APPLICATION EXAMPLES FOR SYSTEM SOLUTIONS

APPLICATIONS IN FACTORY-, LOGISTICS-
AND PROCESS AUTOMATION

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## APPLICATIONS OVERVIEW

### Customized analyzer systems
- PowerCEMS 100
- METRAX 300
- TRANSIC Extractive
- MINE SIC OD TBS
- MKAS Compact
- PowerCEMS 50
- MINE SIC OD EPS
- MINE SIC OD TPS
- MINE SIC OD WCS
- RAS Prime
- Visionary-B
- WIS
- APS
- AOS Prime

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### Driver assistance systems

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### Object detection systems

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### Factory Automation

#### I1. Automotive and parts supplier
- Pick up of raw body components for mounting
- High-precision pin inspection for the press-fit operations during the final assembly of electronic modules
- Traceability of wheels
- Part location in boxes

#### I1. Tire
- TLA (Tire Lector Array) with integrated spotting enables robot handling

#### I1. Food and beverage
- Identification of molds using the Asset Monitoring System
- Packing and storing in inert gas – For optimum freshness and taste
- The right product in the right packaging
- Protrusion monitoring at pallets

#### I1. Packaging
- Reliable dimensioning for efficient production of secondary packaging

#### I1. Machine building
- Part location in boxes

#### I1. Handling and assembly technology
- Part localization in the anyfeeder

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### Logistics Automation

#### I1. Courier, express, parcel and postal
- Manual measuring, weighing, and scanning (DWS)
- Automated identification of objects
- Optimum throughput at maximum read rate
- Camera-based identification on multiple sides
- Camera-based identification on the underside
- Identification on multiple sides with hybrid systems
### APPLICATIONS OVERVIEW

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<td>VMS440/540</td>
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#### Sample Application Examples

- **Factory Automation**
  - **I1 Automotive and parts supplier**
    - Pick up of raw body components for mounting
    - High-precision pin inspection for the press-fit operations during the final assembly of electronic modules
  - **I1 Tire**
    - TLA (Tire Lector Array) with integrated spotting enables robot handling
  - **I1 Food and beverage**
    - Identification of molds using the Asset Monitoring System
    - Packing and storing in inert gas – For optimum freshness and taste
    - The right product in the right packaging
  - **I1 Packaging**
    - Reliable dimensioning for efficient production of secondary packaging
  - **I1 Machine building**
    - Part location in boxes
  - **I1 Handling and assembly technology**
    - Part localization in the anyfeeder
  - **Logistics Automation**
    - Manual measuring, weighing, and scanning (DWS)
    - Automated identification of objects
    - Optimum throughput at maximum read rate
    - Camera-based identification on multiple sides
    - Camera-based identification on the underside
    - Identification on multiple sides with hybrid systems
# APPLICATIONS OVERVIEW

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<th>Driver assistance systems</th>
<th>Object detection systems</th>
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<td><strong>11. Courier, express, parcel and postal</strong></td>
<td>PowerCEMS100</td>
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<td>MINESIC100 EPS</td>
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<td>Position detection of objects with 2D LiDAR sensors</td>
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<td>Goods identification on sorters</td>
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| **11. Storage and conveyor** | MINESIC100 Prime | APS | |
| Dynamic volume measurement with light grids | TIC102 | | |
| Automated identification with RFID for picking and in goods issue | TIC501 | Visionary-B | |
| Bar code reading with a matrix camera | VPS Pro | | |
| Bar code reading with a line-scan camera | Free Flow Profiler | | |
| Dynamic volume measurement | ALIS | | |
| Omni-directional 1D bar code reading | RFGS Pro | | |
| Automated identification with RFID in inbound and goods issue | RFMS Pro | | |
| Admission for maintainer to spare part storage | ICR88x System | | |

| **11. Airport** | ICR89x System | | |
| Automated baggage label reading with camera technology | Lector65x System | | |
| Automatically reading the baggage label | VMS410/510 | | |
| Size detection before X-ray machines | VMS420/520 | | |
| Static freight measuring | DWS Dynamic | | |
| Monitoring the movement of the drive unit | DWS Static | | |

| **11. Retail and warehousing** | | | |
| Camera-based system for measuring, weighing, and scanning in inbound goods | | | |
| Manual master data capture for irregularly shaped objects plus photos | | | |
| Dynamic volume measurement for conveyor systems | | | |
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**APPENDIX**

1. **Logistics Automation**
   - Courier, express, parcel and postal
   - Dynamic volume measurement at cross-belt sorter
   - Dynamic volume measurement at tilt-tray sorter
   - Volume measurement of singulated, irregularly shaped objects
   - Manual measurement, weighing, and scanning of irregularly shaped objects
   - Position detection of objects with 2D LiDAR sensors
   - Decoding codes for an optimum sorting process
   - Goods identification on sorters
2. **Storage and conveyor**
   - Dynamic volume measurement with light grids
   - Automated identification with RFID for picking and in goods issue
   - Bar code reading with a matrix camera
   - Bar code reading with a line-scan camera
   - Dynamic volume measurement
   - Omni-directional 1D bar code reading
   - Automated identification with RFID in inbound and goods issue
   - Admission for maintainer to spare part storage
3. **Airport**
   - Automated baggage label reading with camera technology
   - Automatically reading the baggage label
   - Size detection before X-ray machines
   - Static freight measuring
   - Monitoring the movement of the drive unit
4. **Retail and warehousing**
   - Camera-based system for measuring, weighing, and scanning in inbound goods
   - Manual master data capture for irregularly shaped objects plus photos
   - Dynamic volume measurement for conveyor systems
   - Automated identification with RFID in inbound and goods issue
   - Bar code reading with a matrix camera
   - Bar code reading with a line-scan camera
   - Dynamic volume measurement
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### Logistics Automation

#### 1. Building safety and security
- Classifying vehicles when passing through barriers
- Preventing tailgating at bollards and identification
- Controlling intrusion detection systems
- Protecting adjustable facade windows
- Access control in logistical environment – indoors
- Controlling access to passenger locks in airports and data centers
- Managing access rights by identifying objects

#### 1. Building management
- Bed detection in hospital elevators
- Non-contact access control

#### 1. Mobile automation
- Windrow guidance for balers
- Rear collision warning
- Windrow guidance for forage harvester
- Collision awareness on the forage harvester
- Excavator protection including shovels
- Protecting wheel loaders and bulldozers
- Protecting trucks
- Collision warning at the roller
- Rear collision warning on the airport fire truck
- Driver assistance on aircraft tractors

### Process Automation

#### 1. Cement
- Protecting shovel and bucket excavators
- Protecting wheel loaders and bulldozers
## APPLICATION OVERVIEW

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<thead>
<tr>
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### APPLICATION EXAMPLES

- **Building Safety and Security**
  - Preventing tailgating at bollards and identification
  - Controlling intrusion detection systems
  - Protecting adjustable facade windows
  - Access control in logistical environment – indoors
  - Controlling access to passenger locks in airports and data centers
  - Managing access rights by identifying objects

- **Building Management**
  - Bed detection in hospital elevators
  - Non-contact access control

- **Mobile Automation**
  - Windrow guidance for balers
  - Rear collision warning
  - Windrow guidance for forage harvester
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  - Protecting trucks
  - Collision warning at the roller
  - Rear collision warning on the airport fire truck
  - Driver assistance on aircraft tractors

- **Process Automation**
  - Protecting shovel and bucket excavators
  - Protecting wheel loaders and bulldozers
  - Protecting trucks
  - Collision warning at the roller
  - Rear collision warning on the airport fire truck
  - Driver assistance on aircraft tractors

- **PowerCEMS**
  - PowerCEMS100
  - PowerCEMS50
  - MINESIC100
  - EPSMINESIC100
  - TPSMINESIC100
  - TCWMINESIC100

- **Free Flow Profiler**
  - PrimeVisionary-BWGSAPS
  - AOS Prime

- **InLine Code Matcher**
  - TIC102
  - TIC501VPS Pro

- **Asset Monitoring System**
  - LAC1xx Prime
  - Ram
  - PLB
  - PLR
  - PLDC2D

- **Non-contact access control**
  - Lector65x System
  - VMS410/510
  - VMS420/520

- **Master Data Analyzer**
  - VML

- **DWS Dynamic**
  - DWS Static
  - DWS Pallet
## APPLICATION OVERVIEW

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- Subject to change without notice
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### 1. Mining

- Protecting the coal mill by monitoring CO and O\(_2\)  
- Excavator protection including shovels  
- Protecting trucks  
- Protecting wheel loaders and bulldozers  
- Dozer rear protection  
- Forklift protection  
- Haul truck tire handlers  
- Mine ports vehicle protection

