



# WLG4SP-84161130A00

W4

MINIATURE PHOTOELECTRIC SENSORS

**SICK**  
Sensor Intelligence.



Illustration may differ

### Ordering information

Type	Part no.
WLG4SP-84161130A00	1139754

Other models and accessories → [www.sick.com/W4](http://www.sick.com/W4)



### Detailed technical data

#### Features

<b>Functional principle</b>	Photoelectric retro-reflective sensor										
<b>Functional principle detail</b>	Without reflector minimum distance (autocollimation/coaxial optics), ClearSens, MultiMode										
<b>MultiMode</b>	Setting the modes only possible via IO-Link										
<b>Sensing range</b>	<table border="0"> <tr> <td>Sensing range min.</td> <td>0 m</td> </tr> <tr> <td>Sensing range max.</td> <td>7.1 m</td> </tr> <tr> <td>Recommended sensing range for the best performance</td> <td>0 m ... 5 m</td> </tr> </table>	Sensing range min.	0 m	Sensing range max.	7.1 m	Recommended sensing range for the best performance	0 m ... 5 m				
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<b>Emitted beam</b>	<table border="0"> <tr> <td>Light source</td> <td>PinPoint LED</td> </tr> <tr> <td>Type of light</td> <td>Visible red light</td> </tr> <tr> <td>Shape of light spot</td> <td>Point-shaped</td> </tr> <tr> <td>Light spot size (distance)</td> <td>150 mm (5 m)</td> </tr> <tr> <td>Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle)</td> <td>&lt; +/- 1.5° (at Ta = +23 °C)</td> </tr> </table>	Light source	PinPoint LED	Type of light	Visible red light	Shape of light spot	Point-shaped	Light spot size (distance)	150 mm (5 m)	Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle)	< +/- 1.5° (at Ta = +23 °C)
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Type of light	Visible red light										
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<b>Key LED figures</b>	<table border="0"> <tr> <td>Normative reference</td> <td>EN 62471:2008-09   IEC 62471:2006, modified</td> </tr> <tr> <td>LED risk group marking</td> <td>Free group</td> </tr> </table>	Normative reference	EN 62471:2008-09   IEC 62471:2006, modified	LED risk group marking	Free group						
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Wave length	635 nm
Average service life	100,000 h at T <sub>a</sub> = +25 °C
<b>Adjustment</b>	
Teach-in button	BluePilot: for sensitivity adjustment
IO-Link	For configuring the sensor parameters and Smart Task functions
<b>Indication</b>	
LED blue	BluePilot: Alignment aid
LED green	Operating indicator Static on: power on Flashing: IO-Link mode
LED yellow	Status of received light beam Static on: object not present Static off: object present Flashing: Below the 1.5 function reserve
<b>Special features</b>	MultiMode
<b>Special applications</b>	Detecting objects wrapped in film, Detecting transparent objects

### Safety-related parameters

<b>MTTF<sub>D</sub></b>	1,590 years
<b>DC<sub>avg</sub></b>	0%

### Communication interface

<b>IO-Link</b>	✓, IO-Link V1.1
Data transmission rate	COM2 (38,4 kBaud)
Cycle time	2.3 ms
Process data length	16 Bit
Process data structure	Bit 0 = switching signal Q <sub>L1</sub> Bit 1 = switching signal Q <sub>L2</sub> Bit 2 ... 15 = Current receiver level (live)
VendorID	26
DeviceID HEX	0x800359
DeviceID DEC	8389465
Compatible master port type	A
SIO mode support	Yes

### Electrical data

<b>Supply voltage U<sub>B</sub></b>	10 V DC ... 30 V DC <sup>1)</sup>
<b>Ripple</b>	≤ 5 V <sub>pp</sub>
<b>Usage category</b>	DC-12 (According to EN 60947-5-2) DC-13 (According to EN 60947-5-2)
<b>Current consumption</b>	≤ 20 mA, without load. At U <sub>B</sub> = 24 V
<b>Protection class</b>	III
<b>Digital output</b>	
Number	2
Type	Push-pull: PNP/NPN

<sup>1)</sup> Limit values.

<sup>2)</sup> This switching output must not be connected to another output.

