PRODUCT INFORMATION

MINESIC100 TPS
Truck Protection System

Collision Awareness and Operator Guidance for Haul Trucks

SICK
Sensor Intelligence.

MINESIC100 TPS
Truck Protection System

Protection of mine site equipment, infrastructure and personnel is a highly sophisticated task and presents high demands on collision awareness solutions. Building on experience with the development of advanced driver assistance systems, SICK's MINESIC100 TPS is a turnkey proximity detection, operator assist and collision awareness system for haul trucks used in the mining industry.

Challenges in Collision Awareness and Proximity Detection

Heavy mining vehicle operators have to accomplish a difficult task. The increase in mine productivity has led to a proportional increase in the size of the equipment used. Large mining vehicles have considerable operator blind spots. Normal day to day site conditions including weather, distractions of navigation systems and radio communications mean the most experienced operator is challenged to maintain safe vehicle operation. Despite the best efforts of mine management and plant operators, accidents on mine sites remain an industry wide problem.

The avoidance of mine site accidents demands a combination of technologies to assist operators and reduce risk. Although many accidents occur in low speed interactions, any collision awareness and assistance technology applied must be able to also warn of potential high speed collisions. The effective combination of proven technologies used in the MINESIC100 TPS gives the mine and its operators the right system to maximize productivity while reducing downtime due to operator injury or vehicle damage.

SICK's solution MINESIC100 TPS – Truck Protection System

The MINESIC100 TPS uses advanced laser scanners (Class 1 Eye Safe) combined with equipment such as GPS. Qualified obstacle information from these sensors is utilized in a sophisticated warning strategy, which alerts an operator, via a simple user interface to take evasive action.

SICK has adapted proven technologies for use by mining companies, resulting in a product that is easily installed into a variety of mine vehicle types. The system is simple, removing the need for integration into the vehicles control and sensor system. This allows for cost effective retrofitting and offers further integration into fleet management or other collision avoidance systems as required. Digital outputs included in the system can be used for external signal lighting warning of the close proximity of the vehicle.

