



WLA4SP-1H165100A00

W4

PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.



Illustration may differ

Ordering information

Type	part no.
WLA4SP-1H165100A00	1140053

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)
Sensing range	
Sensing range min.	0 m
Sensing range max.	4 m
Maximum distance range from reflector to sensor (operating reserve 1)	0 m ... 4 m
Recommended distance range from reflector to sensor (operating reserve 3,75)	0 m ... 2.6 m
Reference reflector	Reflector PL80
Recommended sensing range for the best performance	0 m ... 2.6 m
Polarisation filters	Yes
Emitted beam	
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	
Normative reference	EN 62471:2008-09 IEC 62471:2006, modified
LED risk group marking	Free group
Wave length	635 nm
Average service life	100,000 h at Ta = +25 °C
Adjustment	
IO-Link	For configuring the sensor parameters and Smart Task functions
Display	

	LED blue	BluePilot: Alignment aid
	LED green	Operating indicatorStatic on: power onFlashing: IO-Link mode
	LED yellow	Status of received light beamStatic on: object not presentStatic off: object presentFlashing: Below the 1.5 function reserve
Special features		Pin2 pre-setting (MF): alarm output
Special applications		Detecting objects wrapped in film

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
Compatible master port type	A
SIO mode support	Yes

Electronics

Supply voltage U_B	10 V DC ... 30 V DC ¹⁾
Ripple	$\leq 5 \text{ V}_{\text{pp}}$
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
Switching mode	Light 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 μs
Switching frequency	1,000 Hz
Pin/Wire assignment	
Function of pin 4/black (BK)	Digital output, light switching, object present \rightarrow output Q_{L1} LOW ²⁾ IO-Link communication C

¹⁾ Limit values.²⁾ This switching output must not be connected to another output.

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)	Alarm output 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.

Mechanics

Housing	Rectangular
Design detail	Slim
Dimensions (W x H x D)	12.1 mm x 41.9 mm x 18.6 mm
Connection	Cable, 4-wire, 2 m
Connection detail	
Deep-freeze property	Do not bend below 0 °C
Conductor size	0.14 mm ²
Cable diameter	Ø 3.4 mm
Length of cable (L)	2 m
Material	
Housing	Plastic, VISTAL®
Front screen	Plastic, PMMA
Cable	Plastic, PVC
Maximum tightening torque of the fixing screws	0.4 Nm

Ambient data

Enclosure rating	IP66 (EN 60529) IP67 (EN 60529)
Ambient operating temperature	-40 °C ... +60 °C
Ambient temperature, storage	-40 °C ... +75 °C
Typ. Ambient light immunity	Artificial light: ≤ 50,000 lx Sunlight: ≤ 50,000 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 Hz ... 1,000 Hz (Amplitude 1 mm, 3 x 30 min (EN60068-2-6))
Air humidity	35 % ... 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

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

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 μ s ¹⁾
Repeatability	SIO Logic: 200 μ s 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).

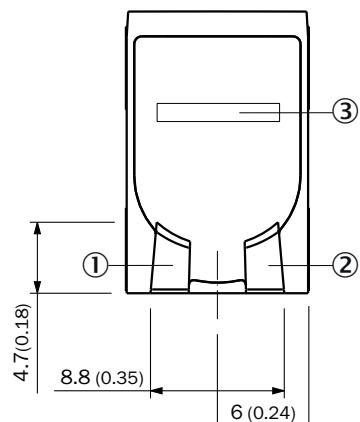
Diagnosis

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

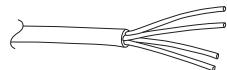
ECLASS 5.0	27270902
ECLASS 5.1.4	27270902
ECLASS 6.0	27270902
ECLASS 6.2	27270902
ECLASS 7.0	27270902
ECLASS 8.0	27270902
ECLASS 8.1	27270902
ECLASS 9.0	27270902
ECLASS 10.0	27270902
ECLASS 11.0	27270902
ECLASS 12.0	27270902
ETIM 5.0	EC002717
ETIM 6.0	EC002717
ETIM 7.0	EC002717
ETIM 8.0	EC002717
UNSPSC 16.0901	39121528

