LMS1xx

COMPACT AND ECONOMICAL, EVEN IN HARSH ENVIRONMENTS

2D laser scanners

SICK
Sensor Intelligence.

LMS1xx – FIRST CHOICE FOR EFFICIENCY IN MEASURING AND DETECTION TASKS

In virtually every sector and industry, efficiency is top priority. In addition to low procurement and operating costs, the performance of the components in use is particularly crucial in this regard. And this is precisely where SICK excels as the market leader for high-performance sensors with the 2D laser scanners of the LMS1xx series.

Equipped with modern multi-echo technology and high mechanical ruggedness, they are ideally suited for a wide range of applications thanks to their excellent reliability.

Scalability
thanks to standardized telegram structure

Stable measured values
thanks to multi-echo technology

High level of application flexibility
thanks to the combination of measuring and detecting functions in one sensor and simultaneous monitoring of up to 10 fields

Low operating costs
thanks to low electricity consumption and low maintenance requirements

High resistance to shock and vibrations
thanks to mechanical ruggedness

Large operating range
up to 50 m

Flexible configuration
via Ethernet and serial
interface

High reliability
even with adverse ambient conditions, thanks to
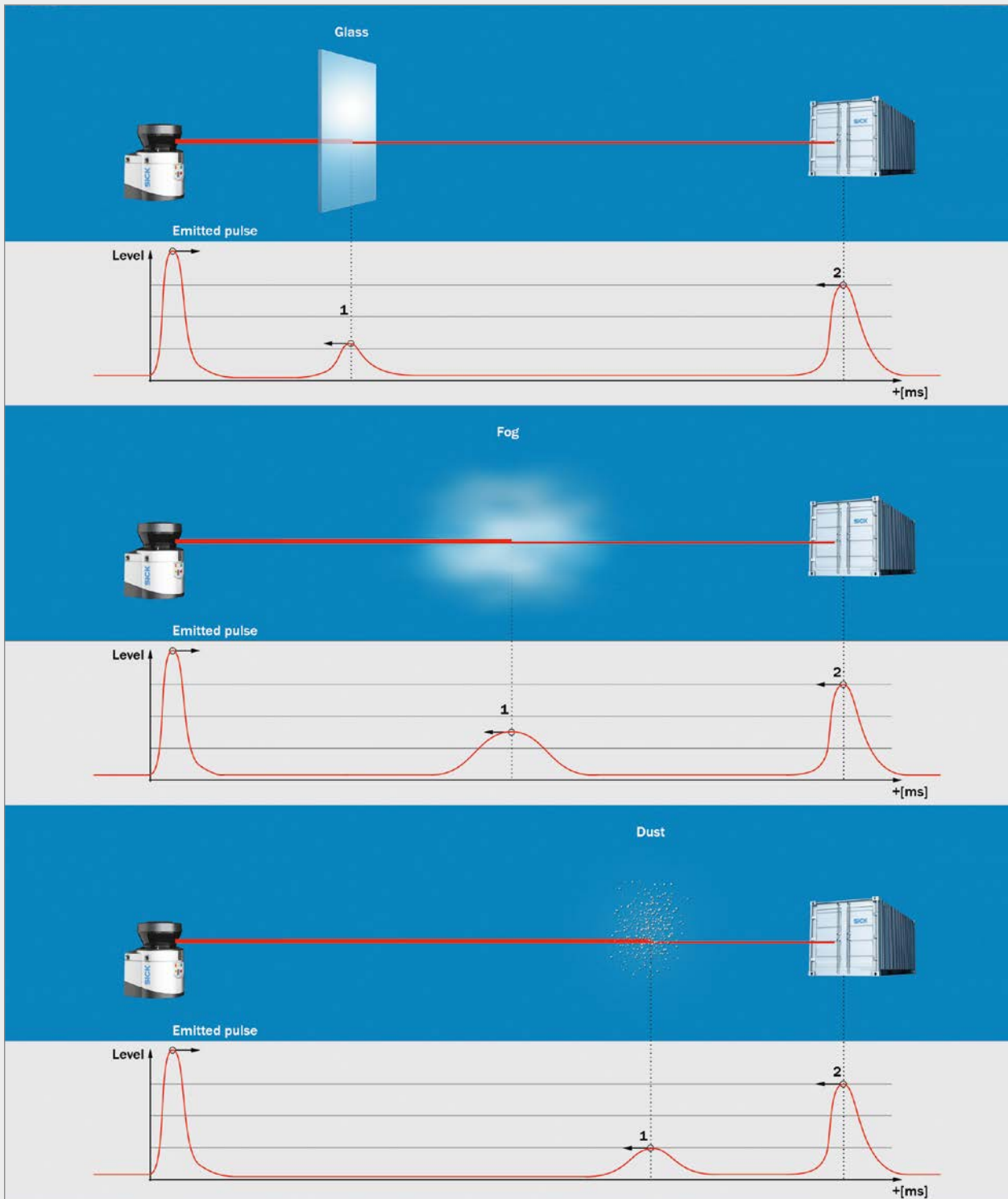multi-echo technology and IP 67 variants

The 2D laser scanners in the LMS1xx series demonstrate their versatility in both indoor and outdoor applications. Whenever **operating ranges up to 50 m** are required, their low procurement and operating costs coupled with outstanding performance make them an excellent choice.