#### Continuous analysis of air quality – monitoring CH\(_4\), CO, CO\(_2\), and O\(_2\)

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

- Tunnel collision warning system

### 2. Oil and Gas

- Emission monitoring on regasification boiler stacks
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- **I1 Mining**
  - Protecting the coal mill by monitoring CO and O2
  - Excavator protection including shovels
  - Protecting trucks
  - Protecting wheel loaders and bulldozers
  - Dozer rear protection
  - Forklift protection
  - Haul truck tire handlers
  - Mine ports vehicle protection
- Continuous analysis of air quality – monitoring CH4, CO2, CO, and O2
- Monitoring carbon emissions – GHG measurements or calculation of carbon tax
- Tunnel collision warning system
- **I1 Oil and Gas**
  - Emission monitoring on regasification boiler stacks
PRODUCTS OVERVIEW

Customized analyzer systems

- PowerCEMS100
- METPAX300
- TRANSIC Extractive
- MINESIC700 GHG
- MINESIC700 TBS
- MKAS
- MKAS Compact
- PowerCEMS50

Driver assistance systems

- MINESIC100 EPS
- MINESIC100 TPS
- MINESIC100 TCW
- MINESIC100 WPS
- RAS Prime
- Visionary-B
- WGS
- APS
- BAS

Object detection systems

- AOS Prime
PRODUCTS OVERVIEW

Profiling systems

- TIC102
- TIC501
- TIC502
- VPS Pro
- VHD

- Free Flow Profiler

Gateway systems

- TDC

Quality control systems

- Inline Code Matcher
- Asset Monitoring System
- Pinspector

Security systems

- LAC1xx Prime
- RAM
PRODUCTS OVERVIEW

Robot guidance systems

- PLB
- PLR
- PLOC2D

Track and trace systems

- OPS
- ALIS
- RFGS Pro
- RFMS Pro
- ICR88x System
- ICR89x System
- Lector65x System
- VMS410/510
- VMS420/520
- VMS4x0 CV
- VML
- DWS Dynamic
- DWS Static
- DWS Pallet
- Master Data Analyzer
Protecting the coal mill by monitoring CO and O₂
Coal dust is commonly used as a primary fuel for cement kilns. Inert gas is introduced into the coal mill to prevent fires. A rise in the O₂ concentration indicates a leak and the ingress of ambient air. By performing continuous O₂ measurement, leaks can be detected early and dealt with in a timely manner. If required, CO measurement can be added to detect smoldering fires. The MKAS Compact analyzer system with an Ex-protected sampling probe is the ideal solution. The integrated SIDOR gas analyzer allows simultaneous measurement of CO and O₂ and can be adjusted using ambient air. This system provides the reliability needed for safety-related measurements.

Fields of application
Cement

Recommended products
MKAS Compact
www.sick.com/MKAS_Compact

Protecting the coal silo by monitoring CO and O₂
Coal dust used as fuel is stored in silos. Coal silos present the risk of smoldering fires in which CO can accumulate to form explosive mixtures with air. By performing continuous measurement of the CO concentration, smoldering fires can be identified at an early stage and dealt with in a timely manner. In addition, O₂ measurement can be integrated in order to monitor inert gas. The MKAS Compact analyzer system with an Ex-protected sampling probe is the ideal solution. The integrated SIDOR gas analyzer allows for simultaneous measurement of CO and O₂ and can be adjusted using ambient air. The long maintenance intervals reduce operating costs.

Fields of application
Cement

Recommended products
MKAS Compact
www.sick.com/MKAS_Compact
APPLICATION EXAMPLES

Customized analyzer systems

Process monitoring at the preheater
The composition of flue gases at the outlet of the preheater provides information about the pyro process and indicates an imminent risk of explosion for the downstream electrostatic precipitator. To acquire this information, changes in the concentration of the gas components CO, NO, O₂, and, if applicable, SO₂ and CH₄ are measured at the preheater. The MKAS multi-component analyzer system with the GMS800 gas analyzer is suited to this measuring task, involving high dust loading, high gas temperatures and space limitations. This system enables reliable process gas monitoring, providing an economical solution for increasing plant efficiency and security.

Fields of application
Cement

Recommended products
MKAS
www.sick.com/MKAS

Monitoring CO and O₂ to protect the coal pulverizer
CO and O₂ concentration 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 measuring task. The system can be configured to sequentially monitor a number of mills. The SIDOR gas analyzer provides simultaneous measurements of O₂ and CO. An important feature is the stability of the measuring benches, which allows routine adjustments to be made using only ambient air or inert gas. It is the ideal device for safety-relevant measurements.

Fields of application
Power

Recommended products
MKAS
www.sick.com/MKAS

Monitoring exhaust gas emissions
Environmental regulations require the continuous monitoring of certain pollutants and reference values. These regulations for emission monitoring are specific for each country. In many countries, emission measuring technology must be tested for suitability e.g., in Europe in accordance with EN15267, or in the US in compliance with EPA standards. SICK’s wide product portfolio for emission monitoring provides complete solutions all from one source. A specially developed CEMS package, the PowerCEMS100, measures CO, NOₓ, SO₂ and O₂. The MERCEM300Z mercury measuring system monitors Hg emissions in flue gases with high availability even at very low concentration ranges and meets required legislative regulations. Data acquisition systems from SICK complete the CEMS package.

Fields of application
Power

Recommended products
PowerCEMS100
www.sick.com/PowerCEMS100
Emission monitoring in exhaust gas
Legal environment regulations require the continuous monitoring of certain pollutants and reference values. These regulations for emission monitoring are specific for each country. In many countries, emission measuring technology must be tested for suitability e.g. in Europe in accordance with EN15267, or in the US in compliance with EPA standards. SICK's wide product portfolio for emission monitoring provides complete solutions from one source. A specially developed CEMS package the PowerCEMS100 measures CO, NOx, O2 and optionally SO2. Data acquisition system from SICK complete the CEMS package.

Fields of application
Power

Recommended products
PowerCEMS100
www.sick.com/PowerCEMS100

Monitoring exhaust gas emissions
Local environment regulations require the continuous monitoring of certain pollutants and reference values specific to each country. In many countries, emission measuring technology must be tested for suitability, in Europe in accordance with EN15267 or in the US in compliance with EPA standards. SICK's wide product portfolio for emission monitoring provides complete solutions from one source. A specially developed CEMS package the PowerCEMS100 measures CO, NOx, SO2, and O2. Data acquisition systems from SICK complete the CEMS package.

Fields of application
Power

Recommended products
PowerCEMS100
www.sick.com/PowerCEMS100

Delta CO measurement at the activated carbon filter
Delta CO measurement can prevent fires in the activated carbon filter bed. The MKAS Twin multi-component analyzer system with the SIDOR modular gas analyzer is ideal for this purpose. In the case of newer systems using dry or semi-dry flue gas cleaning, the activated carbon is added at the same time as the other materials. This means that such monitoring is usually no longer necessary.

Fields of application
Waste and recycling

Recommended products
MKAS
www.sick.com/MKAS
**Protection of biomass bunkers and wood shredders in organic waste incineration**

CO and O₂ measurement in biomass bunkers and wood shredders is required in order to ensure early detection of smoldering fires and/or leakages in the inertization system. The MKAS multi-component analyzer system with explosion-protected sampling probe is ideal for this purpose. Using measuring point switchover, it can be configured to monitor several bunkers or shredders. The SIDOR gas analyzer simultaneously measures O₂ and CO. The stability of the measuring system allows routine adjustments to be made solely using inert gas or ambient air. The SIDOR gas analyzer is ideal for safety-related measurements.

**Fields of application**
Waste and recycling

**Recommended products**
MKAS
www.sick.com/MKAS

**Delta CO measurement at the activated carbon filter in organic waste incineration**

Delta CO measurement can prevent fires in the activated carbon filter bed. The MKAS Twin multi-component analyzer system with the SIDOR modular gas analyzer is ideal for this purpose. In the case of newer systems using dry or semi-dry flue gas cleaning, the activated carbon is added at the same time as the other materials. This means that such monitoring is usually no longer necessary.

**Fields of application**
Waste and recycling

**Recommended products**
MKAS
www.sick.com/MKAS

**Gas analysis after the fermentation process**

In order to record the sample gas components after fermentation, the concentrations of CH₄, H₂S (after technical clarification), O₂, and CO₂ are determined. This is necessary in order to determine the gas composition and therefore the quality of the fermentation. For this purpose, SICK offers the GMS800 modular gas analyzer, which is integrated into a measuring cabinet. Gas sampling for measurement is done extractively. Flametrap at the sample gas inlet and outlet protect the plant against explosions. The GM700 with laser technology is ideal for monitoring low concentrations of NH₃ of between 3 and 4 mg/Nm³ behind the biofilter.

**Fields of application**
Waste and recycling

**Recommended products**
MKAS
www.sick.com/MKAS
**Customized analyzer systems** APPLICATIONS

**Methane quality measurement**
Methane is enriched in a gas conditioner before being fed in to the gas network. In order to determine the quality and calorific value of the methane before feed-in, methane (CH$_4$) concentration is measured at the outlet of the gas conditioner system.