display and adjustment elements

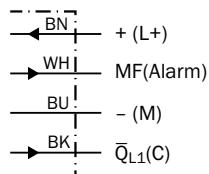


- ① LED green
- ② LED yellow
- ③ LED blue

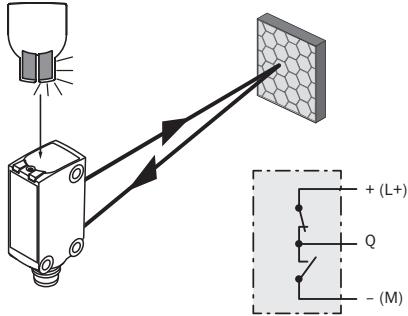
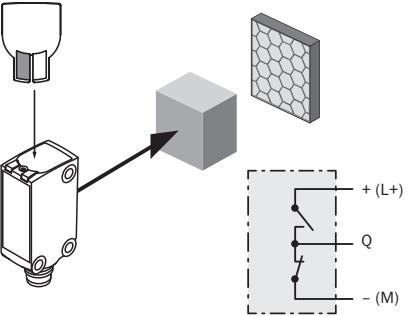
Connection type Cable, 4-wire



Connection diagram Cd-572

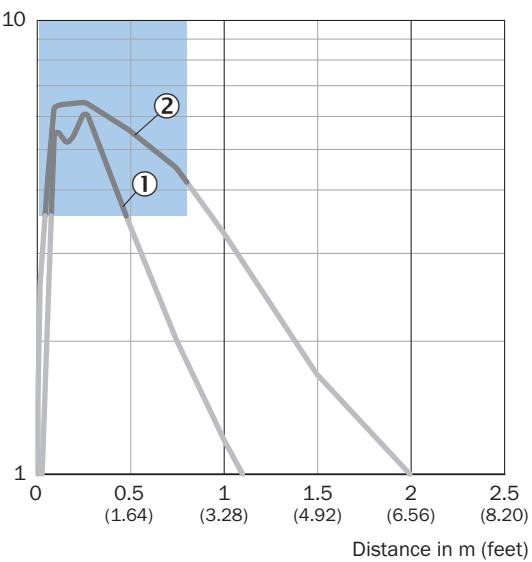


Truth table Push-pull: PNP/NPN - light switching Q

	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 Chemical-resistant reflectors

