SYPERION

CONVEYOR BELT SCANNING

MATERIAL FLOW ANALYSIS ON CONVEYOR BELTS

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CONVEYOR BELT SCANNING

Material flow analysis on conveyor belts

Laser scanners can be used to determine the conveying capacity on mobile and stationary conveyor belts. The optimal measurement and analysis of flow rates, throughput and mass flow rates enables the strategic optimisation of the entire production process. However, there is no universal solution for all areas of application as there are many different conveyor systems and a wide variety of materials. In addition, the challenges of an accurate measurement of material flow rates lie partly in the dusty, wet or foggy environmental conditions or respectively in the evaluation of current process conditions.

The SYPERION measuring system continuously measures the throughput on conveyor belts, so our customers know about the current operating status of their system at all times. Our system was first used in 2005 and has been continuously developed since then. It is very versatile and can be adapted to different environmental and production conditions.

In contrast to other products, SYPERION's conveyor belt scanning is able to generate reliable values even under difficult conditions. It is robust against environmental influences such as rain, fog, dust, temperature changes, vapour, vibrations, etc. Even in the case of very dark material on the belts or particularly fast moving conveyors, measurements can be performed successfully.

Added value for our customers

SYPERION's conveyor belt scanning enables the customer to make quantitative statements on the status of the conveying process at any time. Operating states and weak points can be precisely analysed and optimised if necessary. Our customers benefit from the precise monitoring, e.g. by planning the feeding of the plant, downtimes, mixing processes, adherence to delivery quantities or the utilisation of the loading capacity in an optimal way.

BENEFITS

Accuracy & Efficiency

1

- High measuring accuracy (error rate up to 2 %)
- Robust in harsh environment, low-maintenance & weatherproof
- Trouble-free continuous operation through remote access
- Accurate profile measurement

Advanced technology

2

- Exceptionally versatile application possibilities
- Continuous conveyor belt scanning and mass flow calculation
- No wear due to non-contact measurement
- Easy installation and commissioning
- Pollution notification

Extensive services

3

- Extensive, web-based diagnostic functions
- Analysis of material flow and determination of material properties such as material type, loosening factor, etc.
- Extraction of process parameters such as volume, belt position and centre of gravity of the transported masses on the belt
- High adaptability for special usage requirements

Economical benefits

4

- Precise overview of the current conveying process enables better planning and control of operational processes
- Analysis and optimisation of weak points
- Low maintenance and repair costs

UNIQUE SELLING PROPOSITIONS

- Flexibly customisable (various scanners, process parameters)
- Robust against environmental influences
- Determination of loosening factor




THE MEASURING PRINCIPLE

Laser scanner and sensor head record the loading profile of the belt and transmit the data to a computer unit. The measured value is determined by material and layer height and indicates the respective volume flow rate by multiplication with the conveying speed. Using specific conversion factors, the corresponding mass flow can also be calculated from this data.

The conveyed material is recorded very precisely – under production conditions with an error of less than 2 %. The extraction of process parameters such as volume, belt position and centre of gravity of the transported masses on the belt helps to control and optimise the loading process. In addition to these values, the material flow itself is also analysed to determine the properties of the transported material.

Analysis of the measurement results

The analysis software *Syperion™ Conveyor Bulk Scan* offers various analysis methods and processes data from laser scanners of common manufacturers. The process values of the software are either delivered directly to control units for automation or used in office environments for management purposes.

