Data sheet



WLA12L-1H162830A00

W12

PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.



Illustration may differ

Ordering information

Type	part no.
WLA12L-1H162830A00	1126046

Other models and accessories ➜ www.sick.com/W12

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.	11 m
Maximum distance range from reflector to sensor (operating reserve 1)	0 m ... 11 m
Recommended distance range from reflector to sensor (operating reserve 3,75)	0 m ... 7.5 m
Reference reflector	Reflector P250F
Recommended sensing range for the best performance	0 mm ... 600 mm
Polarisation filters	Yes
Emitted beam	
Light source	Laser
Type of light	Visible red light
Shape of light spot	Ellipse shape
Light spot size (distance)	0.4 mm x 0.35 mm (300 mm)
Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle)	< +/- 1.2° (at Ta = +23 °C)

Focus position	300 mm
Key laser figures	
Normative reference	EN 60825-1:2014, IEC 60825-1:2014
Laser class	1
Wave length	655 nm
Pulse duration	4 µs
Maximum pulse power	< 2.13 mW
Average service life	50,000 h at T_U = +25 °C
Adjustment	
Teach-in button	BluePilot: for sensitivity 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 applications	Detecting small objects, Detection of objects moving at high speeds, Detecting objects wrapped in film

Safety-related parameters

$MTTF_D$	371 years
DC_{avg}	0 %
T_M (mission time)	10 years

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	0x8002DD
DeviceID DEC	8389341
Compatible master port type	A
SIO mode support	Yes

Electronics

Supply voltage U_B	10 V DC ... 30 V DC [1]
Ripple	≤ 5 V
Usage category	DC-12 (According to EN 60947-5-2)

[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.

	DC-13 (According to EN 60947-5-2)
Current consumption	≤ 14 mA, without load. At U_B = 24 V
Protection class	III
Digital output	
Number	2 (Complementary)
Type	Push-pull: PNP/NPN
Switching mode	Light/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	≤ 200 µs [2]
Repeatability (response time)	85 µs [2]
Switching frequency	2,500 Hz [3]
Pin/Wire assignment	
BN	+ (L+)
WH	$\bar{Q}_{L1}$/MFDigital output, dark switching, object present → output $\bar{Q}_{L1}$ HIGH [4] The pin 2 function of the sensor can be configured
	Additional possible settings via IO-Link
BU	- (M)
BK	QL1/CDigital output, light switching, object present → output Q_{L1} LOW [4] The pin 4 function of the sensor can be configured
	Additional possible settings via IO-Link

[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
Dimensions (W x H x D)	15.6 mm x 49.5 mm x 43.1 mm
Connection	Cable, 4-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
Bending radius	For flexible use > 12 x cable diameter
Bending cycles	1,000,000
Material	
Housing	Metal, zinc diecast
Front screen	Plastic, PMMA

Cable	Plastic, PVC
Weight	Approx. 132 g
Maximum tightening torque of the fixing screws	1.4 Nm

Ambient data

Enclosure rating	IP66 (EN 60529) IP67 (EN 60529) IP69 (EN 60529)
Ambient operating temperature	–20 °C ... +55 °C
Ambient temperature, storage	–40 °C ... +70 °C
Warm-up time	< 15 min, Where T_u is under –10 °C
Typ. Ambient light immunity	Artificial light: ≤ 50,000 lx Sunlight: ≤ 50,000 lx
Shock resistance	50 g, 11 ms (25 positive and 25 negative shocks along X, Y, Z axes, 150 total shocks (EN60068-2-27))
Vibration resistance	10 Hz ... 2,000 Hz (Amplitude 0.5 mm / 10 g, 20 sweeps per axis, for X, Y, Z axes, 1 octave/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
Timer function	Deactivated Switch-on delay Off delay ON and OFF delay Impulse (one shot)
Inverter	Yes
Switching frequency	SIO Logic: 2000 Hz [1] IOL: 1600 Hz [2]
Response time	SIO Logic: 250 µs [1] IOL: 300 µs [2]
Repeatability	SIO Logic: 120 µs [1] [2]
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).
[2] Use of Smart Task functions with IO-Link communication function.

