Leuze

RSL 200, RSL 400
Safety Laser Scanners

Safety at Leuze

The Sensor People

Safety Laser Scanners

The powerful RSL 200 and RSL 400 safety laser scanners are equally suitable for safeguarding machinery and systems as well as automated guided vehicles (AGV) and autonomous mobile robots (AMR).
Thanks to their configurable protective and warning fields, they can be used for a wide range of applications – and impress with their easy handling and robust operation.

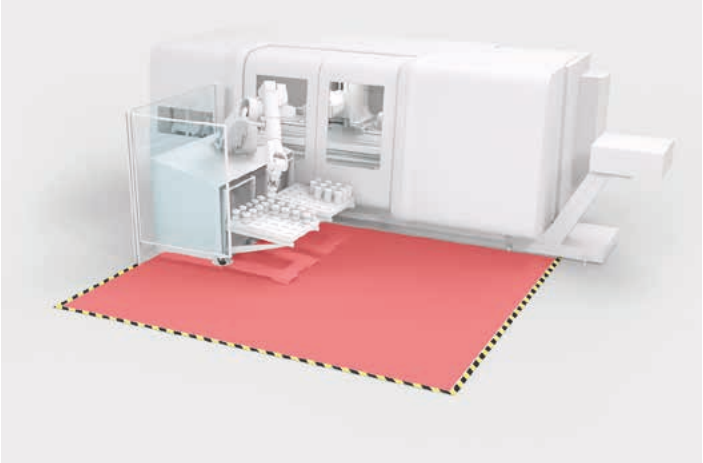
RSL 200
Efficient safety with minimal space requirements

The ultra-compact RSL 200 safety laser scanners have an operating range of 3.0 m and a scanning angle of 275°. Measuring just 80 x 80 x 86 mm, they are ideal for use on AGVs and AMRs.

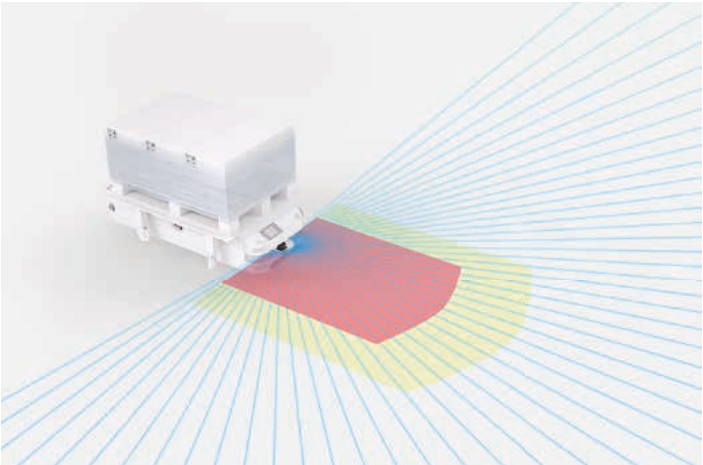
RSL 400
Innovations successfully combined

The RSL 400 safety laser scanners stand out for their large operating range of 8.25 m and a scanning angle of 270°. They are particularly suitable for monitoring large areas. Together with two protective functions, one RSL 400 is able to perform tasks that previously required two scanners.

For area guarding at machines and systems



For safeguarding and navigation of AGVs and AMRs.

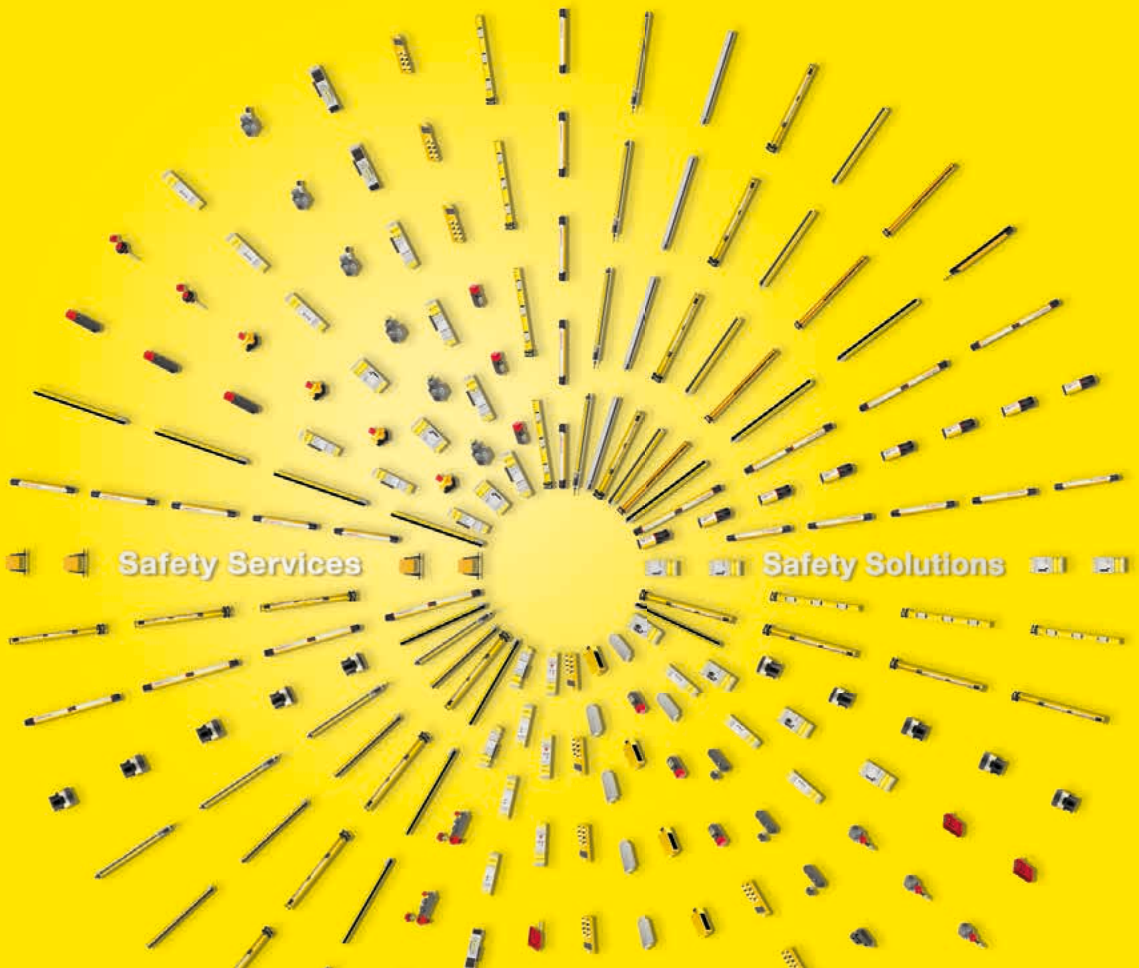


Safety at Leuze

Safety Thought Further.
For all your safety applications worldwide.

Global industry is in a constant state of change. And with it, the complex requirements for safety concepts to protect people and systems. At the same time, the importance of smooth process flows continues to grow due to automation and networking.

Our driving force is the desire to guarantee you gapless safety, efficient material flow and maximum availability at all times. This is why we have bundled our expertise in work and machine safety into one portfolio: Safety at Leuze.



Experts for your application

Effective solutions begin with a comprehensive understanding of the relevant requirements. Our specialized application expertise and many years of experience in our core industries mean that we can offer a unique insight into safety-related applications. Coupled with extensive knowledge of norms and standards, we provide you with targeted answers that are able to solve even complex challenges effectively and efficiently.

Everything from a single source

Individual requirements need flexible solutions. Our high-quality products and intelligent systems as well as competent technical advice and support form the basis of our safety portfolio. Benefit from our extensive range of products. The diversity of our portfolio means that we are able to provide you with all components, from sensor to control, from a single source – all with maximum user-friendliness and all optimally matched to each other.

Experienced safety specialists

Sustainable machine safety begins with professional planning of the safety systems. It spans the entire lifecycle of a machine. Let our experienced and certified safety experts support you with competent advice. Take advantage of over 30 years of experience in machine safety and the passionate commitment of the Sensor People.

Innovative safety concepts

New challenges call for innovative approaches. We are constantly developing new products and system solutions in order to meet existing requirements even better and to meet new challenges effectively. Particularly in the area of optical sensors, new technological concepts mean that we are able to set milestones again and again. From the very first safety photoelectric sensor to concepts such as Smart Process Gating – we actively shape the advances made in industry.

Applications

Stationary area protection

With their configurable protective fields, the RSL 200 and RSL 400 models are the ideal solution for standard area guarding tasks as well as applications with protective field switchover and multiple protective functions. Thanks to the wide scanning angle of 275° / 270° and large operating ranges of 3.00 m to 8.25 m, the devices can be flexibly adapted to the safety task concerned.

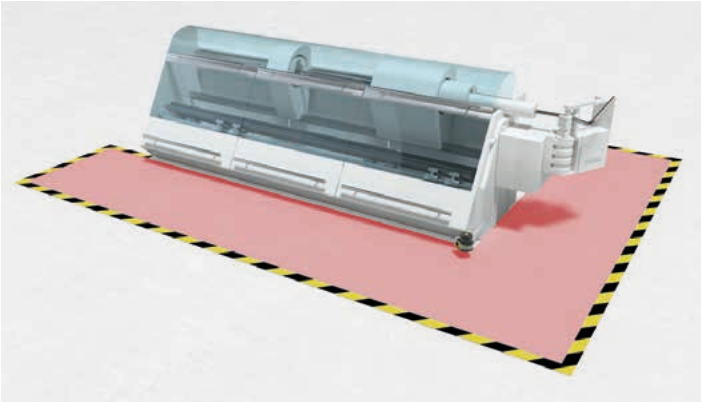
Area guarding

Requirement: The danger zone of the system is to be safeguarded against access by persons. At the same time, the presence of persons is to be monitored to enable the machine or system to restart automatically when the zone has been vacated.

Solution: The RSL 200 / 400 scanners detect the entry and presence of persons in the monitored area. The configurable protective field can be easily adapted to the size of the area to be safeguarded. Thanks to its large operating range, the RSL 400 is even able to guard areas of up to 160 m^2 with just one device.

