PORT
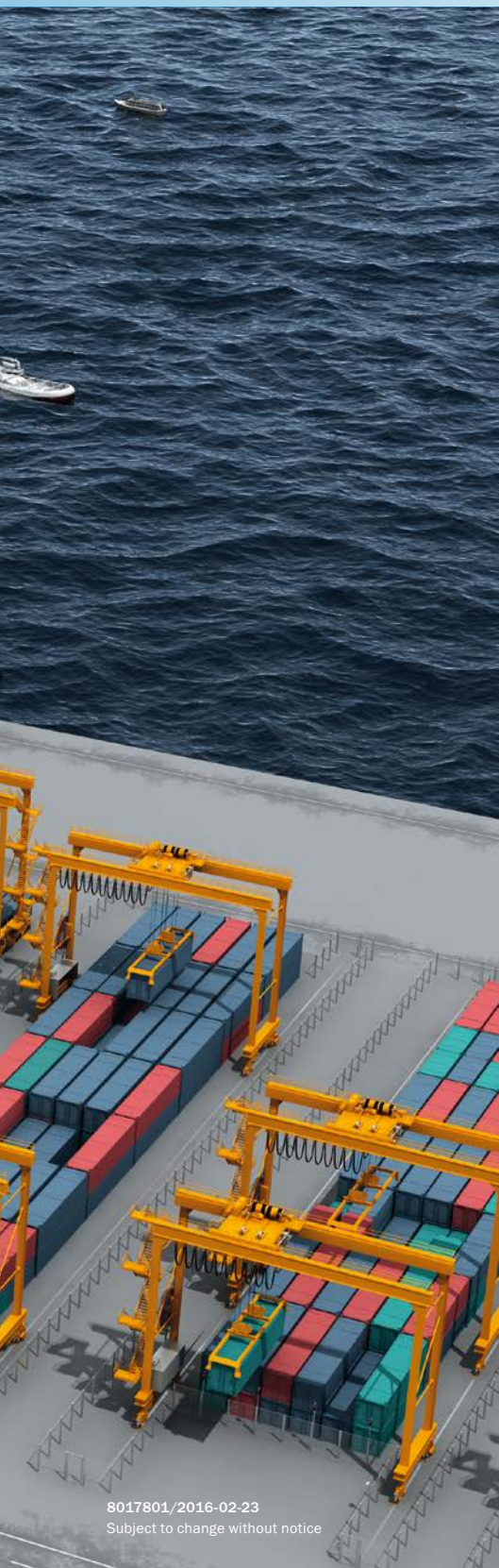
AUTOMATION AND RISK REDUCTION AT PORTS AND TERMINALS ARE NOT AT ODDS

SICK

Sensor Intelligence.

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Automation and risk reduction at ports and terminals are not at odds

A high level of terminal automation across the board and risk reduction are increasingly driving port operators worldwide. SICK offers support in connection with the identification, detection, measurement, protection and collision prevention of goods, cranes, crane booms, containers, and essential port equipment. With its comprehensive and detailed industry knowledge, SICK has become the number one partner for sensor solutions in port processes. Innovative, fast development and implementation of comprehensive customer-tailored solutions – this is where SICK's strength resides.

Protection

Avoiding collisions involving containers, cranes, and other objects is the highest priority when it comes to port logistics. Specific demands are placed on sensors in order to guarantee the level of outdoor safety and security required in ports, and SICK is perfectly placed to respond with its many years of experience and the innovative solutions it has to offer.

Position detection

SICK's sensors assist in correctly positioning and detecting freight and other objects They determine data and transmit it to the relevant controller to ensure that every item of cargo reaches its destination in one piece.

Measurement

Sensors and sensor systems measure the dimensions, contours, speeds, and distances involved in freight positioning, thereby optimizing transport routes and increasing handling safety for crane operators.
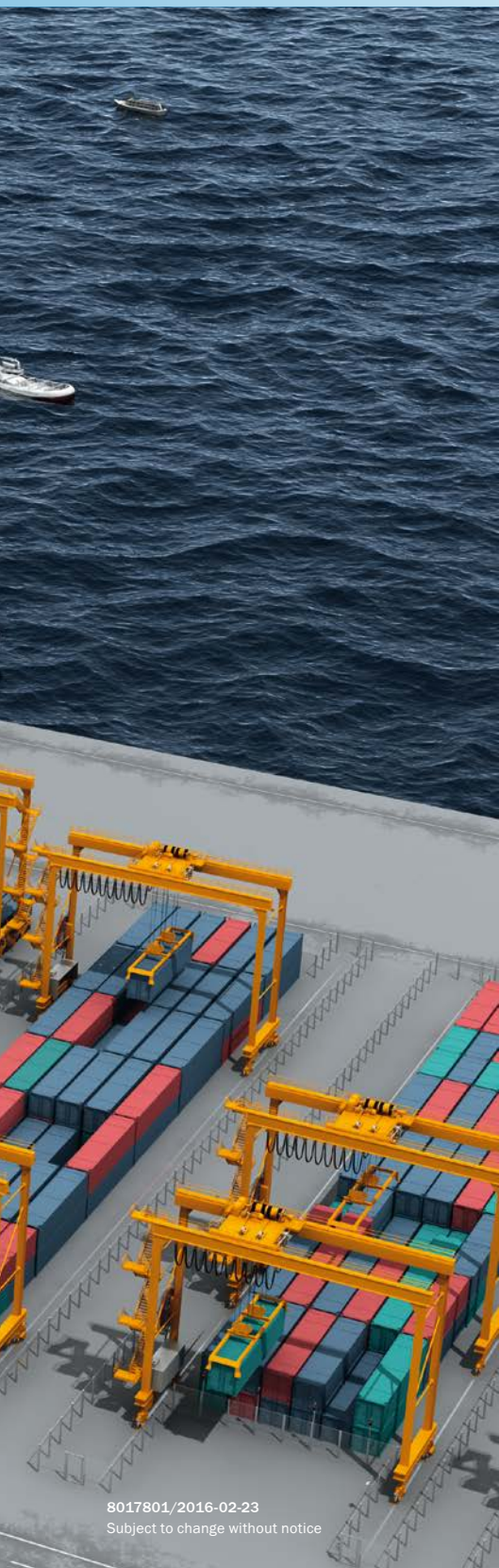

Detection

SICK's sensors provide assistance for controlling and maneuvering cranes and other vehicles. They detect containers and bulk materials that are to be picked up by transportation equipment and can determine whether there are objects in the vicinity of moving vehicles.

Applications in focus

Quay area

It is essential that collision avoidance and efficiency are provided on quay cranes, as larger vessels are launched and avoiding damage are of paramount importance – especially since the number of automated ship-to-shore cranes continues to increase. SICK's sensors determine the contour and position to enable them to operate economically and without any damage being caused.
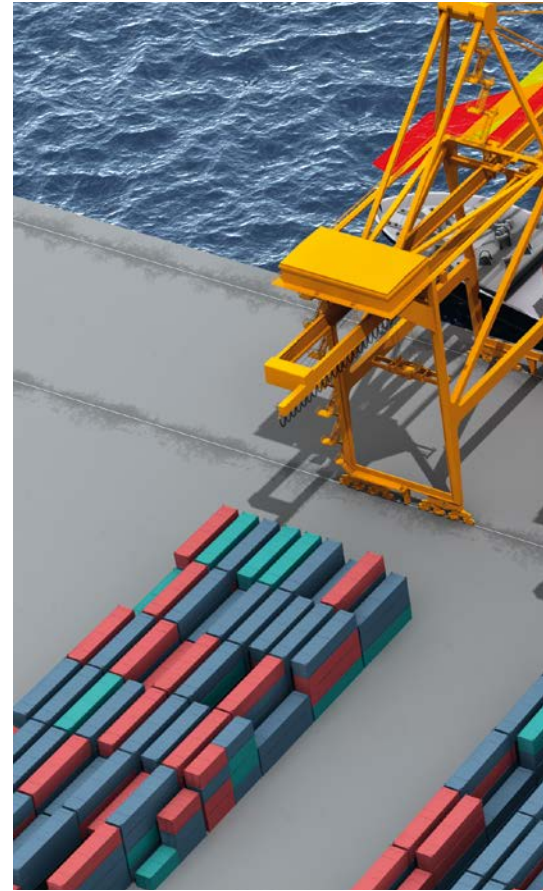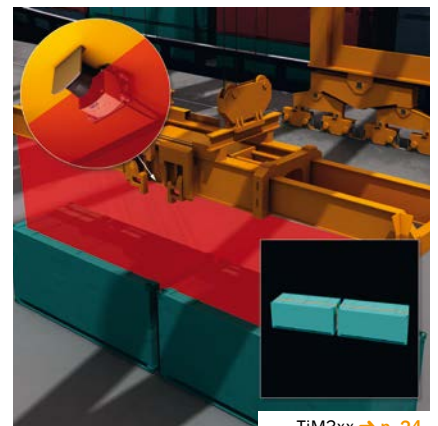

① Collision avoidance on ship-to-shore crane booms and between adjacent cranes

The AOS502 STS securely and reliably detects ship superstructures on ship-to-shore container cranes, such as radar systems. By analyzing the various laser scanner warning and stopping fields, the AOS502 STS provides collision avoidance from crane to crane as well as boom to object. The safety controller and integrated control software monitor the system functions.

② Distinction of different container lengths

The TiM3xx laser scanner in the spreader can distinguish between one 40 foot container and two 20 foot containers because it can detect the gap between two 20 foot containers without making contact. The crane controller reads the sensor outputs to check that the spreader retention device is correctly aligned for each container.

AOS Prime

TiM3xx
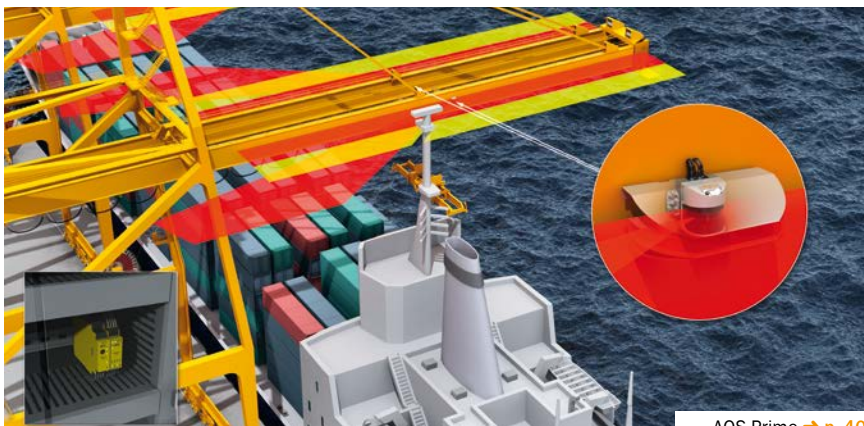
③ Collision avoidance on the path of a ship-to-shore crane by means of laser scanner

The LMS111 2D laser scanner can be relied upon to help avoid collisions between the crane and other objects. The laser scanner has an infinitely flexible 2D scanning detection field of up to 20 m and can monitor areas precisely defined in terms of their length and width.