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

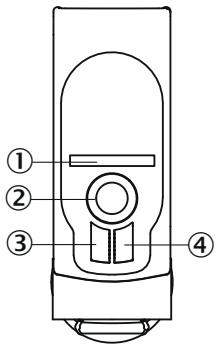
Certificates

EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
Moroccan declaration of conformity	✓
China-RoHS	✓
ECOLAB certificate	✓
cULus certificate	✓
IO-Link	✓
Laser safety (IEC 60825-1) declaration of manufacturer	✓

Classifications

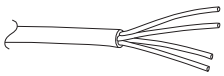
ECLASS 5.0	27270902
ECLASS 5.1.4	27270902
ECLASS 6.0	27270902
ECLASS 6.2	27270902
ECLASS 7.0	27270902
ECLASS 8.0	27270902
ECLASS 8.1	27270902
ECLASS 9.0	27270902
ECLASS 10.0	27270902
ECLASS 11.0	27270902
ECLASS 12.0	27270902
ETIM 5.0	EC002717
ETIM 6.0	EC002717
ETIM 7.0	EC002717
ETIM 8.0	EC002717
UNSPSC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

display and adjustment elements

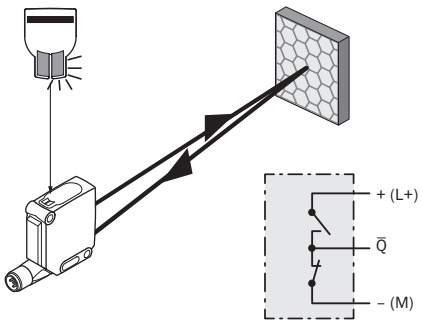
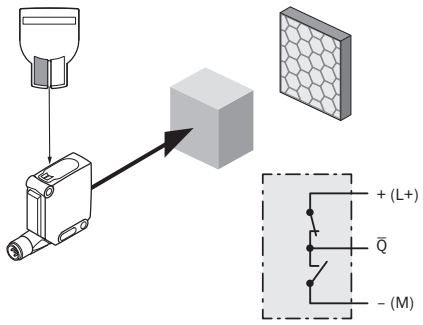


① LED blue
② Teach-in button
③ LED yellow
④ LED green

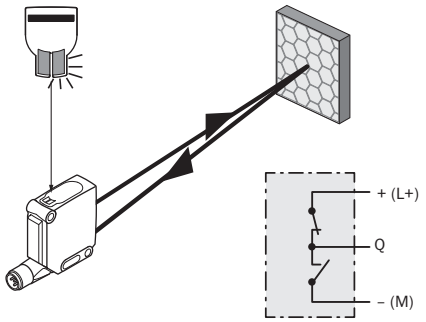
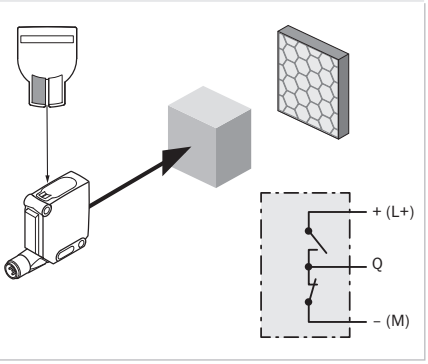
Connection type Cable, 4-wire



Truth table Push-pull: PNP/NPN – dark switching Q̄

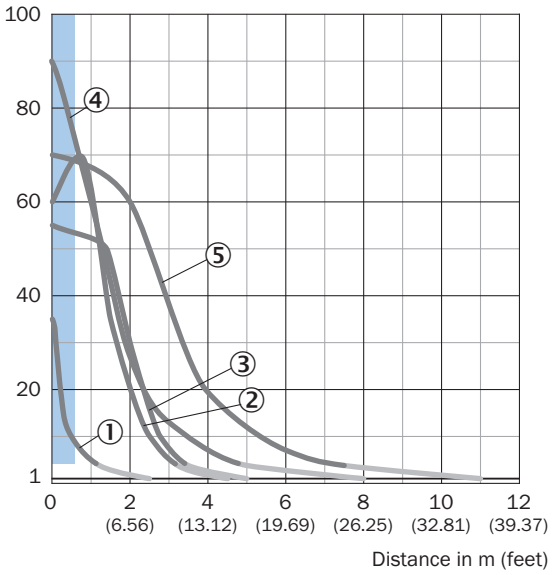
	Dark switching Q̄ (normally open (upper switch), normally closed (lower switch))	
	Object not present ➜ Output LOW	Object present ➜ Output HIGH
Light receive	✓	✗
Light receive indicator	☀	✗
Load resistance to L+	⚠	✗
Load resistance to M	✗	⚠
		

