WTB12L-1H161120A00

W12

PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.

WTB12L-1H161120A00 | W12

PHOTOELECTRIC SENSORS

Illustration may differ

Ordering information

Type	part no.
WTB12L-1H161120A00	1126069

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

Detailed technical data

Features

Functional principle	Photoelectric proximity sensor
Functional principle detail	Background suppression
Sensing range	
Sensing range min.	80 mm
Sensing range max.	850 mm
Adjustable switching threshold for background suppression	90 mm ... 850 mm
Reference object	Object with 90% remission factor (complies with standard white according to DIN 5033)
Minimum distance between set sensing range and background (black 6% / white 90%)	6 mm, at a distance of 250 mm
Recommended sensing range for the best performance	100 mm ... 300 mm
Emitted beam	
Light source	Laser
Type of light	Visible red light
Shape of light spot	Ellipse shape
Light spot size (distance)	2.2 mm x 1.2 mm (300 mm)

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

Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle)	< +/- 1.0 ° (at Ta = +23 °C)
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	< 6.74 mW
Average service life	50,000 h at T_U = +25 °C
Smallest detectable object (MDO) typ.	
	2.5 mm, at a distance of 300 mm
	Object with 90% remission factor (complies with standard white according to DIN 5033)
Adjustment	
Teach-Turn adjustment	BluePilot For setting the sensing range
IO-Link	For configuring the sensor parameters and Smart Task functions
Display	
LED blue	BluePilot: sensing range indicator
LED green	Operating indicator Static on: power on Flashing: IO-Link mode
LED yellow	Status of received light beam Static on: object present Static off: object not present
Special applications	Detecting small objects, Detection of objects moving at high speeds, Detecting perforated objects

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

Safety-related parameters

$MTTF_D$	280 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	0x8002CD
DeviceID DEC	8389325
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
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	≤ 500 µs [2]
Repeatability (response time)	150 µs [2]
Switching frequency	1,000 Hz [3]
Pin/Wire assignment	
BN	+ (L+)
WH	$\bar{Q}_{L1}$/MF Digital output, dark switching, object present → output $\bar{Q}_{L1}$ LOW [4] The pin 2 function of the sensor can be configured Additional possible settings via IO-Link
BU	- (M)
BK	QL1/C Digital output, light switching, object present → output Q_{L1} HIGH [4] The pin 4 function of the sensor can be configured IO-Link communication C 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: 900 Hz [1] IOL: 800 Hz [2]
Response time	IOL: 600 µs [2]
Repeatability	SIO Logic: 200 µs [1]

[1] Use of Smart Task functions without IO-Link communication (SIO mode).

[2] Use of Smart Task functions with IO-Link communication function.

Switching signal	IOL: 250 µs [2]
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

Classifications

ECLASS 5.0	27270904
ECLASS 5.1.4	27270904
ECLASS 6.0	27270904
ECLASS 6.2	27270904
ECLASS 7.0	27270904
ECLASS 8.0	27270904
ECLASS 8.1	27270904
ECLASS 9.0	27270904
ECLASS 10.0	27270904
ECLASS 11.0	27270904
ECLASS 12.0	27270903
ETIM 5.0	EC002719
ETIM 6.0	EC002719
ETIM 7.0	EC002719
ETIM 8.0	EC002719
UNSPSC 16.0901	39121528

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	✓
Information according to Art. 3 of Data Act (Regulation EU 2023/2854)	✓