④ Collision avoidance on the path of a ship-to-shore crane by means of radar

An economical solution, the RAS4xx radar sensor has detection ranges that extend to a length of up to 20 m. It assists the crane operator in monitoring the travel path and helps avoid collisions between the crane and other objects.

LMS1xx ➜ p. 26

RAS4xx ➜ p. 33

⑤ **Shipment profile determination**

The LD-LRS 2D laser scanner is installed on the trolley to help position the spreader as it moves over the cargo hold. The trolley's position and the laser scanner's distance measurements are combined to create a dynamic 2D profile of the vessel and its contents. This data is then used together with control software to assist the crane operator in handling containers smoothly and efficiently.

⑥ **Adjustment of the spreader for containers of different sizes**

The spreader needs to be adjusted for containers of different sizes. A rotary encoder system determines the position of the retention devices in order to prevent damage that may be caused by falling containers.
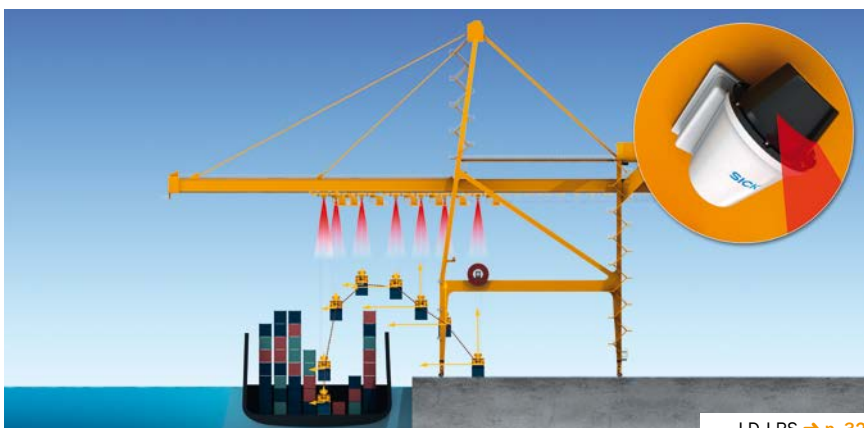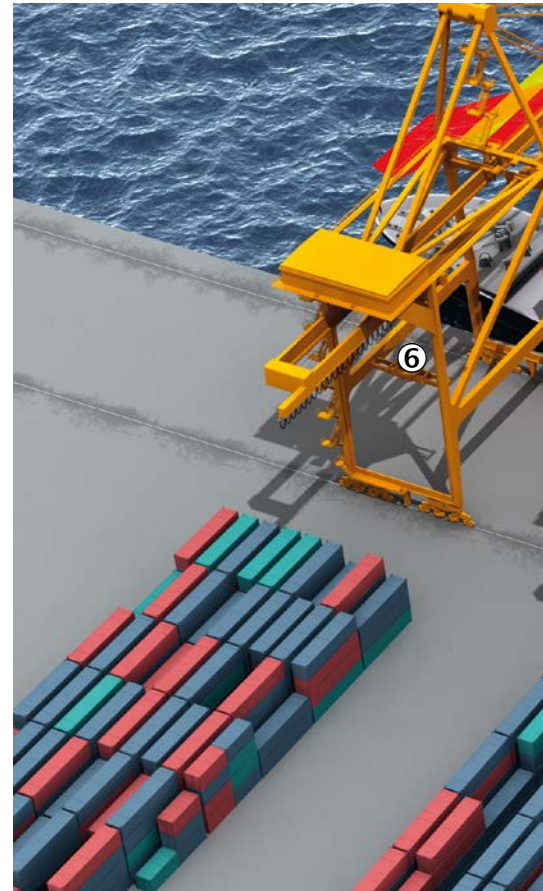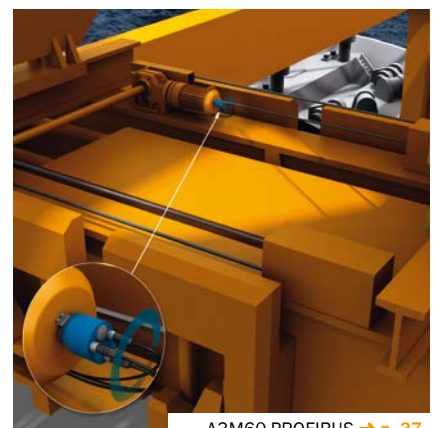
⑦ Access protection at lashing platforms

It is becoming increasingly common to see ship-to-shore cranes fitted with platforms for handling twist locks. Suspended containers pose a danger to stevedores and others, so dangerous crane movement needs to be stopped when anybody they access a lashing platform accidentally. Multiple light beam safety devices, such as the M4000 Standard with heated device columns, provide reliable access protection.

M4000 Standard ➜ p. 38

Focus 2: Yard area

Yard area

Different vehicles are used to handle containers depending on the volume of freight. For example, manned forklift trucks are sufficient for smaller volumes, while man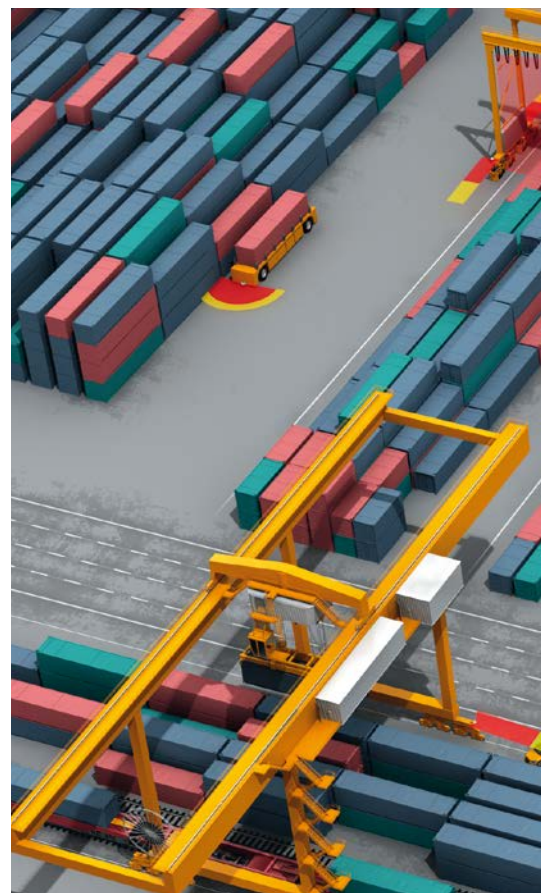ned gantry cranes and then unmanned automated stacking cranes are required as container volume increases. The level of automation and requirements for protection increase as the number of handled containers increases.

① **Collision avoidance on a rubber tired gantry crane**

A reliable solution for preventing gantry crane collisions is the AOS104 RTG object detection system consisting of a 2D laser scanner and a safety controller. The 2D laser scanner helps prevent collisions between the crane and other objects along the crane's path as well as assists the crane operator in monitoring the route to be traveled and during cross travel.

② **Yard area profile determination**

The LMS511 2D laser scanner scans the container stack below the gantry crane, then the measurement points are used to create a contour profile of the container stack. This is then used as the basis for further software processing so as to avoid collisions when using the spreader to pick up and set down containers.
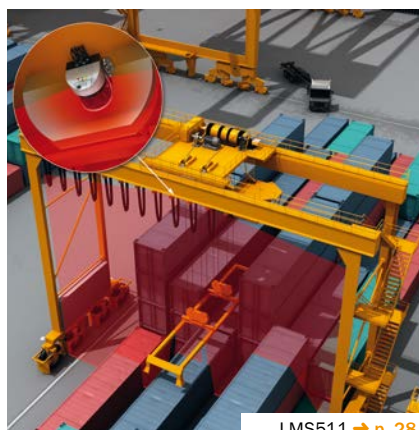
③ **Collision avoidance for rail mounted gantry cranes**

The DMT10-2 long range distance sensor constantly measures the distance between rail mounted cranes. If the distance between two cranes is too small, the DMT10-2 sends a signal to slow down or stop the crane. This distance sensor performs highly accurate non-contact measurements.

AOS Prime → p. 40

LMS511 → p. 28
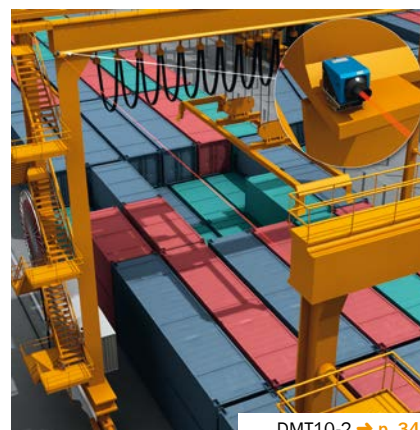
DMT10-2 → p. 34
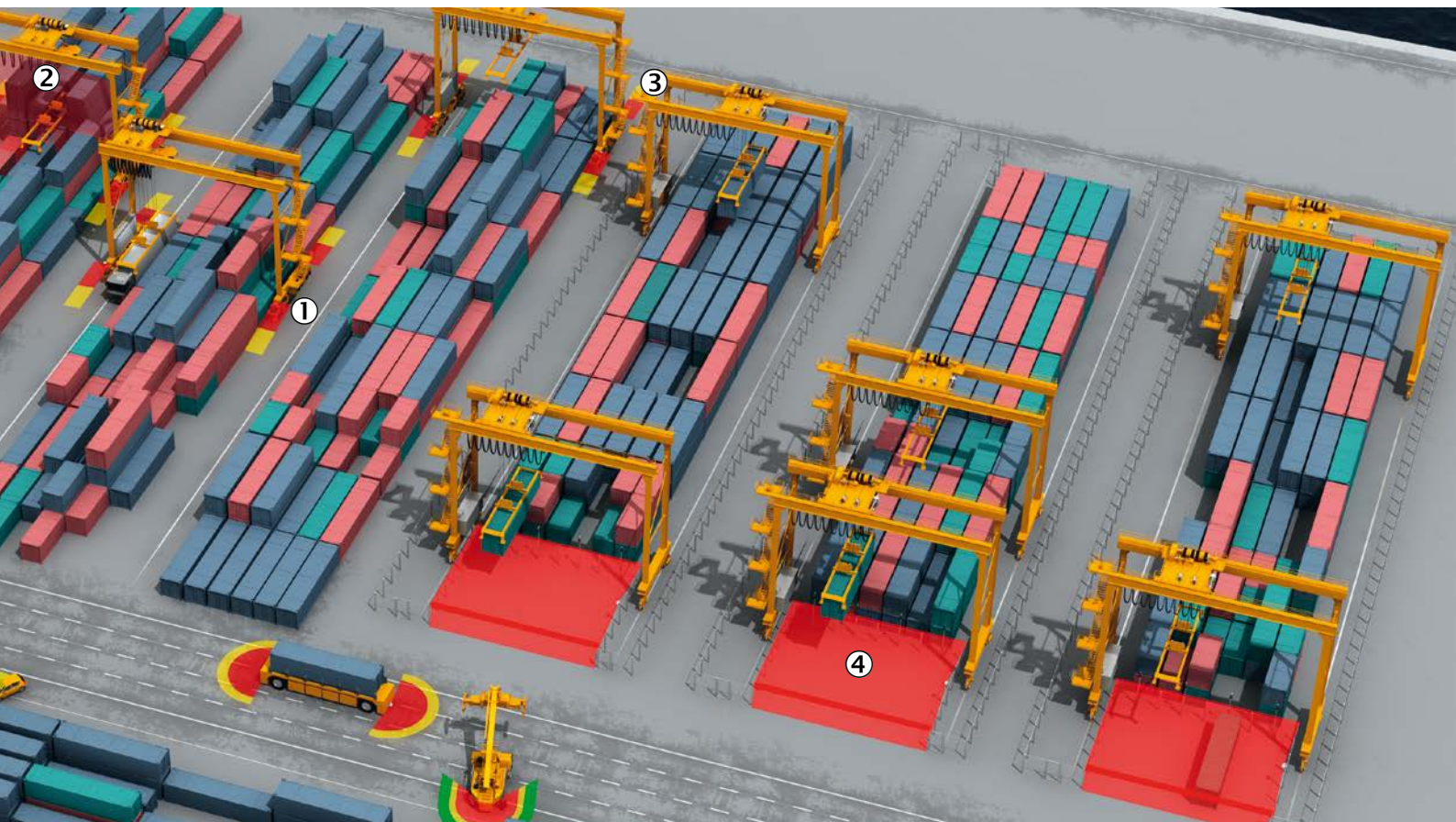
④ Access control at automated stacking crane (ASC)

