



DATA SHEET

WLA12L-24162230A00

W12
Photoelectric sensors

SICK

Sensor Intelligence



Illustration may differ

PHOTOELECTRIC SENSORS

WLA12L-24162230A00

ORDERING INFORMATION

Type	part no.
WLA12L-24162230A00	1125936

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 ... 300 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 0.2 mm (150 mm)
Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle)	< +/- 1.2° (at T _u = +23 °C)
Focus position	150 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 ₀	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	0x8002DA
	DeviceID DEC	8389338
	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 μ s ²⁾
Pin/Wire assignment	Repeatability (response time)	85 μ s ²⁾
	Switching frequency	2,500 Hz ³⁾
	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	Male connector M12, 4-pin	
Material	Housing	Metal, zinc diecast
	Front screen	Plastic, PMMA
	Male connector	Plastic, VISTAL®
Weight	Approx. 77 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.

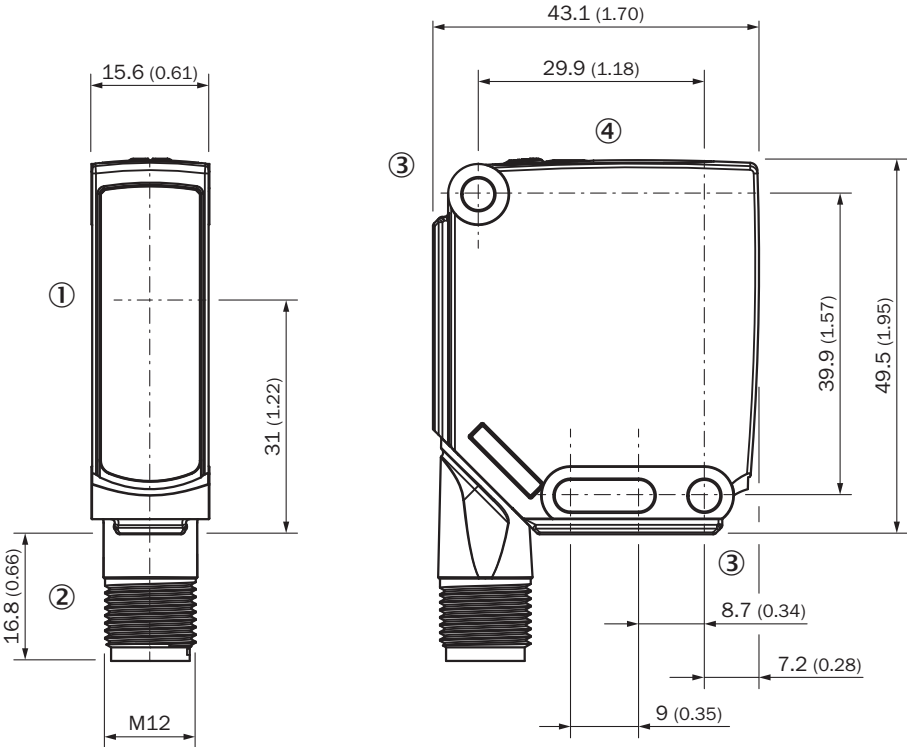
DIAGNOSIS

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

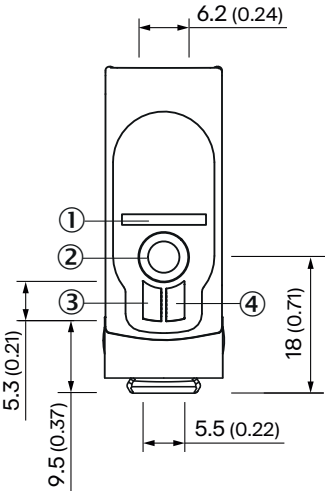
EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
Moroccan declaration of conformity	✓
China RoHS	✓
China Compulsory Product Certification (CCC) exempt	✓
ECOLAB certificate	✓
cULus certificate	✓
IO-Link certificate	✓
Laser safety (IEC 60825-1) declaration of manufacturer	✓
Information according to Art. 3 of Data Act (Regulation EU 2023/2854)	✓

DIMENSIONAL DRAWING



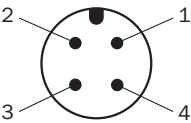
- Dimensions in mm (inch)
- ① Center of optical axis
 - ② Connection
 - ③ Mounting hole, Ø 4.2 mm
 - ④ display and adjustment elements

