Case Study: Sentinel Rapid-Response Monitoring System by Great Southern Land Group Leveraging RIEGL Technology for timely and accurate pit wall monitoring

GSL Machine Robotics, a division of Great Southern Land Group, has successfully developed and deployed the Sentinel - a fully integrated, high-mobility, trailer-mounted RIEGL LiDAR monitoring system for applications in dynamic environments such as open-pit mining.

Project Overview

The Sentinel system was developed after GSL Mine Survey identified a key gap between high-end monitoring hardware capabilities and the logistical constraints of deploying these systems in active mining environments. GSL Machine Robotics, working with RIEGL Australia, developed this solution built around the RIEGL Monitoring App and VZ-1000 scanner, enhanced by the RIEGL 'CB-23' communication box and 'UB-23' upgrade component. This configuration maximizes the VZ-1000's capabilities through the UB-23's advanced processing and connectivity features.

Key Innovations

Rapid-Response Monitoring: Optimized for fast deployment, the Sentinel can be fully operational within minutes of arriving on site. Automated SMS and email alerts notify key personnel instantly in the event of movement or structural change detection.

Highly Mobile & Flexible: The unit's modular design and towable configuration make it ideal for fast repositioning across complex or evolving sites. It brings monitoring capabilities precisely where they are needed, when they are needed - addressing real-world deployment challenges.

Trailer-Mounted Vibration-Proof Platform: Designed in-house by GSL Machine Robotics, the ruggedized trailer platform minimizes external vibrations, ensuring consistent data quality even in harsh operating environments.

Solar Power & Starlink Integration: The Sentinel operates completely off-grid, powered by solar energy and connected via Starlink for real-time data transfer and remote management—anywhere, anytime.

Benefits & Impact

Fully Remote Operation: From setup to data transmission and alerting, the Sentinel is designed for remote configuration and control of RIEGL hardware—reducing the need for onsite technical support.

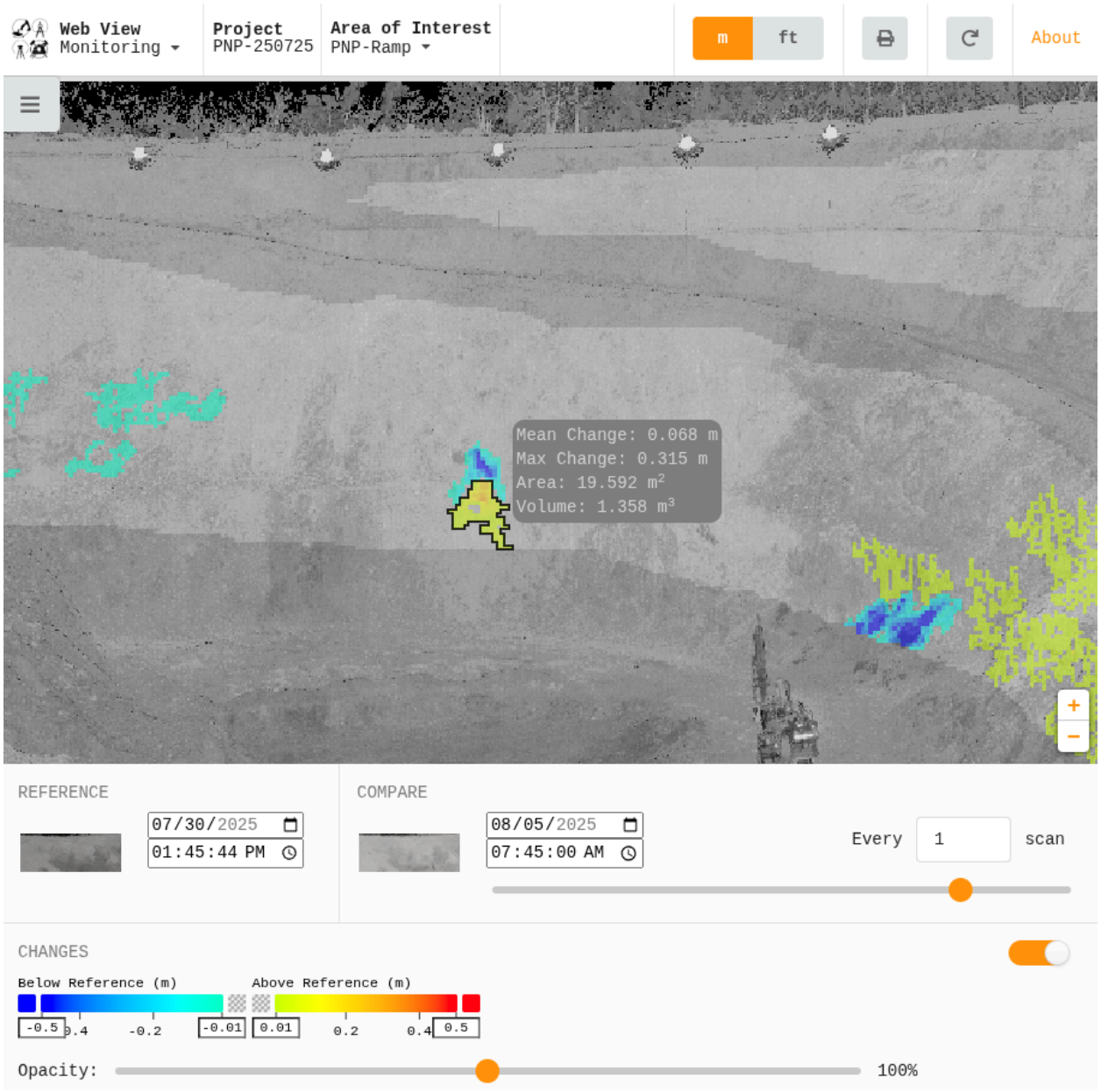
Cloud-to-Cloud Registration: The RIEGL Monitoring+ app's cloud-to-cloud registration technology enables the Sentinel to operate flexibly in real mining conditions. Whether following work crews to new areas, returning to previous monitoring locations, or maintaining accuracy despite ground movement at the scanner position itself, the system's scan-to-scan fitting capability ensures continuous monitoring without project resets. This technology addresses both mobility needs and the reality that scanner-side ground movement often accompanies high wall instability.

Enhanced System Capabilities: By incorporating the CB-23/UB-23 components, the Sentinel combines proven RIEGL scanning technology with modern communication and processing capabilities, delivering comprehensive monitoring functionality for today's mining operations.

Critical Area Monitoring with Minimal Downtime: Ideal for high-risk areas, particularly within active mining pits, this solution delivers rapid situational awareness and supports safety-critical decision-making processes. Available through flexible hire arrangements, the system makes advanced monitoring accessible to operations of all sizes.

Conclusion:

Great Southern Land Group's innovative use of RIEGL scanning technology, combined with custom engineering and modern communication systems, demonstrates a practical approach to geospatial monitoring. Developed through collaboration between GSL Mine Survey, GSL Machine Robotics, and RIEGL Australia, the Sentinel sets a new standard for remote surveying and site surveillance in challenging environments, effectively addressing the need for deployable and accessible monitoring technology in mining operations.


Web View
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Volume: 1.358 m³
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Every
1
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CHANGES
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Sentinel