



WLG4SP-22167130A00

W4

MINIATURE PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.



Illustration may differ

Ordering information

Type	Part no.
WLG4SP-22167130A00	1139760

Other models and accessories → www.sick.com/W4



Detailed technical data

Features

Functional principle	Photoelectric retro-reflective sensor										
Functional principle detail	Without reflector minimum distance (autocollimation/coaxial optics), ClearSens, MultiMode										
MultiMode	Setting the modes only possible via IO-Link										
Sensing range	<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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Emitted beam	<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>< +/- 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)
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)										
Key LED figures	<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 $T_a = +25\text{ °C}$
Adjustment	
Teach-in button	BluePilot: for sensitivity adjustment
IO-Link	For configuring the sensor parameters and Smart Task functions
Indication	
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
Special features	Pin2 pre-setting (MF): teach-in via cable MultiMode
Special applications	Detecting objects wrapped in film, Detecting transparent objects

Safety-related parameters

MTTF_D	1,590 years
DC_{avg}	0%

Communication interface

IO-Link	✓, 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_{L1} Bit 1 = switching signal Q_{L2} Bit 2 ... 15 = Current receiver level (live)
VendorID	26
DeviceID HEX	0x80035F
DeviceID DEC	8389471
Compatible master port type	A
SIO mode support	Yes

Electrical data

Supply voltage U_B	10 V DC ... 30 V DC ¹⁾
Ripple	$\leq 5\text{ V}_{pp}$
Usage category	DC-12 (According to EN 60947-5-2) DC-13 (According to EN 60947-5-2)
Current consumption	$\leq 20\text{ mA}$, without load. At $U_B = 24\text{ V}$
Protection class	III
Digital output	
Number	2
Type	Push-pull: PNP/NPN

¹⁾ Limit values.

²⁾ This switching output must not be connected to another output.

Switching mode	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 $I_{\max.}$	$\leq 100 \text{ mA}$
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	$1,000 \text{ Hz}$
Pin/Wire assignment	
Function of pin 4/black (BK)	Digital output, dark switching, object present \rightarrow output \bar{Q}_{L1} HIGH, IO-Link communication C ²⁾
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 input, teach, HIGH active ²⁾
Function of pin 2/white (WH) – detail	The pin 2 function of the sensor can be configured, Additional possible settings via IO-Link

¹⁾ Limit values.

²⁾ This switching output must not be connected to another output.

Mechanical data

Housing	Rectangular
Design detail	Slim
Dimensions (W x H x D)	$12.1 \text{ mm} \times 41.9 \text{ mm} \times 18.6 \text{ mm}$
Connection	Male connector M8, 4-pin
Material	
Housing	Plastic, VISTAL®
Front screen	Plastic, PMMA
Male connector	Plastic, VISTAL®
Maximum tightening torque of the fixing screws	0.4 Nm

Ambient data

Enclosure rating	IP66 (EN 60529) IP67 (EN 60529)
Ambient operating temperature	$-40 \text{ }^\circ\text{C} \dots +60 \text{ }^\circ\text{C}$
Ambient temperature, storage	$-40 \text{ }^\circ\text{C} \dots +75 \text{ }^\circ\text{C}$
Typ. Ambient light immunity	Artificial light: $\leq 50,000 \text{ lx}$ Sunlight: $\leq 50,000 \text{ lx}$
Shock resistance	30 g , 11 ms (3 positive and 3 negative shocks along X, Y, Z axes, 18 total shocks (EN60068-2-27))
Vibration resistance	$10 \text{ Hz} \dots 1,000 \text{ Hz}$ (Amplitude 1 mm , $3 \times 30 \text{ min}$ (EN60068-2-6))
Air humidity	$35 \% \dots 95 \%$, relative humidity (no condensation)
Electromagnetic compatibility (EMC)	EN 60947-5-2
Resistance to cleaning agent	ECOLAB
UL File No.	NRKH.E181493 & NRKH7.E181493

Smart Task

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

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

Diagnosis

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

Classifications

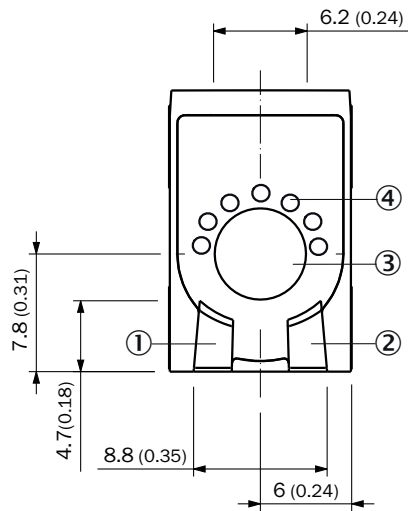
ECLASS 5.0	27270902
ECLASS 5.1.4	27270902
ECLASS 6.0	27270902
ECLASS 6.2	27270902
ECLASS 7.0	27270902
ECLASS 8.0	27270902
ECLASS 8.1	27270902
ECLASS 9.0	27270902
ECLASS 10.0	27270902
ECLASS 11.0	27270902
ECLASS 12.0	27270902
ETIM 5.0	EC002717
ETIM 6.0	EC002717
ETIM 7.0	EC002717
ETIM 8.0	EC002717