Area guarding on corners with up to 275° scanning angle

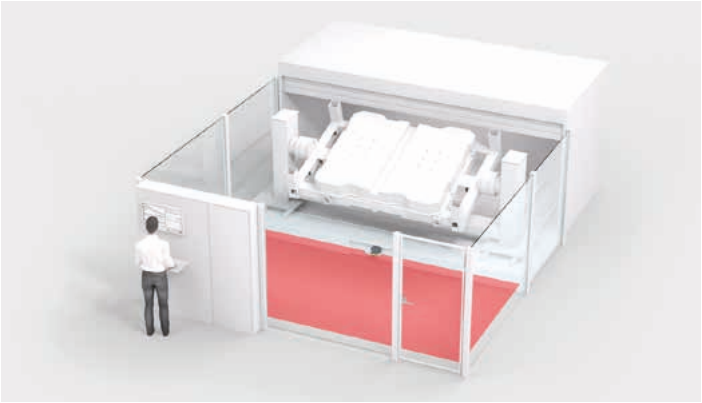
Requirement: The hazardous working range of the machine is to be guarded against entry by and the presence of persons. The contour of the monitored area is to be adapted to the contour of the machine.



Solution: With a scanning angle of 270°/275°, all models of the RSL family are able to guard two sides of a machine ‘around corners’ with just one device. The configurable protective fields allow the monitoring area to be easily adapted to the contours of the machine. With an operating range of up to 8.25 m, the RSL 400 models can safeguard even large machine areas with just one device.

Restart protection and monitoring of hidden areas

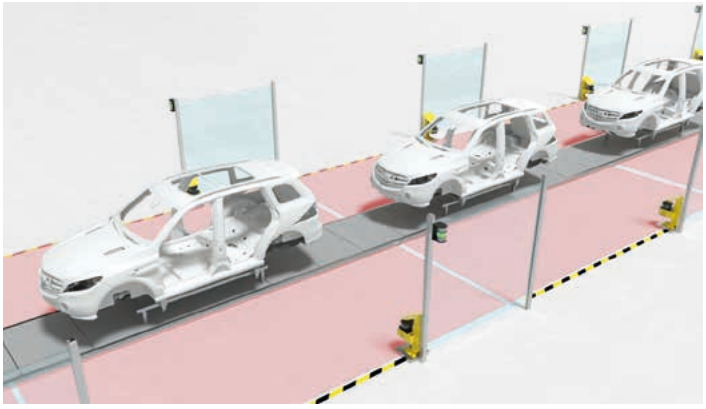
Requirement: To prevent danger, the process may only be restarted once it has been ensured that no person is present in the working range or in the hidden area.



Solution: With their configurable protective field, the RSL 210 and RSL 410 safety laser scanners are able to monitor the presence of persons even in hidden areas.

Area guarding in automated production plants

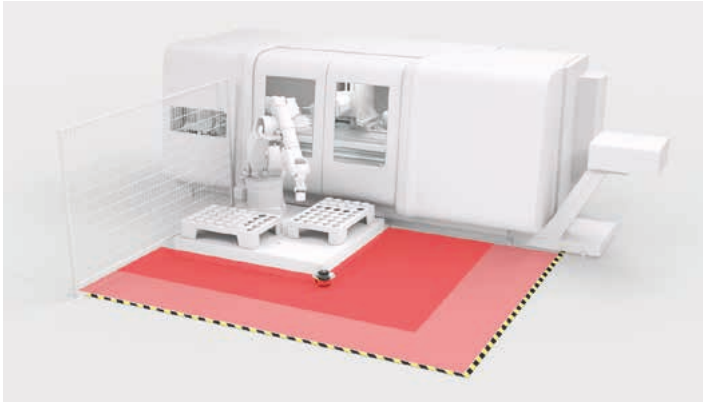
Requirement: The working areas in automated production plants are to be safeguarded and the used safety devices are to be integrated using industrial Ethernet networks.



Solution: With their operating range of up to 8.25 m, the RSL 400 scanners can safeguard even large stations with just one device. Via the PROFIsafe / PROFINET interface, the devices can be easily integrated into industrial Ethernet networks and offer extensive diagnostic options.

Reducing speed safely

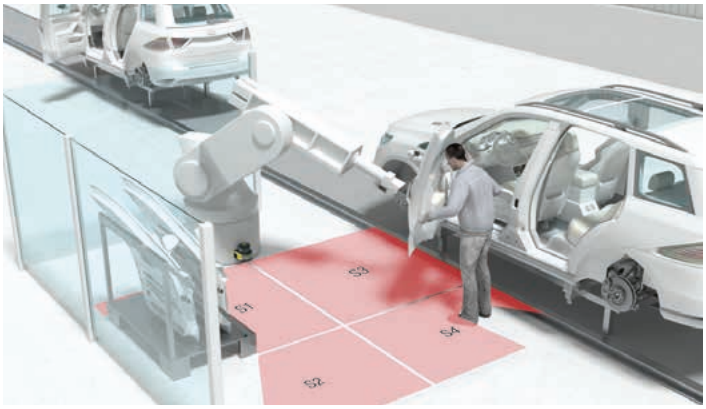
Requirement: If a person approaches the danger zone, the hazardous movement is not to be stopped immediately, but instead operation is first to continue at a reduced speed. The movement is to be stopped only if the person continues to approach.



Solution: An RSL 400 safeguards the danger zone with two independent protective fields. This enables the implementation of functions for safe speed reduction.

Area guarding for human-robot collaboration

Requirement: Depending on the movement of the person involved in the assembly process, different safety functions are to be performed.



Solution: The RSL 400 models with PROFIsafe monitor four protective fields simultaneously. This enables position-dependent monitoring of the working range, e.g. for safe reduction of the working speed.

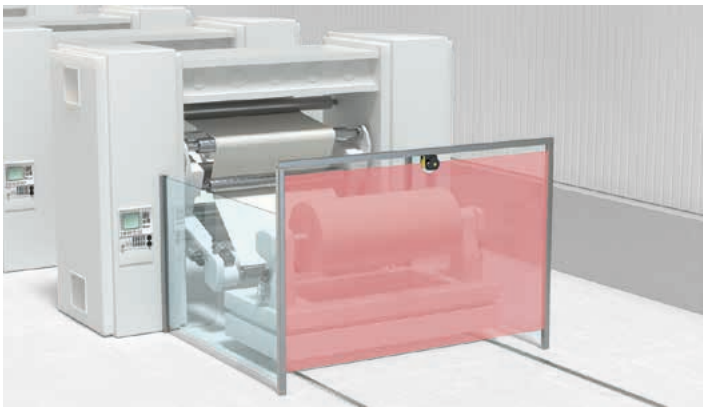
Applications

Stationary guarding of access points and points of operation

When used for access or point of operation guarding, the RSL 400 safety laser scanner is installed vertically. This allows it to identify persons or a hand, for example. In these applications too, the devices impress with their extremely large operating range.

Access guarding

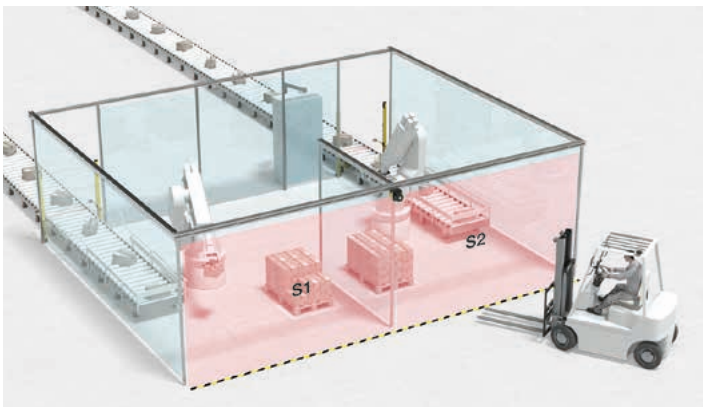
Requirement: Access to the danger zone is to be monitored by means of optoelectronic safety sensors. In addition, movement inside the access area is not allowed to be restricted by the sensor system.



Solution: The RSL 400 is installed above the access area and the protective field is aligned vertically. Thanks to its large operating range, even large access points can be safeguarded with one device. To avoid safety gaps, correct alignment of the device is monitored using a reference contour.

Dual access guarding

Requirement: The two adjacent access points to the danger zones are to be safeguarded efficiently without restriction of movement inside the access areas.



Solution: The RSL 400 is installed centrally above the access areas and the protective field aligned vertically. With its two independent protective functions (S1+S2), the RSL 400 operates like two scanners in one device. This means that both stations are fully safeguarded with just one scanner. Thanks to the 8.25 m operating range, even very large access points can be safeguarded.

Point of operation guarding

Requirement: The point of operation at a machine or system is to be safeguarded by optoelectronic safety sensors. In addition, movement inside the working area is not allowed to be restricted by the sensor system.

Solution: The RSL 400 is installed above the machine opening and the protective field is aligned vertically.
A safety resolution of 40 mm (hand detection) is selected. The RSL 400 monitors its correct alignment using a reference contour. This avoids possible safety gaps resulting from unintentional changes.

Maximum operating range for all resolutions

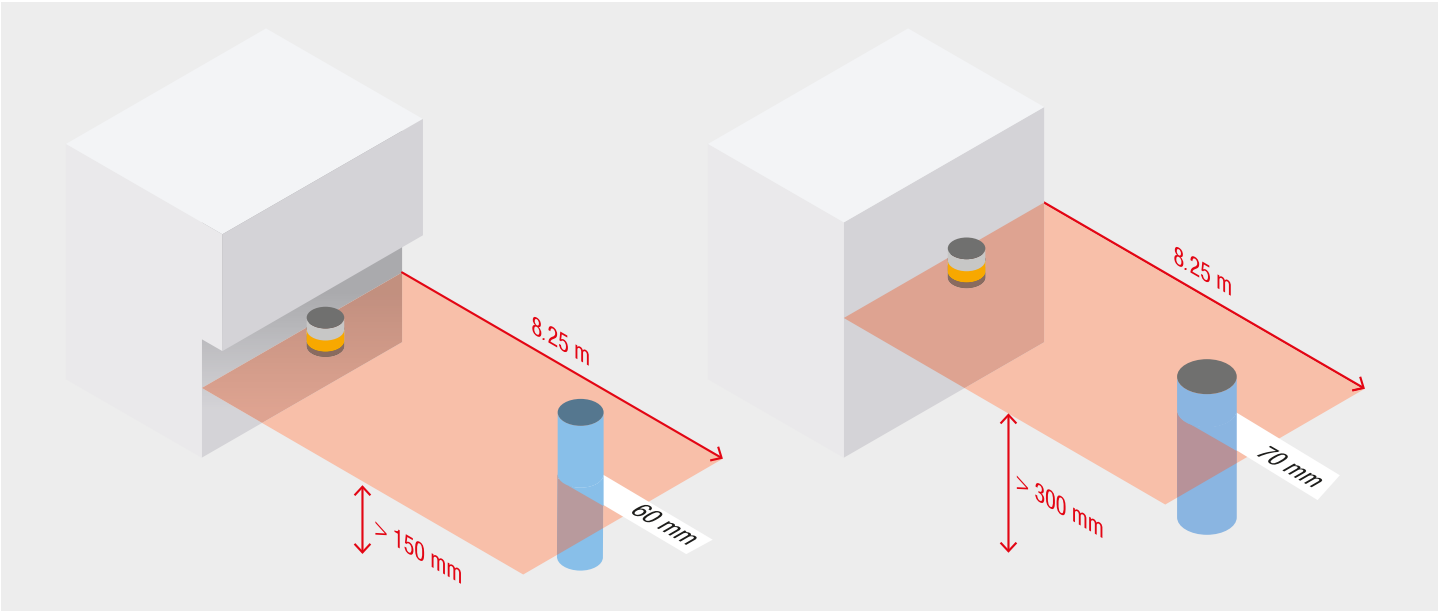
It is not just the standard safety resolution of 70 mm that makes the RSL family so powerful. Even at higher safety resolutions, the unit impresses with extremely large operating ranges.

