

## Straightening out LASER SCANS

A new mobile LIDAR scanning device has been designed to eliminate the errors that can arise from incorrect calibration. Michael Mills reports.

The mining industry has used Light Detection and Ranging (LIDAR) systems to create three dimensional models and images for many years.

This technology is commonly used to assess the size and structure of voids, stopes, shafts and pits.

The scanners can also be mounted on vehicles or aircraft to carry out large-scale measurement and exploration tasks.

However, MDL Australia's Julia Reynolds told *Australian Mining* the scanners needed for such applications can be error-prone if incorrectly calibrated.

"LIDAR technology is made up of three separate components; the laser, the motion sensors and Inertial Navigation System (INS) and finally a Global Positioning System (GPS)," she said.

"The unit needs the INS and the GPS so it can properly pinpoint the location of each laser footprint while the vehicle is moving.

"But with all the units currently available, you have to calibrate these components separately.

"But if one component is not working or incorrectly calibrated, the data can be incorrect."

These discrepancies can include physical offset errors, data timing errors and operations errors.

"Setting up all the separate components can be very time consuming and therefore expensive," Reynolds said.

"There are so many things that can go wrong if everything is not done properly."

MDL has developed Dynascan, a mobile system designed to eliminate the potential for such errors.

The unit incorporates these three components into a single pod, which has been pre-calibrated in the factory.

"The unit does not need a dedicated vehicle and comes with a plug-and-play configuration," Reynolds said.

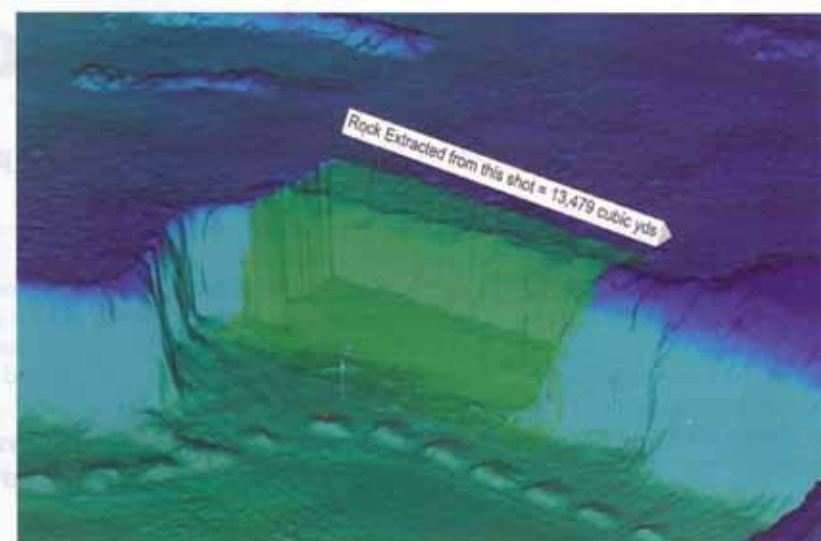
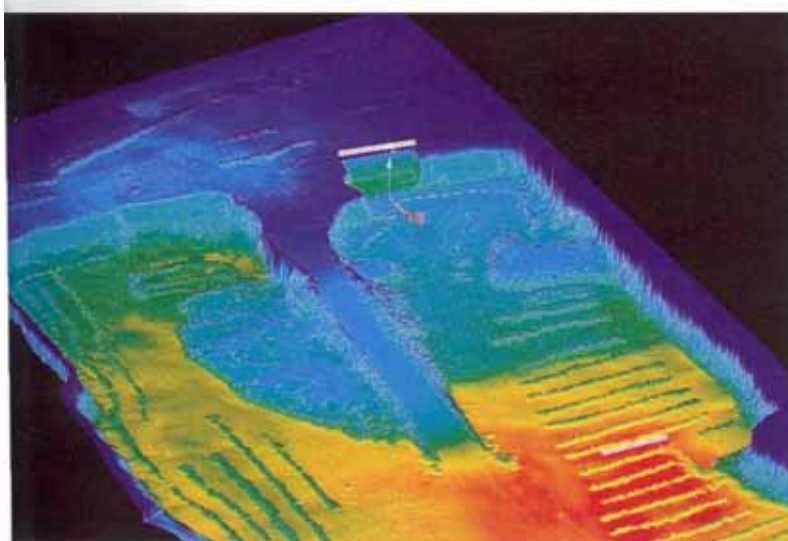
"It comes with a computer, so the surveyor simply has to set the scanning target and start driving.

"This is the first unit of its kind to combine all the necessary components in one setup."

According to Reynolds, these devices can be used for any type of three dimensional mapping, volumetric survey or Geographic Information System (GIS) application.

"For the mining industry specifically, the unit can be used for exploration and resource evaluations, determining ore bodies as well as the design and construction of mines, plants and infrastructure," she said.

"It can also be used to determine pit and void volumes for mine planning and stockpile volumes for account-



The three dimensional models can be used for applications such as mine planning, exploration and resource evaluations, determining ore bodies, pit and void volumes, environmental monitoring and stockpile inventory monitoring, as well as the design and construction of mines, plants and infrastructure.

ing purposes as well as for environmental monitoring and reporting and modelling tailings dams.

"Because the unit is portable and does not require a dedicated vehicle, the unit is really useful for work on remote sites.

"It only weighs 12 kg, so you can take it to a site and mount it on whatever is available."

LIDAR technology uses the pulse time-of-flight principle to map and measure, which means the time it takes

for laser beam to reflect and return to the source is calculated into a distance value.

Understandably, the laser beam must be powerful in order to work effectively in large, open expanses.

"The unit has a measurement frequency of 36 kHz, which means it carries out 36,000 measurements every second," Reynolds said.

"By comparison, our scanners for use in underground voids carry out 250 points per second.

"The laser's range is 150 m and is accurate to within five centimetres, so it meets the expectations of the mining and quarrying industry."

The device's sealed pod meets IP-67 standard for dust and water protection and can withstand ambient temperatures from -20°C to 60°C.

The scanning laser also meets the Class 1 Laser Safety Standards.

"If this unit is popular, we will look add a second laser head to the product in the near future, which will

of course double the scan rate to 72 kHz," Reynolds said.

The unit was tested in a Melbourne quarry last year and will be launched in August at the 2010 Australasian Mine Surveying Convention at Surfers Paradise, Queensland.

• MDL Australia  
 Julia Reynolds  
 03 9318 9666  
 jreynolds@mdlaustralia.com.au  
 www.mdlaustralia.com.au



The device can be easily attached to any vehicle without the need to recalibrate.