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

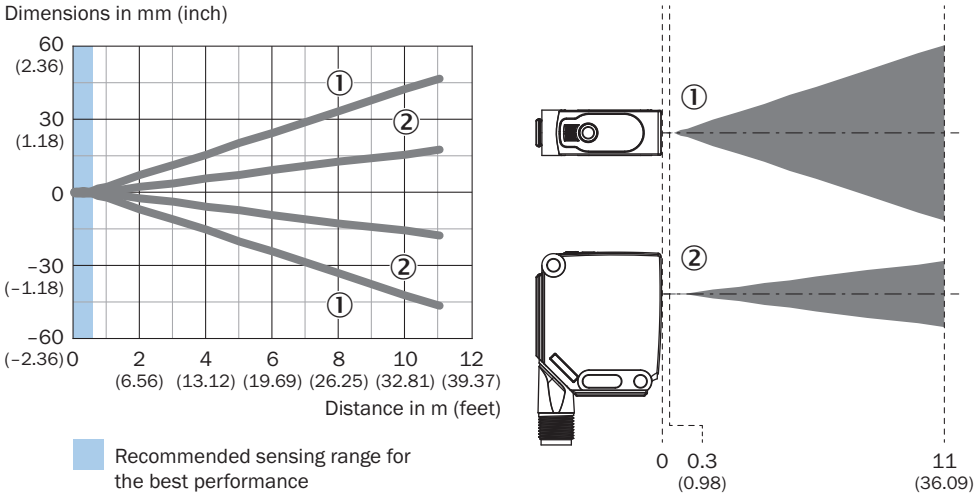
Operating reserve



Recommended sensing range for the best performance

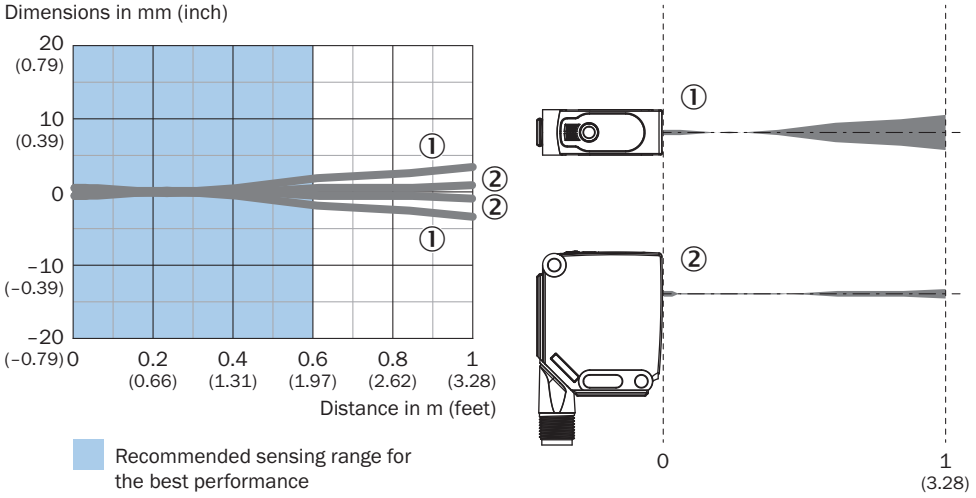
① Reflective tape REF-IRF-56
② PL10F reflector
③ Reflector PL20F
④ Reflective tape REF-AC1000
⑤ Reflector P250F

Light spot size



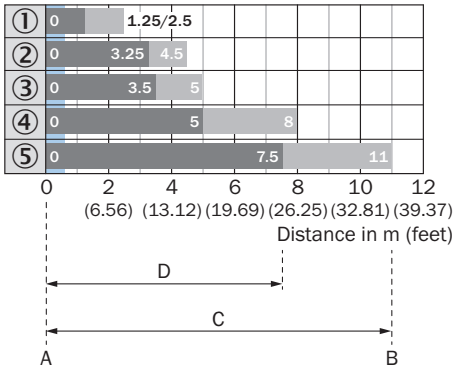
① Light spot horizontal
② Light spot vertical