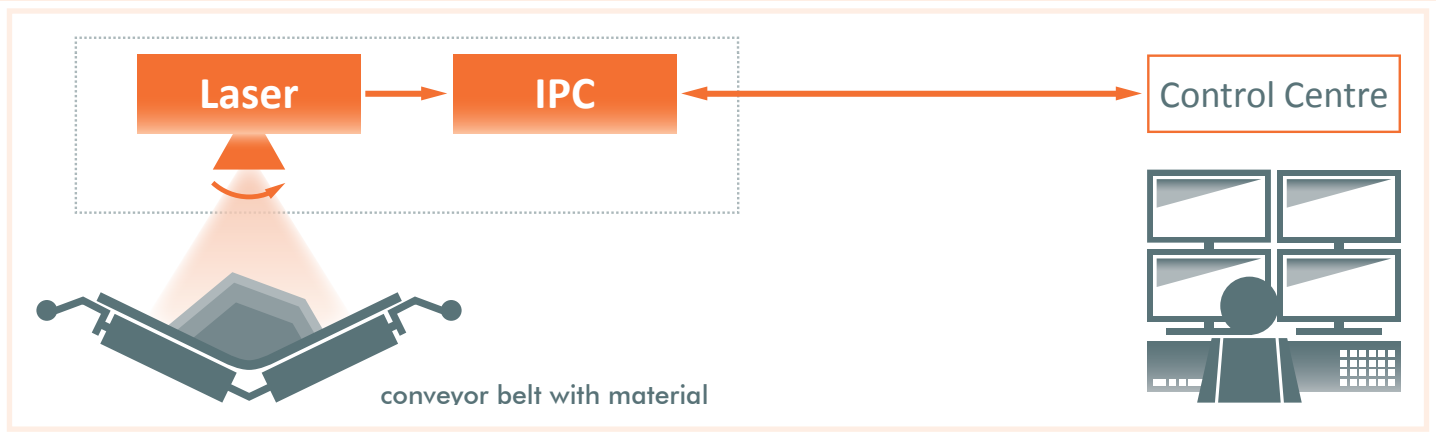
AREAS OF APPLICATION

The laser scanner system and the analysis software *Syperion™ Conveyor Bulk Scan* are very flexible and easy to use, making them suitable for a wide range of applications.

Data on volume, quantity, type and nature of the conveyed material can be determined accurately by means of the conveyor belt scanning by SYPERION, and thus be used for process optimisation.

APPLICATION EXAMPLES

- **Recycling stations & buyback centers**
  e. g. waste wood, plastic etc.
- **Bulk cargo loading & transport**
  e. g. building materials, cereals, salt, pellets etc.
- **Sorting plants**
  e. g. logistics, recycling, food etc.
- **Food and luxury food industry**
  e. g. coffee, tobacco, cereals, corn etc.
- **Open pit mining & underground mining**
  e. g. lignite, sand, gravel, etc.



SYSTEM PROPERTIES OF AN EXAMPLE SYSTEM

GENERAL PROPERTIES

Measurement distance	0,5 – 2m
Measurement deviation	< 2 % (conveyed volume)

Current conveyed volume in m^3/h or %	✓
Accumulated conveyed volume in m^3	✓
Position of the belt, belt rim in mm	✓
Deviation of centre of mass from centre of belt in mm	✓
Material classification by surface analysis	✓
Determination of the loosening factor	✓

INTERFACE FOR PROCESS DATA

Data output	min. 100 ms, typically 1 s
Ethernet TCP/IP	✓
S7 via RFC 1006	✓
Profibus DB	✓
Profinet, Serial, etc.	on request

ABOUT US

SYPERION offers high-quality engineering services as well as special-purpose solutions in the field of laser measurement and video metrology. Innovative measuring systems are created by integrating optical sensors, using laser scanners and video metrology systems. Our technologically advanced products and methods are developed for challenging industrial projects.

We offer

- **Innovative measuring systems with integrated laser scanners**
- **Metrological special-purpose solutions for quality assurance and process measuring systems**
- **Project management**

We work in enduring and faithful partnerships with our customers and contractors. Together we develop practical and profitable ways to incorporate 3D measuring technology in complex business or production processes.
Through this, we generate long-term benefits and competitive advantages for our clients.

In addition to the products and applications presented in this brochure, we develop special solutions tailored to your requirements.

We will find the optimal solution for you, too –
Please contact us!

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