Dimensional drawing
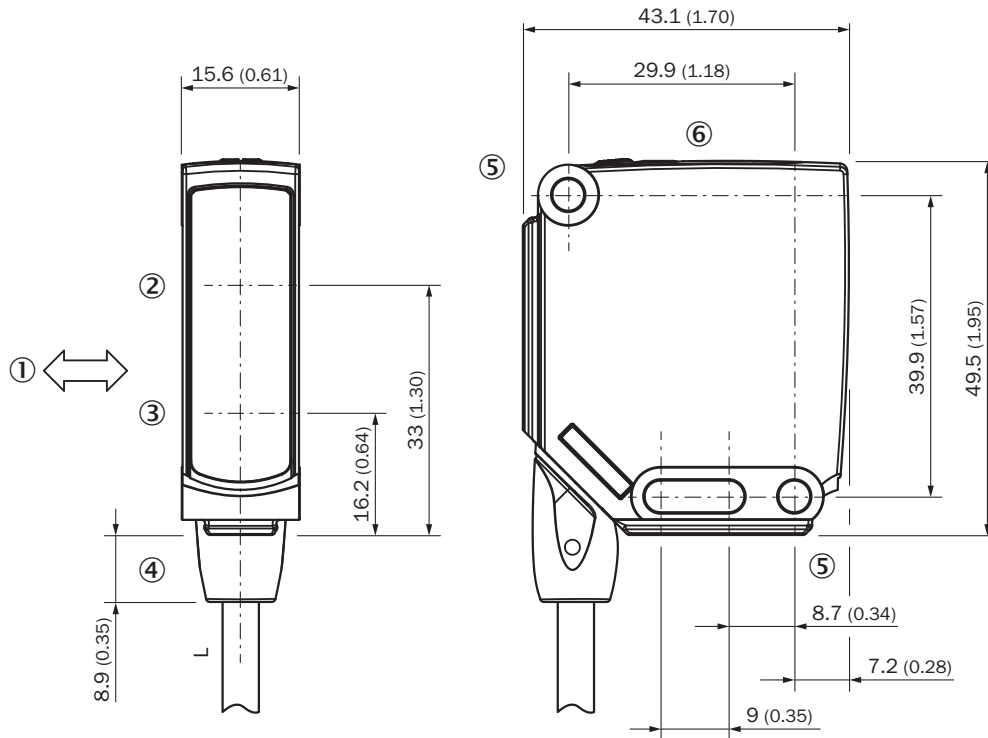
Dimensions in mm (inch)

For length of cable (L), see technical data

① Standard direction of the material being detected

② Center of optical axis, receiver

③ Center of optical axis, sender

④ Connection

⑤ Mounting hole, Ø 4.2 mm

⑥ display and adjustment elements

display and adjustment elements

6.2 (0.24)

18 (0.7)

5.3 (0.21)

9.5 (0.37)

5.5 (0.22)
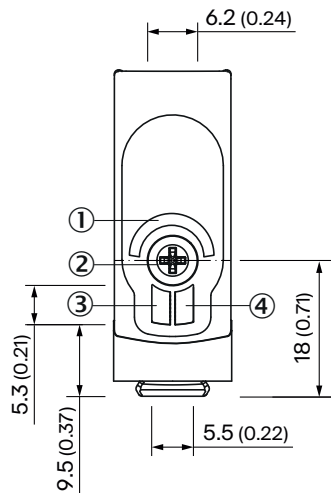
① LED blue
② Teach-Turn adjustment
③ LED green
④ LED yellow

Connection type Cable, 4-wire
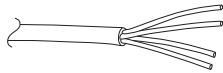
Truth table Push-pull: PNP/NPN – dark switching $\bar{Q}$

	Dark switching $\bar{Q}$ (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	⚡	⊗

Truth table Push-pull: PNP/NPN - light switching Q

	Light switching 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

Minimum distance in mm (y) between the set sensing range and white background (90 % remission)

Recommended sensing range for the best performance

① Black object, 6% remission factor
② Gray object, 18% remission factor
③ White object, 90% remission factor
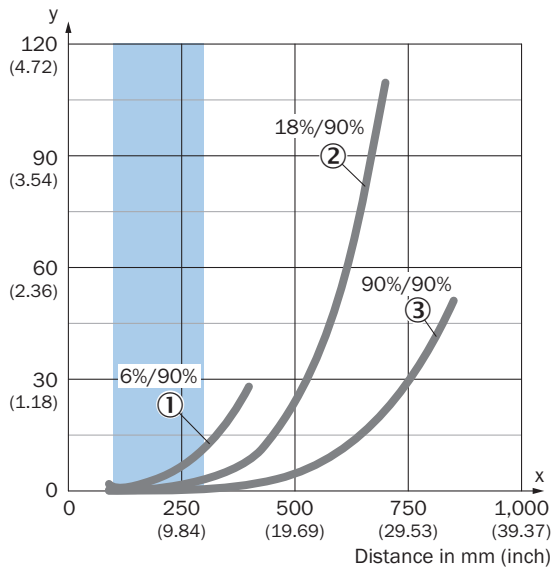
Example:
Safe suppression of the background