The LMS1xx series boasts an impressive exterior too: The sender and receiver are packaged in a **rugged, compact, space-saving housing** with manageable dimensions and weight. The housing can withstand any weather and allows the scanner **to be used outdoors**.
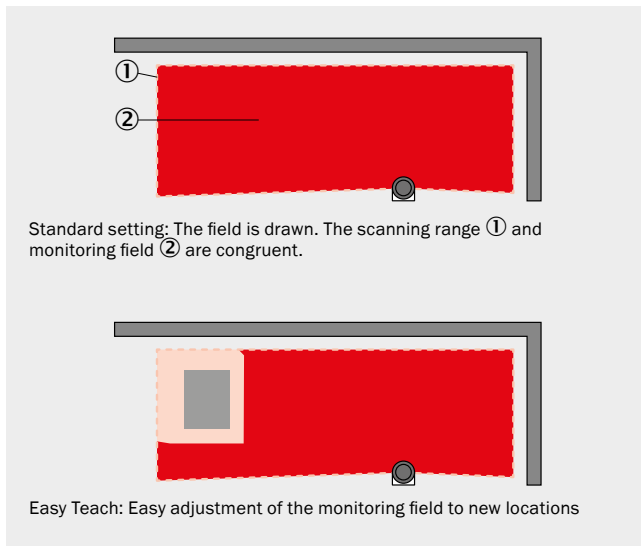
More than anything else, however, it's what's inside that counts. And the 2D laser scanners of the LMS1xx series excel in every regard. Equipped with modern **multi-echo technology**, they are much less sensitive to **weather influences** than many other solutions, and provide reliable data even when installed behind glass.

MULTI-ECHO TECHNOLOGY

The distance between the LMS1xx 2D laser scanner and an object is calculated via the time-of-flight for the pulse emitted. The LMS1xx can analyze two echo signals for each measuring beam. This enables it to provide reliable measurement results at all times – even if it is behind glass or exposed to adverse weather and environmental influences outdoors.

THREE FUNCTIONS FOR EVEN MORE EFFICIENCY

Standard setting: The field is drawn. The scanning range ① and monitoring field ② are congruent.

Easy Teach: Easy adjustment of the monitoring field to new locations

Easy Teach function – for automatic field teach-in and updates

With the Easy Teach function, a PC is not required for the teach-in process on the LMS1xx laser scanner. The Easy Teach function is activated via the digital "Teach" input and the monitoring field is generated automatically during the teach-in process. Easy to operate and, above all, fast. This means that existing monitoring fields can also be adapted to new locations in no time at all.

The benefits of Easy Teach at a glance

- Teach-in of monitoring fields without a PC
- Easy adjustment of up to five existing monitoring fields in one scanning process

LMS12x, LMS13x, LMS14x ➜ see page 12

Field breaches caused by changing ambient conditions


Automatic field adjustment
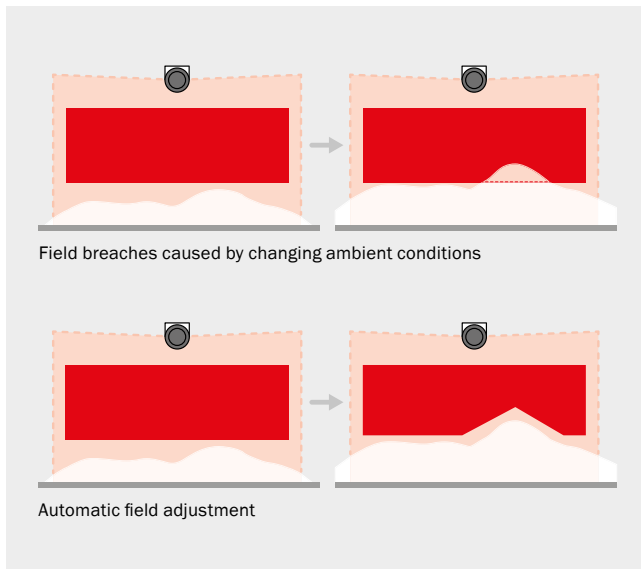
Automatic field adjustment – for adaption to changes in ambient conditions

Tall grass in the summer or snowdrifts in the winter are some examples of how outdoor monitoring fields can quickly become unsuitable and trigger false alarms if they were configured for different environmental situations. The LMS1xx is able to counteract the course of nature with its automatic field adjustment, which dynamically adapts monitoring fields to changes in conditions.