Advanced system functionality

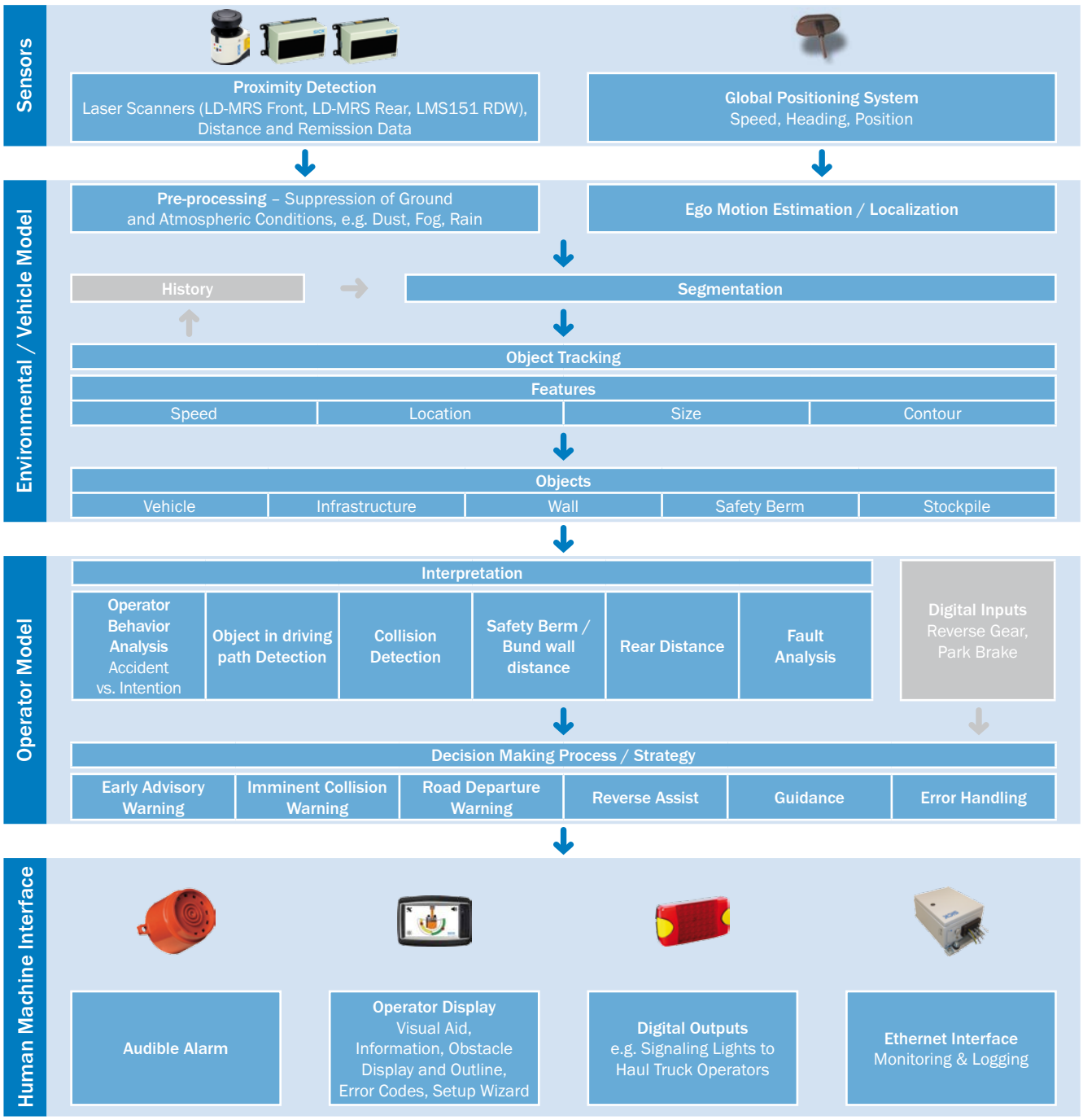
Unintended road departure, potential collisions as well as reversing incidents are prevented by alerting the operator, displaying only relevant information and alarming audibly, if necessary. The MINESIC100 TPS has been developed to be an aid to the operator, not a hindrance. No nuisance alarms to distract normal driver operation. It has an inbuilt recognition of intentional driving behavior, i.e. the avoidance of a rock, or turning at an intersection. The system also automatically adapts warning zone dimensions according to the vehicle speed and switches the context between reversing, travelling forward, crossing roads, turning and loading. GPS coordinates are used to raise operator's attention when approaching predefined hazardous areas (Black Spots) such as intersections and construction sites.

SICK LifeTime Services option

To ensure reliable, repeatable and safe operation the MINESIC100 TPS requires a maintenance program which includes a number of system checks. SICK Service Engineers are qualified to perform this service maintenance.

Installation, service and maintenance training can be provided by SICK.

Truck Protection System



Collision Awareness and Operator Guidance for Haul Trucks

Product description

The MINESIC100 TPS is a high performance collision awareness, guidance and truck protection system ideally suited for large haul trucks used in open-cut (surface) mining. This robust system utilizing 4-layer laser scanning technology, provides driver assistance and safe maneuvering of the vehicle while ensuring individual driver behaviour is recognised. The system is easily retrofitted to most large mining haul trucks.

At a glance

- Intelligent Front-End collision warning
- Road Departure Warning
- Reverse Assist (collision, tyre and suspension protection)
- Black Spot Warning (geo-fencing of hazardous areas)
- Visual feedback (touch screen operator display) & audible alarm
- Open interface to fleet management / dispatch systems & event logging
- Full functional operation across speed range (0...60 km/h)
- Adaptive warning zone dimensions

Your benefits

- Reduction of incidents, downtime and repair costs
- Detection and tracking of moving and stationary obstacles without the need for RFID tags
- Active situation dependent warning with low false alarm rates
- Simple installation, easy to operate
- Easy to maintain – Integrated test function and reporting
- Configurable to mine site operational requirements
- Full service package provided by SICK LifeTime Services
- Sound system knowledge thanks to comprehensive user training

Application

- Haul trucks in surface mines

Additional information

→ **www.mysick.com/en/MINESIC100_TPS**

For more information, just 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

System

Application speed range	0 ... 60 km/h
Supply voltage	DC, 24 V, ± 10% (24 V nominal)
Power consumption	40 W 100 W (Peak power consumption with internal sensor heating)
Ambient operating temperature	–20 ... +50 °C [1] –40 ... +70 °C [2] –30 ... +70 °C [3]
Storage temperature	–40 ... +85 °C
Interfaces	Ethernet (SICK application event protocol, customised object data protocol) Digital I/O (e.g. audible alarm, signalling lights)
Weight	Approx. 20 kg

[1] Components outside cabin (ambient), RDW option.

