Supply Voltage	18...30 V DC
Power consumption of device max.	0,18 A
Max. Switching Current Switching Outputs	0,5 A
Max. Switching Current Switching Outputs IO-Link	0,5 A
max. total current of the digital I/O ports	14 A
Sensor Supply Voltage (Pin 1)	500 mA
Switching Output Voltage Drop	< 2,5 V
Temperature Range	-20...70 °C
Atmospheric humidity	98 % ambient humidity
Digital I/O ports short circuit protected	yes
Digital I/O ports overload protected	yes
Digital I/O ports reverse polarity protected	yes
Standard I/O-Pins	12
Number of IO-link ports	8
Inputs according to DIN EN 61131-2:2003	Type 1
Interface	Ethernet
Communication Mode IO-Link	SIO, COM1, COM2, COM3
IO-Link Version	1.1
Baud Rate	100 Mbit/s
Transmission Mode	Full Duplex
Switch Mode	Store & Forward
VLAN Prioritization	yes
Auto-Crossover	yes
Auto-Negotiating	yes
Auto-Polarity	yes
Protection Class	III
Shock resistance per DIN IEC 68-2-27	50 g / 11 ms
Vibration resistance per DIN IEC 60068-2-6	15 g (5...500 Hz)

Mechanical Data

Material	Zinc diecasting
Weight	500 g
Degree of Protection	IP65/IP67/IP69K
Type of connection digital I/O ports	M12 × 1; 4-pin
Type of Connection Power	2× M12; 5-pin, L-cod.
Type of Connection Industrial Ethernet Ports	2× M12; 4-pin, D-cod.

This IO-Link master enables an easy connection of IO-Link sensors and standard sensors to Industrial Ethernet. Thanks to degree of protection IP65/IP67/IP69K and the zinc diecasting housing the IO-Link master is suiting for rough industrial applications.



Plug Version	
    	Part Number EP0L001
Web server	yes
IO-Link	●
PROFINET-I/O, CC-C	●
EtherNet/IP™	●
Connection Table No.	59
Suitable Connection Technology No.	3

Complementary Products

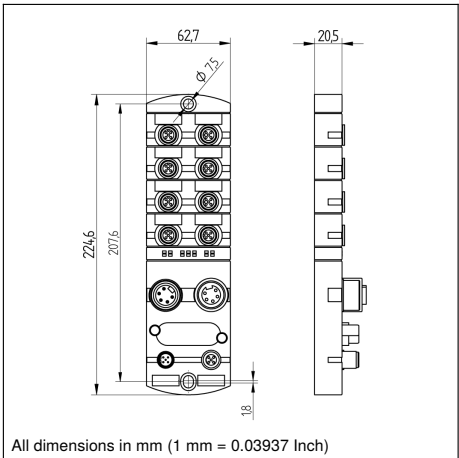
Locking Screw for M12 Z0027

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	1.0, 1.1
IO-link port	Class A
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

IO-Link Master USB

Part Number EFBL002



Electrical Data

Supply Voltage	24 V
Temperature Range	0...55 °C
Number of IO-link ports	1
Interface	USB
Communication Mode IO-Link	SIO, COM1, COM2, COM3
IO-Link Version	1.0, 1.1
IO-link port	Class A
Protection Class	III

Mechanical Data

Material	Aluminum
Weight	64 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

