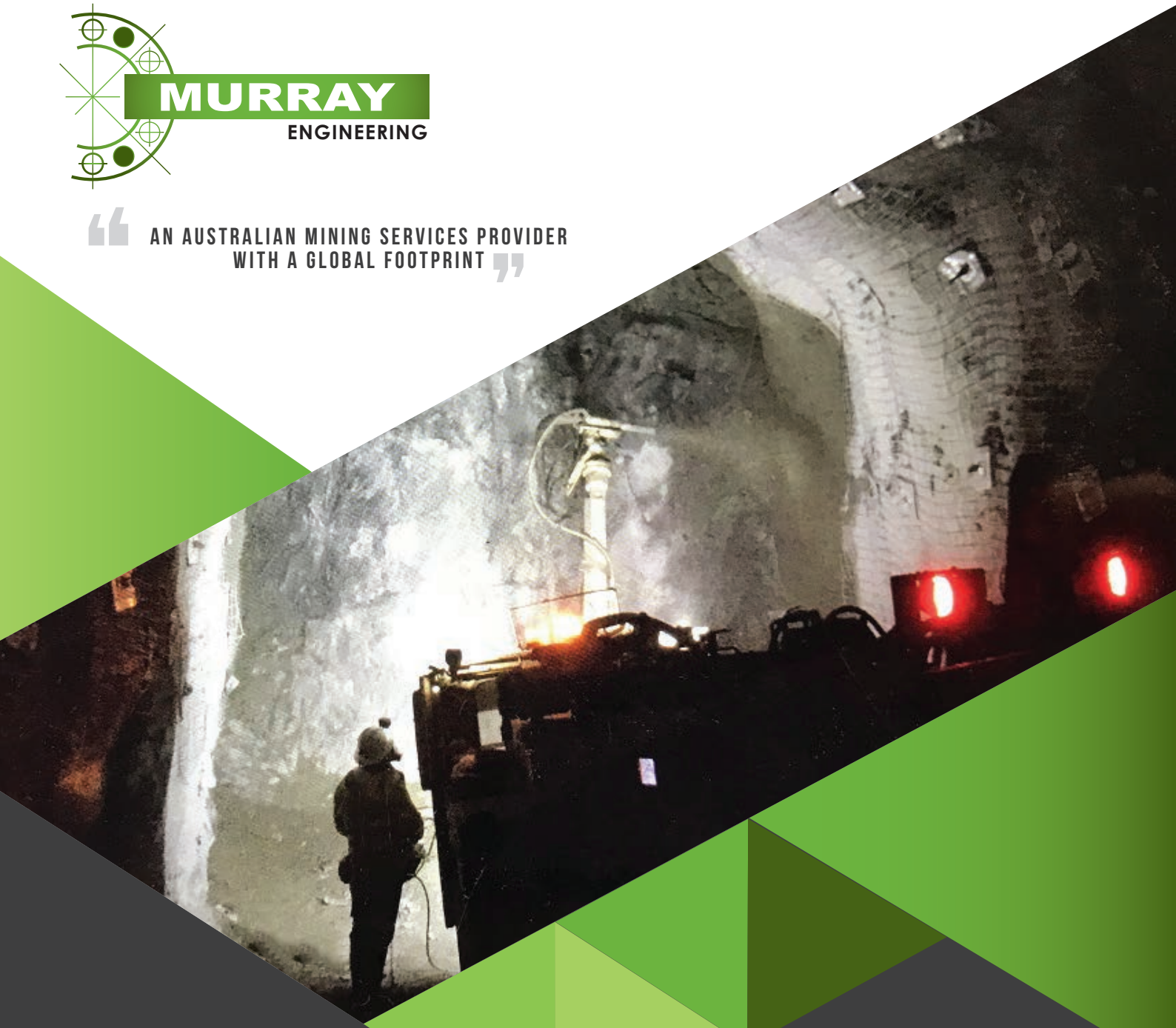
MURRAY
ENGINEERING

"AN AUSTRALIAN MINING SERVICES PROVIDER WITH A GLOBAL FOOTPRINT"



MURRAY ENGINEERING

OptiME

SHOTCRETE OPTIMIZER

GOT QUESTIONS?
LET'S TALK!