In ports, interaction between man and machine can be dangerous. For example, truck drivers and straddle carrier operators deliver containers below an automated stacking crane. Vehicle access can be enforced when a laser scanner is positioned to create a vertical monitoring area and an over-height object can be detected when a laser scanner is positioned to create a horizontal monitoring area. The crane is stopped to avoid collisions with vehicles. If the crane is already located within the transfer area, vehicles will be given a stop signal at the entrance. The Flexi Soft safety controller processes any signals and transmits them to the system controller. The system can be expanded with RFID, GPS, and other sensor types to enable vehicle identification when automated guided vehicles (AGVs) are in use.
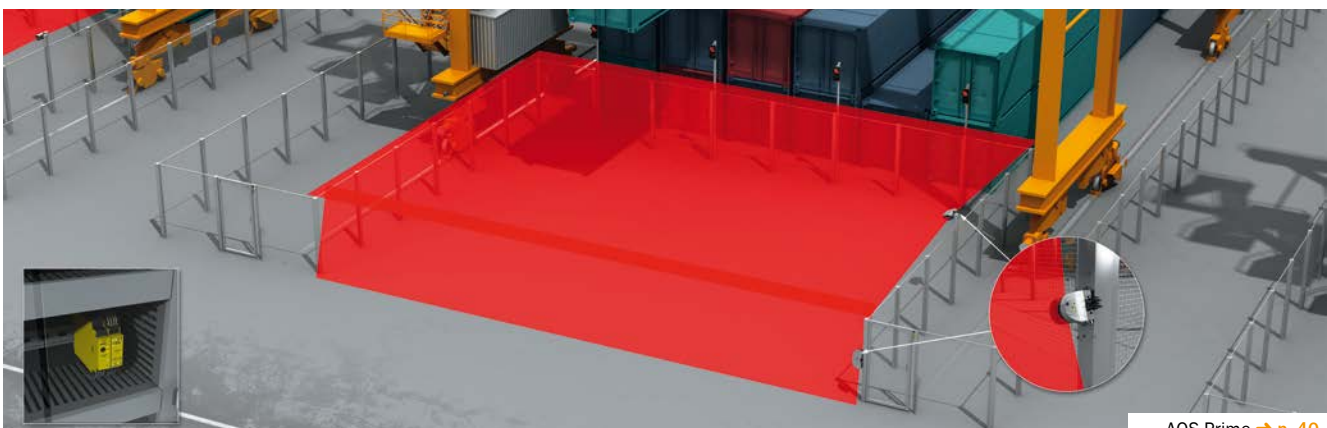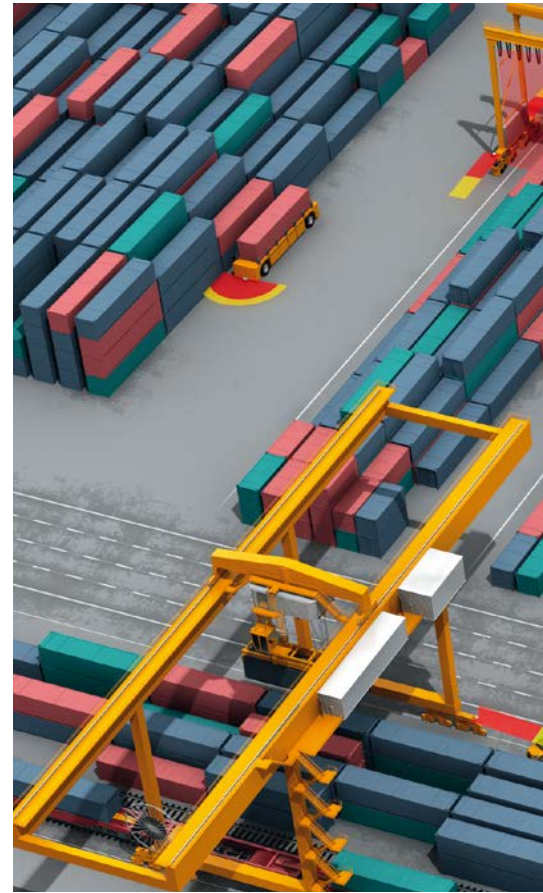
⑤ **Prevention of tractor trailers being lifted by gantry cranes**

When gantry cranes lift containers from trucks, sometimes the truck itself is lifted, too. There is a simple solution available to detect when this is happening – installing the LMS111 2D laser scanner next to the gantry crane's driving path. The LMS111 monitors the area around the lorry's front and rear wheels at about 30 cm above the ground when containers are being unloaded. If the lorry starts to move upward as the gantry crane lifts a container, the crane operator will be sent a signal to notify them of this and the unloading process can be stopped.

⑥ **Position determinaton of trolleys**

The KH53 linear encoder operates magnetically and is the ideal solution for use in harsh environments and over long distances. The position data of the traveling crane determined by the KH53 makes it possible to stack containers with as little offset as possible.
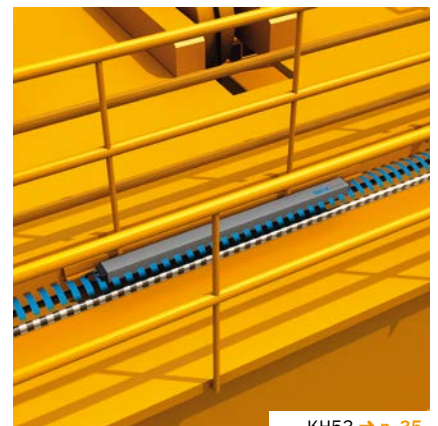
⑦ Electrified rubber tired gantry crane lane assistance

Electrified gantry cranes must be kept a certain distance away from the bus bar in order to maintain the correct electrical contact or to prevent damages. Optical distance sensors are used to perform non-contact measurements near the bus bar. The DT35 distance sensor measures the distance between the bus bar and a point on the gantry crane. When the rail surface is uneven, a laser scanner is an excellent alternative. A laser scanner scans the bus bar and the area surrounding it in real time without any mechanical adjustments and provides many more measurement data points between the bus bar and the crane. The crane controller can then correct the distance immediately if it is not correct. Laser scanners also provide collision avoidance in the crane's direction of travel.

ⓘ This graphic is not presented in the overview.

Ground transportation

Straddle carriers, automated guided vehicles, terminal tractors, and heavy trucks are used to transport containers between several different areas in the container yard. While some of these moves are automated, others are not and benefit from sensors that assist in operator performance and productivity. SICK's sensors are here to help.
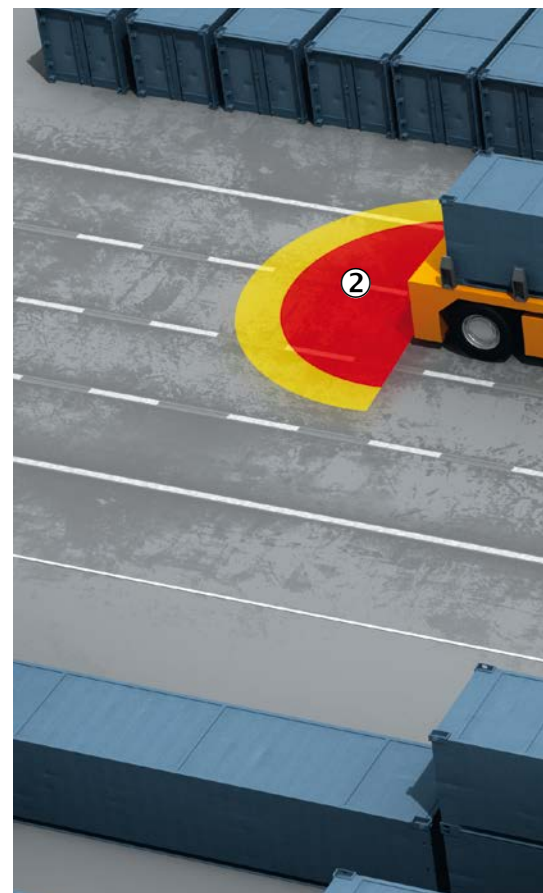
① Driver assistance using a laser scanner on a reach stacker

The RAS Prime collision awareness system monitors the entire area behind a reach stacker without interruption – during the day and night. If an object enters the preconfigured warning fields, RAS Prime alerts the operator with visual and audible signals. Real-time laser scans provide assistance in all driving situations.

② Protection of automated guided vehicles (AGVs)

The AOS502 Prime advanced object detection system avoids collisions between automated guided vehicles and other objects within the container yard. When objects are detected in the monitored areas, the AGV is slowed down or stopped.

