MOBILE AUTOMATION

SENSOR SOLUTIONS FOR CONSTRUCTION AND MINING MACHINES

SICK
Sensor Intelligence.

TASKS FOR CONSTRUCTION AND MINING MACHINES

Providing innovative and intelligent sensor solutions, SICK has been shaping the logistics, factory and process automation sector as one of the leading global sensor manufacturers for decades. With industry knowledge and a wide sensor-technology portfolio, SICK is the ideal partner for providing sensor solutions for mobile machines. Integrating sensors and sensor systems in construction and mining machines create intelligent solutions suited for daily use that meet customer expectations both in terms of an increased yield and lower process costs.

More information about SICK sensor-technology portfolio
➜ **www.sick.com/mobile_automation**

Solutions – designed for machine manufacturers

SICK has a comprehensive, innovative technology portfolio. Based on these technologies, SICK develops tailor-made sensor solutions for construction and mining machinery manufacturers. The portfolio ranges from standard sensors and sensors with integrated application software through to complex sensor-system solutions. Please contact us. We would be happy to provide you with more information.

Collision awareness

Driver assistance systems based on SICK LiDAR sensor or 3D vision sensors reliably detect blind zones around mobile machines and warn the operator of potential sources of danger or accidents in good time. This means the driver is able to identify and prevent possible collisions early on. As a result, damage to the machine and the surrounding area is rare. This reduces the machine downtimes and repair costs.


Contour guidance

Driver assistance systems for contour guidance based on SICK LiDAR sensors increase the efficiency of construction and mining machines, while simultaneously relieving the strain on the operator. Thanks to intelligent sensors with integrated application software, the recorded raw data and the vehicle data are directly evaluated by the sensor. Application-relevant results are therefore available without resource-intensive processing in the driver assistance systems of the machinery manufacturer.

Positioning and detecting

Sensors such as encoders, inclination, proximity and ultrasonic sensors, as well as pressure and level sensors manufactured by SICK, are the basis of numerous positioning and detection tasks in construction and mining machines.

SENSOR SOLUTIONS FOR COLLISION AWARENESS
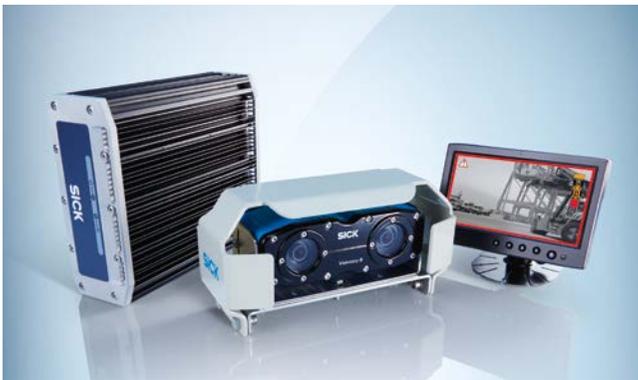
3D vision sensor Visionary-B

The SICK Visionary-B is a driver assistance system for vehicles making use of stereo vision. It is well suited for working in outdoor environments, e.g. in mines, ports and construction sites. The Visionary-B supports drivers maneuvering large vehicles by continuously monitoring blind spots in 3 dimensions.

2D and 3D LiDAR sensors

2D and 3D LiDAR sensors offer a large range of applications. The two- or more-dimension contour data recorded can be processed both internally and externally. The products in the LiDAR sensor product range, depending on the version, are suited for contour guidance and collision warning in driver assistance systems of mobile machines such as diggers and mining vehicles. Thanks to their rugged design and excellent performance even in unfavorable weather conditions, the 2D and 3D LiDAR sensors form the core of our collision warning assistance systems.

Driver assistance systems

SICK offers complete sensor system solutions for the realization of driver assistance systems for collision warning. These intelligent systems significantly reduce the installation and evaluation effort for the mechanical engineer. An example of this is the MINESIC sensor system. Please contact us if you are interested. We would be happy to provide you with more information.

EXCAVATOR

Leveling the excavator arm

To optimize the work routine of an excavator, the absolute position of the moving parts to each other must be known. Inclination sensors TMS/TMM88 reliably record this position by measuring the inclination of the upper and lower carriage and the excavator arm. Absolute encoder AHS/AHM36 on the respective arm joints can support the measurement.

- TMS/TMM88 inclination sensor
- AHS/AHM36 CANopen absolute encoder

→ www.sick.com/
TMS_TMM88

→ www.sick.com/
AHS_AHM36_CANopen

Collision awareness on the rear of an excavator

Already in medium-sized excavators a clear view for the machine operator is significantly limited and thus increases the risk of accidents. The 2D LiDAR sensor LMS1xx mounted on the excavator immediately detects objects in the collision range of the vehicle and warns the machine operator. This allows any possible collisions with objects to be detected and avoided. Less damage results to the machine and in the surroundings and the availability of the excavator is increased. Costs for repairs are simultaneously lowered.