The benefits of automatic field adjustment at a glance

- Protection of open spaces and fences, regardless of environment, with dynamic field adjustment
- Prevention of false alarms

LMS12x, LMS13x, LMS14x ➜ see page 12

Data source

OPC client

OPC server

ABC

Data recipient
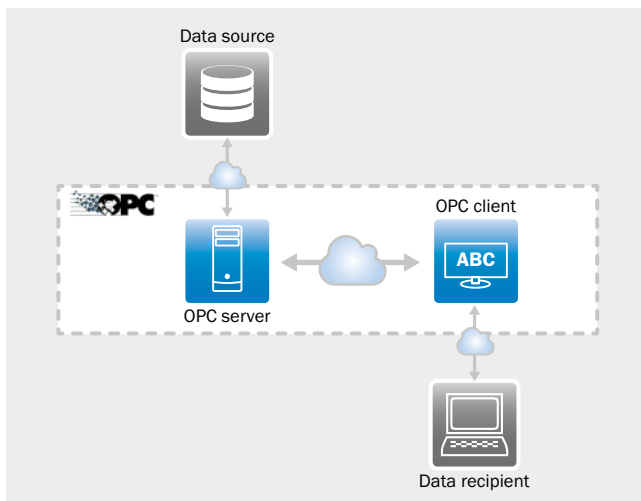
OPC – for scalable solutions

OPC technology plays an important role in large integrative solutions. OPC is the most widely accepted industrial communication standard. It allows communication between devices, controllers, and applications without the usual driver-related connection problems.

The benefits of OPC at a glance

- Standardized data format
- Significant reduction of drivers and protocols
- Easy implementation and low costs of commissioning
- User-friendly data handling (device data)
- No special knowledge about interfaces and data protocols required

LMS1xx ➜ see page 12

➜ www.mysick.com/en/OPC-Server

INDOOR OR OUTDOOR – UNLIMITED OPTIONS WITH LMS1xx

The LMS1xx series offers a diverse range of variants, including application-specific solutions, ensuring that the right 2D laser scanner will be available for virtually any challenge.

Wherever space is particularly tight, the LMS1xx really comes into its own as a collision protection and navigation support system. Whether it is in a container terminal or a high-bay warehouse, used as a driver assistance system or on automated guided vehicles, the LMS1xx always has its eyes open.

And this attention to detail is also demonstrated in the field of traffic telematics. Mounted either directly under the roof or on the gantry, the LMS1xx monitors two lanes simultaneously in order to support traffic monitoring and control, vehicle classification, camera triggering, and vehicle separation.

## Collision protection in ports and on cranes

In container terminals, crane operators have to keep track of large, visible obstacles in their path as well as objects that may be hidden or concealed in order to prevent collisions – even when driving backward.

Benefits at a glance
- Efficient solution for operating ranges up to 50 m
- Rugged housing with IP 67 enclosure rating
- Field evaluation using intelligent algorithms

Ideal solution
LMS11x, LMS15x ➜
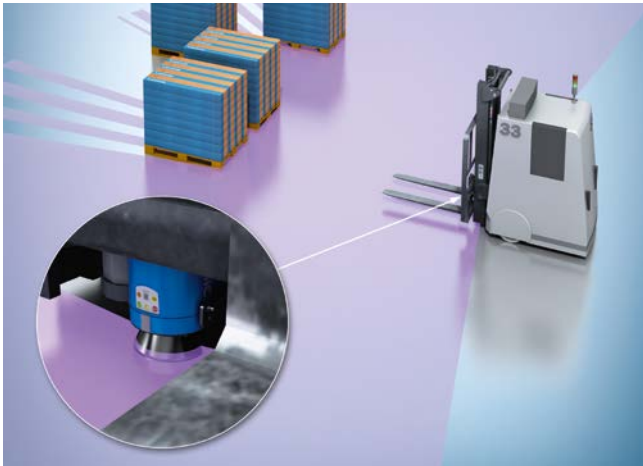
Navigation support, pallet measurement, and collision protection on industrial vehicles

Lanes for vehicles often have to be kept narrow in order to make the best possible use of storage space. LMS1xx provides support for navigation and maneuvering both indoors and outdoors.

Benefits at a glance

- Efficient solution for operating ranges up to 50 m
- Dynamic field adjustment
- Rugged housing with IP 67 enclosure rating
- Low weight makes it easy to mount

Ideal solution

LMS10x, LMS11x

Recording and displaying vehicle data

Due to its low operating and maintenance costs, the LMS1xx is ideal for use in toll stations: It can be mounted directly under the roof with no need for further installation in posts or underground wiring.

Benefits at a glance

- No wiring required between sender and receiver
- Low weight makes it easy to mount
- Separate field evaluation of two lanes simultaneously
- Device can be configured after mounting

Ideal solution

LMS11x

Contour guidance and collision awareness on driver assistance systems for mobile work machines

The LMS1xx is used on machinery such as diggers, mining vehicles, and harvesting machines. With its ruggedness and field evaluation function, it forms the heart of assistance systems for collision awareness and driver assistance solutions for contour guidance.

Benefits at a glance

- Resistance to environmental influences
- Integrated contamination detection
- Excellent object detection and precise distance measurement

Ideal solution

LMS11x, LMS15x

Further application fields

With its rugged housing and multi-echo technology, LMS1xx provides reliable results even when exposed to adverse weather and ambient conditions. This allows the 2D laser scanners to offer dependable support even in particularly challenging applications such as airports or mining.

