



WTB16I-39112120ZZZ

W16

PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.

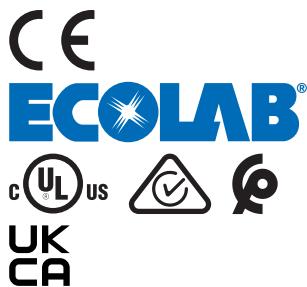


Ordering information

Type	part no.
WTB16I-39112120ZZZ	1222674

Other models and accessories → www.sick.com/W16

Illustration may differ



Detailed technical data

Features

Functional principle	Photoelectric proximity sensor
Functional principle detail	Background suppression
Sensing range	
Sensing range min.	10 mm
Sensing range max.	1,500 mm
Adjustable switching threshold for background suppression	100 mm ... 1,500 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%)	70 mm, at a distance of 600 mm
Recommended sensing range for the best performance	100 mm ... 600 mm
Emitted beam	
Light source	LED
Type of light	Infrared light
Shape of light spot	Point-shaped
Light spot size (distance)	Ø 12 mm (800 mm)
Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle)	< +/- 1.0° (at Ta = +23 °C)
Key LED figures	
Normative reference	EN 62471:2008-09 IEC 62471:2006, modified
LED risk group marking	Free group

Adjustment	Wave length	850 nm
	Average service life	100,000 h at $T_a = +25^\circ\text{C}$
Display	Teach-Turn adjustment	BluePilot: For setting the sensing range
	LED blue	BluePilot: sensing range indicator
	LED green	Operating indicatorStatic on: power on
	LED yellow	Status of received light beamStatic on: object presentStatic off: object not present

Safety-related parameters

MTTF_D	626 years
DC_{avg}	0 %
T_M (mission time)	20 years

Electronics

Supply voltage U_B	10 V DC ... 30 V DC ¹⁾
Ripple	$\leq 5 \text{ V}_{\text{pp}}$
Usage category	DC-12 (According to EN 60947-5-2) DC-13 (According to EN 60947-5-2)
Current consumption	$\leq 30 \text{ mA}$, without load. At $U_B = 24 \text{ V}$ ²⁾
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.}	$\leq 100 \text{ mA}$
Circuit protection outputs	Reverse polarity protected Overcurrent and short-circuit protected
Response time	$\leq 500 \mu\text{s}$ ³⁾
Repeatability (response time)	150 μs
Switching frequency	1,000 Hz ⁴⁾
Pin/Wire assignment	
Function of pin 4/black (BK)	Digital output, dark switching, object present \rightarrow output \bar{Q} LOW ⁵⁾
Pin 5 function/white (WH)	Digital output, light switching, object present \rightarrow output Q HIGH

¹⁾ Limit values.²⁾ 10 V DC ... 16 V DC, without load.³⁾ Signal transit time with resistive load in switching mode.⁴⁾ With light/dark ratio 1:1.⁵⁾ This switching output must not be connected to another output.

Mechanics

Housing	Rectangular
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Dimensions (W x H x D)	20 mm x 55.7 mm x 42 mm
Connection	Cable with Q6 male connector, 6-pin, DC-coded, 298 mm
Connection detail	
Deep-freeze property	Do not bend below 0 °C
Conductor size	0.14 mm ²
Cable diameter	Ø 4.8 mm
Length of cable (L)	270 mm
Bending radius	For flexible use > 12 x cable diameter
Bending cycles	1,000,000
Material	
Housing	Plastic, VISTAL®
Front screen	Plastic, PMMA
Cable	Plastic, PVC
Male connector	Plastic, VISTAL®
Weight	Approx. 70 g
Maximum tightening torque of the fixing screws	1.3 Nm

Ambient data

Enclosure rating	IP65 (EN 60529)
Ambient operating temperature	-40 °C ... +60 °C
Ambient temperature, storage	-40 °C ... +75 °C
Shock resistance	50 g, 11 ms (25 positive and 25 negative shocks per axis, for X, Y, Z axes, 150 shocks in total (EN60068-2-27)) 50 g, 6 ms (5,000 positive and 5,000 negative shocks per axis, for X, Y, Z axes, 30,000 shocks in total (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
UL File No.	NRKH.E181493 & NRKH7.E181493