Switching mode	Light/dark switching
Signal voltage PNP HIGH/LOW	Approx. $U_B - 2.5 \text{ V} / 0 \text{ V}$
Signal voltage NPN HIGH/LOW	Approx. $U_B / < 2.5 \text{ V}$
Output current $I_{\text{max}}$	$\leq 100 \text{ mA}$
Circuit protection outputs	Reverse polarity protected Overcurrent protected Short-circuit protected
Response time	$\leq 500 \mu\text{s}$
Repeatability (response time)	150 $\mu\text{s}$
Switching frequency	1,000 Hz
<b>Pin/Wire assignment</b>	
Function of pin 4/black (BK)	Digital output, dark switching, object present $\rightarrow$ output $\bar{Q}_{L1}$ HIGH, IO-Link communication C <sup>2)</sup>
Function of pin 4/black (BK) – detail	The pin 4 function of the sensor can be configured, Additional possible settings via IO-Link
Function of pin 2/white (WH)	Digital output, light switching, object present $\rightarrow$ output $Q_{L1}$ LOW <sup>2)</sup>
Function of pin 2/white (WH) – detail	The pin 2 function of the sensor can be configured, Additional possible settings via IO-Link

<sup>1)</sup> Limit values.

<sup>2)</sup> This switching output must not be connected to another output.

### Mechanical data

<b>Housing</b>	Rectangular
<b>Design detail</b>	Slim
<b>Dimensions (W x H x D)</b>	12.1 mm x 41.9 mm x 18.6 mm
<b>Connection</b>	Cable with M12 male connector, 4-pin, 190 mm
<b>Connection detail</b>	
Deep-freeze property	Do not bend below 0 °C
Conductor size	0.14 mm <sup>2</sup>
Cable diameter	Ø 3.4 mm
Length of cable (L)	142 mm
Length of male connector	48 mm
<b>Material</b>	
Housing	Plastic, VISTAL®
Front screen	Plastic, PMMA
Cable	Plastic, PVC
Male connector	Plastic, VISTAL®
<b>Maximum tightening torque of the fixing screws</b>	0.4 Nm

### Ambient data

<b>Enclosure rating</b>	IP66 (EN 60529) IP67 (EN 60529)
<b>Ambient operating temperature</b>	-40 °C ... +60 °C
<b>Ambient temperature, storage</b>	-40 °C ... +75 °C
<b>Typ. Ambient light immunity</b>	Artificial light: $\leq 50,000 \text{ lx}$ Sunlight: $\leq 50,000 \text{ lx}$
<b>Shock resistance</b>	30 g, 11 ms (3 positive and 3 negative shocks along X, Y, Z axes, 18 total shocks (EN60068-2-27))

<b>Vibration resistance</b>	10 Hz ... 1,000 Hz (Amplitude 1 mm, 3 x 30 min (EN60068-2-6))
<b>Air humidity</b>	35 % ... 95 %, relative humidity (no condensation)
<b>Electromagnetic compatibility (EMC)</b>	EN 60947-5-2
<b>Resistance to cleaning agent</b>	ECOLAB
<b>UL File No.</b>	NRKH.E181493 & NRKH7.E181493

### Smart Task

<b>Smart Task name</b>	Base logics
<b>Logic function</b>	Direct AND OR
<b>Timer function</b>	Deactivated Switch-on delay Off delay ON and OFF delay Impulse (one shot)
<b>Inverter</b>	Yes
<b>Switching frequency</b>	SIO Logic: 800 Hz <sup>1)</sup>
<b>Response time</b>	SIO Logic: 600 µs <sup>1)</sup>
<b>Repeatability</b>	SIO Logic: 200 µs <sup>1)</sup>
<b>Switching signal</b>	
Switching signal Q <sub>L1</sub>	Switching output
Switching signal $\bar{Q}$ <sub>L1</sub>	Switching output

<sup>1)</sup> Use of Smart Task functions without IO-Link communication (SIO mode).

### Diagnosis

<b>Device temperature</b>	
Measuring range	Very cold, cold, moderate, warm, hot
<b>Device status</b>	Yes
<b>Detailed device status</b>	Yes
<b>Operating hour counter</b>	Yes
<b>Operating hours counter with reset function</b>	Yes
<b>Quality of teach</b>	Yes
<b>Quality of run</b>	Yes, Contamination display

### Classifications

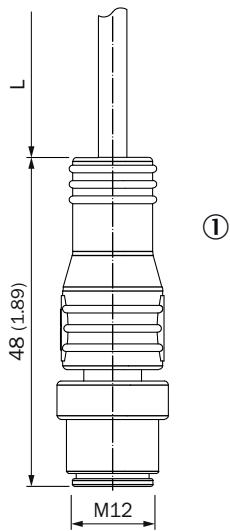
<b>ECLASS 5.0</b>	27270902
<b>ECLASS 5.1.4</b>	27270902
<b>ECLASS 6.0</b>	27270902
<b>ECLASS 6.2</b>	27270902
<b>ECLASS 7.0</b>	27270902
<b>ECLASS 8.0</b>	27270902
<b>ECLASS 8.1</b>	27270902
<b>ECLASS 9.0</b>	27270902
<b>ECLASS 10.0</b>	27270902

