



OUR SLOPE MONITORING **SOLUTIONS**

MAKING
MINING
SAFER

decision confidence™



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HIGH VALUE INFORMATION TO MANAGE RISK

**GROUNDPROBE'S
MISSION IS TO
PROVIDE HIGH VALUE
INFORMATION TO
ENABLE OUR CLIENTS
TO MANAGE RISK**

Having developed the world's first slope stability radar technology, GroundProbe is the number one provider of slope stability solutions, using radar.

With our Slope Stability Radar (SSR™) and our Work Area Monitor (WAM™) we measure the movement of slopes in open pit

mines, and provide early warning for the safe evacuation of people and equipment in case of a wall collapse.

Our technology detects the amount, shape and degree of the wall movement, and indicates where movement occurs.

With this information, a decision can be made to safely evacuate people and equipment.

CONFIDENCE IN PLANNING MINE OPERATIONS

**ANALYSIS OF THE
DATA PRODUCED BY
OUR RADARS CAN BE
USED TO FURTHER
UNDERSTAND A
MINE'S CONDITION**

Geotechnical Engineers or Mine Engineers use the data to perform predictive analysis and plan more productive and profitable operations.

Interpreting our data makes it possible to manage high risk areas and increase the life of the mine.

DELIVERING THE ULTIMATE SLOPE MONITORING SOLUTION



DESIGNED TO PROVIDE REAL TIME MONITORING, THE SSR™ AND WAM™ HAVE DISTINCT, BUT HIGHLY COMPLEMENTARY APPLICATIONS

The SSR™ operates as a broad area, real time monitoring system continuously collecting data over time. It provides Geotechnical Engineers with high precision data, sophisticated trending information and advanced alarming capabilities.

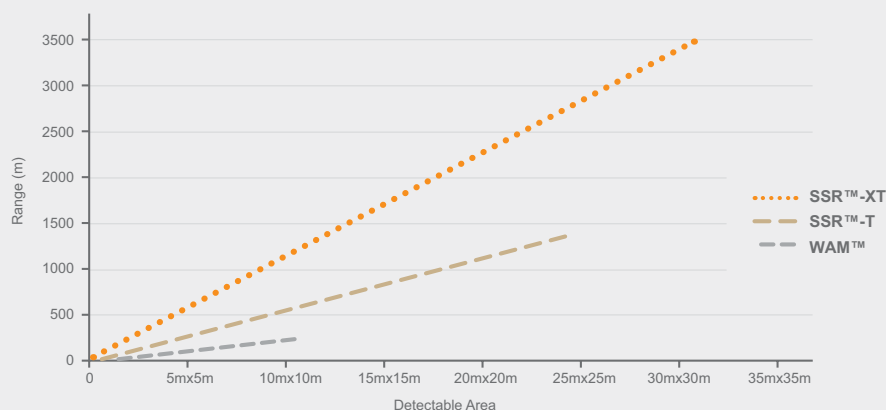
The WAM™ operates as a real time monitoring system in work areas. It is designed to warn work crews of wall movement using visual and audible alerts.

The WAM™ can be easily deployed by work crews. Its range and slope coverage make it ideal for applications close to the wall. The resolution and range of the SSR™ make it suitable for deployment further from the wall.

For the ultimate solution in slope stability monitoring, our clients use a combination of SSR™ and WAM™ systems.

APPLICATION

	WAM™	SSR™-T (0.9m dish)	SSR™-XT (1.8m dish)
Application	Scans work area slopes from close proximity, while looking up from the pit floor	Scans mine slopes from a distance, while looking down and across at the opposite side of the pit	
Angle of view	Azimuth: 110° Elevation: 48°	Azimuth: 270° Elevation: 122°	Azimuth: 270° Elevation: 122°
Operating range	30m to 300m	30m to 1,400m	30m to 3,500m
Detectable area	At 200m detects a 7m x 7m failure	At 1,000m detects a 17m x 17m failure	At 1,000m detects a 9m x 9m failure
Slope coverage	Work area	Pit coverage	Pit coverage



WAM™



SSR™-T



SSR™-XT

SLOPE STABILITY RADAR (SSR™)

WITH THE DEVELOPMENT OF THE SLOPE STABILITY RADAR (SSR™) IN 2001, GROUNDPROBE REVOLUTIONISED SAFETY IN MINING

It was the first time that radar was used to monitor and warn of ground movement in open pit mines.

Today, radar is widely accepted as best practice technology for real-time warning of wall failures.



