BULKSCAN

Volume Flow Measurement of Bulk Materials on Conveyer Belts

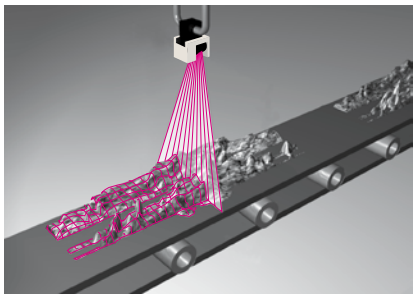
The BULKSCAN system measures volume throughput of any bulk materials on conveyer belts and determines the volumes of such materials in storage. The measured values can then be used for control and adjustment functions.

Measurement Principle

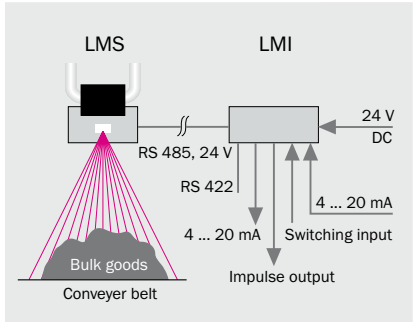
LMS sensors work according to the principle of time-of-flight measurement. A pulsed laser beam is emitted as a "measuring feeler". If it encounters an object (bulk material) it is reflected and the reflection is registered in the scanner's receiver. The time between transmission and reception of the impulse is directly proportional to the distance between the scanner and the object (time-of-flight).
The pulsed laser beam is deflected by an internal rotating mirror so that a fanshaped scan is made of the surrounding area (laser radar).

The contours of the target objects are determined from the sequence of impulses received.

The scanner's 2-dimensional contour data are transferred to the LMI evaluation unit via an RS422 data interface. The volume or throughput at any particular time can be determined by combining this data with other known quantities such as, for example, belt speed (shaft encoder or analog value) or the density of the bulk material (analog input).



Position of the conveyer belt sensor



System design

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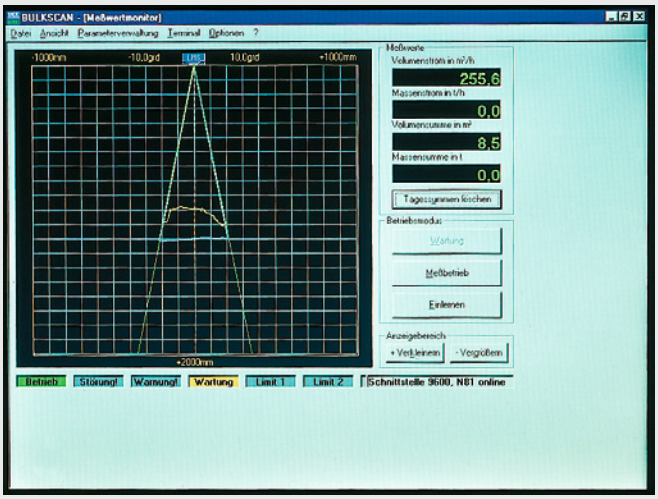
Output Values

The following output values are directly available:

- Current volume flow [m³/h] in [mA]
- Current throughput [t/h] in [mA]
- Volume [m³] - adding counter
- Mass [t] - adding counter
- Limiting value switch - relay outputs

Furthermore, each measurement value can be transferred to a host computer via a serial RS422 interface.
2 additional freely programmable switching outputs are available to signal that limiting values have been exceeded or undershot.

System Parameters are easy to set using a Window user interface.



User-friendly programming

Technical Data		
General		**Examples of applications** • Adjustment of conveyer belt speeds in relation to the load • Monitoring of loading on trucks, ships or trains • Determining amounts transported for record-keeping or as daily totals • Determining volumes in bulk material stores (bunkers)
Accuracy	Deviation typ. ± 5 % (± 3 % under ideal conditions)	
Conveyer belt width	max. 4 m (13 ft)	
Cable length (sensor – evaluation unit)	max. 500 m (1,640 ft)	
Evaluation unit LMI		
Power supply	24 V DC, approx. 3 W	
Enclosure rating	IP 65	
Ambient temperature	0 ... 50 °C (32 ... 122 °F)	
Outputs	1 analog: 0/4 ... 20 mA) 3 digital (relay): • 1 total mass/total volume • 2 limit value	**Advantages** • No friction produced by contact-free measurement • High precision • Unaffected by vibration or other environmental conditions • Easy installation and retrofitting • Automatic built-in checking
Inputs	Belt speed (impulse or analog value) density (analog value)	
Interfaces	RS422 (host computer) RS232 (for setting parameters)	
Display	alphanumeric, 16 x 2	
Sensors LMS		
Enclosure rating	IP 65/IP 67	
Power supply	24 V DC, 17/130 W	
Ambient temperature	0 ... 55 °C/–30 ... 50 °C (32 ... 130 °F/–22 ... 120 °F)	

LMS indoor version

LMS outdoor version

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