③ Length measurement on the boom of a reach stacker

The BTF wire draw encoder measures how far a reach stacker's boom has been extended. (90)

RAS Prime ➜ p. 41

AOS Prime ➜ p. 40

HighLine ➜ p. 36
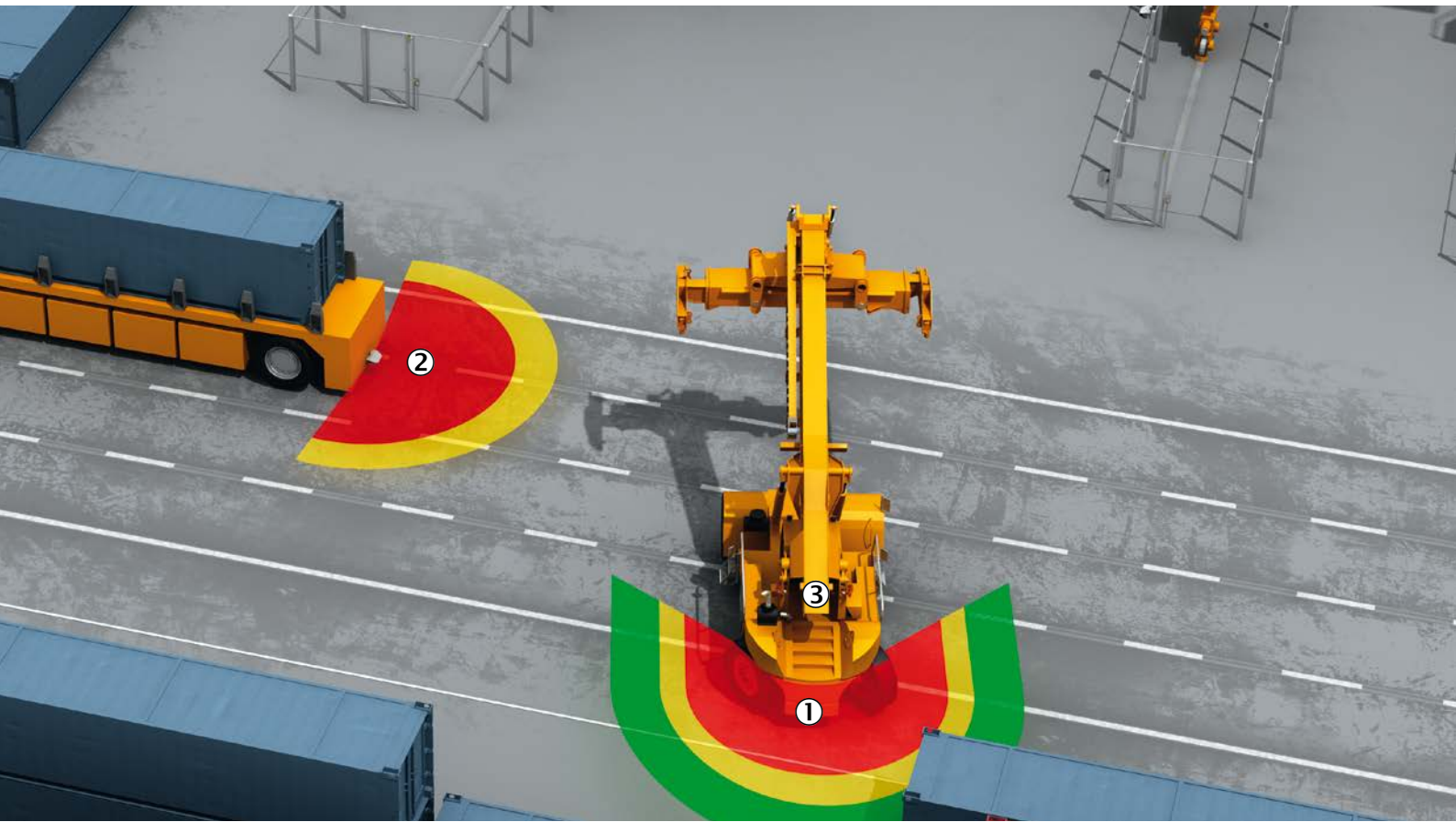
Intermodal area

Containers are transported at intermodal terminals and container yards ready for shipment, with their onward transportation generally taking place on inland routes via river, rail or trucks. SICK's sensors assist in the highly automated processes involved in loading the containers.

① Determination of the spreader height position

The DMT10-2 long range distance sensor continuously transmits accurate information about the height of the spreader to avoid the spreader colliding with container stacks. Best-suited for outdoor environments, this sensor performs highly accurate non-contact measurements.
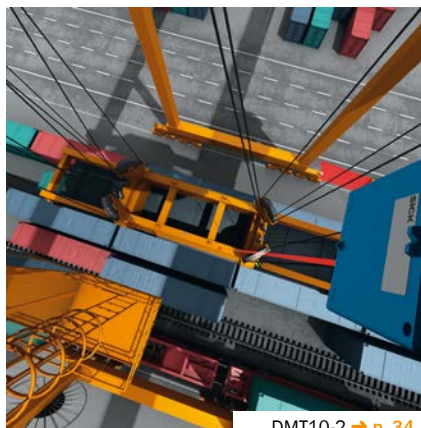
② Access protection

It is important to prevent access to a dangerous area until all dangerous movements are completed. The i110 Lock electro-mechanical safety locking device protects access points against unauthorized entry.

③ Collision avoidance

To help the crane operator avoid collisions with objects on the route, the AOS Prime object detection system provides a reliable solution.

DMT10-2 ➜ p. 34

i110 Lock ➜ p. 39

AOS Prime ➜ p. 40
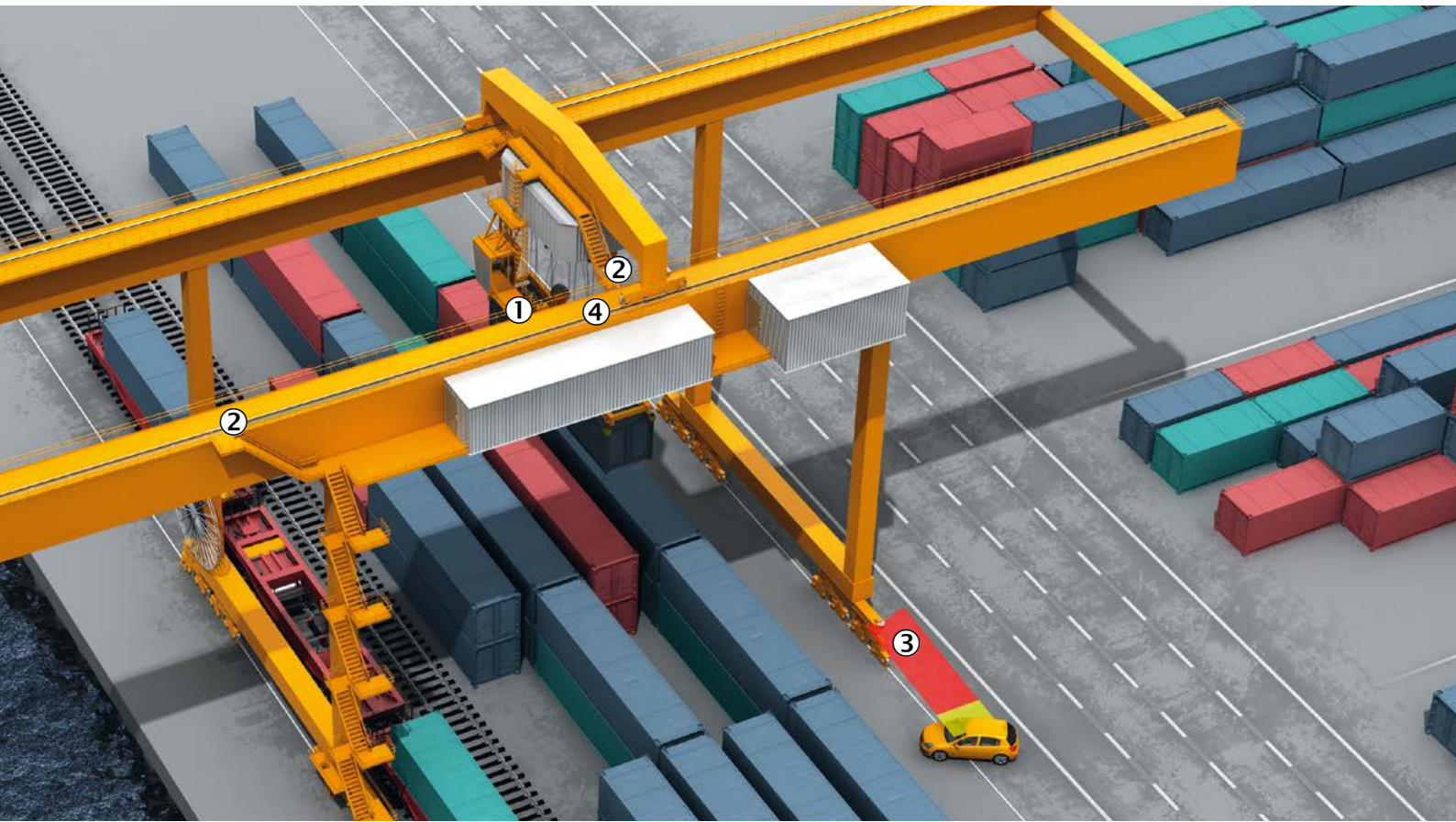
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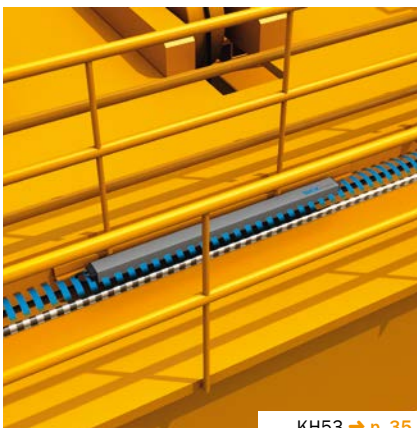
KH53 ➜ p. 35

COLLISION AWARENESS IN PORTS

Minimizing the risk of damage and preventing accidents

In order to reduce the risk of damage, port operators take organizational measures, such as arranging regular training sessions which includes specific handling instructions. Port operators also have to define the areas in which people are permitted access – and those in which they are not. As well as these measures, automated systems must include complete collision avoidance systems. SICK has a wide range of sensors and sensor solutions available for overcoming the challenges faced in ports and minimizing the risk of damage, such as its AOS Prime object detection system.

Analysis – Yard crane claim costs distribution

1 %
9 %
11 %
71 %
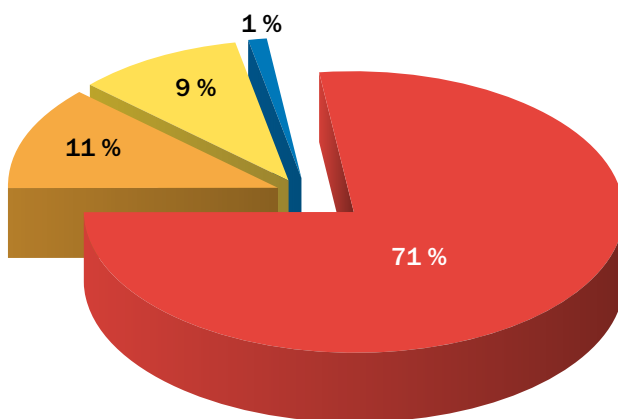
- ■ Stack collisions
- ■ Spreader / twistlock issues
- ■ Gantry collisions
- ■ Others

Analysis – Quay crane claim costs distribution

3 %
6 %
12 %
13 %
17 %
17 %
32 %
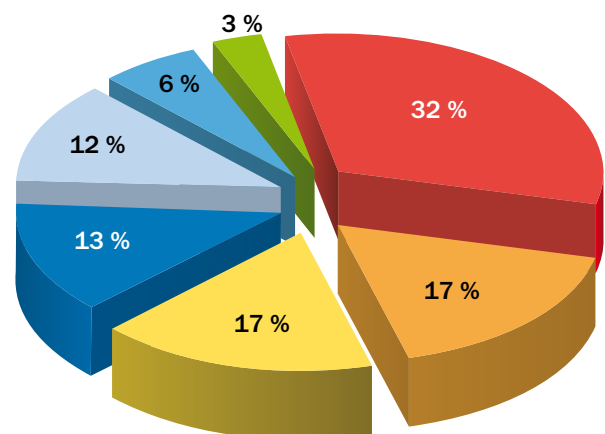
- ■ Boom collisions
- ■ Other collisions (gantry, etc.)
- ■ Other spreader, hoist issues
- ■ Weight, twistlock, cell guide
- ■ Stack collisions
- ■ Twin-twenty issues
- ■ Others

Source: Global analysis claims data (2010 – 2014), TT Club

AOS Prime object detection system

AOS Prime – one solution for two distinct applications

The AOS Prime object detection system guarantees safety for many port applications. SICK has developed two special variants of this solution – the AOS104 RTG and the AOS502 STS – with the aim of avoiding costly collisions, and in turn keeping damage to a minimum and significantly improving equipment productivity.