**Fields of application**
Waste and recycling

**Recommended products**
MKAS

www.sick.com/MKAS

**Gas analysis at the gas outlet of landfill sites**
Landfill gas is used to generate thermal or electrical energy. In Germany, combined heat and power stations with very high energy efficiency are used for processing landfill gas. At the gas outlet, the CO$_2$, CH$_4$, and O$_2$ components are continuously measured. The monitored recording of these gases helps to prevent explosions. For this purpose, SICK offers the SIDOR gas analyzer, which is integrated into a measuring cabinet. Gas sampling for measurement is done extractively. Flametrap at the sample gas inlet and outlet of the analyzer plant prevent the system against explosions.

**Fields of application**
Waste and recycling

**Recommended products**
MKAS

www.sick.com/MKAS

**Continuous recording of pollutant components in crematoria**
The MCS100E HW is used for multiple component measurements. It continuously records all gas components that must be monitored under law. For emissions measurement in Germany, the cold-extractive system solution MKAS with SIDOR is sufficient. In all cases, continuous dust measurement is obligatory. With its portfolio of dust measuring devices, SICK offers the ideal measuring solution for crematoria in all regions, in accordance with the applicable local legal provisions.

**Fields of application**
Waste and recycling

**Recommended products**
MKAS

www.sick.com/MKAS
Continuous monitoring of NO, CO, and O₂ in used air from buildings
In order to monitor used air coming from buildings, which is necessary in order to detect leakages in the process, SICK offers a cost-effective emissions monitoring system. The multiple component measuring system MKAS with the SIDOR analyzer continuously monitors the current concentrations of NO, CO, and O₂. Gas sampling for monitoring purposes is performed by an extractive sampling system.

Fields of application
Waste and recycling

Recommended products
MKAS
www.sick.com/MKAS

Protecting the coal mill by monitoring CO and O₂
CO and O₂ measurement in the coal mill is important for early detection of a smoldering fire or a leak in the inertization system. The MKAS gas analyzer system, equipped with an explosion-protected sampling probe, is ideal for this task. The system can be configured to sequentially monitor several mills. The SIDOR gas analyzer simultaneously measures O₂ and CO levels. An important feature of this solution is the stability of the measuring benches allowing routine adjustments to be made using only ambient air or inert gas. This makes the system ideal for safety-relevant measurements.

Fields of application
Metal and steel

Recommended products
MKAS
www.sick.com/MKAS

Gas pollutant emissions
Based on the different iron and steel producing processes, there is a wide range of pollutants in a steel plant’s off-gas systems. Some are based on organic chemicals (i.e. carbon and hydrogen based), while others are of a more metallic origin (such as mercury). Monitoring these pollutants requires customized gas analyzer solutions where the sensors fit the gas matrix and the specific compounds to be monitored. The level of gas emissions and the measuring range both play important roles in selecting which gas analyzer system to use.

Fields of application
Metal and steel

Recommended products
MKAS
www.sick.com/MKAS
Customized analyzer systems APPLICATIONS

Ensuring plant safety and process optimization by monitoring O₂, CO, CO₂, H₂O, (H₂) in the exhaust gas from the electric arc furnace

Analyzing the exhaust gases from an electric arc furnace provides valuable information about the smelting process and the nature of the slag. The exhaust gas analysis can also be used to detect leaks in the water-cooled parts of the electric arc furnace and in the off-gas system. Along with moisture detection, monitoring the CO and O₂ content at the end of the water-cooled pipe also helps to detect dangerous CO concentrations, thus preventing potential explosions in downstream exhaust gas lines. The METPAX300 process gas analyzer system enables efficient, photometric monitoring and simultaneous measurement of up to nine process gases, thus ensuring the operational safety of the plant.

**Fields of application**
- Metal and steel

**Recommended products**
- METPAX300
  - [www.sick.com/METPAX300](http://www.sick.com/METPAX300)

Protecting the coal mill by monitoring CO and O₂

Carbon monoxide (CO) and oxygen (O₂) measurement in the coal pulverizer is important for early warning of a smoldering fire and/or a leak in the inertization system. The MKAS analyzer system equipped with an explosion-protected sampling probe is the ideal solution for this measuring task. The SIDOR gas analyzer provides simultaneous measurements of O₂ and CO. An important feature is the stability of the optical measuring systems, which allows routine adjustments to be made using only ambient air or inert gas.

**Fields of application**
- Mining

**Recommended products**
- MKAS
  - [www.sick.com/MKAS](http://www.sick.com/MKAS)

Continuous analysis of air quality – monitoring CH₄, CO₂, CO, and 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.

**Fields of application**
- Mining

**Recommended products**
- MINESIC700 TBS
  - [www.sick.com/MINESIC700_TBS](http://www.sick.com/MINESIC700_TBS)
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.

Fields of application
Mining

Recommended products
MINESIC700 GHG  www.sick.com/MINESIC700_GHG

Emission monitoring on regasification boiler stacks

LNG is transported by vessels to any point in the world where an so-called import terminal is available for receiving the LNG load. Here, the LNG is stored and distributed in liquid or gaseous form for further downstream use. The regasification can be performed, e.g., by means of gas-fired water bath boilers. In most regions of the world, local legislations are asking for continuous monitoring of gaseous emissions on the stacks of the regasification boilers. Here, SICK offers very cost-efficient solutions.

Fields of application
Oil and gas

Recommended products
PowerCEMS100  www.sick.com/PowerCEMS100
PowerCEMS50  www.sick.com/PowerCEMS50

Packing and storing in inert gas – For optimum freshness and taste

Modified atmosphere packing (MAP) and storage in a controlled atmosphere (CA) are common methods of keeping foods such as fruit, vegetables, or baked goods tasting fresh and preserving their natural color for longer without the addition of preservatives or stabilizers. The controlled and resource-saving use of inert gases reduces the oxygen content and prevents oxidation and hydrolysis. With TRANSIC Extractive or TRANSIC100LP (in-situ), SICK offers analyzer systems for measuring the oxygen concentration continuously. Thanks to their modular design, the TRANSIC variants can be easily adapted to a wide range of requirements and are always simple to install, handle, and maintain.

Fields of application
Food and beverage

Recommended products
TRANSIC Extractive  www.sick.com/TRANSIC_Extractive
Driver assistance using a 2D LiDAR sensor on a reach stacker

Day or night, the RAS Prime driver assistance system monitors the entire area behind a reach stacker without interruption. If an object enters the preconfigured warning fields, RAS Prime alerts the operator with visual and audible signals. Real-time laser scans provide assistance in all driving situations.

Fields of application
Port
Recommended products
RAS Prime

Protecting reach stackers

The Visionary-B driver assistance system monitors the area behind the reach stacker. If there is an object in this area, the Visionary-B driver assistance system warns the driver with visual and acoustic signals. In addition to these active warning signals, the camera provides the driver with a rear view showing the positions of the obstacles in all driving situations.

Fields of application
Port
Recommended products
Visionary-B
**APPLICATIONS**  
**Driver assistance systems**

### Windrow guidance for balers

The WGS sensor system is based on the TiM 2D LiDAR sensor and determines the position and height profile of the windrows. The system uses this information to calculate a target trajectory and makes it available on the CAN bus. Using this trajectory, the tractor-baler combination can be guided automatically. Furthermore, the WGS continuously determines the windrow volume and also sends this information to the CAN bus. This allows the speed to be controlled automatically, therefore providing the optimum volume flow so that the baler can work at its optimum performance.

**Fields of application**
Mobile automation

**Recommended products**
WGS  
[www.sick.com/WGS](http://www.sick.com/WGS)

### Rear collision warning

Whenever harvesters collide with objects in their surroundings, the results are almost always serious for the materials and people involved. The intelligent 3D assistance system with the Visionary-B vision sensor improves collision awareness in harsh outdoor environments. It provides a real-time image with optical and acoustic warning signals. Even in bright sunlight or heavy rain, it helps the operator of the harvester to detect objects in blind zones around the vehicle. This means the operator can focus on his main task.

**Fields of application**
Mobile automation

**Recommended products**
Visionary-B  
[www.sick.com/Visionary-B](http://www.sick.com/Visionary-B)

### Windrow guidance for forage harvester

The WGS sensor system, which is based on the TiM 2D LiDAR sensor and mounted on the forage harvester’s roof, determines the position and height profile of the windrows. The system uses this information to calculate a target trajectory and makes it available on the CAN bus. The forage harvester can be guided automatically along this path. Furthermore, the WGS continuously determines the windrow volume and also sends this information to the CAN bus. This allows the speed to be controlled automatically so that the forage harvester can work at its optimum performance.