Operating reserve

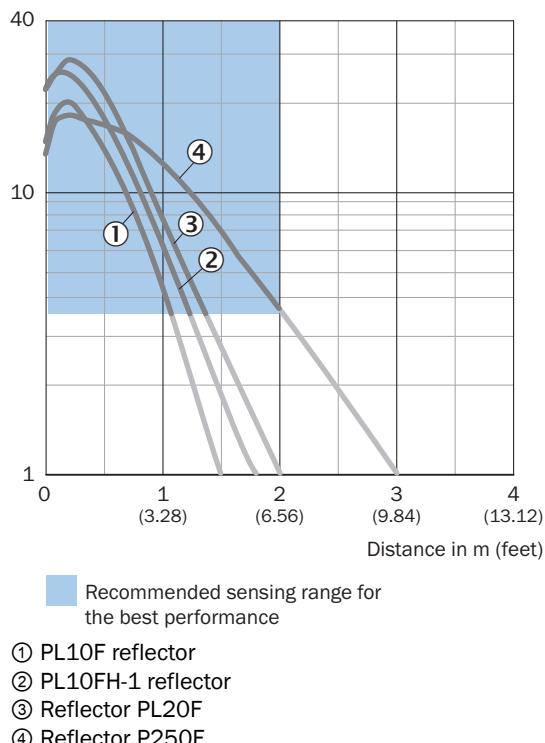


Recommended sensing range for
the best performance

- ① Reflector PL20 CHEM
- ② Reflector P250 CHEM

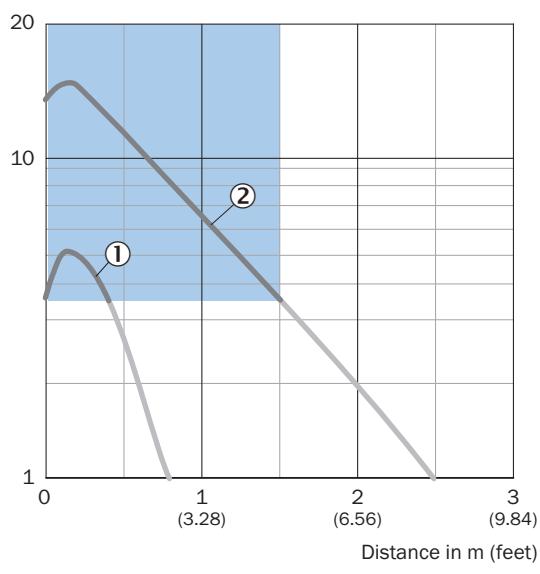
Characteristic curve Fine triple reflectors

Operating reserve



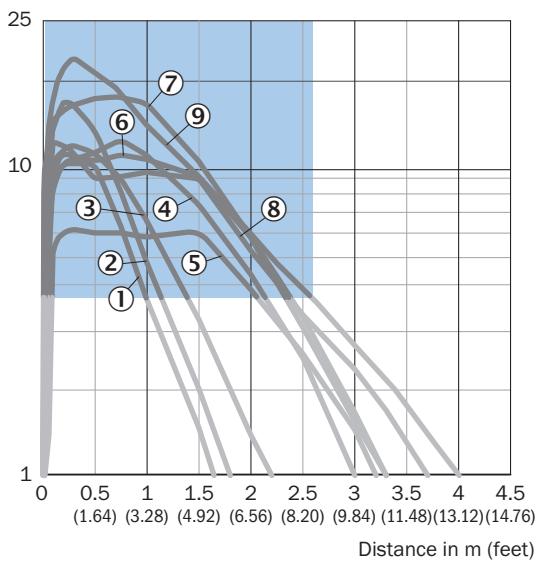
Characteristic curve Reflective tape

Operating reserve



Characteristic curve Standard reflectors

Operating reserve

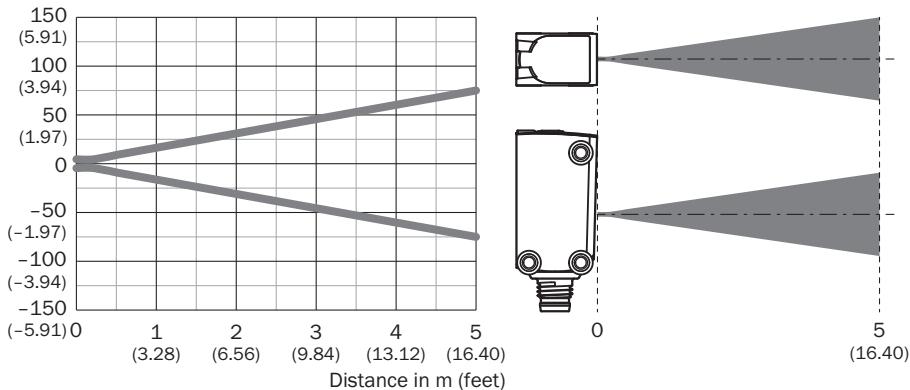


Recommended sensing range for the best performance

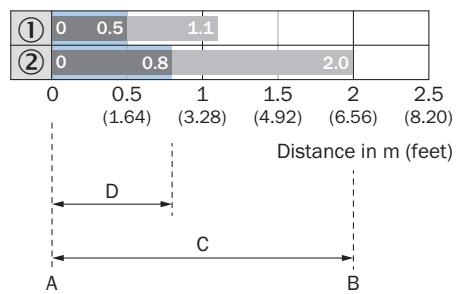
- ① Reflector PL20A
- ② reflector PL22-2
- ③ Reflector P250H
- ④ Reflector PL30A
- ⑤ Reflector PL40A Antifog
- ⑥ Reflector PL40A
- ⑦ Reflector P250
- ⑧ Reflector C110A
- ⑨ Reflector PL80A

Light spot size

Dimensions in mm (inch)



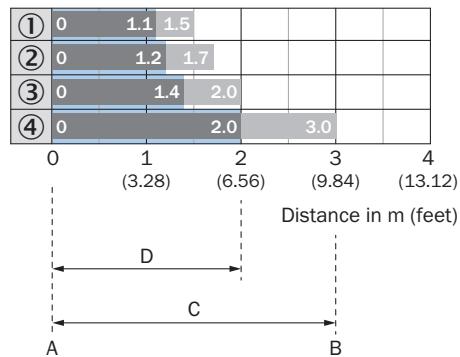
Sensing range diagram Chemical-resistant reflectors



