WLG4FP-1G311130ZZZ
W4

PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.

Ordering information

Type	part no.
WLG4FP-1G311130ZZZ	1150303

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

Detailed technical data

Features

Functional principle	Photoelectric retro-reflective sensor
Functional principle detail	ClearSens, With minimum distance to reflector (dual lens system)
Sensing range	
Sensing range min.	15 mm
Sensing range max.	4.5 m
Maximum distance range from reflector to sensor (operating reserve 1)	0.015 m ... 4.5 m
Recommended distance range from reflector to sensor (operating reserve 3,75)	0.035 m ... 3.9 m
Reference reflector	Reflector P250
Recommended sensing range for the best performance	0.035 m ... 3.9 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)	Ø 38 mm (1,000 mm)
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 T_a = +25 °C
Adjustment	
Teach-in button	For sensitivity adjustment
Display	
LED green	Operating indicatorStatic on: power on
LED yellow	Status of received light beamStatic on: object not presentStatic off: object presentFlashing: Below the 1.5 function reserve
Special applications	Detecting transparent objects

Safety-related parameters

$MTTF_D$	747 years
DC_{avg}	0 %
T_M (mission time)	20 years

Electronics

Supply voltage U_B	10 V DC … 30 V DC [1]
Ripple	≤ 5 V_{pp}
Usage category	DC-12 (According to EN 60947-5-2) DC-13 (According to EN 60947-5-2)
Current consumption	≤ 20 mA, without load. At U_B = 24 V
Protection class	III
Digital output	
Number	1
Type	Push-pull: PNP/NPN
Switching mode	Dark switching
Signal voltage PNP HIGH/LOW	Approx. U_B-2.5 V / 0 V
Signal voltage NPN HIGH/LOW	Approx. U_B / < 2.5 V
Output current $I_{max.}$	≤ 100 mA
Circuit protection outputs	Reverse polarity protected
	Overcurrent protected
	Short-circuit protected
Response time	≤ 500 µs
Repeatability (response time)	150 µs [2]
Switching frequency	1,000 Hz [3]
Pin/Wire assignment	
Function of pin 4/black (BK)	Digital output, dark switching, object present → output Q HIGH [4]

[1] Limit values.

[2] Signal transit time with resistive load in switching mode.

[3] With light/dark ratio 1:1.

[4] This switching output must not be connected to another output.

Mechanics

Housing	Rectangular
Design detail	Flat
Dimensions (W x H x D)	16 mm x 40.1 mm x 12.1 mm
Connection	Cable, 3-wire, 2 m
Connection detail	
Deep-freeze property	Do not bend below 0 °C
Conductor size	0.14 mm²
Cable diameter	Ø 3.4 mm
Length of cable (L)	2 m
Material	
Housing	Plastic, VISTAL®
Front screen	Plastic, PMMA
Cable	Plastic, PVC
Weight	Approx. 30 g
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

Certificates

EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
Moroccan declaration of conformity	✓
China-RoHS	✓
ECOLAB certificate	✓
cULus certificate	✓
EAC certificate / DoC	✓
IO-Link	✓

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

Adjustments
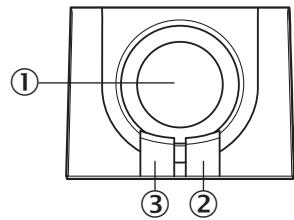
① Teach-in button
② LED yellow
③ LED green

Connection type Cable, 3-wire
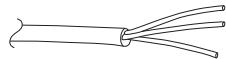
Connection diagram Cd-514

BN 1 + (L+)
BU 3 - (M)
BK 4 Q̄
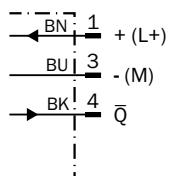
Truth table Push-pull: PNP/NPN – dark switching $\bar{Q}$

	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	✕	⚡
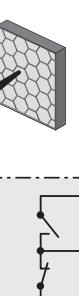
Characteristic curve Reflective tape

