



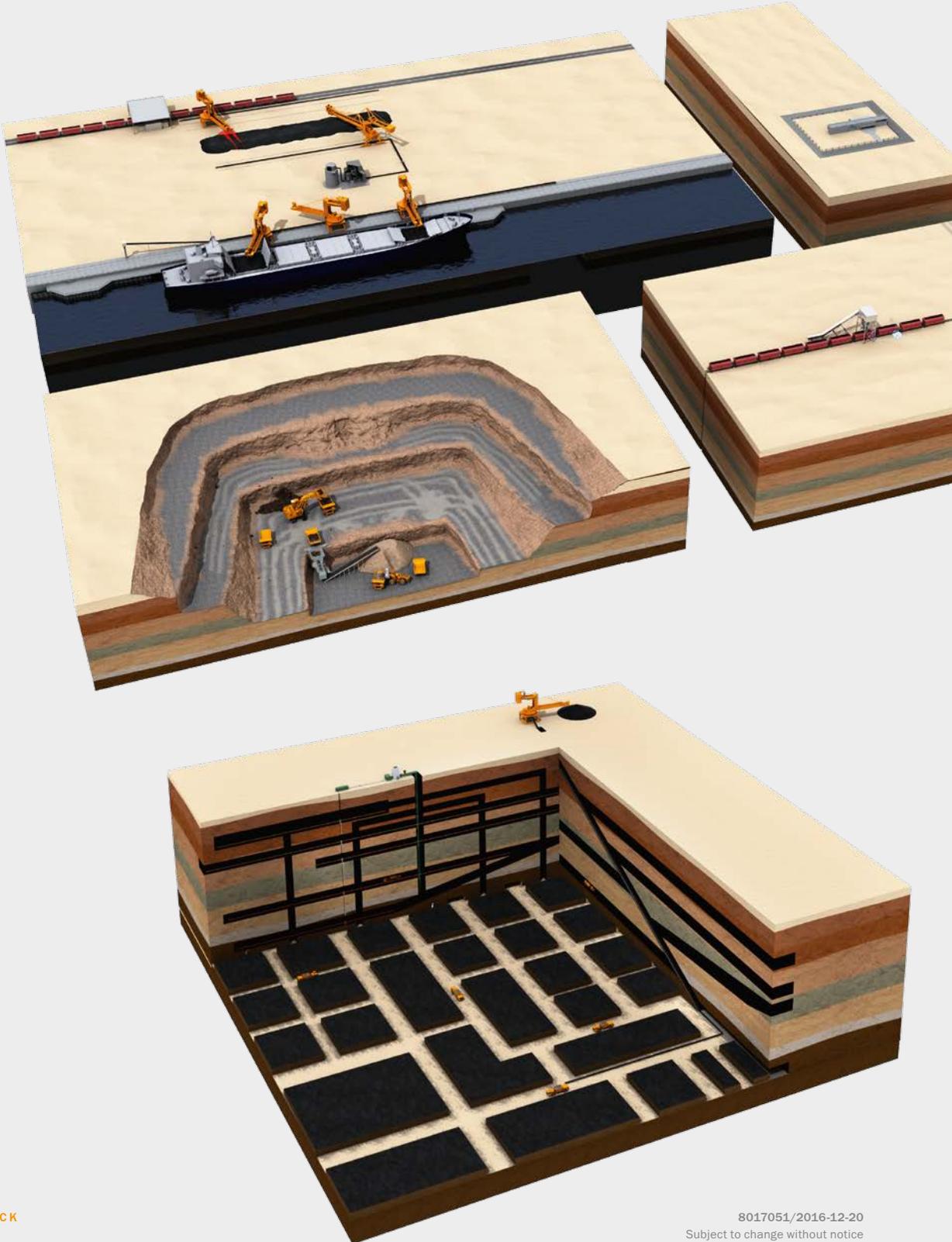
MINING INDUSTRY

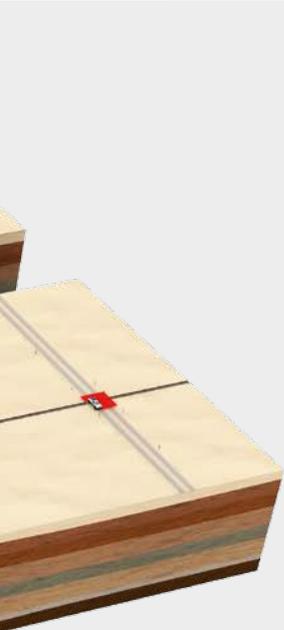
ENSURING PRODUCTIVITY AND PROTECTION
IN SURFACE AND UNDERGROUND MINING.

SICK
Sensor Intelligence.



TABLE OF CONTENTS





Tasks

Tasks in the Mining Industry	4
------------------------------	---

Applications in focus

The application graphics shown are not binding, they are no substitute for the need to seek expert technical advice.

Surface mining	6
Underground mining	20

Products

Product overview	26
------------------	----

General information

Company	44
Industries	46
SICK LifeTime Services	48
Versatile product range for industrial automation	50
Industrial communication and device integration	54
Services	59

TASKS IN THE MINING INDUSTRY

From monitoring gas levels and air quality in mines to protection from collisions for large vehicles at mine sites, SICK offers a wide range of sensors and systems to improve safety and to monitor potentially dangerous situations. SICK offers solutions for the analysis and control of underground coal mining atmospheres. The solutions supply the coal mine operator valuable safety and ventilation information, as well as data that identifies mine production areas in which people may or may not be working. In addition, SICK offers solutions for the protection of mobile equipment, collision avoidance and tunnel warning systems in underground and surface mining operations.



Monitoring and controlling

Analyzers and analyzer solutions monitor and control emission limit values, the atmosphere in underground mines as well as the emission of pollutants to the environment. In the mining industry, SICK's solution for carbon monitoring is one of the examples which controls the greenhouse gas emissions.



Measuring

Sensors and sensor systems from SICK are ideal for precise and direct measurement of volume and mass flow. For optimal management of conveyor belt usage and reduction of incidents, the speed, loading height and distribution of bulk material are monitored.



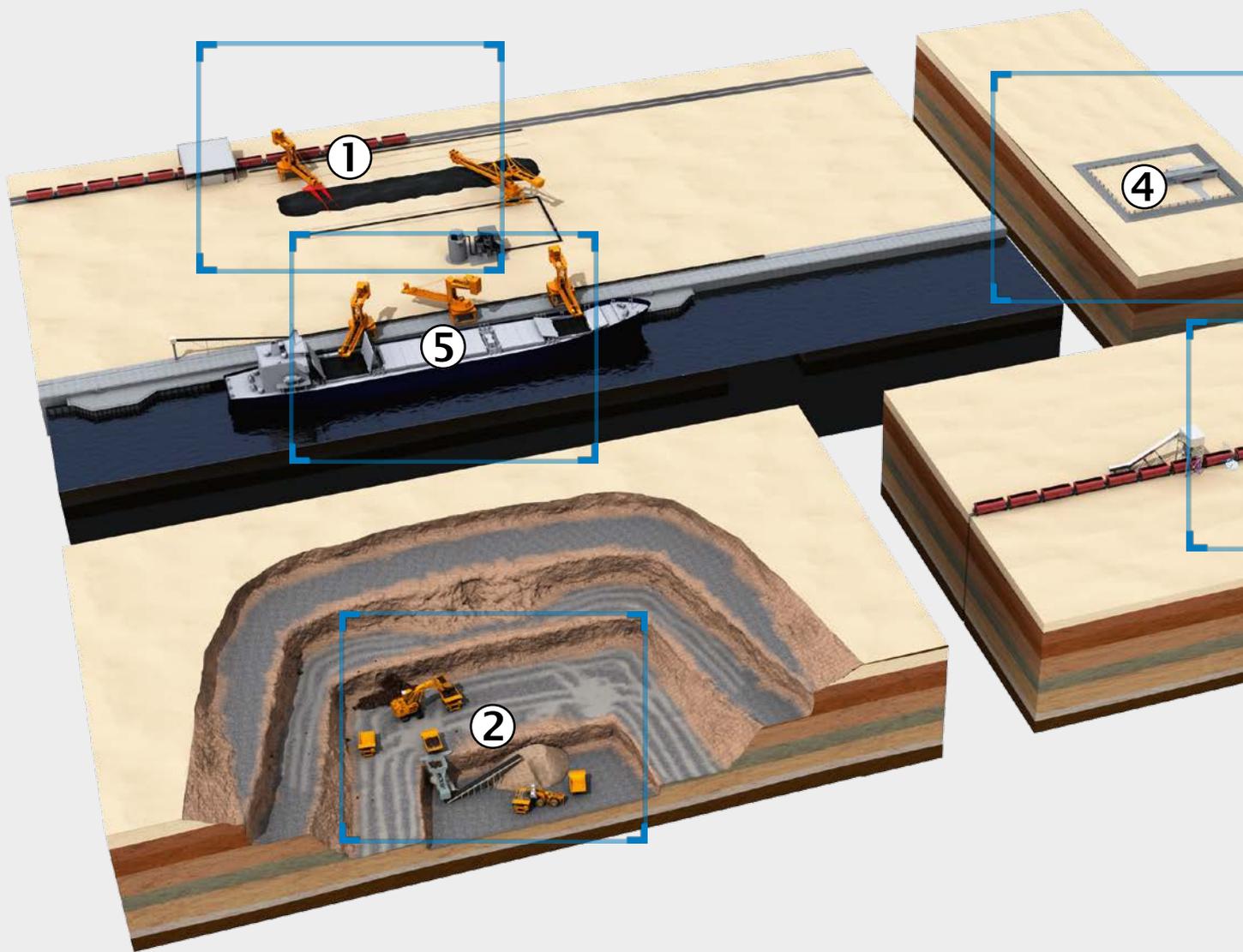
Protecting

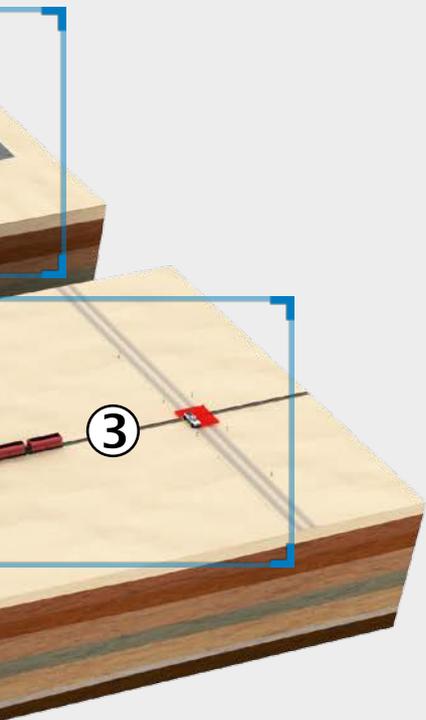
The protection of personnel, machines and objects is the highest priority in a mine. Sensors and sensor solutions protect hazardous areas, machine positions and movements. SICK offers innovative and groundbreaking products, to fulfill these tasks.

Service

Competent consulting, qualified planning support, detailed project planning and engineering, installation and start-up – SICK provides all of these services with our own personnel. SICK is also available to provide service support of the equipment during scheduled outages and in emergency situations.

APPLICATIONS IN FOCUS SURFACE MINING





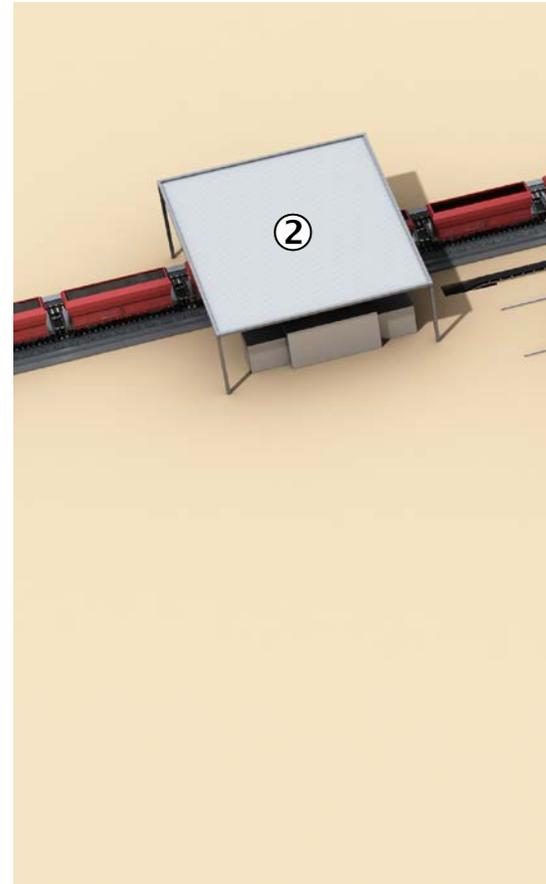
Surface mining

In surface mining, there are a number of factors that ensure the efficient movement of materials and the safety of both the equipment and miners. Protecting mobile equipment from collisions, ensuring vehicles are loaded and unloaded efficiently and safely, and managing the loading of mine transport vehicles are all major requirements for any surface mining operation.