Collision avoidance in pathway travel and cross travel with the AOS104 RTG

When being used to handle containers, a rubber tired gantry crane can switch between the stack lanes. This is why the AOS104 RTG system solution combines the following two functions:

- straight line collision avoidance
- cross travel collision avoidance

Both functions are based on predefined warning and stopping fields that are monitored by a safety controller with the corresponding logic functions.

- Extreme accurate detection of obstacles
- Excellent system reliability thanks to self-monitoring function
- Detection of product failures and mechanically misaligned laser scanners as a result of the high level of diagnostic coverage offered by the AOS
- Simultaneous monitoring of multiple areas thanks to the 2D laser scanners
- High level of operational reliability
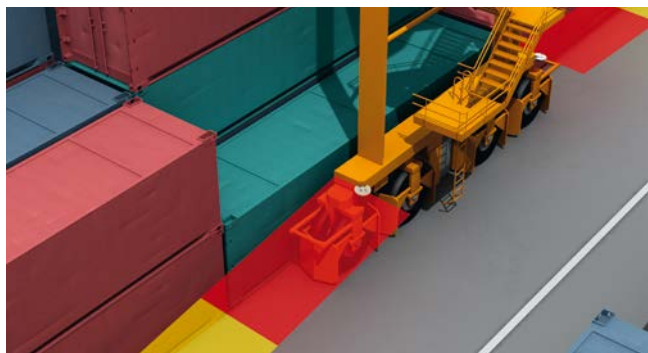
Collision avoidance on ship-to-shore cranes with the AOS502 STS

The AOS502 STS securely and reliably detects ship superstructures on ship-to-shore container cranes, such as radar systems, combining the following two functions in one system solution:

- collision avoidance for the crane boom
- collision avoidance for crane-to-crane

The AOS502 STS analyzes the various laser scanner warning and stopping fields, and its integrated control software monitors the system functions.

- Reliable monitoring of ship-to-shore cranes with booms of any length
- Crane-to-crane collision avoidance
- Self-monitoring function
- Detection of product failures and mechanically misaligned laser scanners as a result of the high level of diagnostic coverage offered by the AOS
- Simultaneous monitoring of multiple areas thanks to the 2D laser scanners
- High level of operational reliability
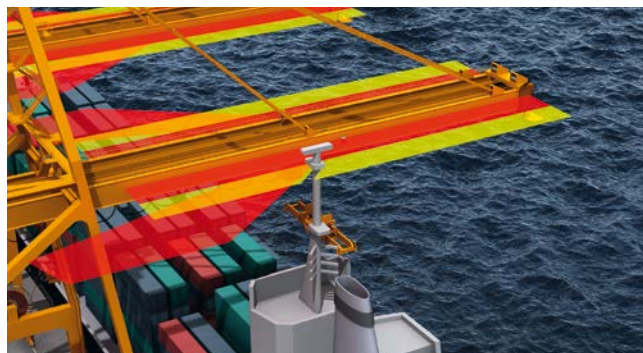
PRODUCT OVERVIEW

Product overview

2D laser scanners

Mid range distance sensors

Radar sensors

Long range distance sensors

Linear encoders

Wire draw encoders

Absolute encoders

Multiple light beam safety devices

Safety locking devices

Object Detection Systems

Collision awareness system

At a glance

- Configure without a PC using "touch and teach"
- Small, lightweight and economical measurement sensor
- Field evaluation using intelligent algorithms

- Set parameter interface is accessible while device is mounted
- One of the smallest laser scanners on the market
- Proven industrial design
- Low power consumption (typ. 3 W)

Your benefits

- Low cost of ownership
- Easily hidden from view due to small dimensions
- Low installation costs and exchange time due to M12 x 12 or D-Sub connector
- Long operation for battery-driven vehicles

- Preconfigured fields ensure short installation time
- Reduced hardware costs since only one sensor can be used for large anti-collision fields (up to 235 qm)
- No wiring necessary between sender and receiver

➜ www.mysick.com/en/TiM3xx

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.

Ordering information

Other models ➜ www.mysick.com/en/TiM3xx

- **Sub product family:** TiM36x
- **Field of application:** Indoor
- **Electrical connection:** 1 x "Ethernet" connection, 4-pin M12 female connector
  1 x connection "Power", 12-pin, M12 male connector
  1 x Micro USB female connector, type B

Switching outputs	Angular resolution	Object remission	Housing color	Type	Part no.
3 (PNP, Additional 1 x "Device Ready")	0.33°	4 % ... > 1,000 %, reflectors	Gray (RAL 7032)	TIM361-2134101	1071399

Accessories

	Brief description	Type	Part no.
Mounting brackets and mounting plates			
	Mounting kit with sun shade/weather protection	Mounting kit	2068398
Plug connectors and cables			
	Head A: female connector, M12, 12-pin, straight, A-coded Head B: cable Cable: shielded, 5 m	Connecting cable (female connector - open)	6042735
	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	SSL-2J04-G05ME	6034415
Illustration may differ	Head A: male connector, M12, 4-pin, straight, D-coded Head B: male connector, RJ45, 8-pin, straight Cable: Ethernet, suitable for refrigeration, shielded, 5 m	Connection cable (male connector-male connector)	6050200

At a glance

- Monitoring area of up to 1470 m² with just one sensor
- High ambient light tolerance due to HDDM technology
- Rugged housing with up to an IP 67 enclosure rating
- Low power consumption (typ.3 W)

- Compact design with a housing height of just 86 mm maximum
- Integrated Ethernet interface
- Long sensing range of up to max. 25 m
- Industry-standard design and M12 male connector

Your benefits

- Reliable object detection independent of the surface and ambient light
- Rugged IP 67 enclosure rating withstands both indoor and outdoor conditions
- Easy integration into compact automated guided vehicles (AGV) due to small size
- Ethernet interface enables straightforward implementation and remote maintenance

- Can determine additional information such as object size, shape, etc. due to measured data output
- Low implementation costs due to scalability: Sensor telegram is identical to sensor telegrams for laser scanners in the SICK portfolio

→ www.mysick.com/en/TiM5xx

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.

Ordering information

Other models → www.mysick.com/en/TiM5xx

- **Sub product family:** TiM55x
- **Field of application:** Indoor
- **Electrical connection:** 1 x "Ethernet" connection, 4-pin M12 female connector
  1 x connection "Power/Synchronization output" 5-pin, M12 male connector
  1 x Micro USB female connector, type B

Switching outputs	Angular resolution	Object remission	Housing color	Type	Part no.
1 (PNP, "SYNC"/ "device ready")	1°	4 % ... > 1,000 %, reflectors	Gray (RAL 7032)	TIM551-2050001	1060445

Accessories

	Brief description	Type	Part no.
Mounting brackets and mounting plates			
	Mounting kit with sun shade/weather protection	Mounting kit	2068398
Plug connectors and cables			
	Head A: female connector, M12, 5-pin, straight, A-coded Head B: cable Cable: shielded, 5 m	Connecting cable (female connector - open)	6036159
	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	SSL-2J04-G05ME	6034415
Illustration may differ	Head A: male connector, M12, 4-pin, straight, D-coded Head B: male connector, RJ45, 8-pin, straight Cable: Ethernet, suitable for refrigeration, shielded, 5 m	Connection cable (male connector-male connector)	6050200

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

➜ www.mysick.com/en/LMS1xx

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.

Ordering information

Other models ➜ www.mysick.com/en/LMS1xx

- **Version:** Short Range
- **Field of application:** Outdoor
- **Electrical connection:** 1 x M12 round connector

Switching outputs	Angular resolution	Object remission	Housing color	Type	Part no.
3	0.25°, 0.5°	10 % ... > 1,000 %, reflectors	Gray (RAL 7032)	LMS111-10100S01	1047516

Accessories

Brief description	Type	Part no.
Mounting brackets and mounting plates		
1 piece, mounting bracket for rear mounting on wall or machine	Mounting kit 1a	2034324
Standard mounting set for 190°/270° weather hood	Mounting bracket	2046025
Device protection (mechanical)		
Weather hood, 190°	Weather protection cover 190°	2046459
Weather hood, 270°	Weather protection cover 270°	2046458

Brief description	Type	Part no.
Modules and gateways		
Electrical connection box for power, I/Os and RS-232/-422 data (no Ethernet), with three pre-wired M12 cables, 8 pin	Connection box	2062346
Plug connectors and cables		
Head A: female connector, M12, 5-pin, straight, A-coded Head B: cable Cable: shielded, 20 m	Connecting cable (female connector - open)	6036161
Head A: female connector, M12, 8-pin, straight, A-coded Head B: cable Cable: RS-232, RS-422, shielded, 20 m	Connecting cable (female connector - open)	6036154
Head A: male connector, M12, 8-pin, straight, A-coded Head B: cable Cable: shielded, 20 m	Connecting cable (male connector- open)	6036157
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, 10 m	SSL-2J04-G10ME	6030928

At a glance

- Powerful and efficient laser scanner for measuring ranges of up to 80 m
- Outstanding performance in adverse weather conditions due to multi-echo technology
- Compact housing up to IP67 enclosure rating and built-in heater for outdoor devices
- Low power consumption
- Fast signal processing
- Multiple I/Os
- Synchronization of multiple sensors possible

Your benefits

- Superior performance in a vast range of applications
- Smallest laser scanner with highest accuracy in this sensor class
- Rapid and reliable detection of objects under practically any ambient conditions
- Extensive product family with various product lines and types for all performance and cost requirements
- Low power consumption reduces total cost of ownership
- Best price/performance ratio in this sensor class
- Fast and easy commissioning with SOPAS engineering tool
- Self-monitoring functions increase system availability

➜ www.mysick.com/en/LMS5xx

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.

