Underground Cavity Scanning System

Measurement Devices Ltd (MDL) (United Kingdom) has launched a new miniature remote 3D laser scanning system designed for rugged use in underground surveys has been launched, the Cavity Autoscanning Laser System (C-ALS). This laser system has only a 50mm diametre and is inserted into underground workings through pre-drilled boreholes. On entry to the workings or cavity, C-ALS robotically measures the three-dimensional void and its surface reflectivity.

A motorised two-axis scanning head ensures a complete 360 degrees scan of the whole void up to a range of 500ft. The system also has an increased scanning rate of up to 650,000 points in an hour. Fast scans, where only a few points are collected, can take just a few minutes.

The new C-ALS can scan from any direction and inclination including horizontally or when pushed ‘uphole’™. A digital compass and pitch-and-roll sensors inside the scanning head enable accurate positioning and orientation of the unit. The latest C-ALS also incorporates a ‘nosecone’™ camera and infra-red lighting system in the probe which enables it to gauge the exact distance from the borehole collar to the ‘breakout’™ point in a cavity. The camera also allows C-ALS to check the condition of the borehole by picking up any obstructions, blockages or ‘cave-ins’™.

C-ALS is deployed by cable but, where there is strong magnetic interference or for upwards deployment, the system can be lowered or raised with fibreglass Boretrak rods which ensure that the scanner’s azimuth is constant. A rugged PC computer is used for set up, data acquisition and control. A cable data telemetry system transmits all measured data back to a surface control unit. MDL supplies software for processing, viewing and editing the data and can also provide advanced processing software for 3D modelling and analysis.