Focus 1	8
① Material handling	
Focus 2	12
② Collision awareness	
Focus 3	16
③ Transport	
Focus 4	18
④ Mine site protection	
Focus 5	19
⑤ Port handling	

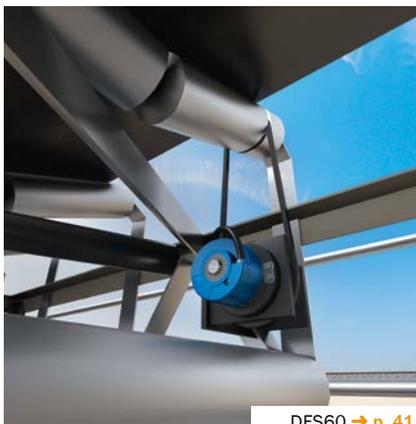
① Conveyor belt control and crusher monitoring

Mined materials are transported to the crusher on conveyor belts. Volume measurement and an appropriate loading time are necessary to control ore or coal delivery to the mill and optimize throughput. The Bulkscan® LMS511 is a non-contact solution that records volume flow on conveyor belts using time-of-flight laser measurement. The integrated center-of-gravity calculator maximizes transport performance and detects one-sided loading or uneven conveyor belt loads. The belt running control unit detects belt unevenness, resulting in less downtime and lower belt wear costs.



② Calculation of conveyor belt speed and running direction

The belt speed at which mined materials are conveyed to stockpiles, ship loaders, and railroad loading facilities is of paramount importance. The DFS60 incremental encoder calculates the speed and running direction of the belt. The DFS60 encoder can be configured either via a PC or with a separate programming tool, thus offering comprehensive programming flexibility for all mining requirements.

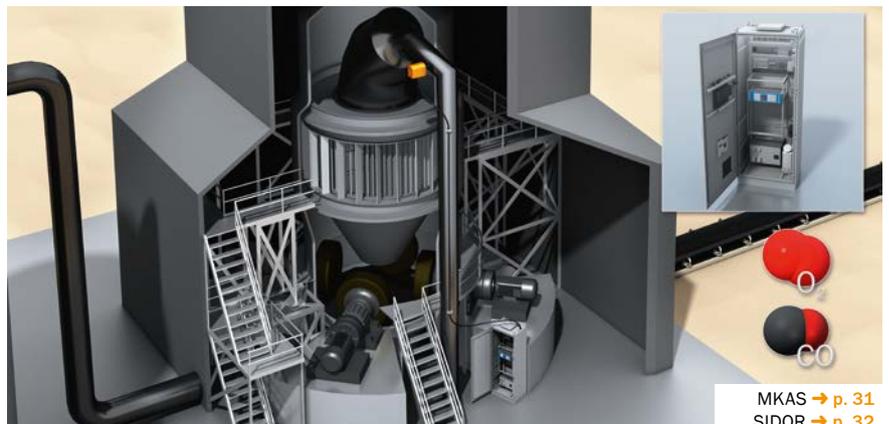


DFS60 → p. 41

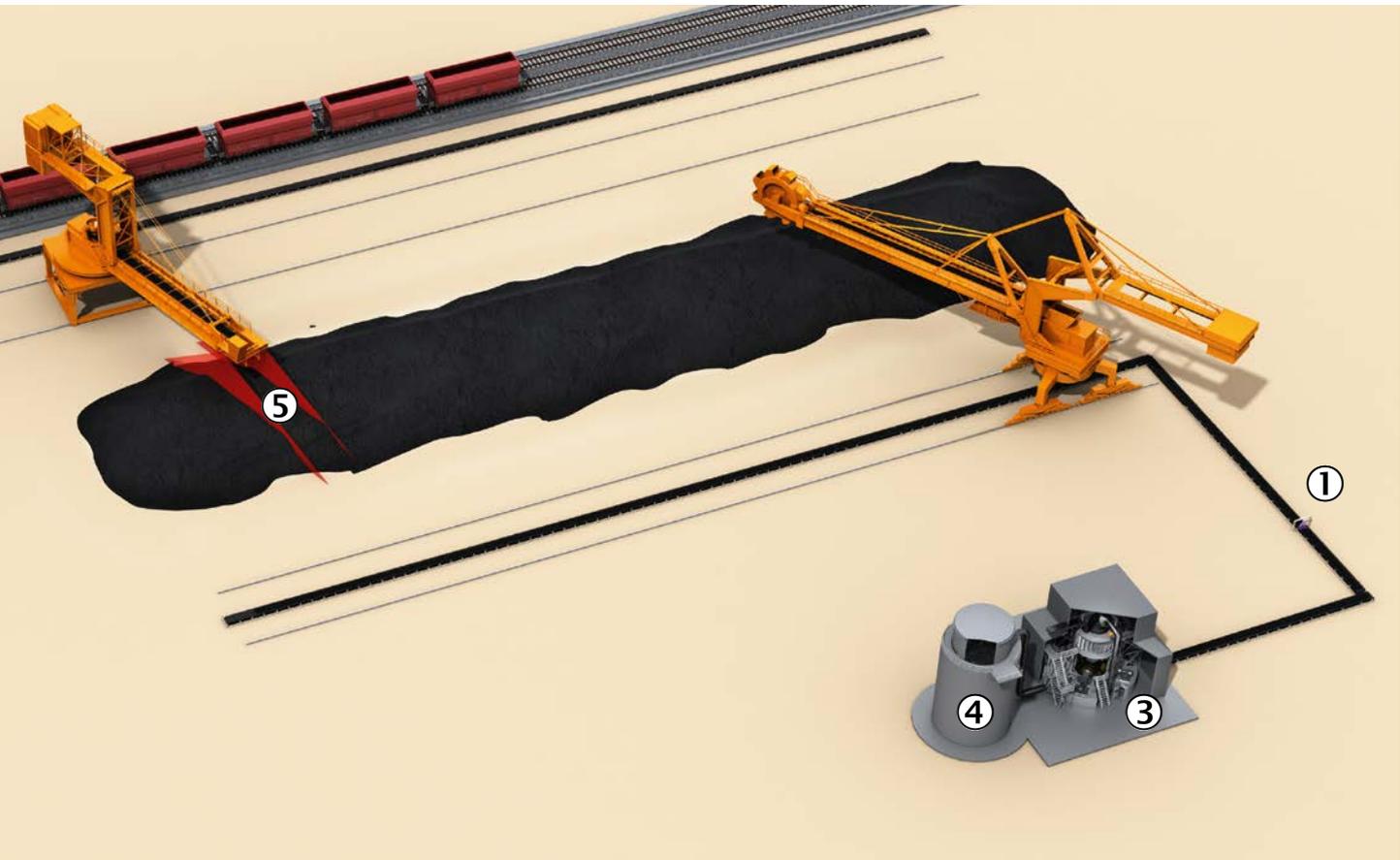
③ Protecting the coal mill by monitoring CO and O₂

Carbon monoxide (CO) and oxygen (O₂) measurement in the coal mill is important for early warning of a smoldering fire and/or a leak in the inerting system. The MKAS analyzer system equipped with an explosion-protected sampling probe is the ideal solution for this monitoring process.

The SIDOR gas analyzer provides simultaneous measurements of O₂ and CO. An important feature is the stability of the measuring benches, allowing routine adjustments to be made using only ambient air or inert gas.

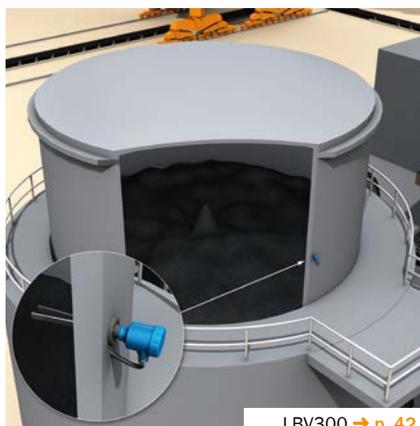


MKAS → p. 31
SIDOR → p. 32



④ Overfill protection for coal bunkers and silos

Coal is typically stored in silos after it has been pulverized. In order to prevent overfilling of the silo, a point measurement of the level is needed. The LBV300 vibration level switch is extremely rugged. It operates with no mechanical moving parts, and is resistant to deposit formation. This makes it an ideal choice for monitoring the coal levels.



LBV300 → p. 42

⑤ Detection of bulk materials profile in stockpile

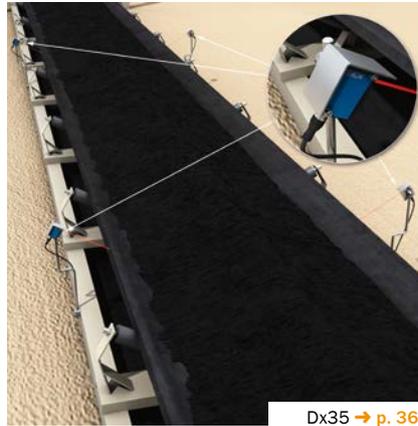
The irregularity of a stockpile makes it difficult to accurately calculate the volume of bulk material stored. The LMS151 and LMS511 laser scanners, which have been classified with IP67 enclosure rating for outdoor applications, generate an accurate 3D profile of the stockpile as it traverses on a stacker or a reclaimer, and deliver necessary information to the mine.



LMS1xx → p. 34
LMS5xx → p. 34

⑥ Conveyor belt drift detection

When bulk materials are irregularly loaded, the tensioners and runners of the conveyor belt can deviate from the optimal alignment and cause belt drift. When this occurs, the edge of the conveyor belt may overshoot the support roller. Bulk materials can be lost or, in extreme cases, derail the belt. Compact Dx35 distance sensors on both sides of the conveyor belt monitor the lateral movements of the belt and put out a warning before belt drift occurs. The Dx35 uses HDDM™ time-of-flight technology with a infrared emitted light, which is insensitive to ambient light and dust. It results in almost no maintenance costs after installation. With its flexible interfaces and easy installation, the Dx35 is a economic measurement solution.



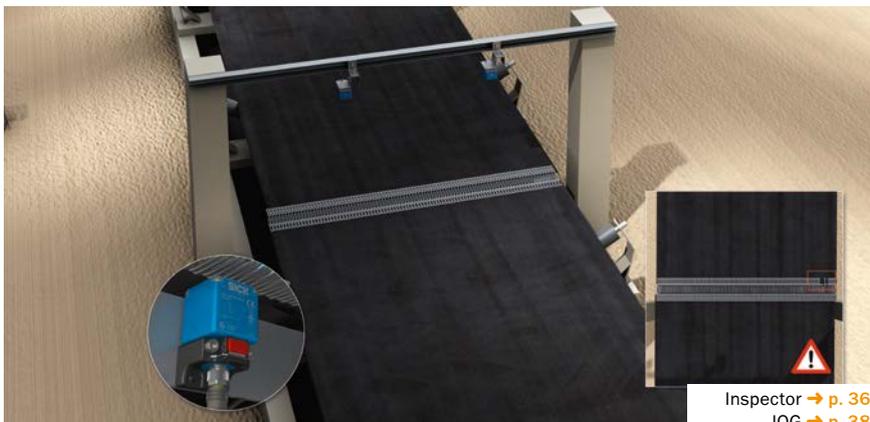
Dx35 → p. 36



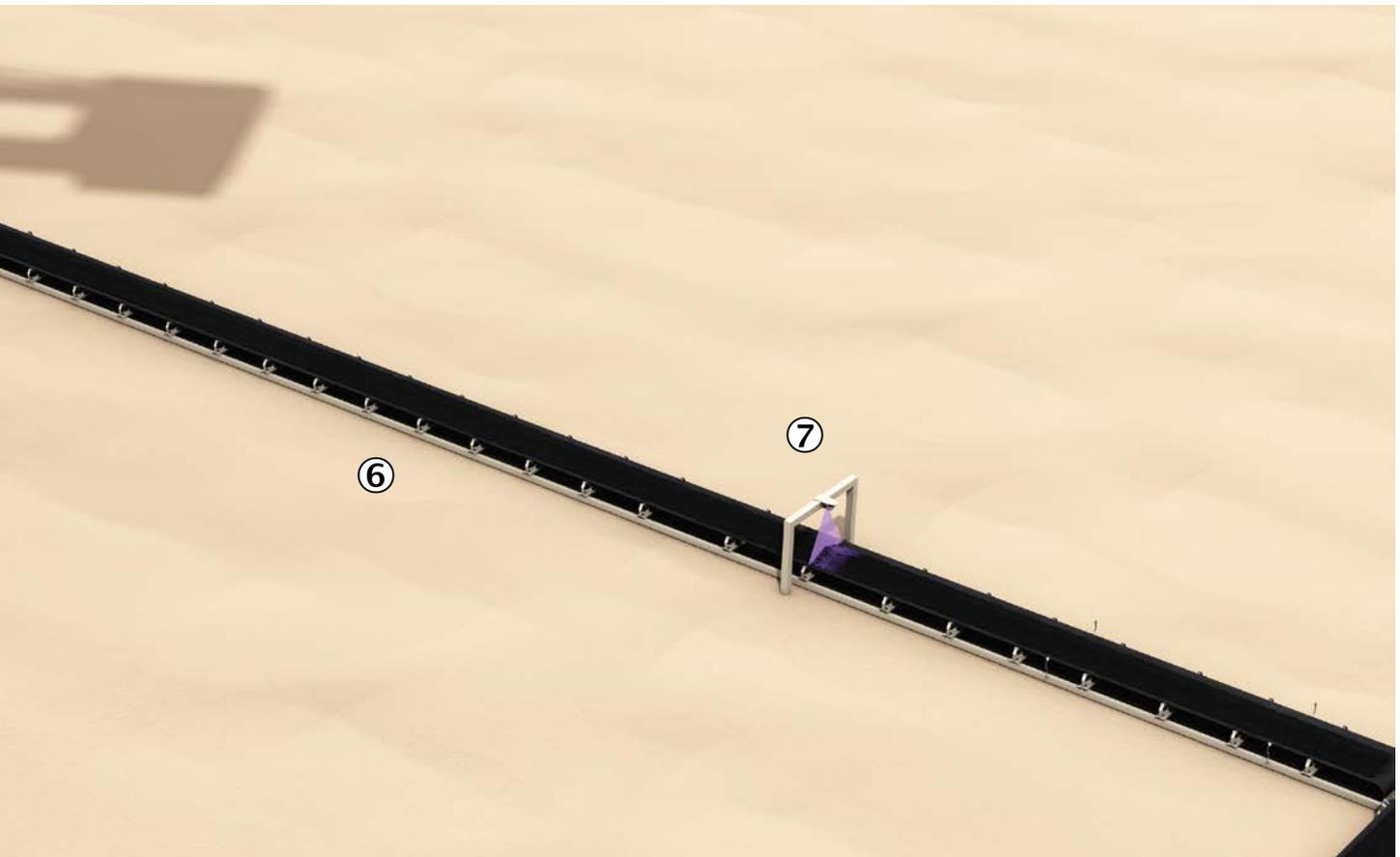
⑦ Conveyor belt staple tear inspection

Belt staples are robust and quick to install for joining bulk material conveyor belts together. However, with the harsh requirements of long high tension conveyor belts, tears near the staples cause belt failure and catastrophic downtime losses. Human inspection for belt faults near the staples is tedious, time-consuming and requires a non-moving belt. This is very costly process and is subject