Special application in mind? Please contact us. We will be happy to show you how the 2D laser scanners of the LMS1xx series can provide the best possible support for your application. ➜ www.sick.com

INDOOR AND OUTDOOR – YOU CAN RELY ON LMS1xx

Building safety and security solutions need to protect properties, public buildings, critical infrastructures, industrial facilities, private homes, or material assets from vandalism, theft, terrorism, intrusion, or where necessary, unlawful escape. The protection offered by mechanical measures and guards is often not sufficient. That's why it's important to be able to rely on support from the LMS1xx series.

Thanks to its multi-echo technology, the LMS1xx is particularly reliable – even when exposed to difficult conditions in outdoor applications. As a result, the false alarm rate has been reduced to a minimum. The independent institution VdS (VdS Schadenverhütung GmbH) confirms its high reliability and detection speed. There are a number of VdS-certified LMS1xx variants available. The detection systems of the LMC1xx product family, for example, have been approved for class C intruder alarm systems in accordance with VdS 2311.

Outdoor protection

There are several possibilities available for protecting the outside of buildings, including perimeter protection, object protection, and access control. Electronic detection systems also supplement protective devices such as fences and walls. They are able to detect people trying to break in or out, for example, at an early stage. LMS13x and LMS14x are particularly suited to vertical protection of fences and walls, but can also be used for horizontal protection of open spaces.

Ideal solution
LMS13x, LMS14x

Internal protection

Monitoring interiors is a key part of building protection. This includes monitoring interior ceilings, walls, and windows. LMS12x and LMS14x can protect walls and ceilings or large glass areas from inside. Thanks to their precise measuring technology, monitored areas can be adapted to the relevant building geometry or monitoring situation with pinpoint accuracy.

Ideal solution

LMS12x, LMS14x ➜

Object protection

Valuable objects, such as those kept in museums, need to be protected against theft and vandalism. Particularly in museums, sensors have to deal with the added challenge of visitors trying to touch the items on display. The more inconspicuous, precise, and reliable the protection is for these objects, the more everyone can enjoy the exhibits. The 2D laser scanners from SICK are specially designed for this task. LMS12x and LMS13x can be installed so inconspicuously that they do not detract from visitors' enjoyment in any way, while still providing excellent protection for the exhibits.

Ideal solution

LMS12x, LMS13x ➜

LMS14x – all-round protection, even in extreme temperatures

In the LMS14x, market leader SICK presents a 2D laser scanner which perfectly complements the LMS12x and LMS13x variants and the success they have already achieved in the building safety and security sector. It goes without saying that the LMS14x offers all of the familiar features, including a compact housing with IP 67 enclosure rating and multi-echo technology. However, what makes it really stand out is the extended temperature range (–40 °C to +60 °C), double the operating range (up to 40 m), and security-specific features such as Easy Teach.

Detailed product information

➜ or
➜ www.mysick.com/en/LMS1xx

SELECTION GUIDE

	Application/ enclosure rating		Operating range			Scanning range with 10 % remission		
	Indoor / IP 65	Outdoor / IP 67	Up to 20 m	Up to 40 m	Up to 50 m	Up to 18 m	Up to 30 m	
LMS10x	■		■			■		
LMS11x		■	■			■		
LMS12x	■		■			■		
LMS13x		■	■			■		
LMS14x		■	■			■		
LMS15x		■	■			■		

VdS

[1] **Laser Measurement Certified – intelligent security**

The LMC1xx product family has been developed for class C intrusion and hold-up systems (German/Austrian security certificate) which are compliant with VdS and VSÖ. The LMC1xx 2D laser scanner consists of a 2D laser scanner, mounting kit, and special firmware. The LMC provides protection both indoors and out. It can be positioned as a curtain to protect individual pictures or entire walls (vertical field) or to protect ceilings and floors (horizontal field). If anyone breaches the monitoring field, the LMC immediately triggers an alarm. The laser scanners can be operated independently or as part of an existing alarm management system using several relay outputs and an OPC interface.

|	Integrated application			Switching inputs			Min./max. ambient operating temperature					
	Field evaluation with flexible fields	Security-specific configuration [1]	Easy Teach	2 x digital	4 x digital	2 x encoder	−40 °C / −30 °C / 0 °C / +50 °C / +60 °C					Page
	■			■		■	(0 °C to +50 °C)					→ 12
	■			■		■	(−30 °C to +50 °C)					→ 12
	■	■	■		■		(0 °C to +50 °C)					→ 12
	■	■	■		■		(−30 °C to +50 °C)					→ 12
	■	■	■		■		(−40 °C to +60 °C)					→ 12
	■			■	■	■	(−30 °C to +50 °C)					→ 12

There is a huge range of VdS-certified LMC1xx laser scanners available online.
- Indoor variants
  - LMC12x
- Outdoor variants
  - LMC13x

