LMS4421R-16000

LMS4000

2D LIDAR SENSORS

SICK
Sensor Intelligence.

LMS4421R-16000 | LMS4000

2D LIDAR SENSORS

Ordering information

Type	Part no.
LMS4421R-16000	1094132

Other models and accessories ➜ www.sick.com/LMS4000

Detailed technical data

Features

Task	Measuring - Dimension, contour and volume Measuring - Length and distance Monitoring and controlling - Quality Identifying - Classifying Identifying - Sorting Determining position - 2D position determination
Application	Indoor
Reading field	Front
Light source	Visible red light (660 nm)
Laser class	2 (IEC 60825-1:2014, EN 60825-1:2014)
Aperture angle	
Horizontal	70°
Scanning frequency	600 Hz
Angular resolution	0.0833°
Working range	0.7 m … 3 m
Scanning range	
At 2% remission	3 m
At 3,5% remission	3 m
At 10% remission factor	3 m

Mechanics/electronics

Connection type	1 x M12, 5-pin plug (CAN In) 1 x M12, 5-pin female connector (CAN Out) 1 x M12, 8-pin female connector (Ethernet) 1 x M12, 5-pin female connector (encoder + sync)
Supply voltage	24 V DC, ± 25 %
Power consumption	≤ 16 W, start-up phase max. 29 W
Output current	≤ 100 mA
Housing material	Aluminum die cast
Housing color	Light blue (RAL 5012)
Enclosure rating	IP65
Protection class	III

Electrical safety	IEC 61010-1:2011
Weight	3.7 kg
Dimensions (L x W x H)	397 mm x 370 mm x 107 mm
MTBF	80 years

Safety-related parameters

$MTTF_D$	> 100 years

Performance

Scan/frame rate	504,600 measurement point/s
Response time	≥ 4.8 ms
Detectable object shape	Almost any
Systematic error	± 1 mm [1]
Statistical error	1.5 mm [1]
Integrated application	Output of measurement data
Filter	Rectangular filter Edge filter Median filter Gloss compensation Average filter

[1] Typical value; actual value depends on environmental conditions.

Interfaces

Ethernet	✓, TCP/IP
Function	Measurement data output (distance, RSSI, angle, quality)
Data transmission rate	100 Mbit/s … 1,000 Mbit/s, half/full-duplex
CAN	✓
Function	SICK CAN sensor network CSN (secondary)
Data transmission rate	20 kbit/s … 1 Mbit/s
Encoder inputs	2 (phase A, phase B)
Synchronization inputs/outputs	One (master / slave)
Optical indicators	4 LEDs
Configuration software	SOPAS ET
Maximum encoder frequency	50 kHz

Ambient data

Object remission	2 % … 200 %
Electromagnetic compatibility (EMC)	EN 61000-6-3:2007+A1:2011, IEC 61000-6-3:2006+AMD1:2010
Vibration resistance	EN 60068-2-6:2007
Shock resistance	EN 60068-2-27:2008
Ambient operating temperature	–10 °C … +50 °C [1]
Storage temperature	–20 °C … +70 °C
Permissible relative humidity	≤ 90 %, Non-condensing
Ambient light immunity	2,000 lx

[1] Initialization phase: 0 °C … 50 °C.

General notes

Note on use	The sensor does not constitute a safety component as defined by relevant legislation on machine safety. Use in volume measurement systems (non-LFT) from SICK.

Classifications

ECLASS 5.0	27270990
ECLASS 5.1.4	27270990
ECLASS 6.0	27270913
ECLASS 6.2	27270913
ECLASS 7.0	27270913
ECLASS 8.0	27270913
ECLASS 8.1	27270913
ECLASS 9.0	27270913
ECLASS 10.0	27270913
ECLASS 11.0	27270913
ECLASS 12.0	27270913
ETIM 5.0	EC002550
ETIM 6.0	EC002550
ETIM 7.0	EC002550
ETIM 8.0	EC002550
UNSPSC 16.0901	41111615

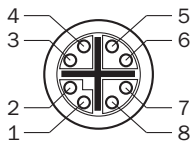## Dimensional drawing (Dimensions in mm (inch))

