



## Bulkscan

Non-contact and maintenance-free measurement of volume flow

**SICK**  
Sensor Intelligence.

## Advantages



### Maximum transport capacity with minimum maintenance – non-contact volume flow measurement with the Bulkscan®

The detection of volume flows on industrial conveyor belts can be very demanding depending on the ambient conditions. Over time, dust, moisture and vibrations affect mechanical solutions such as belt scales. The consequence: Time-intensive maintenance or recalibration processes. With the Bulkscan®, on the other hand, the data can be continuously recorded using time-of-flight technology. The distance to the surface of the bulk material is measured without making contact. The starting point for calculation of the volume flow is the reference contour of the empty conveyor belt. The bulk material profile results from the difference between the reference value and the measured value. The volume flow can be calculated in combination with the belt speed. This makes it possible to determine the optimum belt speed and ensures economical belt utilization.



#### Direct detection of volume flow

Environmental influences such as moisture affect the bulk material mass. If belt scales are used on their own, incorrect volume assumptions can lead to overloading or underloading in downstream processes and to plant shutdowns. Direct volume detection with the Bulkscan® prevents this.



#### Determining the belt speed

The Bulkscan® can be combined with an encoder to obtain accurate measurement data for conveyor belts running at variable speeds. It delivers the current belt speed to the Bulkscan®.

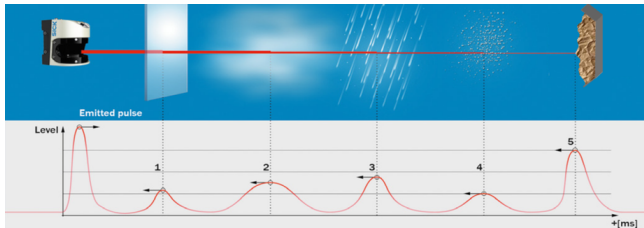


**The non-contact measurement principle of the Bulkscan® ensures a long service life of the sensor technology as well as consistently reliable measurement data.**

## Designed for extreme conditions

Whether in snow or in rain: Reliable data for bulk material transport is necessary even under harsh ambient conditions and with heavy contamination. The Bulkscan® is designed for these types of extreme situations. The proven 5-echo pulse technology of the Bulkscan® LMS511 filters out interfering echoes caused by dust, fog, glass or precipitation, to name a few examples, thereby delivering reliable measurement results. The IP67 housing also reliably protects the sensor technology from the

penetration of dust and moisture. Designed for a wide range of temperatures, an integrated heating element keeps the electronics at operating temperature even in the coldest conditions.



**Compensation of weather conditions thanks to 5-echo technology**

The 5-echo technology of the Bulkscan® LMS511 enables reliable and high-precision volume flow measurements in nearly any weather conditions.



**High-quality components in a rugged housing**

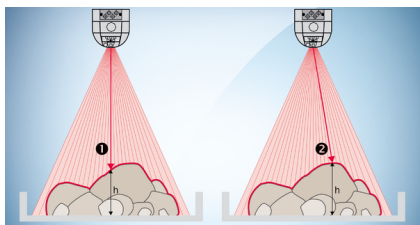
The rugged housing with enclosure rating IP67 makes the Bulkscan® resistant to dust and water.



**The Bulkscan® ensures maximum reliability for volume flow measurement in outdoor areas, regardless of weather conditions.**

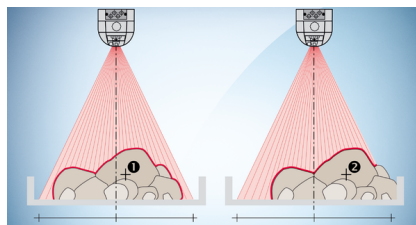
**Optimize processes with additional Bulkscan® functions**

The Bulkscan® can calculate the height of bulk material in the center of the conveyor belt or the highest point of the bulk material. This way, large rocks can be detected in a timely manner before blocking or damaging equipment in downstream machining processes. The sensor can also calculate the center of gravity of the bulk material. Asymmetrical belt filling or uneven mass distribution can cause the belt to skew, increasing wear. The monitoring of the center of gravity forms the basis for correction of the belt load, thus extending plant availability. In addition, the Bulkscan® LMS511 makes it possible to detect belt skew and material loss. The sensor swiftly detects the loading position and limit with the belt monitoring function. This ensures optimal plant utilization.



