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DATA SHEET

LRS4581R-230001

LRS4000
2D LiDAR sensors

SICK Sensor Intelligence

2D LIDAR SENSORS

LRS4581R-230001

ORDERING INFORMATION

Type	part no.
LRS4581R-230001	1098855

Further device versions and accessories at www.sick.com/LRS4000

DETAILED TECHNICAL DATA

FEATURES

Application	Outdoor, Indoor
Light source	Infrared (886 nm, (max. output power 7.7 W; pulse duration 2.44 ns))
Laser class	1, Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed.3., as described in “Laser Notice No. 56” dated May 8, 2019 (IEC 60825-1:2014, EN 60825-1:2014)
Aperture angle	
Horizontal	360°
Scanning frequency	12.5 Hz 25 Hz
Angular resolution	
Horizontal	0.02° 0.04° 0.06° 0.08° 0.1° 0.12° 0.24°
Heating	Self-heating
Working range	0.2 m ... 300 m
Scanning range	
At 10% remission factor	120 m
At 90% remission factor	250 m
Spot size	2.6 mrad x 0.4 mrad (Single spot) 2.6 mrad x 0.4 mrad (+ angular resolution for HDDM+)
Amount of evaluated echoes	3

MECHANICS/ELECTRONICS

Connection type	3 x M12, stainless steel
Supply voltage	10 V DC ... 30 V DC
Power consumption	Typ. 13 W, Max. 20 W
Output current	≤ 0.25 A

Housing material	AlSi12
Housing color	Gray (RAL 7042)
Optical hood	Polycarbonate (PC)
Enclosure rating	IP65 (IEC 60529:1989+AMD1:1999+AMD2:2013) IP67 (IEC 60529:1989+AMD1:1999+AMD2:2013)
Protection class	III (IEC 61140:2016-11)
Electrical safety	IEC 61010-1:2010-06
Weight	1.7 kg
Dimensions (L x W x H)	151.9 mm x 150 mm x 126.7 mm

PERFORMANCE

Scan/frame rate	37,500 measurement point/s ... 225,000 measurement point/s
Response time	≥ 40 ms
Detectable object shape	Almost any
Systematic error	± 15 mm
Statistical error	< 10 mm
Temperature drift	± 0.2 mm/K
Integrated application	Field evaluation Output of measurement data
Number of field sets	16 fields
Filter	Median filter Average filter Particle filter

INTERFACES

Ethernet	✓ , TCP/IP, UDP/IP
Function	Data interface (read result output)
Data transmission rate	10/100 MBit/s
Digital inputs/outputs	
Inputs	6
Outputs	6
Encoder inputs	2
Optical indicators	LEDs
Configuration software	Web server

AMBIENT DATA

Remission factor	2 % ... 1,000 % (Reflector)
Electromagnetic compatibility (EMC)	
Emitted radiation	Residential area (EN 61000-6-3:2007+AMD:A1:2011)
Electromagnetic immunity	Industrial environment (EN 61000-6-2:2005)
Vibration resistance	
Sine test	10 Hz ... 500 Hz, 5 g, 10 frequency cycles [1]
Shock resistance	50 g, 11 ms, 6 shocks per axis [2] 25 g, 6 ms, 1000 shocks per axis [2]
Ambient operating temperature	–30 °C ... +50 °C
Storage temperature	–40 °C ... +75 °C
Permissible relative humidity	≤ 90 %, Non-condensing
Ambient light immunity	80 klx

[1] EN 60068-2-6:2007.

[2] EN 60068-2-27:2008.

