



# LMS511-22100 Heavy Duty

LMS5xx

2D LIDAR SENSORS

**SICK**  
Sensor Intelligence.



### Ordering information

Type	Part no.
LMS511-22100 Heavy Duty	1071996

Other models and accessories → [www.sick.com/LMS5xx](http://www.sick.com/LMS5xx)



### Detailed technical data

#### Features

<b>Application</b>	Outdoor, Indoor
<b>Variant</b>	Heavy-Duty
<b>Resolution power</b>	High Resolution
<b>Light source</b>	Infrared (905 nm, ± 10 nm)
<b>Laser class</b>	1 (EN/IEC 60825-1:2014 (Ed.3), EN/IEC 60825-1:2007 (Ed.2) CAN/CSA-E60825-1:2015-11 (Ed.3))
<b>Aperture angle</b>	Horizontal 190°
<b>Scanning frequency</b>	25 Hz 35 Hz 50 Hz 75 Hz 100 Hz
<b>Angular resolution</b>	Horizontal 0.042°, interlaced 0.083°, interlaced 0.1667° 0.25° 0.333° 0.5° 0.667° 1°
<b>Scan field flatness</b>	Scan field flatness combined: ± 0.72° Typical conical error: 1 sigma value - 0.11° ± 0.1° Typical tilt: 1 sigma value + 0.15° ± 0.08°
<b>Heating</b>	Self-heating with additional integrated heating
<b>Working range</b>	0.2 m ... 80 m
<b>Scanning range</b>	At 10% remission factor 26 m
<b>Measurement accuracy</b>	± 12 mm

<b>Spot size</b>	Divergence: 4.7 mrad At the viewing window: 13.5 mm In 26 m: 136 mm In 40 m: 202 mm
<b>Amount of evaluated echoes</b>	5

## Mechanics/electronics

<b>Connection type</b>	4 x M12 round connector (stainless steel)
<b>Supply voltage</b>	24 V DC, $\pm 20\%$
<b>Power consumption</b>	22 W, + 55 W heating (typical)
<b>Housing material</b>	AISI12
<b>Housing color</b>	Gray (RAL 7032)
<b>Window material</b>	Polycarbonate, scratch-resistant coating
<b>Enclosure rating</b>	IP65 (EN 60529, Section 14.2.7) IP67 (EN 60529, Section 14.2.7)
<b>Protection class</b>	III (IEC 61140:2016-11)
<b>Weight</b>	3.7 kg
<b>Dimensions (L x W x H)</b>	160 mm x 155 mm x 185 mm
<b>MTBF</b>	> 100 years

## Safety-related parameters

<b>MTTF<sub>D</sub></b>	> 100 years
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## Performance

<b>Response time</b>	$\geq 10$ ms
<b>Detectable object shape</b>	Almost any
<b>Systematic error</b>	$\pm 25$ mm (1 m ... 10 m) $\pm 35$ mm (10 m ... 20 m) <sup>1)</sup>
<b>Statistical error</b>	7 mm (1 m ... 10 m) 9 mm (10 m ... 20 m) <sup>1)</sup>
<b>Integrated application</b>	Field evaluation Output of measurement data
<b>Number of field sets</b>	10 fields
<b>Simultaneous evaluation cases</b>	10
<b>Filter</b>	Echo filter Fog filter Particle filter Average filter Glare filter

<sup>1)</sup> Typical value; actual value depends on environmental conditions.

## Interfaces

<b>Ethernet</b>		✓, TCP/IP, UDP/IP
	Function	Host and AUX, NTP
	Data transmission rate	10/100 MBit/s
<b>Serial</b>		✓, RS-232, RS-422
	Function	Host and AUX
	Data transmission rate	9.6 kBaud ... 500 kBaud
<b>CAN</b>		✓

	Function	Extension of outputs
	Data transmission rate	20 kBit/s, 500 kBit/s, 1 MBit/s, Synchronization
<b>USB</b>		✓
	Remark	Mini-USB
	Function	Service interface
<b>Digital inputs</b>		4 (Digital, encoder (HTL), synchronization)
<b>Digital outputs</b>		6 (digital)
<b>Optical indicators</b>		5 LEDs (Additional 7-segment display)
<b>Parameter storage</b>		Integrated into system plug with cloning parameter memory

