Product family overview

LMS5xx

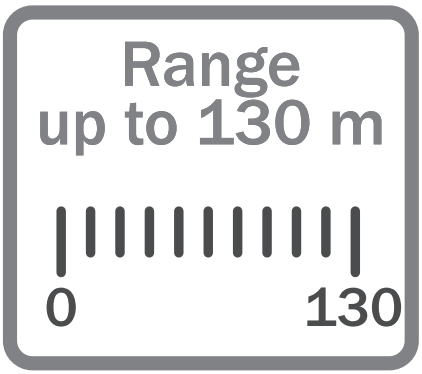
High-performance 2D LiDAR sensor for accurate detection of far away objects

SICK
Sensor Intelligence.

Advantages

In the field of 2D LiDAR sensors, SICK is setting standards worldwide for industrial applications: The sensor manufacturer knows how to protect the sensitive technology of intelligent sensors so that they can work reliably and economically for many years, even under unfavorable ambient conditions. This knowledge is an integral part of LMS5xx 2D LiDAR sensors.

5-echo technology for precise measurements
The 5-echo technology from SICK enables reliable and high-precision laser measurements in nearly all weather conditions.

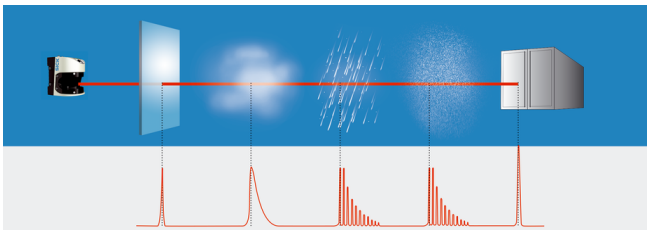


A very high level of performance
Peak values for the sensing range, resolution and frequency, paired with a compact design, countless inputs and outputs as well as flexible integration into the communication infrastructures of the customer and the powerful SICK SOPAS ET software: That is why the LMS5xx is the right sensor for so many applications.

High economic efficiency throughout the entire product life.cycle
The LMS5xx stands for sophisticated self-monitoring and low energy consumption. The sensor offers extreme economic efficiency throughout its entire product life-cycle.

The LMS5xx combines precision with intelligence and a rugged design to offer the best performance all along the line: The highest level of detection, recording and transmission of measured values. Throughout the entire product life-cycle.

The multi-echo evaluation combined with intelligent scanning technology is what allows for the best possible compensation of weather influences when recording measured values and increases the reliability of collected data. This outstanding performance can be improved even more with additional digital filters for preparation and optimization of distance values measured by the LMS5xx. With these filters, users can perfectly and efficiently adjust the LMS5xx settings to the specific requirements of the respective application. The special heavy-duty variants of the LMS5xx are used under very challenging application conditions, for example in ports.

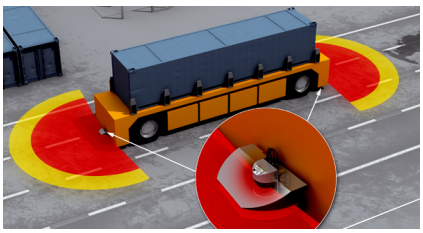


Compensation of weather conditions thanks to 5-echo technology
The 5-echo technology is perfectly suited for applications that require the reliable detection of objects in changing or unfavorable weather conditions. The LMS5xx receives up to five echos per transmitted pulse, which is more than other sensors. In the example shown, the first four measurements (e.g. glass, fog, rain or dust) are above the trigger threshold — however, none of these measurements detects the target object. With the fifth echo, the LMS5xx reliably detects the object.

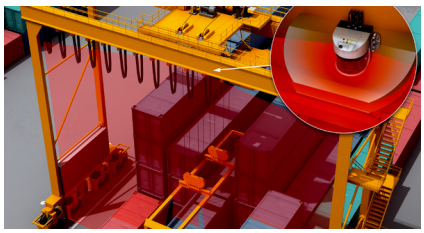
High-quality components in a rugged housing
The rugged design and the special alloy of the housing protect the sensor from mechanical influences and unfavorable ambient conditions. In addition, the self-monitoring and -calibration functions increase the availability of the sensor: For example, the integrated contamination monitoring function of the LMS5xx automatically signals the exact time required for maintenance, thereby reducing maintenance effort.

Maximum availability and outdoor performance due to intelligent 5-echo technology, protected by a rugged housing.

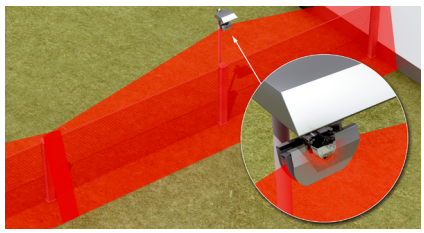
The LMS5xx is the ideal solution for outdoor applications: Even under harsh ambient conditions such as rain and snow, the 2D LiDAR sensor impresses with quick, reliable object detection and very high performance.