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OptiME

SHOTCRETE OPTIMIZER

PRECISE SHOTCRETE THICKNESS MEASUREMENT

OptiME Shotcrete Optimizer is a precision 3D scanning technology for measuring, analysing, visualising and reporting the application of shotcrete ground support. Shotcrete thickness measurement is crucial in evaluating the quality of shotcrete application. OptiME helps to improve the quality, efficiency and safety of shotcrete application via a combination of under-spray detection, over-spray reduction, and optimal material usage- ultimately minimizing rework.

The safety and durability of ground support is ensured when shotcrete is applied in accordance to specifications. Shotcrete Optimizer technology provides shotcrete thickness analysis in-situ, therefore enabling instant and accurate evaluations to get the job right first time.

In addition to savings in raw materials, this immediate shotcrete thickness information allows the operator to identify and fix thin-spots there and then. As a result, the need for expensive and time-consuming rework can be eliminated.

Shotcrete Optimizer technology is designed to deliver performance in the rugged underground mining environment. It is suitable for permanent install onto a shotcrete spray rig/vehicle or operated as a standalone device. Its built-in wireless connectivity enables remote operation in hard-to-reach or hazardous locations.

CHALLENGES

Shotcrete thickness measurement is crucial in evaluating the quality of shotcrete application as well as in determining the quantity of material applied. Accurate and reliable shotcrete thickness information can help to manage the performance of ground support work delivered. It can also improve the efficiency of material use without compromising on quality or safety.

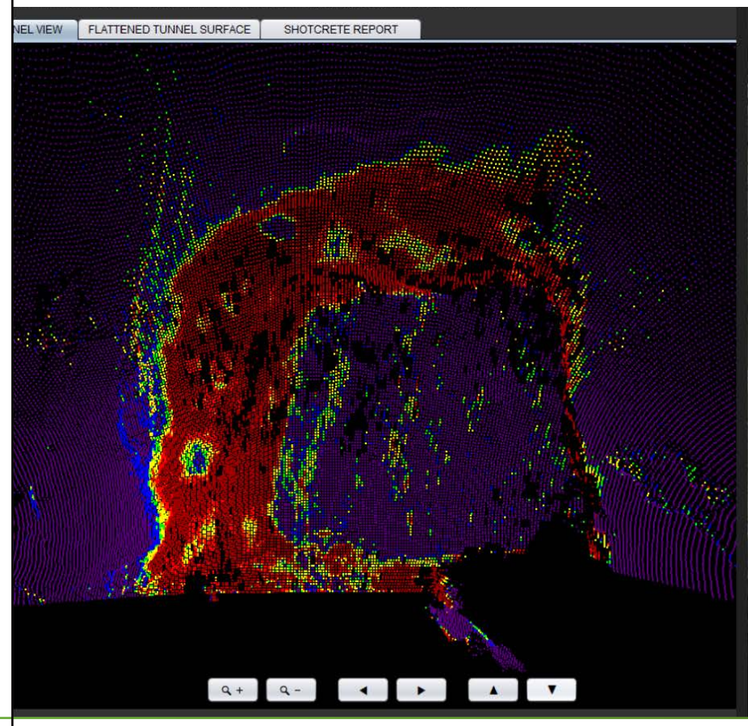
Under-spraying can still occur and go undetected, resulting in thin spots which has its significant safety implications. Operators face various challenges when applying shotcrete. In the underground environment, there are various difficulties such as uneven rock surfaces, dust, poor lighting and long distances that make it almost impossible to judge the actual shotcrete thickness from its surface appearance.

Currently, traditional thickness measurement is limited to manual point-sampling with steel probes. Conventional measurement is time-consuming whereby an operator has only limited time to select and measure a small handful of sampling points. Such estimation can be inaccurate and has a tendency to encourage over-spray in order to err on the safe side, resulting in material wastage.

Over-spray behaviour results in very wasteful use of material. Excessive shotcrete volumes are typically ordered and consumed to account for wastage, over-spraying, and varying skills of the human operator.

DON'T SETTLE FOR INFERIOR

Conventional shotcrete thickness measurement is time consuming, inconsistent and unreliable. OptiME helps to eliminate human error, and gives accurate measurements, to save you time, material and cost.