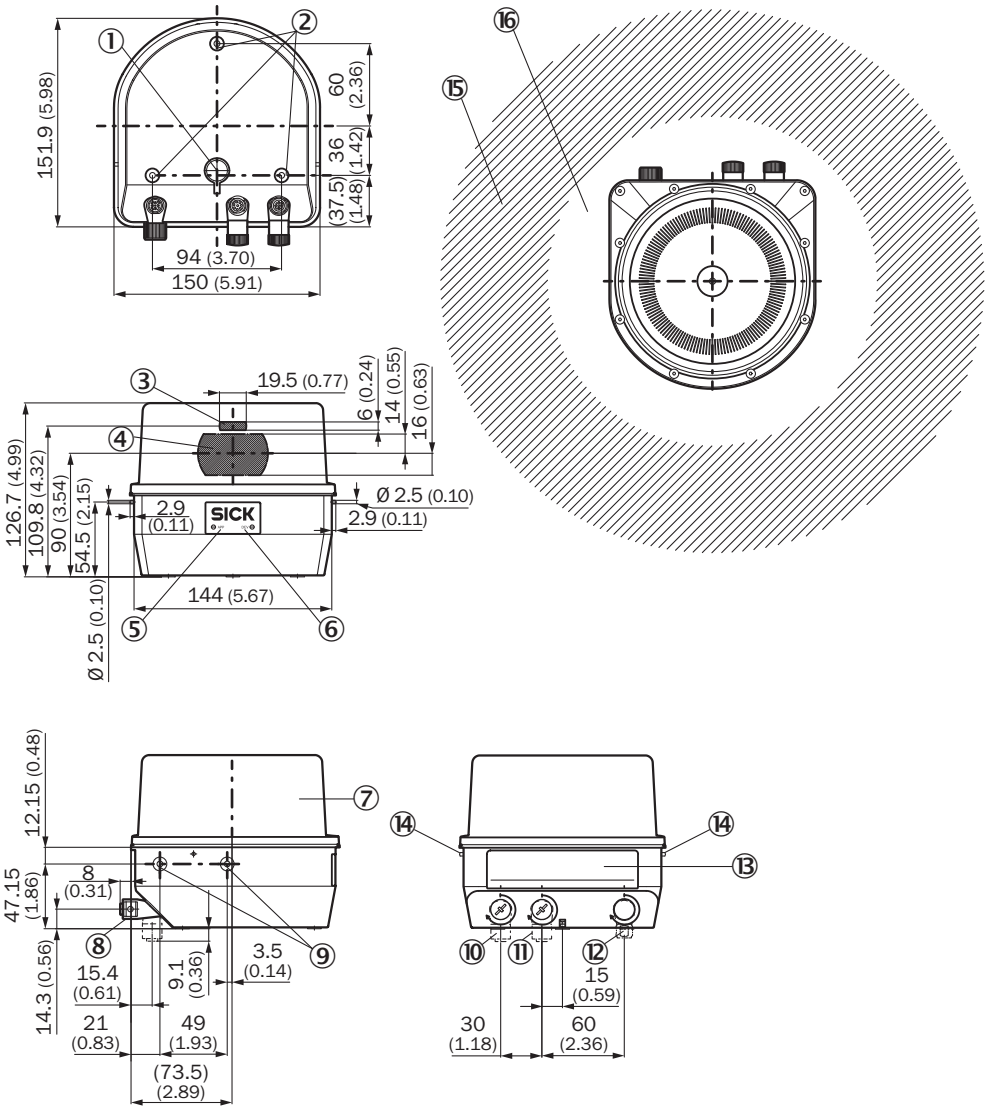
GENERAL NOTES

Note on use	The sensor does not constitute a safety component as defined by relevant legislation on machine safety.