**Fields of application**
Mobile automation

**Recommended products**
WGS  
[www.sick.com/WGS](http://www.sick.com/WGS)
Collision awareness on the forage harvester

Particularly when maneuvering in blind spots or reversing, collisions with objects at the rear of the forage harvester are likely to occur. The intelligent 3D assistance system with the Visionary-B vision sensor is used to assist the driver in these maneuvers and to prevent damage. It provides a real-time image with optical and acoustic warning signals. Even in bright sunlight or heavy rain, it helps the forage harvester operator to reliably detect objects in blind zones around the vehicle and warns the operator in critical driving situations.

Fields of application
Mobile automation

Recommended products
Visionary-B  
www.sick.com/Visionary-B

Excavator protection including shovels

Drivers loading and unloading their vehicles in close proximity of moving trucks and dozers and working in areas where space for moving and maneuvering is restricted by embankments must be highly aware of their surroundings. The MINESIC100 EPS is a high-precision collision awareness system that monitors the area around a shovel. It guides truck operators safely 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 safely and in good time.

Fields of application
Mobile automation

Recommended products
MINESIC100 EPS  
www.sick.com/MINESIC100_EPS

Protecting wheel loaders and bulldozers

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.

Fields of application
Mobile automation

Recommended products
MINESIC100 WPS  
www.sick.com/MINESIC100_WPS
APPLICATIONS  Driver assistance systems

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 also takes the current driving situation into account. A road departure warning provides guidance to the truck operator along the haul road and outputs a warning if the truck is about to leave the safe driving path.

Fields of application
Mobile automation
Recommended products
MINESIC100 TPS  www.sick.com/MINESIC100_TPS

Collision warning at the roller
The Visionary-B streaming camera is used as an intelligent driver assistance system to reduce the risk of collisions during turning maneuvers and reversing. The system detects stationary objects as well as other vehicles in and around the blind zone and provides a real-time image with visual and acoustic warning signals. The vehicle driver is given the best possible assistance, even in difficult weather conditions such as bright sunlight or rain. This makes it easier for the operator to focus on their other tasks.

Fields of application
Mobile automation
Recommended products
Visionary-B  www.sick.com/Visionary-B

Rear collision warning on the airport fire truck
The intelligent driver assistance system with the Visionary-B vision sensor helps reduce the risk of collisions during turning maneuvers or reversing. The system displays a real-time image with optical and acoustic warning signals. Even in bright sunlight or heavy rain, it helps the operator to detect objects in blind zones around the vehicle. This allows the operator to focus on the main tasks.

Fields of application
Mobile automation
Recommended products
Visionary-B  www.sick.com/Visionary-B

Driver assistance on aircraft tractors
The APS (Aircraft Protection System) driver assistance system provides reliable warnings against collisions with other ground vehicles and the airport infrastructure. It also provides the tractor driver with assistance during push-back, maintenance and maneuver towing. The display shows all the obstacles that are in the vicinity of the aircraft. The driver receives an acoustic and optical warning when there are obstacles in the aircraft’s towing corridor.

Fields of application
Mobile automation
Recommended products
APS  www.sick.com/APS
Protecting shovel and bucket excavators

It can be challenging for vehicle operators to give their full attention during loading operations when surrounded by other moving dump trucks or graders, especially when driving space is limited due to embankments. The MINESIC100 EPS is a high-precision driver assistance system that monitors the area around the vehicle. It guides the dump truck operator safely to the correct loading position. The operating display indicates all obstacles within the relevant warning field. If a collision is imminent, the operator will be warned by an audible alarm so that the current maneuver can be safely stopped in a timely manner.

Fields of application
Cement

Recommended products
MINESIC100 EPS

www.sick.com/MINESIC100_EPS

Protecting wheel loaders and bulldozers

When using wheel loaders and bulldozers, there is a risk of collision with other moving vehicles when backing up. Infrastructure obstacles such as embankments, stockpiles, or silos pose a considerable collision risk. When loading and unloading, wheel loaders are constantly moving forward and backward, while the main attention of the operator is focused on the bucket. The MINESIC100 WPS is a highly precise driver assistance system that monitors the critical zones within the rear section of the vehicle. The system sends a warning signal when there is a risk of collision and provides assistance to the operator during difficult maneuvers.

Fields of application
Cement

Recommended products
MINESIC100 WPS

www.sick.com/MINESIC100_WPS

Protecting haul trucks

Due to the size, height and speed of haul trucks, as well as the constantly changing operating conditions, the haul truck driver often has poor visibility. Therefore, in a stone quarry, for example, front-end and rear-end collisions, as well as unintended road departures are all common. The MINESIC100 TPS is a highly precise driver assistance system that monitors critical zones around the vehicle and also takes the current driving conditions into consideration. 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.

Fields of application
Cement

Recommended products
MINESIC100 TPS

www.sick.com/MINESIC100_TPS
Collision avoidance for grab excavators

Used tires are often utilized as secondary fuels in cement plants for thermal recycling. The Visionary-B streaming camera is used as an intelligent driver assistance system to reduce the risk of collision during turning maneuvers and when traveling in reverse. The camera provides a live image, and optical as well as acoustic warning signals, so that objects and other vehicles are detected in and around the blind spot. The vehicle operator also receives appropriate support even in poor outdoor conditions such as bright sunlight, rain or dust. The Visionary-B lets the operator focus on the key tasks, while still maintaining awareness of critical situations whenever they occur.

Fields of application
Cement

Recommended products
Visionary-B  www.sick.com/Visionary-B

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.

Fields of application
Mining

Recommended products
MINESIC100 EPS  www.sick.com/MINESIC100_EPS

Protecting trucks

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. 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.

Fields of application
Mining

Recommended products
MINESIC100 TPS  www.sick.com/MINESIC100_TPS
**Protecting wheel loaders and bulldozers**
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.

**Fields of application**
Mining

**Recommended products**
MINESIC100 WPS  [www.sick.com/MINESIC100_WPS](http://www.sick.com/MINESIC100_WPS)

**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 filing 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 driver assistance system alarms when there is potential collision with stationary or moving objects and when reversing or maneuvering in confined areas.

**Fields of application**
Mining

**Recommended products**

**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 driver assistance system 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 LiDAR sensor 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.

**Fields of application**
Mining

**Recommended products**
**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 driver assistance system 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.

**Fields of application**
- Mining

**Recommended products**
- Visionary-B
  - [www.sick.com/Visionary-B](http://www.sick.com/Visionary-B)

**Mine ports vehicle protection**

The Visionary-B driver assistance system monitors the area behind the reach stacker. If there is an object in this area, the Visionary-B driver assistance system warns the driver with visual and acoustic signals. In addition to these active warning signals, the camera provides the driver with a rear view showing the positions of the obstacles in all driving situations.

**Fields of application**
- Mining

**Recommended products**
- Visionary-B
  - [www.sick.com/Visionary-B](http://www.sick.com/Visionary-B)

**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.

**Fields of application**
- Mining

**Recommended products**
- MINESIC100 TCW
  - [www.sick.com/MINESIC100_TCW](http://www.sick.com/MINESIC100_TCW)
Object detection systems APPLICATIONS

Monitoring the movement of the drive unit
The AOS Prime object detection system monitors a freely definable area around the passenger boarding bridge’s drive unit. AOS Prime can monitor several fields simultaneously. In the event that a warning field is violated, movement of the passenger boarding bridge is slowed or even stopped in the event a stop field is violated.

Fields of application
Airport

Recommended products
AOS Prime
www.sick.com/AOS_Prime

Collision avoidance on a rubber tired gantry crane
A reliable solution for preventing gantry crane collisions is the AOS104 RTG object detection system consisting of a 2D LiDAR sensor and a safety controller. The 2D LiDAR sensor helps prevent collisions between the crane and other objects along the crane’s path as well as assists the crane operator in monitoring the route to be traveled and during cross travel.

Fields of application
Port

Recommended products
AOS Prime
www.sick.com/AOS_Prime
Access control at automated stacking crane (ASC)
In ports, interaction between man and machine can be dangerous. For example, truck drivers and straddle carrier operators deliver containers below an automated stacking crane. Vehicle access can be enforced when a 2D LiDAR sensor is positioned to create a vertical monitoring area and an overheight object can be detected when a 2D LiDAR sensor is positioned to create a horizontal monitoring area. The crane is stopped to avoid collisions with vehicles. If the crane is already located within the transfer area, vehicles will be given a stop signal at the entrance. The Flexi Soft safety controller processes any signals and transmits them to the system controller. The system can be expanded with RFID, GPS, and other sensor types to enable vehicle identification when automated guided vehicles (AGVs) are in use.

Fields of application
Port
Recommended products
AOS Prime
www.sick.com/AOS_Prime

Monitoring of automated guided vehicles (AGVs)
The AOS502 Prime advanced object detection system avoids collisions between automated guided vehicles and other objects within the container yard. When objects are detected in the monitored areas, the AGV is slowed down or stopped.