Protective field range per RSL version

		RSL 200-S	RSL 400-S	RSL 400-M	RSL 400-L	RSL 400-XL
Resolution	150 mm*		3.00 m	4.50 m	6.25 m	8.25 m
	70 mm	3.00 m	3.00 m	4.50 m	6.25 m	8.25 m
	60 mm		3.00 m	4.50 m	6.25 m	8.25 m
	50 mm	3.00 m	3.00 m	4.50 m	6.25 m	6.25 m
	40 mm		3.00 m	4.50 m	4.50 m	4.50 m
	30 mm		3.00 m	3.50 m	3.50 m	3.50 m

*) 150 mm resolution only with RSL 400

The RSL 400 maintains its full operating range even with a resolution of 60 mm for installation close to the ground



If a safety laser scanner has to be mounted at a height below 300 mm due to structural conditions, a higher safety resolution (lower value) must be selected in accordance with ISO 13855. For many scanners, this significantly reduces the operating range. The RSL 400 proves its capabilities here: even at mounting heights between 150 mm and 300 mm, all models retain their full operating range of up to 8.25 m.

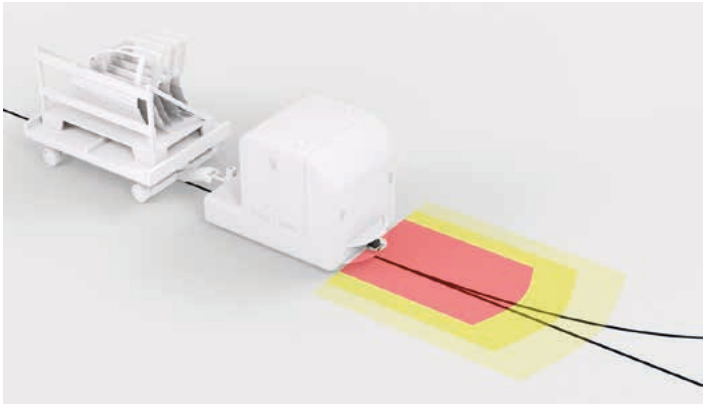
Applications

AGV and AMR safeguarding and navigation

Thanks to the configurable and switchable protective and warning fields, the RSL 200 / 400 scanners are ideal for flexible safeguarding of AGVs and AMRs. They allow the monitored areas to be optimally adapted to curved paths, different speeds and various load conditions. In addition, measurement value output for navigation of the vehicles is optionally integrated in the RSL 200 and RSL 400.

Safeguarding compact vehicles with simple transportation paths

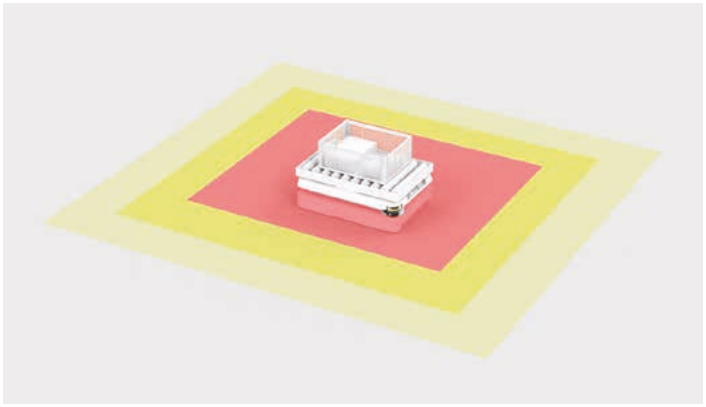
Requirement: The compact towing vehicle moves in one direction – e.g. by means of optical guidance. The transportation path of the vehicle must be safeguarded.



Solution: The RSL 220 safeguards the transportation path of the vehicle. Eight switchable sets of protective and warning fields enable easy adaptation in the case of curved paths and different speeds.

Safeguarding omnidirectional AGVs / AMRs for small loads

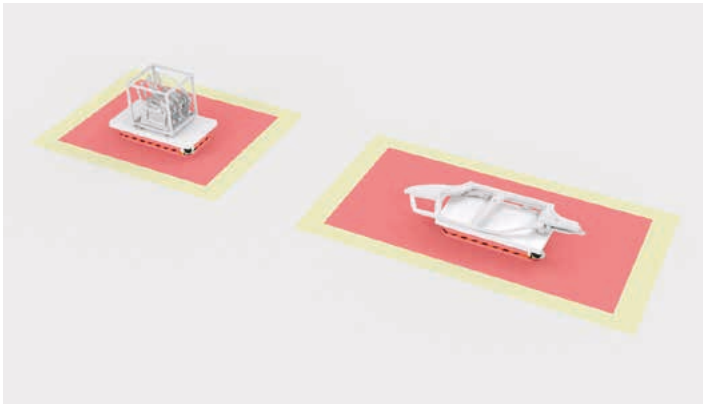
Requirement: The transportation path of the omnidirectional AGV / AMR must be safeguarded in all directions of travel.



Solution: The RSL 200 models safeguard AGVs and AMRs in all directions. Thanks to the scanning angle of 275°, only two diagonally mounted devices are required.
32 switchable sets of protective and warning fields enable adaptation to the respective direction of travel and speed.

Safeguarding omnidirectional AGVs / AMRs for large loads

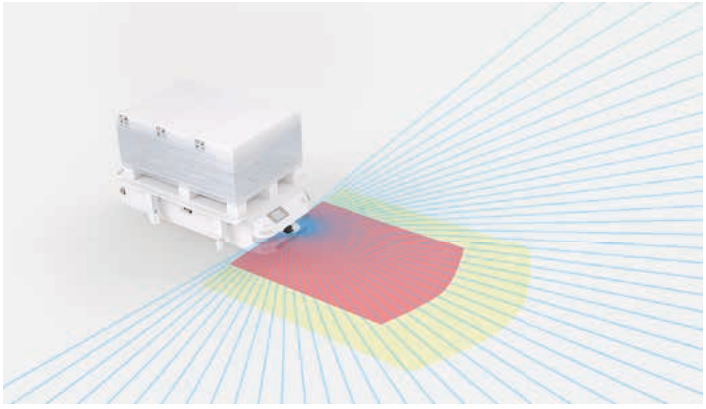
Requirement: The transportation path of omnidirectional AGVs / AMRs for large loads is to be safeguarded in all directions of travel. The vehicles transport various loads, such as very large and overhanging parts.



Solution: With their scanning angle of 270°, two diagonally mounted RSL 400 scanners safeguard a vehicle on all sides. An operating range of 8.25 m ensures that even large vehicles and loads are reliably safeguarded. Up to 100 switchable sets consisting of protective and warning fields enable adaptation to direction of travel, speed and different loads.

AGV / AMR navigation for small loads

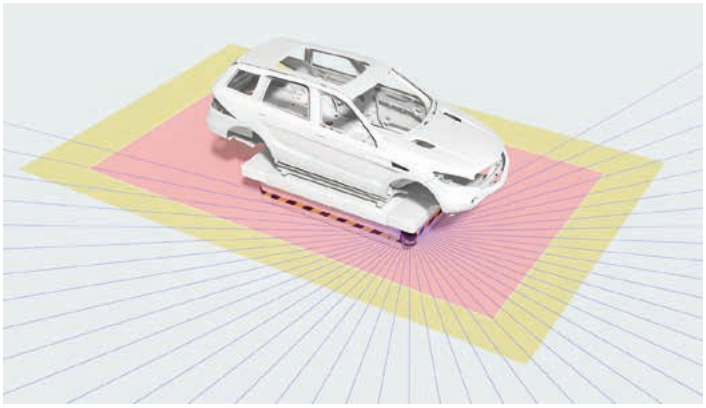
Requirement: On compact vehicles, the safety laser scanner must provide not only the safety function but also measurement data for natural navigation.



Solution: Measuring just 80 x 80 x 86 mm, the RSL 235 combines safety technology and measurement value output in one device. It is therefore particularly suitable for use on compact vehicles where the compact design of the scanner is a key factor. The devices have operating ranges of 3 m for the protective field and 25 m for the measurement data.

Navigation of AGVs / AMRs for large loads

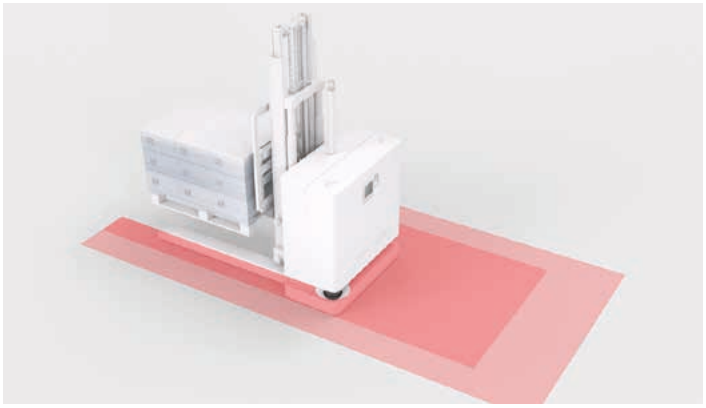
Requirement: On vehicles for large loads, the safety laser scanner is to provide not only the safety function but also measurement values for natural navigation. Features are to be reliably detected even at a great distance or if they are particularly small.



Solution: The RSL 400 merges safety technology and measurement value output in a single device. Its protective field range of up to 8.25 m also safeguards large vehicles. Thanks to the high angular resolution of 0.1°, the devices detect even small features and have an operating range of 50 m for the measurement data.