CERTIFICATES

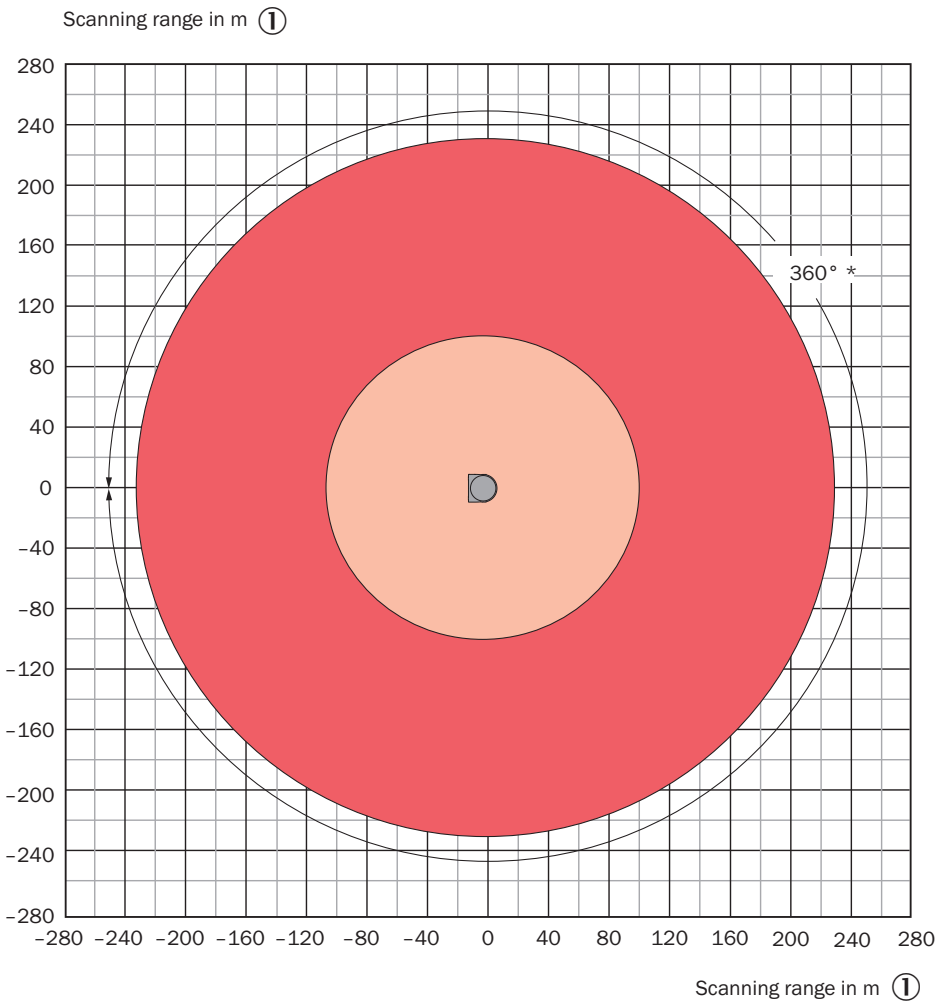
EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
China RoHS	✓
cTUVus certificate	✓
Information according to Art. 3 of Data Act (Regulation EU 2023/2854)	✓

DIMENSIONAL DRAWING



Dimensions in mm (inch)
① Gore-Tex membrane
② Fixing hole M5 x 7.5 (3 x)
③ sender
④ receiver
⑤ LED APP
⑥ LED DEV
⑦ Optical hood
⑧ Rotatable connections (max. 270°)
⑨ Fixing hole M5 x 7.5 (2 x)
⑩ Ethernet connection
⑪ I/O connection
⑫ POWER connection
⑬ type label
⑭ Locating pin for hooking into the bracket during mounting
⑮ Measuring range > 500 mm
⑯ Near range < 500 mm