<b>ECLASS 11.0</b>	27270902
<b>ECLASS 12.0</b>	27270902
<b>ETIM 5.0</b>	EC002717
<b>ETIM 6.0</b>	EC002717
<b>ETIM 7.0</b>	EC002717
<b>ETIM 8.0</b>	EC002717
<b>UNSPSC 16.0901</b>	39121528

Maßzeichnung (Dimensions in mm (inch))

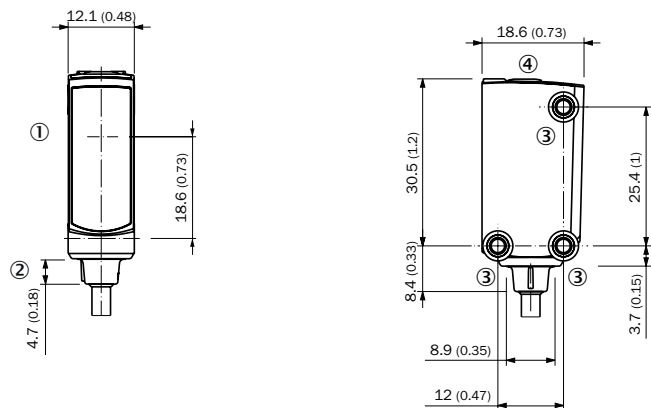
Dimensional drawing (Dimensions in mm (inch))

Dimensional drawing, connection



For length of cable (L), see technical data  
① Cable with M12 male connector

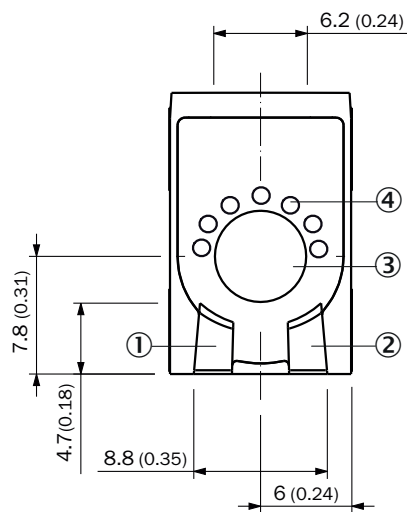
Dimensional drawing, sensor



- ① Center of optical axis
- ② Connection
- ③ M3 mounting hole
- ④ Display and adjustment elements

Adjustments

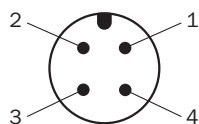
Display and adjustment elements



- ① LED green
- ② LED yellow
- ③ Teach-in button
- ④ LED blue

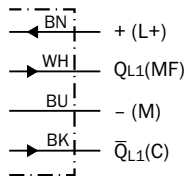
Connection type

M12 male connector, 4-pin



## Connection diagram

Cd-504



## Truth table

Push-pull: PNP/NPN - dark switching  $\bar{Q}$

	Dark switching $\bar{Q}$ (normally open (upper switch), normally closed (lower switch))	
	Object not present → Output LOW	Object present → Output HIGH
Light receive	✓	✗
Light receive indicator	☉	✗
Load resistance to L+	✗	✗
Load resistance to M	✗	⚠

Push-pull: PNP/NPN - light switching Q

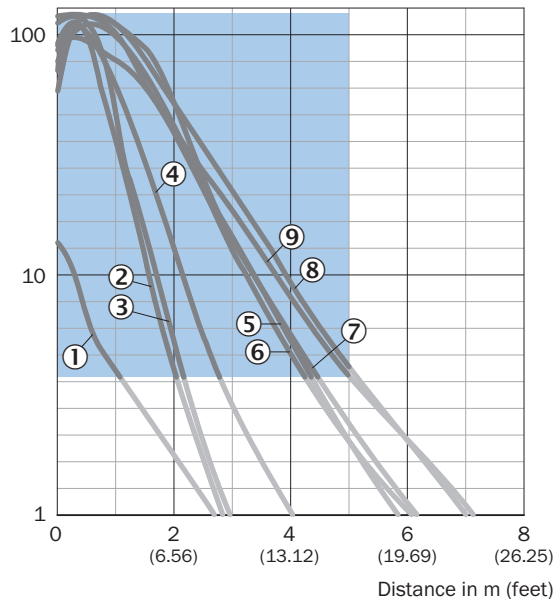
	Light switching Q (normally closed (upper switch), normally open (lower switch))	
	Object not present → Output HIGH	Object present → Output LOW
Light receive	✓	✗
Light receive indicator	☉	✗
Load resistance to L+	✗	⚠
Load resistance to M	⚠	✗