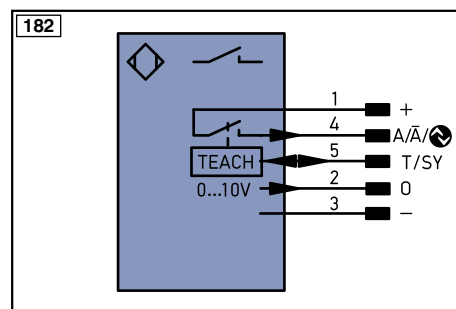
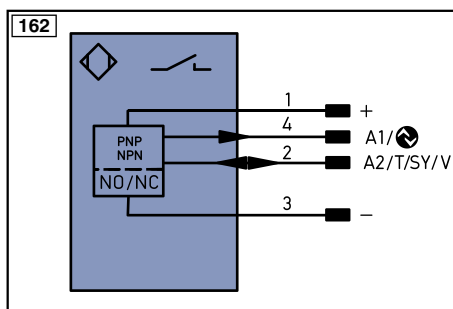
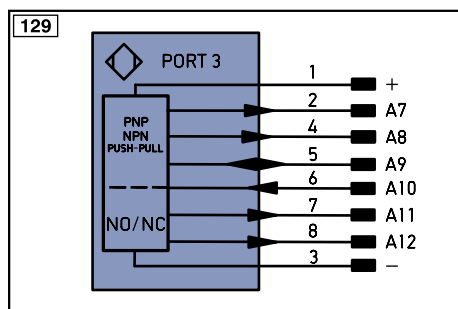
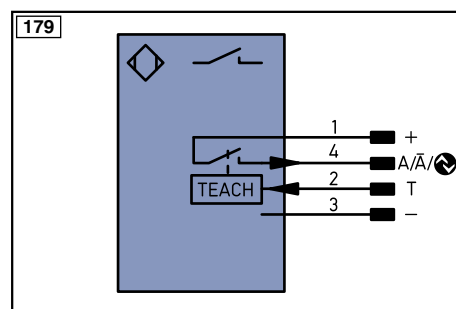
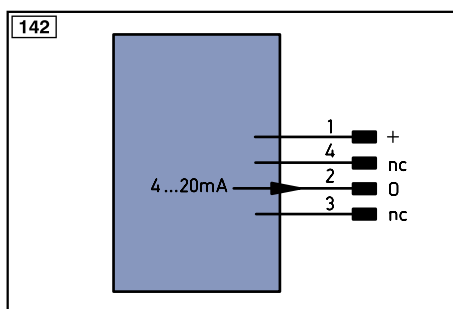
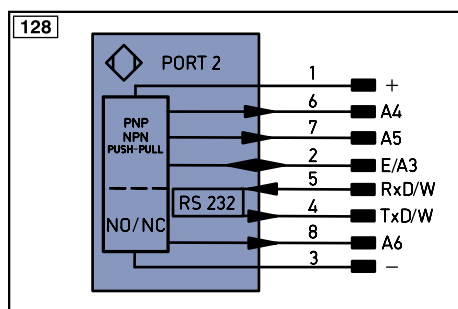
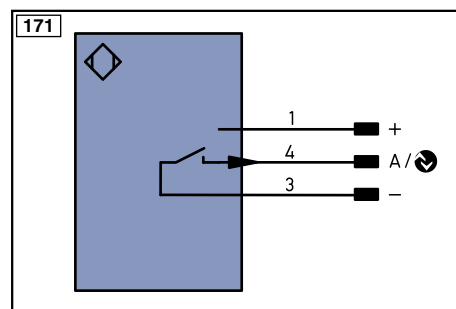
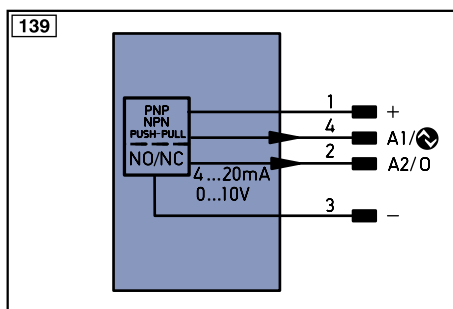
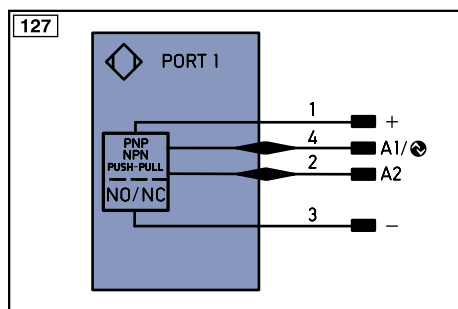
+	Supply Voltage +
-	Supply Voltage 0 V
~	Supply Voltage (AC Voltage)
A	Switching Output (NO)
$\bar{A}$	Switching Output (NC)
V	Contamination/Error Output (NO)
$\bar{V}$	Contamination/Error Output (NC)
E	Input (analog or digital)
T	Teach Input
Z	Time Delay (activation)
S	Shielding
RxD	Interface Receive Path
TxD	Interface Send Path
RDY	Ready
GND	Ground
CL	Clock
E/A	Output/Input programmable
	IO-Link
PoE	Power over Ethernet
IN	Safety Input
OSSD	Safety Output
Signal	Signal Output
BI_D+/-	Ethernet Gigabit bidirect. data line (A-D)
EN0RS422	Encoder 0-pulse 0-0 (TTL)