### Ambient data

<b>Object remission</b>		2 % ... > 1,000 % (reflectors)
<b>Electromagnetic compatibility (EMC)</b>		
	Emitted radiation	Industrial environment (IEC 61000-6-3:2020 / EN IEC 61000-6-3:2007+A1:2011)
	Electromagnetic immunity	Industrial environment (IEC 61000-6-2:2016 / EN IEC 61000-6-2:2019)
<b>Vibration resistance</b>		
	Sine test	10 Hz ... 150 Hz, Amplitude 0.35 mm to 5 g, 20 cycles <sup>1)</sup>
<b>Shock resistance</b>		15 g, 11 ms, 6 single shocks/axis <sup>2)</sup> 10 g, 16 ms, 1,000 continuous shocks/axis <sup>2)</sup>
<b>Impact resistance</b>		IK05, IK06, IK07 (DIN EN 50102:09-1997)
<b>Ambient operating temperature</b>		-40 °C ... +60 °C
<b>Storage temperature</b>		-40 °C ... +70 °C
<b>Ambient light immunity</b>		70,000 lx

<sup>1)</sup> IEC 60068-2-6:2007-12.

<sup>2)</sup> IEC 60068-2-27:2008-02.

### General notes

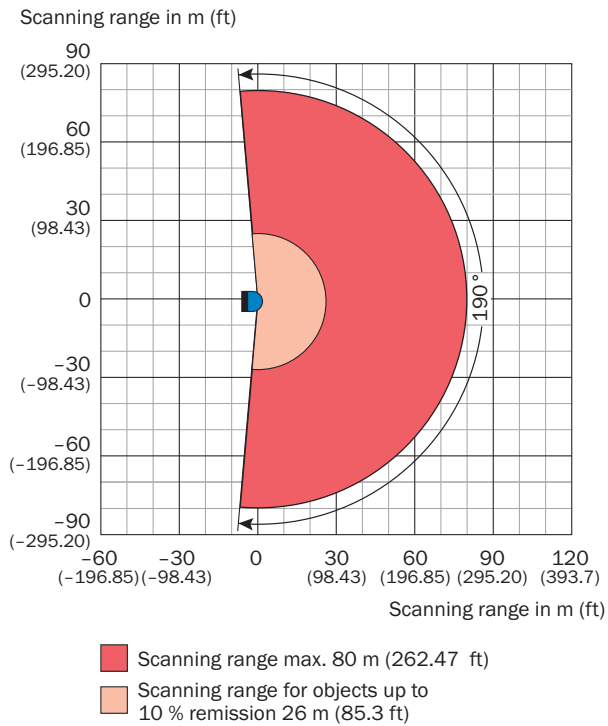
<b>Note on use</b>	The sensor does not constitute a safety component as defined by relevant legislation on machine safety.
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### Classifications

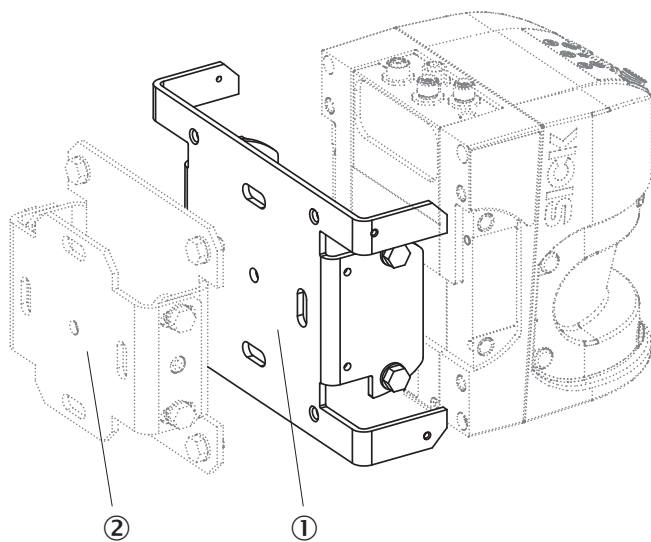
<b>ECLASS 5.0</b>	27270990
<b>ECLASS 5.1.4</b>	27270990
<b>ECLASS 6.0</b>	27270913
<b>ECLASS 6.2</b>	27270913
<b>ECLASS 7.0</b>	27270913
<b>ECLASS 8.0</b>	27270913
<b>ECLASS 8.1</b>	27270913
<b>ECLASS 9.0</b>	27270913
<b>ECLASS 10.0</b>	27270913
<b>ECLASS 11.0</b>	27270913
<b>ECLASS 12.0</b>	27270913
<b>ETIM 5.0</b>	EC002550
<b>ETIM 6.0</b>	EC002550