to the pitfalls of human error. Using the robust IQ40 inductive sensor to trigger the Inspector PIM60, the inspection can be automated on a live running belt, even at speeds above 6 m/s. The Inspector PIM60 triggers an alarm, or other function, if a tear appears. This system is capable of uploading inspected images to an FTP server for historical data collection.



Inspector → p. 36
IQG → p. 38



Collision awareness

Protection of mine site equipment, infrastructure and personnel is a highly sophisticated task and presents great demands on equipment operators. Large mining vehicles have considerable blind spots that impair visibility. To safeguard and optimize daily vehicle operations, SICK has developed turnkey collision awareness and operator guidance systems for mining equipment. The adaption of advanced operator assistance system know-how in the SICK collision awareness systems (CAS) series gives the mine's operators the right system to maximize productivity, while reducing downtime due to equipment damage.



① Excavator protection including shovels

Loading within close proximity of moving trucks, dozers, graders and high walls presents a great challenge to operators when operating shovels and excavators. The MINESIC100 EPS is a high precision proximity detection system that monitors the shovel's surroundings and identifies potential collision hazards with other vehicles and even stationary objects. The MINESIC100 EPS guides truck operators to the correct loading position.

The operator display shows all obstacles in the corresponding warning zones. If a collision is imminent, the operator will be warned by an audible alarm so that he can safely stop the maneuvering.



MINESIC100 EPS → p. 28

② Truck protection

Haul trucks are the most regularly used mining vehicles. Their size, height and speed combine to create very poor visibility with continuously changing operating conditions. Front-end and rear-end collisions and unintended road departures are all commonplace on site. The MINESIC100 TPS is a high precision proximity detection system that monitors critical zones surrounding the vehicle and considers the current driving situation.





③ Wheel loader and bulldozer protection

It identifies potential collision hazards with other objects. A road departure warning provides guidance to the truck operator along the haul road and alerts the operator if the truck is about to leave the safe driving path.

When operating a wheel loader or bulldozer, there is a risk of colliding with other moving vehicles when reversing. Infrastructure such as embankments, stockpiles, and ROM bins, also pose a significant collision risk. While loading and unloading, a wheel loader is constantly moving back and forth, with

the operator's primary focus being on the bucket. The MINESIC100 WPS is a high-precision collision awareness system which monitors critical areas surrounding the rear end of the vehicle. The system warns of impending collisions and provides operator assistance in critical maneuvers.



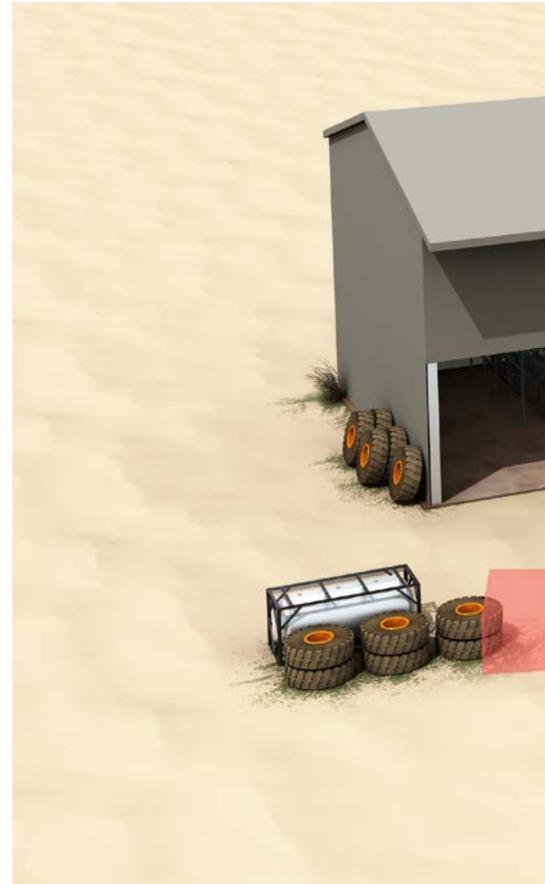
MINESIC100 TPS → p. 29



MINESIC100 WPS → p. 28

④ Forklift protection

Forklifts are regularly used inside and outside the workshop area for various jobs; stocking supplies, moving equipment or parts etc. Reversing in a relatively confined environment, due to close proximity of big mining vehicles, equipment and workshop personals can be a huge driving challenge for forklift operators. The Visionary-B streaming camera simplifies parking and tricky maneuvers by providing the operator with a rear view of potential obstacles in real time by visual feedback and audible warnings. As an alternative the compact and advanced 2D laser scanner TiM3xx can be used. This scanner actively monitors the area behind the forklift and provides the driver with real time feedback via audible warnings when the forklift comes close to stationary or moving objects.



⑤ Dozer rear protection

Small dozers or crawlers are used for construction and maintenance within the mine. They may be used for clearing and grading lots, sloping, and up-keep of the road, back filling of material etc. The dozers generally work in areas with high traffic near workshops or in close proximity to stockpiles and infrastructure.

The Visionary-B streaming camera provides driving assistance by alarming when there is potential collision with stationary or moving objects and when reversing or maneuvering in confined areas.





⑥ Haul truck tire handlers

Mine haul trucks require tires and suspension to be regularly maintained. Each tire assembly weights close to five tons and requires a special vehicle designed to assist in this maintenance. The Visionary-B streaming camera

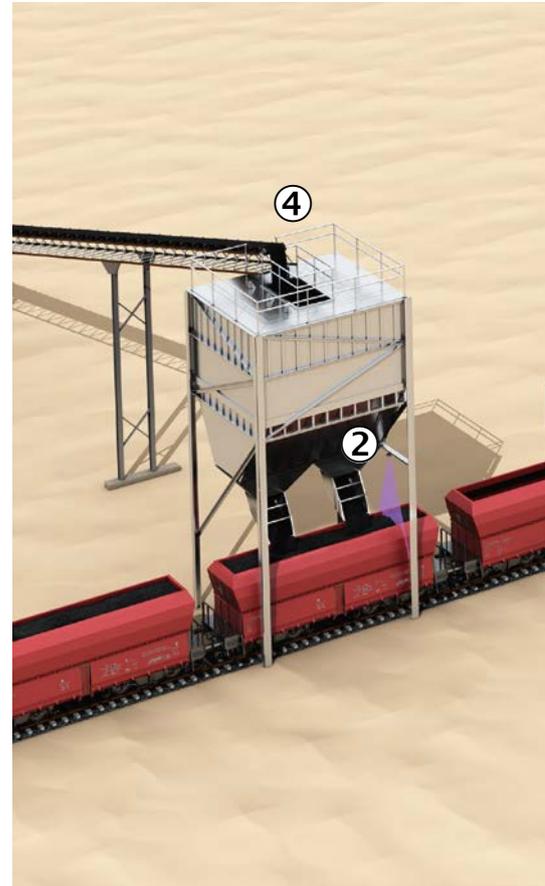
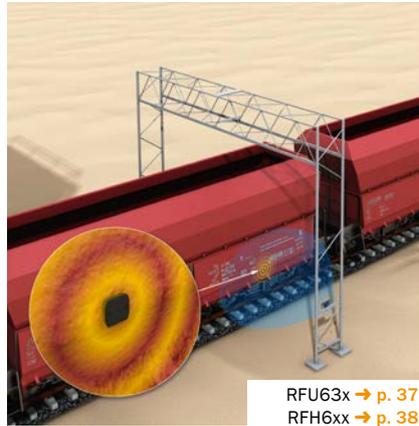
provides the operator with a real time field of view of the front and rear of the vehicle allowing the driver to maneuver correctly to position the tire on the haul truck. The Visionary-B can be fitted to all tire change handlers.



Visionary-B → p. 30

① Train wagon RFID tracking

Automatic tracking and identification of loaded wagons is an important task in the asset management and production chain from pit to port. SICK's RFID readers offer the robustness and range necessary to provide reliable data for track and trace.



② Wagon interior monitoring

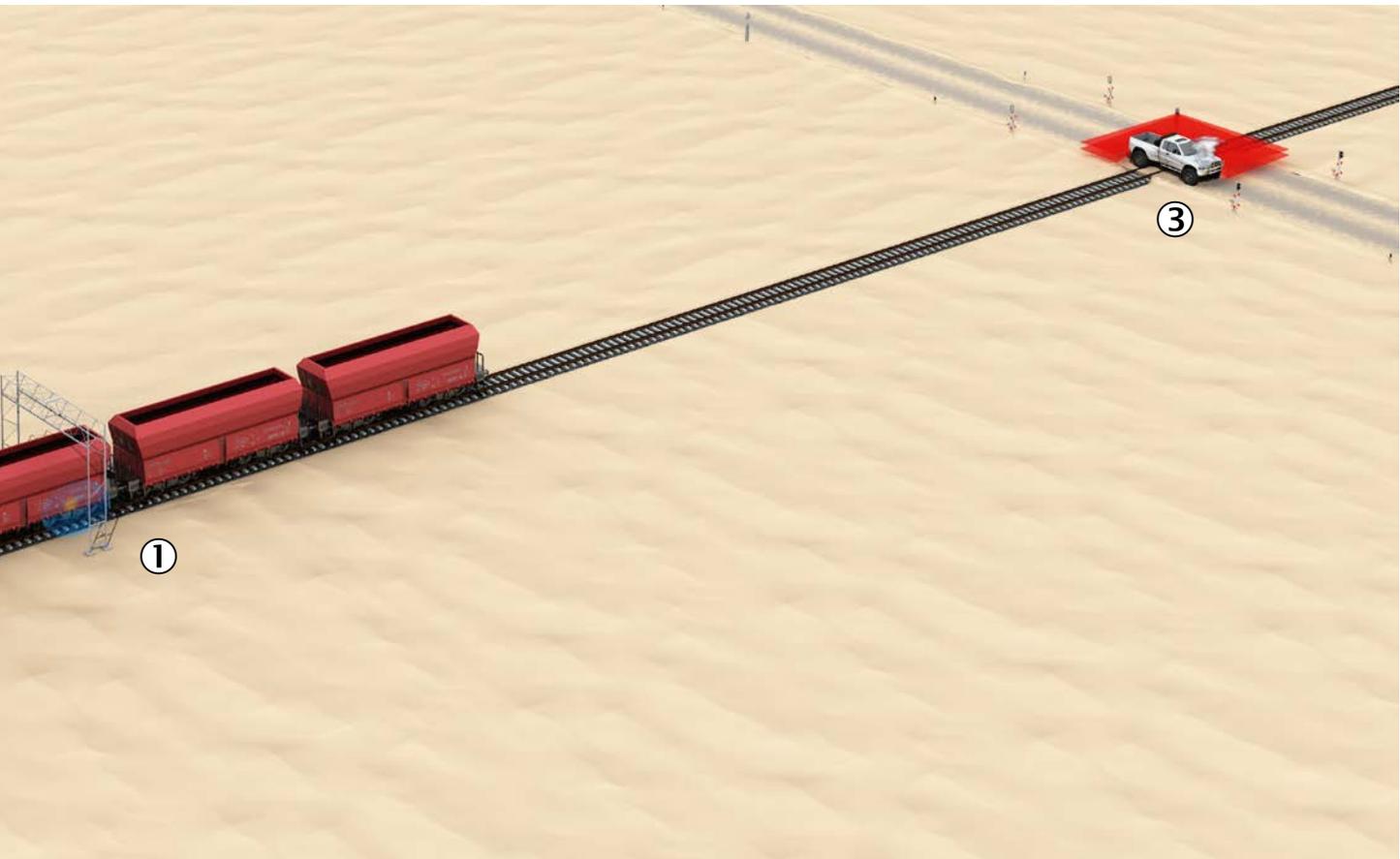
Uneven loading and incorrect emptying of train wagons are potential sources of derailment. A train wagon which has product remaining on board after unloading could swing and oscillate as the train travels, causing the wagon to derail. Accurate detection of a wagon's content, location, and load profile can prevent derailment.