→ www.mysick.com/en/LMC1xx

COMPACT AND ECONOMICAL, EVEN IN HARSH ENVIRONMENTS
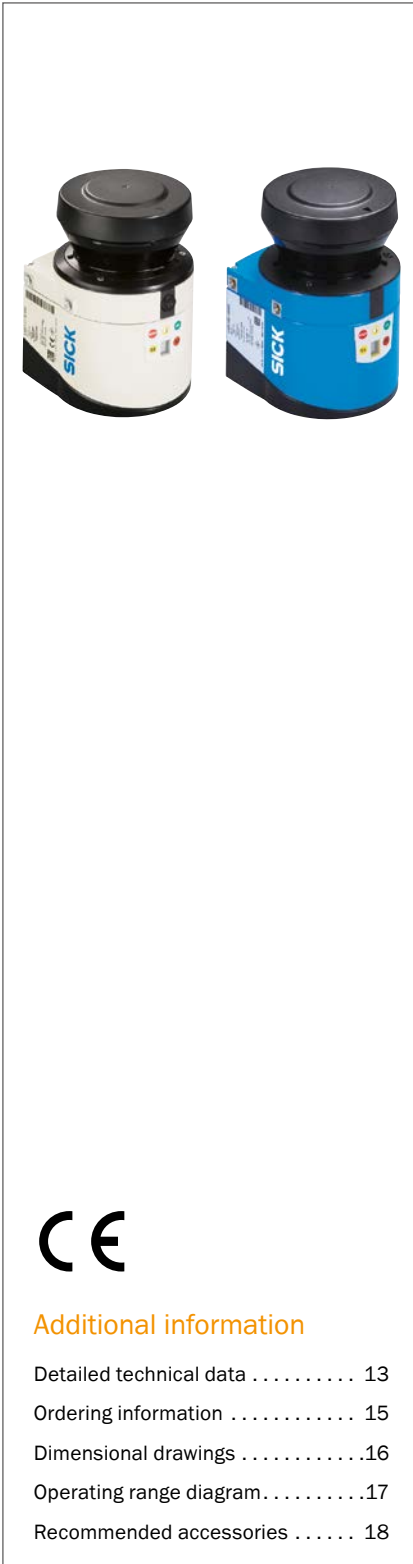
Product description

The LMS1xx 2D laser scanners form part of the extensive portfolio of laser measurement technology from SICK, and offer an efficient and cost-effective alternative to other solutions for both indoor and outdoor use. SICK offers these 2D laser scanners in a number of variants. The LMS1xx scanners can therefore easily cope with various requirements in terms of sensing range and application software. And there are a number of security versions to round off the wide range of applications. All variants in this product family are marked out by their compact design and dimensions, as well as their light weight. Compact design meets impressive innovation: Multi-echo technology increases the availability of the sensors outdoors and even enables them to be installed behind glass.

At a glance

- Efficient and cost-effective 2D laser scanner for measuring ranges of up to 50 m
- Outstanding performance whatever the weather, thanks to multi-echo technology and intelligent algorithms
- Rugged, compact housing with enclosure rating up to IP 67, integrated heating and a temperature range from −40°C and +60°C
- Variants for security applications with relay outputs and VdS certification available
- Measurement data output via Ethernet interface in real time
- Number of switching outputs can be expanded via external CAN modules

Your benefits

- Straightforward integration and mounting due to compact design
- Low purchase and operating costs: One device can monitor areas of over 5,500 m² in size
- Product family with many variants, which also provide solutions for demanding and specialized applications
- Extended filter options significantly reduce measurement errors caused by conditions such as fog, rain or snow
- Optional CAN I/O module increases number of switching outputs for greater application flexibility
- Ethernet interface enables straightforward implementation and remote maintenance

CE

Additional information

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.

Detailed technical data

Features

	LMS10x	LMS11x	LMS12x	LMS13x	LMS14x	LMS15x
Light source	Infrared (905 nm)					
Laser class	1 (IEC 60825-1 (2007-3))					
Aperture angle	270°					
Scanning frequency	25 Hz / 50 Hz					
Heating	No	Yes	No	Yes		
Operating range	0.5 m ... 20 m				0.5 m ... 40 m	0.5 m ... 50 m
Max. range with 10 % reflectivity	18 m				30 m	18 m
Amount of evaluated echoes	2					
Fog correction	Yes					

Performance

	LMS10x	LMS11x	LMS12x	LMS13x	LMS14x	LMS15x
Response time	≥ 20 ms					
Detectable object shape	Almost any					
Systematic error	± 30 mm [1]					
Statistical error	12 mm [1]				Typ. 12 mm (0.5 m ... 10 m) Typ. 20 mm (10 m ... 20 m) Typ. 35 mm (20 m ... 40 m)	12 mm [1]
Integrated application	Field evaluation with flexible fields	Field evaluation with flexible fields, easy teach option (depending on type)	Field evaluation with flexible fields, security conform parameterization, Easy Teach lite and pro (depending on type)			Field evaluation with flexible fields
Number of field sets	10 fields				4 / 10 fields (depending on type)	10 fields
Simultaneous evaluation cases	10				4 / 10 (depending on type)	10

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

Interfaces

	LMS10x	LMS11x	LMS12x	LMS13x	LMS14x	LMS15x
Serial (RS-232)	✔					
Function	Host, AUX		AUX			Host, AUX
Data transmission rate	9.6 kBaud ... 115.2 kBaud		57.6 kBaud ... 115.2 kBaud			9.2 kBaud ... 115.2 kBaud
Ethernet	✔					
Function	Parameterization / Host (depending on type)					
Data transmission rate	10/100 MBit/s					
Protocol	TCP/IP, OPC					