[2] Components outside cabin (ambient)

[3] Components inside cabin (ambient)

Laser scanner

	LMS151 "TPS-RDW"	LD-MRS HD "TPS-Rear" and LD-MRS HD "TPS-Front"
Operating range	0.2 ... 50 m (up to 18 m at 10% reflectivity)	0.3 ... 150 m (up to 30 m at 10% remission)
Operating conditions	Outdoor (dust, rain, snow, fog)	
Scanning angle	270° (total horizontal)	85° operating angle with 4 measurement layers, 25° work area expansion with 2 measurement layers Total: 110°
Angular resolution	0.25° / 0.5°	0.125° / 0.25° / 0.5°
Horizontal measurement area	0.8° per measurement layers Total: 3.2°	
Scanning frequency	25 Hz / 50 Hz	12.5 Hz / 25 Hz / 50 Hz
Number of measurement pulses (Multi-Echo)	2	3
Dimensions (W x H x D)	102 mm x 162 mm x 105 mm	88 mm x 164.5 mm x 93.2 mm (including fastening tabs)
Weight	1,100 g	900 g
Error / Distance Accuracy	12 mm	100 mm
MTBF	≥ 50,000 h (at 25 °C)	
Enclosure rating		
No external protection	IP 67	IP 69K
With weather protection	IP 67 or better	IP 69K or better
Plug (2 m / 24 h)	–	IP 68 (EN 60529 (1991-10) + A1:2000-02)
Protection class	III (EN 50178 (1997;10))	
EMC	EN 61000-6-3 (2007-01), Interference emission EN 61000-6-2 (2005-08), Interference immunity	
Repeated bump / shock Immunity	15 g, 11 ms, single	13 g, 16 ms, 30 min per axis, all three axis (EN 60068-2-29 (1993-04))
Vibration, broadband random and guidance	10 ... 150 Hz, all 3 axes, 8 h per axis (total 24 h), 5 g rms, EN 60068-2-6:1995-04	

Operator Panel PC

Dimensions (W x H x D)	130 mm x 95 mm x 55 mm (landscape or portrait)
Weight	< 1 kg
Screen	Touch Screen, TFT, transmissive
Enclosure rating	IP 67
Repeated bump / shock Immunity	ISO 15003–5.5.2, IEC 60068-2-27, EN 60068-2-29: 1993-04
Vibration, broadband random and guidance	ISO 15003-5.6, IEC 60086-2-6, -2-47, -2-64
EMC	ISO 16750-2 – electrical loads ISO 15003 EN 61000-6-3, 6-4 EN 61000-6-2

Control Cabinet

Enclosure rating	IP 66
Weight	8 kg
Fuse	7.5 A (2x, one in each V+ and GND)
Signal ground	Single GND (vehicle GND) for all supply, input and output signals
Repeated bump / shock Immunity	25 g, 11 ms, 3+3 per axis, all three axis (total 18) (EN 60068-2-29 (1993-04))
Vibration, broadband random and guidance	5 ... 2,000 Hz, all 3 axis, 8h per axis (total 24 h), 3g rms, EN 60086-2-6:1994-06

Ancillary Items

Components	GPS Receiver Set Mounting Operator Panel PC Cables – Plugin Electrical Connection Siren – Audible Warning Vibration Mounts

Options

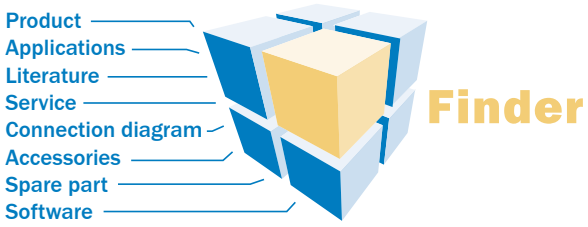
Software package	Front End Collision Warning Road Departure Warning Reverse Assist Black Spot Warning

Ordering information

Our regional sales organization will help you to select the best fitting device configuration.

www.mysick.com – search online and order

Search online quickly and safely – with the SICK "Finders"

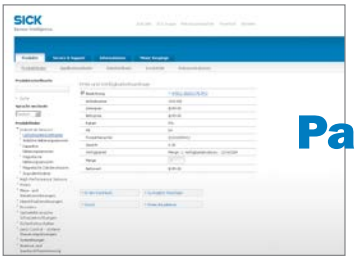


Product Finder: We can help you to quickly target the product that best matches your application.