Fields of application
Port
Recommended products
AOS Prime
www.sick.com/AOS_Prime

Monitoring the track area
At stations without platform screen doors, LMS511 2D LiDAR sensors can be used to monitor the track area for the protection of the track system or for the safety of passengers. The control center is notified when anyone is in this area. The combination of the intelligent field functions of the LMS511 and the Flexi Soft safety controller allows the system to distinguish between people and incoming or outgoing trains. The monitoring fields are activated or deactivated depending on the position of the train via the Flexi Soft safety controller.

Fields of application
Traffic
Recommended products
AOS Prime
www.sick.com/AOS_Prime
All-clear signal at railroad crossings
With fully-gated railroad crossings, the train only receives a free signal if it is ensured that no large object is located in the danger area between the closed barriers. The AOS Prime object detection system consisting of the LMS511 2D LiDAR sensor combined with the intelligent Flexi Soft safety controller is a reliable and cost-effective solution. The dispatcher is relieved of purely visual monitoring tasks, as the free signal is generated automatically. Due to the clear user interface of the LMS511, the monitoring field can be easily and precisely adapted to the geometry of the danger area. Thanks to the two-channel structure and the automatic system tests of the AOS, a high level of reliability and diagnostic cover is achieved.

Fields of application
Traffic

Recommended products
AOS Prime
www.sick.com/AOS_Prime

Monitoring tunnel portals
To prevent unauthorized entrance to the tunnel, people and animals must be reliably detected in the tunnel portal. LMS111 or LMS511 2D LiDAR sensors are to ensure that the area around the tunnel portal is monitored horizontally and vertically. Combined with the Flexi Soft safety controller, a distinction is made between an incoming train, people, or animals. False alarms are therefore avoided.

Fields of application
Traffic

Recommended products
AOS Prime
www.sick.com/AOS_Prime

Collision avoidance
To safely support the crane driver when avoiding collisions with objects on the route, the AOS Prime object detection system is a reliable solution.

Fields of application
Traffic

Recommended products
AOS Prime
www.sick.com/AOS_Prime
Area monitoring at lock gates
Incorrectly positioned vessels in the lock chamber can collide with the gates. The gates can also seize vessels and endanger people or cause expensive damage and downtime. The LMS511 2D LiDAR sensor is mounted above the lock chamber. In combination with the intelligent Flexi Soft safety controller and self-tests on a defined test objective, it is possible to reliably monitor whether a vessel gets too close to the area of the lock gates. An input signal can be used to adjust the monitoring field to the water level on the LMS511.

Fields of application
Traffic

Recommended products
AOS Prime  
[www.sick.com/AOS_Prime](http://www.sick.com/AOS_Prime)

Preventing collisions between tower cranes and buildings
The AOS Prime object detection system reduces the risk of a collision between a tower crane and a building wall. The system’s 2D LiDAR sensors monitor the area around the crane jib. They detect when the crane jib gets too close to a building based on the previously set safety distance. The Flexi Soft safety controller then notifies the crane operator and takes control of the crane.

Fields of application
Building safety and security

Recommended products
AOS Prime  
[www.sick.com/AOS_Prime](http://www.sick.com/AOS_Prime)

Area monitoring on and under draw bridges
Before a draw bridge can open, it is important to ensure that there are no objects still on the bridge. When the draw bridge is closing, there must be no vessels underneath it. The 2D LiDAR sensors in the AOS Prime object detection system reliably detect objects on and underneath the bridge. The monitoring field can be adapted to the exact size of the monitored area. Breaching the field causes the 2D LiDAR sensors to send a signal to the Flexi Soft safety controller.

Fields of application
Building safety and security

Recommended products
AOS Prime  
[www.sick.com/AOS_Prime](http://www.sick.com/AOS_Prime)
Object detection systems APPLICATIONS

Protecting adjustable facade windows
Modern penthouses and other highly automated buildings often have large, adjustable facade windows. If they close automatically after the room has been ventilated, it is important to ensure that any people nearby are not harmed. After an accurate situational analysis and a single on-site inspection of the building, the AOS Prime object detection system is best utilized for this purpose. The 2D LiDAR sensor in the system reliably detects objects within the hazardous area. As soon as an object is detected, this information is sent to the Flexi Soft modular safety controller, which then stops the facade windows from moving.

Fields of application
Building safety and security

Recommended products
AOS Prime
www.sick.com/AOS_Prime

Collision avoidance on crane booms and between adjacent cranes
The AOS502 STS mounted on a gantry crane provides a safe and reliable method of detecting ship superstructures, such as radar systems. By analyzing the various 2D LiDAR sensor (2D laser scanner) warning and stopping fields, the AOS502 STS provides collision avoidance from crane to crane as well as from boom to object. The safety controller and integrated control software monitor the system functions and ensure reliable operation.

Fields of application
Cement

Recommended products
AOS Prime
www.sick.com/AOS_Prime

Collision avoidance
The AOS Prime is a reliable solution for preventing gantry crane collisions. This object detection system consists of a 2D LiDAR sensor and a safety controller. The 2D LiDAR sensor helps to avoid collisions between the crane and other objects along the crane’s path, as well as assisting the crane operator in monitoring the route to be traveled. With wide ranges and variable monitoring fields that allow the operator to adjust the length and width, the AOS Prime is a reliable and versatile solution.

Fields of application
Cement

Recommended products
AOS Prime
www.sick.com/AOS_Prime
Classification and camera triggering on multi-lane free-flow systems
To correctly determine the toll, vehicles must be registered and classified. The integrated TIC102 Traffic Information Collector identifies up to 30 predefined vehicle classes, which can be grouped together according to requirements (e.g., TLS 8+1). The system is easily and inexpensively mounted above the road, allowing even high-value road surfaces to remain functional. Automated calibration makes it possible to configure the sensor within just a few minutes. Even drivers who change lanes are correctly classified. With the TIC102, adjusting the trigger for the camera for license plate detection is simple and flexible so that incorrectly registered vehicles can be reliably identified.

Fields of application
Traffic

Recommended products
TIC102
www.sick.com/TIC102

Detection of vehicles transporting hazardous materials
Knowing the number and type of vehicles transporting hazardous materials in a tunnel is important for traffic safety. An infrared camera recognizes the hazardous materials placard based on its shape and reads its content. The integrated TIC102 Traffic Information Collector also records the 3D profile for analysis of possible positions of the hazardous material placard. This ensures the read rate is increased considerably and misinterpretations are avoided.

Fields of application
Traffic

Recommended products
TIC102
www.sick.com/TIC102
Measurement of the truck profile
Trucks that are too wide or too tall can cause accidents or damage to the infrastructure. The VPS Pro profiling system automatically measures vehicle dimensions using LMS511 2D LiDAR sensors, even in areas that are difficult to reach. 3D visualization that highlights protruding objects with colors allows quick localization of the potential hazard. The system is suitable for custody transfer applications.

Fields of application
Traffic

Recommended products
VPS Pro
www.sick.com/VPS_Pro

Automated vehicle measurement in free-flow traffic conditions
If too wide or high, trucks can cause accidents or damage to infrastructure. The Free Flow Profiler uses 2D LiDAR sensors to perform automated checks on vehicle size in free-flow traffic conditions. The system’s modular structure means it can be upgraded to include components for vehicle classification, axle counting, or detecting overheated vehicle parts. The system can also be used for custody transfer applications.

Fields of application
Traffic

Recommended products
Free Flow Profiler
www.sick.com/Free_Flow_Profiler

Traffic data collection at traffic counting stations
Traffic planning and road construction decisions and actions are based on traffic data collection at traffic counting stations. The integrated TIC102 Traffic Information Collector identifies up to 28 predefined vehicle classes, which can be grouped together according to customer’s requirements or standards like TLS 8+1. The system is easily and inexpensively mounted above the road, allowing even high-value road surfaces to remain functional. Drivers who change lanes are classified at the same high accuracy as those that remain in the same lane. The TIC102 is the first overhead mounted system used as reference for testing other technologies for traffic data collection.

Fields of application
Traffic

Recommended products
TIC102
www.sick.com/TIC102
Traffic data collection in traffic control systems
Traffic control systems are intended to improve the flow of traffic on one or more sections of road, at intersections or throughout the entire network. To do so, traffic data such as the number and speed of vehicles, as well as the class of vehicle must be collected. The integrated TIC501 profiling system can also be used in areas where no sensors may be installed in the roadway.

Fields of application
Traffic
Recommended products
TIC501  www.sick.com/TIC501

Determining parking occupancy for trucks
The steady increase in freight on highways leads to an overflow of trucks at rest stops. With the integrated TIC102 profiling system, trucks are counted upon entry and exit and accurately classified. Based on this data, it is possible to precisely determine the open capacity at the stop. At full occupancy, trucks can be diverted to the next rest stop with available parking spaces.