## Characteristic curve

Standard reflectors

Operating reserve

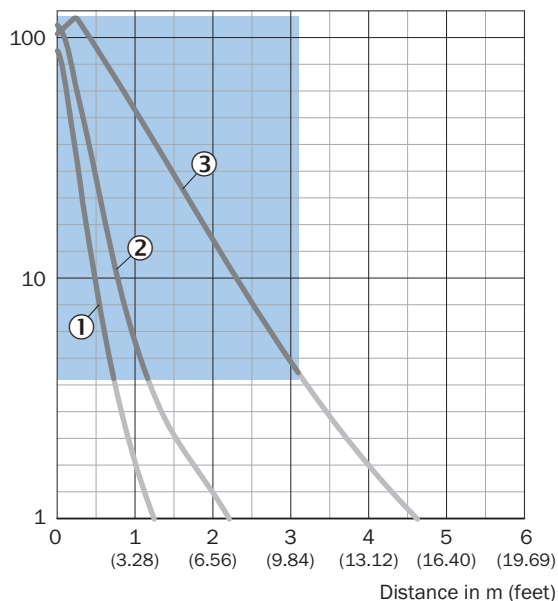


Recommended sensing range for the best performance

- ① Reflector PL40A Antifog
- ② Reflector PL20A
- ③ Reflector PL22-2
- ④ Reflector P250H
- ⑤ Reflector P250
- ⑥ Reflector PL30A
- ⑦ Reflector PL40A
- ⑧ Reflector C110A
- ⑨ Reflector PL80A

Reflective tape

Operating reserve

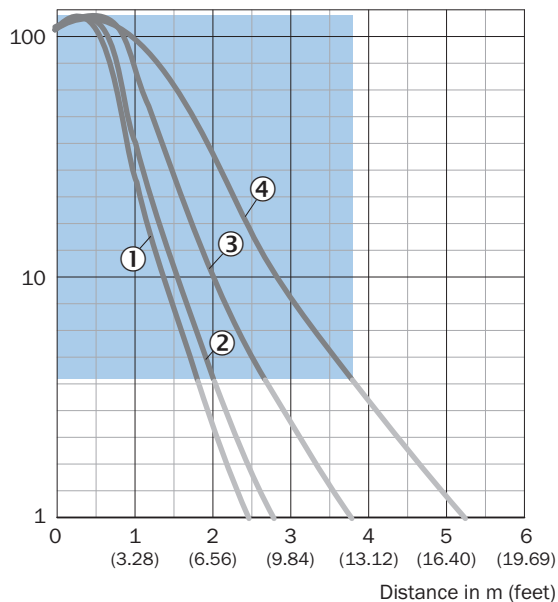


Recommended sensing range for the best performance

- ① Reflective tape REF-DG
- ② Reflective tape REF-IRF-56
- ③ Reflective tape REF-AC1000

Fine triple reflectors

Operating reserve

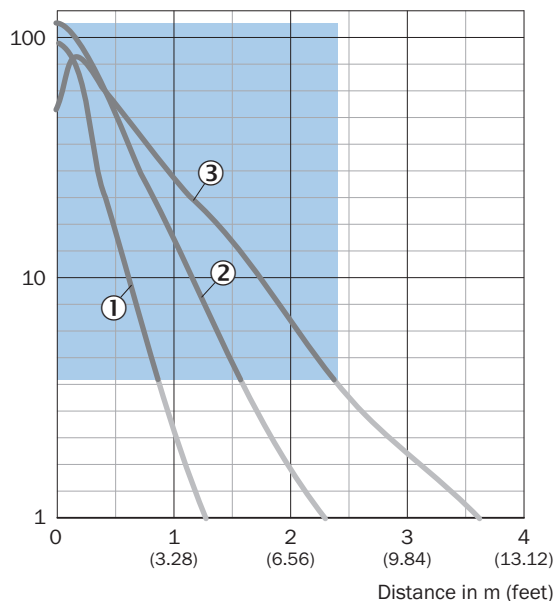


Recommended sensing range for the best performance

- ① PL10F reflector
- ② PL10FH-1 reflector
- ③ Reflector PL20F
- ④ Reflector P250F