LMS4x2x head with laser protection cover
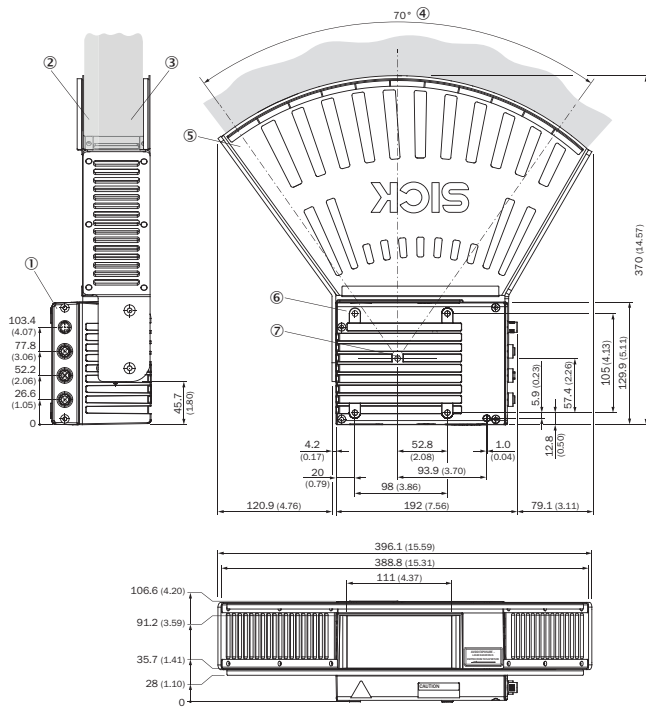
① Interfaces, types and number can vary
② Sending area
③ Receiving area
④ Aperture angle
⑤ Optical hood
⑥ Reference boreholes
⑦ Distance measurement zero point

Working range diagram

Scanning range in m (ft)

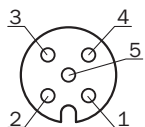Working range 0.7 m to 3 m
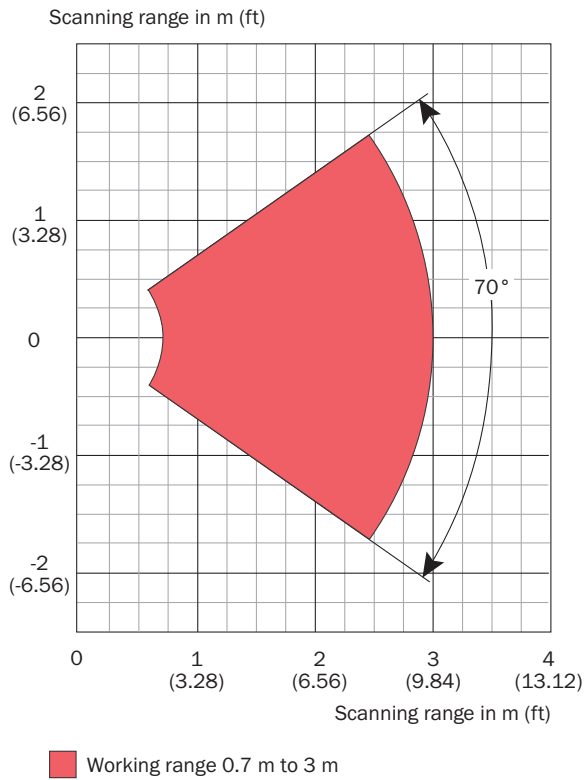
Connection type

Gigabit Ethernet

M12, 8-pin socket, X-coded (Gigabit Ethernet)
① TRD0_P
② TRD0_N
③ TRD1_P
④ TRD1_N
⑤ TRD3_P
⑥ TRD3_N
⑦ TRD2_P
⑧ TRD2_N

PIN assignment

Encoders

Female connector M12, 5-pin, A-coded
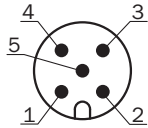① 24 V DC ± 25 %
② Encoders B
③ GND
④ Encoders A
⑤ SYNC

CAN Out
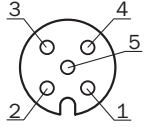
Female connector M12, 5-pin, A-coded
① shield
② 24 V DC ± 25 %
③ GND
④ CAN HIGH
⑤ CAN LOW

CAN In

Connector M12, 5-pin, A-coded
① shield
② 24 V DC ± 25 %
③ GND
④ CAN HIGH
⑤ CAN LOW