<b>ETIM 7.0</b>	EC002550
<b>ETIM 8.0</b>	EC002550
<b>UNSPSC 16.0901</b>	41111615

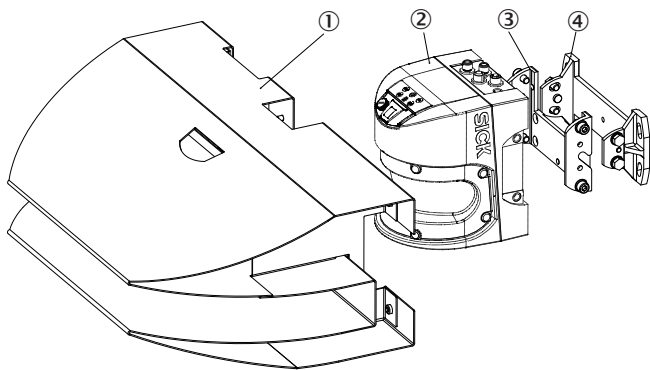
### Working range diagram



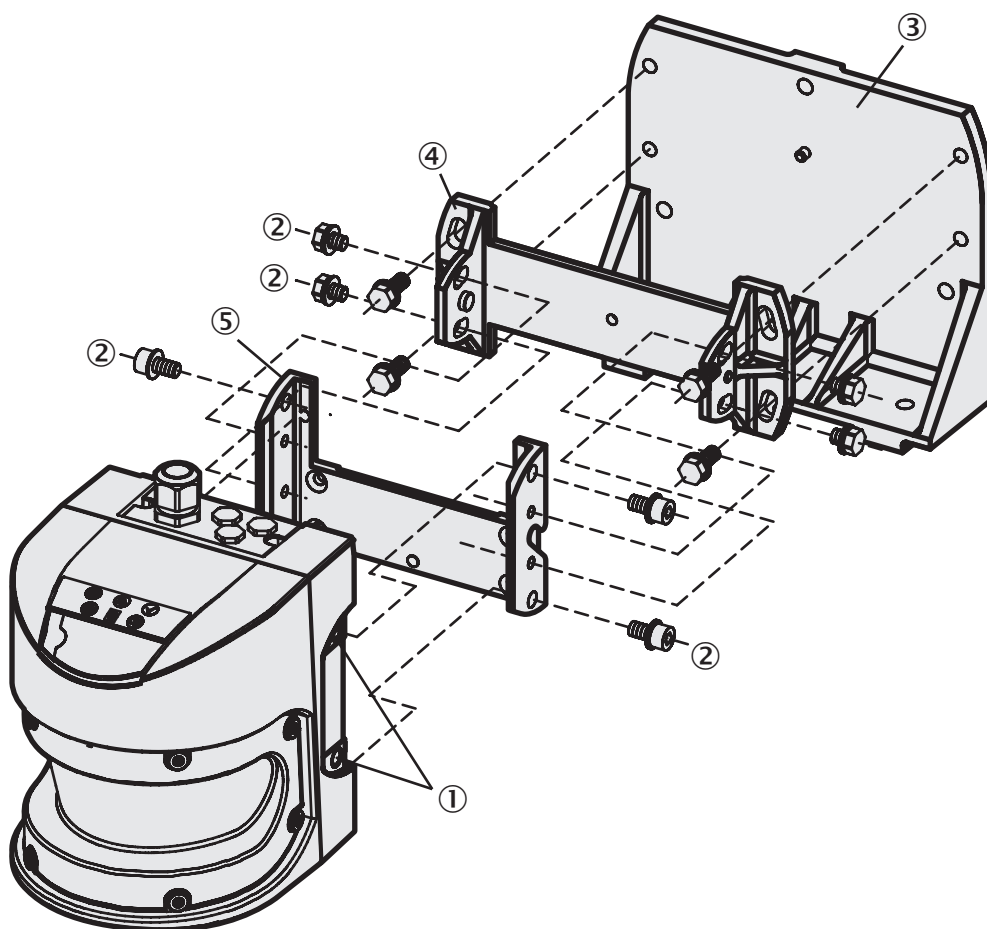
### Assembly note



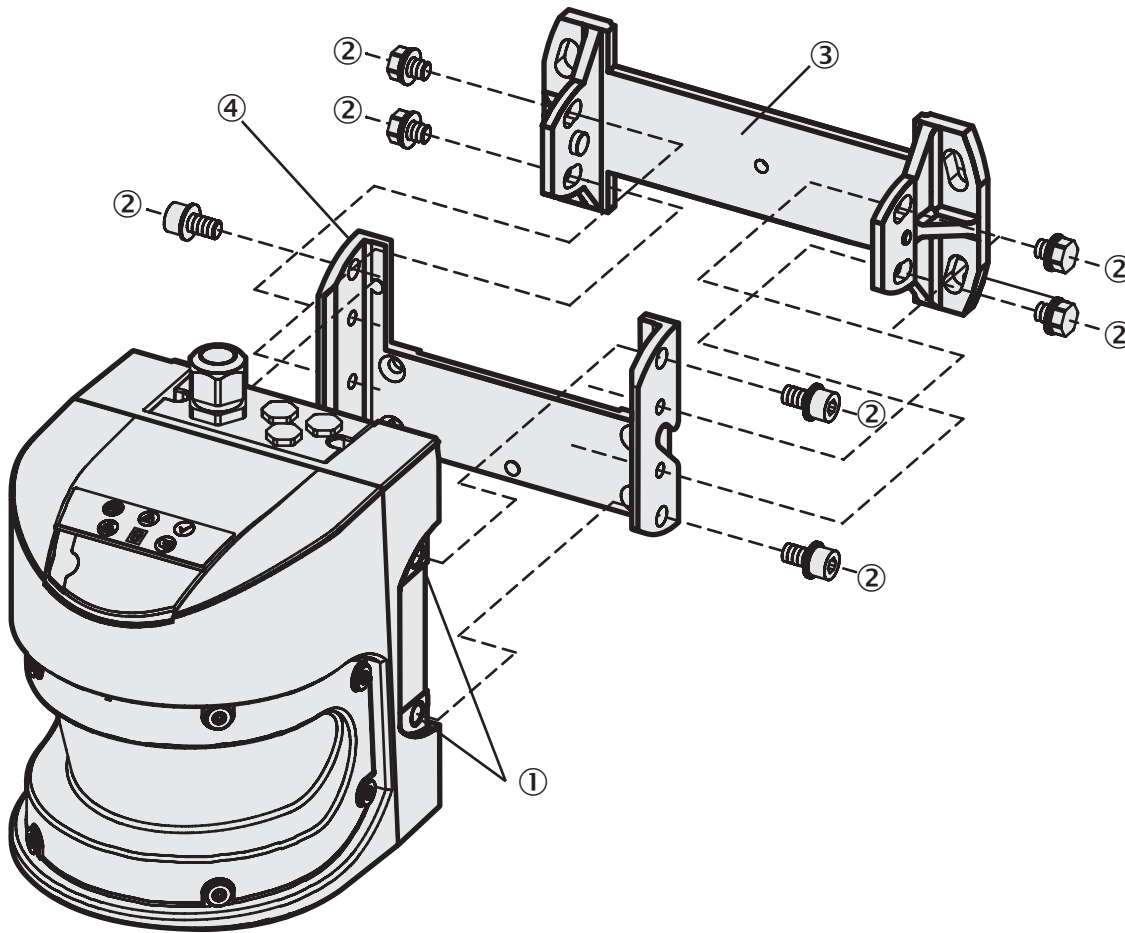
- ① Mounting bracket 2059271
- ② Mounting bracket 2018303



