Heavy industry

Online analysis and process control

SCHMERSAL

Safe solutions for your industry

Heavy industry

Online analysis and process control

Consistent product quality, plant safety and profitability are important aspects when transporting bulk materials on conveyor systems. In order to extend its range of solutions in terms of the process reliability of conveyor systems, the Schmersal Group has entered into a sales partnership with ScanMin Africa (Pty) Ltd. The South African company specialises in radio-isotope mass spectral analysis of materials like coal, cement, minerals and ores. This technology can be used to generate real-time information for process control and also for quality controls during operations.

The range of services offered by ScanMia Africa inlcudes online elemental analysis, online moisture analysis, the approximate determination of bulk density and the SPARTA Particle Size Analyser.

ScanMin Africa now also distributes the safety products from Schmersal.

NITA II: Online elemental analysis for bulk goods

Improving product quality and process efficiency are major objectives which can be achieved using ScanMin Africa's on-line bulk elemental analysers NITA II. NITA II is an automated system which is installed on the conveyor equipment to monitor the bulk goods. It makes routine, manual extraction of samples for analysis superfluous. NITA II uses advanced neutron-gamma technology to analyse the elemental composition of the bulk material directly on the conveyor belt, providing the data online in real-time. The technology is perfect for measurement of chemical elements such as carbon, hydrogen, oxygen, iron, potassium, calcium, sulphur, aluminium, copper, nickel or manganese. NITA II can monitor large volumes of materials and even operates in hostile environments.

This means the system has a wide range of applications:

- **Coal**

The quality of coal is critical for mining, transport and processing. Online analysis systems providing reliable data in real-time make a valuable contribution to process reliability, including optimising combustion in the furnace, while at the same time increasing process safety and reducing CO_2 emissions. The NITA II online elemental analyser provides real-time, reliable and accurate information online and is capable of measuring more elements (incl. oxygen and carbon) directly unlike other technologies. This enables accurate, direct determination of coal parameters, rather than relying on correlations as in other technologies.

- **Mineral processing**

Ore grade finger printing is an important aspect of the mineral processing industry. The development of the NITA II elemental analyser was prompted by the demand from the industry to have direct analyses of a larger range of elements, and to identify different ore grades for different beneficiation options.

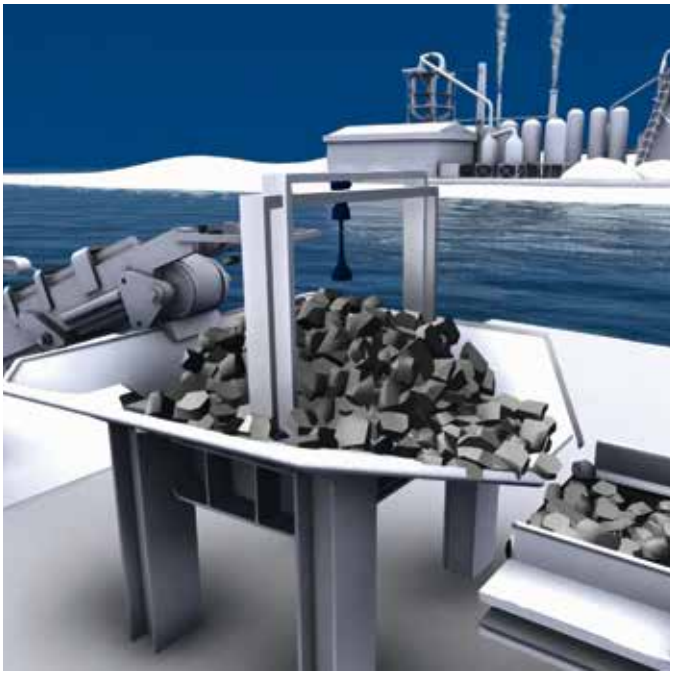
SPARTA Particle Size Analyser

The Particle Size Analyser (PSA) solution provides real-time automated analysis of particle size distribution on the conveyor belt, with interface capability to almost any system. The PSA features a camera with on-board ultra-fast processing power to analyse the product on the conveyor at a suitable point in the process. The cameras image grabbing technology and inherent built in intelligence performs accelerated inspections such as presence, absence, defect detection, shape analysis, particle size and many more real time functions. The prime objective is to increase the processing efficiency in the comminution circuit. Particle size has a critical impact on various aspects of the process and on the process efficiency. By being able to monitor the particle size online this will allow valuable minerals to be extracted in subsequent downstream processes.

Ultra-Moist: Moisture monitoring

Moisture measurement has always been an important process parameter. Traditionally this has been carried out

using the conventional laboratory real time analysis of a manual sample. Not only is this an expensive and time consuming process but the time taken to provide the result means that the information is only of historical value. During the time interval between taking the sample and reporting the result, operational conditions may have changed and the reported result may no longer be valid.



The Ultra-Moist On-Belt Moisture Measurement System now allows the accurate measurement of moisture in real-time analysis. This ready availability of moisture information allows proactive process control actions. The information can be used in a number of ways including, for example, diverting excessively moist material away from vulnerable downstream processes and product nett weight monitoring for quality control purposes.

The microwave moisture technique has been found to be suited to a wide range of materials including; coal, iron ore, chrome, platinum ore, gold ore, wood flake, bauxite, sugar, bagasse, sand, mineral sands, foods, chemicals, etc.

Bulk Density Analyser: Analysis of bulk density

Bulk density is an important key index for the conveyor behaviour of bulk goods. The Bulk Density Analysis uses ultrasonic level sensors at three to five points along the conveyor belt to measure the height of the coal or other bulk goods across the width of the belt. In this way an approximation may be made as to cross-sectional area of the coal on the belt. Knowledge of the cross-sectional area of the material on the conveyor belt combined with ultrasonic level sensor, mass and belt speed permits a calculation of an approximate bulk density of the ore on the conveyor belt.

The Schmersal Group

In the demanding field of machine safety, the owner-managed Schmersal Group is one of the international market leaders. The company, which was founded in 1945, has a workforce of about 2000 people and seven manufacturing sites on three continents along with its own companies and sales partners in more than 60 nations.

Customers of the Schmersal Group include global players from the area of mechanical engineering and plant manufacturing as well as operators of machinery. They profit from the company's extensive expertise as a provider of systems and solutions for machine safety. Furthermore, Schmersal specialises in various areas including foodstuff production, the packaging industry, machine tool industry, lift switchgear, heavy industry and the automotive industry.

A major contribution to the systems and solutions offered by the Schmersal Group is made by tec.nicum with its comprehensive range of services: certified Functional Safety Engineers advise machinery manufacturers and machinery operators in all aspects relating to machinery and occupational safety – and do so with product and manufacturer neutrality. Furthermore, they plan and realise complex solutions for safety around the world in close collaboration with the clients.

Safety Products

- Safety switches and sensors, solenoid interlocks
- Safety controllers and safety relay modules, safety bus systems
- Optoelectronic and tactile safety devices
- Automation technology: position switches, proximity switches

Safety Systems

- Complete solutions for safeguarding hazard areas
- Individual parametrisation and programming of safety controllers
- Tailor-made safety technology – be it for individual machines or a complex production line
- Industry-specific safety solutions

Safety Services

- tec.nicum academy – Seminars and training
- tec.nicum consulting – Consultancy services
- tec.nicum engineering – Design and technical planning
- tec.nicum integration – Execution and installation

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