



RAS Prime

OPERATOR ASSISTANCE FOR COLLISION-FREE
CONTAINER HANDLING

Driver assistance systems

SICK
Sensor Intelligence.

RAS Prime FROM SICK: EARLY DETECTION AND AVOIDANCE OF COLLISIONS

Protecting vehicles, containers, and infrastructure in ports is a difficult and very challenging task. It makes high demands of drivers in particular. To assist them in their work and reduce the pressure to which they are exposed, SICK has developed an assistance system which can easily be retrofitted to reach stackers and empty container handlers. The assistant combines the company's outstanding knowledge in the field of driver assistance systems with its reliable sensor technology.

The challenge in container handling

Maximum efficiency non-stop: container terminals, which work around the clock, 365 days a year, demand high availability and low downtimes. Increasing automation and the associated increase in container handling volumes are potentially very dangerous for reach stacker drivers.

Reach stackers and empty container handlers are large machines which transport heavy loads from A to B at high speeds. Some areas of the vehicle are not visible to the driver. The greatest danger is posed by the high dynamic response of the tail end of the vehicle, which is attributable to the rear-wheel steering and the incredibly narrow turning circle. Therefore, it is not sufficient if only the rear end of the vehicle is monitored during reversing. Accordingly, to avoid accidents, RAS Prime permanently monitors the entire rear end of the vehicle, including the sides, during reversing and forward movement.



RAS Prime: Its functions

Active driver assistance

To reach their handling targets, drivers must focus their entire attention on safely guiding their vehicles and transporting bulky loads in confined spaces. The assistance system is designed to provide drivers with the best possible support whilst not distracting their attention from the task at hand.

Operator display

RAS Prime is a high-precision driver assistance system which permanently monitors the entire rear end of the vehicle. An operator display gives the driver a clear and easy-to-understand view of the surrounding area in the form of object contours. To reduce the response time of the driver to a minimum, only objects the vehicle may be at risk of colliding with are shown. Any objects in the immediate vicinity of the vehicle are highlighted on the display. This makes it immediately clear where the vehicle is most at risk of collision and the driver can react accordingly.



Efficient collision awareness

A sophisticated warning strategy sends visual and audible signals to the driver providing information and warnings. The signals vary depending on the distance between the vehicle and the collision object. Objects the vehicle is approaching are shown on the display for information (green zone). An advance warning will sound as the vehicle and the object move closer together. The advance warning is designed to increase the driver's awareness and draw attention to the possible danger (amber zone). If the distance between the two decreases still further, the risk of collision is at its highest. At this point, RAS Prime emits a continuous audible alarm signal to prompt the driver to take immediate action (brake heavily or swerve, for example).



DRIVING PROVEN TECHNOLOGY TO INNOVATION



The benefits at a glance

- Protecting vehicles, containers, and infrastructure in ports
- Quick and cost-effective retrofitting of new vehicles and vehicles that are already in use
- Permanent monitoring of the entire area at the rear of the vehicle to avoid accidents
- Visual and audible collision alarm
- Early warning alarm to alert drivers
- Easy-to-understand display of the rear area of the vehicle
- Easy installation and maintenance



