

WLA12L-34162730A00

The logo for SICK Sensor Intelligence. The word "SICK" is in a large, bold, blue sans-serif font. To its right, the words "Sensor Intelligence" are written in a smaller, blue sans-serif font.



Illustration may differ

PHOTOELECTRIC SENSORS

WLA12L-34162730A00

ORDERING INFORMATION

Type	part no.
WLA12L-34162730A00	1126002

Further device versions and accessories at 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 ... 500 mm
Polarisation filter		Yes
Emitted beam		
	Light source	Laser
	Type of light	Visible red light
	Shape of light spot	Ellipse shape
	Light spot size (distance)	0.3 mm x 0.3 mm (250 mm)
	Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle)	< +/- 1.2° (at T _U = +23 °C)
Focus position		250 mm
Key laser figures		
	Normative reference	EN 60825-1:2014, IEC 60825-1:2014
	Laser class	1 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

¹⁾ Do not intentionally look into the laser beam. Never point the laser beam at people's eyes.

	IO-Link	For configuring the sensor parameters and Smart Task functions
Display		
	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

¹⁾ Do not intentionally look into the laser beam. Never point the laser beam at people's eyes.

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	0x8002DC
DeviceID DEC	8389340
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)
Current consumption	≤ 14 mA, without load. At U _B = 24 V

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.

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	
Function of pin 4/black (BK)	Digital output, light switching, object present → output $Q_{\square}$ LOW ⁴⁾
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 output, dark switching, object present → output $\bar{Q}_{\square}$ HIGH ⁴⁾
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⁾ 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 plug, M12, 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⁾ IOL: 150 µs 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

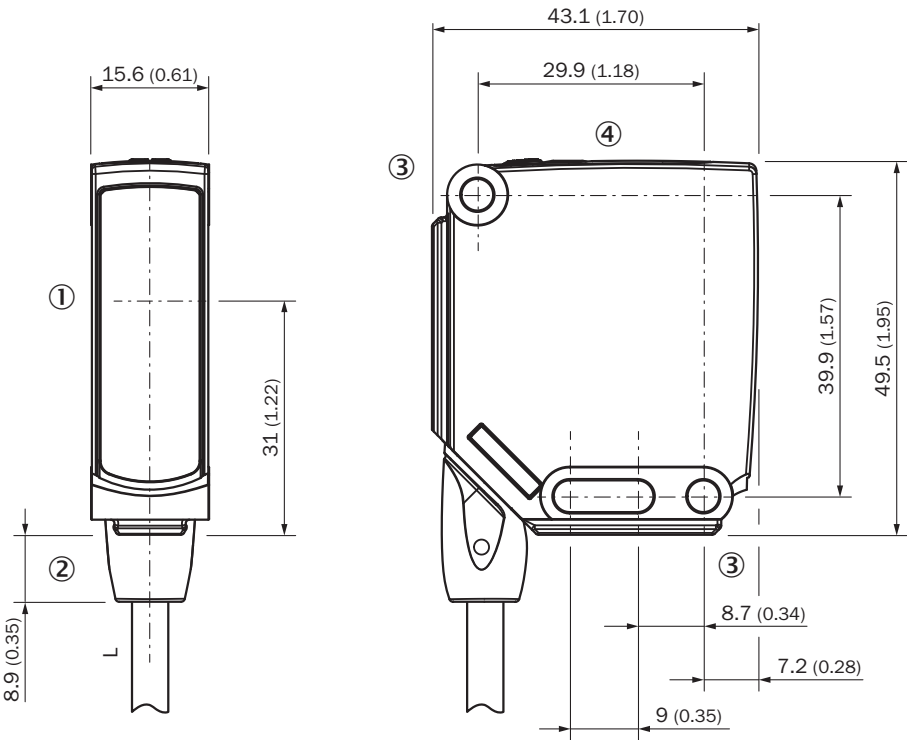
Device temperature	Measuring range	Very cold, cold, moderate, warm, hot
Device status		Yes
Detailed device status		Yes
Operating hour counter		Yes
Operating hours counter with reset function		Yes
Quality of teach		Yes
Quality of run		Yes, Contamination display

CERTIFICATES

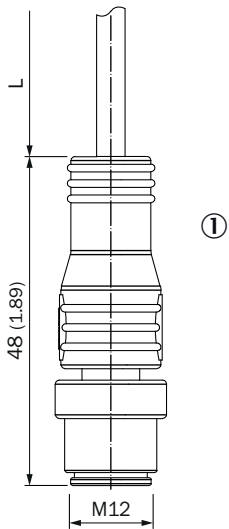
EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
Moroccan declaration of conformity	✓
China RoHS	✓
China Compulsory Product Certification (CCC) exempt	✓
ECOLAB certificate	✓
cULus certificate	✓