OptiME

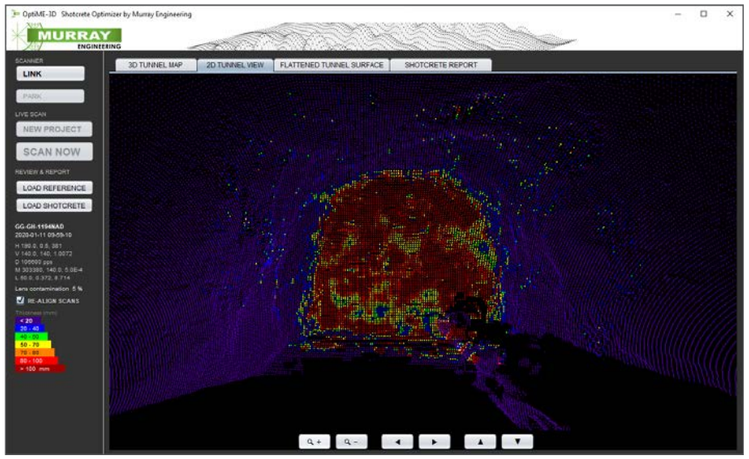
FEATURES & BENEFITS

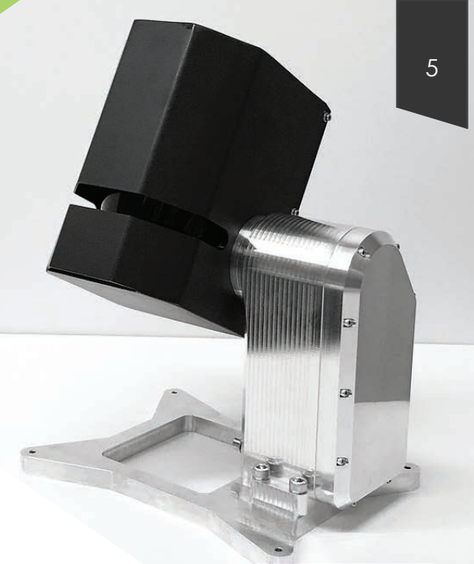
Shotcrete Optimizer's 3D laser technology is able to rapidly measure and analyse tens of thousands of sample points, delivering all the benefits of automatic shotcrete thickness measurement. High-granularity measurements are conducted rapidly, presenting intuitive colour-coded 3D visuals to users immediately for their inspection.

By providing immediate shotcrete thickness information, Shotcrete Optimizer's game-changing technology enables the operator to identify and fix thin spots immediately 'right here, right now'. As a result, it eliminates the need for expensive and time-consuming rework.

A rugged Tablet PC with intuitive Touchscreen Display enables easy user operation out in the field. Its high-contrast display provides high quality graphical visualisation alongside easy-to-control touchscreen buttons and menus. For maximum reliability and error-free data during unexpected events of vehicle power-loss, its dual battery packs will provide several hours of continued operation to ensure that the integrity of your data is never compromised.

Its built-in wireless Wi-Fi connectivity enables convenient data transfer for sharing and backing up your work.





Operational Benefits

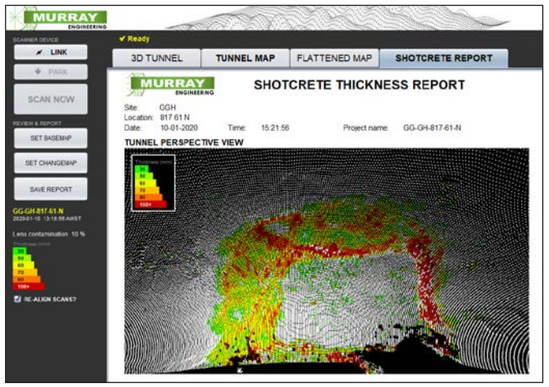
- Detect under-spray thin spots
- Reduce over-spray wastage
- Minimise and eliminate re-work
- Improve operational efficiency saving time and cost
- Streamline your paste-making supply logistics chain
- Enhance overall mine productivity and safety

Technology Features & Benefits

- Automatic shotcrete thickness measurement
- Automatic identification of over/under-spray areas
- High-resolution precision measurement with Eye-Safe laser scanning
- Measure, Analyse and Report 100,000+ sampling points in 3D immediately
- 3D Shotcrete Map visuals with colour-coded Point Cloud display
- 2D Shotcrete Surface Map conversion for reporting and printing
- Clear and intuitive Touchscreen Display
- Built-in Wi-Fi network connectivity for remote operation, optional 4G-LTE
- Easily Create, Save, Load and Manage your project files
- Software upgrades can be tailored to your specific project and operational needs