Collision avoidance
In ports, collision avoidance has utmost priority. The AGVs used there are equipped with LMS511 devices. Using the monitored areas previously defined for the AGVs, the sensors prevent collisions between these and other vehicles or objects such as cranes and containers: If an AGV comes too close, the LMS511s detects any protective field violations. The AGV then reduces its speed or stops.



Profile measurement
SICK's sensors assist in correctly positioning and detecting freight and other objects. The sensors record the respective data and transmit it to the relevant control. to ensure that every item of cargo reaches its destination in one piece. The LMS511 2D LiDAR sensor scans the yard area below the gantry crane, then the measurement points are used to create a contour profile of the yard area. This is used as the basis for further software processing so as to avoid collisions when using the spreader to pick up and set down containers.



Horizontal and vertical monitoring
In building safety and security, the protection of buildings, property and access areas is very important, as is the protection of persons and valuables. SICK sensors therefore protect buildings and property against intrusion and jailbreak. A 2D LiDAR sensor detects individuals crawling beneath or otherwise crossing the perimeter of a standard fence with high detection speed and unaffected by interference from the weather. The sensor generates a vertical field. If anyone penetrates this field, the 2D LiDAR sensor triggers an alarm.

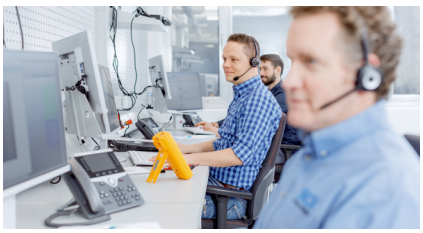
They allow for versatile use in industrial applications — and are very reliable during object detection under challenging ambient conditions.

SICK LifeTime Services

SICK's services increase machine and plant productivity, enhance the safety of people all over the world, provide a solid foundation for a sustainable business operation, and protect investment goods. In addition to its usual consulting services, SICK provides direct on-site support during the conceptual design and commissioning phases as well as during operation.

The range of services not only covers aspects like maintenance and inspection, but also includes performance checks as well as upgrades and retrofits. Modular or customized service contracts extend the service life of plants and therefore increase

their availability. If faults occur or limit values are exceeded, these are detected at all times by the corresponding sensors and systems.



Consulting and design
Application-specific advice on the product, its integration and the application itself.

commissioning and maintenance
Application-optimized and sustainable — thanks to professional commissioning and maintenance by a trained SICK service technician.

service contracts
Extended warranty, SICK Remote Service, 24-hour helpdesk, maintenance, availability guarantees and other modular components can be individually combined on request.

Technical data overview

Application	Indoor Outdoor Outdoor Security (depending on type)
Integrated application	Field evaluation with flexible fields, Data output
Aperture angle	
Horizontal	190°
Angular resolution	0.25° 0.5° 1° 0.042°, interlaced 0.083°, interlaced 0.1667° 0.333° 0.667°
Working range	0.2 m ... 130 m (depending on type)
Scanning range	
At 10% remission	26 m ... 52 m (depending on type)
Amount of evaluated echoes	2 / 5 (depending on type)
Scanning frequency	25 Hz, 35 Hz, 50 Hz, 75 Hz, 100 Hz (depending on type)
Heating	Self-heating / Self-heating with additional integrated heating (depending on type)
Ambient operating temperature	–40 °C ... +60 °C (depending on type)
Ethernet	✓
Serial	✓
USB	✓
CAN	✓
Digital inputs	2 (digital) 4 (Digital, encoder (HTL), synchronization) 3 (digital) 4 (digital)
Digital outputs	3 (digital) 6 (digital) 3 (2 relay, 1 digital) 4 (4 digital outputs in relay function)
Weight	3.7 kg

Product description

The LMS5xx 2D LiDAR sensor is the successor of the successful LMS2xx family. With numerous innovative functions, the LMS5xx increases the productivity of existing applications and opens up entirely new application possibilities. The new, ultra-fast multi-echo technology makes laser measurement applications less sensitive to weather conditions and increases the reliability of captured data. Reduced power consumption as well as intelligent self-monitoring functions ensures extraordinarily low total cost of ownership. With the two Lite and PRO variants, the right version is available for every application. The LMS5xx boasts the best price-performance ratio on the market in this sensor class.