Classifications

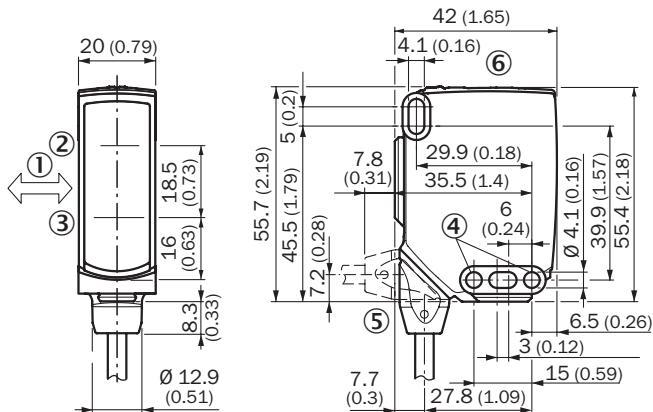
ECLASS 5.0	27270904
ECLASS 5.1.4	27270904
ECLASS 6.0	27270904
ECLASS 6.2	27270904
ECLASS 7.0	27270904
ECLASS 8.0	27270904
ECLASS 8.1	27270904
ECLASS 9.0	27270904
ECLASS 10.0	27270904
ECLASS 11.0	27270904
ECLASS 12.0	27270903
ETIM 5.0	EC002719

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	✓
Photobiological safety (DIN EN 62471) certificate	✓

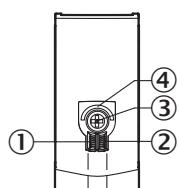
Dimensional drawing, sensor



Dimensions in mm (inch)

- ① Standard direction of the material being detected
- ② Center of optical axis, sender
- ③ Center of optical axis, receiver
- ④ Mounting hole, Ø 4.1 mm
- ⑤ Connection
- ⑥ display and adjustment elements

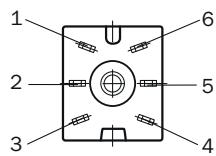
display and adjustment elements



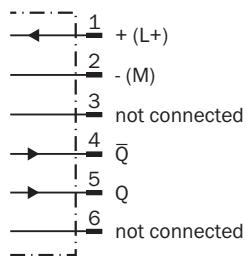
- ① LED indicator green

- ② LED indicator yellow
- ③ Teach-Turn adjustment
- ④ LED blue

Connection type Cubic connector, 6-pin



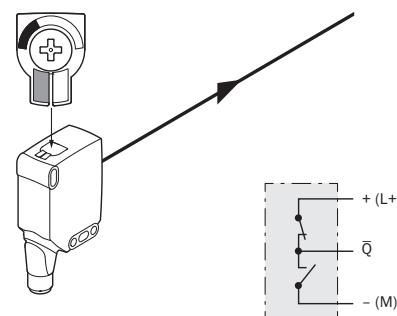
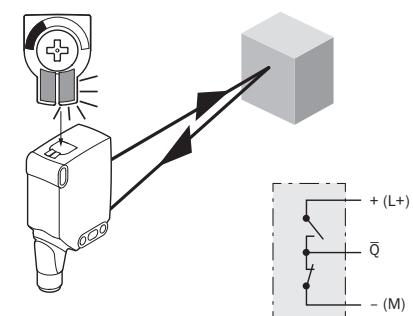
Connection diagram Cd-425



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

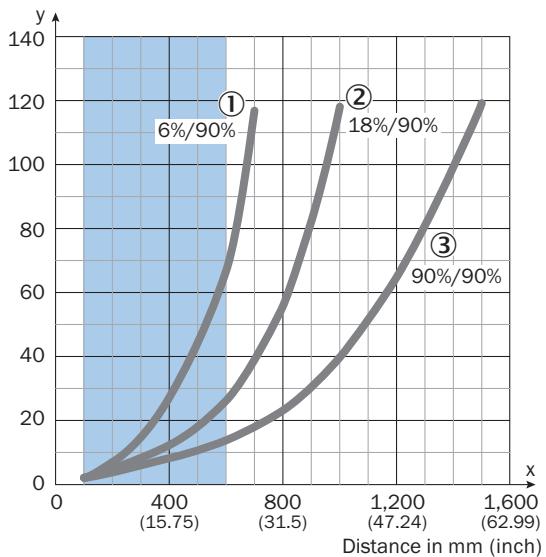
Light switching Q (normally open (upper switch), normally closed (lower switch))		
	Object not present → Output LOW	Object present → Output HIGH
Light receive	✗	✓
Light receive indicator	✗	✗
Load resistance to L+	✗	✗
Load resistance to M	✗	✗
	<div style="border: 1px dashed black; padding: 5px; display: inline-block;"> $+ (L+)$ Q $- (M)$ </div>	<div style="border: 1px dashed black; padding: 5px; display: inline-block;"> $+ (L+)$ Q $- (M)$ </div>