Chemical-resistant reflectors

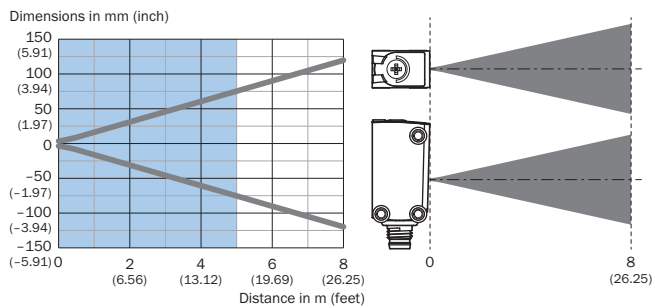
Operating reserve



Recommended sensing range for the best performance

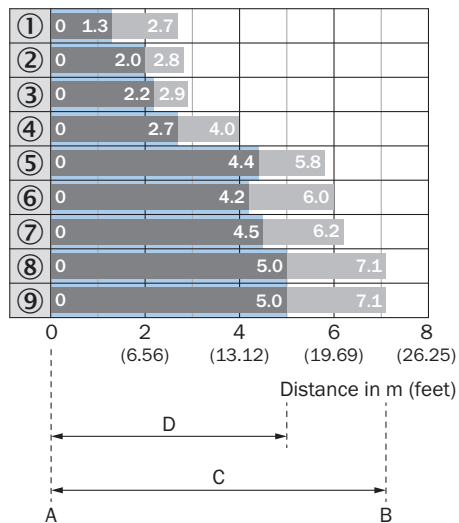
- ① PL10F CHEM reflector
- ② Reflector PL20 CHEM
- ③ Reflector P250 CHEM

Light spot size



### Sensing range diagram

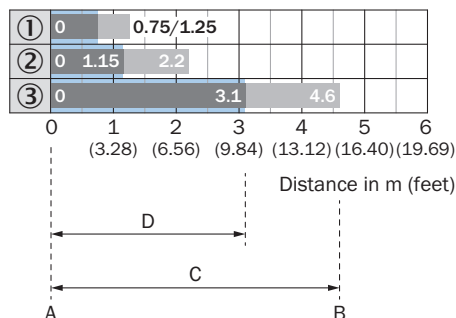
Standard reflectors



Recommended sensing range for the best performance

1	Reflector PL40A Antifog
2	Reflector PL20A
3	Reflector PL22-2
4	Reflector P250H
5	Reflector P250
6	Reflector PL30A
7	Reflector PL40A
8	Reflector C110A
9	Reflector PL80A
A	Sensing range min. in m
B	Sensing range max. in m
C	Maximum distance range from reflector to sensor (operating reserve 1)
D	Recommended distance range from reflector to sensor (operating reserve 3,75)

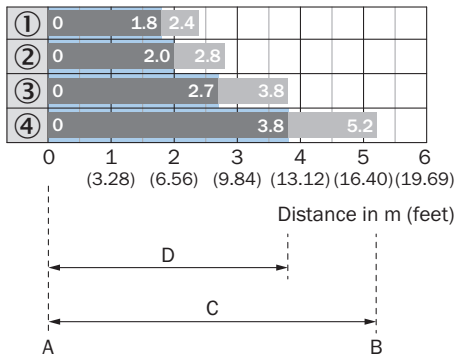
Reflective tape



Recommended sensing range for the best performance

1	Reflective tape REF-DG
2	Reflective tape REF-IRF-56
3	Reflective tape REF-AC1000
A	Sensing range min. in m
B	Sensing range max. in m
C	Maximum distance range from reflector to sensor (operating reserve 1)
D	Recommended distance range from reflector to sensor (operating reserve 3,75)

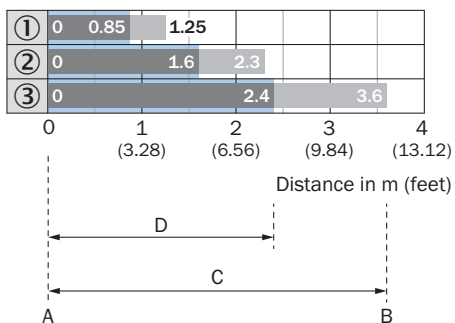
Fine triple reflectors



Recommended sensing range for the best performance

1	PL10F reflector
2	PL10FH-1 reflector
3	Reflector PL20F
4	Reflector P250F
A	Sensing range min. in m
B	Sensing range max. in m
C	Maximum distance range from reflector to sensor (operating reserve 1)
D	Recommended distance range from reflector to sensor (operating reserve 3,75)

Chemical-resistant reflectors



Recommended sensing range for the best performance

1	PL10F CHEM reflector
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2	Reflector PL20 CHEM
3	Reflector P250 CHEM
A	Sensing range min. in m
B	Sensing range max. in m
C	Maximum distance range from reflector to sensor (operating reserve 1)
D	Recommended distance range from reflector to sensor (operating reserve 3,75)

## SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

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