



WLA12L-34162130A00

W12

SMALL PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.



Illustration may differ

Ordering information

Type	Part no.
WLA12L-34162130A00	1126053

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.	20 m
Maximum distance range from reflector to sensor (operating reserve 1)	0 m ... 20 m
Recommended distance range from reflector to sensor (operating reserve 3,75)	0 m ... 12 m
Reference reflector	Reflector P250F
Recommended sensing range for the best performance	0 mm ... 12,000 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)	1.5 mm x 1.2 mm (1,000 mm)
Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle)	< +/- 1.2° (at Ta = +23 °C)
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
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 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 (EN ISO 13849, rate of use: 60 %)

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	0x8002D9
DeviceID DEC	8389337
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) DC-13 (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.

Current consumption		≤ 14 mA, without load. At $U_B = 24\text{ V}$
Protection class		III
Digital output		
	Number	2 (Complementary)
	Type	Push-pull: PNP/NPN
	Switching mode	Light/dark switching
	Signal voltage PNP HIGH/LOW	Approx. $U_B - 2.5\text{ V} / 0\text{ V}$
	Signal voltage NPN HIGH/LOW	Approx. $U_B / < 2.5\text{ V}$
	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 1	+ (L+)
	WH 2	$\bar{Q}_{L1}/\text{MF}$ Digital output, dark switching, object present → output $\bar{Q}_{L1}$ HIGH ⁴⁾ The pin 2 function of the sensor can be configuredAdditional possible settings via IO-Link
	BU 3	- (M)
	BK 4	Q_{L1}/C Digital output, light switching, object present → output Q_{L1} LOW ⁴⁾ The pin 4 function of the sensor can be configuredAdditional 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 with M12 male connector, 4-pin, 315 mm
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)	275 mm
	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
	Male connector	Plastic, VISTAL®

Weight	Approx. 94 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

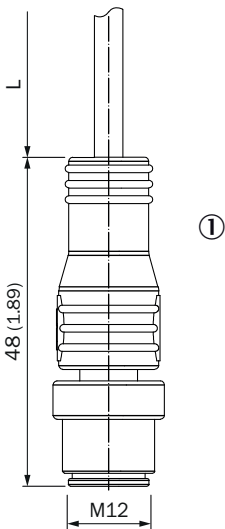
Classifications

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

Maßzeichnung (Dimensions in mm (inch))

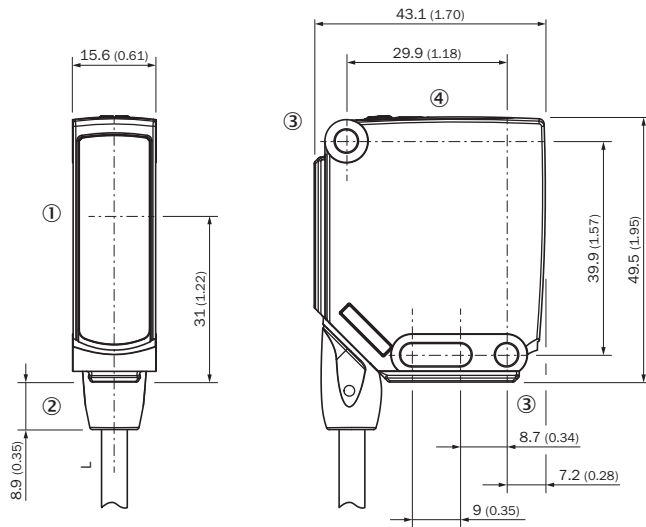
Dimensional drawing (Dimensions in mm (inch))

Dimensional drawing, connection



For length of cable (L), see technical data

- ① Cable with M12 male connector

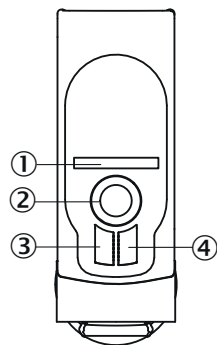


For length of cable (L), see technical data

- ① Center of optical axis
② Connection
③ Mounting hole, Ø 4.2 mm
④ Display and adjustment elements

Adjustments

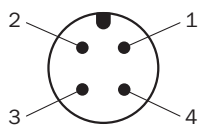
Display and adjustment elements



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

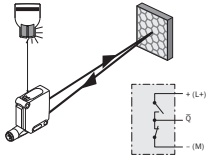
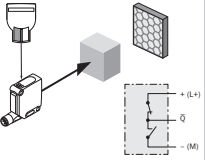
Connection type

M12 male connector, 4-pin

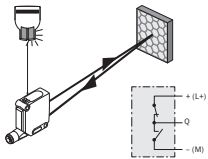
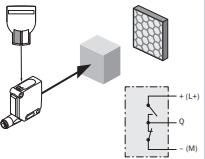