UNSPSC 16.0901

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Adjustments

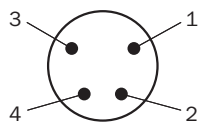
Display and adjustment elements



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

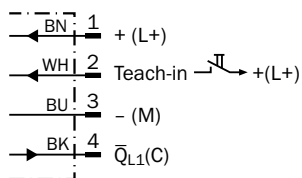
Connection type

Male connector M8, 4-pin



Connection diagram

Cd-510



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	✗	⚠

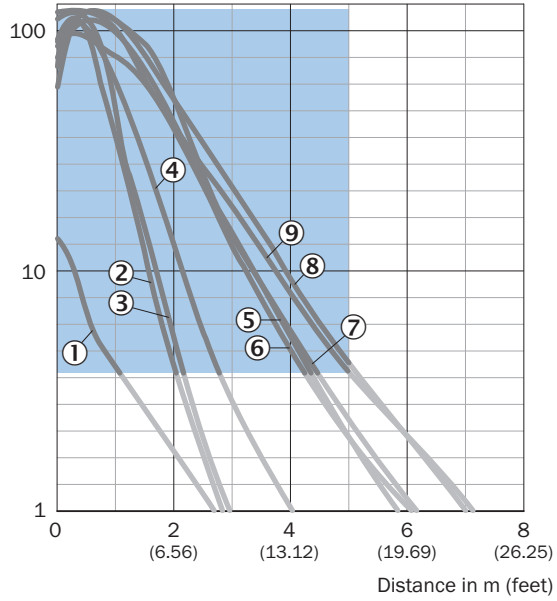
Push-pull: PNP/NPN - light switching Q

	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

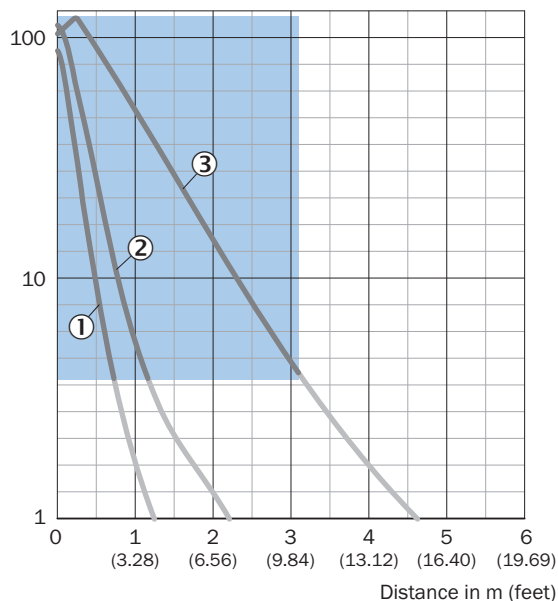


Recommended sensing range for the best performance

- 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

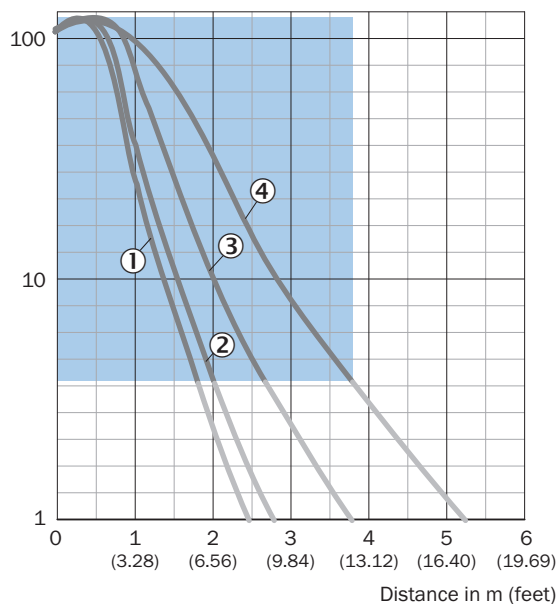


Recommended sensing range for the best performance

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

Fine triple reflectors

Operating reserve

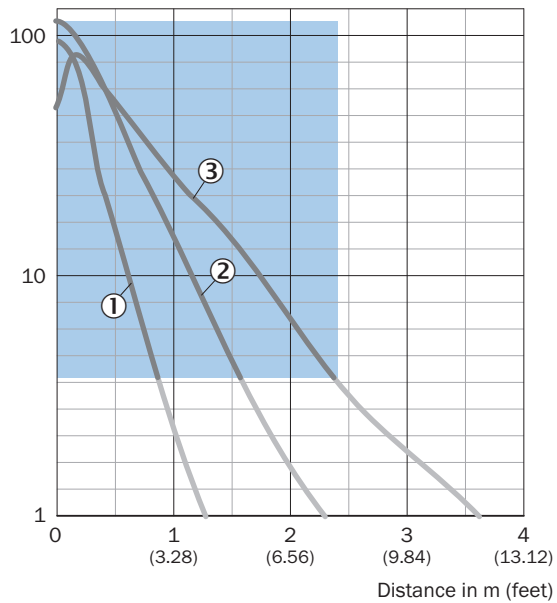


Recommended sensing range for the best performance

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

Chemical-resistant reflectors

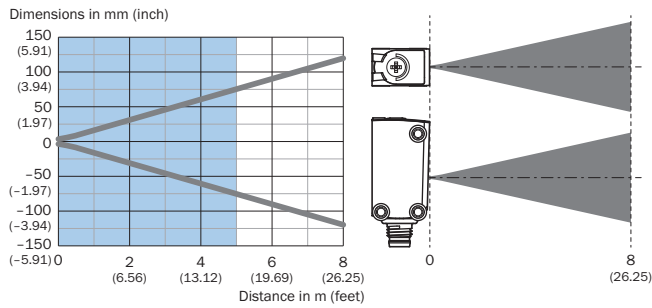
Operating reserve