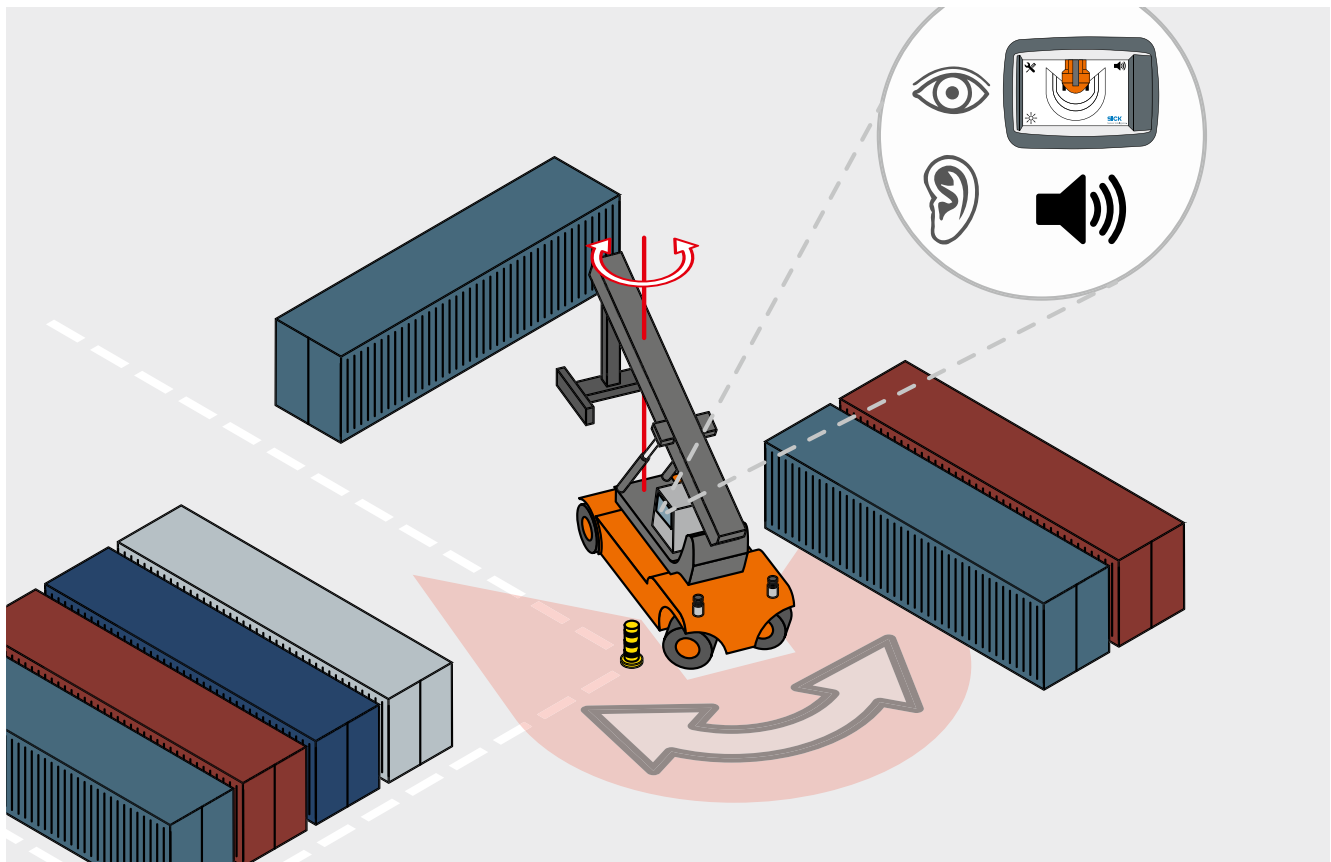
With this product, SICK has combined its proven sensor technology and system knowledge in an assistance system. The system is easy to install on all reach stacker and empty container handler models. Costly integration into the vehicle control system is not necessary. The system can be retrofitted to new vehicles and vehicles that are already in use quickly and cost-effectively.

DISTANCE WARNING AND MANEUVERING ASSISTANCE FOR BOTH DAY AND NIGHT

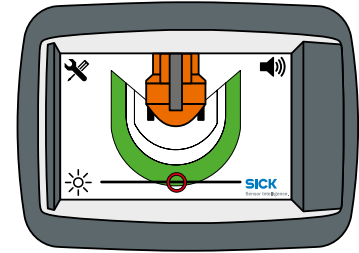
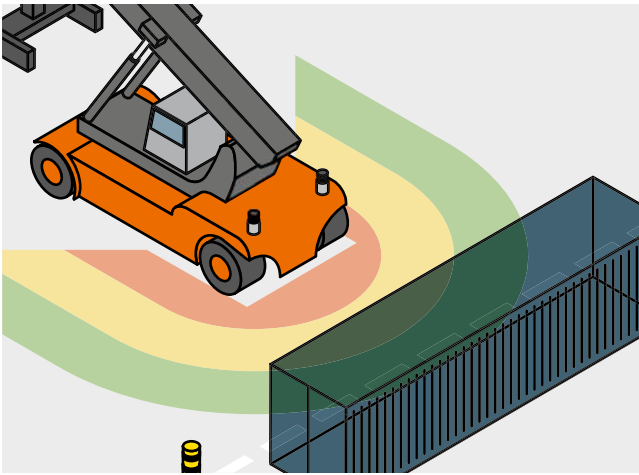
Conventional driver assistance systems only warn of potential collisions with other objects. SICK's RAS Prime driver assistance system does more, permanently monitoring the area behind a reach stacker. As soon as an obstacle enters one of the three preconfigured warning zones, RAS Prime emits visual and audible signals to tell the driver that this warning zone has been violated.