CRUCIAL ROLE IN SLOPE STABILITY MONITORING

WITH THE ABILITY TO SCAN LARGE AREAS IN MINUTES, AND WITH A HIGH DEGREE OF PRECISION IN DETECTING MOVEMENT, THE SSR™ PLAYS A CRUCIAL ROLE IN SLOPE STABILITY MONITORING:

- Developed to remotely track the movement of slopes in open pit mines
- With no personal risk to operators, alarms warn of accelerating slope movement prior to wall failure
- Allows mines to increase production in high risk areas
- Improves mine planning and design

ADVANCED ANALYSIS CAPABILITIES



THE SSRVIEWER SUITE™ OFFERS ADVANCED ANALYSIS CAPABILITIES TO ASSIST MINES IN DEVELOPING LONGER TERM UNDERSTANDING OF MINE CONDITIONS:

- Advanced analysis tools allow for long term trending and hazard identification
- Reporting tools allow easy data collation, presentation, and export to standard mine software for further analysis and reporting
- Photographs of the scan area allow user-friendly identification and interpretation of slope movements
- Wall Continuation Wizard™ allows the restart of a wall folder if the system has to be temporarily moved for blasting or servicing

OPERATIONAL IN EVERY IMAGINABLE MINING TERRAIN & CONDITION

WE HAVE DEPLOYED SSR™ SYSTEMS IN OVER 20 COUNTRIES AND IN HUNDREDS OF MINES AROUND THE WORLD. OUR EXPERIENCE COVERS:

- Inhospitable environments, including altitudes of 5,000m above sea level
- Extremes in weather, including temperatures from -40°C to +55°C
- The harsh results of intense sun, rain, wind, snow and humidity
- Every imaginable mining terrain across all commodity groups



SSR™ AT A GLANCE



OPERATIONAL SPECIFICATIONS:

Angle of view:

Azimuth: 270°

Elevation: 122°

Communications:

Integrated wireless link
or connect to mine network

Operating range:

SSR™-T (0.9m dish) 30m to 1,400m

SSR™-XT (1.8m dish) 30m to 3,500m

Power supply:

In-built 12 Volt DC generator
/ batteries or connect to mine power
(100-250 Volts AC at 50-60 Hz)

Detectable area:

SSR™-T (0.9m dish)

- At 30m detects a 0.5m x 0.5m failure
- At 1,400m detects a 24.4m x 24.4m failure

SSR™-XT (1.8m dish)

- At 30m detects a 0.3m x 0.3m failure
- At 3,500m detects a 30.5m x 30.5m failure



ENVIRONMENTAL:

Altitude: 0 to 5,000m

Humidity: 5% to 99%

Rainfall: 0 to 100 mm/h

Temperature:

Standard kit: -25°C to +60°C

Extreme kit: -40°C to +60°C

Wind gust:

SSR™-T (0.9m dish) up to 120 km/h

SSR™-XT (1.8m dish) up to 88 km/h

Wind speed:

SSR™-T (0.9m dish) up to 190 km/h

SSR™-XT (1.8m dish) up to 160 km/h



THE SSR™ SCANS
MINE SLOPES FROM
A DISTANCE, WHILE
LOOKING DOWN
AND ACROSS AT
THE OPPOSITE SIDE
OF THE PIT

WORK AREA MONITOR (WAM™)

WITH A FOCUS ON PROTECTING WORK CREWS AND EQUIPMENT IN WORK AREAS, GROUNDPROBE DESIGNED THE WORK AREA MONITOR (WAM™)

Built onto a mine vehicle to allow easy driving access to work areas, the WAM™ is quick to set up and easy to use. When wall movement is detected, the WAM™ transmits visual alarms and audible warnings to each crew member via their Personal Alerting (PAL) devices.



IDEAL FOR USE BY PRODUCTION AND DRILL AND BLAST CREWS

WITH THE ABILITY TO DETERMINE WHEN A WORK AREA IS SAFE FROM POTENTIAL BENCH OR SLOPE FAILURES, THE WAM™ IS IDEAL FOR USE BY PRODUCTION AND DRILL AND BLAST CREWS

- Developed to monitor work areas
- Used to warn personnel of wall movement
- Designed to be highly mobile and operational in minutes
- All crew members alerted with lights and personal alerts
- Reduces post-blasting production delays

“

Every mine in the world should think really seriously about having one of these.

”

John Simmons
Sherwood Geotechnical
and Research Services



ADVANCED ANALYSIS CAPABILITIES



THE WAMONITOR™ SOFTWARE ALLOWS WORK CREWS TO CONFIGURE, ANALYSE AND INTERPRET SLOPE MOVEMENT DATA FROM WITHIN THE WAM™ VEHICLE

The WAM Analysis Pack™ is available as an additional suite of tools for Geotechnical Engineers or Geologists to remotely analyse slope movement data and alarm events.