SCAN ME

Scan me to visit the OptiME web page or visit: https://bit.ly/OptiME



OptiME SPECIFICATIONS

SYSTEM COMPRISES

3D Scanner Module with integrated precision optics
Rugged Tablet PC with integrated Touchscreen Display (glove capable)
Software app for Shotcrete 3D Scanning and Visualisation ready installed
Wireless Wi-Fi connectivity
Complete set of power adaptor, cables and interconnects
Complete set of tailored hardware mounts, brackets and fixings

PERFORMANCE

Field of view	Horizontal	180°
	Vertical	-25° to +120° from horizontal, standard
		-40° to +220° from horizontal, wide option
Range	0m to 15m typical	max 25m
Sensor	Optics	Infrared 905 nm, Class 1 eye-safe IEC 60825-1
	Accuracy	+/- 25mm (1m – 10m)
		+/- 35mm (10m – 20m)
Sampling time*	Quick scan	2 minutes
	High resolution scan	3.5 minutes

* Actual times may vary depending on the user's operational requirements.

POWER & CONNECTIVITY

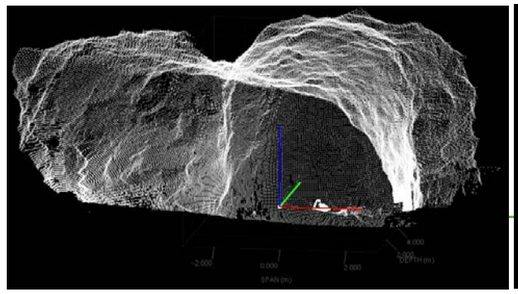
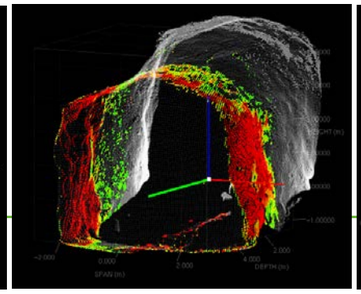
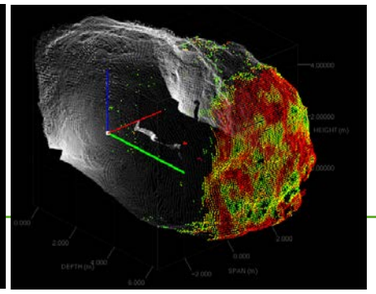
Host power source	20-40V DC, nom 2.5A at 24V
Network	Wireless Wi-Fi and Ethernet

INGRESS PROTECTION

3D Scanner	Waterproof and corrosion-resistant for permanent outdoor use including wash down
Rugged Tablet PC	MIL-SPEC-810G, IP65

WEIGHT & DIMENSIONS

Scanner Module	W 30 x D 35 x H 40 cm, 7.0 kg
Rugged Tablet PC	W 31 x D 2.5 x H 20 cm, 1.3 kg
Dashboard Dock Mount	W 32 x D 7.0 x H 26 cm, 2.0 kg

WE BRING THE SKILLS

Murray Engineering is a world class service provider to the mining industry, and is headquartered at our modern, purpose-built 55,000m2 facility in Western Australia, with branches in Kalgoorlie, Newcastle, Roxby Downs and Mongolia.

Founded in 2007, the company has grown to a +$120 million per annum revenue.

Murray Engineering prides itself on providing world class service, reflected in its growing list of clients, which includes leading companies from a range of industries throughout the world.

With seven divisions and hundreds of services, we've got you covered.

ACCREDITATIONS

Safety
Accreditation to ISO 45001

Quality Management Systems
Accreditation to ISO 9001

Environment
Accreditation to ISO 14001

Certifications
Steelwork Compliance Australia Certification, ECL008637, AU31857, AU45191, MRB10056

Training Facilities
Training Centre with Registered Training Organisation (RTO) Accreditation.

ELECTRICAL | MECHANICAL | FABRICATION | PUMPING

AUTOMATION & CONTROL SYSTEMS | PRODUCT & EQUIPMENT HIRE/SALES | LABOUR HIRE

MURRAY
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SEVEN DIVISIONS, HUNDREDS OF SERVICES-
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