The distance warning function can be relied upon to support the driver during reversing. However, RAS Prime shows its true potential when maneuvering in narrow locations where visibility is poor. Due to the rear-axle steering, the tail end of a reach stacker swings out at extreme angles. Constant monitoring of the area at the rear of the vehicle gives drivers previously unachievable levels of freedom in safe maneuvering. They do not need to turn their heads, as they are kept fully informed by the display and alarms in the cab. This is even true at night, as the display features a special night mode.

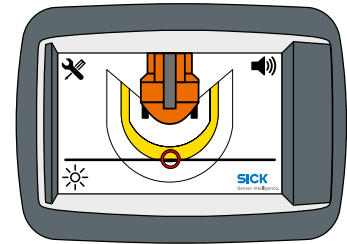
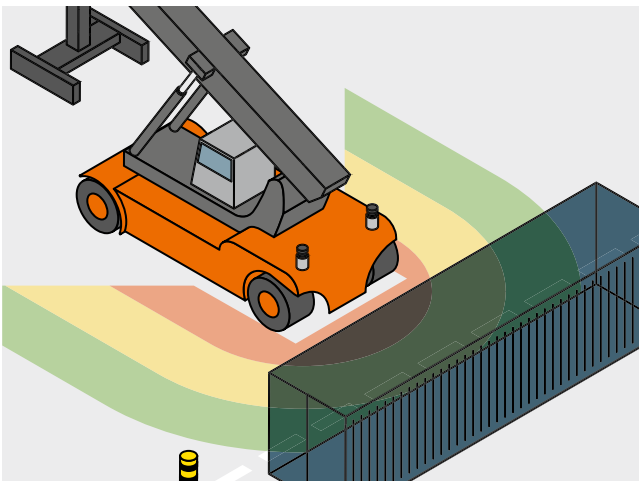
RAS Prime can be relied upon for safe driving and maneuvering at all times, day and night.



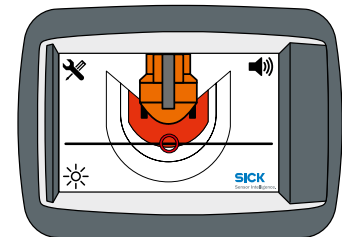
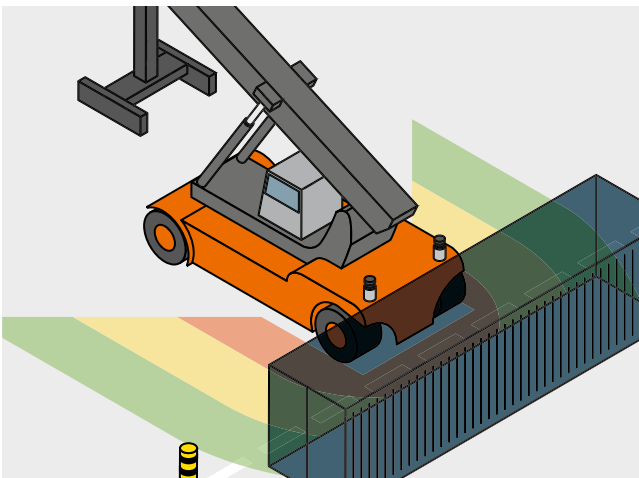
DISTANCE WARNING AND MANEUVERING ASSISTANT FOR BOTH DAY AND NIGHT