White background (90 %)
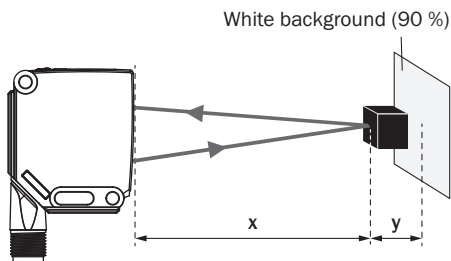
Black object (6 % remission)
Set sensing range x = 250 mm
Needed minimum distance to white background y = 6 mm

Light spot size

Dimensions in mm (inch)

Distance in mm (inch)
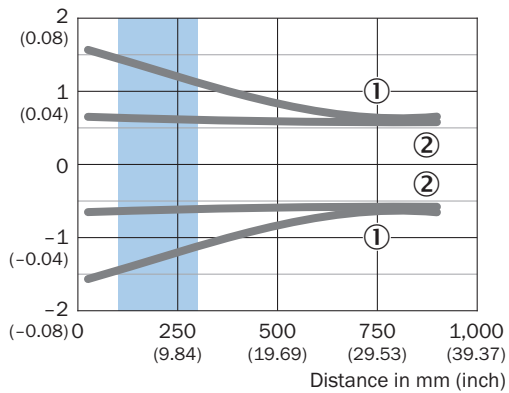
■ Recommended sensing range for the best performance
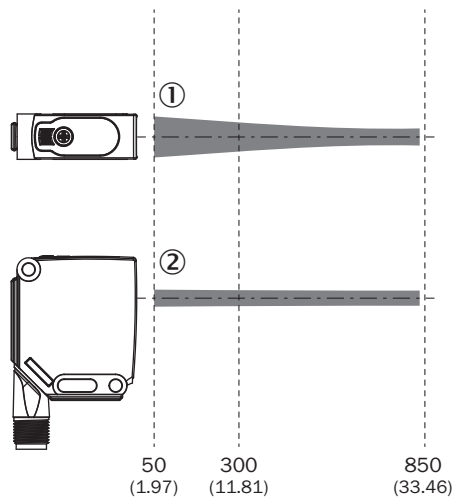
① Light spot horizontal
② Light spot vertical

Sensing range diagram
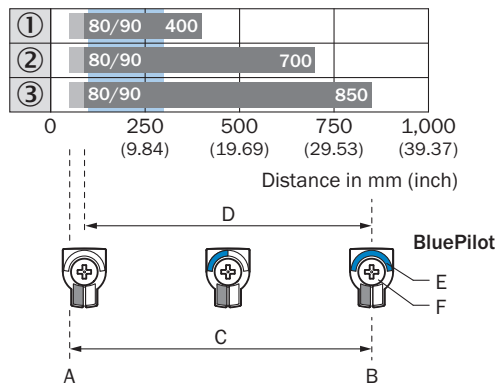
Distance in mm (inch)

BluePilot

■ Recommended sensing range for the best performance

1	Black object, 6% remission factor
2	Gray object, 18% remission factor
3	White object, 90% remission factor
A	Sensing range min. in mm
B	Sensing range max. in mm
C	Field of view
D	Adjustable switching threshold for background suppression
E	Sensing range indicator
F	Teach-Turn adjustment

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
connectors and cables		
• **Connection type head A:** Male connector, M12, 4-pin, straight, A-coded • **Description:** Unshielded • **Connection systems:** Screw-type terminals • **Permitted cross-section:** ≤ 0.75 mm²	STE-1204-G	6009932

	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."

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