Operating reserve

Distance in m (feet)
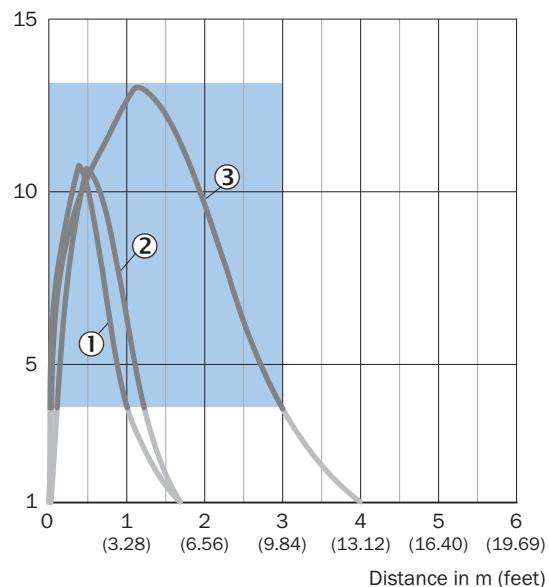
■ Recommended sensing range for the best performance

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

Characteristic curve Standard reflectors

Operating reserve

Distance in m (feet)

■ Recommended sensing range for the best performance

① Reflector PL22
② Reflector PL20A
③ Reflector PL30A
④ Reflector PL40A
⑤ Reflector PL80A
⑥ Reflector C110A
⑦ Reflector P250
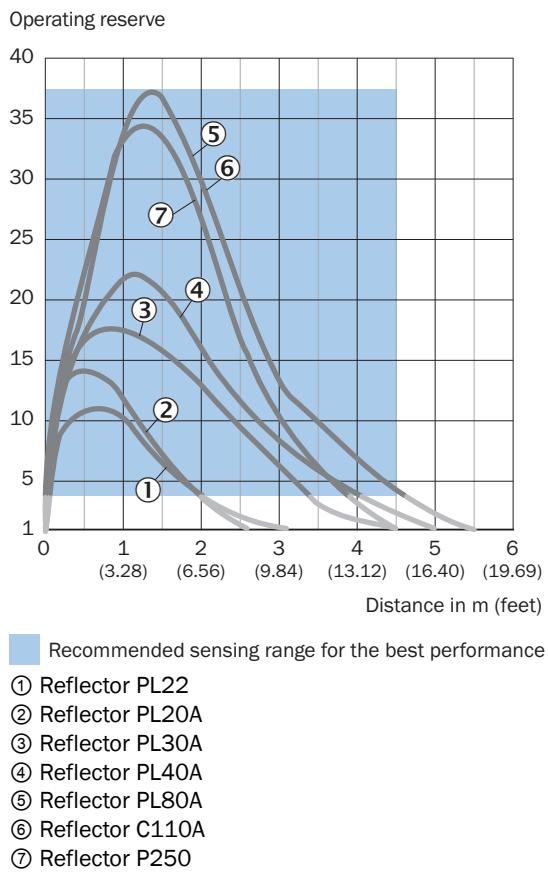
Characteristic curve Fine triple reflectors

Operating reserve
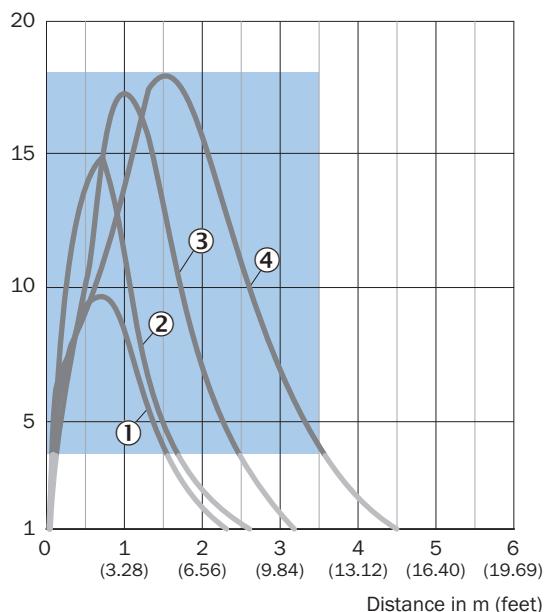
Distance in m (feet)

Recommended sensing range for the best performance
① PL10FH reflector
② PL10F reflector
③ Reflector PL20F
④ Reflector P250F