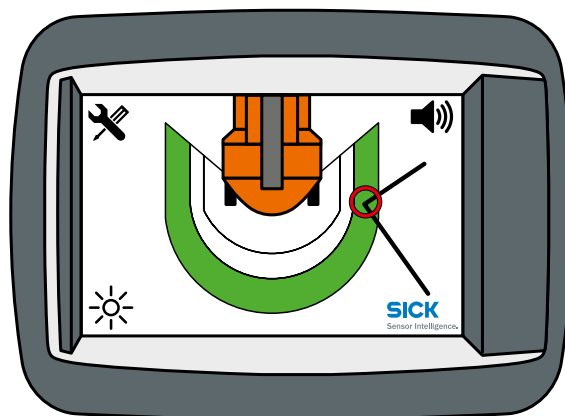
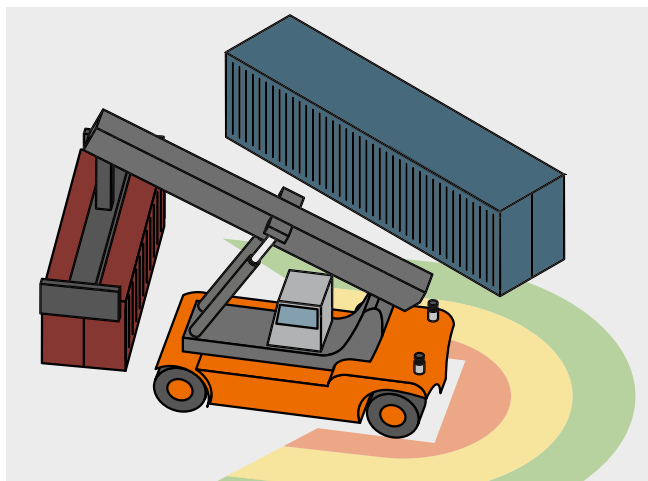
The first of the three warning zones is visualized in green on the display, representing the "monitoring zone". It gives the driver an overview of the immediate vicinity. An obstacle is shown on the display as a contour but will not trigger an audible alarm.



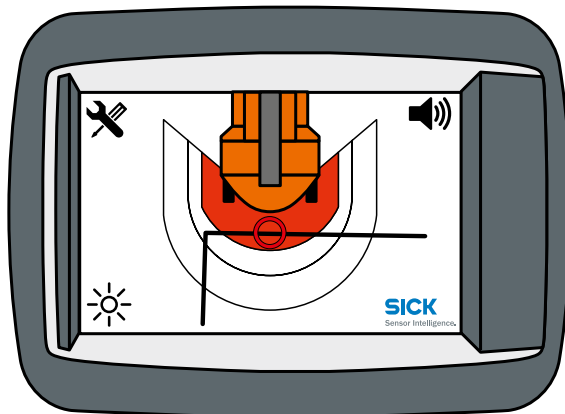
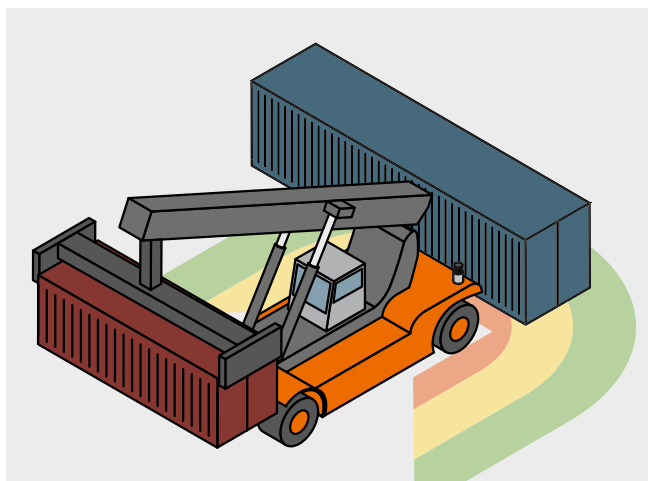
The zone shown in amber is the "early warning" area. As the reach stacker approaches an obstacle and enters this area, an audible signal is also triggered to increase the driver's awareness in preparation for braking.