Reducing speed safely

Requirement: When persons or objects in the protective field are detected, the speed is to be safely reduced first before the machinery is stopped completely, and a correspondingly smaller protective field is to be used.

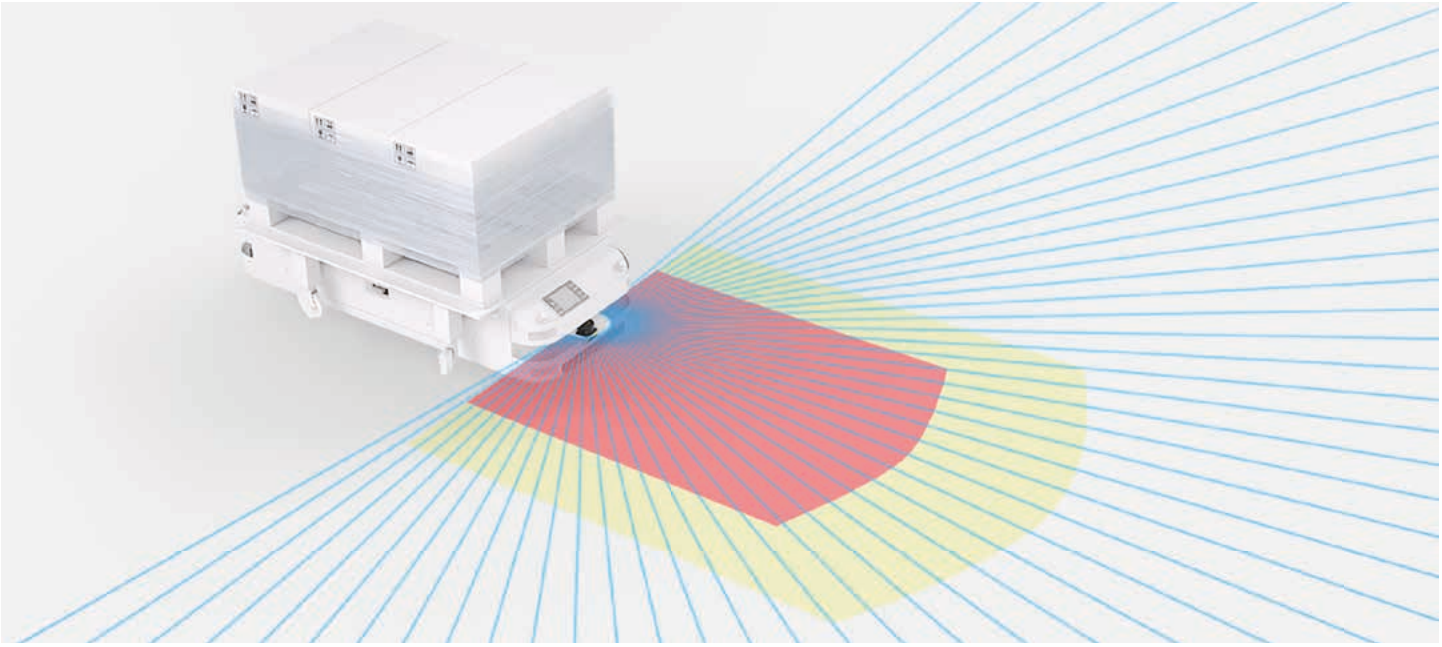


Solution: Available both as an I/O model and a PROFIsafe model, the RSL 400 offers two protective fields simultaneously. This enables the implementation of functions for safe speed reduction.

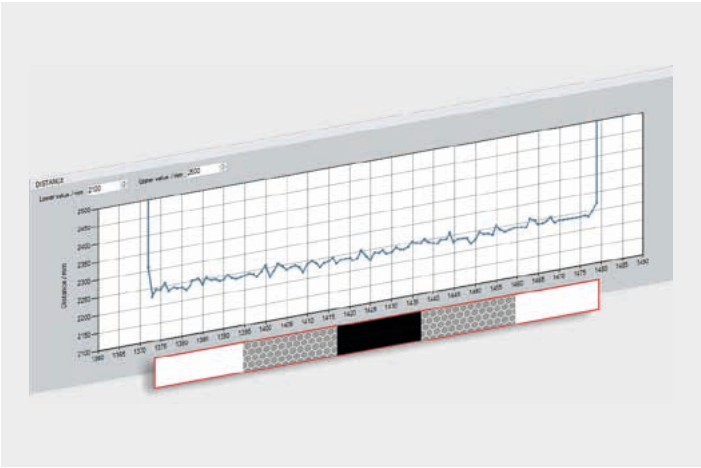
Measurement data output for natural navigation

If the principle of natural navigation (or SLAM navigation) is used for navigation, the RSL 200 / 400 scanners provide not only first-class safety technology but also the measurement data necessary for navigation.

Here, the quality of the measurement data provided by the laser scanner is critical. The RSL 200 / 400 devices stand out for their reliable distance values, a uniform and position-neutral laser spot, and unique signal strength values for reflector detection. Furthermore, the RSL 400 models impress with their high angular resolution of 0.1 degrees and a measurement range of 50 meters.

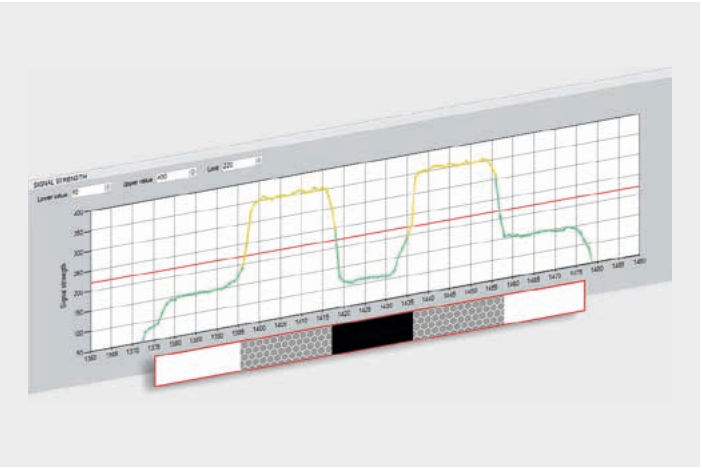


Reliable distance values



Whether reflector or a black wall – the RSL 200 / 400 provide unique distance values that are not influenced by the reflectance of the object. The RSL 200 has a measurement range of up to 25 meters and the RSL 400 a measurement range of up to 50 meters.

Signal strength values for reflector detection



The RSL 200 / 400 scanners output the received signal strength value for each beam. The navigation software can thus independently and reliably identify reflectors. The signal strength increases significantly when beams hit a reflector.

Overview of key characteristics for AGV / AMR applications with measurement data output for navigation

RSL 200

RSL 400

Safety	Protective field operating range	3.00 m	3.00 | 4.50 | 6.25 | 8.25 m
	Warning field operating range	15 m	20 m
	Scanning angle	275 °	270 °
	Number of field pairs (1 protective field + 1 warning field)	–	10 | 100
	Number of 3-field sets (1 protective field + 2 warning fields)	32	–
	Number of 4-field sets (2 protective fields + 2 warning fields)	–	– | 50
Measurement value output for navigation	Data output	UDP via Ethernet, cycle time 25 ms	UDP via Ethernet, cycle time 40 ms
	Measurement data operating range	25 m	50 m
	Scanning angle	275 °	270 °
	Angular resolution	0.2 °	0.1 °
	Systematic measurement error (measurement range up to 25 m)	± 20 mm	± 10 mm
	Output of distance values, configurable	X	X
	Output of signal strength values, configurable	X	X
	ROS driver (version 1 and 2)	X	X
General	Dimensions (W x H x D)	80 x 80 x 86 mm	140 x 149 x 140 mm | 140 x 169 x 140 mm
	Interface	I/O	I/O, PROFIsafe

RSL 200

Efficient safety with minimal space requirements

The RSL 200 safety laser scanners are optimized for minimal space requirements. This makes it suitable for use on AGVs and AMRs. Clever features such as rotatable connections and a smart diagnostics app enable simple integration and efficient maintenance.

Your benefit

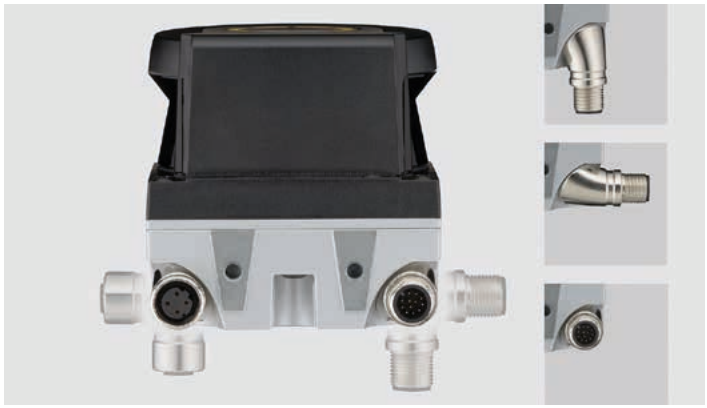
- Thanks to the small dimensions of 80 x 80 x 86 mm, the devices can also be integrated perfectly into compact AGVs and AMRs
- Reliable operation: Robust against shocks and vibrations as well as dirt and airborne particles
- Different function variants always offer the right solution:
  - up to 32 switchable field sets for dynamic adaptation to the protection scenario
  - high-quality data output for AGV and AMR navigation
- Easy integration thanks to standard M12 connections with rotating connectors
- Fast access to status information and simple diagnosis using the RSL 200 app

	RSL 200
Features	3.00 m operating range with 275° scanning angle
	Safety: Type 3, performance level PL d, SIL 2
	Up to 32 configurable field sets (1 protective field and 2 warning fields)
	Configuration and diagnosis via USB and Bluetooth, also Ethernet TCP / IP in the case of RSL 230 / 235
	High-quality measurement data output of distance value and signal strength
	Selectable resolution 70 / 50 mm
	Easy and convenient diagnosis via RSL 200 app (Android and iOS)
	Easy-to-use configuration software in 9 languages with context-sensitive online help

Robust in operation

The RSL 200 is very adept at filtering out objects that are not safety-relevant, such as dust and particles in the air. Thanks to the LiDar technology used and the resulting reduced mass, the RSL 200 is also robust against vibrations and shock. This reduces unnecessary switching off.

Rotating connections for perfect integration



With its rotating connections, the RSL 200 provides maximum flexibility for integration. Cables can thus be routed optimally and the required installation space is minimized.
The use of common M12 connectors also makes installation easier.