Ordering information

Other models ➜ **www.mysick.com/en/LMS5xx**

- **Version:** Mid Range
- **Field of application:** Outdoor
- **Variant:** PRO
- **Switching outputs:** 6
- **Angular resolution:** 0.167°, 0.25°, 0.333°, 0.5°, 0.667°, 1°
- **Object remission:** 2 % ... > 1,000 %, reflectors
- **Housing color:** gray (RAL 7032)

Sub product family	Resolution power	Spot size	Electrical connection	Type	Part no.
–	Standard Resolution	11.9 mrad	M12 round connector	LMS511-10100S02	1057618
LMS511	High Resolution	4.7 mrad	4 x M12 round connector	LMS511-20100 PRO	1047782

Accessories

Brief description		Type	Part no.
Mounting brackets and mounting plates			
	Mounting bracket for LMS5xx (for retrofitting, if 2018303 is already in use)	Mounting bracket	2059271
	Mounting kit for wall-mounting (adjustment bracket)	Mounting kit	2018303

	Brief description	Type	Part no.
Device protection (mechanical)			
	Protection hood	Protection cover	2056850
	Weather hood (180°), vertical mounting	Weather hood	2063050
Plug connectors and cables			
	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, 10 m	SSL-2J04-G10ME	6030928
Sets and kits			
	LMS511 accessory set 1 including adapterbox, adapter set, mounting kit	LMS511 accessories set 1	1059092
	LMS511 accessory set including electrical connection box PRO, adapter bracket, standard adjustable bracket and weatherhood	LMS511 accessories set 2	1059093

At a glance

- Maximum reliability, immunity to ambient light, and best price/performance ratio thanks to HDDM™ technology
- Measuring range of 0.05 m to 12 m for natural objects or 0.2 m to 35 m on reflective tape

- Devices with analog and switching output, or just switching
- Infrared or red laser in class 1 or class 2
- Repeatability: 0.5 mm to 5 mm
- Small housing size
- IO-Link

Your benefits

- Precise and reliable measurement regardless of object color extends run time and process quality
- A small size and blind zone make flexible mounting possible when space is limited
- Optimum solution thanks to flexible settings for speed, range and repeatability
- Flexible interface use: 4 mA to 20 mA, 0 V to 10 V, PNP output, NPN output, or IO-Link – making machine integration simple

- Offering easy alignment, optimal performance or inconspicuous measurement, versatile light senders make it an ideal solution for all scenarios
- Low investment costs and high performance levels guarantee a quick return on investment
- IO-Link offers full process control, from commissioning to service
- A wide variety of control options ensures rapid commissioning and fast batch changes

➜ www.mysick.com/en/Dx35

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.

Ordering information

Other models ➜ www.mysick.com/en/Dx35

- **Measuring range:**
  50 mm … 12,000 mm, 90 % remission (for speed setting Slow)
  50 mm … 5,300 mm, 18 % remission
  50 mm … 3,100 mm, 6 % remission
- **Analog output:** 1 x 4 mA … 20 mA (≤ 450 Ω) / 1 x 0 V … 10 V (≥ 50 kΩ) / –
  (Output Q_2, selectable: 4 mA … 20 mA / 0 V … 10 V / switching output.)

Switching output	Response time	Variant	Data interface	Type	Part no.
1 x / 2 x push-pull: PNP/NPN (100 mA), IO-Link [1] [2] [3]	2.5 ms / 6.5 ms / 12.5 ms / 24.5 ms / 96.5 ms [4] [5]	Red laser, class 2	IO-Link	DT35-B15251	1057652

[1] Output Q short-circuit protected.

[2] Voltage drop < 3 V.

[3] Output Q_2 selectable: 4 mA … 20 mA / 0 V … 10 V / switching output.

[4] Depending on the set speed: Super Fast … Super Slow.

[5] Lateral entry of the object into the measuring range.

Accessories

	Brief description	Type	Part no.
Mounting brackets and mounting plates			
	Mounting bracket: horizontal sending axis for ceiling or floor installation or vertical sending axis for wall installation, steel, zinc coated, incl. mounting material, steel, zinc coated, mounting hardware for the sensor included	BEF-WN-DX35	2069592
Terminal and alignment brackets			
	Alignment unit, steel, zinc coated, mounting hardware for the sensor included	BEF-AH-DX50	2048397

	Brief description	Type	Part no.
Universal bar clamp systems			
	Plate N02 for universal clamp bracket, Zinc plated steel (sheet), Zinc die cast (clamping bracket), Universal clamp (5322626), mounting hardware	BEF-KHS-N02	2051608
Plug connectors and cables			
Illustration may differ	Head A: female connector, M12, 5-pin, straight Head B: cable Cable: PVC, unshielded, 2 m	DOL-1205-G02M	6008899
Illustration may differ	Head A: female connector, M12, 5-pin, angled Head B: cable Cable: PVC, unshielded, 2 m	DOL-1205-W02M	6008900
	Head A: female connector, M12, 5-pin, straight, A-coded Head B: male connector, M12, 5-pin, straight, A-coded Cable: digital I/Os, drag chain use, PUR, halogen-free, unshielded, 2 m	DSL-1205-G02MC	6025931

At a glance

- Long scanning range, even when detecting dark surfaces
- High angular resolution of up to 0.0625 degrees
- High immunity to solar radiation
- Synchronous monitoring of up to four different fields
- Small laser spot diameter even at long distances

Your benefits

- Reliable operation even in harsh ambient conditions
- Low installation costs due to large monitoring areas
- Reliable detection of small objects at long distances
- Easy installation options for excavators and crane systems

→ www.mysick.com/en/LD-LRS

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.

Ordering information

Other models → www.mysick.com/en/LD-LRS

- **Version:** Long Range
- **Field of application:** Outdoor

Electrical connection	Switching outputs	Angular resolution	Housing color	Type	Part no.
1 x 20-pin Harting plug	4 (digital)	0.125°, 0.1875°, 0.25°, 0.375°, 0.5°, 0.75°, 1°	Gray (RAL 7032)	LD-LRS3600	1060831

Accessories

Brief description	Type	Part no.
Mounting brackets and mounting plates		
Mounting kit for wall-mounting (adjustment bracket)	Mounting kit	2018303
Plug connectors and cables		
Head A: male connector, Harting male connector, 20-pin, angled Head B: - Cable: shielded *Illustration may differ*	Male connector (ready to assemble)	2039025
Head A: female connector, D-Sub-HD, 15-pin, straight Head B: male connector, RJ45, straight Cable: Ethernet, shielded, 10 m	Connection cable (male connector - female connector)	6036683

At a glance

- Optional and simple sensing range adjustment of up to 20 m
- High level of availability even with contamination and in poor weather conditions

- Simple mounting and adjustment
- Additional sender / receiver modules

Your benefits

- The resistant collision avoidance system and driver assistance made to work in a diverse range of applications under any weather conditions
- A configurable sensor even makes it possible to detect awkward objects in extreme situations
- Large sensing ranges and detection beams are ideal for detecting objects early to provide reliable collision avoidance even under high workloads

- Quick and cost-effective adaptation to local conditions
- Long maintenance cycles to provide high levels of availability
- No additional wiring is required thanks to high level of independence from interference signals

➜ www.mysick.com/en/RAS4xx

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.

Ordering information

Other models ➜ www.mysick.com/en/RAS4xx

Sub product family	Electrical connection	Switching outputs	Housing color	Type	Part no.
RAS407	1 x Cable open end	3 (relays)	Gray	RAS407-2801000	1072142

Accessories

Suitable accessories can be found at ➜ www.mysick.com/en/RAS4xx

At a glance

- Measuring range up to 155 m on natural objects
- High measurement accuracy thanks to time-of-flight measurement
- Easy alignment thanks to pilot laser
- Easy handling with programmable parameters
- Serial RS-422 or RS-232 interface, PROFIBUS, analog output, and two switching outputs
- Near field blanking for operation in a protective housing with view through protective front screen
- Special models are available for measurement on hot surfaces up to 1,400 °C

Your benefits

- Extremely wide measurement range of up to 155 m on natural targets offers high flexibility in applications where range is key
- Supplementary visible alignment laser allows fast and easy alignment – even over long distances, offering fast and cost-effective installation
- Tough metal housing design for trouble-free operation in the roughest environmental conditions
- Non-visible, Class 1 IR laser for safe measurement and detection
- User-friendly software with an easy-to-follow interface ensures fast and cost-optimized setup
- Serial and analog interfaces as well as two digital switching outputs allow flexible use for varied applications
- Integrated filter option allows for direct measurement of 1,400 °C glowing, hot targets

➔ www.mysick.com/en/DMT

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.

Ordering information

Other models ➔ www.mysick.com/en/DMT

Special characteristic	Measuring range	Response time	Aperture delay time	Interface	Type	Part no.
Electronic aperture	0.5 m ... 155 m, 90 % remission 0.5 m ... 65 m, 18 % remission 0.5 m ... 40 m, 6 % remission	1 ms ... 3,000 ms [1]	≥ 1 ms [2]	RS-422, RS-232 [3]	DMT10-2-2111	1028540

[1] Dependent on averaging method, averaging depth, timeout, baud rate, data output, output format, and delay time.

[2] Dependent on averaging method, averaging depth, timeout, baud rate, data output, and output format.

[3] Switchable.

Accessories

Brief description		Type	Part no.
Terminal and alignment brackets			
	Alignment unit for DMT/DML, incl. mounting material, steel, zinc coated, mounting hardware included	BEF-GH-DME	5309130
Lens and accessories			
	Lens tube for DMT, with filter and gasket	Tube for DMT	2031331

At a glance

- Non-contact length measurement – maintenance-free, rugged, long lifetime
- High reproducibility (0.3 mm / 1 mm), high system resolution (0.1 mm)
- SSI and PROFIBUS interfaces
- Determination of absolute position
- Measuring lengths of up to 1,700 m possible
- Can be used in harsh environments
- High travel speeds of up to 6.6 m/s
- Distance tolerance between read head and measuring element: up to 55 mm ± 20 mm possible

Your benefits

- After installation, the system is immediately available and completely maintenance-free, which leads to time and cost savings.
- Reliable determination of position under harshest environmental conditions such as influences of dirt, dust, fog, shocks and vibrations
- High efficiency and productivity
- Savings on time – no reference run necessary on initial operation due to absolute position measurement
- Accurate positioning even with high mounting tolerances

→ **www.mysick.com/en/KH53**

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.

Ordering information

Other models → **www.mysick.com/en/KH53**

Measurement range	Description	Electrical interface	System part	Type	Part no.
≤ 54 m	Read head 54	PROFIBUS DP	Read head 54	KHK53-PXF00054	1036167
–	Measuring element up to 54 m	–	Measuring element up to 54 m	KHT53-XXX00054	1035445
				KHU53-XXX00054	1035446
	Mounting gauge 54	–	Mounting gauge 54	KHM53-XXX00054	1035447

Accessories

	Brief description	Type	Part no.
Plug connectors and cables			
	Head A: female connector, M12, 4-pin, straight Head B: - Cable: unshielded	DOS-1204-G	6007302
	Head A: female connector, M12, 5-pin, straight, B-coded Head B: - Cable: PROFIBUS DP, shielded	DOS-1205-GQ	6021353
	Head A: male connector, M12, 5-pin, straight, B-coded Head B: - Cable: PROFIBUS DP, shielded	STE-1205-GQ	6021354
	Head A: male connector, M12, 4-pin, straight, B-coded Cable: PROFIBUS DP, terminal resistor	STE-END-Q	6021156

At a glance

- Measuring lengths: 2 m ... 50 m
- Modular measuring system with a wide selection of interfaces/measuring lengths
- Very rugged system (dirt scraper, integrated brushes)
- High-quality winding mechanism and wire input

- High enclosure rating
- High shock and vibration resistance
- Extremely high resolution possible
- Expandable using external accessories

Your benefits

- Reliable solution for use in harsh ambient conditions
- Long service life due to rugged industrial housing
- Quick and easy installation without the need for precise linear guidance
- Low integration and maintenance costs

- Customization option reduces storage costs
- Analog interface speeds up commissioning and cost-effective interface card can be used

➔ www.mysick.com/en/HighLine

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.