Light spot size (detailed view) Close range



① Light spot horizontal
② Light spot vertical

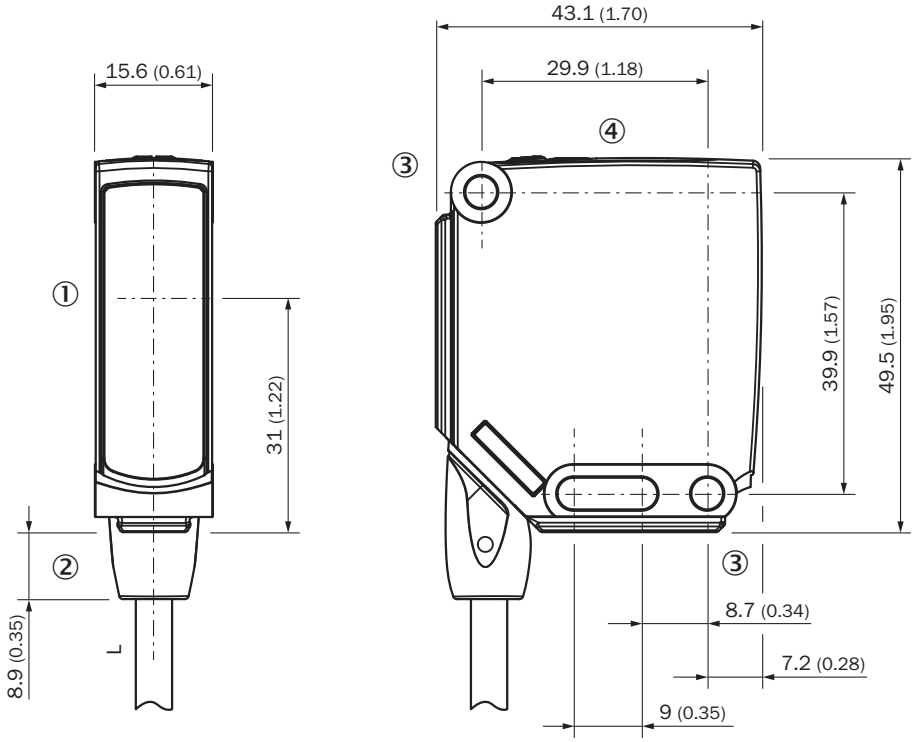
Sensing range diagram



Recommended sensing range for the best performance

1	Reflective tape REF-IRF-56
2	PL10F reflector
3	Reflector PL20F
4	Reflective tape REF-AC1000
5	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)

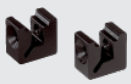
Dimensional drawing



Dimensions in mm (inch)
For length of cable (L), see technical data
① Center of optical axis
② Connection
③ Mounting hole, Ø 4.2 mm
④ display and adjustment elements

Recommended accessories

Other models and accessories ➜ www.sick.com/W12

	Brief description	Type	part no.
Mounting systems			
	• **Description:** Plate N03 for universal clamp bracket, zinc coated • **Material:** Steel, zinc diecast • **Details:** Zinc plated steel (sheet), Zinc die cast (clamping bracket) • **Items supplied:** Universal clamp (5322626), mounting hardware • **Usable for:** UC12, W14-2, W18-2, W18-3, W11-2, W12-3, W12-2 Laser, W12G, W12 Teflon, W16, W24-2 Ex, PowerProx, W11G-2, TranspaTect, W18-3 Ex, W24-2, PL50A, PL80A, PL40A, P250	BEF-KHS-N03	2051609
	• **Description:** Clamping block for dovetail mounting • **Material:** Aluminum • **Details:** Aluminum (anodised) • **Items supplied:** Mounting hardware included • **Suitable for:** W11-2, W12-3	BEF-KH-W12	2013285
	• **Description:** Mounting bracket, large • **Material:** Stainless steel • **Details:** Stainless steel • **Items supplied:** Mounting hardware included • **Suitable for:** W11-2, W12-3, W16	BEF-WG-W12	2013942
	• **Material:** Aluminum • **Details:** Aluminum • **Items supplied:** Including mounting material (sensor) and mounting material (bracket) • **Usable for:** Adapter plate for W23L/W27L to W12L	BEF-AP-W12	2127742
reflectors and optics			
	• **Description:** Fine triple reflector, screw connection, suitable for laser sensors • **Dimensions:** 52 mm 62 mm • **Ambient operating temperature:** –30 °C ... +65 °C	P250F	5308843

	Brief description	Type	part no.
network devices			
		SIG300-0A0GAA100	1131014
		SIG300-0A04AA100	1131011
		SIG300-0A05AA100	1131012
		SIG300-0A06AA100	1131013

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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