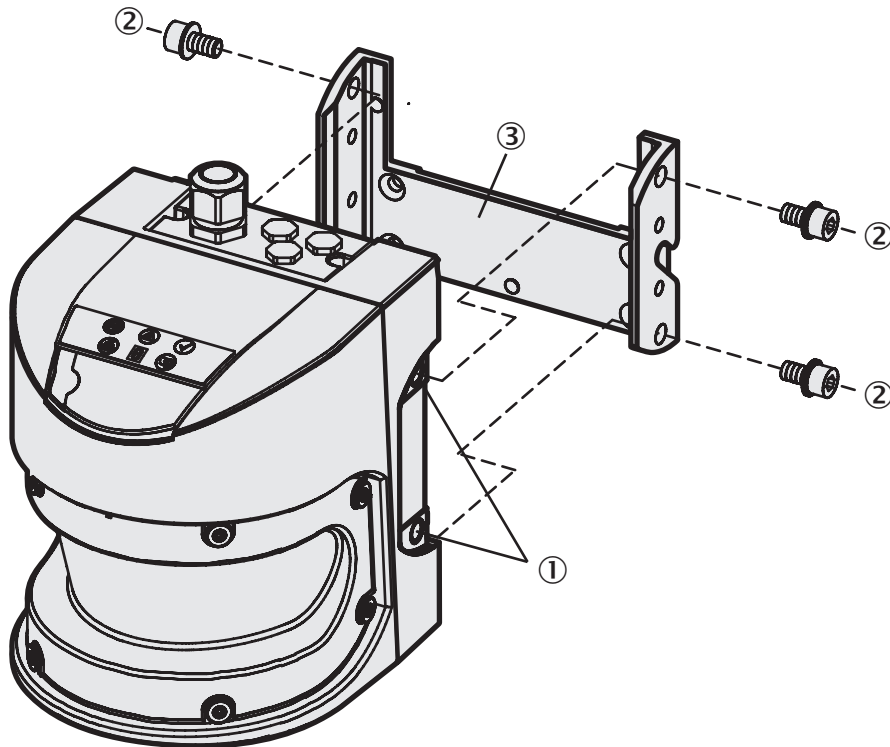
- ① Weather hood
- ② LMS5xx
- ③ Mounting kit 1
- ④ Mounting kit 2



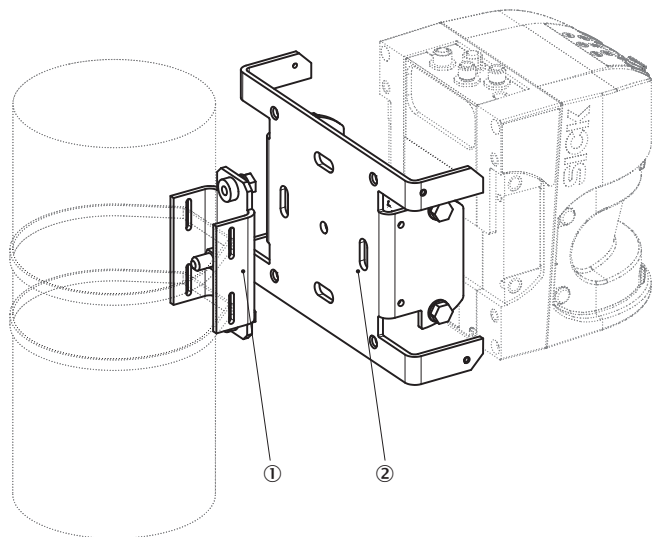
- ① Threaded holes M8x9
- ② Mounting screws
- ③ Mounting kit 3
- ④ Mounting kit 2
- ⑤ Mounting kit 1