Optimized for minimal space requirements

The mounting bracket allows easy horizontal and vertical alignment of the RSL 200. Here, too, the design is optimized for minimal space requirements.
Furthermore, if servicing is required, the devices can be swapped out easily with just two screws without needing to be realigned.

AGV and AMR safeguarding and navigation

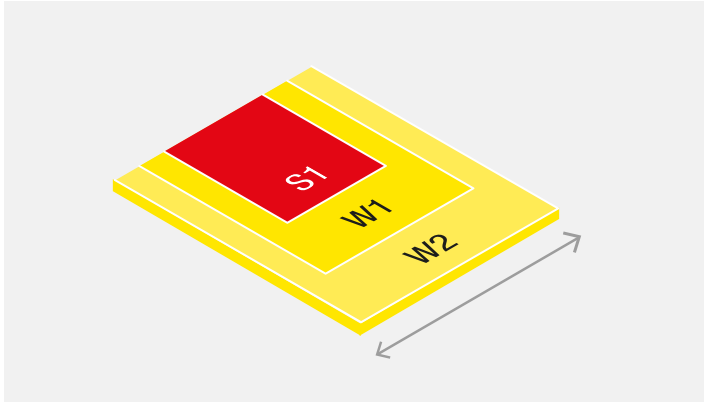
This is where the RSL 200 shows its strengths: minimal space requirement, up to 96 configurable fields, easy integration and measurement value output for navigation make it ideal for use on AGVs and AMRs.

Ideal for compact vehicles

With their small dimensions of 80 x 80 x 86 mm (W x H x D), the RSL 200 scanners are ideal for safeguarding compact vehicles. The devices have a scanning angle of 275°. This allows vehicles to be fully safeguarded on all sides using two scanners.

At the same time, the RSL 200 models deliver the necessary measurement data for navigation of the vehicles.

Flexible safeguarding



Up to 96 configurable fields enable flexible adaptation to the speed, direction of travel and vehicle load. Switchover takes place in 3-field sets (triples), which each consist of one protective field and two warning fields. Up to 32 adapted configurations are therefore available.

Easy I/O concept

The RSL 200 is connected via a standard M12 connector with 8 pins or 12 pins depending on the device's respective function. All functions, including protective field switchover, can be controlled and evaluated via this connection. This makes the RSL 200 scanners particularly easy to integrate.

The RSL 230 / 235 models have additional Ethernet data transmission via an extra 4-pin M12 connection.

Simple and efficient

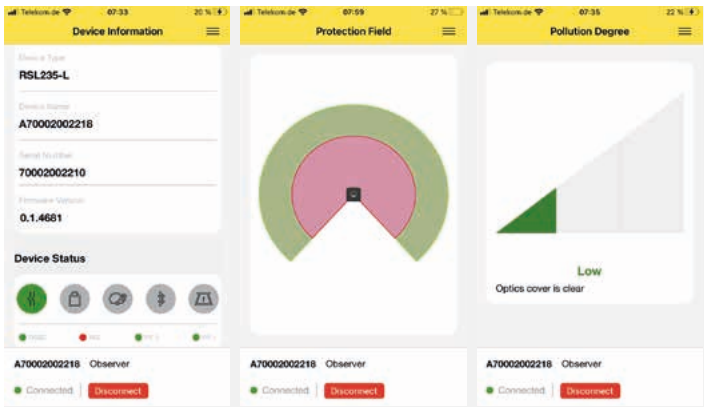
Whether installation, operation or service: sophisticated details ensure easy handling and fast access to status information.

Three communication options

All RSL 200 scanners have USB and Bluetooth interfaces for configuration and diagnosis. In addition, thanks to their integrated Ethernet TCP/IP interface, the RSL 230 / 235 models are already network-capable, e.g. for the transmission of measurement data for navigating AGVs / AMRs or for diagnosis via central access points.

— USB
— Bluetooth
— Ethernet TCP / IP (RSL 230 or later)

Fast diagnosis using the RSL 200 mobile app



The RSL 200 mobile app enables easy access to status information and diagnostic data via Bluetooth – even if the RSL 200 is mounted in a poorly visible area or access to the device is limited. It allows important, detailed information to be collected remotely without having to interrupt the protective field.
All messages are displayed in plain text and, if necessary, can also be sent directly to the Leuze service center.
The app can be used on smartphones and tablets with the Android or iOS operating system.

High availability thanks to removable configuration memory

The RSL 200 models have a removable configuration memory. If the device needs to be serviced, the device configuration can thus be quickly and easily transferred to a new device.

RSL 400

Innovations successfully combined

The innovative RSL 400 safety laser scanners stand out for their performance, robustness and easy handling. Thanks to their high operating range of 8.25 m and scanning angle of 270°, they can monitor even large areas. Together with two protective functions, one RSL 400 is able to perform tasks that previously required two scanners.

Your benefit

- Operating ranges of 3 m to 8.25 m and various function variants always offer the right solution for your application
- Simple integration into industrial networks by using variants with PROFIsafe / PROFINET interface
- High-quality measurement value output with a resolution of 0.1° for reliable AGV navigation
- Simple handling through removable connection unit, display that is readable from a distance, and integrated spirit level

	RSL 400
Features	Operating range up to 8.25 m with 270° scanning angle
	Safety: Type 3, performance level PL d, SIL 2
	Up to 200 configurable fields, switchable as field pairs or 4-field sets
	I/O models with 1 or 2 parallel protective functions, PROFIsafe models with 1 or 4 parallel protective functions
	Configuration and diagnosis via Ethernet TCP/IP, USB (RSL 420 or later) and Bluetooth
	High-quality measurement data output of distance value and signal strength with 0.1° angular resolution
	Selectable resolution of 30 / 40 / 50 / 60 / 70 / 150 mm
	Easy-to-use configuration software in 9 languages with context-sensitive online help

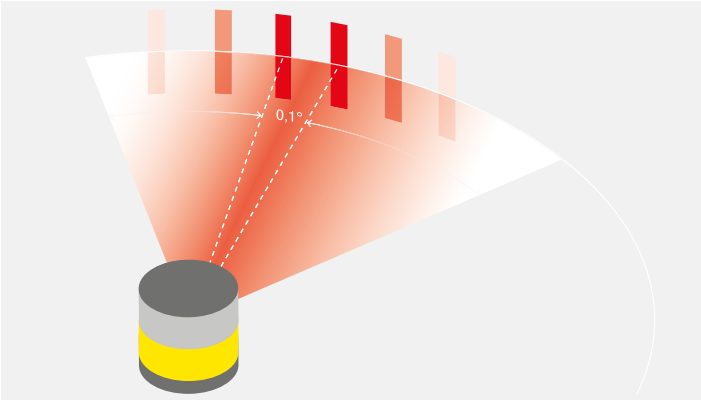
Effective due to rotation

With the RSL 400, the entire transmit/receive system rotates. This means an extremely narrow and uniform laser spot is created over the entire scanning range, which provides the basis for the high angular resolution of 0.1 degree (3x higher sampling compared to conventional scanners).

Robust in operation

The RSL 400 is very adept at filtering objects that are not safety-relevant, such as dust and particles in the air. This reduces unnecessary switching off.

Large operating range and extremely high-quality measurement data

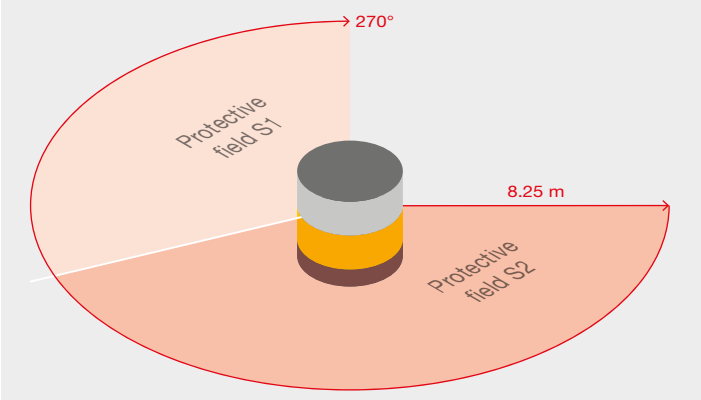


The high angular resolution of 0.1 degrees makes the RSL 400 particularly suitable for applications in the areas of natural navigation and SLAM (simultaneous localization and mapping).

Always the right configuration

8.25 m operating range, 270° scanning angle, 200 configurable fields and up to four parallel protective functions: with their diverse protective and warning functions, the RSL 400 scanners can be flexibly adapted to both stationary and mobile applications.

Two scanners in one



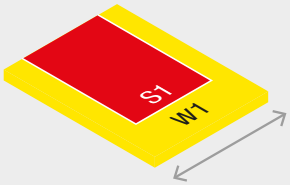
With their operating range of up to 8.25 meters and the scanning angle of 270 degrees, the RSL 400 models are also able to monitor large areas at machines and systems simply and efficiently. Together with two protective functions, one RSL 400 is able to perform tasks that previously required two scanners.

Safeguarding and navigation of large AGVs

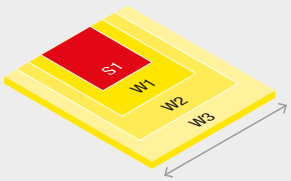
With an operating range of up to 8.25 m, the RSL 400 scanners are ideal for safeguarding large vehicles and loads. Up to 100 switchable field pairs allow easy adaptation of the protective fields to different transport materials. The RSL 400 models deliver the measurement data necessary for navigation according to the principle of natural feature navigation.

Maximum flexibility with 200 fields

1 protective function

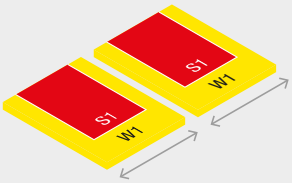


100 switchable field pairs: 1 protective field + 1 warning field

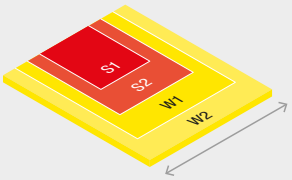


10 switchable 4-field sets: 1 protective field + 3 warning fields

2 parallel protective functions



2 x 10 switchable field pairs: each 1 protective field + 1 warning field, independently switchable



50 switchable 4-field sets: 2 protective fields + 2 warning fields
Can also be configured as a set with 4 protective fields with PROFIsafe

The RSL 400 offers maximum flexibility to adapt to the given application with up to 200 configurable fields that can be switched as pairs or sets of 4 fields. With two parallel protective functions, it works like two devices in one or offers an additional, upstream protective field as an alternative to a warning field. This safeguards the warning function. In the PROFIsafe version, the RSL 400 monitors even four protective fields simultaneously.