Recommended accessories

Other models and accessories ➜ www.sick.com/LMS4000

	Brief description	Type	Part no.
Terminal and alignment brackets			
	Holder for Item Profile	Alignment bracket	2030421
Others			
	• **Connection type head A:** Female connector, M12, 5-pin, straight, A-coded • **Connection type head B:** Male connector, M12, 5-pin, straight, A-coded • **Signal type:** DeviceNet™, CANopen • **Cable:** 5 m • **Description:** DeviceNet™, CANopen, shielded, CAN cable	CAN cable (male connector - female connector)	6021168
	• **Connection type head A:** Female connector, M12, 5-pin, A-coded • **Connection type head B:** Flying leads • **Signal type:** Power, CAN • **Cable:** 5 m, 5-wire • **Description:** Power, CAN, unshielded	DOL-1205-G05M_Can	6021166

	Brief description	Type	Part no.
	• **Connection type head A:** Female connector, M12, 5-pin, straight, A-coded • **Connection type head B:** Male connector, M12, 5-pin, straight, A-coded • **Signal type:** Sensor/actuator cable • **Cable:** 5 m, 5-wire, PUR, halogen-free • **Description:** Sensor/actuator cable, shielded • **Application:** Zones with oils and lubricants, Drag chain operation	YF2A85-050UB6M2A85	2096119
	• **Connection type head A:** Male connector, M12, 5-pin, straight • **Signal type:** CANopen • **Description:** CANopen, unshielded, CAN male connector, with terminating resistor	CAN male connector	6021167
	PS50W-24V	PS50W-24V	7028789
	• **Measuring wheel circumference:** 300 mm • **Measuring wheel surface:** O-ring NBR70 • **Communication interface:** 10 V ... 32 V, Incremental, HTL, Push pull • **Supply voltage:** 10 V ... 32 V • **Connection type:** Male connector, M12, 5-pin, radial • **Resolution in pulses/mm:** 5 • **Specialty:** M12 male connector, 5-pin	DFV60B-22EZ0-S03	1051292
	• **Connection type head A:** Male connector, M12, 8-pin, straight, X-coded • **Connection type head B:** Male connector, RJ45, 8-pin, straight • **Signal type:** Ethernet, Gigabit Ethernet • **Cable:** 5 m, 8-wire, PUR, halogen-free • **Description:** Ethernet, Gigabit Ethernet, shielded • **Application:** Zones with oils and lubricants	YM2X18-050EG1MRJA8	2106259

Recommended services

Additional services ➜ www.sick.com/LMS4000

	Type	Part no.
Maintenance		
• **Product area:** 2D LiDAR sensors, 3D LiDAR sensors • **Range of services:** Inspection, analysis and restoring of defined functions, Inspection and adaptation of basic settings, parameters of field application, filters for raw data output, and product-specific configuration • **Duration:** Additional work will be invoiced separately	Maintenance of LiDAR sensors	1682593
Commissioning		
• **Product area:** 2D LiDAR sensors, 3D LiDAR sensors • **Range of services:** Inspection of connection, fine adjustment, configuration of monitored areas, configuration and optimization of parameters as well as tests, Setup of previously defined functions of basic settings, parameters of field application, filters for raw data output and product-specific configuration • **Duration:** Additional work will be invoiced separately	Commissioning LiDAR sensors	1680672
Extended warranty		
• **Product area:** Machine vision, LiDAR sensors, safety camera sensors, Safety laser scanners, Safety radar sensors, Radar sensors, Fixed mount barcode scanners, Image-based code readers, RFID, Mobile handheld scanners • **Range of services:** The services correspond to the scope of the statutory manufacturer warranty (SICK general terms of delivery). • **Duration:** Five-year warranty from delivery date.	Extended warranty for a total of five years from delivery date	1680671

	Type	Part no.
Service agreements		
• **Product area:** Robot guidance systems, Track and trace systems, Driver assistance systems, Object detection systems, Profiling systems, Gateway systems, Quality control systems • **Range of services:** Maintenance, Troubleshooting, extended warranty, 8/5 remote support, 8/5 help desk • **Duration:** Duration is arranged individually with the customer and defined in the contract	Bronze service agreements for Systems	1616164

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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