- ① Threaded holes M8x9
- ② Fixing screw
- ③ Mounting kit 2
- ④ Mounting kit 1

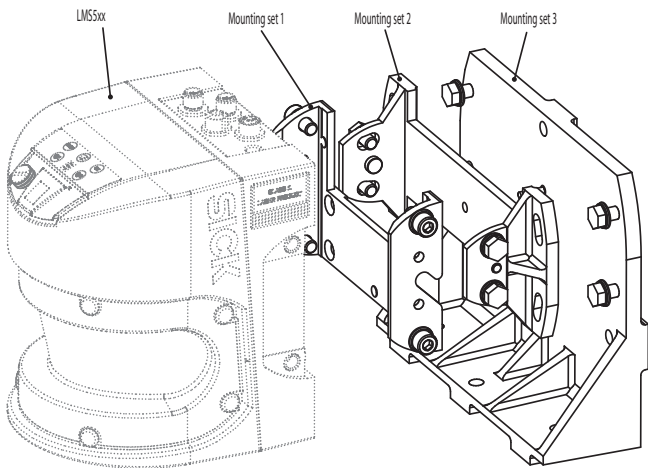
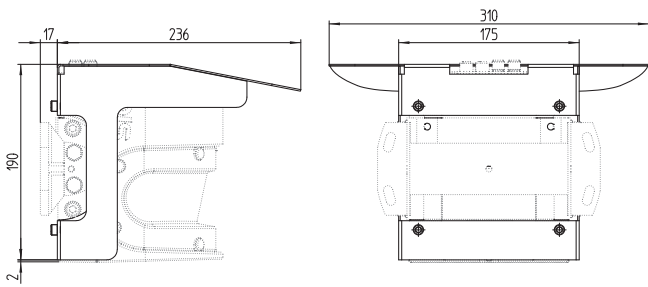
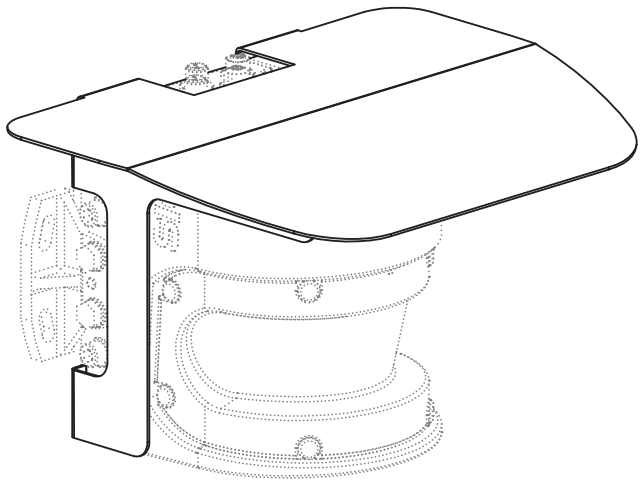


- ① Threaded holes M8x9
- ② Mounting screws
- ③ Mounting kit 1



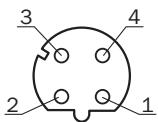
- ① Post bracket
- ② Mounting bracket 2059271





## Connection type

Ethernet

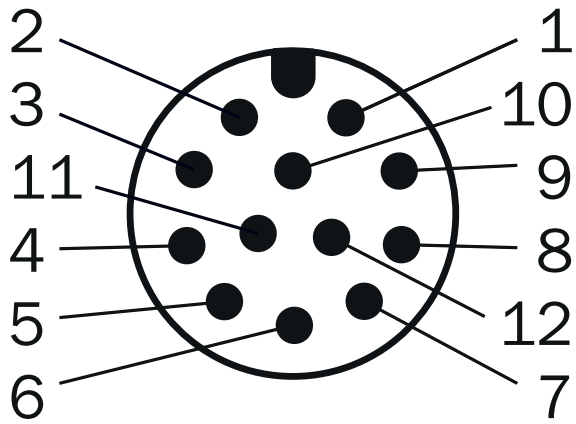


M12 female connector, 4-pin, D-coded

- ① TX+
- ② RX+
- ③ TX-
- ④ RX-

### PIN assignment

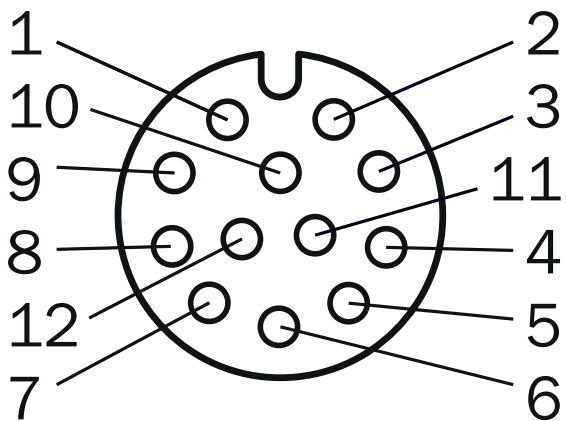
Data



M12, 12-pin male connector, A-coded

- ① V<sub>S</sub> OUT
- ② RD-/RxD
- ③ OUT1
- ④ GND RS/CAN
- ⑤ OUT2
- ⑥ Reserved
- ⑦ TD-/TxD
- ⑧ Reserved
- ⑨ RD+
- ⑩ TD+
- ⑪ CAN LOW
- ⑫ CAN HIGH

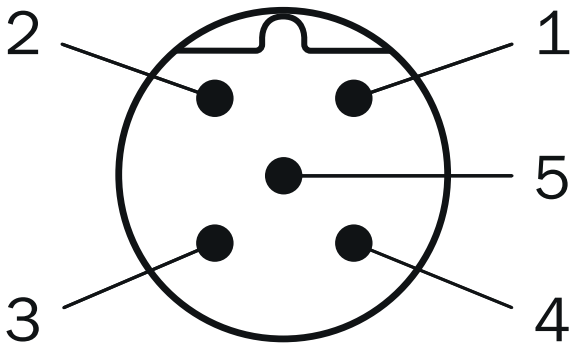
I/O



M12, 12-pin female connector, A-coded (I/O)