The long range and wide angle features on the Bulkscan® LMS511 or the LMS151 make for easy installation and accurate real-time measurement.

③ Train level crossing monitoring

In remote locations, level crossings may not be properly guarded. Therefore operators would need to rely purely on visual monitoring. To reduce the risk of collision, a LMS511 laser scanner in conjunction with a Flexi Soft safety controller can provide the operator with an all-clear signal.



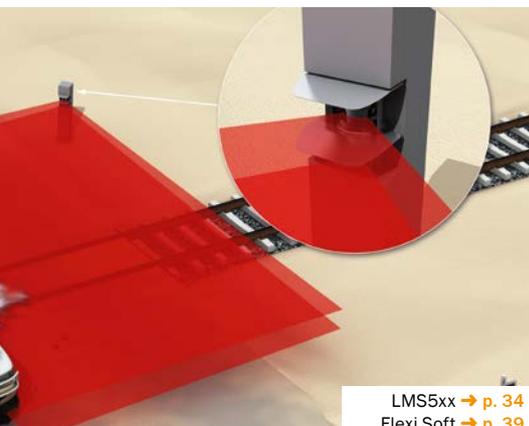


The LMS511 is able to operate in all weather conditions. Combined with the dual channel Flexi Soft safety controller, which continuously monitors the operational state of the laser scanner, a reliable system is provided for level crossing monitoring.

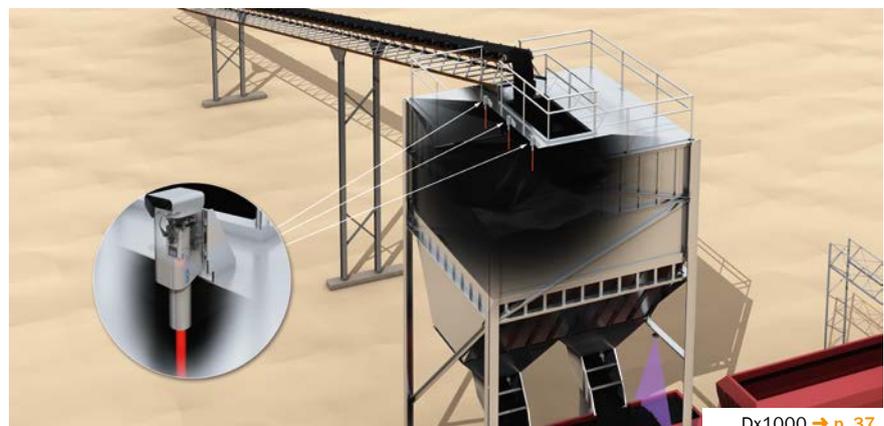
④ Bin and chute level detection

Lignite (soft coal) and anthracite (hard coal) are stored temporarily in storage bins up to 15 to 35 meters high at various process lines in a mine. Knowing the exact storage capacity available in a storage bin, surge bin or train loadout bin is crucial for receiving a constant supply of the mined material. Overfilling or minimal bulk material reduces production supply and productivity. To ensure the conveyor belt is continuously

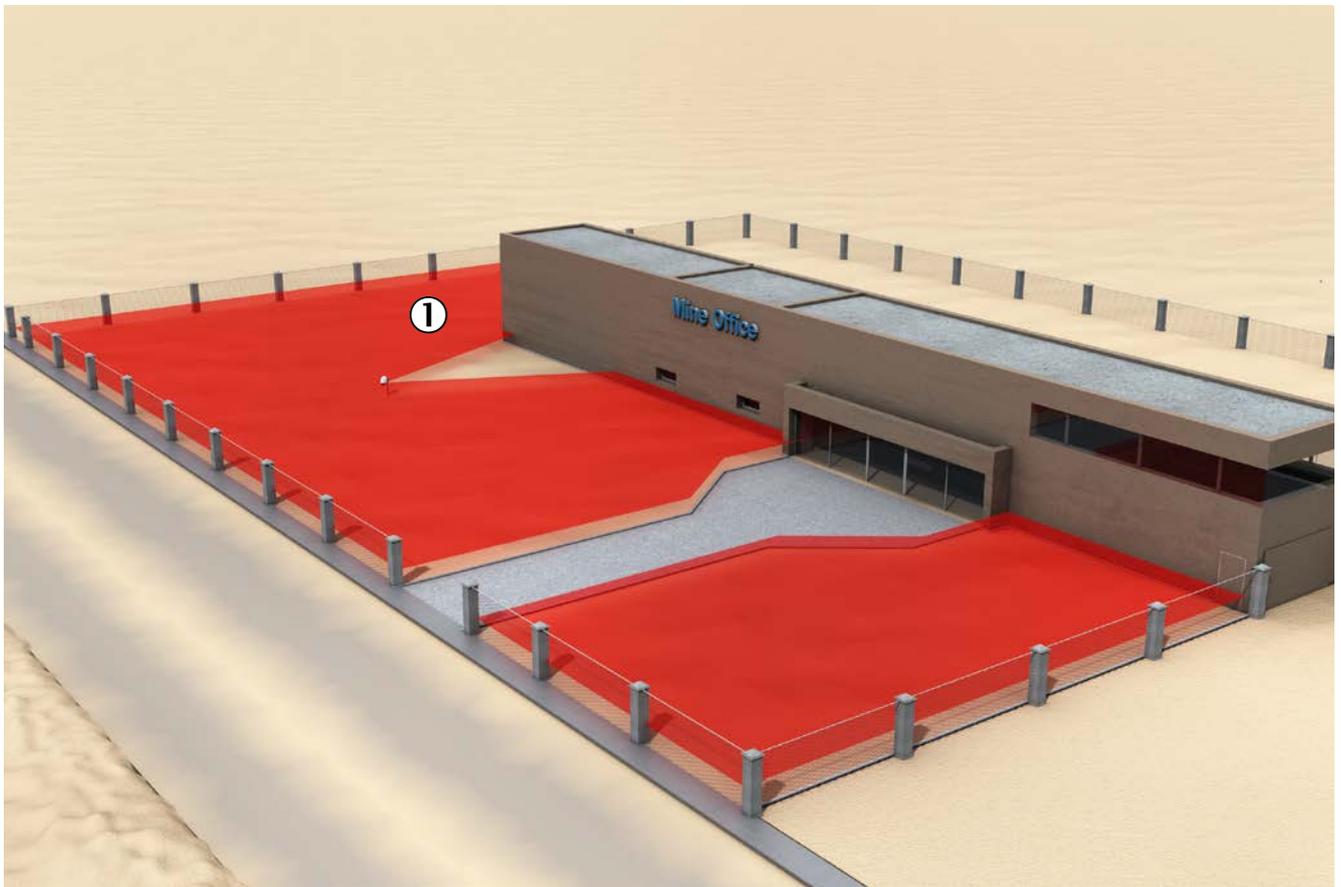
loaded without interruption, using a single or multiple long range distance. The DT1000 long range distance sensor can show the real-time level of the bin. The versatile DT1000 is a robust IP65 sensor using time-of-flight technology. It provides reliable measurements of the bin level which can be passed to the control room. Additional measurements can be used to prevent overfilling of the bins or chute.



LMS5xx → p. 34
Flexi Soft → p. 39



Dx1000 → p. 37



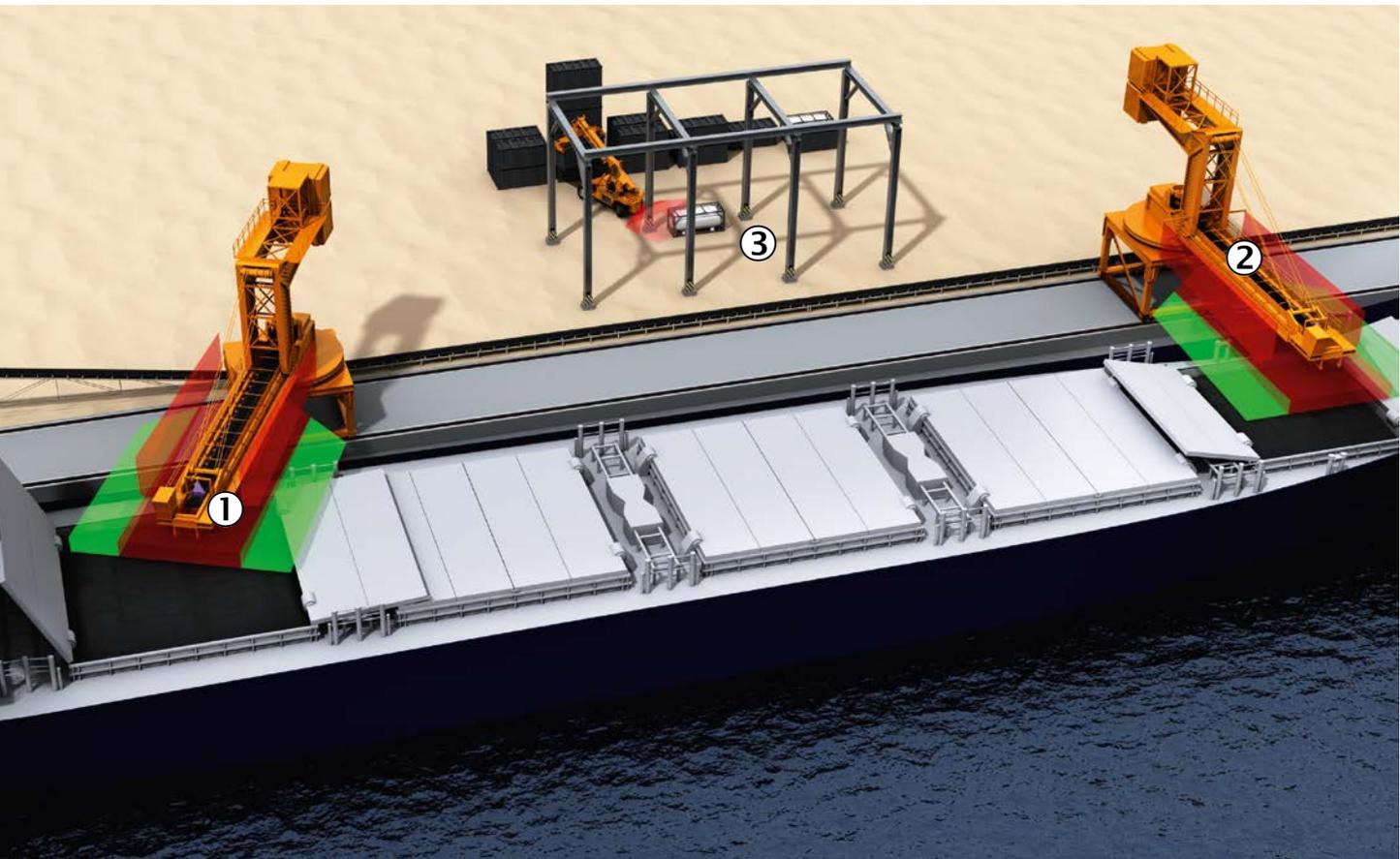
① Protection of buildings and surrounding areas

Using security guards to protect buildings and company ground has its limitations. Making additional use of a laser scanner for area monitoring can help reduce these limitations. The areas to be monitored can be freely defined so that animals or adverse weather conditions will not trigger false alarms.

The laser scanner can offer extra protection 24/7 since it is able to switch between programmed zones for day and night monitoring.



LMS1xx → p. 34
LMS5xx → p. 34



① Ship loading and profiling, volume measurement

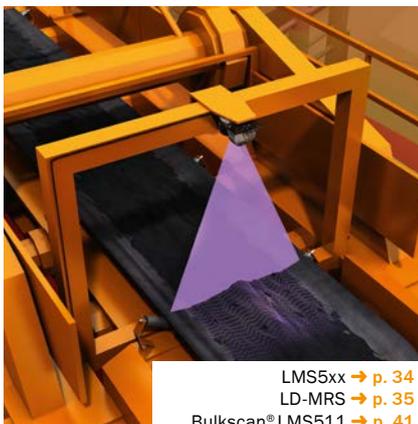
Efficient loading processes on belts, stockpiles, ship loaders, and silos require the precise measurement of the material flow in order to keep downtimes to a minimum and maximize control. It is very important to minimize loading problems when controlling the material flow from mine site to port of loading. SICK provides a comprehensive solution for these requirements.

② Protection of ship loader

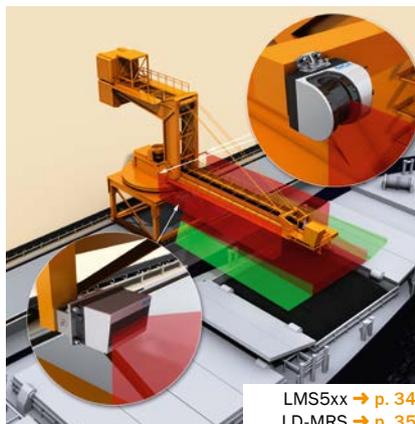
Safe loading of ships requires monitoring of many locations at the port and on the ship. Locations such as hatches, deck structures, ship loader booms and mobile equipment are all potential hazardous areas. SICK solutions minimize the risk of collisions and maximize productivity.