	LMS10x	LMS11x	LMS12x	LMS13x	LMS14x	LMS15x
CAN bus	✔					
Function	Extension of outputs					
Switching inputs	2 digital and 2 encoder inputs	4 digital				4 digital (thereof 2 suitable for encoders)
Optical indicators	7-segment display (plus 5 LEDs showing device status, contamination warning and initial condition)					

Mechanics/electronics

	LMS10x	LMS11x	LMS12x	LMS13x	LMS14x	LMS15x
Operating voltage	10.8 V DC ... 30 V DC		9 V DC ... 30 V DC		9 V DC ... 30 V DC [1]	10.8 V DC ... 30 V DC
Power consumption	Typ. 8 W	Typ. 8 W, heating typ. 35 W	Typ. 8 W	Typ. 8 W, heating typ. 35 W		
Enclosure rating	IP 65 (EN 60529, Section 14.2.5)	IP 67 (EN 60529, Section 14.2.7)	IP 65 (EN 60529, Section 14.2.5)	IP 67 (EN 60529, Section 14.2.7)		
Protection class	III (EN 50178 (1997;10))					
Weight	1.1 kg					
Dimensions (L x W x H)	105 mm x 102 mm x 152 mm	105 mm x 102 mm x 162 mm	105 mm x 102 mm x 152 mm	105 mm x 102 mm x 162 mm		

[1] With heating 21.6 V DC ... 28.8 V DC.

Ambient data

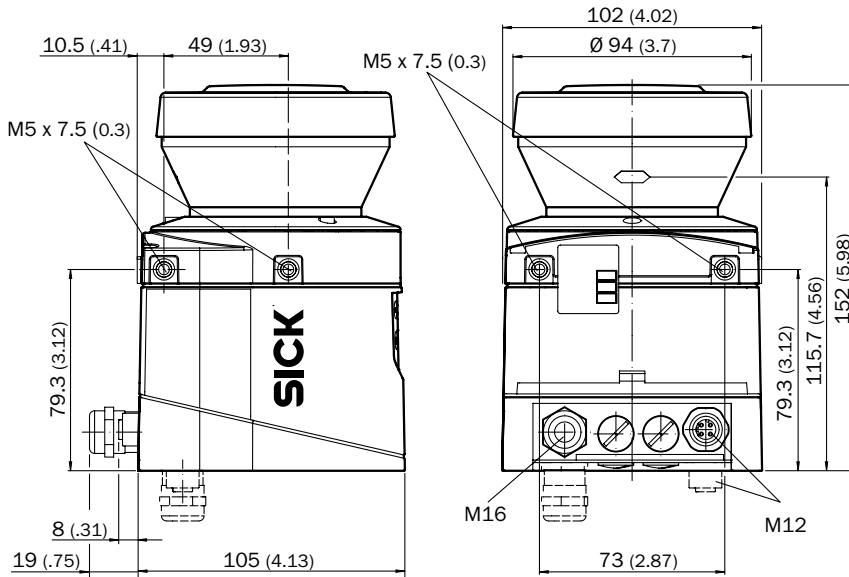|	LMS10x	LMS11x	LMS12x	LMS13x	LMS14x	LMS15x
Electromagnetic compatibility (EMC)	EN 61000-6-2:2005 / EN 61000-6-4 (2007-01)					
Vibration resistance	EN 60068-2-6 (1995-04)					
Shock resistance	EN 60068-2-27 (1993-03)					
Ambient operating temperature	0 °C ... +50 °C	–30 °C ... +50 °C	0 °C ... +50 °C	–30 °C ... +50 °C	–40 °C ... +60 °C	–30 °C ... +50 °C
Storage temperature	–30 °C ... +70 °C				–40 °C ... +70 °C	–30 °C ... +70 °C
Ambient light immunity	40,000 lx					

Ordering information

- **Angular resolution:** 0.25°, 0.5°
- **Object remission:** 2 % ... > 1,000 %, reflectors

Sub product family	Field of application	Electrical connection	Switching outputs	Housing color	Type	Part no.
LMS10x	Indoor	1 x system plug with screw terminal block	3	Light blue (RAL 5012)	LMS100-10000	1041113
				Gray (RAL 7032)	LMS101-10000	1048236
				Black (RAL 9005)	LMS102-10000	1048235
LMS11x	Outdoor	1 x M12 round connector	3	Gray (RAL 7032)	LMS111-10100	1041114
					LMS111-10100S09	1068858
LMS12x	Security, Indoor	1 x system plug with screw terminal block	3 (2 relay, 1 digital)	Gray (RAL 7032)	LMS121-10000 Security	1051384
				Black (RAL 9005)	LMS122-10000 Security	1044322
				Signal white (RAL 9003)	LMS123-10000 Security	1044321
LMS13x	Security, Outdoor	1 x M12 round connector	3 (2 relay, 1 digital)	Gray (RAL 7032)	LMS131-10100 Security	1051379
				Black (RAL 9005)	LMS132-10100 Security	1051402
				Signal white (RAL 9003)	LMS133-10100 Security	1051403
LMS14x	Security, Outdoor	1 x M12 round connector	3 (2 relay, 1 digital)	Gray (RAL 7032)	LMS141-05100 Security Core	1070209
					LMS141-15100 Security Prime	1070409
				Black (RAL 9005)	LMS142-15100 Security Prime	1070410
				Signal white (RAL 9003)	LMS143-15100 Security Prime	1070411
LMS15x	Outdoor	1 x M12 round connector	3	Gray (RAL 7032)	LMS151-10100	1047607
				Signal white (RAL 9003)	LMS153-10100	1065550

