# LMS4121R-13000

LMS4000

**2D LIDAR SENSORS**

**SICK**
Sensor Intelligence.

# LMS4121R-13000 | LMS4000

## 2D LIDAR SENSORS
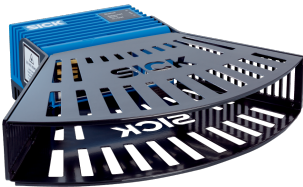
## Ordering information

| Type | Part no. |
|------|----------|
| LMS4121R-13000 | 1091393 |

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

## Detailed technical data

### Features

| | |
|---|---|
| Task | Measuring - Dimension, contour and volume<br>Measuring - Length and distance<br>Monitoring and controlling - Quality<br>Identifying - Classifying<br>Identifying - Sorting<br>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 (Power + I/O + Sync)<br>1 x M12, 8-pin female connector (Ethernet)<br>1 x M12, 5-pin female connector (Encoder + I/O) |
| 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<br>Edge filter<br>Median filter<br>Gloss compensation<br>Average filter |

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

## Interfaces

| | |
|---|---|
| **Ethernet** | ✓, TCP/IP, UDP/IP |
| Function | Measurement data output (distance, RSSI, angle) |
| Data transmission rate | 100 Mbit/s ... 1,000 Mbit/s, half/full-duplex |
| **Digital inputs** | 2 |
| **Encoder inputs** | 2 (phase A, phase B) |
| **Digital outputs** | 3 |
| **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. |

## 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
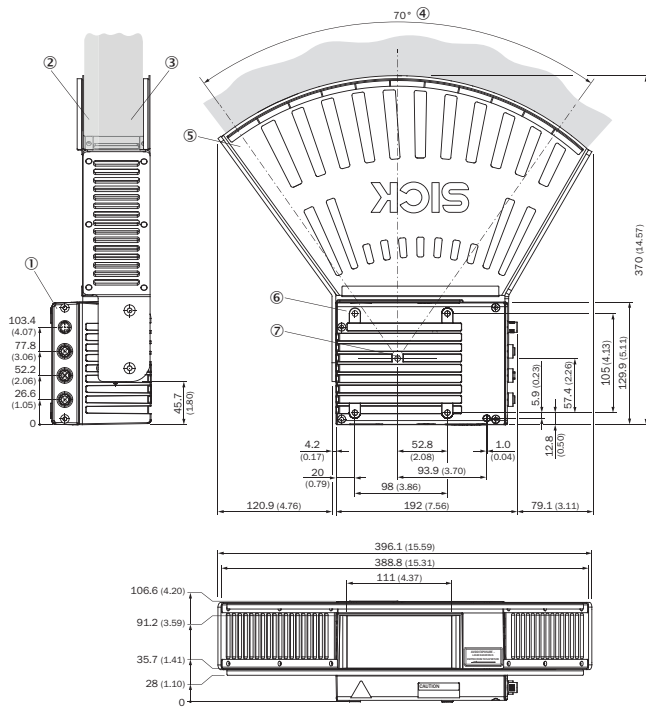
① Interfaces, types and number can vary
② Sending area
③ Receiving area
④ Aperture angle
⑤ Optical hood
⑥ Reference boreholes
⑦ Distance measurement zero point

## Working range diagram

Scanning range in m (ft)



70°

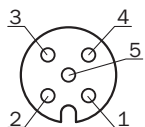Scanning range in m (ft)

■ Working range 0.7 m to 3 m
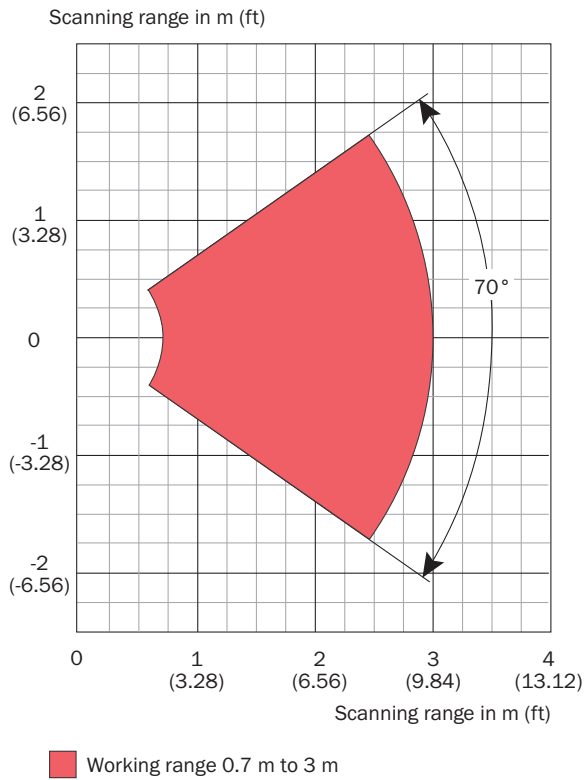
## Connection type