User-friendly – clever details

Whether installation, operation or service: well-thought-out details, such as the removable connection unit and integrated display, ensure easy handling.

Removable connection unit

The connection unit of the RSL 400 is removable and can be mounted separately. The scanner head thus remains protected and can simply be attached afterwards.If service is required, the scanner can be replaced in less than 30 seconds: turn two screws by 90° and the scanner head can be replaced. Without realignment, readjusting and configuration effort, as the configuration memory is integrated in the connection unit.

Three communication options

Suitable access is always guaranteed with three means of communication for configuration and diagnosis. In addition, all RSL 400 models are already network-capable thanks to the standard Ethernet-TCP/IP interface, e.g. for diagnosis via central access points.

— Ethernet TCP / IP
— USB (RSL 420 or later)
— Bluetooth

Device status always viewable

The RSL 400 is the only safety laser scanner on the market with an integrated display on which the text messages can be easily read, even from a distance of several meters. This ensures that information about status and protective field violations is directly accessible. In addition, the bright status LEDs provide a quick overview.

Integrated level

The built-in electronic spirit level allows you to quickly align the RSL 400. This is automatically activated when the device is switched on for the first time.

Safe in the network

The RSL 400 PROFIsafe scanners with PROFINET interface can be easily integrated into industrial networks. Thanks to the standardized connection technology, integration is fast and reliable. Furthermore, the models also have interesting additional functions for mobile and stationary applications.

- 2-port switch integrated in connection unit
- Network functions remain intact even if a scanner is swapped out; no network interruptions
- For use in star, line and ring topologies
- Supports PROFINET Conformance Class C and Isochronous Real Time communication (IRT)

Scanner head with PROFIsafe function

Connection unit with integrated PROFINET switch

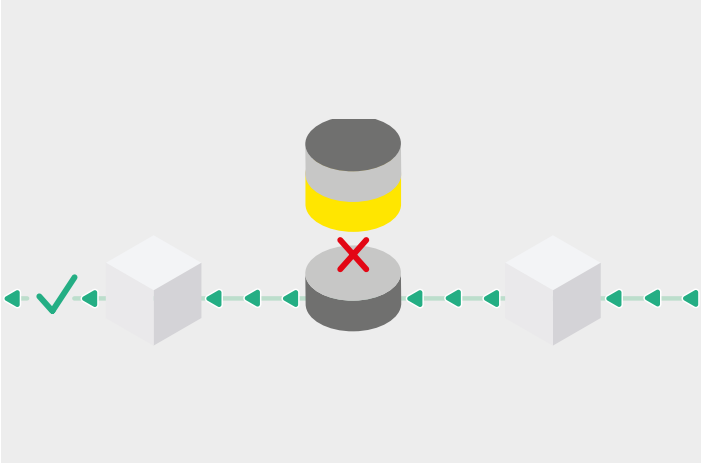
PROFINET connection unit with standard M12 connections

- PROFINET connection unit with industrial M12 connectors for 2-port switch and voltage supply
- Model 4x M12 with additional output for the voltage supply of multiple devices in series connection

PROFINET connection unit, AIDA-compliant

- AIDA-compliant PROFINET connection unit with push-pull connectors
- Network connection via copper or fiber optic cable

Replace without network interruption



The removable connection unit with a PROFINET switch means the scanner can be replaced without causing an interruption.

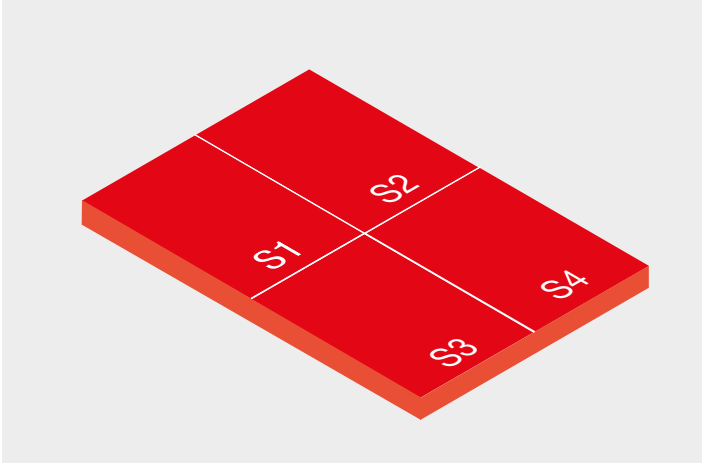
Freely usable display

The RSL 400 outputs text generated by the control with up to 32 characters on the display.

Safe speed reduction by means of an upstream protective field

The RSL 450P / 455P scanners provide parallel evaluation of two protective fields. By incorporating an upstream protective field, this allows the machine speed to be safely reduced at first. Triggering of the inner protective field then generates a stop signal. For dynamic, state-related area guarding – e.g. at robots or AGVs and AMRs – up to 100 switchable sets consisting of two protective fields are available.

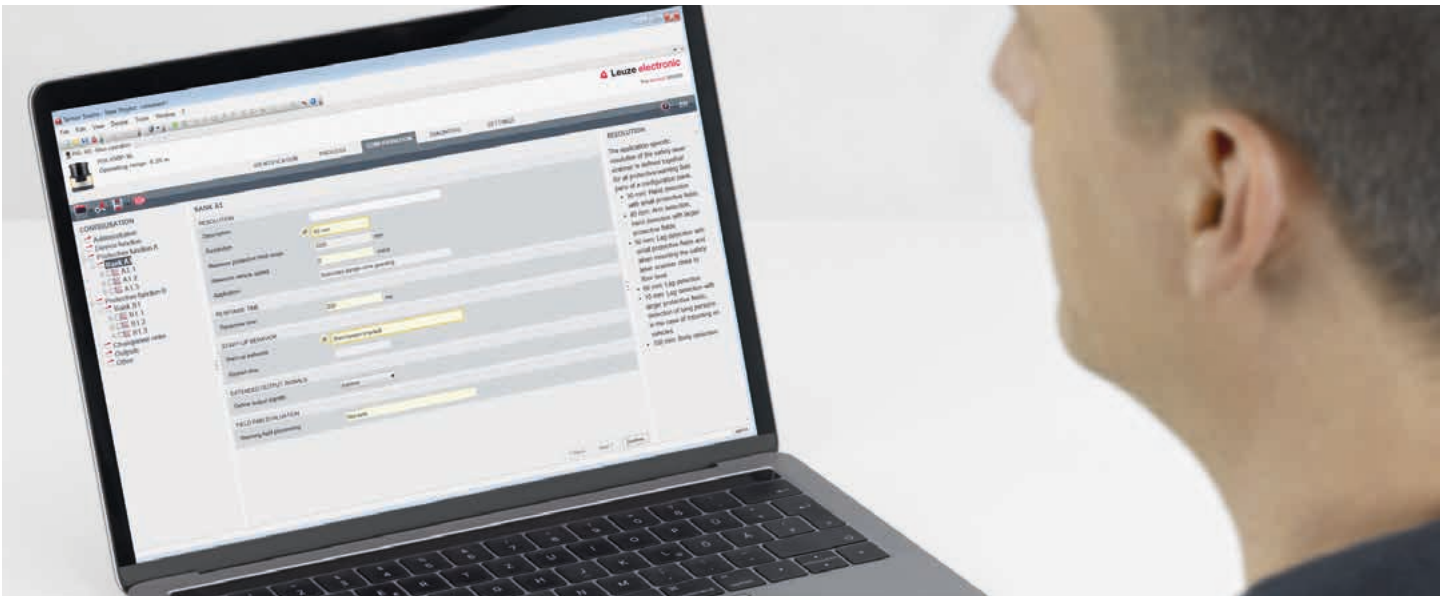
Simultaneous monitoring of multiple areas



The RSL 450P / 455P scanners monitor up to four protective fields simultaneously. This enables e.g. position-dependent monitoring of the working range in the case of human-robot collaboration. With a total of 200 configurable protective fields – organized into 50 switchable 4-field sets – even dynamic applications can be safeguarded flexibly.

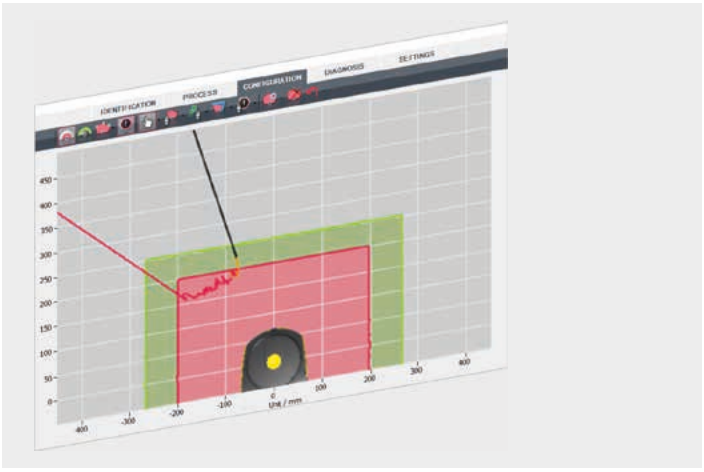
Simple, user-friendly configuration and operation

The Sensor Studio configuration and diagnostic software makes it easy to configure and commission the RSL 200 and RSL 400 scanners. The parameters are depicted in an easy-to-understand and graphical form.



The Sensor Studio configuration software is easy to use and offers users numerous convenient functions.