Applications Finder: Select the application description on the basis of the challenge posed, industrial sector, or product group.

Literature Finder: Go directly to the operating instructions, technical information, and other literature on all aspects of SICK products.

Efficiency – with the e-commerce tools from SICK



Partner Portal
www.mysick.com

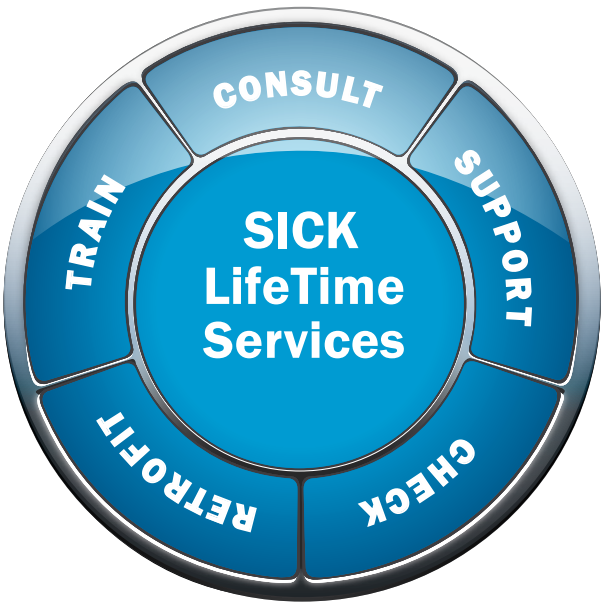
Find out prices and availability: Determine the price and possible delivery date of your desired product simply and quickly at any time.

Request or view a quote: You can have a quote generated online here. Every quote is confirmed to you via e-mail.

Order online: You can go through the ordering process in just a few steps.

For safety and productivity: 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 system design all the way 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.



Consulting & Design
Globally available experts for cost-effective solutions

Product & System Support
Fast and reliable, by telephone or on location

Verification & Optimization
Checks and recommendations for increased availability

Upgrade & Retrofits
Uncovers new potential for machines and systems

Training & Education
Employee qualification for increased competitiveness

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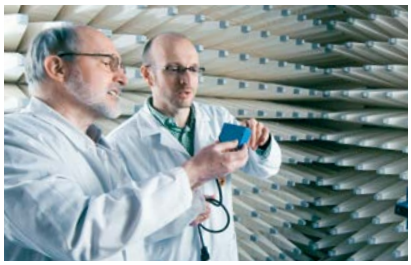
SICK at a glance



Leading technologies

With a staff of more than 6,000 and over 40 subsidiaries and representations worldwide, SICK is one of the leading and most successful manufacturers of sensor technology. The power of innovation and solution competency have made SICK the global market leader. No matter what the project and industry may be, talking with an expert from SICK will provide you with an ideal basis for your plans – there is no need to settle for anything less than the best.

Unique product range

- Non-contact detecting, counting, classifying, positioning and measuring of any type of object or media
- Accident and operator protection with sensors, safety software and services
- Automatic identification with bar code and RFID readers
- Laser measurement technology for detecting the volume, position and contour of people and objects
- Complete system solutions for analysis and flow measurement of gases and liquids

Comprehensive services

- SICK LifeTime Services – for safety and productivity
- Application centers in Europe, Asia and North America for the development of system solutions under real-world conditions
- E-Business Partner Portal www.mysick.com – price and availability of products, requests for quotation and online orders

Worldwide presence with subsidiaries in the following countries:

Australia
Belgium/Luxembourg
Brasil
Ceská Republika
Canada
China
Danmark
Deutschland
España
France
Great Britain
India
Israel
Italia
Japan
México
Nederland
Norge
Österreich
Polska
România
Russia
Schweiz
Singapore
Slovenija
South Africa
South Korea
Suomi
Sverige
Taiwan
Türkiye
United Arab Emirates
USA

Please find detailed addresses and additional representatives and agencies in all major industrial nations at **www.sick.com**

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