③ Mine ports vehicle protection

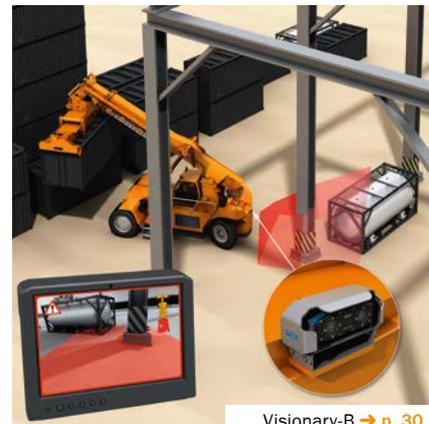
The Visionary-B streaming camera monitors the area behind the reach stacker. If an object is present in the warning field, the Visionay-B camera alerts the operator with visual and audible signals. The camera provides the operator with a rear view of any obstacles present and real time assistance in all driving situations.



LMS5xx → p. 34
LD-MRS → p. 35
Bulkscan® LMS511 → p. 41

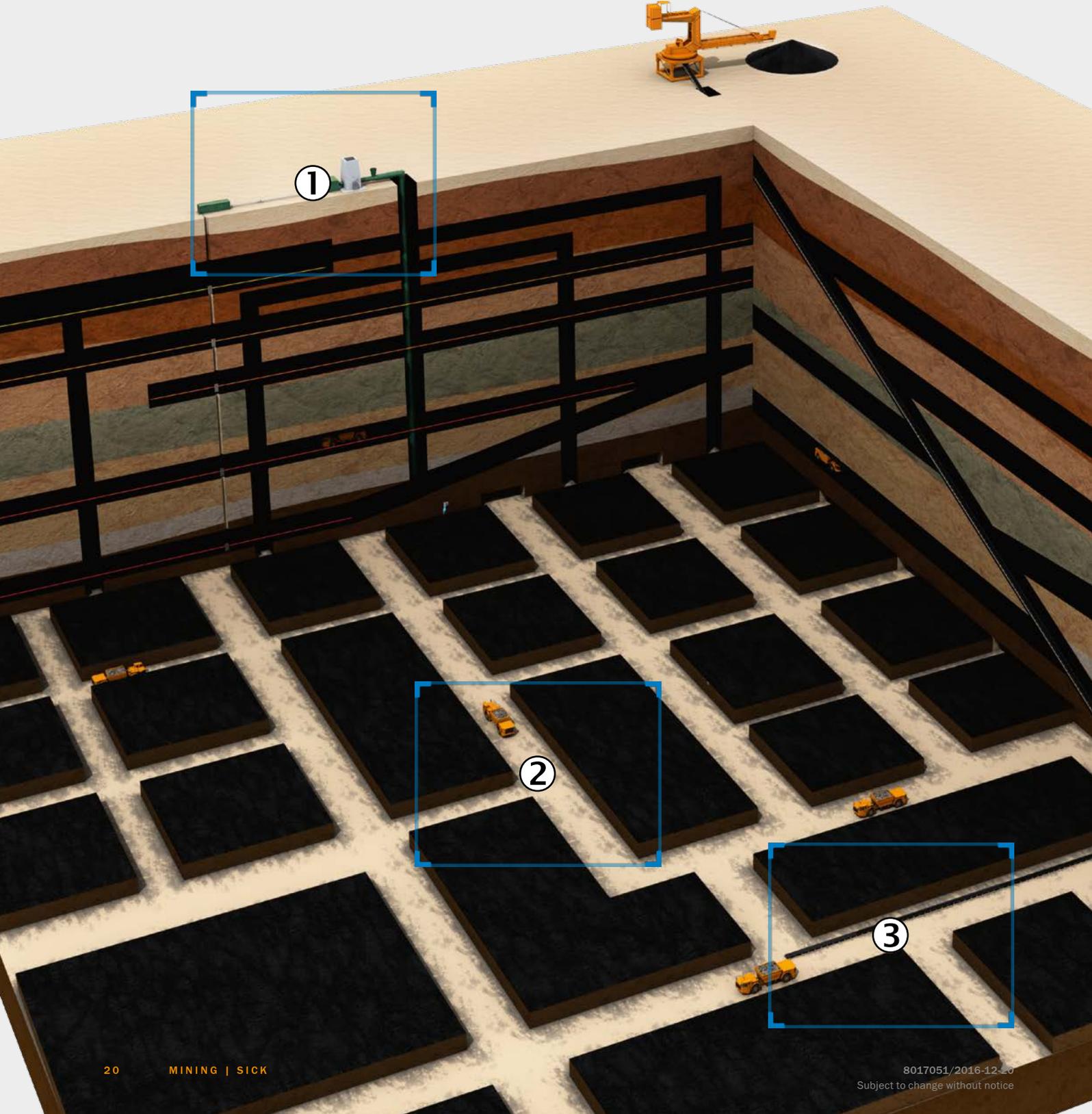


LMS5xx → p. 34
LD-MRS → p. 35



Visionary-B → p. 30

APPLICATIONS IN FOCUS UNDERGROUND MINING





Underground mining

Underground coal mines contain potentially harmful gases, which must be monitored and controlled in order to allow normal mining operations and to minimize the risk of explosions. Underground mines are also a potentially dangerous place for mine workers. Large mobile equipment in confined tunnels is a continuous hazard to miners and infrastructure. SICK will support you by providing safe solutions to monitor mine atmospheres and control underground mine equipment in these hazardous applications.

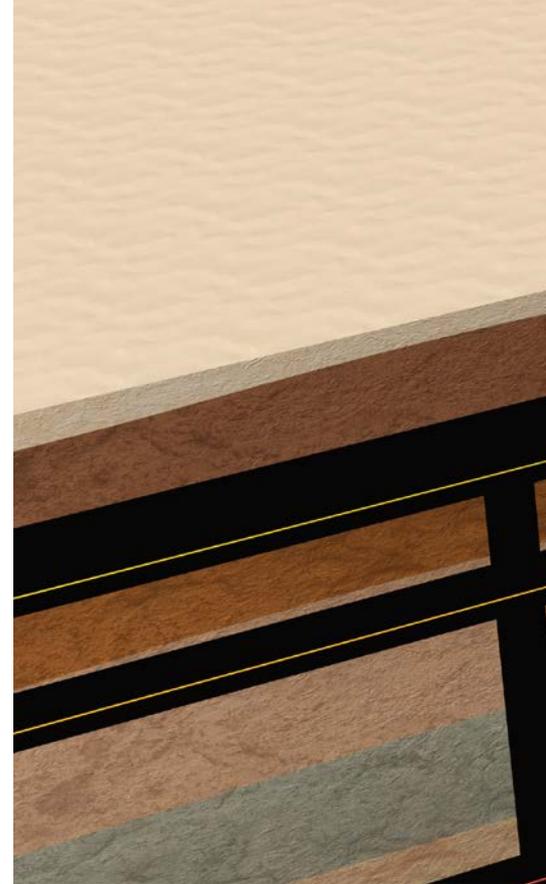
Focus 1	22
① Gas analysis	
Focus 2	24
② Collision awareness	
Focus 3	25
③ Material handling	

① Continuous air quality analysis - monitoring CH₄, CO₂, CO, O₂

Underground coal mines contain potentially harmful gases, which must be monitored and controlled in order to allow normal mining operations. Measuring percentage levels of oxygen (O₂), carbon dioxide (CO₂), methane (CH₄) and ppm levels of carbon monoxide (CO) gives the mine long and short term trending information. The MINESIC700 TBS continuously draws gas samples from sampling locations underground to the surface through LDPE tubes using vacuum pumps. On the surface, the gas samples are analyzed using the extractive S715 gas analyzer.



MINESIC700 TBS → p. 31



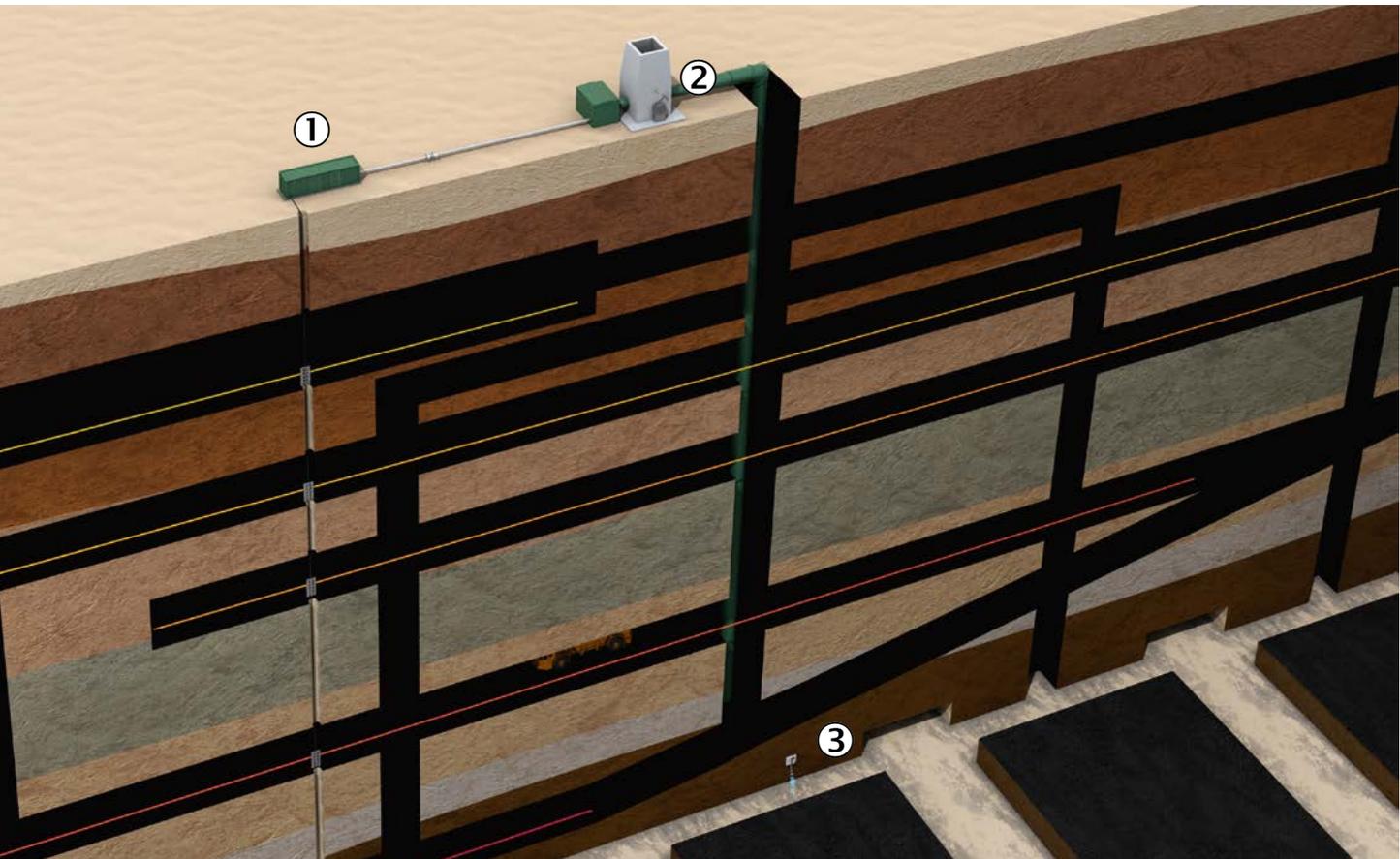
② Monitoring carbon emissions – GHG measurements or calculation of carbon tax

The greenhouse gas emissions (GHG) of a mine are continuously monitored. The measurements are taken in the ventilation shaft. Precisely measuring GHG emissions provides data which is used as the basis for calculating the tax liability. The MINESIC700 GHG uses the S715 extractive gas analyzer and the FLOWSIC100 ultrasonic gas flow measuring device to continuously record

GHG emissions from underground coal mines. High-precision sensors also measure temperature and pressure. An option to measure moisture can also be integrated. Customer-specific reporting software can be deployed to create emissions reports for submission to the tax authorities.