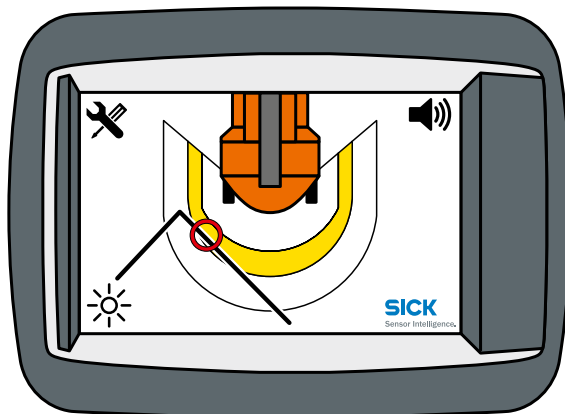
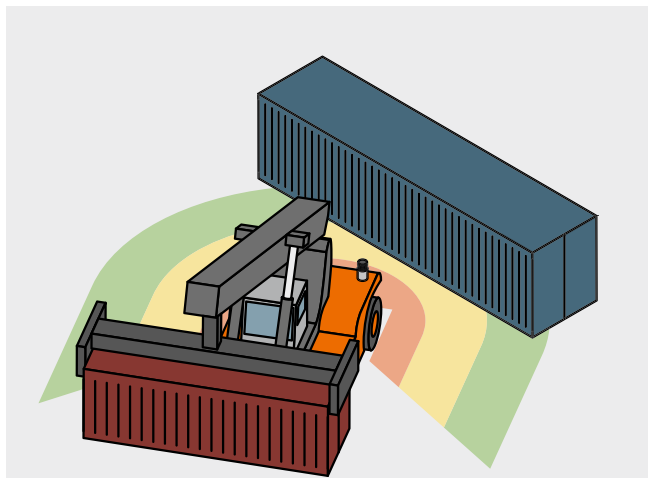
A "collision alarm" is triggered if an obstacle enters the zone displayed in red. Alongside the visual display, an audible signal clearly alerts the driver to the impending danger. The vehicle must be stopped immediately in order to avoid a collision.



RAS Prime takes the load off the driver, who needs to see the immediate vicinity from all angles during maneuvering. Objects appear on the display mirroring the surrounding environment. Whenever space is at a premium and visibility is poor, this helps drivers to estimate the distance between objects in the vicinity and the reach stacker so that they can maneuver their vehicles safely.



Rotation through the front axle causes the tail end to swing out sharply and an obstacle rapidly moves into the critical area of the reach stacker. The collision alarm warns the driver both visually and audibly and can prevent a collision.



A reassuring feeling when an acute collision hazard is averted. Even after this, with RAS Prime, the driver is able to keep an eye on the obstacles thanks to continuous monitoring – and a cool head thanks to the early warning function.

OPERATOR ASSISTANCE FOR COLLISION-FREE CONTAINER HANDLING



Product description

The RAS Prime (Reachstacker Assistance System) driver assistance system is a cost-effective solution that can be retrofitted on reach stackers and empty container handlers. It provides a warning that prevents collisions with other vehicles and the port infrastructure and assists the operator in critical driving situations, e.g., when approach-

ing containers, pillars, and cranes. Obstacles located in one of the defined warning areas are indicated on a display. The operator is warned in advance to ensure appropriate safety distances are maintained. If a collision is imminent, an alarm will alert the operator so that the vehicle can be stopped.

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



Additional information

Detailed technical data	9
Ordering information	9
Dimensional drawing	10
Accessories.....	10

→ www.sick.com/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.