Characteristic curve Chemical-resistant reflectors

Operating reserve
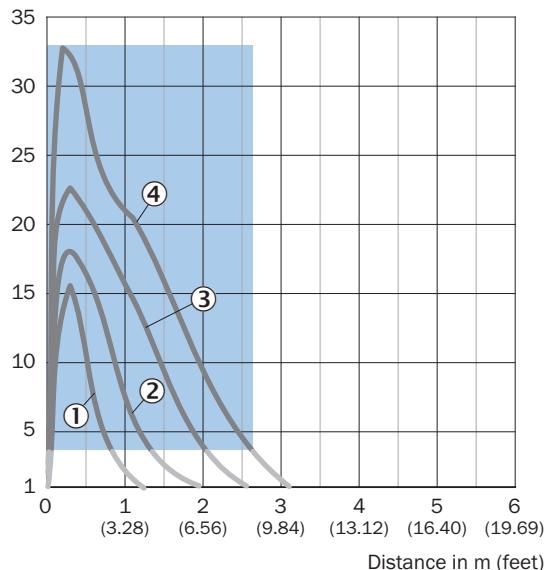
Distance in m (feet)

Recommended sensing range for the best performance
① PL10F CHEM reflector
② Reflector PL20 CHEM

③ Reflector P250 CHEM
④ Reflector P250H

## Light spot size

Dimensions in mm (inch)
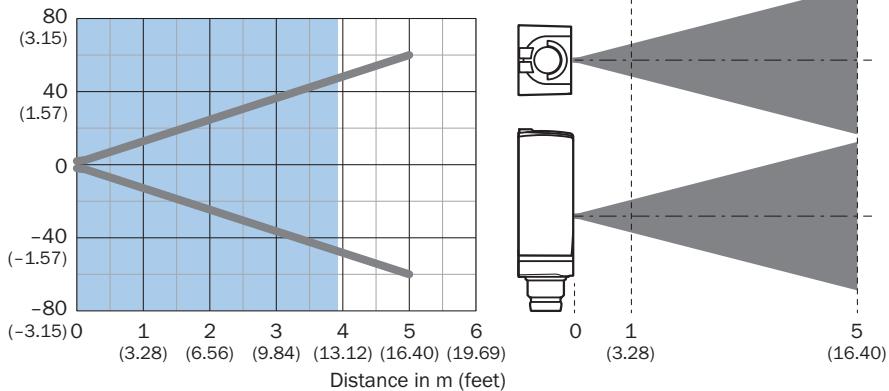
	Recommended sensing range for the best performance

## Sensing range diagram Standard reflectors
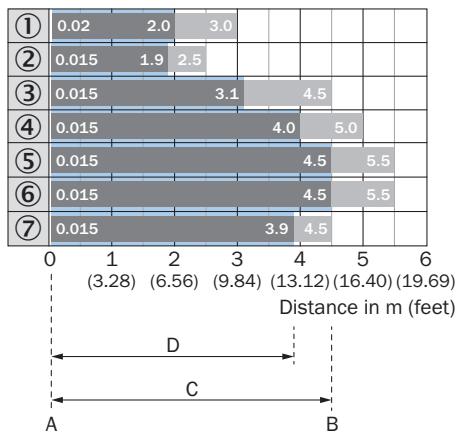
A = Sensing range min. in m
B = Sensing range max. in m
C = Maximum distance range from reflector to sensor (operating reserve 1)
D = Recommended distance range from reflector to sensor (operating reserve 3.75)

	Recommended sensing range for the best performance

① Reflector PL22
② Reflector PL20A
③ Reflector PL30A
④ Reflector PL40A
⑤ Reflector PL80A
⑥ Reflector C110A
⑦ Reflector P250

Sensing range diagram Reflective tape

①	0.025	1.0	1.8		
②	0.05	1.2	1.8		
③	0.025			3.0	4.0

0   1 (3.28)   2 (6.56)   3 (9.84)   4 (13.12)

Distance in m (feet)

D

C

A   B

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)
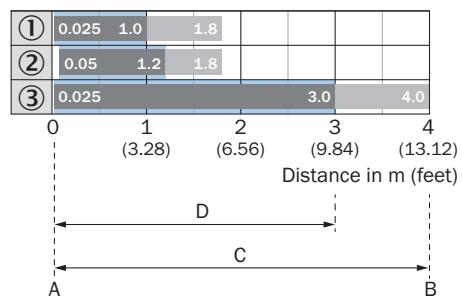
■ Recommended sensing range for the best performance