Fields of application
Traffic
Recommended products
TIC102  www.sick.com/TIC102

Classifying vehicles when passing through barriers
If buses are allowed to park for free at a parking lot, but cars are not, the barrier needs to be able to differentiate between the two. This can be done by using a 2D LiDAR sensor which measures the length of vehicles wanting to pass through. If the vehicle is over a certain length, the barrier opens automatically. Otherwise, the driver must take a ticket to enter.

Fields of application
Building safety and security
Recommended products
TIC102  www.sick.com/TIC102
High-precision pin inspection for the press-fit operations during the final assembly of electronic modules
The Pinspector quality control system, which consists of a 3D streaming camera from the Ranger product family and laser technology, detects deviations from the defined quality standard for plug connectors and pins at the connection side of printed circuit boards. A three-dimensional, non-contact measurement function is used to check that the pins are correctly aligned with the designated through holes in the printed circuit board. After successful positioning, Pinspector gives the go-ahead for the press-fit operation. The same three-dimensional position measurement function is run after the press-fit operation to monitor the presence, height, and co-planarity of the pins.

Fields of application
Automotive and parts suppliers

Recommended products
Pinspector
www.sick.com/Pinspector

Identification of molds using the Asset Monitoring System
Identification and traceability play an important role in the food industry. Chocolate molds must be checked and, if necessary, replaced after a certain number of usage cycles. The Asset Monitoring System compares the 1D or 2D codes of the molds with the saved data and shows them on the HMI. The Asset Monitoring System offers intuitive operation via an HMI with touch display and can be easily retrofitted to existing machines.

Fields of application
Food and beverage

Recommended products
Asset Monitoring System
www.sick.com/Asset_Monitoring_System
The right product in the right packaging
Food safety is becoming more and more important. As part of this, it must be ensured that the right product ends up in the right packaging. The Inline Code Matcher quality control system takes care of this by comparing various 1D and 2D codes (code matching) on the packaging. The system offers intuitive operation via an HMI with touch display and can be easily retrofitted.

Fields of application
Food and beverage

Recommended products
Inline Code Matcher

www.sick.com/Inline_Code_Matcher
Admission for maintainer to spare part storage
The RAM security system allows hands free access to maintenance restricted areas, such as spare part and tool storage locations at technical facilities. Due to the large scanning range of the sensor, the ID card does not need to be placed directly onto the reading device. This function allows an authorized individual the ability to gain access to the storage location while carrying bulky items without stopping. The implemented log function allows a controlled admittance list to the storage location and increases transparency of entry and exit access.

Fields of application
Storage and conveyor
Recommended products
RAM

Access control in logistical environment – outdoors
The LAC1xx Prime security system ensures that the supply chain is always secure. This is done by using two 2D LiDAR sensors that monitor the area to be secured from both sides. The RFU63x RFID-reading device has a long scanning range and identifies authorized personnel before granting them access only.

Fields of application
Building safety and security
Recommended products
LAC1xx Prime
RAM

Preventing tailgating at bollards and identification
Bollards rise and retract slowly, which means it is possible to tailgate. A 2D LiDAR sensor scans the area in front of the bollards and identifies the number of vehicles. At the same time, the RFID-reading device, which has a long scanning range, identifies authorized people or vehicles.

Fields of application
Building safety and security
Recommended products
LAC1xx Prime
Controlling intrusion detection systems
The RAM security system is able to activate and deactivate intrusion detection systems. When you leave a building or area (premises, etc.), the RAM automatically arms the alarm system. It is therefore impossible to forget to arm it, enhancing the availability of the intrusion detection system. Conversely, when you enter a building or area, area monitoring can be deactivated without having to make contact with the system, resulting in fewer false alarms. This principle is suitable for museums and construction sites, for example.

Fields of application
Building safety and security

Recommended products
RAM www.sick.com/RAM

Access control in logistical environment – indoors
In logistics, secure supply chains and, therefore, access control systems are subject to an ever-increasing number of requirements. SICK offers a solution according to the requirements of the C-TPAT, which means safe goods handling only by authorized persons and protects the investment in goods.

Fields of application
Building safety and security

Recommended products
LAC1xx Prime www.sick.com/LAC1xx_Prime
RAM www.sick.com/RAM

Controlling access to passenger locks in airports and data centers
The RAM security system with the RFU62x RFID reads the tags in the ID cards of authorized individuals and grants them access. Due to the large scanning range of the sensor, the ID card does not need to be placed directly onto the reading device. This means that authorized individuals can gain access to authorized areas with no hassle.

Fields of application
Building safety and security

Recommended products
RAM www.sick.com/RAM

Managing access rights by identifying objects
The RAM security system can identify individuals, objects, object carriers, and similar items, and manage their authorizations. It can be used in the automotive production industry, for example, to assign people to individual tools or to grant them authorization to work with specific objects based on their level of training. The RAM can also control the access of individuals to specific areas.

Fields of application
Building safety and security

Recommended products
RAM www.sick.com/RAM
**Security systems APPLICATIONS**

**Bed detection in hospital elevators**
An RFID read/write device in a hospital elevator detects the transponder mounted on the bed and triggers a preferential journey. This ensures quick arrival at the destination floor without intermediate stops, giving the patient the desired discretion at the same time.

**Fields of application**
- Building management

**Recommended products**
- RAM
  - [www.sick.com/RAM](http://www.sick.com/RAM)

**Non-contact access control**
The RAM security system flexibly manages access rights. The RFID read/write device reads the transponders of authorized individuals and grants them access as appropriate. Due to the large scanning range of the sensor, persons are detected early-on and doors open without contact being made.

**Fields of application**
- Building management

**Recommended products**
- RAM
  - [www.sick.com/RAM](http://www.sick.com/RAM)
Part localization in the anyfeeder
An anyfeeder machine conveys and flips small parts without refeeding and without the use of conveyor belts. In this case, small parts are randomly aligned. The PLOC2D robot guidance system quickly and safely detects the parts’ position and transmits data for the position and rotation of properly aligned parts to the robot control system. Using this information, the robot is able to pick the properly aligned parts and feed them to the next process. Any parts that are not properly aligned are ignored. Once the properly aligned parts have been removed, the remaining components in the pick zone are realigned by a pulsed vertical oscillation.

Fields of application
Handling and assembly technology

Recommended products
PLOC2D
www.sick.com/PLOC2D

Part location in boxes
Connecting rods are delivered in boxes as bulk parts. They must be removed from the boxes and isolated for additional processing. The PLB vision system supplies the robot with the necessary information to take the parts out of the box individually. The connecting rods are then placed into the machine at the specified position and aligned accordingly.

Fields of application
Automotive and parts suppliers

Recommended products
PLB
www.sick.com/PLB
Pick up of raw body components for mounting
The robots grip the parts autonomously out of the rack. The vision system finds the gripping position and provides an output to the robot to move to the corresponding location, irrespective of the position tolerances in the rack. The parts are inserted into machine with high accuracy for further processing. Device replacement is an easy operation: the vision system has integrated tools for calibration and communication with the robot. The calibration image is used to determine the robot’s position.

Fields of application
Automotive and parts suppliers

Recommended products
PLR
www.sick.com/PLR

Part location in boxes
Piston rods are delivered in boxes as bulk materials. The rods must be separated from the boxes for further processing. The PLB system solution supplies the robot with the necessary information to take the parts out of the box individually. The connecting rods are then placed into the machine at the specified position and aligned accordingly.

Fields of application
Machine tools

Recommended products
PLB
www.sick.com/PLB
APPLICATIONS Track and trace systems

Manual measuring, weighing, and scanning (DWS)
Static DWS systems read the bar code and determine the weight and dimensions of an item in a single step. Specially designed for measuring cubic and irregularly shaped items, DWS520 is a complete solution with an integrated roller conveyor specifically for smaller throughputs at manual facilities or for post-processing of rejects. The DWS system is certified so it can be used for invoicing (legal-for-trade).

Fields of application
Courier, express, parcel and postal

Recommended products
DWS Static
www.sick.com/DWS_Static

Automated identification of objects
After the items are unloaded, they are subjected to identification which manifests the transfer of risk for the subsequent process steps. Automated systems with permanently installed high-speed bar code scanners or image-based code readers are used for high-volume facilities. SICK provides a complete range of high-performance scanners for virtually all types of bar codes to reduce manual intervention to a minimum.

Fields of application
Courier, express, parcel and postal

Recommended products
OPS
www.sick.com/OPS

Optimum throughput at maximum read rate
The Lector65x System track and trace system is based on the Lector65x matrix camera and is designed for optimum throughput and maximum read rates at high belt speeds and with small gaps between objects. With its high-resolution images, it supports video coding and optical character recognition (OCR). The track and trace system is able to identify and decode up to six adjacent, different objects at the same time. What’s more, it can also be combined with ICR8xx line-scanning cameras, volume measurement systems, laser-based code readers, and weigh scales.