Recommended sensing range for the best performance

1	Reflector PL20 CHEM
2	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)

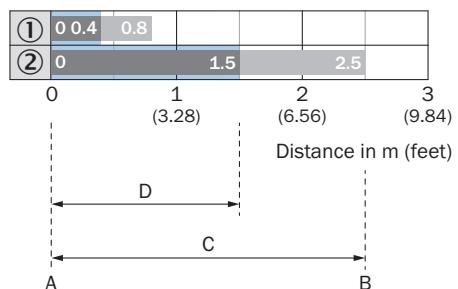
Sensing range diagram Fine triple reflectors



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)

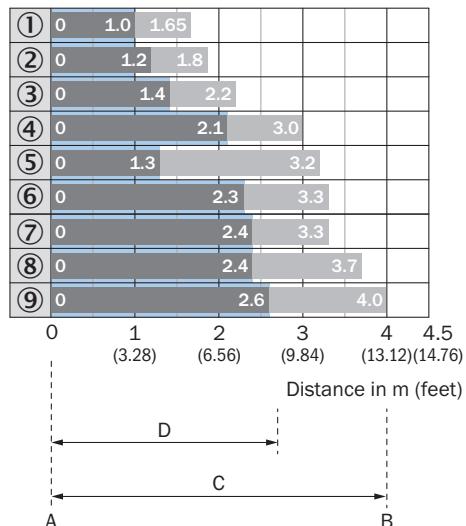
Sensing range diagram Reflective tape



Recommended sensing range for the best performance

1	Reflective tape REF-IRF-56
2	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)

Sensing range diagram Standard reflectors

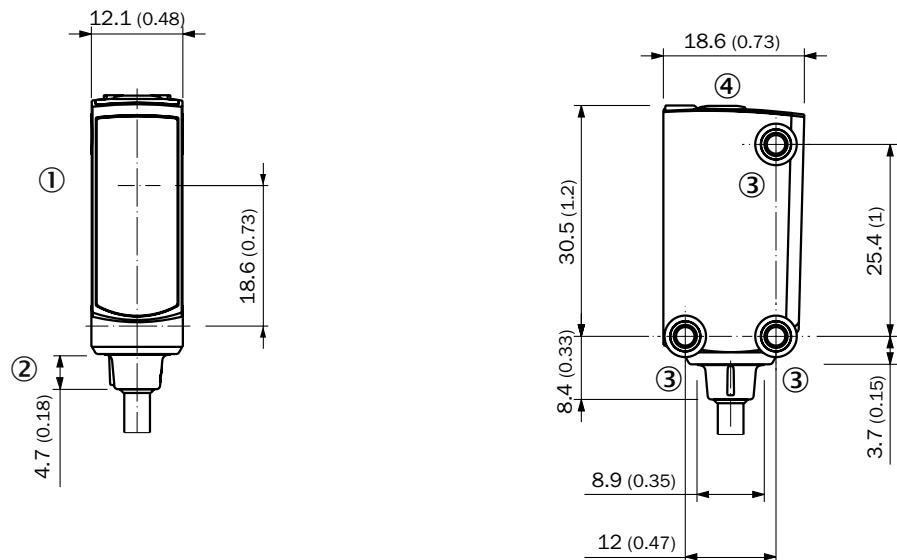


Recommended sensing range for the best performance

1	Reflector PL20A
2	Reflector PL22-2
3	Reflector P250H
4	Reflector PL30A
5	Reflector PL40A Antifog

6	Reflector PL40A
7	Reflector P250
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)

Dimensional drawing, sensor



Dimensions in mm (inch)

① Center of optical axis

② Connection

③ M3 mounting hole

④ display and adjustment elements

Recommended accessories

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

	Brief description	Type	part no.
reflectors and optics			
	<ul style="list-style-type: none">Description: Rectangular, screw connectionDimensions: 84 mm 84 mmAmbient operating temperature: -30 °C ... +65 °C	PL80A	1003865

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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