Ordering information

Other models ➔ www.mysick.com/en/HighLine

Measuring range	Electrical interface	Connection type	Type	Part no.
0 m ... 10 m	CANopen	Male connector, universal [1]	BTF13-C1QM1049	1068891

[1] Only in combination with AHM36 CANopen.

Accessories

	Brief description	Type	Part no.
Plug connectors and cables			
Illustration may differ	Head A: female connector, M12, 5-pin, straight Head B: cable Cable: CANopen, DeviceNet, drag chain use, shielded, 5 m A-coded	DOL-1205-G05MY	6053042
	Head A: female connector, M12, 5-pin, straight Head B: - Cable: CANopen, DeviceNet, shielded	DOS-1205-GA	6027534

At a glance

- Rugged absolute multiturn encoder with up to 31 bits (14-bit singleturn and 17-bit multiturn)
- Face mount flange, servo flange or blind hollow shaft
- Compact design (<70 mm)
- Integrated PROFIBUS interface with DP V0, V1, and V2 functionality (depending on type)
- Connectivity: 3 x M12 male connector
- Protection class up to IP67
- Operating temperature: –30 to +80 °C (depending on type)

Your benefits

- Maximum system throughput, even under extreme ambient conditions
- Reduced maintenance costs due to wear-free magnetic singleturn and multiturn scanning
- Space-saving and cost-efficient design - the best solution, particularly when installation space is limited
- High productivity thanks to fast communication and position calculation
- Immune to contamination and condensation - ideal for tough ambient conditions
- High performance at a cost-efficient price

➔ www.mysick.com/en/A3M60_PROFIBUS

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.

Ordering information

Other models ➔ www.mysick.com/en/A3M60_PROFIBUS

- **Shaft diameter:** 10 mm, 19 mm
- **Electrical interface:** PROFIBUS DP

Connection type	Number of steps	Resolution	Programmable	Type	Part no.
3 x M12, 5-pin, axial	≤ 16,384	16,384 x 131,072	✔	A3M60A-S4PB014X17	1053341

Accessories

Brief description	Type	Part no.
Plug connectors and cables		
Head A: female connector, M12, 5-pin, angled Head B: cable Cable: PROFIBUS DP, PUR, halogen-free, shielded, 10 m	DOL-1202-W10MC	6042068
Head A: female connector, M12, 5-pin, straight Head B: cable Cable: PROFIBUS DP, PVC, shielded, 10 m	DOL-1205-G10MQ	6026008
Head A: female connector, M12, 5-pin, straight, B-coded Head B: - Cable: PROFIBUS DP, shielded	DOS-1205-GQ	6021353

At a glance

- Type 4 (IEC 61496), SIL3 (IEC 61508), PL e (EN ISO 13849)
- Robust housing with three mounting grooves
- Wide scanning range, up to 70 m
- External device monitoring (EDM), restart interlock and application diagnostic output
- Standardized M12 connectivity
- 7-segment display
- Configuration keys located directly on the device
- Optional integration features: laser alignment aid, LED or AS-i interface

Your benefits

- The wide scanning range allows the device to be customized according to the application
- Robust design with a high level of resistance to environmental changes ensures high machine availability, even under special ambient conditions
- Customized protection field adaption with deflection mirror reduces installation costs
- Customer-friendly interfaces and status display simplify commissioning and maintenance
- Mounting grooves on three housing sides ensure more flexibility during mounting and simplify machine integration
- Fast start-up times due to easy alignment, using the optional laser alignment aid and performing configuration directly on the device
- Reduced downtime through 360° visible LED and diagnostics displays

→ www.mysick.com/en/M4000_Standard

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.

Ordering information

Other models → www.mysick.com/en/M4000_Standard

Scanning range	Number of beams	Beam separation	Sender		Receiver	
			Type	Part no.	Type	Part no.
0.5 m ... 70 m, configurable	3	400 mm	M40S-034000AR0	1200003	M40E-034000RR0	1200020

Accessories

Brief description	Type	Part no.
Mounting brackets and mounting plates		
Adjusting plate for floor mounting of device columns, height 3 mm, steel	Adjusting plate	4031053
Plug connectors and cables		
Head A: female connector, M12, 8-pin, straight Head B: cable Cable: drag chain use, PUR, halogen-free, shielded, 15 m	DOL-127SG15ME25KM0	2076544
Device columns		
For outdoor area with heating 220 V, column height 1223 mm	PUM12-S01	2020800

At a glance

- Narrow plastic housing
- Metal actuator head
- Rigid or mobile actuators
- Available with M20 X 1.5 cable entry glands or Flexi Loop-compatible M12 plug connector (depending on variant)
- Locked by spring force and magnetic force
- Lock and door monitoring

Your benefits

- Small design simplifies installation and makes it easy to mount directly on the guard door frame
- Flexible electrical connectivity due to three cable entry glands
- Improved diagnostics due to additional contacts for door monitoring
- Simple adjustment due to various actuators that are suitable for any door
- Different switching elements offer the appropriate solution for electrical installation
- Rugged metal housing provides increased machine reliability, even when the guard has a mechanical offset
- Flexi Loop now enables a safe series connection with enhanced diagnostics capabilities and minimal wiring effort.

➜ www.mysick.com/en/i110_Lock

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.
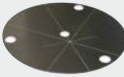
Ordering information

Other models ➜ www.mysick.com/en/i110_Lock

- **Locking type:** mechanical
- **Actuator head material:** metal
- **Locking force F_{max}:** ≤ 2,500 N

Number of positive action N/C solenoid monitoring contacts	Number of N/O solenoid monitoring contacts	Number of positive action N/C door monitoring contacts	Number of N/O door monitoring contacts	Number of N/C door monitoring contacts	Connection type	Type	Part no.
2	0	1	0	0	Plug connector, M12, 8-pin	i110-M0454	6051602

Accessories

	Brief description	Type	Part no.
Plug connectors and cables			
	Head A: female connector, M12, 8-pin, straight Head B: cable Cable: PVC, shielded, 15 m	DOL-1208-G15MA	6022153
Actuators			
	Angled, rigid	iE10-A1	5306535
	Rigid, semiflexible, door hinged on left/right	iE10-R2	5306529
	Straight, rubber-mounted	iE10-S2	5306530

At a glance

- High diagnostic coverage
- Automated self-test cycles for the entire system
- Safe monitoring of the correct switching behavior and connecting cable of the laser scanner
- Easy implementation of additional login functions
- Easily expandable due to modular concept

Your benefits

- The independent self-testing system ensures secure operation due to excellent diagnostic capabilities
- Reliable, industry-proven laser scanner with enhanced diagnostics for outdoor applications
- Variable monitoring fields make the AOS ideal for a wide range of applications
- Modular concept makes expanding the system simple
- Optional gateways ensure connection to bus systems or remote diagnostics
- Built-in control functions for peripheral devices, even for safety-related signals like emergency stop
- Supports and simplifies individual operating licenses for machinery

➔ www.mysick.com/en/AOS_Prime

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.

Ordering information

Other models ➔ www.mysick.com/en/AOS_Prime

Field of application	Items supplied	Type	Part no.
STS cranes	LMS511-10100S02 (2 x) Flexi Soft main module FX3-CPU000000 Flexi Soft system plug FX3-MPL000001 Flexi Soft I/O module FX3-XTIO84002 (2 x) USB configuration cable DSL-8U04G02M025KM1 USB stick with configuration files Ethernet connection cable SSL-2J04-G10ME (2 x) LMS511 accessory set 2 (2 x)	AOS502 STS	1064545
Basic systems for different applications	LMS511-10100S02 (2 x) Flexi Soft main module FX3-CPU000000 Flexi Soft system plug FX3-MPL000001 Flexi Soft I/O module FX3-XTIO84002 USB configuration cable DSL-8U04G02M025KM1 USB stick with configuration files Ethernet connection cable SSL-2J04-G10ME LMS511 accessory set 1 (2 x)	AOS502	1066130
RTG cranes	LMS111-10100S01 (4 x) Flexi Soft main module FX3-CPU000000 Flexi Soft system plug FX3-MPL000001 Flexi Soft I/O module FX3-XTIO84002 (2 x) USB configuration cable DSL-8U04G02M025KM1 USB stick with configuration files I/O connecting cable (4 x) Power supply connecting cable (4 x) RS-232 input connecting cable (4 x) Weather protection cover 270° (4 x) Mounting bracket (4 x) Ethernet connection cable SSL-2J04-G10ME	AOS104 RTG	1064544

Accessories

Suitable accessories can be found at ➔ www.mysick.com/en/AOS_Prime

At a glance

- Rear-end collision warning
- 2-stage warning system provides the operator with advance warning of a collision and (stage 2) initiates a response
- Touchscreen that displays obstacle outlines
- Configurable safety distances
- Suppression of false alarms for higher operator acceptance
- Self-diagnostics for straightforward troubleshooting and maintenance

Your benefits

- Prevention of collisions and accidents reduces repair costs and spare part costs
- High machine availability for trouble-free container handling
- Collision avoidance extends machine service life
- Integrated installation wizard simplifies installation and operation
- Self-diagnostics function and reporting make system maintenance easy

➔ www.mysick.com/en/RAS_Prime

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.

Ordering information

Other models ➔ **www.mysick.com/en/RAS_Prime**

Applications	Items supplied	Type	Part no.
Collision protection for reachstackers and empty container handlers for container handling in ports	LMS151-10100S03 LMS151-10100S04 Operator display Mounting set for display Ethernet switch Buzzer USB stick with operating instructions Power supply connecting cable for LMS1xx (2 x) Ethernet connection cable for LMS1xx (2 x) Ethernet connection cable for display Connecting cables for display	RAS Prime	1057936

Accessories

Suitable accessories can be found at ➔ **www.mysick.com/en/RAS_Prime**

WE DELIVER "SENSOR INTELLIGENCE."

SICK sensor solutions for industrial automation are the result of exceptional dedication and experience. From development all the way to service: The people at SICK are committed to investing all their expertise in providing with the very best sensors and system solutions possible.

A company with a culture of success

Almost 7,000 people are on staff, with products and services available to help SICK sensor technology users increase their productivity and reduce their costs. Founded in 1946 and headquartered in Waldkirch, Germany, SICK is a global sensor specialist with more than 50 subsidiaries and representations worldwide. The people work with pleasure at SICK.

This is demonstrated by the accolades that the company is regularly awarded in the "Great Place to Work" competition. This lively corporate culture holds strong appeal for qualified and skilled persons. In SICK, they are part of a company that ensures an excellent balance between career progression and quality of life.

Innovation for the leading edge

SICK sensor systems simplify and optimize processes and allow for sustainable production. SICK operates at many research and development centers all over the world. Co-designed with customers and universities, our innovative sensor products and solutions are made to give a decisive edge. With an impressive track record of innovation, we take the key parameters of modern production to new levels: reliable process control, safety of people and environmental protection.