Intuitive and precise user interface



- Simple design and adaptation of the protective fields through different drawing functions
- Import/export for editing corner point coordinates in Excel
- Quick and precise online presentation of the scan contour

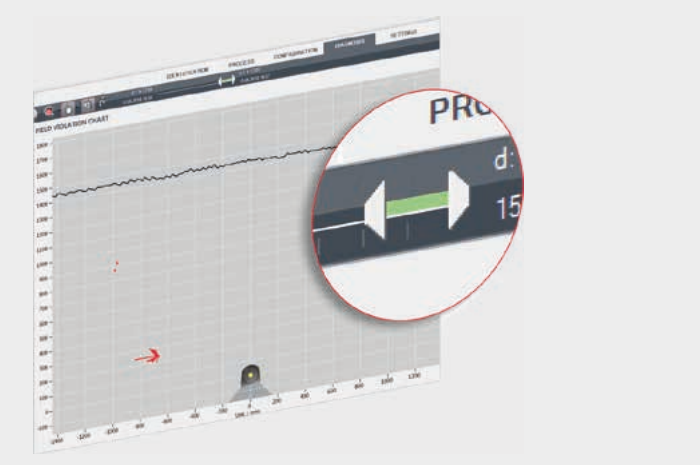
Easy documentation in pdf format

- All settings can be saved in a PDF file for documentation
- Protective and warning fields are easy to read from the graphical representation

Event log with tabular and graphical representation

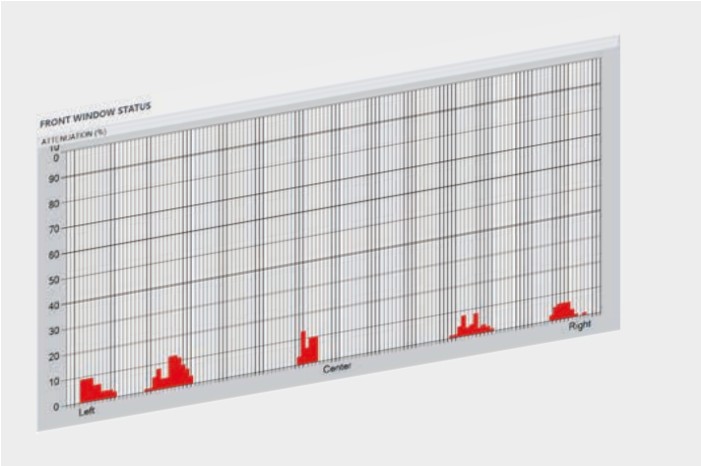
- Simplifies the diagnosis and detection of dependencies
- Recording of selectable events in the Event Log table with time stamp
- Graphical state representation of selected signals over time (for RSL 200)

Representation of protective field violation positions



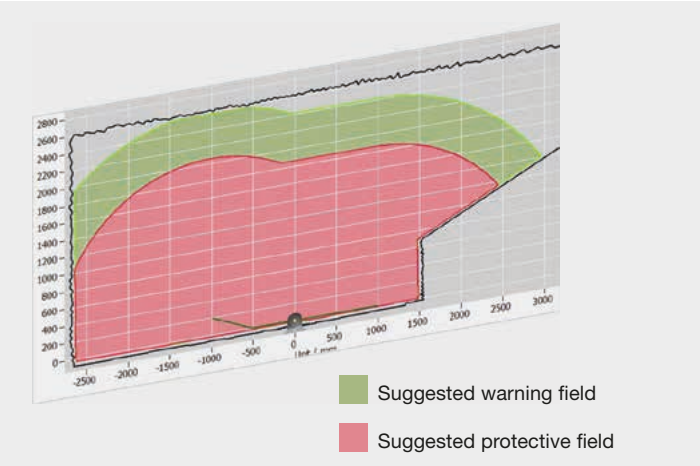
- For position and time analysis of protective field violations
- Simple evaluations e.g. whether protective field violations always occur at the same position
- Selection of the time range via slider

Graphical representation of optics cover monitoring



- The optics cover is continuously monitored for possible soiling. The result of monitoring is graphically represented over the entire scanning angle (for RSL 200)
- Fast localization of possible soiling simplifies the cleaning process

Extensive comfort functions



- Automatically generated protective field suggestion with optimal size to the configured danger zone, adapted to boundaries such as walls; only the reaction time of the downstream components needs to be added
- Protective field suggestion can be transferred to the configuration at the push of a button and adapted if required

RSL 200 technical data

General	Protective field operating range
	Scanning angle
	Angular resolution
	Warning field operating range (at 10% diffuse reflection)
	Resolution, selectable
	Response time
	Safety
	Dimensions (W x H x D)
	Temperature range
Functions	Technology for robust operation
	Safety-related switching outputs
	Number of 3-field sets (1 protective field + 2 warning fields)
	Configurable I/Os for RES, EDM, signal outputs
	UDP data output optimized for AGV navigation, 25 m operating range
	Removable configuration memory
Interfaces/ connection	Rotating connection: – for I/Os and power supply – for data transmission
	Interfaces for configuration and diagnosis
	Diagnosis via RSL mobile app

RSL 210	**RSL 220**	**RSL 230, 235**
3.0 m	3.0 m	3.0 m
275°	275°	275°
0.2°	0.2°	0.2°
15 m	15 m	15 m
50 / 70 mm	50 / 70 mm	50 / 70 mm
≥ 75 ms	≥ 75 ms	≥ 75 ms
Type 3, SIL 2, PL d	Type 3, SIL 2, PL d	Type 3, SIL 2, PL d
80 x 80 x 86 mm	80 x 80 x 86 mm	80 x 80 x 86 mm
X	X	X
1	1	1
1	8	32
4	4 (used together with protective field switching function)	8 (of which 6 used together with protective field switching function)
		For RSL 235
X	X	X
M12 connector, 8-pin –	M12 connector, 8-pin –	M12 connector, 12-pin M12 connector, 4-pin
USB, Bluetooth	USB, Bluetooth	USB, Bluetooth, Ethernet TCP / IP
X	X	X

RSL 400 technical data

RSL 410

RSL 420, 425

General	Protective field range	3.0 / 4.5 / 6.25 / 8.25 m	3.0 / 4.5 / 6.25 / 8.25 m
	Scanning angle	270°	270°
	Angular resolution	0.1°	0.1°
	Warning field range (at 10% diffuse reflection)	20 m	20 m
	Resolution, selectable	30 / 40 / 50 / 60 / 70 / 150 mm	30 / 40 / 50 / 60 / 70 / 150 mm
	Response time	≥ 80 ms	≥ 80 ms
	Safety	Type 3, SIL 2, PL d	Type 3, SIL 2, PL d
	Dimensions, incl. connection unit (W x H x D)	140 × 149 × 140 mm	140 × 149 × 140 mm
	Temperature range	0 ... +50°	0 ... +50°
Functions	Technology for robust operation	X	X
	Safety-related switching outputs	1	1
	Number of field pairs (1 protective field + 1 warning field)	1	10
	Number of 4-field sets (1 protective field + 3 warning fields)	1	10
	Number of 4-field sets (2 protective fields + 2 warning fields)	–	–
	Number of independent sensor configurations	1	1
	Internal safe time delay (stop 1)	–	–
	Parking function (protective field switch-off)	–	X
	Restart interlock (RES), configurable	X	X
	Contactor monitoring (EDM), selectable	X	X
	Linkage of a safety device, e.g. E-Stop button	–	X
	Configurable signal outputs	3	4
	UDP data output optimized for AGV navigation, 50 m operating range	–	for RSL 425
Interfaces/connection	Connection unit with integrated configuration memory and flexible cable routing	M12 connector, 8-pin	Cable or connector, 16-pin
	Interfaces for configuration and diagnosis	Ethernet TCP/IP, Bluetooth	Ethernet TCP/IP, USB, Bluetooth
	PROFINET	–	–

All units have an integrated display and electronic spirit level




RSL 430	RSL 440, 445	RSL 420P PROFINET/PROFIsafe	RSL 450P, 455P PROFINET/PROFIsafe
3.0 / 4.5 / 6.25 / 8.25 m	3.0 / 4.5 / 6.25 / 8.25 m	3.0 / 4.5 / 6.25 / 8.25 m	3.0 / 4.5 / 6.25 / 8.25 m
270°	270°	270°	270°
0.1°	0.1°	0.1°	0.1°
20 m	20 m	20 m	20 m
30 / 40 / 50 / 60 / 70 / 150 mm	30 / 40 / 50 / 60 / 70 / 150 mm	30 / 40 / 50 / 60 / 70 / 150 mm	30 / 40 / 50 / 60 / 70 / 150 mm
≥ 80 ms	≥ 80 ms	≥ 120 ms	≥ 120 ms
Type 3, SIL 2, PL d	Type 3, SIL 2, PL d	Type 3, SIL 2, PL d	Type 3, SIL 2, PL d
140 × 149 × 140 mm	140 × 149 × 140 mm	140 × 169 × 140 mm	140 × 169 × 140 mm
0 ... +50°	0 ... +50°	0 ... +50°	0 ... +50°
X	X	X	X
2	2	PROFIsafe, 1 protective field	PROFIsafe, 4 simultaneous protective fields
10 + 10	100	10	100*)
10	10	–	–
–	50	–	50*)
2	10	1	10
X	X	–	–
X	X	X	X
X	X	X	X
X	X	–	–
X	X	–	–
9	9	All status information can be called up	All status information can be called up
–	for RSL 445	–	for RSL 455P
Cable or connector, 29-pin	Cable or connector, 29-pin	3x M12 connector for 2-port switch and power supply or 4x M12 connector (L-coded) with additional voltage output | AIDA variant with push-pull connectors, communication via copper or fiber-optic cable	3x M12 connector for 2-port switch and power supply or 4x M12 connector (L-coded) with additional voltage output | AIDA variant with push-pull connectors, communication via copper or fiber-optic cable
Ethernet TCP/IP, USB, Bluetooth	Ethernet TCP/IP, USB, Bluetooth	Ethernet TCP/IP, USB, Bluetooth	Ethernet TCP/IP, USB, Bluetooth
–	–	Conformance class C | Network load class III | PROFINET device according to specification V2.3.4 | GSDML according to specification V2.3.2	Conformance class C | Network load class III | PROFINET device according to specification V2.3.4 | GSDML according to specification V2.3.2

*) Warning fields can be evaluated as protective fields

Accessories and suitable products

For quick and easy commissioning of the RSL 200/400 scanners, we offer a wide range of accessories and matching products. They include special items for mounting and connecting the devices as well as supplementary products for integrating the devices in machines and systems.

	RSL 200	RSL 400
Mounting system For horizontal and vertical alignment		
Loop guard To protect the optics cover, in conjunction with the mounting system		
Mounting brackets for corner and floor mounting		
Connection and interconnection cables For connection, for configuration/diagnosis		
Cleaning set For cleaning of the optics cover, e.g. for dust, oil and grease		

Programmable safety control

MSI 400 basic and extension modules with up to 168 I/Os and gateway functions for integrating safety sensors into the machine circuit

Safety relays

MSI evaluation units, evaluation units with time delay and contact extensions for integrating safety sensors into the machine circuit

Signaling devices

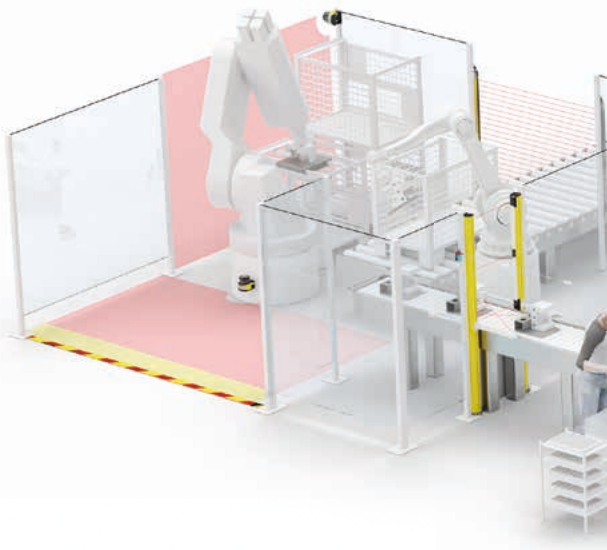
For visual and acoustic status visualization, pre-mounted or modular

Passive distribution boxes

MD distribution box for signal bundling and distribution

Safety from a single source

Individual requirements need flexible solutions.
Our high-quality products and intelligent systems as well as competent technical advice and support form the basis of our safety portfolio. Benefit from our extensive range of products.
The diversity of our portfolio means that we are able to provide you with all components, from sensor to control, from a single source – all with maximum user-friendliness and all optimally matched to each other.



