

Precise Height Measurement for LIBS Systems

Industry: Mining
Application type: Positioning

Description



Fig 1: Online Elemental Analyzer

Lyncis (www.lyncis.it) specializes in online elemental analyzers using Laser-Induced Breakdown Spectroscopy (LIBS) to measure the chemical composition of mineral materials in real-time directly on conveyor belts. This eliminates delays from traditional lab testing and enables timely process adjustments to boost efficiency and product quality.

LIBS is a powerful technique (see Fig. 1) in which a laser generates plasma on the surface of a material. The emitted light from this plasma is then analyzed to determine the elemental composition. This method is particularly useful in industrial environments such as mining and mineral processing, where real-time data can significantly enhance operational efficiency.

A key challenge in conveyor-based LIBS analysis is the varying height of mineral loads. Changes in size and volume make it difficult to maintain consistent focus, which is critical for accurate measurement. Height deviations can result in unreliable data and flawed process control.

Dimetix Laser Distance Sensors solve the challenge of height measurement. These high-precision sensors continuously measure material height on the conveyor (see Fig. 2), ensuring the LIBS system maintains proper focus.

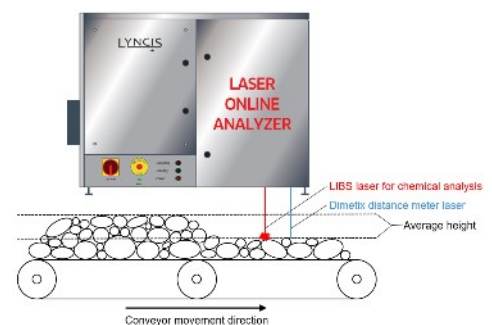


Fig 2: Conveyor belt & movement

By integrating Dimetix Sensors, Lyncis has enhanced the performance of its LIBS analyzers, delivering a robust, real-time solution for elemental analysis on conveyors. This collaboration showcases how advanced sensing technology can increase efficiency, measurement reliability, and overall process control in demanding industrial settings.

Customer advantage

- **High Precision:** Millimeter-level accuracy ensures exact LIBS focus.
- **Real-Time Data:** Instant height feedback enables continuous refocusing.
- **Robust Design:** Reliable operation in dusty, vibrating and hot environments.



DIMETIX APPLICATION EXAMPLE

AE-2101

Dimetix Sensors – the solution for applications with high precision requirements

Thanks to the clearly arranged product portfolio the evaluation of a suitable Dimetix Laser Distance Sensor is simple and uncomplicated.

Dimetix Sensors offer numerous features, which are integrated in each and every device as standard, including, among others, various interfaces like SSI, RS-422/485, RS-232 and 2 digital outputs.

Optionally, the Industrial Ethernet interfaces PROFINET, EtherNET/IP and EtherCAT are also available. Furthermore, all devices are IP65-protected and impress with a weight of less than 500 grams!

Particularly noteworthy, however, is the accurate measurement of 1 millimeter over distances of up to 500 meters, even under the most extreme conditions. This is possible with the sensors of the types DPE, DEN and DEH.

No less interesting are sensors of types DAE, DAN and DBN. Preferably, they can be used for projects which do not require a range over 500 meters or are cost-sensitive.

	DPE-10-500	DPE-30-500	DEN-10-500	DEH-30-500
PARTNUMBER	500630	500636	500637	500638
SPECIFICATION				
Typical accuracy $\cong \pm 2\sigma$	$\pm 1 \text{ mm}$	$\pm 3 \text{ mm}$	$\pm 1 \text{ mm}$	$\pm 3 \text{ mm}$
Mensurierung range on natural surfaces	0.05...~100 m	0.05...~100 m	0.05...~100 m	0.05...~100 m
Measuring range on reflective foil	~0.5...500 m	~0.5...500 m	~0.5...500 m	~0.5...500 m
Max. measuring rate	250 Hz	250 Hz	100 Hz	100 Hz
Operating temperature	-40...+60°C	-40...+60°C	-10...+50°C	-10... +60°C

	DAE-10-050	DAN-10-150	DAN-30-150	DBN-50-050
PARTNUMBER	500633	500632	500634	500635
SPECIFICATION				
Typical accuracy $\cong \pm 2\sigma$	$\pm 1 \text{ mm}$	$\pm 1 \text{ mm}$	$\pm 3 \text{ mm}$	$\pm 5 \text{ mm}$
Mensurierung range on natural surfaces	0.05...~50 m	0.05...~100 m	0.05...~100 m	0.05...~50m
Measuring range on reflective foil	~40...50 m	~40...150 m	~40...150 m	
Max. measuring rate	100 Hz	100 Hz	100 Hz	10 Hz
Operating temperature	-40...+60°C	-10...+50°C	-10...+50°C	-10...+50°C