Detailed technical data

Features

Field of application	Port
Vehicle	Reach stackers, empty container handlers
Laser class	1 (IEC 60825-1 (2007-3))

Performance

Display	4.3" touch display
Functions	Audible and visual collision warning Maneuvering assist with active guidance
Number of laserscanners	2
Monitored area	Rear end, rear side left, rear side right
Warning zones	3
GPS	-
Self-diagnostics	✓
WebInterface	Software updates

Interfaces

Ethernet	✓
Function	Software updates
Operator interface	Touch display

Mechanics/electronics

Supply voltage	24 V DC, 19.2 V DC ... 28.8 V DC
Power consumption (typ., max.)	40 W, 165 W, With heating
Weight, display	360 g, 600 g with mounting
Dimensions display (W x D x H)	142 mm x 44 mm x 98 mm (with mounting 130 mm depth)

Ambient data

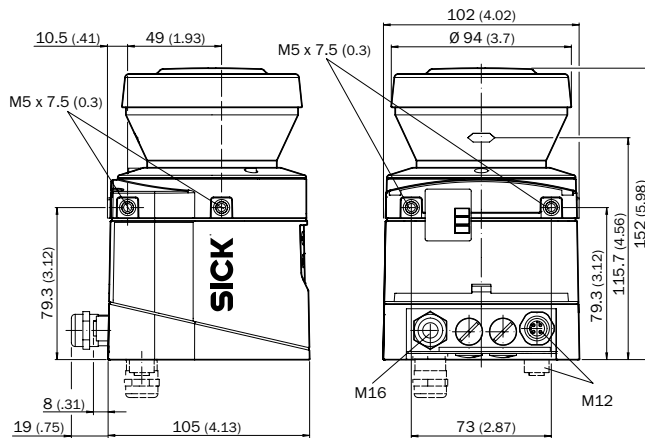
Ambient temperature operation	-25 °C ... +50 °C
Ambient storage temperature	-25 °C ... +60 °C

Ordering information

Applications	Items supplied	Type	Part no.
Collision protection for reach stackers and empty container handlers for container handling in ports	LMS151-10100S03 LMS151-10100S04 Operator display Mounting set for operator 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 operator display	RAS Prime	1057936

Dimensional drawing (Dimensions in mm (inch))

2D laser scanner LMS15x



Accessories


Mounting systems

Mounting brackets and mounting plates


Figure	Brief description	Type	Part no.
	Mounting kit with shock mount for LMS1xx	Mounting kit with shock mount	1053343

Connection systems

Modules and gateways

Figure	Brief description	Type	Part no.
	Connection box for power (sensors, display, sound generator, Ethernet switch)	Connection box	2070552

Plug connectors and cables

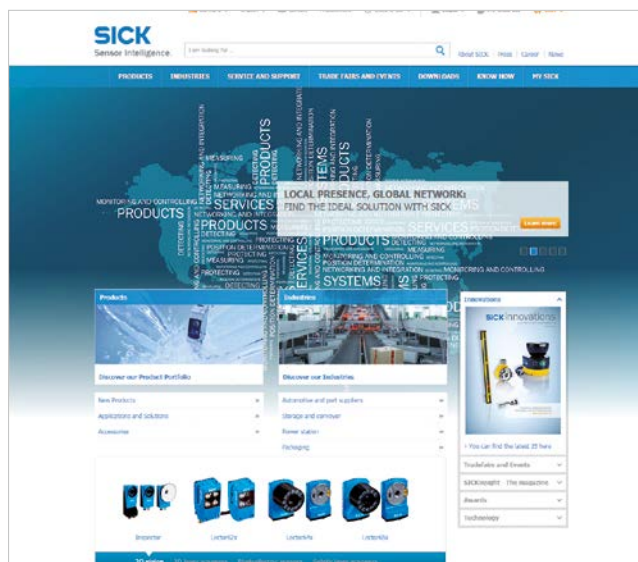
Figure	Accessory family	Brief description	Cable length	Type	Part no.
	Connection cables with male and male connector	Head A: male connector, M12, 4-pin, straight, D-coded Head B: male connector, RJ45, 8-pin, straight Cable: Ethernet, drag chain use, PUR, shielded	10 m	SSL-2J04-G10ME	6030928

Power supply units and power cord connectors

Brief description	Type	Part no.
DC/DC converter with connecting cables, input operating voltage range 13 V ... 32 V, output operating voltage 24 V, output power 240 W	DC/DC converter	6044524

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SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 7,400 employees and over 50 subsidiaries and equity investments as well as numerous agencies 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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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 further locations → www.sick.com