A corporate culture for sustainable excellence

SICK is backed by a holistic, homogeneous corporate culture. We are an independent company. And our sensor technology is open to all system environments. The power of innovation has made SICK one of the technology and market leaders – sensor technology that is successful in the long term.

"SENSOR INTELLIGENCE." FOR ALL REQUIREMENTS

SICK is a renowned expert in many industries, and is entirely familiar with the critical challenges they face. While speed, accuracy and availability take center stage in all industries, technical implementations vary greatly. SICK puts its vast experience to use to provide with precisely the solution you need.

For applications worldwide

Hundreds of thousands of installations and applications go to prove that SICK knows the different industries and their processes inside out. This tradition of uncompromising expertise is ongoing: As we move into the future, we will continue to design, implement and optimize customized solutions in our application centers in Europe, Asia and North America. You can count on SICK as a reliable supplier and development partner.

For your specific industry

With a track record of proven expertise in a great variety of industries, SICK has taken quality and productivity to new heights. The automotive, pharmaceutical, electronics and solar industries are just a few examples of sectors that benefit from our know-how. In addition to increasing speed and improving traceability in warehouses and distribution centers, SICK solutions provide accident protection for automated guided vehicles. SICK system solutions for analysis and flow measurement of gases and liquids enable environmental protection and sustainability in, for example, energy production, cement production or waste incineration plants.

For performance across the board

SICK provides the right technology to respond to the tasks involved in industrial automation: measuring, detecting, monitoring and controlling, protecting, networking and integrating, identifying, positioning. Our development and industry experts continually create groundbreaking innovations to solve these tasks.

➜ **www.sick.com/industries**

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SICK LifeTime Services

SICK LifeTime Services is a comprehensive set of high-quality services provided to support the entire life cycle of products and applications from plant walk-through to upgrades. These services increase the safety of people, boost the productivity of machines and serve as the basis for our customers' sustainable business success. LifeTime Services range from product-independent consulting to traditional product services and are characterized by extensive industry expertise and more than 60 years of experience.

➜ www.sick.com/service

Consulting and design

- Plant walk-through
- Risk assessment
- Safety concept
- Safety software and hardware design
- Validation of functional safety
- CE-conformance check

Product and system support

- Installation
- Commissioning
- Start-up support
- Calibrations
- Telephone support
- 24-hour helpline
- SICK Remote Service
- Troubleshooting on site
- Repairs
- Exchange units
- Extended warranty

Verification and optimization

- Inspection
- Stop time measurement
- Machine safety inspection
- Electrical equipment check
- Accident investigation
- Initial verification
- Performance check
- Maintenance

Upgrade and retrofits

- Upgrade services

Training and education

- Training
- Seminars
- Web training

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From the simple acquisition task to the key sensor technology in a complex production process: With every product from its broad portfolio, SICK offers a sensor solution that best combines cost effectiveness and safety.
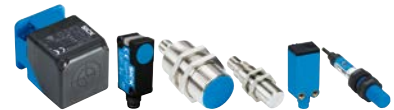
→ **www.sick.com/products**

Photoelectric sensors

- Miniature photoelectric sensors
- Small photoelectric sensors
- Compact photoelectric sensors
- Cylindrical photoelectric sensors
- Fiber-optic sensors and fibers
- MultiTask photoelectric sensors

Proximity sensors

- Inductive proximity sensors
- Capacitive proximity sensors
- Magnetic proximity sensors

Magnetic cylinder sensors

- Analog positioning sensors
- Sensors for T-slot cylinders
- Sensors for C-slot cylinders
- Sensor adapters for other cylinder types

Registration sensors

- Contrast sensors
- Markless sensors
- Color sensors
- Luminescence sensors
- Fork sensors
- Array sensors
- Register sensors
- Glare sensors

Automation light grids

- Measuring automation light grids
- Switching automation light grids

Opto-electronic protective devices

- Safety laser scanners
- Safety light curtains
- Safety camera systems
- Multiple light beam safety devices
- Single-beam photoelectric safety switches
- Mirror columns and device columns

Safety switches

- Electro-mechanical safety switches
- Non-contact safety switches
- Safety command devices
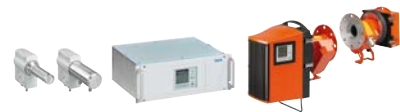
sens:Control – safe control solutions

- Safe sensor cascade
- Safety controllers
- Safety relays

Gas analyzers

- Gas transmitters
- In-situ gas analyzers
- Extractive gas analyzers

Dust measuring devices

- Scattered light dust measuring devices
- Transmittance dust measuring devices
- Gravimetric dust measuring devices

Analyzer solutions

- CEMS solutions
- Process solutions

Traffic sensors

- Tunnel sensors
- Overheight detectors
- Visual range measuring devices

Ultrasonic gas flow measuring devices

- Volume flow measuring devices
- Mass flow measuring devices
- Flow velocity measuring devices
- Gas flow meters

Identification solutions

- Image-based code readers
- Bar code scanners
- RFID
- Hand-held scanners
- Connectivity

Vision

- 2D vision
- 3D vision

Distance sensors

- Short range distance sensors (Displacement)
- Mid range distance sensors
- Long range distance sensors
- Linear measurement sensors
- Ultrasonic sensors
- Optical data transmission
- Position finders

Detection and ranging solutions

- 2D laser scanners
- 3D laser scanners

- Radar sensors

Motor feedback systems

- Motor feedback system rotary HIPERFACE®
- Motor feedback system rotary HIPERFACE DSL®
- Motor feedback system rotary incremental

- Motor feedback system rotativ incremental with commutation
- Motor feedback system linear HIPERFACE®

Encoders

- Absolute encoders
- Incremental encoders
- Linear encoders

- Wire draw encoders
- Safety encoders

Fluid sensors

- Level sensors
- Pressure sensors

- Flow sensors
- Temperature sensors

System solutions

- Customized analyzer systems
- Driver assistance systems
- Robot guidance systems
- Object detection systems
- Profiling systems

- Quality control systems
- Security systems
- Track and trace systems
- Functional safety systems

EASY INTEGRATION INTO YOUR AUTOMATION WORLD

Sensor integration with SICK is easy and fast for you: Our intelligent sensor solutions and safety controllers provide different integration technologies which allow easy access – from HMI, PLC, and engineering tools – to data from our sensors. In this way, we support you towards solving your application rapidly and easily and increase machine reliability with a continuous diagnostic concept.

PLC and engineering tool integration

Function Blocks	
IO-Link devices Level sensors Pressure sensors Presence detection sensors Distance sensors	**Bar code scanners, Image-based code readers** 1D und 2D
Vision sensors Inspector	**RFID** RFH6xx RFU62x, RFU63x
Absolute encoders AFS60/AFM60	**Laser volume flowmeter** Bulkscan® LMS511

Function blocks

The SICK function blocks quickly allow you to establish acyclic communication to our sensors within your PLC program. Additionally, complex and variable process data can be parsed into their individual information contents without programmer effort.

DTM (Device Type Manager)

FDT/DTM is a cross-manufacturer concept, with which configuration and diagnosis of devices from different manufacturers can be done with just one engineering tool.

TCI (Tool Calling Interface)

The Tool Calling Interface (TCI) makes it possible to call up a tool used to carry out parameterization and diagnosis of a field device via the existing communication infrastructure.

HMI integration

OPC server

OPC technology is used to exchange data between field devices and Windows-based applications. The SOPAS OPC server from SICK follows the OPC DA specification and thus can be used on Windows operating systems.

Web server

The SOPAS web server from SICK can be used everywhere, where a web browser is available. The web server is distinguished by its ability to both carry out pure data exchange and also to provide visualizations for the devices, which is a big advantage, particularly for vision sensors.

## Fieldbus Communication Interface

Modbus®TCP

Our fieldbus and network solutions allow SICK sensors and safety controllers to be connected to all conventional automation systems. This guarantees an easy and fast access to the available data.

➔ www.sick.com/industrial-communication

REGISTER AT WWW.SICK.COM TODAY AND ENJOY ALL THE BENEFITS

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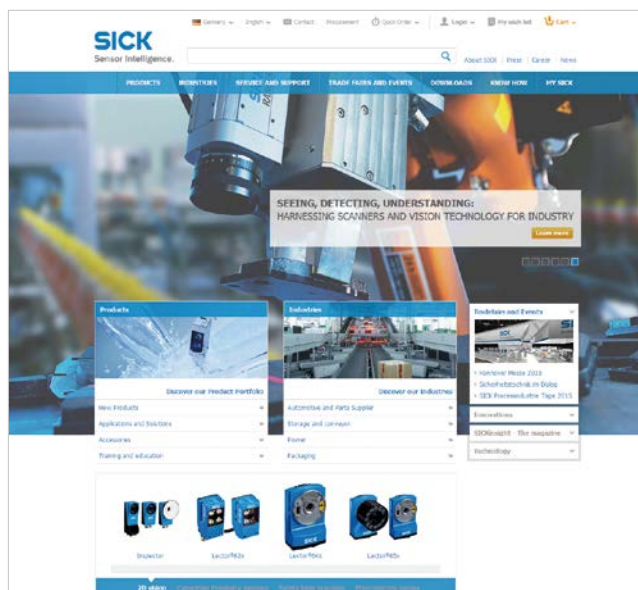
SERVICES FOR MACHINES AND SYSTEMS: SICK LifeTime Services

Our comprehensive and versatile LifeTime Services are the perfect addition to the comprehensive range of products from SICK. The services range from product-independent consulting to traditional product services.
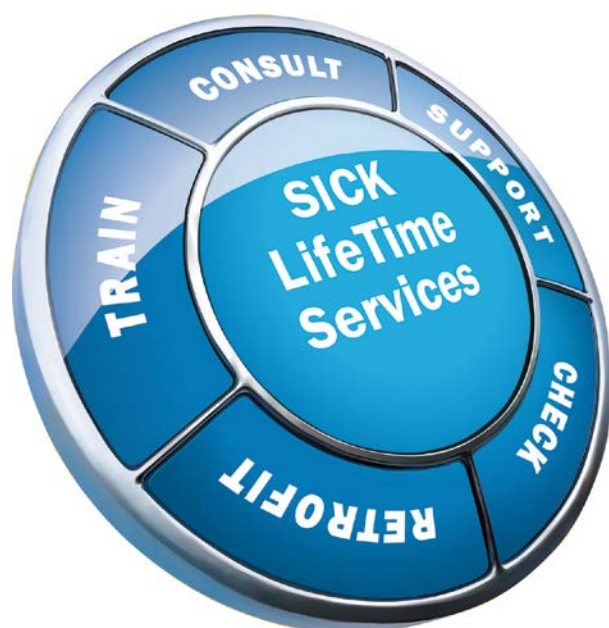
Consulting and design
Safe and professional

Product and system support
Reliable, fast and on-site

Verification and optimization
Safe and regularly inspected

Upgrade and retrofits
Easy, safe and economical

Training and education
Practical, focused and professional

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."

Worldwide presence:

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, India, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, USA, Vietnam.

Detailed addresses and additional representatives ➜ **www.sick.com**

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