DISPLAY AND ADJUSTMENT ELEMENTS

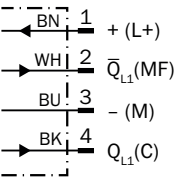


- ① LED blue
- ② Teach-in button
- ③ LED green
- ④ LED yellow

CONNECTION TYPE M12 MALE CONNECTOR, 4-PIN



CONNECTION DIAGRAM CD-490



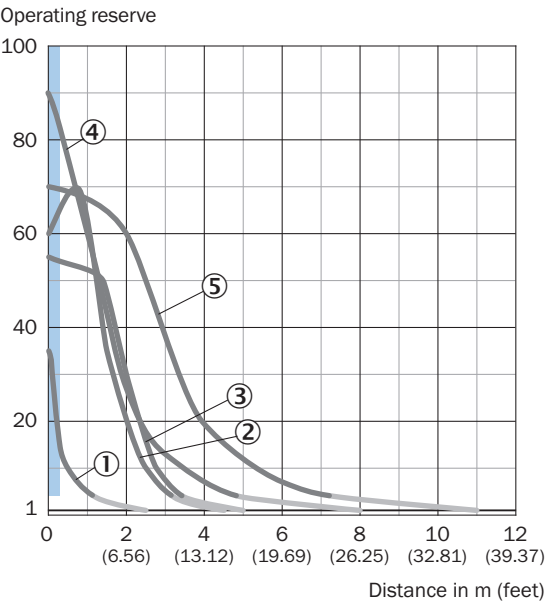
TRUTH TABLE PUSH-PULL: PNP/NPN – DARK SWITCHING $\bar{Q}$

	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	⚡	✗

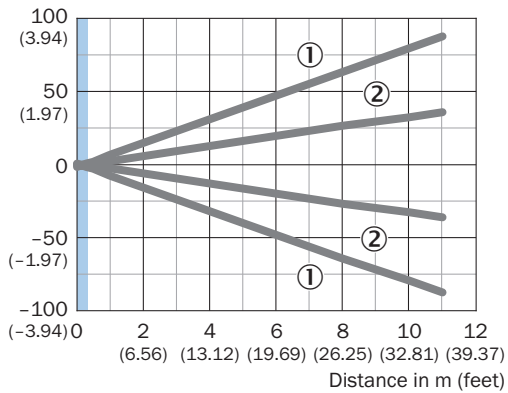
CHARACTERISTIC CURVE



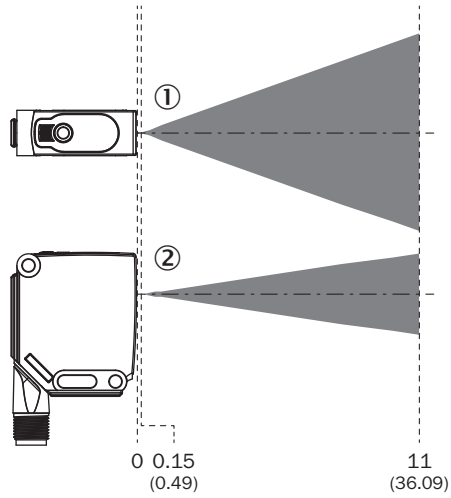
- Recommended sensing range for the best performance
- ① Reflective tape REF-IRF-56
 - ② PL10F reflector
 - ③ Reflector PL20F
 - ④ Reflective tape REF-AC1000
 - ⑤ Reflector P250F

LIGHT SPOT SIZE

Dimensions in mm (inch)



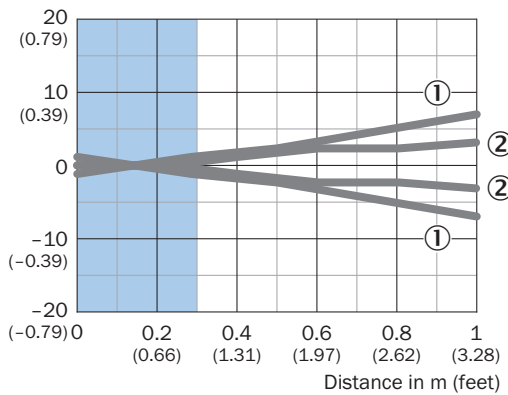
Recommended sensing range for the best performance



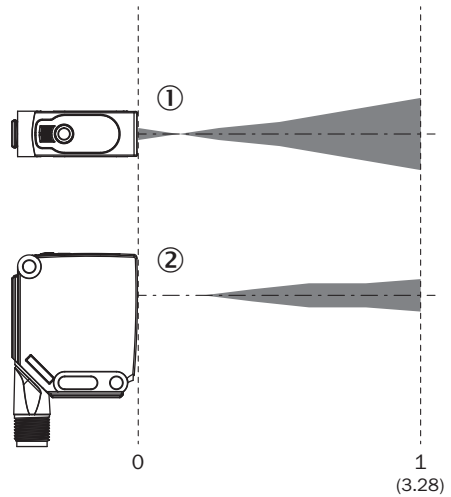
- ① Light spot horizontal
- ② Light spot vertical

LIGHT SPOT SIZE (DETAILED VIEW) CLOSE RANGE

Dimensions in mm (inch)

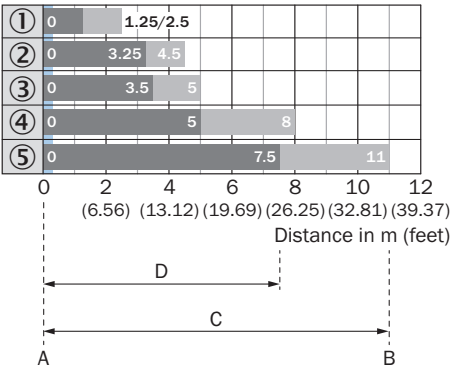


Recommended sensing range for the best performance



- 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)

Further information as well as suitable accessories, example applications and downloads such as CAD di-
mensional models, operating instructions and software can be found at www.sick.com/1125936



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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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