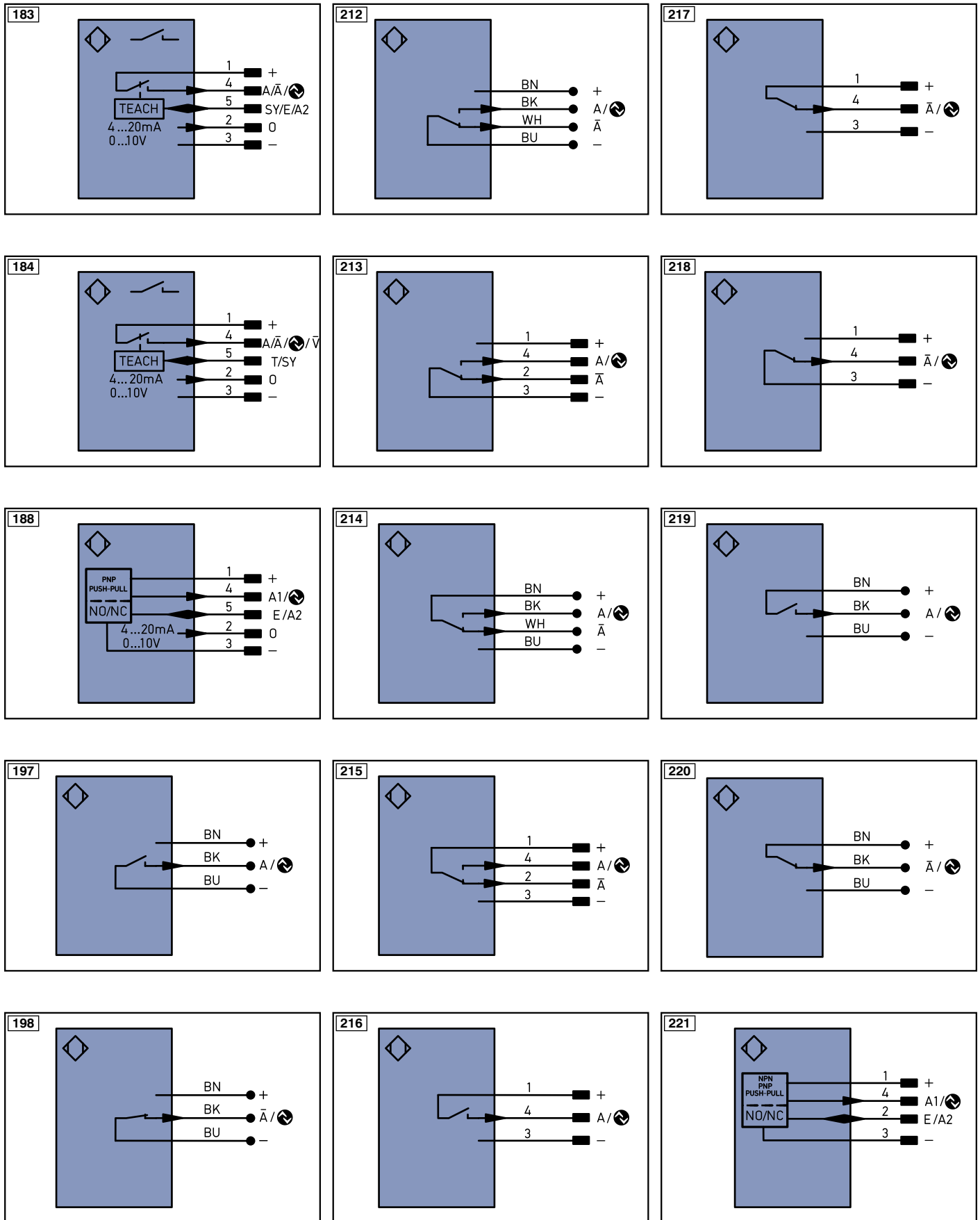
PT	Platinum measuring resistor
nc	not connected
U	Test Input
$\bar{U}$	Test Input inverted
W	Trigger Input
O	Analog Output
O-	Ground for the Analog Output
BZ	Block Discharge
AMV	Valve Output
a	Valve Control Output +
b	Valve Control Output 0 V
SY	Synchronization
E+	Receiver-Line
S+	Emitter-Line
$\pm$	Grounding
SnR	Switching Distance Reduction
Rx+/-	Ethernet Receive Path
Tx+/-	Ethernet Send Path
Bus	Interfaces-Bus A(+)/B(-)
La	Emitted Light disengageable
Mag	Magnet activation
RES	Input confirmation
EDM	Contactor Monitoring
ENAR5422	Encoder A/ $\bar{A}$ (TTL)
ENBR5422	Encoder B/ $\bar{B}$ (TTL)