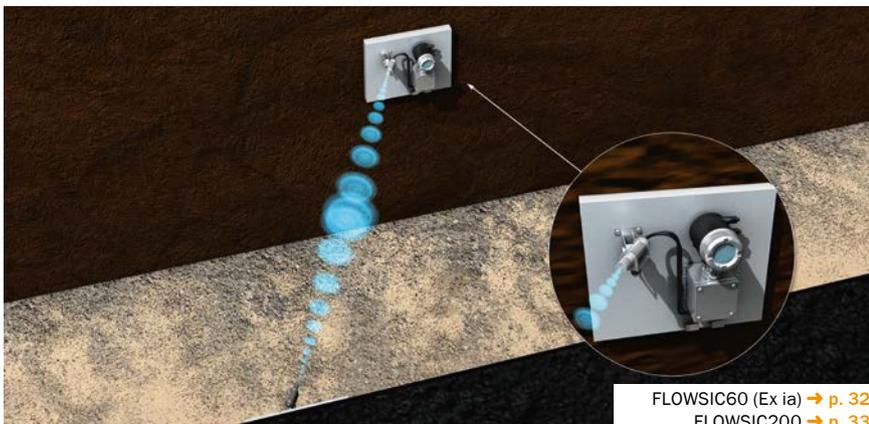
MINESIC700 GHG → p. 30
FLOWSIC100 → p. 33



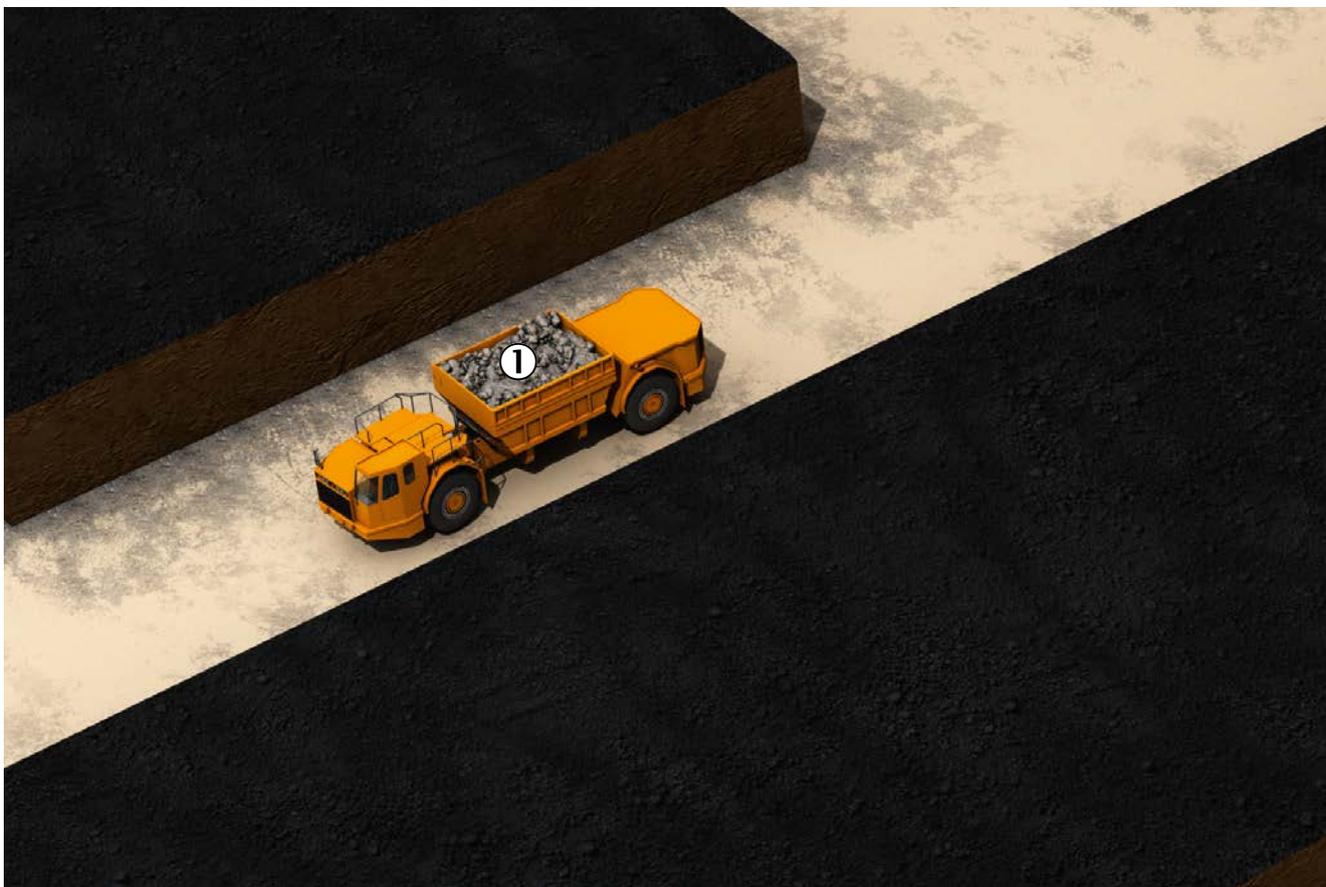
③ Air flow measurement – ventilation

Ventilation is important for maintaining safe operations underground. Correct levels of ventilation must be ensured at all times. Therefore, the supply and exhaust air flows must be measured regularly. Based on the ultrasonic measurement principles, the FLOWSIC200 and the intrinsically safe FLOWSIC60 (Ex ia) can continuously measure air velocity across the entire tunnel cross-section. The FLOWSIC offers maximum

reliability in harsh environments and provides real-time measurements at various points, allowing adjustments to be made based on the results taken. The VM400 is a compact air velocity sensor designed to continuously measure the air velocity at single point within a mine tunnel. The VM400 is a cost-effective solution with user-friendly setup for real-time flow measurement.



FLOWSIC60 (Ex ia) → p. 32
FLOWSIC200 → p. 33



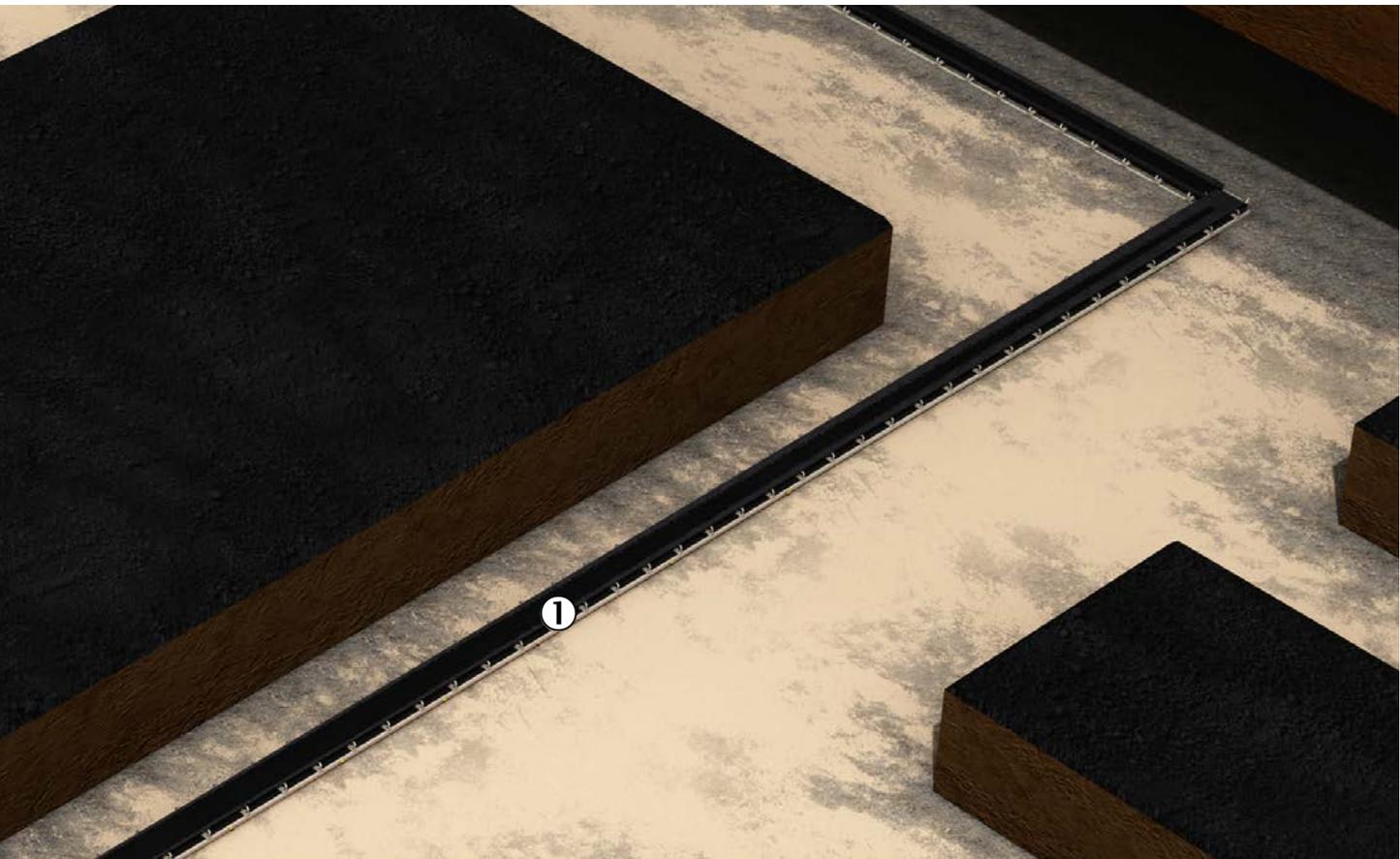
① Tunnel collision warning system

The risks in operating underground machinery lay in turning, cornering and reversing in close proximity to walls or other equipment. Mistakes can result in machine damage. The MINESIC100 TCW or, for hazardous areas, the MINESIC100 TCW Ex (Ex d mb) are mounted in underground vehicles. These are high precision proximity

detection systems that monitor the distance to the tunnel's surroundings and identify potential collision hazards. The MINESIC100 TCW and MINESIC TCW Ex provide guidance to the operator through the tunnel and offer accurate assistance for safe and efficient driving and maneuvering.



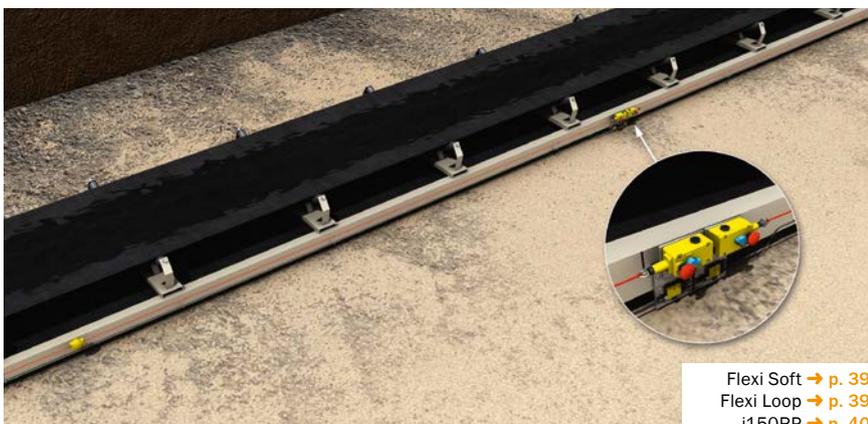
MINESIC100 TCW → p. 29



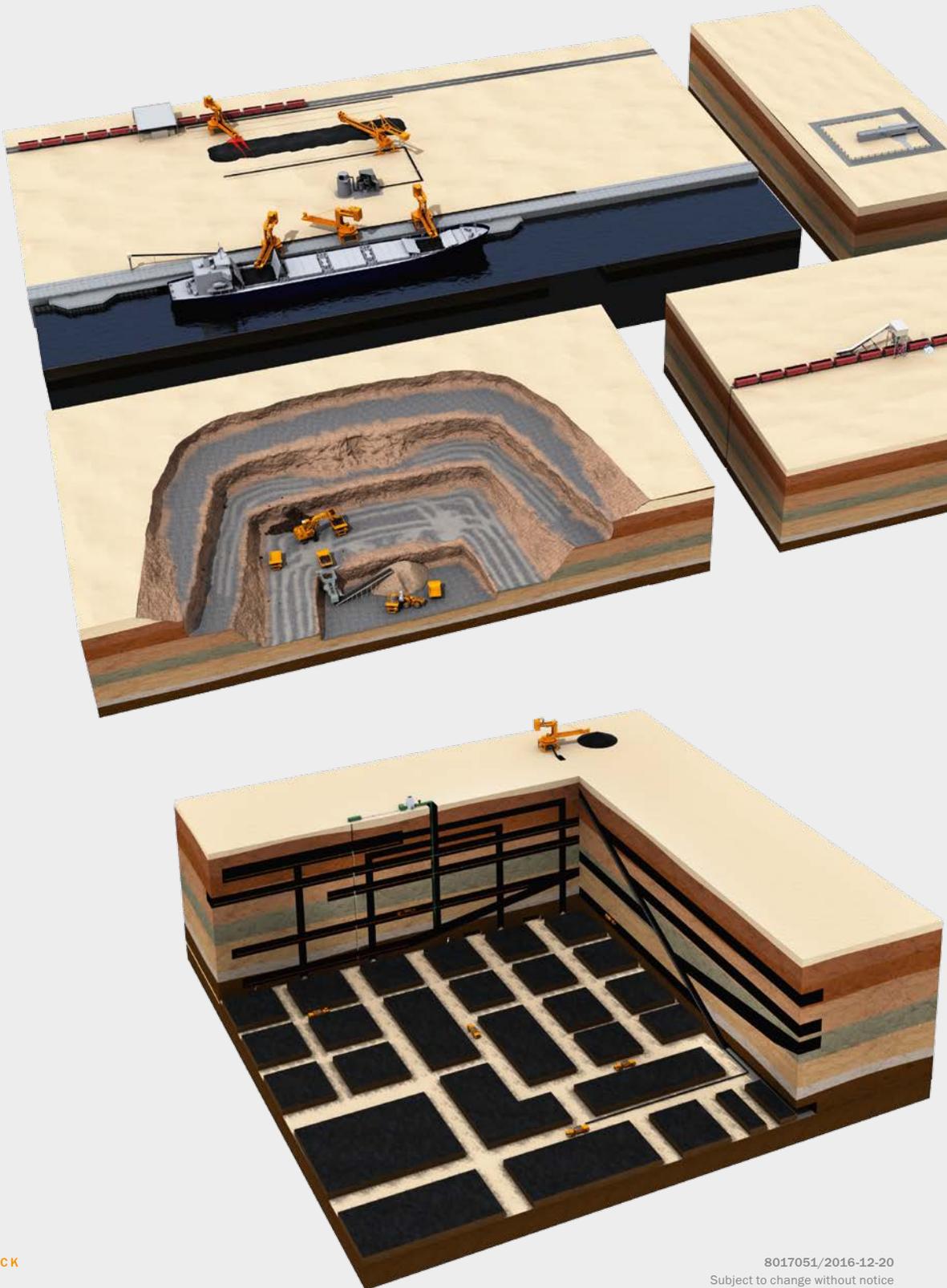
① Conveyor belt monitoring

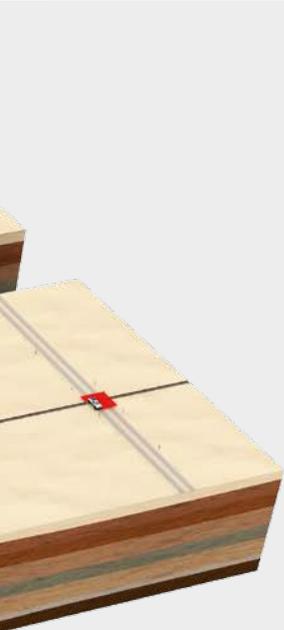
Belts in underground mining are potentially hazardous, they must be monitored using simple control points along their entire length. Rope pull switches ensure that the belt can be stopped reliably at any point along the rope in the event of a hazard. In operational status, the rope

is under tension and the safety-relevant contacts are monitored by the Flexi Soft safety controller so that potential hazards can be detected. This process can be automated by means of the additional integration of the Flexi Loop safe sensor cascade.