- LMS1xx 2D LiDAR sensor

→ www.sick.com/LMS1xx

Detection of slewing ring position

In order to realize semi-automated machine processes it is necessary to measure the position of the upper to the lower carriage with an absolute encoder at the slewing ring. With its very compact size and the rugged design, the AHS/AHM36 absolute encoder is perfect for this task. Thanks to the absolute position detection, high resolution and high repeatability, it can also realize repeating work processes.

- AHS/AHM36 CANopen absolute encoder

→ www.sick.com/
AHS_AHM36_CANopen

MINING EQUIPMENT

Protecting trucks

The size, height, and speed of trucks combined with continuously changing operating conditions often make for very poor visibility for drivers. Front-end and rear-end collisions and leaving the road unintentionally are not uncommon occurrences in a mine. The MINESIC100 TPS is a high-precision collision awareness system that monitors critical zones surrounding a vehicle and warns the operator of danger leaving the road unintentionally.

➜ www.sick.com/MINESIC100_TPS

- MINESIC100 TPS driver assistance system

Protecting wheel loaders and bulldozers

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.

➜ www.sick.com/MINESIC100_WPS

- MINESIC100 WPS driver assistance system

Excavator protection including shovels

The MINESIC100 EPS is a high-precision collision awareness system that monitors the area around a shovel. It guides truck operators to the correct loading position. The operator display shows all obstacles in the corresponding warning fields. If a collision is imminent, the operator will be warned by an audible alarm so that the current maneuver can be stopped in good time.

➜ www.sick.com/MINESIC100_EPS

- MINESIC100 EPS driver assistance system

MOBILE CRANE

Inclination sensors for positioning tasks on the mobile crane

To avoid damage due to overload and overturning, sensor solutions for load torque restrictions are used on the mobile crane. The 2 dimensionally functioning inclination sensor TMM88 suited for the support during the automated leveling of the mobile crane has a compensated cross sensitivity and configurable vibration suppression. The one-dimensional functioning inclination sensor TMM88 records the position of the boom. Its measuring range of 360° and the freely adjustable zero point allow flexible application in various installation situations.

- TMS/TMM88 inclination sensor

➜ www.sick.com/
TMS_TMM88

Wire draw encoder for support and boom positioning on the mobile crane

A sub-function for the load torque restriction on the mobile crane is the position detection of the extendable support feet and the recording of the boom and crane arm position. The wire draw encoders from the EcoLine product family are perfect for the support positioning thanks to their narrow shape. The wire draw encoder from the HighLine product family, with their rugged housing and measurement length up to maximum 50 m, are the right solution for boom positioning.

- EcoLine wire draw encoder
- HighLine wire draw encoder

➜ www.sick.com/
EcoLine

➜ www.sick.com/
HighLine

Encoder for angle recording on the boom

The angle and the position of the boom relative to the lower carriage must be known for a stable load torque restriction. The absolute encoder AHS/AHM36 is suitable thanks to its compact and rugged design and the CANopen interface for this task.

- AHS/AHM36 CANopen absolute encoders

➜ www.sick.com/
AHS_AHM36_CANopen

DRILL RIG

Object detection on the drill

For uninterrupted drilling, it is necessary to be able to detect objects early on which could enter the drilling area. The LMS1xx 2D LiDAR sensor, insensitive to dust in its field of view and with a wide sensing range, is particularly well-suited for this task.

- LMS1xx 2D LiDAR sensor

➜ www.sick.com/LMS1xx

Monitoring the drilling angle

The foundation for successful drilling is accurate positioning and adjustment of the drilling machine. To do so, the TMM88 inclination sensor determines the x- and y-coordinates. High accuracy over the entire measuring range, excellent temperature stability as well as compensated cross sensitivity and configurable vibration suppression make the TMM88 the perfect solution for this challenging task.

- TMS/TMM88 inclination sensor

➜ www.sick.com/ TMS_TMM88

Monitoring of the drill feed and drill speed

For precise drilling, it is important to know the exact drill speed and the position of the drill feed. The AHS/AHM36 absolute encoder is the optimal choice for this purpose due to the absolute position detection, dust-proof performance as well as reliable fully-magnetic sensors. In addition, it can be used for position detection in combination with a wire draw mechanism, the BTF wire draw encoder.

- AHS/AHM36 CANopen absolute encoder
- HighLine wire draw encoder

➜ www.sick.com/ AHS_AHM36_CANopen

➜ www.sick.com/ HighLine

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**

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SICK AG | Waldkirch | Germany | www.sick.com