Combined, the advanced analysis capabilities of the WAM™:

- Allows remote access to view and assess slope movement and set alarm parameters
- Helps users to create custom reports documenting analysis and slope movement behaviour

WAM™ AT A GLANCE



OPERATIONAL SPECIFICATIONS:

Angle of view:

Azimuth: 110°

Elevation: 48°

Communications:

Standalone system or integrated wireless link or connect to mine network*

Operating range:

30m to 300m

* With WAM Analysis Pack software

Power supply:

In-built 12 Volt DC vehicle alternator / batteries or connect to mine power (100-250 Volts AC at 50-60 Hz)

Detectable area:

At 30m detects a
0.9m x 0.9m failure

At 300m detects a
10.5m x 10.5m failure



ENVIRONMENTAL:

Altitude: 0 to 5,000m

Humidity: 5% to 99%

Rainfall: 0 to 100 mm/h

Temperature: -20°C to +60°C

Wind speed: Up to 75 km/h



THE WAM™ SCANS
WORK AREA SLOPES
FROM CLOSE
PROXIMITY, WHILE
LOOKING UP FROM
THE PIT FLOOR





GEOTECHNICAL SUPPORT SERVICES

**FROM INTERIM
SUPPORT TO A
FULLY OUTSOURCED
SOLUTION, OUR
GEOTECHNICAL
SUPPORT SERVICES
DELIVER TAILORED
ASSISTANCE TO
OUR CLIENTS**

Our Geotechnical Engineers travel extensively, visiting client sites where our products are deployed. On request, they train site personnel; remotely monitor the output of working radars; interpret data and produce regular reports.

Our Geotechnical Engineers have an extensive understanding of mine conditions and requirements. They use this to continually refine the use of radar for advanced slope monitoring.

Through their expertise, we design and provide tailored slope monitoring solutions on any scale.

GLOBAL BEST PRACTICE

- Outsourced service solution which can include equipment, geotechnical analysis, reporting, technical specialists, or any combination
- Available for short or long-term assignments
- Advanced geotechnical training and support packages tailored to individual needs
- Remote geotechnical reporting for around-the-clock monitoring and daily reports
- Expert advice and support to help with the management of mine walls using radar

GLOBAL VISION, DEDICATED SUPPORT



**FROM THE PRODUCTS
WE DEVELOP TO THE
SLOPE MONITORING
SOLUTIONS WE
TAILOR, OUR
VISION IS MAKING
MINING SAFER**

What differentiates us is our commitment to provide our clients with dedicated training and support.

Our offices in Balikpapan, Belo Horizonte, Brisbane, Johannesburg, Perth, Santiago and Tucson are staffed by local people.

They carry a stock of spare parts for quick service and maintenance; and a fleet of lease radars ready for deployment to meet any need.

Our Technical Specialists are trained and certified to our global standards. They are available to provide on-site training and

support in local language with a local's knowledge of our clients' environment and conditions. Our Technical Specialists operate as an integral part of our customers' mine sites.



COMMITTED INDUSTRY PARTNER

**WE ARE MEMBERS
OF THE GLOBAL
MINING INDUSTRY.
WE FOSTER CLOSE
RELATIONSHIPS
WITH THE MINING
COMMUNITY IN AN
EFFORT TO BETTER
UNDERSTAND OUR
CLIENTS' NEEDS**

We combine industry feedback with the technical know-how of our engineers and product specialists and the experience of our in-house geotechnical engineers – all dedicated to finding the most innovative solutions to improve the safety, productivity and profitability of our clients' mines.

We are uniquely equipped to design and provide tailored slope monitoring solutions on any scale. We are a comprehensive provider of slope stability solutions using radar.



SHARE AND LEARN

THROUGH AN ACTIVE USER COMMUNITY

With membership to GroundProbe's user community, our clients can attend local and international user conferences where Geotechnical Engineers and Mine managers share their knowledge through case studies and personal observations.

By actively encouraging the participation of our clients from every major mining operation, we create strong discussion forums for sharing and learning of best practices.



ABOUT GROUNDPROBE

**SINCE 2001, GROUNDPROBE HAS BEEN
REDEFINING SAFETY AND PRODUCTIVITY
IN MINING**

Through an unwavering commitment to safety, dedicated industry focus and pioneering technology, GroundProbe developed the world's first Slope Stability Radar; a system to monitor and warn of ground movement in open pit mines. Today, GroundProbe provides high value information to help customers to better manage risk. With a range of slope monitoring solutions built on the successful detection of over five hundred wall failures, GroundProbe's products, services and people enable customers to make confident decisions about mine safety and ongoing production.

GroundProbe operates in over 20 countries, serving all major mining companies through local offices across Australia, the Americas, Africa and Asia. More information about GroundProbe can be found at www.groundprobe.com.



+ MAKING MINING SAFER

FROM THE PRODUCTS WE DEVELOP
TO THE SLOPE MONITORING SOLUTIONS WE TAILOR,
OUR VISION IS MAKING MINING SAFER

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