Recommended sensing range for the best performance

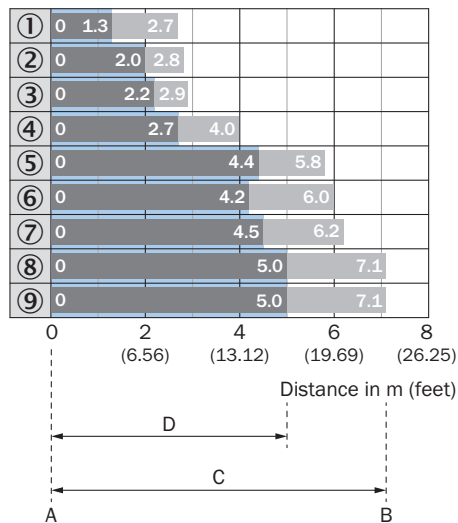
- ① PL10F CHEM reflector
- ② Reflector PL20 CHEM
- ③ Reflector P250 CHEM

Light spot size



Sensing range diagram

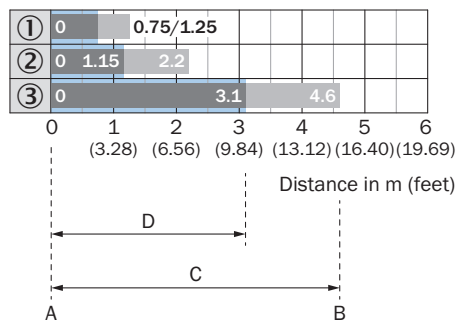
Standard reflectors



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)

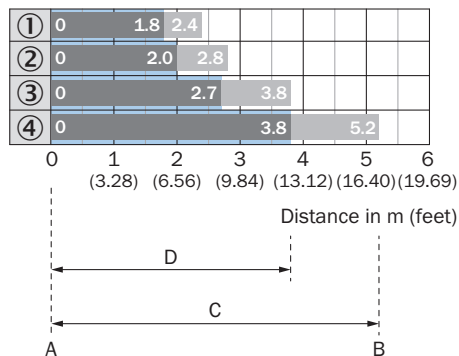
Reflective tape



Recommended sensing range for the best performance

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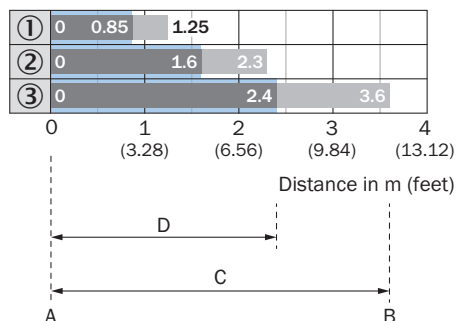
Fine triple reflectors



Recommended sensing range for the best performance

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Chemical-resistant reflectors



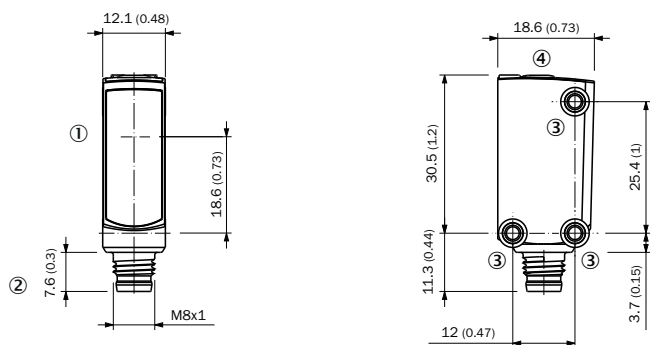
Recommended sensing range for the best performance

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Dimensional drawing (Dimensions in mm (inch))

Dimensional drawing, sensor



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

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.”

WORLDWIDE PRESENCE:

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