Fields of application
Courier, express, parcel and postal

Recommended products
Lector65x System
www.sick.com/Lector65x_System
Camera-based identification on multiple sides
The scalable track and trace system ICR89x System permits omnidirectional reading of codes on sorter systems. Three high-resolution cameras cover up to five sides. The system supports 1D codes, 2D codes, and postal codes, and image capture for optical character recognition (OCR) and video coding (VC). It is characterized by excellent read rates, even in the case of partially damaged codes and poor quality labels. The Package Analytics Software from SICK provides valuable data for calculating trends and high-resolution images and videos for inspections as well as track and trace.

Fields of application
Courier, express, parcel and postal

Recommended products
ICR88x System  www.sick.com/ICR88x_System
ICR89x System  www.sick.com/ICR89x_System

Camera-based identification on the underside
This solution can be added to a five-side auto-ident system for reading of codes on all six sides. If combined with an in-motion scale, this solution can integrate weighing and bottom identification at the infeed points of a tilt-tray or cross-belt sorter with five-side identification and volume measurement. The application uses a high-performance camera for omni-directional reading of codes on the bottom side of items. Resolution and image quality are superior to any other system on the market. The system supports 1D bar codes, 2D matrix codes, optical character recognition (OCR), image capturing, and video coding of unidentified labels. It excels with outstanding read rates even for partially damaged codes and lower-quality labels. Based on off-the-shelf products, this solution can be customized.

Fields of application
Courier, express, parcel and postal

Recommended products
ICR88x System  www.sick.com/ICR88x_System

Identification on multiple sides with hybrid systems
Technology mix solutions from SICK combine the best of all technology worlds to increase flexibility, boost performance, and optimize the price/performance ratio. Based on off-the-shelf camera and laser products, these scalable solutions can be fully customized. Such systems can, for example, use a cost-effective 2D LiDAR sensor to counter the effect of total reflections that may cause cameras to “go blind” (counter-skew reading). Another example: If it is known that the items are aligned in such a way that the labels are usually on one specific side, a camera is used for this side and cost-effective 2D LiDAR sensors on the remaining sides. The systems support 1D bar codes, 2D matrix codes, optical character recognition (OCR), image capturing, and video coding of unidentified labels. They excel with outstanding read rates even for partially damaged codes and lower-quality labels. An under-the-belt camera can be added for identification from all six sides.

Fields of application
Courier, express, parcel and postal

Recommended products
ICR88x System  www.sick.com/ICR88x_System
ICR89x System  www.sick.com/ICR89x_System
APPLICATIONS Track and trace systems

**Dynamic volume measurement at cross-belt sorter**
The geometry of cross-belt sorters allows for volume measurement directly above the sorter. Efficient dual-head systems boost the performance for mixed streams of cubic and irregularly shaped items. The system excels with high measuring rates and outstanding accuracy. The system is certified and can be used for invoicing (legal-for-trade). Based on off-the-shelf products, this scalable solution can be fully customized. For example, it is possible to expand the solution into a fully featured dimensioning and scanning system.

**Fields of application**
Courier, express, parcel and postal

**Recommended products**
VMS420/520  [www.sick.com/VMS420_520](http://www.sick.com/VMS420_520)

**Dynamic volume measurement at tilt-tray sorter**
In the past, volume measurement at tilt-tray sorters was only possible at flat inbound belts due to the geometry of the trays. The innovative volume measurement systems provided by SICK measure the volume of items directly above the tray, irrespective of their shape. The ability to measure the volume directly above the tilt tray sorter leads to dramatic cost reductions since such systems no longer have to be installed above each individual flat inbound belt. Dual-head systems boost the performance for mixed streams of cubic and irregularly shaped items. The system excels with high measuring rates and outstanding accuracy. The system is certified and can be used for invoicing (legal-for-trade). Based on off-the-shelf products, this scalable solution can be fully customized.

**Fields of application**
Courier, express, parcel and postal

**Recommended products**
VMS420/520  [www.sick.com/VMS420_520](http://www.sick.com/VMS420_520)

**Volume measurement of singulated, irregularly shaped objects**
SICK provides volume measurement solutions for automated determination of freight charges on belts with bulk goods. These systems enable CEP operators to significantly increase the throughput of “non-conveyable” goods. VMS530-IDS (Irregular Dimension System) allows for determining the volume of irregularly shaped, non-touching items. With VMS530-NSDS (Non-Singulated Dimensioning System), non-singulated streams of cubic items can be effectively measured.

**Fields of application**
Courier, express, parcel and postal

**Recommended products**
VMS420/520  [www.sick.com/VMS420_520](http://www.sick.com/VMS420_520)
Manual measurement, weighing, and scanning of irregularly shaped objects
This dimensioning, weighing, and scanning system reads the bar code and determines the weight and dimensions of an item in a single step. Specially designed for measuring cubic and irregularly shaped items, DWS520 is a complete solution with an integrated roller conveyor specifically for smaller throughputs at manual facilities or for post-processing of rejects (up to 500 items per hour). The system is commissioned in a matter of minutes and can be used as a mobile station. With DWS510 Static, a single-head solution is available for cubic items. Both systems are certified so they can be used for invoicing (legal-for-trade).

Fields of application
Courier, express, parcel and postal

Recommended products
DWS Static
www.sick.com/DWS_Static

Position detection of objects with 2D LiDAR sensors
Laser measurement sensors installed above the cross belt can capture full 2D and 3D contour data to precisely determine the current position of items on the cell. Items with improper alignment that might adversely affect the identification process or ejection to the outbound slides or chutes can be reliably detected so that the position can be corrected. This solution provides added precision in leading edge detection and can handle multiple items on single cells.

Fields of application
Courier, express, parcel and postal

Recommended products
VMS410/510
www.sick.com/VMS410_510

Traceability of wheels
The omni-directional OPS Customized code reading system identifies wheels prior to automatic assembly and ensures that the correct wheels are mounted on the vehicle. The OPS Customized’s two scan lines move crosswise over the wheel and thereby detect the bar code independently of its orientation.

Fields of application
Automotive and parts suppliers

Recommended products
OPS
www.sick.com/OPS
Decoding codes for an optimum sorting process
The Lector65x image-based code reader decodes all normal code types on totes and parcels. Through its dynamic focus, the code reader generates top quality images which are best suited to video coding and OCR reading. Thanks to the integrated tracking function, it is possible, for example, to reduce gaps between objects on belt conveyors, thereby increasing throughput. The system can be scaled to any customer requirements and, if required, can be combined with other identification technologies.

Fields of application
Courier, express, parcel and postal

Recommended products
Lector65x System
www.sick.com/Lector65x_System

Goods identification on sorters
Bar coded items on a tilt tray in random orientation are identified and tracked using an OPS system. Omni directional coverage and aggressive scan and decode capabilities allow faster and more precise tracking of conveyed packages.

Fields of application
Courier, express, parcel and postal

Recommended products
OPS
www.sick.com/OPS
ICR88x System
www.sick.com/ICR88x_System
ICR89x System
www.sick.com/ICR89x_System

Dynamic volume measurement with light grids
The VML volume measurement system is based on a light grid frame in connection with evaluation logic. It even measures transparent, foil-wrapped and very dark objects reliably, creating the basis for an automated and efficient logistics process. Be it for master data collection for size-optimized storage of products or for the automated palletizing of transport units. Auto identification systems and weighing technology make it possible to expand the range of applications.

Fields of application
Storage and conveyor

Recommended products
VML
www.sick.com/VML
Automated identification with RFID for picking and in goods issue
With the modular RFMS (Radio Frequency Modular System) reading tunnel, RFID transponders are read fully automatically and without interruption. Interrogators for identification with RFID, central controllers with an integrated assignment algorithm and incremental encoders for determining object position on the conveying line ensure complete monitoring and transparency in goods receipt, order picking and goods issue. Integrated service, monitoring and diagnostic tools secure a high level of performance in the long-term.

Fields of application
Storage and conveyor

Recommended products
RFMS Pro
www.sick.com/RFMS_Pro

Bar code reading with a matrix camera
The use of different types of bar codes and 2D codes or different conveying speeds require camera-based code reading from multiple sides and omni-directional reading. The dynamic focus position and brightness adjustment also allow you to read the bar codes on objects of different heights. In addition, the “side-by-side” focusing and integrated tracking function increase the throughput. The system has a modular design and, as a result, easily fulfills the application requirements.

Fields of application
Storage and conveyor

Recommended products
Lector65x System
www.sick.com/Lector65x_System

Bar code reading with a line-scan camera
The track and trace system based on the ICR88x line-scan camera is the ideal solution for high-end applications in the area of 1D/2D code reading in modern logistics processes. The maintenance-free system has a modular camera design and includes an LED illumination module, focus control, and a high-performance decoder. This allows it to detect the most complex bar codes omni-directionally, store and output them, even at high conveying speeds. An image output option for tracking and analysis software and SOPAS configuration software are available.