PRODUCT OVERVIEW MINING





Product overview

Driver assistance systems

MINESIC100 EPS	28
MINESIC100 WPS.	28
MINESIC100 TPS	29
MINESIC100 TCW.	29
Visionary-B	30

Customized analyzer systems

MINESIC700 GHG.	30
MINESIC700 TBS	31
MKAS	31

Extractive gas analyzers

SIDOR	32
-----------------	----

Flow velocity measuring devices

FLAWSIC60	32
FLAWSIC200	33

Volume flow measuring devices

FLAWSIC100	33
----------------------	----

2D laser scanners

LMS1xx	34
LMS5xx	34
TiM3xx	35

3D laser scanners

LD-MRS	35
------------------	----

2D vision

Inspector.	36
--------------------	----

Mid range distance sensors

Dx35	36
----------------	----

Long range distance sensors

Dx1000	37
------------------	----

RFID

RFU63x	37
RFH6xx.	38

Inductive proximity sensors

IQG.	38
--------------	----

Safety controllers

Flexi Soft.	39
---------------------	----

Safe sensor cascade

Flexi Loop	39
----------------------	----

Safety command devices

i150RP.	40
-----------------	----

Measuring wheel encoders

DFV60	40
-----------------	----

Incremental encoders

DFS60	41
-----------------	----

Flow sensors

Bulkscan® LMS511.	41
---------------------------	----

Level sensors

LBV300	42
------------------	----



MINESIC100 EPS – At a glance

- Active collision awareness for shovel operator when there are other mining vehicles in the vicinity
- Vehicle positioning and loading assistance
- Highwall collision warning
- Visual feedback (touch screen operator display) and audible alarm
- Open interface to fleet management via event logging

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
- Easy to install and operate
- Easy to maintain, integrated test function and reporting
- Can be configured to meet on-site operational requirements at the mine
- Full service package provided by SICK LifeTime Services
- Sound system knowledge thanks to comprehensive user training

→ www.sick.com/MINESIC100_EPS

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.



MINESIC100 WPS – At a glance

- Full coverage rear-end collision warning
- Visual feedback (touch screen operator display) and audible alarm
- Open interface to fleet management / dispatch systems & event logging
- Full functional operation across speed range (0...v_{max})
- Active reverse assist for maneuvering in confined spaces
- Displays accurately all obstacles behind the vehicle (windrows, vehicles, personnel) in real time

Your benefits

- Reduction of incidents, downtime and repair costs
- Detection and identification of mobile and stationary obstacles without the need for RFID tags
- Active situation-dependent warning with low false alarm rates
- Easy to install and operate
- Easy to maintain, integrated test function and reporting
- Can be configured to meet on-site operational requirements at the mine
- Full service package provided by SICK LifeTime Services
- Sound system knowledge thanks to comprehensive user training

→ www.sick.com/MINESIC100_WPS

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.





MINESIC100 TPS – At a glance

- Intelligent front-end collision warning
- Road departure warning
- Reverse assist (collision awareness protects tires and suspension)
- Black-spot warning (geo fencing of hazardous areas)
- Visual feedback (touch screen operator display) and audible alarm
- Open interface to fleet management via 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

→ www.sick.com/MINESIC100_TPS

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.



MINESIC100 TCW – At a glance

- Front and rear-end tunnel collision warning
- Corner cutting and over shooting warning
- Active assistance for maneuvering in confined spaces – displays the tunnel wall outline
- Visual feedback (touch screen operator display) and audible alarm
- Open interface to fleet management / dispatch systems & event logging
- Full functional operation across speed range (0...v_{max})

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

→ www.sick.com/MINESIC100_TCW

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.





Visionary-B – At a glance

- Intelligent 3D assistant systems improve collision awareness in harsh outdoor environments
- High temperature range from $-40\text{ }^{\circ}\text{C}$ to $+75\text{ }^{\circ}\text{C}$
- Rugged housing: IP 69K for the sensor head
- Sensing range up to 6 m
- 2-in-1 solution: Active 3D sensor with integrated 2D live camera
- Installation height between 1 m and 2.4 m
- Standalone system with monitor enables simple configuration
- Records activities from the last hours

Your benefits

- This 3D solution provides a real image with a visual and audible warning enhances collision awareness
- Perfectly designed to work in challenging outdoor environments – even in strong sunlight or rain.
- You get everything in one package, suitable for retrofit business
- Assists operator to concentrate more on his duties, e.g. during maneuvering
- 3D vision helps to detect relevant objects in blind zones around the vehicle
- Recording feature helps for event analysis
- Simple and intuitive configuration

→ www.sick.com/Visionary-B

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.



MINESIC700 GHG – At a glance

- Accurate measurement of greenhouse gas emissions
- Reliable measurement with minimal measurement uncertainties
- Automated switchover for up to five measuring points
- Software package to calculate and record all of the greenhouse gas emissions
- Flow rate, pressure, and temperature are measured with devices for IECEx Zone 1
- Available as a self-contained cabinet or integrated in MINESIC700 TBS

Your benefits

- Proven greenhouse gas measurement with reliable ultrasonic flow rate and gas measuring technology
- Up to 5 measurement points with a modular expandable system
- Precise measurement and reporting in line with legal requirements
- Reduced tax charges, as exact costs are calculated with minimal measurement uncertainties
- System is easy to operate and maintain
- Extensive service package including support options provided by SICK LifeTime Services
- Sound system knowledge thanks to comprehensive user training

→ www.sick.com/MINESIC700_GHG

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.





CE

MINESIC700 TBS – At a glance

- Extractive measurement of gases in coal mines
- Certified according to IECEx and ANZEx
- Reliable, continuous measurement (24/7)
- Automated switching between measuring points for up to 40 sites
- Automated alarm and alarm report
- Self-contained, transportable system
- Separate room for test gases
- Control room separated from the analysis and test gas room

Your benefits

- The system includes reliable and durable analyzers from SICK
- Modular system that can be expanded from 10 to 40 measuring points
- Measuring point switchover can be configured by the user
- Increased mine safety as the long-term trends of the mine atmosphere at every measuring point are recorded
- Remote control from the central control room
- System is easy to operate and maintain
- Extensive service package including support options provided by SICK LifeTime Services
- Sound system knowledge thanks to comprehensive user training

→ www.sick.com/MINESIC700_TBS

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.



CE

MKAS – At a glance

- Up to 3 S710 or SIDOR analyzers or NO_x-converter
- Includes the major system components
- Can be upgraded with optional components
- Wired and tested – ready for use

Your benefits

- Modular design to match the measuring task
- Use of highly proven system components ensures high reliability
- Meets the requirements for automated measuring devices in accordance with EU standards
- Sample gas bypass for reduced response time

→ www.sick.com/MKAS

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.





SIDOR – At a glance

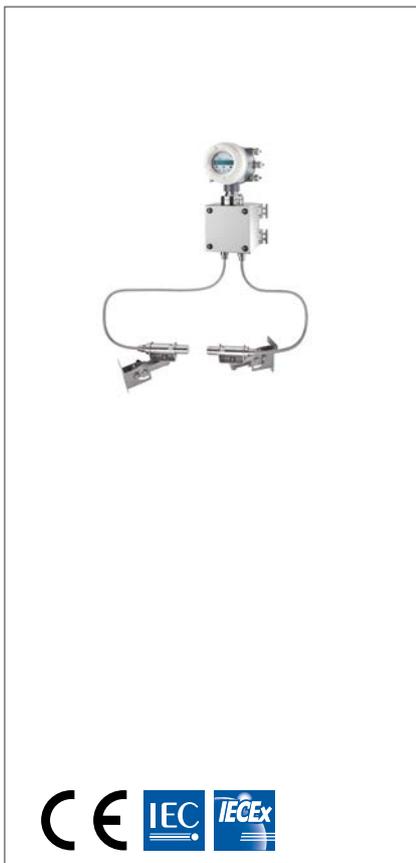
- Detector with high long-term stability
- Paramagnetic or electrochemical O₂ measurement
- Automated adjustment with component-free ambient air
- Immune to contamination

Your benefits

- Automated readjustment, self-monitoring, and fault diagnosis
- Test gas only needs to be checked every 6 months
- Long maintenance intervals
- TÜV suitability testing and MCERTS certification according to EN 15267
- Can be repaired on-site in many cases
- Replacement of components without complicated factory temperature calibration

→ www.sick.com/SIDOR

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.



FLOWSIC60 – At a glance

- Continuous air flow measurement
- Intrinsically safe with IECEx approval for zone 0 (EPL Ma)
- Ultrasonic technology with no moving parts
- Representative measurement across the entire width of the tunnel
- For tunnel diameters from 0.5 m to 8.5 m
- Stainless-steel components and cable protection tubing for a long service life in harsh environments
- Integrated self-diagnostics
- Analog output with error current output

Your benefits

- Reliable operation by intrinsically safe measuring system
- Convenient use through continuous automated air flow measurement
- Reliable measurement results through measurement across the entire width of the tunnel
- Long service life thanks to the use of durable stainless steel components and the wear-free measurement principle
- Low operating costs thanks to minimal maintenance work and integrated self-diagnostics
- Reduced installation and commissioning effort thanks to flexible mounting positions and simple electrical installation
- Low maintenance and long service intervals thanks high tolerance to contamination and the fact that there are no moving parts
- Easy connection to monitoring and control systems via analog measurement signal

→ www.sick.com/FLOWSIC60

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.





FLAWSIC200 – At a glance

- Very large measuring distances possible
- Non-contact measurement
- Extremely rugged components made of titanium, stainless steel, or die cast
- Versions for very corrosive tunnel atmospheres
- Determination of flow direction
- No mechanical moving parts

Your benefits

- Representative measurement across total tunnel width
- Very reliable measurement, compared with punctual measurement methods
- Accurate measurement even of very low flow velocities
- Long maintenance intervals of up to 5 years
- Low operating costs due to reliable operation and low maintenance
- High availability of devices and, therefore, of measurement data also

→ www.sick.com/FLAWSIC200

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.



FLAWSIC100 – At a glance

- Rugged titanium converters for long service life
- Corrosion-resistant material for use with aggressive gases (option)
- Integrated measurement via duct diameter for types H, M, and S
- Probe version PR for cost-saving, single-sided installation in duct
- Automated operational check with zero and reference point test

Your benefits

- Reliable flow measurement for ducts with small up to very large diameters
- High durability of the device
- Minimum operating and maintenance costs
- Accurate measuring results under difficult measuring conditions
- Measurement without pressure loss, therefore no influences on the process
- User-friendly operation via SOPAS ET software
- Reliable function monitoring due to enhanced diagnosis
- No purge air required for applications with gas temperatures up to 260 °C

→ www.sick.com/FLAWSIC100

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.





LMS1xx – 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.sick.com/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.



LMS5xx – 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.sick.com/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.





TiM3xx – 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. 4 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.sick.com/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.



LD-MRS – At a glance

- Simultaneous measurements on up to 8 scan planes
- Weatherproof thanks to multi-echo technology and IP 69K enclosure rating
- Lightweight, compact design: Approx. 1 kg
- Wide temperature range: -40 °C to +70° C
- Low power consumption: 8 watts
- Different angular resolutions in the scanning range are available
- Integrated object tracking

Your benefits

- Simultaneous measurement on up to 8 planes compensates for vehicle pitch
- Easy sensor integration due to compact design
- Low operating costs due to low power consumption
- Fast data output, even when processing a high amount of information
- IP 69K-rated housing ensures accurate measurements in difficult environmental conditions
- Better detection by focusing on a defined scanning segment
- Data preprocessing allows tracking of up to 128 objects

→ www.sick.com/LD-MRS

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.