WORKING RANGE DIAGRAM



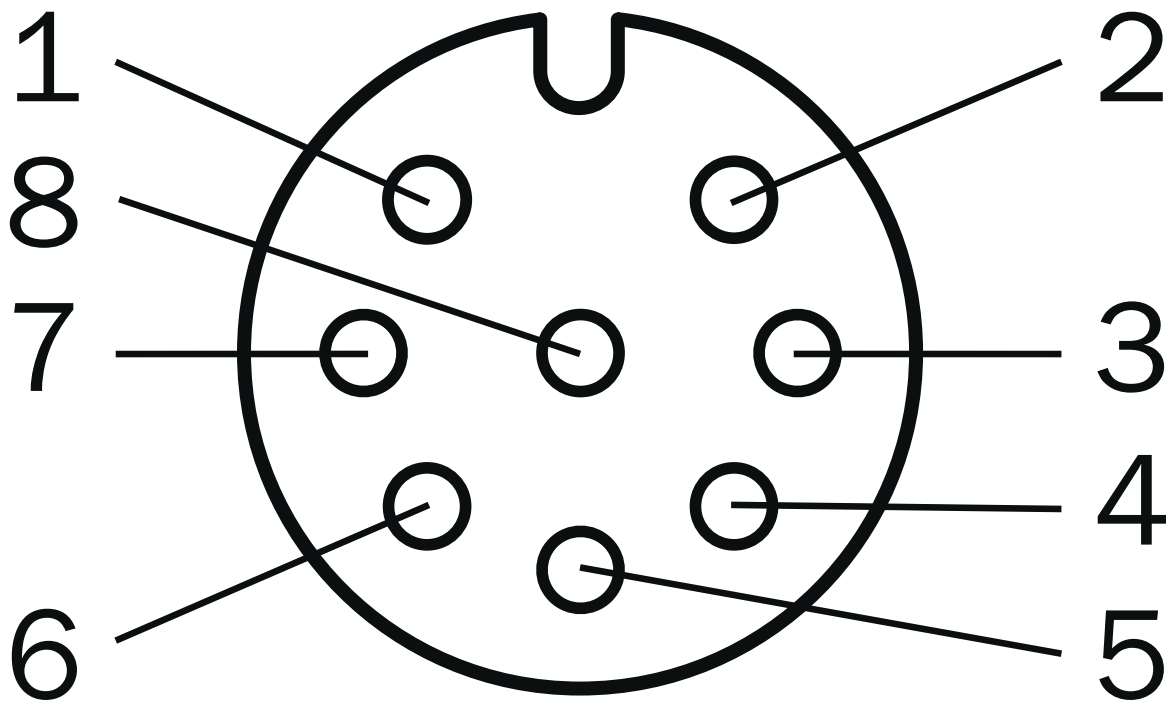
* With the angular resolution 0.02°/12.5 Hz and 0.04°/25 Hz, the aperture angle is limited to 288° ②

Scanning range max. for objects up to 90 % Remission 250 m ③

Scanning range for objects up to 10 % Remission 80 m ④

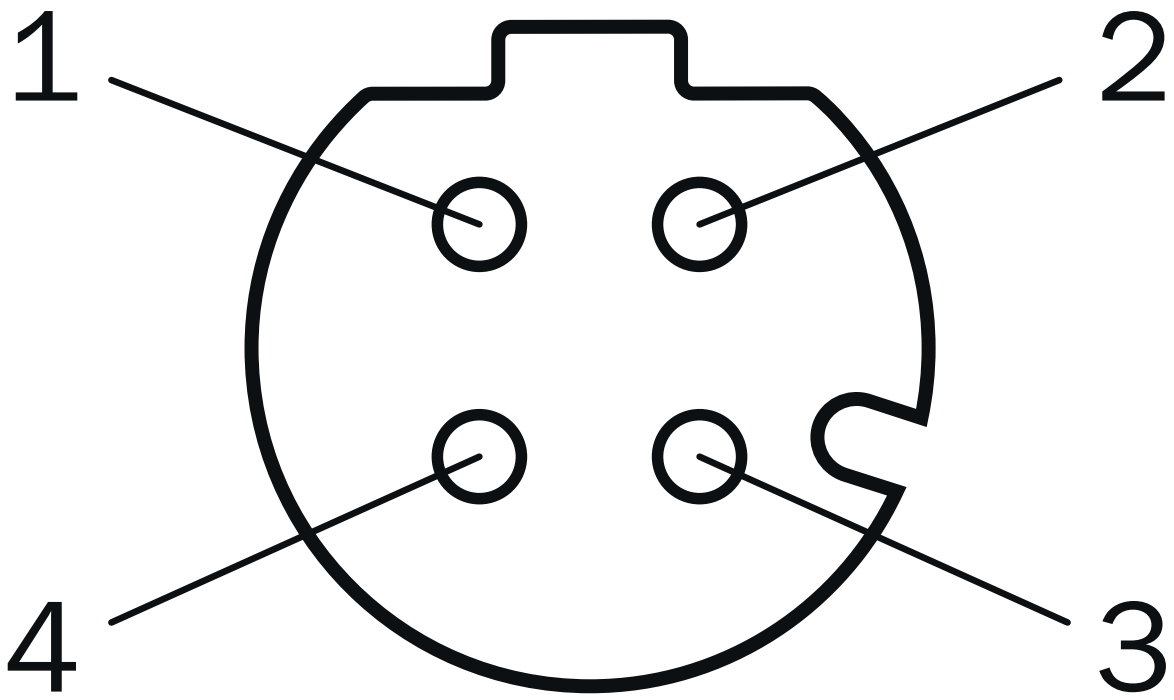
① Scanning range in m
② The aperture angle is limited to 288° with angular resolution 0.020°/12.5 Hz and 0.040°/25 Hz
③ Scanning range for objects with up to 90% remission factor, 250 m
④ Scanning range for objects up to 10% remission factor: 100 m

