3D-MEASUREMENT OF DUMPS

MEASURING DUMPS PRECISELY AND RELIABLY IN REAL TIME

Syperion has measured and created complex mapping systems of mining dump shapes for more than a decade. We provide measurement solutions for surface lignite mining through a combination of laser scanners, GPS/GNSS receivers and other 3D sensors to achieve accurate and precise mapping and measurement results in real time. The collected data can be used for process control and for evaluation and planning purposes.

Our systems use a series of diagnostic functions and sensors to accurately measure dump areas in continuous operation and located in harsh environments, such as spreaders, excavators, stackers and reclaimers. It is robust towards environmental influences like rain, fog, dust, variations in temperature, vibrations etc.

Our ready-to-use measurement systems enable mine operators to analyse dump sites in both nominal and actual data visualisations without extensive training or practice. They also include the options to transmit the process values to the control system and to process all the information into a database to maintain accurate records.

PROPERTIES

- We use 2D or 3D laser scanners to capture areas with dimensions of upto 5.000 m by 5.000 m
- Measuring-distance on dark material like lignite is up to 350 m
- ± 0.05 m accuracy has been proven at dump height measurement
- Process values like the comparison between nominal and actual values, volume, reserve space etc. can be extracted from the shape of the dumps
- If required, dump measurement profiles can be delivered in absolute GPS/GNSS-coordinates.
- If desired, data or process values can be transmitted to the control system.
- Extensive diagnosis functions allow an unobstructed permanent operation
- The measurement system is robust towards environmental influences like rain, fog, dust, change of temperatures, vibrations, etc.

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SYPERION

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SYSTEM PROPERTIES

GENERAL

Number of systems in permanent use	> 10
Proven accuracy of height values	< ±0,05 m
Lateral resolution of the grid in Gauss-Krüger coordinates	0,5 m
Number of grid points per second	70–3.000
usage of a 3D laser scanner	•
usage of 2D laser scanners	•
Automated adoption of set values from the control station	•
Automated transfer of actual values (permanent, differential, layer wise)	•
Filtering of dust trails / ??? dump flow ???	•
Automated measurement mode around impact point	•
Manual measurement mode	•
Automated standby function on halt	•

VISUALISATION FOR THE OPERATOR

Update rate of display content	2 s
Update rate of measurement values	5 s
Web-Application for visualisation	•
Number of visualisation clients	> 5
Scalable screen resolution	•
Direct display of set-actual comparison	•
Display of data in Gauss-Krüger coordinates	•
Display of data in local coordinates relative to the belt conveyor system	•
Display along the spreader	•
Display at the impact point along the pivoting radius of the spreader	•
Display at the impact point in direction of the belt conveyor system	•
Display perpendicular to the belt conveyor system, dumping below / above view	•
Display of set-actual differences around the impact point in colours	•
Zoom functions	•
Display of position	•
Display of distance between belt conveyor system and carriage	•
Display of distance between belt conveyor system and impact point	•
Display of diagnosis functions	•
Model of the Spreader	•

DIAGNOSIS FUNCTIONS

Display of line-of-sight obstructions (fog, snow, etc.)	•
Display of line-of-sight obstructions by objects	•
Display of GPS / GNSS errors	•
Display of laser scanner errors	•
Display of ??? Kopplungsfehlern (SPS, Istwerte, Sollwerte, etc.) ???	•
Filing of measurement values	•
Open file formats for system analysis	•