



DATA SHEET

GTB20G-2411160ZZZ

G20
Photoelectric sensors

SICK

Sensor Intelligence



Illustration may differ

PHOTOELECTRIC SENSORS

GTB20G-24111160ZZZ

ORDERING INFORMATION

Type	part no.
GTB20G-24111160ZZZ	1119840

Further device versions and accessories at www.sick.com/G20



DETAILED TECHNICAL DATA

FEATURES

Functional principle	Photoelectric proximity sensor
Functional principle detail	Background suppression
Sensing range	
Sensing range min.	0.005 m
Sensing range max.	3 m
Adjustable switching threshold for background suppression	0.1 m ... 3 m
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%)	200 mm, at a distance of 1000 mm
Emitted beam	
Light source	LED
Type of light	Visible red light
Shape of light spot	Rectangular
Light spot size (distance)	Ø 28 mm (500 mm)
Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle)	< +/- 1.5° (at T _u = +23 °C)
Key LED figures	
Normative reference	EN 62471:2008-09 IEC 62471:2006, modified
LED risk group marking	Free group
Wave length	630 nm
Average service life	100,000 h at T _a = +25 °C
Adjustment	
Potentiometer	For setting the sensing range, 7 rotations
Display	
LED green	Operating indicator Static on: power on
LED yellow	Status of received light beam Static on: object present Static off: object not present

SAFETY-RELATED PARAMETERS

MTTF _D	806 years
DC _{avg}	0%

ELECTRONICS

Supply voltage U _B	10 V DC ... 30 V DC ¹⁾																		
Ripple	< 5 V _{pp}																		
Usage category	DC-13 (according to EN 60947-1)																		
Current consumption	≤ 30 mA, without load. At U _B = 24 V																		
Protection class	III																		
Digital output	<table> <tr> <td>Number</td><td>2 (Complementary)</td></tr> <tr> <td>Type</td><td>Push-pull: PNP/NPN</td></tr> <tr> <td>Switching mode</td><td>Light/dark switching</td></tr> <tr> <td>Signal voltage PNP HIGH/LOW</td><td>V_S - (≤ 3 V) / approx. 0 V</td></tr> <tr> <td>Signal voltage NPN HIGH/LOW</td><td>V_S - (≤ 3 V) / approx. 0 V</td></tr> <tr> <td>Output current I_{max.}</td><td>≤ 100 mA ²⁾</td></tr> <tr> <td>Circuit protection outputs</td><td>Reverse polarity protected Overcurrent protected Short-circuit protected</td></tr> <tr> <td>Response time</td><td>≤ 1.67 ms</td></tr> <tr> <td>Switching frequency</td><td>300 Hz ³⁾</td></tr> </table>	Number	2 (Complementary)	Type	Push-pull: PNP/NPN	Switching mode	Light/dark switching	Signal voltage PNP HIGH/LOW	V _S - (≤ 3 V) / approx. 0 V	Signal voltage NPN HIGH/LOW	V _S - (≤ 3 V) / approx. 0 V	Output current I _{max.}	≤ 100 mA ²⁾	Circuit protection outputs	Reverse polarity protected Overcurrent protected Short-circuit protected	Response time	≤ 1.67 ms	Switching frequency	300 Hz ³⁾
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Pin/Wire assignment	<table> <tr> <td>Function of pin 4/black (BK)</td><td>Digital output, light switching, object present → output Q HIGH</td></tr> <tr> <td>Function of pin 2/white (WH)</td><td>Digital output, dark switching, object present → output Q̄ LOW</td></tr> </table>	Function of pin 4/black (BK)	Digital output, light switching, object present → output Q HIGH	Function of pin 2/white (WH)	Digital output, dark switching, object present → output Q̄ LOW														
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¹⁾ Limit values.²⁾ At U_B > 24 V, I max. = 100 mA.³⁾ With light/dark ratio 1:1.