Fields of application
Storage and conveyor

Recommended products
ICR88x System
www.sick.com/ICR88x_System
Dynamic volume measurement
Volume measurement systems are frequently used in modern logistics processes, including quality assurance at the receiving work station, determining the optimum storage place, calculating the freight-specific weight or creating load proposal lists. The systems measure almost any object shape accurately on flat, tray and cross-strap conveyor belts at a speed of up to 3.6 m/s. Integration is easy thanks to their compact design. All measurement functions are integrated into the measuring head and are also available legal-for-trade in accordance with OIML, MID and additional standards.

Fields of application
Storage and conveyor

Recommended products
VMS420/520 www.sick.com/VMS420_520

Omni-directional 1D bar code reading
Omni-directional OPS (omni portal systems) ensure track and trace at high throughputs. The use of high-performance scanners for identifying 1D bar codes on goods and merchandise in a technically optimized overall system enable the implementation of an optimum configuration and thus minimize manual interruptions in the process.

Fields of application
Storage and conveyor

Recommended products
OPS www.sick.com/OPS

Automated identification with RFID in inbound and goods issue
The RFGS Pro (Radio Frequency Gate System) track and trace system is available for quality and productivity increases in goods receipt and goods issue. Reading of RFID transponders is fully automatic and interruption-free. Object, speed and direction detection enable unique assignment of RFID transponders. The “false-positive read” suppression distinguishes static from dynamic transponders. Integrated service, monitoring and diagnostic tools secure a high level of performance.

Fields of application
Storage and conveyor

Recommended products
RFGS Pro www.sick.com/RFGS_Pro
Automated baggage label reading with camera technology
The Lector65x image-based code reader features high resolution and an extensive depth of field. Integrated into the ALIS Vision system, it provides the very highest reading performance, even when bar codes are damaged and dirty, and enables images to be used for vision tasks. If the baggage source message is missing, the data required for sorting can be read from the baggage label using video coding or plain text recognition (OCR). This increases sorting rate and optimizes transfer time. Thanks to SICK’s intelligent network concept, the vision system can be integrated into existing laser systems, as well as other types of technology.

Fields of application
Airport

Recommended products
Lector65x System [www.sick.com/Lector65x_System]

Automatically reading the baggage label
Baggage labels ensure clear identification of luggage. Important information is coded onto the labels in the form of a bar code, RFID tag or plain text. The ALIS track and trace system is a specially developed system for luggage that reliably reads the IATA-specified labels regardless of their position. SICK offers customers a complete system with ALIS, including electronic components, encoders, photoelectric sensors and diagnostic software. SICK is also available at your side as an expert partner during installation, commissioning and maintenance.

Fields of application
Airport

Recommended products
ALIS [www.sick.com/ALIS]

Size detection before X-ray machines
To protect the components in a baggage handling system (e.g., an X-ray machine) from damage and optimize automated flight make-up, the VML track and trace system measures baggage as it is being conveyed. By reliably determining the dimensions of the bag, the VML ensures optimal usage of the storage space and maximizes baggage handling system availability.

Fields of application
Airport

Recommended products
VML [www.sick.com/VML]
Static freight measuring

Two LMS5xx 2D LiDAR sensors are installed on a positioning unit above the air freight. This positioning unit is evenly maneuvered along over the freight during which two-dimensional scan data of the freight is recorded. In addition, a DFS60 incremental encoder provides precise speed information. This makes it possible to determine the dimensions and volume of the air freight. The measuring process is activated via scanning the air freight identification number. This is done using an IDM16x handheld scanner. Inductive proximity sensors detect the end positions of the positioning unit.

Fields of application
Airport

Recommended products
DWS Static  [www.sick.com/DWS_Static]
DWS Pallet  [www.sick.com/DWS_Pallet]

Camera-based system for measuring, weighing, and scanning in inbound goods

Items are automatically identified, weighed and dimensioned to maximize throughput in high-speed shipping areas. The ICR890 captures and processes 1D/2D image data, and the VMS provides package dimensional data to optimize shipment loads. Weigh scales can also be integrated for gathering in-motion weight data for complete and accurate freight calculation. This information can update your warehouse management system and can also be used as basis for reliable credit memo processes with your forwarding company.

Fields of application
Retail and warehousing

Recommended products
DWS Static  [www.sick.com/DWS_Static]

Manual master data capture for irregularly shaped objects plus photos

The Master Data Analyzer applies the easiest possible approach to achieve standardized recording of object master data, e.g., size, weight as well as part number and photos. Products are visualized and digitalized in real time, regardless of their shape, surface, and material properties. A high level of process security and major time savings are achieved because the product does not need to be aligned and can be measured from either direction. Accurate master data enables efficient transport processes and supports storage optimization to a high degree.

Fields of application
Retail and warehousing

Recommended products
Master Data Analyzer  [www.sick.com/Master_Data_Analyzer]
**Dynamic volume measurement for conveyor systems**

VMS420/520 volume measurement systems are frequently used in modern logistics for completing master data, determining the optimum storage space, calculating cargo weight, or creating load proposal lists. The systems accurately measure objects of almost any shape, on flat, tray, and cross-strap conveyor belts, at a speed of up to 3.6 m/s. Thanks to their compact design, the volume measurement systems can also be easily integrated into any conveyor system.

**Fields of application**
Retail and warehousing

**Recommended products**
VMS420/520  [www.sick.com/VMS420_520](http://www.sick.com/VMS420_520)

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**Measuring the volume of cuboid objects**

The VMS410/510 single head volume measurement system accurately measures cuboid objects moving on flat conveyor belts or cross-belt sorters at a speed of up to 2 m/s, and can be used for quality assurance at the receiving work station, determining the optimum storage space, calculating volumetric weight, or creating load proposal lists. Its compact design makes it easy to integrate into any conveyor belt system.

**Fields of application**
Retail and warehousing

**Recommended products**
VMS410/510  [www.sick.com/VMS410_510](http://www.sick.com/VMS410_510)

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**Volume measurement for master data capture**

The VML track and trace system is based on a light grid frame and evaluation logic. It can even provide highly accurate measurements of transparent, foil-wrapped and very dark objects. The system therefore provides the basis for an automated, efficient logistics process, whether it be for collecting master data for size-optimized product storage or for the automated palletization of transport units. Auto identification systems and weighing technology means the range of applications can be expanded.

**Fields of application**
Retail and warehousing

**Recommended products**
VML  [www.sick.com/VML](http://www.sick.com/VML)

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**Camera-based system for measuring, weighing, and scanning in packing and shipping**

Items are automatically identified, weighed and dimensioned to maximize throughput in high-speed receiving areas. The ICR890 captures and processes bar code data or 2D codes from all 6 sides of the parcel if necessary. The captured image can be used for OCR demands, to process additional information from vendor labels. The VMS provides package dimensional data to optimize warehouse activities and weigh scales can also be integrated for gathering in-motion weight data.

**Fields of application**
Retail and warehousing

**Recommended products**
DWS Dynamic  [www.sick.com/DWS_Dynamic](http://www.sick.com/DWS_Dynamic)
TLA (Tire Lector Array) with integrated spotting enables robot handling
Bar codes are attached to the interior of every tire for an optimal tire manufacturing process. The bar codes and their position must be reliably detected. Dynamic reading makes stopping the conveyor system unnecessary, which was previously required. To do so, a VML track and trace system is integrated into a Tire Lector Array tire code reading system for so-called spotting. This ensures the dynamic detection of bar codes and their position. The position data is made available for the downstream robotics in order to make interaction with other dynamic processes run problem-free.

**Fields of application**
- Tire

**Recommended products**
- VML
  - [www.sick.com/VML](http://www.sick.com/VML)

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Protrusion monitoring at pallets
Before the pallet enters the stretch wrapper, its dimensions are measured. The load is checked for overruns in order to ensure a smooth wrapping process. The framework arrangement of the programmable MLG-2 Pro automation light grid reduces shadows. A simple alternative is the TiM5xx 2D LiDAR sensor. The volume can also be determined using the VML track and trace system.

**Fields of application**
- Food and beverage

**Recommended products**
- VML
  - [www.sick.com/VML](http://www.sick.com/VML)

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Reliable dimensioning for efficient production of secondary packaging
Reliable measurement of the respective products is necessary for the manufacture of secondary packagings which are produced specially for the products to be sent. The light-grid based VML system measures goods correctly regardless of the surface quality and send the relevant data to the packaging machine. This optimizes the logistics chain and lowers logistics costs.

**Fields of application**
- Packaging

**Recommended products**
- VML
  - [www.sick.com/VML](http://www.sick.com/VML)
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