Products

Safety laser scanners

Safety light curtains / with Smart Process Gating

Single light beam safety devices

Multiple light beam safety devices / with muting

Safety radar sensors

Safe bar code positioning system

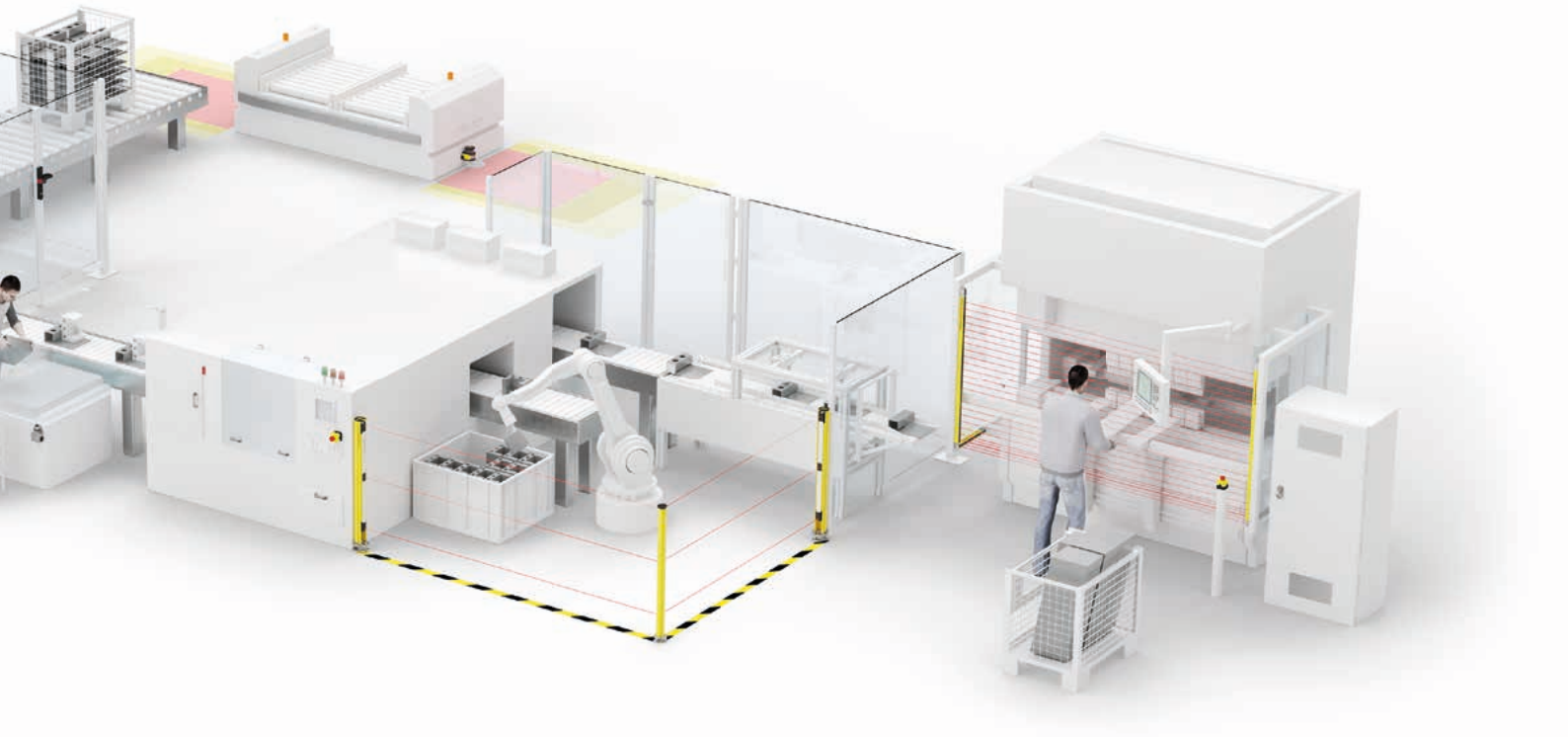
Safety switch

Safety proximity sensors

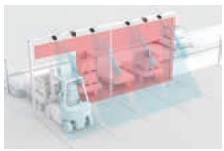
Safety locking devices

Safety command devices

Safety relays and controls



Solutions



Safety solutions, e.g. for safeguarding transfer stations and access points to transport systems

Services

Safety services, e.g. inspections, risk assessment and validation

Our company
Everything at a glance

In a constantly changing industrial world, we work together with our customers to find the best solution for their sensor applications: innovatively, precisely and efficiently.

Key figures

Foundation year	1963
Company structure	GmbH + Co. KG, 100 % family-owned
Executive management	Salvatore Buccheri, Dr. Henning Grönzin, Helge Held
Headquarters	Owen / Teck, Germany
Distribution companies	21
Production locations	6
Technological competence centers	3
Distributors	40
Employees	1,500

Product range

- Switching sensors
- Measuring sensors
- Safety
- Identification
- Data transmission
- Network and connection technology
- Industrial image processing
- Accessories and add-on products

Focus industries

- Intralogistics
- Packaging industry
- Machine tools
- Automotive industry
- Laboratory automation

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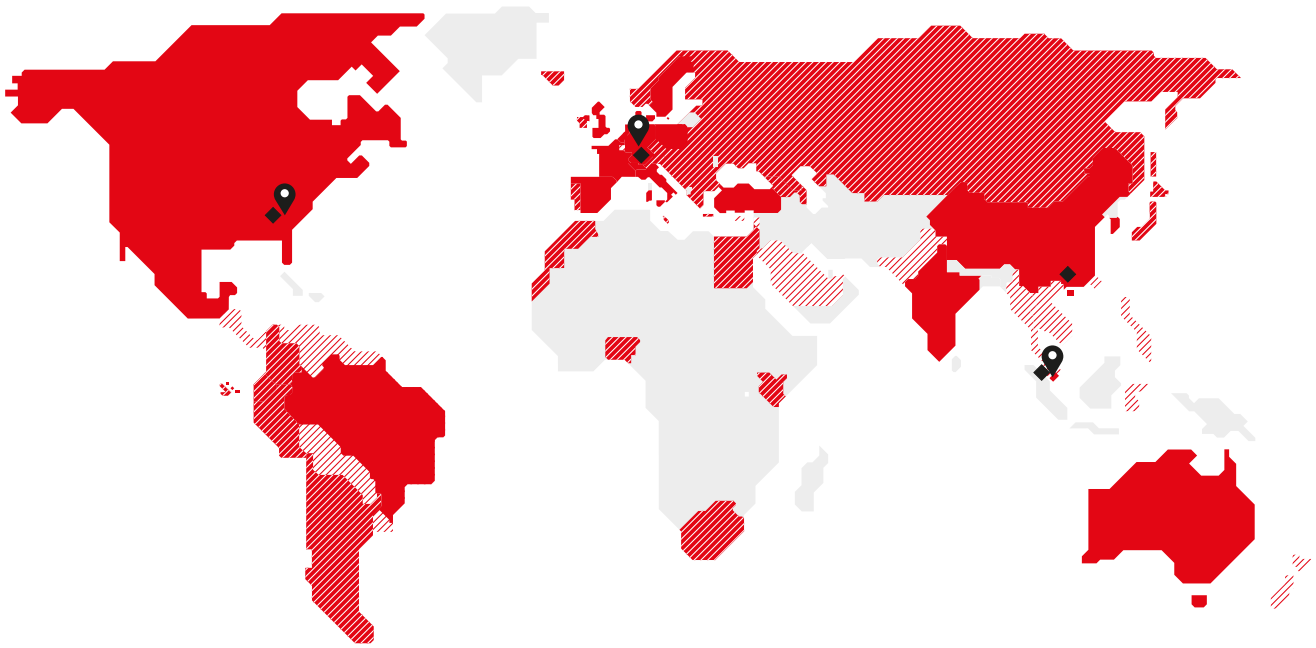
Our locations
At work for you around the world

Your success is our motivation. We therefore place great value on always being personally, quickly, and easily accessible to you. We produce on four continents, allowing us to offer you reliable product availability.



- Technological competence centers
- Production locations
- Distribution companies
- Distributor
- Distribution through neighboring country

Technological competence centers

Owen, Germany
Duluth / Georgia, USA
Singapore

Production locations

Owen, Germany
Unterstadion, Germany
Duluth / Georgia, USA
Shenzhen, China
Malacca, Malaysia

Distribution companies

Australia / New Zealand
Belgium
Brazil
China
Denmark / Sweden
Germany – headquarters
Germany – distribution company
France
Great Britain
Hong Kong
India
Italy
Mexico
Poland
Singapore
Spain
South Korea
Switzerland
The Netherlands
Turkey
USA / Canada

Our portfolio at a glance

Switching sensors
— Optical sensors
— Inductive sensors
— Capacitive sensors
— Ultrasonic sensors
— Fiber optic sensors
— Fork sensors
— Light curtains
— Special sensors

Measuring sensors
— Distance sensors
— Positioning sensors
— 3D sensors
— Light curtains
— Bar code positioning systems
— Fork sensors

Safety
— Safety Solutions
— Safety Laser Scanners
— Safety Light Curtains
— Single and Multiple Light Beam Safety Devices
— Safety Radar Systems
— Secure Locking Devices, Switches and Proximity Sensors
— Safety Controllers and Relays
— Machine Safety Services

Identification
— Bar Code Identification
— 2D-Code Identification
— RF Identification

Data transmission
— Optical data transmission systems

Network and connection technology
— Connection technology
— Modular connection units

Industrial image processing
— Light section sensors
— Industrial IP cameras
— Vision sensors

Accessories and add-on products
— Signaling devices
— Mounting systems
— Reflectors

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