PIN ASSIGNMENT I/O CONNECTION



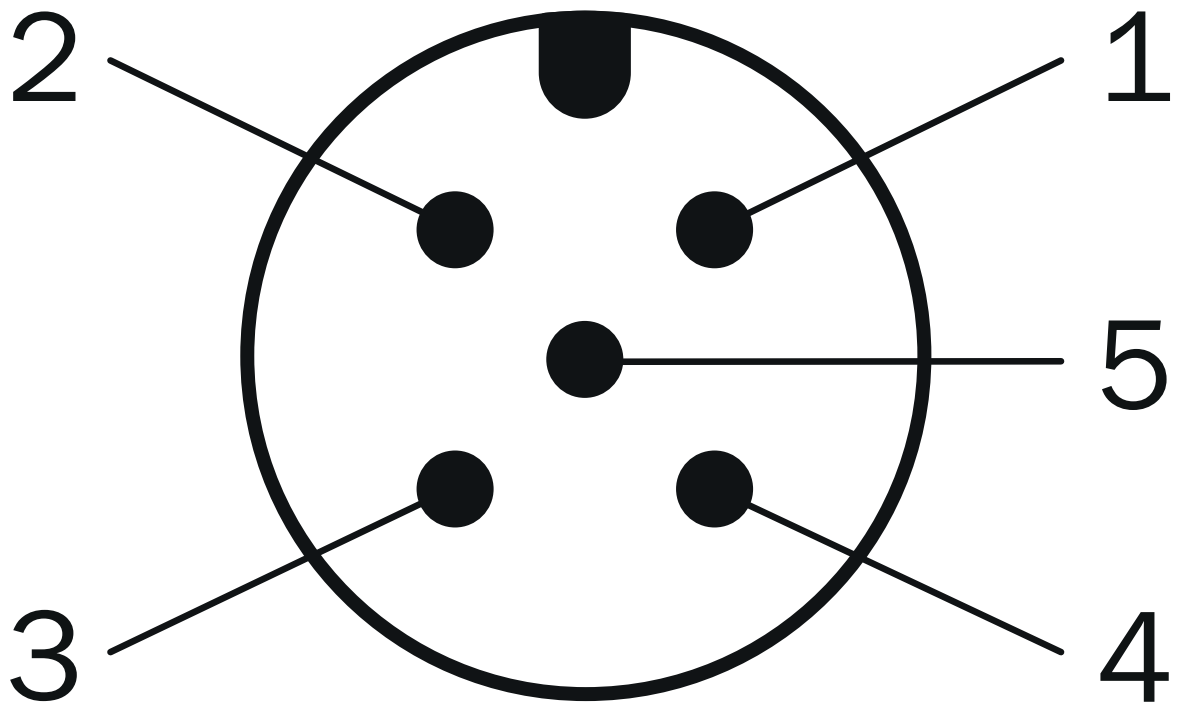
female connector M12, 8-pin, A-coded
① In_1
② In_2
③ IN3/OUT3
④ IN4/OUT4
⑤ IN5/OUT5
⑥ IN6/OUT6
⑦ GND INx/OUTx
⑧ IN7/OUT7

PIN ASSIGNMENT “ETHERNET” CONNECTION



M12 female connector, 4-pin, D-coded
① TX+
② RX+
③ TX-
④ RX-

PIN ASSIGNMENT POWER CONNECTION



male connector M12, 5-pin, A-coded
① V_s
② Reserved
③ GND
④ IN8/OUT8
⑤ Reserved

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/1098855

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SICK AT A GLANCE

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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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