IO-Link certificate	✓
Laser safety (IEC 60825-1) declaration of manufacturer	✓
Information according to Art. 3 of Data Act (Regulation EU 2023/2854)	✓

DIMENSIONAL DRAWING



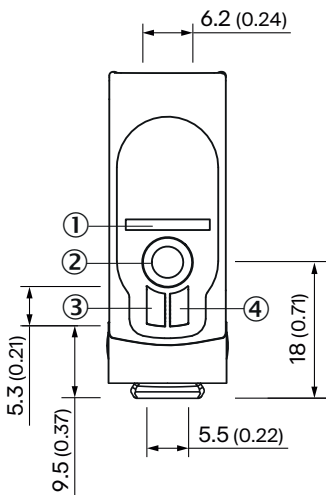
Dimensions in mm (inch)
For length of cable (L), see technical data
① Center of optical axis
② Connection
③ Mounting hole, Ø 4.2 mm
④ display and adjustment elements

DIMENSIONAL DRAWING, CONNECTION

Dimensions in mm (inch)

For length of cable (L), see technical data

① Cable with M12 male connector

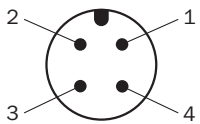
DISPLAY AND ADJUSTMENT ELEMENTS

① LED blue

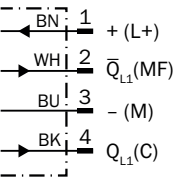
② Teach-in button

③ LED green

④ LED yellow

CONNECTION TYPE M12 MALE CONNECTOR, 4-PIN

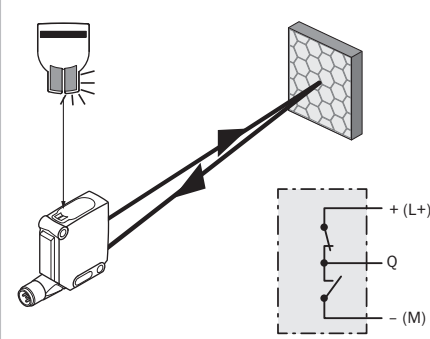
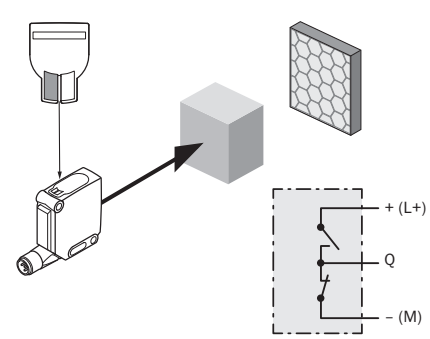
CONNECTION DIAGRAM CD-490



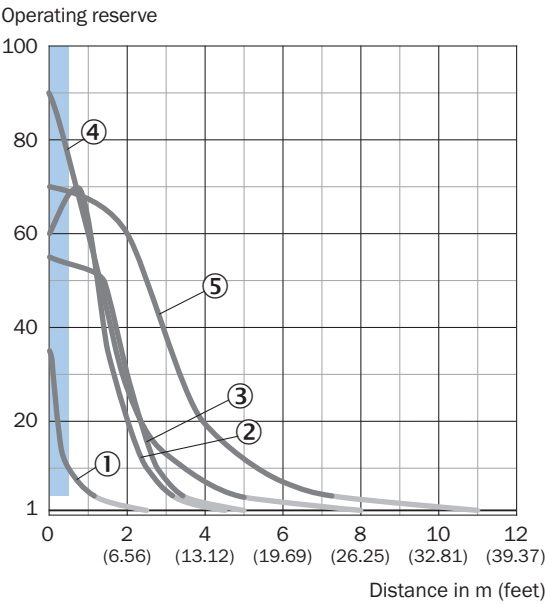
TRUTH TABLE PUSH-PULL: PNP/NPN - DARK SWITCHING $\bar{Q}$