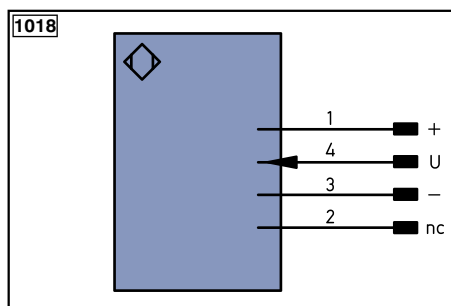
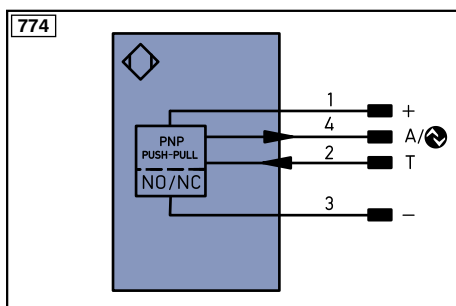
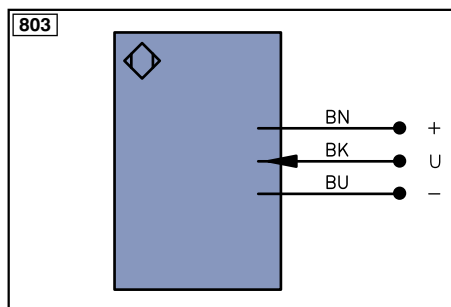
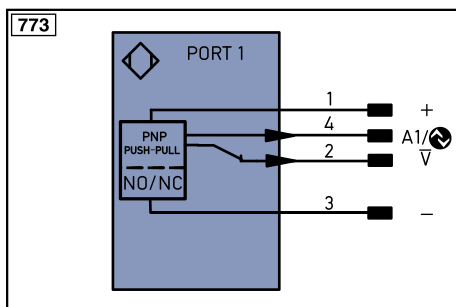
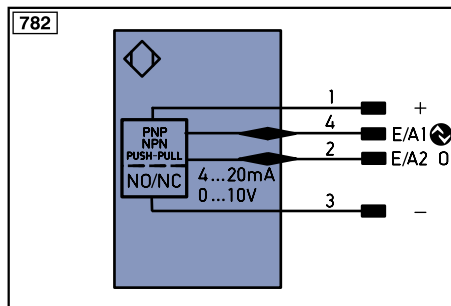
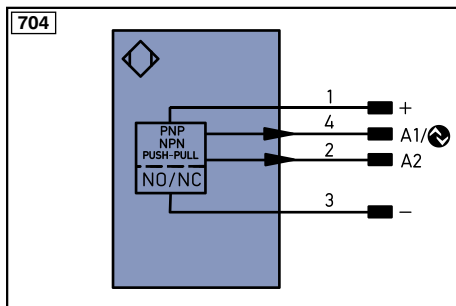
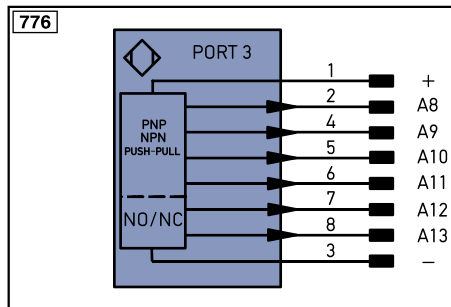
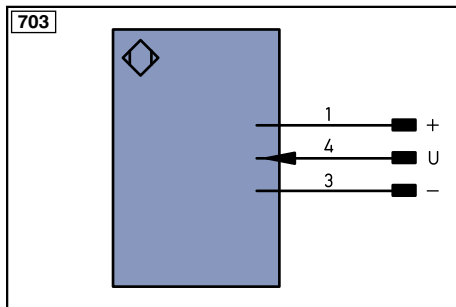
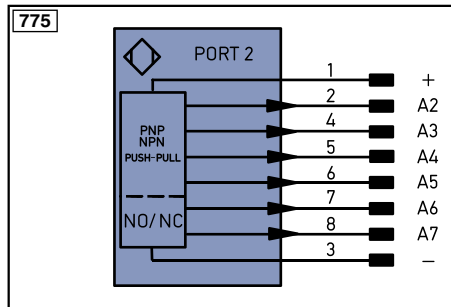
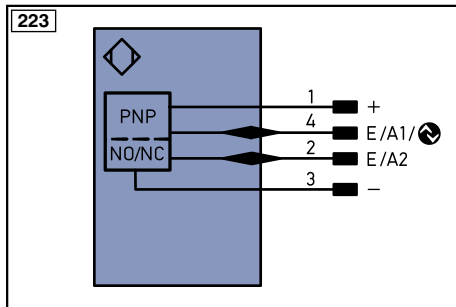
ENa	Encoder A
ENb	Encoder B
AMIN	Digital output MIN
AMAX	Digital output MAX
AOK	Digital output OK
SY In	Synchronization In
SY OUT	Synchronization OUT
OLT	Brightness output
M	Maintenance
rsv	reserved

Wire Colors according to DIN IEC 757

BK	Black
BN	Brown
RD	Red
OG	Orange
YE	Yellow
GN	Green
BU	Blue
VT	Violet
GY	Grey
WH	White
PK	Pink
GNYE	Green/Yellow







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