Gigabit Ethernet
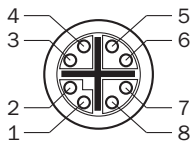


M12, 8-pin socket, X-coded (Gigabit Ethernet)
① TRD0_P
② TRD0_N
③ TRD1_P
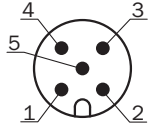④ TRD1_N
⑤ TRD3_P
⑥ TRD3_N
⑦ TRD2_P
⑧ TRD2_N

## PIN assignment

Encoders

Female connector M12, 5-pin, A-coded
① 24 V DC ± 25 %
② Encoders B
③ GND
④ Encoders A
⑤ IN1/OUT1

Power



Connector M12, 5-pin, A-coded
① 24 V DC ± 25 %
② SYNC
③ GND
④ IN2/OUT2
⑤ OUT4

## 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<br>• **Connection type head B:** Male connector, M12, 5-pin, straight, A-coded<br>• **Signal type:** Sensor/actuator cable<br>• **Cable:** 5 m, 5-wire, PUR, halogen-free<br>• **Description:** Sensor/actuator cable, shielded<br>• **Application:** Zones with oils and lubricants, Drag chain operation | YF2A85-050UB6M2A85 | 2096119 |
| | • **Connection type head A:** Female connector, M12, 5-pin, straight, A-coded<br>• **Connection type head B:** Flying leads<br>• **Signal type:** Sensor/actuator cable<br>• **Cable:** 5 m, 5-wire, PUR, halogen-free<br>• **Description:** Sensor/actuator cable, shielded<br>• **Application:** Zones with oils and lubricants, Drag chain operation, Robot | YF2A25-050UB6XLEAX | 2095733 |
| | PS50W-24V | PS50W-24V | 7028789 |
| | • **Measuring wheel circumference:** 300 mm<br>• **Measuring wheel surface:** O-ring NBR70<br>• **Communication interface:** 10 V ... 32 V, Incremental, HTL, Push pull<br>• **Supply voltage:** 10 V ... 32 V<br>• **Connection type:** Male connector, M12, 5-pin, radial<br>• **Resolution in pulses/mm:** 5<br>• **Specialty:** M12 male connector, 5-pin | DFV60B-22EZ0-S03 | 1051292 |

| | Brief description | Type | Part no. |
|---|---|---|---|
| | • **Connection type head A:** Male connector, M12, 8-pin, straight, X-coded<br>• **Connection type head B:** Male connector, RJ45, 8-pin, straight<br>• **Signal type:** Ethernet, Gigabit Ethernet<br>• **Cable:** 5 m, 8-wire, PUR, halogen-free<br>• **Description:** Ethernet, Gigabit Ethernet, shielded<br>• **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<br>• **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<br>• **Duration:** Additional work will be invoiced separately | Maintenance of LiDAR sensors | 1682593 |
| **Commissioning** | | |
| • **Product area:** 2D LiDAR sensors, 3D LiDAR sensors<br>• **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<br>• **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<br>• **Range of services:** The services correspond to the scope of the statutory manufacturer warranty (SICK general terms of delivery).<br>• **Duration:** Five-year warranty from delivery date. | Extended warranty for a total of five years from delivery date | 1680671 |
| **Service agreements** | | |
| • **Product area:** Robot guidance systems, Track and trace systems, Driver assistance systems, Object detection systems, Profiling systems, Gateway systems, Quality control systems<br>• **Range of services:** Maintenance, Troubleshooting, extended warranty, 8/5 remote support, 8/5 help desk<br>• **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."**

# WORLDWIDE PRESENCE:

Contacts and other locations –**www.sick.com**

SICK AG  |  Waldkirch  |  Germany  |  www.sick.com

**SICK**
Sensor Intelligence.