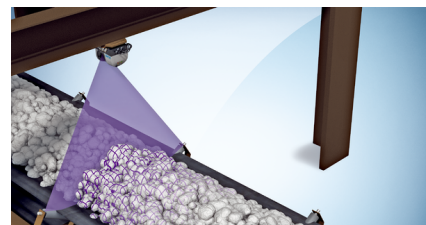
**Measuring the level**

More safety in downstream processing steps through monitoring of the height profile and warning in case of abnormalities.



**Calculating the center of gravity**

There is less wear on conveyor belts and rollers thanks to center-of-gravity calculation of the bulk material, which can detect one-sided loading.



**Belt monitoring**

Continuous belt monitors checks whether the conveyor belt is drifting too far from the ideal running position, reduces plant wear and also prevents material loss.



**The additional functions of the Bulkscan® minimize unplanned downtime and reduce maintenance work, as faulty loads are detected immediately.**



## Numerous communication interfaces for a wide range of applications

The Bulkscan<sup>®</sup> flow sensor can be integrated very easily into almost any production environment thanks to multiple communication interfaces. In addition to Ethernet, RS-232/RS-422 and binary switching inputs and outputs are available. The device can be accessed via USB interface during maintenance. With the optional BAM100 I/O module, the digital measured values can be converted into analog signals on four channels. This enables the use of the Bulkscan<sup>®</sup> even without external controllers and increases the options for integration.



**Different communication interfaces within larger plant networks are no problem for the Bulkscan<sup>®</sup> thanks to its wide range of output signals.**



### Technical data overview

<b>Measurement principle</b>	Laser run time technology
<b>Medium</b>	Bulk solids
<b>Output signal</b>	Ethernet Digital inputs and digital outputs USB auxiliary interface RS-232/RS-422
<b>Max. conveyor speed</b>	30 m/s / ≤ 20 m/s (depending on type)

### Product description

The Bulkscan® uses non-contact time-of-flight technology to measure the volume flow of bulk materials on conveyor belts. Irrespective of the properties of the bulk material and the weather conditions, the Bulkscan® generates a reliable volume flow signal based on the laser's time of flight and the belt speed thanks to multi-echo technology. Besides recording the total quantity and calculating the mass flow, the Bulkscan® comes with an integrated function for determining the center-of-gravity of the bulk material, thereby enabling it to detect uneven loading and thus avoid excessive belt wear. The rugged industrial housing is ideal for extreme operating conditions. An integrated heater ensures safe operation over a wide range of ambient temperatures. Discrete signals as well as Ethernet TCP/IP can be used to connect the measuring system to a host communication system.

### At a glance

- High sensor resolution thanks to laser pulses with high angular resolution
- Integrated functions for determining the center-of-gravity of the bulk material and detecting the height profile
- Seamless integration of SICK encoders possible
- Multi-echo pulse evaluation produces highly reliable measurements
- Compact housing with enclosure rating IP67
- Integrated heating

### Your benefits

- Efficient and non-contact measurement of volume and mass flow of bulk materials
- Reduces maintenance costs by preventing belt slippage
- Avoids blockages due to too high bulk materials
- Optimizes conveyor belt efficiency and speed with encoder support
- Precise and reliable measurement results even in harsh weather conditions
- Rugged design for use in harsh ambient conditions
- Wide ambient operating temperature range for use in outdoor applications

### Fields of application

- Monitoring the volume flow of raw materials in the food industry
- Monitoring of transport systems for conveying coal or ore
- Loading systems and packaging facilities
- Measuring the ash produced in power stations
- Measuring volume and mass in gravel plants and other operations in the construction industry
- Monitoring the volume of pieces of pneumatic in recycling tires plants
- Measuring the volume and mass of clinker in cement plants

## Ordering information

Other models and accessories → [www.sick.com/Bulkscan](http://www.sick.com/Bulkscan)

- **Output signal:** Ethernet, Digital inputs and digital outputs, USB auxiliary interface, RS-232/RS-422
- **Laser class:** 1, eye-safe (IEC 60825-1:2014)
- **Protection class:** III
- **Switching inputs:** 2 (+ Encoder)
- **Enclosure rating:** IP67

Working range	Switching outputs	Supply voltage scanner/heater	Type	Part no.
0.5 m ... 10 m	3	10.8 V ... 30 V	LMS111-10190	1093274
0.5 m ... 20 m	6	19.2 V ... 28.8 V	LMS511-20190	1059529

## SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. 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 a wide range of 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 complete 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:

Contacts and other locations –[www.sick.com](http://www.sick.com)