MECHANICS

Housing	Rectangular				
Dimensions (W x H x D)	23.5 mm x 74.5 mm x 52.5 mm				
Connection	Male connector M12, 4-pin				
Material	<table> <tr> <td>Housing</td><td>Plastic, ABS</td></tr> <tr> <td>Front screen</td><td>Plastic, PMMA</td></tr> </table>	Housing	Plastic, ABS	Front screen	Plastic, PMMA
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Front screen	Plastic, PMMA				
Weight	Approx. 55 g				

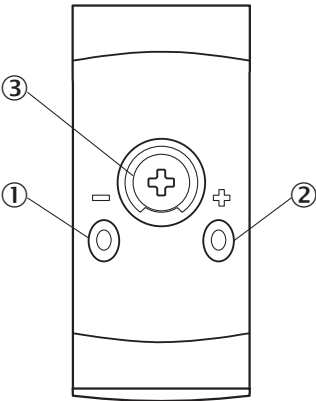
AMBIENT DATA

Enclosure rating	IP67 (EN 60529)
Ambient operating temperature	-30 °C ... +60 °C
Ambient temperature, storage	-40 °C ... +70 °C
Typ. Ambient light immunity	Sunlight: ≤ 20,000 lx
Shock resistance	30 g, 11 ms (3 positive and 3 negative shocks along X, Y, Z axes, 18 total shocks (EN60068-2-27))
Vibration resistance	10 Hz ... 1,000 Hz (Amplitude 1 mm, 3 x 30 min (EN60068-2-6))
Air humidity	35 % ... 95 %, relative humidity (no condensation)
Electromagnetic compatibility (EMC)	EN 60947-5-2
UL File No.	NRKH.E348498 & NRKH7.E348498

CERTIFICATES

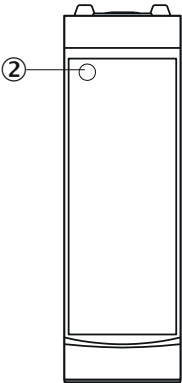
EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
Moroccan declaration of conformity	✓
China RoHS	✓
China Compulsory Product Certification (CCC) exempt	✓
cULus certificate	✓
Photobiological safety (IEC EN 62471)	✓

DISPLAY AND ADJUSTMENT ELEMENTS



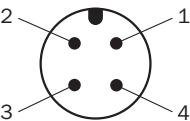
- ① LED green
- ② LED yellow
- ③ Potentiometer

