



StoneThree

The Future of Work. Now.

Particle Size Analyser

Stone Three introduces its latest deep learning based Particle Size Analyser (PSA) offering improved accuracy. The Stone Three PSA system is a reliable and robust machine vision-based system used to measure the size distribution of bulk material such as mineral ore on a conveyor belt. The Stone Three PSA makes use of the latest industrial high-resolution laser and camera technology for superior accuracy and robustness.

Key Benefits

Traditional particle size distribution (PSD) sampling methods typically entails manual, labour intensive belt cuts and material sieving. This process is prone to human error and provides only a snapshot measurement and it is often impractical to get a representative sample. The benefits of on-line PSD analysis is that;

- It is real-time and continuous, this enables a measurement that is statistically representative.
- The continuous measurement is ideal for trending PSD changes and enables process performance monitoring.
- It is also a very valuable input to Advanced Control Systems for process stabilization and optimization.
- The machine vision based measurement is non-contact and therefore robust and low maintenance.



Machine Learning PSA Performance

Stone Three now utilizes the latest deep learning particle segmentation technology. This enables particle detection performance, significantly better than traditional water-shedding approaches. The ore region is automatically detected for increased performance since areas containing fines are automatically identified and included in the PSD analysis. Large rock detection performance is also increased since this method can detect partially hidden particles and are robust against the presence of sunlight and shadows on the imaging area. Graphical Processing Unit (GPU) hardware is leveraged for faster analysis frequency.

Capabilities

The Stone Three PSA has been proven on a multitude of ore types including iron, copper, platinum, nickel, zinc, bauxite, kimberlite and coal. The system has been used in a wide range of applications - from Run-of-Mine streams with large variations in PSD to product streams with a very narrow PSD. The PSD data is made available for integration into the client's SCADA, historian and control systems using industry standard protocols such as OPC.

Volumetric Measurement

Stone Three laser based PSA provides real time volumetric flow measurement of the material on the belt. The system includes auto-calibrating functionality which means it does not require frequent calibration common to belt scales. This measurement is ideal where a belt scale is not practical or to complement a belt scale to identify scale drift or to monitor changes in bulk density.

Applications

The Stone Three PSA has proven to add significant benefit in the following applications:

- Optimisation of crushing operations ranging from simple reduction ratio monitoring and operator intervention to automated crusher gap control
- Optimisation of blasting by measuring run of mine ore PSD
- Preventing downstream blockages by robust oversize detection
- Product quality control before shipment of material to avoid penalties
- Optimisation of grinding operations through feed forward control or feed blending strategies

Health Monitoring

Stone Three continuously monitors system health for sensor issues with communication, camera or light equipment. Server health monitoring includes disk space, CPU usage, Memory usage, and OPC health monitoring.

Technical Support

Stone Three places significant emphasis on timely, consistent and accurate technical support and has developed reliable and cost-effective systems to achieve this objective. Stone Three supplies a comprehensive technical support plan as part of their value adding service. Technical support includes remote support and routine site inspections. Weekly reports are sent to the client detailing system uptime, OPC health and PSD performance indicators.