Truth table

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

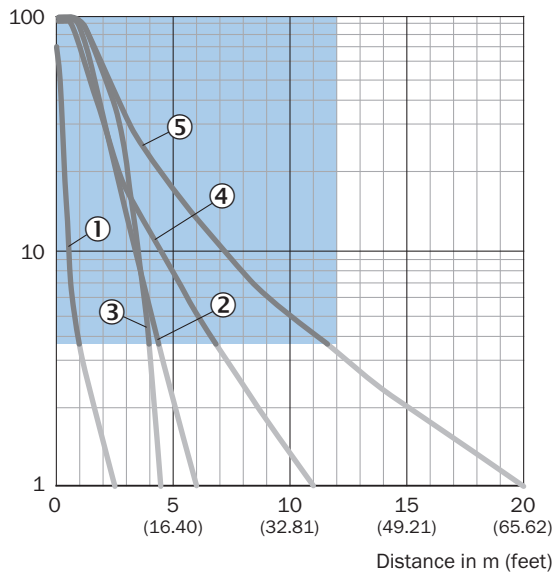
	Dark switching $\bar{Q}$ (normally open (upper switch), normally closed (lower switch))	
	Object not present → Output LOW	Object present → Output HIGH
Light receive	✓	✗
Light receive indicator	☉	✗
Load resistance to L+	⚠	✗
Load resistance to M	✗	⚠
		

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

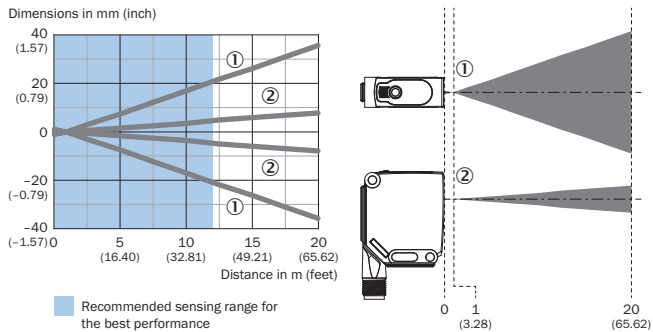
Operating reserve



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

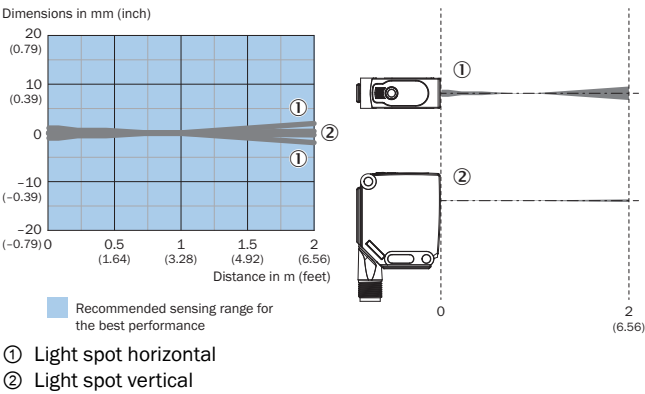
Light spot size



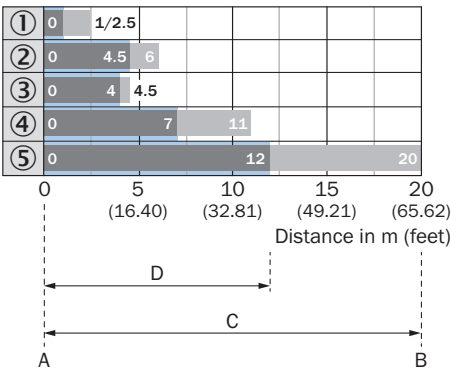
- ① Light spot horizontal
- ② Light spot vertical

Light spot size (detailed view)

Close range



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)

Recommended accessories

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

	Brief description	Type	Part no.
Mounting brackets and plates			
	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
	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
Terminal and alignment brackets			
	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
Universal bar clamp 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: Mounting bar, straight, 300 mm, steel Material: Steel Details: Steel, zinc coated Items supplied: Without mounting hardware Usable for: Fiber-optic sensors	BEF-MS12G-B	4056055
	Description: Bar clamp for bar diameter of 12 mm (fixing the mounting rod) Material: Aluminum Details: Aluminum Items supplied: 2 screws M6 x 30, 2 spring discs Usable for: Fiber-optic sensors	BEF-RMC-D12	5321878
Others			
	Description: Fine triple reflector, screw connection, suitable for laser sensors Dimensions: 52 mm 62 mm Ambient operating temperature: -30 °C ... +65 °C	P250F	5308843
	Connection type head A: Female connector, M12, 4-pin, straight, A-coded Connection type head B: Flying leads Signal type: Sensor/actuator cable Cable: 5 m, 4-wire, PVC Description: Sensor/actuator cable, unshielded Application: Zones with chemicals, Uncontaminated zones	YF2A14-050VB3XLEAX	2096235
Sensor Integration Gateway			
	Further functions: Web server integrated, IIoT interface available (dual talk) Logic editor: no Communication interface: IO-Link, Ethernet, PROFINET, REST API, MQTT, OPC UA Product category: IO-Link Master	SIG350-0004AP100	6076871

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:

Contacts and other locations –www.sick.com