	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	✗	⚡

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	⚡	✗
		

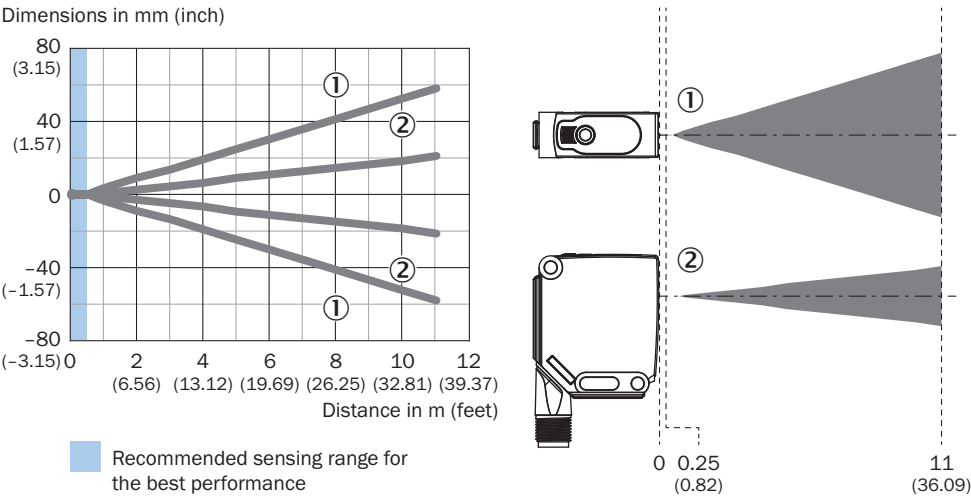
CHARACTERISTIC CURVE



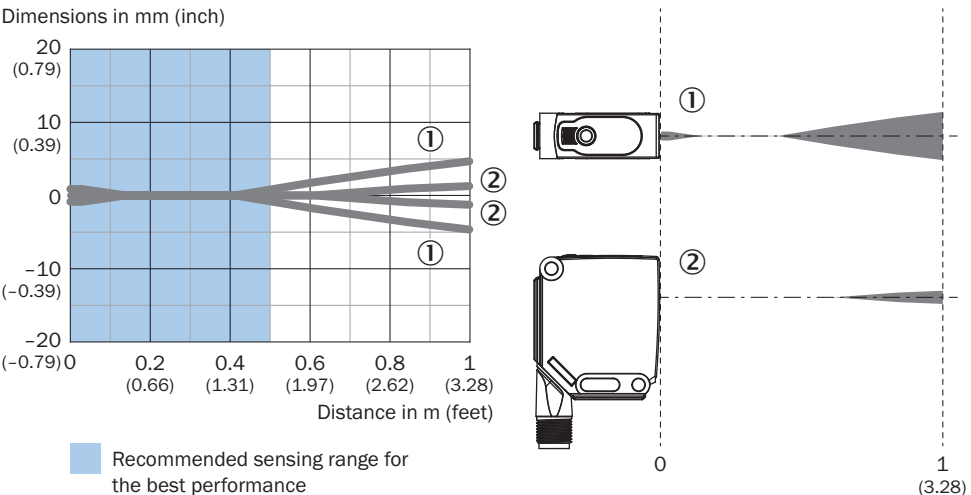
Recommended sensing range for the best performance

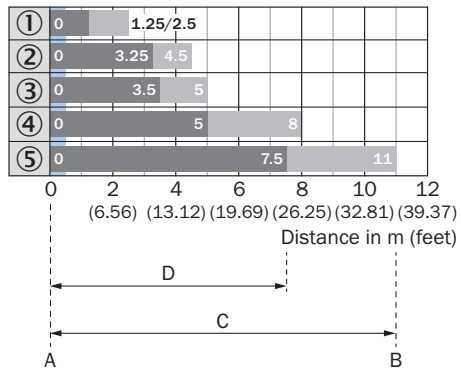
- ① Reflective tape REF-IRF-56
- ② PL10F reflector
- ③ Reflector PL20F
- ④ Reflective tape REF-AC1000
- ⑤ Reflector P250F

LIGHT SPOT SIZE



LIGHT SPOT SIZE (DETAILED VIEW)



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)

Further information as well as suitable accessories, example applications and downloads such as CAD dimensional models, operating instructions and software can be found at www.sick.com/1126002



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SICK AT A GLANCE

SICK is a leading global technology company for intelligent sensors and integrated solutions in industrial automation. Our technologies set benchmarks, making your industrial processes more efficient, safer and more sustainable – both in logistics and manufacturing operations.

SICK combines sensor intelligence with industry expertise and certified consulting services. We provide the ideal foundation for scalable as well as tailor-made automation solutions and create added value along the entire value chain. Our close partnerships with our customers are more than just a promise: Together, we optimize productivity, improve quality, protect health and safety, and help build a sustainable future. All with empathy and trust.

Since 1946, we have been developing innovative technologies with passion and a pioneering spirit. With a global network in around 40 countries, SICK has a global presence and is always close by. The company's headquarters are located in Waldkirch near Freiburg, Germany. Our customers benefit from our understanding of both local and global requirements, which enables us to deliver tailor-made solutions

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