Dimensional drawings (Dimensions in mm (inch))

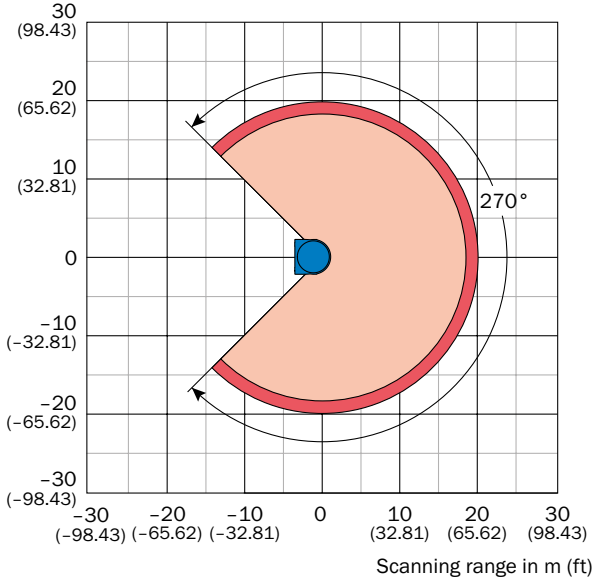### LMS10x, LMS12x

LMS11x, LMS13x, LMS14x, LMS15x
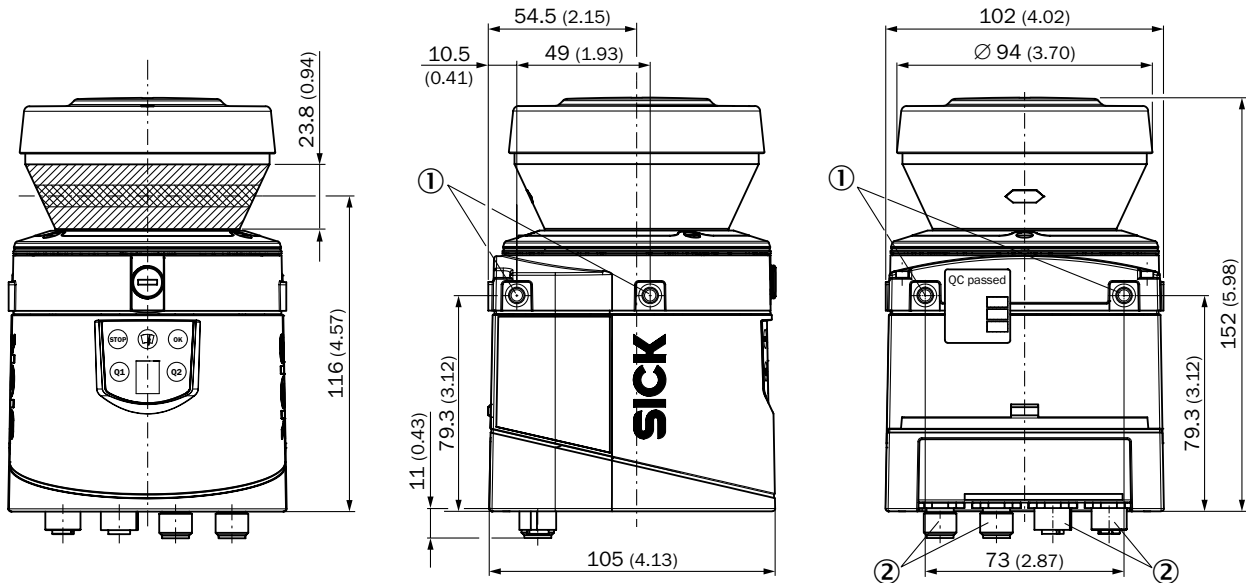
① Mounting hole M5 x 7.5
② Connector M12

Operating range diagram

LMS10x, LMS11x, LMS12x, LMS13x
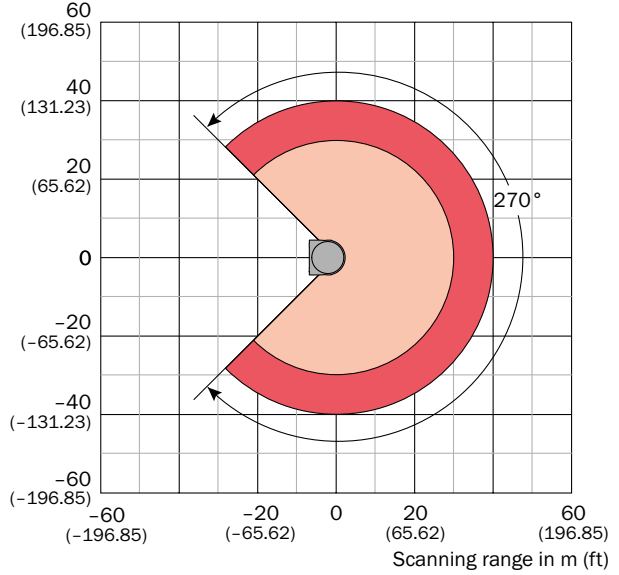
Scanning range in m (ft)