DISPLAY AND ADJUSTMENT ELEMENTS

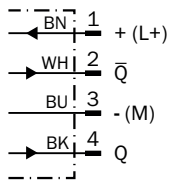


- ② LED yellow

CONNECTION TYPE M12 MALE CONNECTOR, 4-PIN

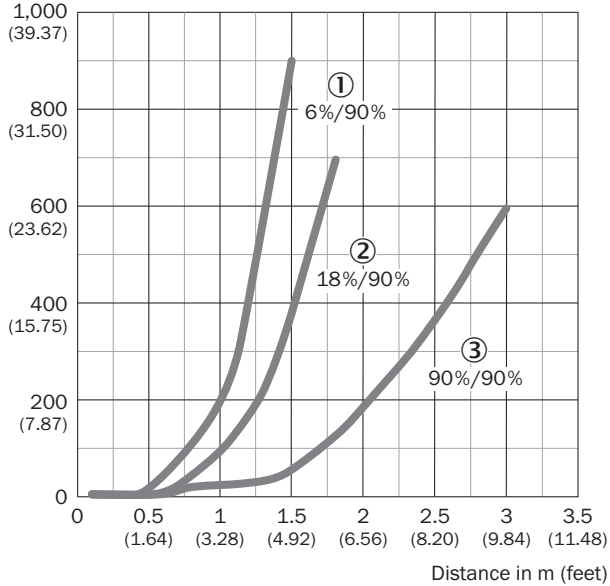


CONNECTION DIAGRAM CD-084

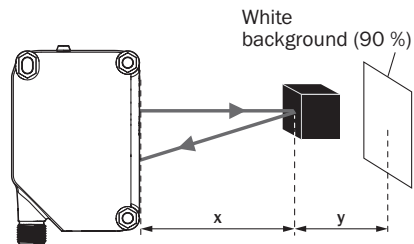


CHARACTERISTIC CURVE

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



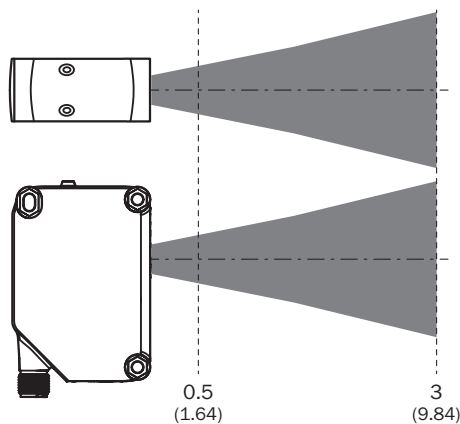
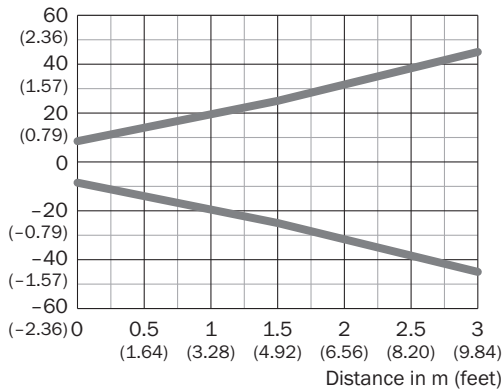
Example:
Safe suppression of the background



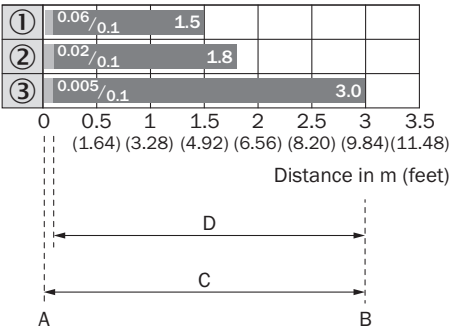
- ① Black object, 6% remission factor
- ② Gray object, 18% remission factor
- ③ White object, 90% remission factor

LIGHT SPOT SIZE

Dimensions in mm (inch)

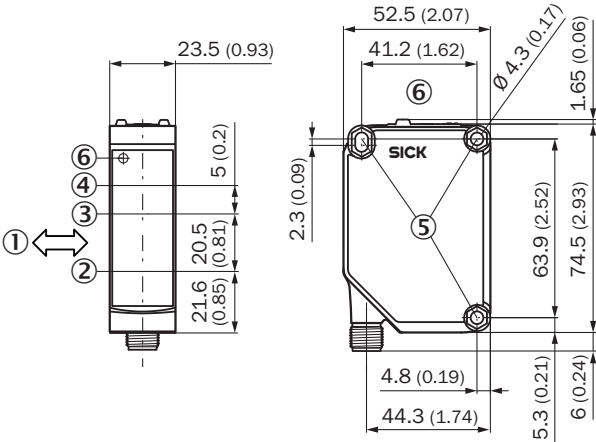


SENSING RANGE DIAGRAM



1	Black object, 6% remission factor
2	Gray object, 18% remission factor
3	White object, 90% remission factor
A	Sensing range min. in m
B	Sensing range max. in m
C	Field of view
D	Adjustable switching threshold for background suppression

DIMENSIONAL DRAWING



Dimensions in mm (inch)

- ① Standard direction of the material being detected
- ② Center of optical axis, sender
- ③ Center of optical axis, receiver (close range)
- ④ Center of optical axis, receiver (far range)
- ⑤ fixing hole
- ⑥ display and adjustment elements

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/1119840



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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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