Inspector – At a glance

- High-speed positioning, inspection and measurement
- Powerful “object locator” tool, independent of position, rotation and scale
- Unique, interchangeable housing design supporting dome and various optical accessories
- Simple step-by-step configuration in PC including emulator
- Easy-to-use operator interfaces
- Flexible machine and HMI design interfaces

Your benefits

- The multi-functional vision toolbox offers smart camera-level performance but with sensor ease-of-use
- Unique, interchangeable housing design provides the easiest way to improve image quality
- The simple configuration in SOPAS, including emulator for offline configuration and testing, will reduce downtimes in production to a minimum
- The easy-to-use operator interfaces are optimized to make it easier for the operator to oversee daily work more efficiently
- Ethernet communication and web API gives excellent connectivity and freedom to customize user’s HMI

→ www.sick.com/Inspector

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.



Dx35 – 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.sick.com/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.





Dx1000 – At a glance

- Long range distance sensor with infrared laser featuring HDDM+ technology
- Measures natural objects (DT1000) or reflectors (DL1000)
- Dust-proof and waterproof housing (IP 65 and IP 67) made of highly corrosion-resistant aluminum alloy
- Configurable digital inputs and outputs, analog output, RS-422/SSI
- Measures hot surfaces (DT1000)

Your benefits

- Reliable distance measurement indoors and outdoors enables high system throughput
- Multi-echo technology can suppress undesirable reflections – enabling use in a wider range of applications
- Comprehensive options for adjustments enable perfect adaptation to the individual measuring task
- Fast, safe commissioning using a graphical touch display, convenient SOPAS ET user interface and red alignment laser
- A small number of device variants (standardization) accommodating a wide range of requirements keeps costs down
- Laser class 1 and therefore eye-safe

→ www.sick.com/Dx1000

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.



RFU63x – At a glance

- UHF RFID read/write unit for industrial applications
- With or without integrated antenna, depending on the type (up to four external antennas can be connected)
- Standard-compliant transponder interface (ISO/IEC 18000-6C/EPC G2C1)
- Supports common industrial data interfaces and fieldbuses
- MicroSD memory card for device parameter cloning
- Several diagnostic and service options available

Your benefits

- Intelligent technology allows stand-alone usage
- Highest reading/writing performance
- Flexible integration in common industrial fieldbuses via 4Dpro compatibility
- Less maintenance time due to an integrated cloning back-up system using microSD memory card
- Easily adapts to application requirements via SOPAS parameter setting tool
- Free usable feedback LED quickly provides read results and diagnostic information directly to the user

→ www.sick.com/RFU63x

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.





RFH6xx – At a glance

- 13.56 MHz RFID write/read device for ranges up to 240 mm
- Transponder communication according to ISO/IEC 15693 standard
- Compact, industrial design with integrated antenna
- Embedded protocols allow interfacing with standard industrial fieldbus technologies
- Powerful micro-processor executes internally configurable logic
- Flexible trigger control
- Supports parameter cloning via microSD memory card
- Built-in diagnostics

Your benefits

- Reliable identification ensures maximum throughput
- Adapts to changing needs, ensures investment over the long term
- Simple integration saves installation time
- A wide range of functionality ensures flexible solutions
- Maintenance-free
- Uses same connectivity and configuration software as SICK's bar code scanners and image-based code readers – compatible through standardized 4D^{pro} platform

→ www.sick.com/RFH6xx

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.



IQG – At a glance

- Type: 40 mm x 40 mm
- Extended sensing ranges: 20 mm to 40 mm
- Electrical configuration: DC 3-/4-wire
- Enclosure rating: IP 68, IP 69K
- Temperature range: -25 °C to +85 °C
- Plastic housing
- Push-lock mounting system
- Sensor head can be rotated in five directions

Your benefits

- Easy to mount in only two seconds without the need for additional tools
- Reliable, cost-effective detection
- The four corner LEDs ensure that the sensor status can be identified from any viewing direction, whatever the mounting position
- Can be easily adapted to numerous applications
- Long sensor service life, even in harsh environments that are subjected to severe weather conditions
- Stable processes thanks to extensive sensing ranges

→ www.sick.com/IQG

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.





Flexi Soft – At a glance

- Expansion modules, Motion Control modules, and gateways for all common fieldbuses
- Configuration data stored in the system plug
- Safe networking of up to 32 Flexi Soft stations

Your benefits

- Scalable for an efficient and cost-optimized safety application solution
- Cost savings: Flexi Soft offers a modular structure that is in line with your requirements, and thus offers an ideal level of granularity
- Intuitive configuration software featuring comprehensive functions enables continuous monitoring of the configuration
- Rapid verification of the safety application: The configuration software provides documentation and a wiring diagram

- Integration of sensor cascade
- Multi-language, license-free configuration software: exceptionally simple operation, plausibility check, simulation mode, wiring diagram, parts list, documentation, and data recorder

→ www.sick.com/Flexi_Soft

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.



Flexi Loop – At a glance

- Ability to cascade 32 sensors with up to 100 m per segment in compliance with performance level e
- Compatible with sensors from all manufacturers
- Detailed diagnostics information
- Integrated standard inputs and outputs

Your benefits

- Cascading of safety switches and safety sensors with OSSD outputs minimizes the wiring effort and the number of inputs of the safety controller, which saves costs
- Easy retrofitting of existing machines
- Simple calculation of the performance level saves time since the Flexi Loop node monitors each sensor individually
- User-friendly due to quick and easy configuration

- Voltage supply for sensors is included
- Unshielded standard cable featuring M12 connectivity
- Enclosure rating IP 65 and IP 67
- Intelligent accessories for field diagnostics and commissioning

- Ability to be used over long distances increases application flexibility
- Detailed diagnostic information minimizes system downtime
- Seamless system integration and communication with other SICK safety controllers
- Detailed status information on Flexi Loop components, diagnostics accessories, and safety controller enable quick and easy field diagnostics

→ www.sick.com/Flexi_Loop

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.





i150RP – At a glance

- Rope lengths up to 75 m, with rope break and rope pull function
- Metal housing with integrated emergency stop push button and tension display
- Rotary unlocking lever
- Available with M20 X 1.5 cable entry gland or Flexi Loop compatible M12 plug connector (depending on variant)
- Slow-action switching elements with four contacts

Your benefits

- The emergency stop function can be triggered at any point along the rope
- The long rope length reduces the number of rope pull switches, which saves costs
- Simple adjustment of the rope tension
- Rugged metal housing offers a high level of protection for the rope pull switch
- Integrated emergency stop push-button allows users to trigger the emergency stop function at the end of the rope
- User-friendly systems available with many rope lengths
- Additional contacts provide quick and easy diagnostics
- With Flexi Loop: safe series connection including diagnostics with minimal wiring effort

→ www.sick.com/i150RP

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.



DFV60 – At a glance

- Rotatable spring arm for universal use
- 300 mm wheel circumference with o-ring made from NBR70
- Mounting arm and measurement wheels made from aluminum
- Programmable output voltage, zero pulse position, zero pulse width and number of pulses
- Connection: radial M12 connector outlet or radial/axial cable outlet
- Electrical interfaces: 5V & 24V TTL/RS-422, 24 V HTL/push pull
- Remote zero setting possible

Your benefits

- Universal-use spring arm ensures fast and simple mounting
- The high level of spring tension enables use in harsh environmental conditions
- Reduced storage costs and downtime due to programmability
- Connector-in cable outlet in radial or axial direction enables customer-specific cable solutions
- Excellent concentricity even at high speeds
- Permanent and safe operation due to a high enclosure rating, temperature resistance and a long bearing lifetime
- Programmability via the PGT-08-S programming software and the PGT-10-Pro display programming tool allow the encoder to be adapted flexibly and quickly according to customer needs
- Programmable zero pulse position simplifies installation

→ www.sick.com/DFV60

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.





DFS60 – At a glance

- Compact installation depth
- High resolution up to 16 bits
- Optionally programmable: Output pulse voltage, zero pulse position, zero pulse width and number of pulses
- Connection: Radial or axial cable outlet, M23 or M12 connector, axial or radial
- Electrical interfaces: 5V & 24V TTL/RS-422, 24 V HTL/push pull
- Mechanical interfaces: face mount or servo flange, blind or through hollow shaft
- Remote zero set possible

Your benefits

- Reduced storage costs and downtime due to customer-specific programming
- Variety of different mechanical and electrical interfaces enable the encoder to be optimally adjusted to fit the installation situation
- Excellent concentricity even at high speeds
- High resolution of up to 16 bits ensures precise measurements
- Permanent and safe operation due to a high enclosure rating, temperature resistance and a long bearing lifetime
- Programmability via the PGT-08-S programming software and the PGT-10-Pro display programming tool allow the encoder to be adapted flexibly and quickly according to customer needs
- Programmable zero pulse position simplifies installation

→ www.sick.com/DFS60

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.



Bulkscan® LMS511 – At a glance

- Non-contact measurement of volume and mass flow of bulk materials
- Laser pulses with high angular resolution ensure outstanding image resolution
- 5-echo pulse evaluation produces highly reliable measurements
- Non-contact belt monitoring
- Integrated center-of-gravity calculator
- Rugged design for harsh ambient conditions
- Integrated heater allows measurement even at low temperatures
- Compact housing with IP 67 enclosure rating

Your benefits

- Maximizes conveyor throughput
- Reduces maintenance costs by preventing belt slippage
- Increases the conveyor belt's service life
- Reduces loading time
- Increases efficiency by optimizing belt capacity
- Simple installation
- Low maintenance costs
- Offers savings through minimized energy consumption

→ www.sick.com/Bulkscan_LMS511

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.





LBV300 – At a glance

- Tough device design
- Several housing materials and electrical outputs available
- Immune to deposit formation
- Commissioning without filling
- Process temperature up to 250 °C
- Very high repeatability
- ATEX versions (1D/2D/1G/2G) available
- Tube-extended version (LBV330) up to 6 m and rope extensions version (LBV320) up to 80 m available for vertical mounting

Your benefits

- Easy installation and commissioning, no calibration necessary
- Easy operation and integration, saves time
- Maintenance-free sensor, reduces downtime
- Testing in place possible – no mounting required, which reduces installation time
- Flexible and tough system for a multitude of applications
- Solutions for vertically mounted switches in difficult installation conditions and surroundings

→ www.sick.com/LBV300

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.



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

More than 7,400 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 agencies 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



SERVICES FOR MACHINES AND SYSTEMS: 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 70 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



VERSATILE PRODUCT RANGE FOR INDUSTRIAL AUTOMATION

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](http://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
- Upgrade kits for opto-electronic protective devices



Safety switches

- Electro-mechanical safety switches
- Non-contact safety switches
- Safety locking devices
- Safety command devices



sens:Control – safe control solutions

- Safe sensor cascade
- Safety controllers
- Motion Control 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
- Sensor integration machine



Distance sensors

- Displacement measurement sensors
- 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 and inclination sensors

- Absolute encoders
- Incremental encoders
- Linear encoders
- Wire draw encoders
- Safety encoders
- Inclination sensors
- Measuring wheel 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



Softwareprodukte

- SICK AppSpace
- Analytics Solutions
- Integrated Managing Solutions



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

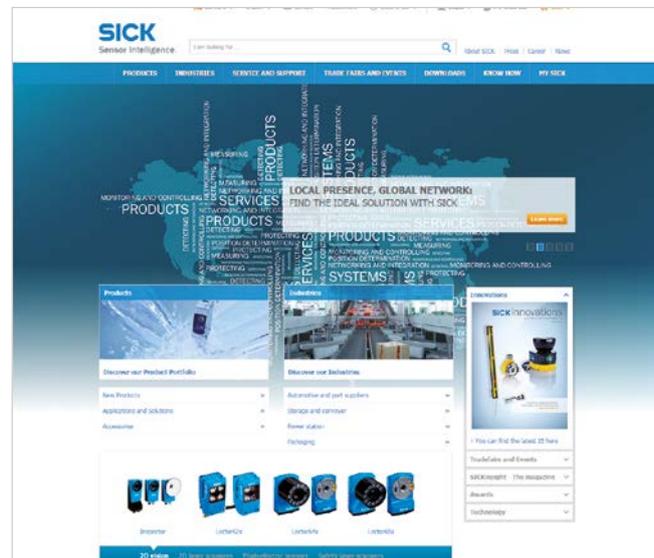


Our fieldbus and network solutions allow SICK sensors and safety controllers to be connected to all conventional automation systems. This guarantees an easy and fast access to the available data.

→ www.sick.com/industrial-communication

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

- ✓ Select products, accessories, documentation and software quickly and easily.
- ✓ Create, save and share personalized wish lists.
- ✓ View the net price and date of delivery for every product.
- ✓ Requests for quotation, ordering and delivery tracking made easy.
- ✓ Overview of all quotations and orders.
- ✓ Direct ordering: submit even very complex orders in moments.
- ✓ View the status of quotations and orders at any time. Receive e-mail notifications of status changes.
- ✓ Easily repeat previous orders.
- ✓ Conveniently export quotations and orders to work with your systems.



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 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.”

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 further locations → www.sick.com