Scanning range in m (ft)

■ Scanning range max. 20 m (65.62 ft)

▨ Scanning range for objects up to
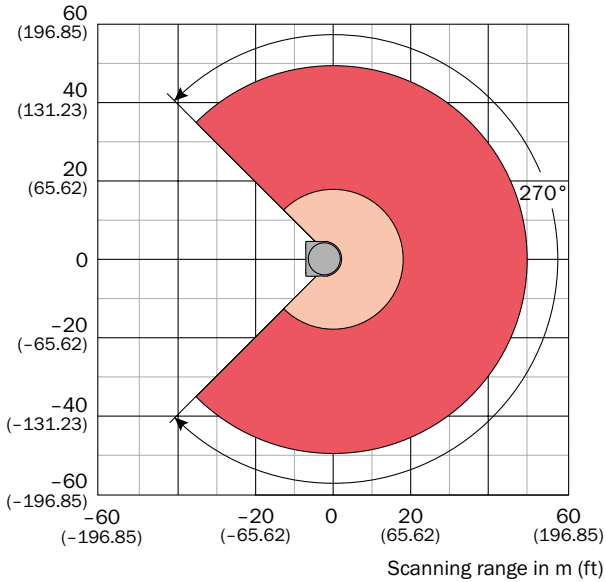10 % remission 18 m (59.06 ft)

LMS14x

Scanning range in m (ft)

Scanning range in m (ft)

■ Scanning range max. 40 m (131.23 ft)

▨ Scanning range for objects up to
10 % remission 30 m (98.42 ft)

LMS15x

Scanning range in m (ft)

Scanning range in m (ft)

■ Scanning range max. 50 m (164.04 ft)

▨ Scanning range for objects up to
10 % remission 18 m (59.06 ft)

Recommended accessories

Brief description	Part no.	LMS10x	LMS11x	LMS12x	LMS13x	LMS14x	LMS15x
Device protection (mechanical)							
Weather hood, 190°	2046459	–	●	–	●	●	●
Weather hood, 270°	2046458	–	●	–	●	●	●
Mounting brackets and mounting plates							
Standard mounting set for 190°/270° weather hood	2046025	–	●	–	●	●	●
1 piece, mounting bracket for rear mounting on wall or machine	2034324	●	●	●	●	●	●
1 piece, mounting bracket for rear mounting on wall or machine with protection of optics hood	2034325	●	●	●	●	●	●
1 piece, mounting bracket, adjustable lateral axis, only in conjunction with mounting kit 1a (2034324) or 1b (2034325)	2039302	●	●	●	●	●	●
1 piece, mounting plate, adjustable longitudinal axis, only in conjunction with mounting kit 2 (2039302)	2039303	●	●	●	●	●	●
Terminal and alignment brackets							
Quick-action lock system for weather hood 190°/270°	2046989	–	●	–	●	●	●
Plug connectors and cables							
Head A: cable Head B: cable Cable: PVC, unshielded On 100 m reel	6030795	●	–	●	–	–	–
Head A: female connector, M12, 8-pin, straight, A-coded Head B: cable Cable: RS-232, RS-422, shielded, 5 m	6036153	–	●	–	●	●	●
Head A: female connector, M12, 5-pin, straight, A-coded Head B: cable Cable: shielded, 5 m	6036159	–	●	–	●	●	●
Head A: male connector, M12, 8-pin, straight, A-coded Head B: cable Cable: shielded, 5 m	6036155	–	●	–	●	●	●
Head A: male connector, M12, 4-pin, straight, D-coded Head B: male connector, RJ45, 8-pin, straight Cable: Ethernet, drag chain use, PUR, shielded, 5 m	6034415	●	●	●	●	●	●

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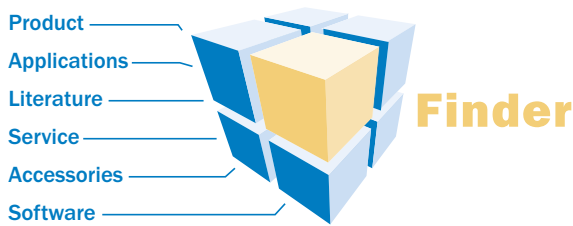
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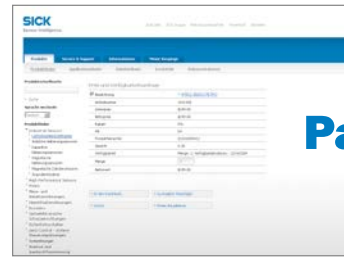
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SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With almost 7,000 employees and over 50 subsidiaries and equity investments as well as numerous representative offices worldwide, we are always close to our customers. 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 various 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 round out 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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Detailed addresses and additional representatives ➜ **www.sick.com**

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