At a glance

- Powerful, efficient 2D LiDAR sensor for measuring ranges up to 80 m
- Excellent performance even under unfavorable weather conditions due to multi-echo technology
- Compact housing up to enclosure rating IP 67 and integrated heating for outdoor devices
- Low power consumption
- Quick signal processing
- Several inputs and outputs
- Synchronization of several sensors possible

Your benefits

- Extremely powerful in countless applications
- Quick, reliable detection of objects under nearly any ambient conditions
- Extensive product family with various product series and types for all requirements regarding performance and cost
- Low power consumption minimizes the total cost of ownership
- Quick and easy commissioning with SOPAS engineering tool
- Self-check function for increasing system availability

Ordering information

Other models and accessories ➜ www.sick.com/LMS5xx

- **Working range:** 0.2 m ... 80 m
- **Resolution power:** High Resolution
- **Integrated application:** Field evaluation with flexible fields, Data output

Enclosure rating	Color	Connection type	Scanning frequency	Angular resolution	Type	Part no.
IP65	Light blue (RAL 5012)	1 x M12 round connector 1 x System plug with screw terminal block, incl. 2 x cable glands	25 Hz, 35 Hz, 50 Hz, 75 Hz, 100 Hz	0.042°, 0.083°, 0.1667°, 0.25°, 0.333°, 0.5°, 0.667°, 1°	LMS500-20000 PRO	1047468
					LMS500-20000S01	1056468
			25 Hz, 35 Hz, 50 Hz, 75 Hz	0.25°, 0.5°, 1°	LMS500-21000 Lite	1054153
IP65, IP67	Gray (RAL 7032)	4 x M12 round connector	25 Hz, 35 Hz, 50 Hz, 75 Hz, 100 Hz	0.042°, 0.083°, 0.1667°, 0.25°, 0.333°, 0.5°, 0.667°, 1°	LMS511-20100 PRO	1047782
			25 Hz, 35 Hz, 50 Hz, 75 Hz	0.25°, 0.5°, 1°	LMS511-21100 Lite	1054154
		4 x M12 round connector (stainless steel)	25 Hz, 35 Hz, 50 Hz, 75 Hz, 100 Hz	0.042°, 0.083°, 0.1667°, 0.25°, 0.333°, 0.5°, 0.667°, 1°	LMS511-22100 Heavy Duty	1071996
					LMS511-22100S08 Heavy Duty	1107125
		4 x M12 round connector on the rear side	25 Hz, 35 Hz, 50 Hz, 75 Hz, 100 Hz		LMS511-20100S01	1065168

- **Working range:** 0.2 m ... 80 m
- **Resolution power:** Standard Resolution
- **Integrated application:** Field evaluation with flexible fields, Data output
- **Enclosure rating:** IP65, IP67
- **Color:** gray (RAL 7032)

Connection type	Scanning frequency	Angular resolution	Type	Part no.
1 x Harting male connector	25 Hz, 35 Hz, 50 Hz, 75 Hz, 100 Hz	0.042°, 0.083°, 0.1667°, 0.25°, 0.333°, 0.5°, 0.667°, 1°	LMS511-10900S04 PRO	1069807
4 x M12 round connector	25 Hz, 35 Hz, 50 Hz, 75 Hz, 100 Hz		LMS511-10100 PRO	1046135
	25 Hz, 35 Hz, 50 Hz, 75 Hz	0.25°, 0.5°, 1°	LMS511-11100 Lite	1054155
4 x M12 round connector (stainless steel)	25 Hz, 35 Hz, 50 Hz, 75 Hz, 100 Hz	0.042°, 0.083°, 0.1667°, 0.25°, 0.333°, 0.5°, 0.667°, 1°	LMS511-12100 Heavy Duty	1071590
			LMS511-12100S08 Heavy Duty	1107124
4 x M12 round connector on the rear side	25 Hz, 35 Hz, 50 Hz, 75 Hz, 100 Hz		LMS511-10100S01	1055659

- **Working range:** 1 m ... 130 m
- **Resolution power:** Standard Resolution
- **Integrated application:** Field evaluation with flexible fields, Data output
- **Enclosure rating:** IP65, IP67
- **Color:** gray (RAL 7032)
- **Connection type:** 4 x M12 round connector (stainless steel)
- **Scanning frequency:** 25 Hz, 35 Hz, 50 Hz, 75 Hz, 100 Hz
- **Angular resolution:** 0.042°, 0.083°, 0.1667°, 0.25°, 0.333°, 0.5°, 0.667°, 1°

Type	Part no.
LMS511-15100 Heavy Duty Extended Range	1128608
LMS531-15100 Heavy Duty Extended Range Security	1128609

- **Working range:** 1 m ... 80 m
- **Resolution power:** Standard Resolution
- **Integrated application:** Field evaluation with flexible fields, Data output
- **Enclosure rating:** IP65, IP67
- **Color:** gray (RAL 7032)

Connection type	Scanning frequency	Angular resolution	Type	Part no.
4 x M12 round connector	25 Hz, 35 Hz, 50 Hz, 75 Hz	0.25°, 0.5°, 1°	LMS531-11100 Security	1055376
4 x M12 round connector (stainless steel)	25 Hz, 35 Hz, 50 Hz, 75 Hz, 100 Hz	0.042°, 0.083°, 0.1667°, 0.25°, 0.333°, 0.5°, 0.667°, 1°	LMS531-10100 Security	1067356

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

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