① Reflective tape REF-DG (50 x 50 mm)

② reflective tape REF-IRF-56

③ Reflective tape REF-AC1000

Sensing range diagram Fine triple reflectors
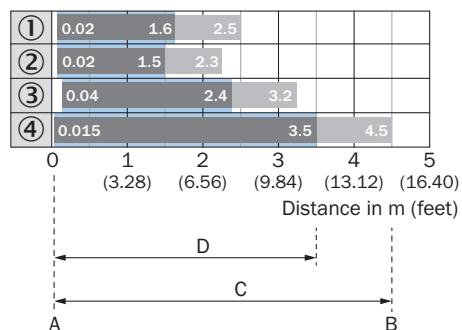
①	0.02	1.6	2.5			
②	0.02	1.5	2.3			
③	0.04		2.4	3.2		
④	0.015			3.5	4.5	

0   1 (3.28)   2 (6.56)   3 (9.84)   4 (13.12)   5 (16.40)

Distance in m (feet)

D

C

A   B

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)

■ Recommended sensing range for the best performance

① PL10FH reflector

② PL10F reflector

③ Reflector PL20F

④ Reflector P250F

Sensing range diagram Chemical-resistant reflectors
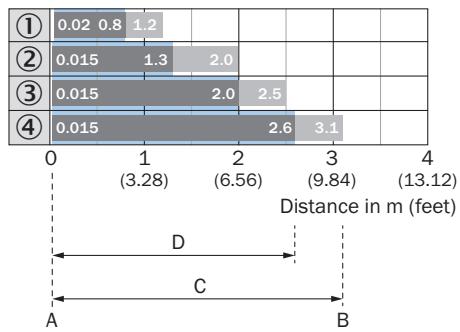
A = Sensing range min. in m
B = Sensing range max. in m
C = Maximum distance range from reflector to sensor (operating reserve 1)
D = Recommended distance range from reflector to sensor (operating reserve 3.75)

Recommended sensing range for the best performance
① PL10F CHEM reflector
② Reflector PL20 CHEM
③ Reflector P250 CHEM
④ Reflector P250H

Dimensional drawing
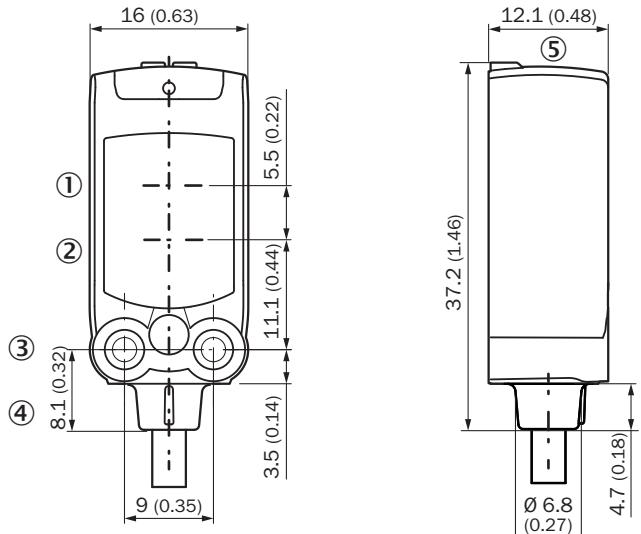
Dimensions in mm (inch)
① Center of optical axis, sender
② Center of optical axis, receiver
③ M3 mounting hole
④ Connection
⑤ display and adjustment elements

Recommended accessories

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

	Brief description	Type	part no.
Mounting systems			
	• **Description:** Mounting bracket for wall mounting • **Material:** Stainless steel • **Details:** Stainless steel 1.4571 • **Items supplied:** Mounting hardware included • **Suitable for:** W4S, W4F, W4S	BEF-W4-A	2051628
reflectors and optics			
	• **Description:** Fine triple reflector, screw connection, suitable for laser sensors • **Dimensions:** 20 mm 32 mm • **Ambient operating temperature:** –30 °C … +65 °C	PL10F	5311210
connectors and cables			
	• **Connection type head A:** Male connector, M8, 3-pin, straight, A-coded • **Description:** Unshielded • **Connection systems:** Screw-type terminals • **Permitted cross-section:** 0.14 mm² … 0.5 mm²	STE-0803-G	6037322

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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