- ① V<sub>s</sub> OUT
- ② GND IN1/2
- ③ In<sub>1</sub>
- ④ GND IN3/4/IN Sync
- ⑤ In<sub>2</sub>
- ⑥ In<sub>3</sub>
- ⑦ GND Out 3 ... 6
- ⑧ IN4/IN Sync
- ⑨ OUT3
- ⑩ OUT4
- ⑪ OUT5
- ⑫ OUT6/OUT Sync

POWER connection









Male connector M12, 5-pin, A-coded

- ① V<sub>s</sub>
- ② V<sub>s</sub> Heat.
- ③ GND
- ④ Reserved
- ⑤ GND heat.

## Recommended accessories

Other models and accessories → [www.sick.com/LMS5xx](http://www.sick.com/LMS5xx)

	Brief description	Type	Part no.
<b>Mounting brackets and plates</b>			
	1 piece, mounting bracket for direct mounting, from the rear, on wall or machine, not adjustable, Aluminum	Mounting kit 1	2015623
	1 piece, mounting bracket for rear mounting on wall or machine, adjustable longitudinal and lateral axes, only in conjunction with mounting kit 1 (2015623), Aluminum	Mounting kit 2	2015624
<b>Others</b>			
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 4-pin, straight</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Cable:</b> 5 m, 4-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Shielded</li> <li>• <b>Application:</b> Zones with oils and lubricants, Outdoor, Drag chain operation</li> </ul>	YF2A64-050UE1XLEAX	6054495

	Brief description	Type	Part no.
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 12-pin, straight</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Sensor/actuator cable</li> <li>• <b>Cable:</b> 5 m, 12-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Sensor/actuator cable, shielded</li> <li>• <b>Connection systems:</b> Flying leads</li> <li>• <b>Application:</b> Zones with oils and lubricants, Outdoor, Drag chain operation</li> </ul>	DOL-1212-G05MACO	2094407
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Male connector, M12, 12-pin, straight</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Sensor/actuator cable</li> <li>• <b>Cable:</b> 5 m, 12-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Sensor/actuator cable, shielded</li> <li>• <b>Connection systems:</b> Flying leads</li> <li>• <b>Application:</b> Zones with oils and lubricants, Outdoor, Drag chain operation</li> </ul>	STL-1212-G05MACO	2094409
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Male connector, M12, 4-pin, straight, D-coded</li> <li>• <b>Connection type head B:</b> Male connector, RJ45, 4-pin, straight</li> <li>• <b>Signal type:</b> Ethernet</li> <li>• <b>Cable:</b> 5 m, 4-wire, CAT5, CAT5e, PUR</li> <li>• <b>Description:</b> Ethernet, shielded</li> <li>• <b>Application:</b> Outdoor</li> </ul>	YM2D34-050PN4MRJA4	6054493

### Recommended services

Additional services → [www.sick.com/LMS5xx](http://www.sick.com/LMS5xx)

	Type	Part no.
Maintenance		
<ul style="list-style-type: none"> <li>• <b>Product area:</b> 2D LiDAR sensors, 3D LiDAR sensors</li> <li>• <b>Range of services:</b> 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</li> <li>• <b>Duration:</b> Additional work will be invoiced separately</li> </ul>	Maintenance of LiDAR sensors	1682593
Commissioning		
<ul style="list-style-type: none"> <li>• <b>Product area:</b> 2D LiDAR sensors, 3D LiDAR sensors</li> <li>• <b>Range of services:</b> 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</li> <li>• <b>Duration:</b> Additional work will be invoiced separately</li> </ul>	Commissioning LiDAR sensors	1680672
Extended warranty		
<ul style="list-style-type: none"> <li>• <b>Product area:</b> 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</li> <li>• <b>Range of services:</b> The services correspond to the scope of the statutory manufacturer warranty (SICK general terms of delivery).</li> <li>• <b>Duration:</b> Five-year warranty from delivery date.</li> </ul>	Extended warranty for a total of five years from delivery date	1680671

## 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](http://www.sick.com)