Truth table Push-pull: PNP/NPN – dark switching \bar{Q}

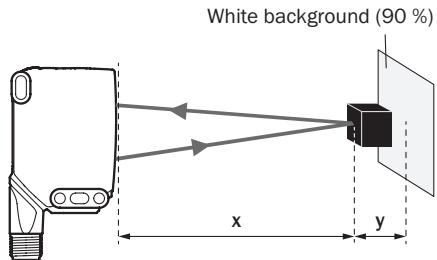
	Dark switching \bar{Q} (normally closed (upper switch), normally open (lower switch))	
	Object not present → Output HIGH	Object present → Output LOW
Light receive	✖	✓
Light receive indicator	✖	✖
Load resistance to L+	✖	⚡
Load resistance to M	⚡	✖
		

Characteristic curve

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



Example:
Safe suppression of the background



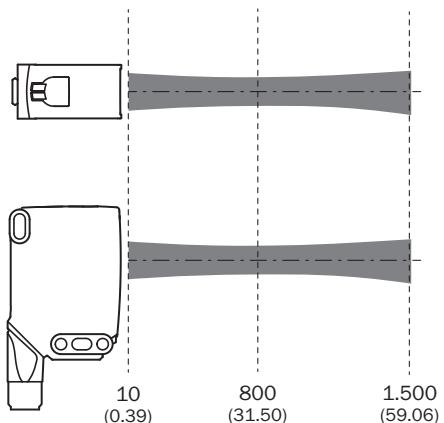
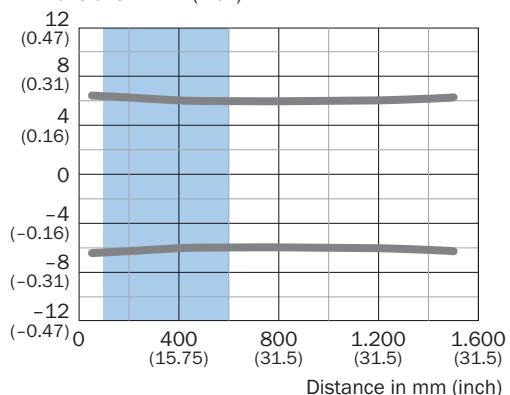
Black object (6 % remission)
Set sensing range $x = 600$ mm
Needed minimum distance to white background $y = 70$ mm

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

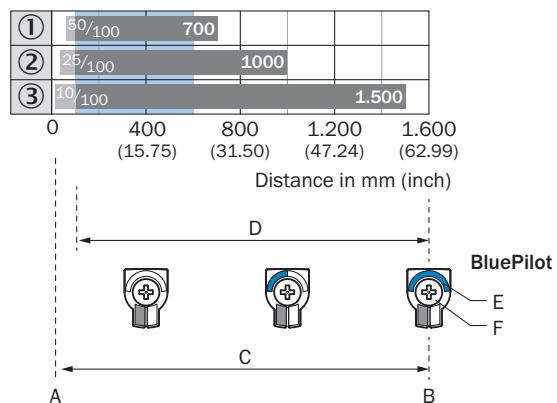
Light spot size WTB16I-xxxxx1xx, WTB16I-xxxxAxx

Dimensions in mm (inch)



■ Recommended sensing range for the best performance

Sensing range diagram



■ 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/W16

	Brief description	Type	part no.
connectors and cables			
	<ul style="list-style-type: none">Connection type head A: Female connector, 6-pin, angled, DC-codedConnection type head B: Flying leadsSignal type: Sensor/actuator cableCable: 2 m, PVCDescription: Sensor/actuator cable, unshielded	DOL-1306-W02M	6030217
Mounting systems			
	<ul style="list-style-type: none">Description: Plate N02 for universal clamp bracketMaterial: Steel, zinc diecastDetails: Zinc plated steel (sheet), Zinc die cast (clamping bracket)Items supplied: Universal clamp (5322626), mounting hardwareUsable for: W4S-3 Glass, W10, W4SLG-3, W4S-3 Inox, W4S-3 Inox Glass, W9, W11-2, W12-3, W12-2 Laser, W12G, W12 Teflon, W16, W250, W250-2, PowerProx, W11G-2, TranspaTect, WTT12, UC12, P250, G6 Inox, W4S, W4SL-3V, W4SLG-3V, W4SL-3H	BEF-KHS-N02	2051608
	<ul style="list-style-type: none">Description: Adapter for mounting W16 sensors in existing W14-2/W18-3 installations or L25 sensors in existing L28 installationsMaterial: PlasticDetails: PlasticItems supplied: Fastening screws included	BEF-AP-W16	2095677

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