

GroundProbe®

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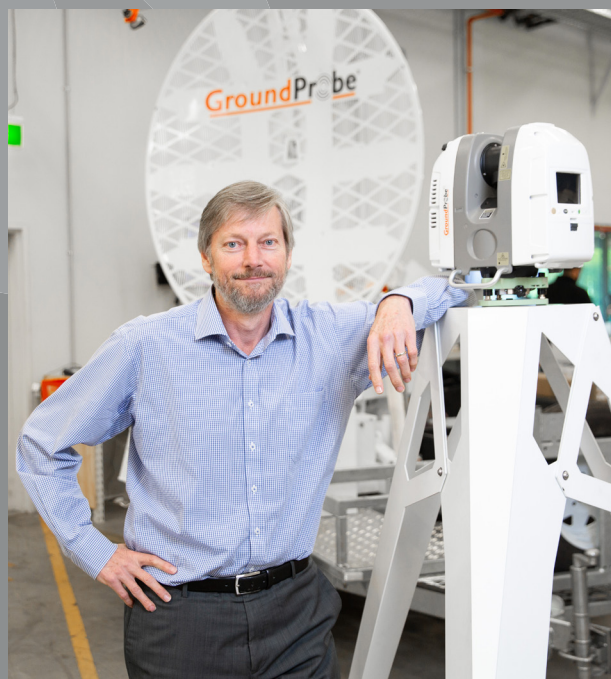
GROUND-BREAKING NEWS

THE LATEST IN
RADAR TECHNOLOGY,
SSR-OMNI



groundprobe.com

decision confidence™



Since GroundProbe launched in 2001 and the very first Slope Stability Radar (SSR) rolled off the production line, we have experienced first-hand the various challenges presented by different mine sites around the world.

At GroundProbe, we don't believe that a single solution can meet the needs of every mine. Each mine site is unique, existing in some of the most remote, challenging and varied environments in the world.

We've worked with the global mining industry over the last 17 years to understand these environments and their unique challenges, ensuring we tailor our product development to our learnings and experiences. We've committed ourselves to developing a comprehensive suite of products; one that ensures a solution for each mine site and their specific needs.

We constantly strive to redefine and advance our Slope Stability Radar suite, ensuring we remain at the forefront of innovation and in-tune with customer needs, yet always relying on the same proven mechanical engineering know-how that we've perfected over our history.

As a result, GroundProbe is proud to announce the latest addition to our industry-leading Slope Stability Radar suite, the SSR-Omni.

Equipped with a host of innovative features and functionality, the system is the new market leader for full-coverage, high-resolution, real-time monitoring.

John Beevers

Chief Executive Officer



A Premium Addition to Our Slope Stability Radar Suite

PRODUCT NEWS

GroundProbe is proud to announce our most advanced monitoring solution to date, the SSR-Omni.

GroundProbe is the world-leader in real-time, sub-millimetre deformation monitoring. We understand when movement becomes a problem, and predict and warn when a collapse is likely to occur. The SSR-Omni is the latest, premium addition to our technology suite.

The system is a full-coverage, high-resolution monitoring solution that delivers beautiful data. More than just a radar, it merges the best of radar technology with superior-resolution imaging, GNSS and a weather station to deliver a premium, fit-for-purpose monitoring solution.

It combines the best features of Real Aperture Radar (RAR) and Synthetic Aperture Radar (SAR). The SSR-Omni is RAR technology that delivers unique, real aperture measurements that you can trust, that have never missed a collapse. With RAR technology, every measurement is unique and less susceptible to contamination, but akin to SAR technology, it also delivers millions of pixels in an ultra-fast, all-encompassing scan.

The result is a high-confidence, real-time monitoring and alarming system for even the most complex geotechnical and operational environments. The SSR-Omni is fully compatible with SSR-Viewer, our renowned analysis and alarming software, common across all of our monitoring systems.

High-Resolution, Precise and Manageable Data

INNOVATION

The SSR-Omni produces beautiful, usable data with the highest resolution and sharpest definition for world-class monitoring and analysis.

THE HIGHEST RESOLUTION WITH THE SHARPEST DEFINITION

The SSR-Omni is the highest resolution rotational radar in the market, robustly segmenting the wall surface into reliable, independent pixels for evaluation and alarming.

Its fine spatial footprint, defined by its 2.74m aperture baseline, allows its users to easily and confidently locate and distinguish true areas of movement.

With a fine pixel footprint also comes the ability to see smaller movement earlier. Crucial in safety-critical situations, early detection means a faster response.

The SSR-Omni is not only high resolution, but also high definition. It comes equipped with the sharpest of definition modes, selectable between 0.08°, 0.24° and 0.33° pixels, each at 0.1 millimetre accuracy.

HIGH RESOLUTION WITHOUT THE EXCESSIVE DATA SIZE

For GroundProbe systems, high resolution doesn't mean excessive data. Despite its ultra-high resolution qualities and sharp definition, we manage the data better to ensure it is clean and usable for the end user.

GroundProbe's renowned, intelligent processing algorithms reduce the size of the raw data by 96.5%, maintaining the smallest possible file size. With only 9 megabytes of data per full-coverage 360° scan at 0.24° pixels, the in-built processing and raw data size reduction allows users to critically monitor ongoing risks even over a slow or congested Wi-Fi link.

DELIVERS DATA FASTER

The SSR-Omni doesn't just produce clean, usable data, it delivers it fast. It sweeps 360° in just 40 seconds to acquire the raw data in one data set, with no stitching required. But data acquisition is just the beginning; it is its hyper-efficient in-built processing that ensures it delivers data faster. We process the data at the radar in real time, resulting in an end-to-end scan time of just two minutes for a full-coverage 360° scan.

GroundProbe's scan time includes data acquisition, data processing and transfer, and alarming, meaning clean, fully-processed data is immediately available for analysis and action at the end of every two minute scan. There are no additional latencies or delays in the transfer of the data to the Primary Monitoring Point.

The SSR-Omni's rapid 40 second acquisition speed also helps the system to more effectively manage changes in the atmosphere.



Mechanically Robust and a History of Reliability

PRODUCT NEWS

The SSR-Omni is built on GroundProbe's latest SSR platform, backed by a long history of reliability, uptime and proven mechanical engineering.

We've had over 17 years of experience in building the most durable SSRs in the world. Like all our systems, the SSR-Omni has been built and tested to reliably operate

across a myriad of inhospitable environments, including intense sun, rain, wind, snow and humidity.

With a global uptime of over 99.8% across our entire fleet, GroundProbe has the most reliable and robust radars. On-board the SSR-Omni is the most reliable hybrid diesel generator system in the radar industry. It's built tough, runs independent of weather and meets all current emission standards, globally.



Long Range, Extensive Coverage

PRODUCT NEWS

The SSR-Omni boasts all-encompassing coverage, scanning a full 360° to a range of up to 5.6 kilometres.

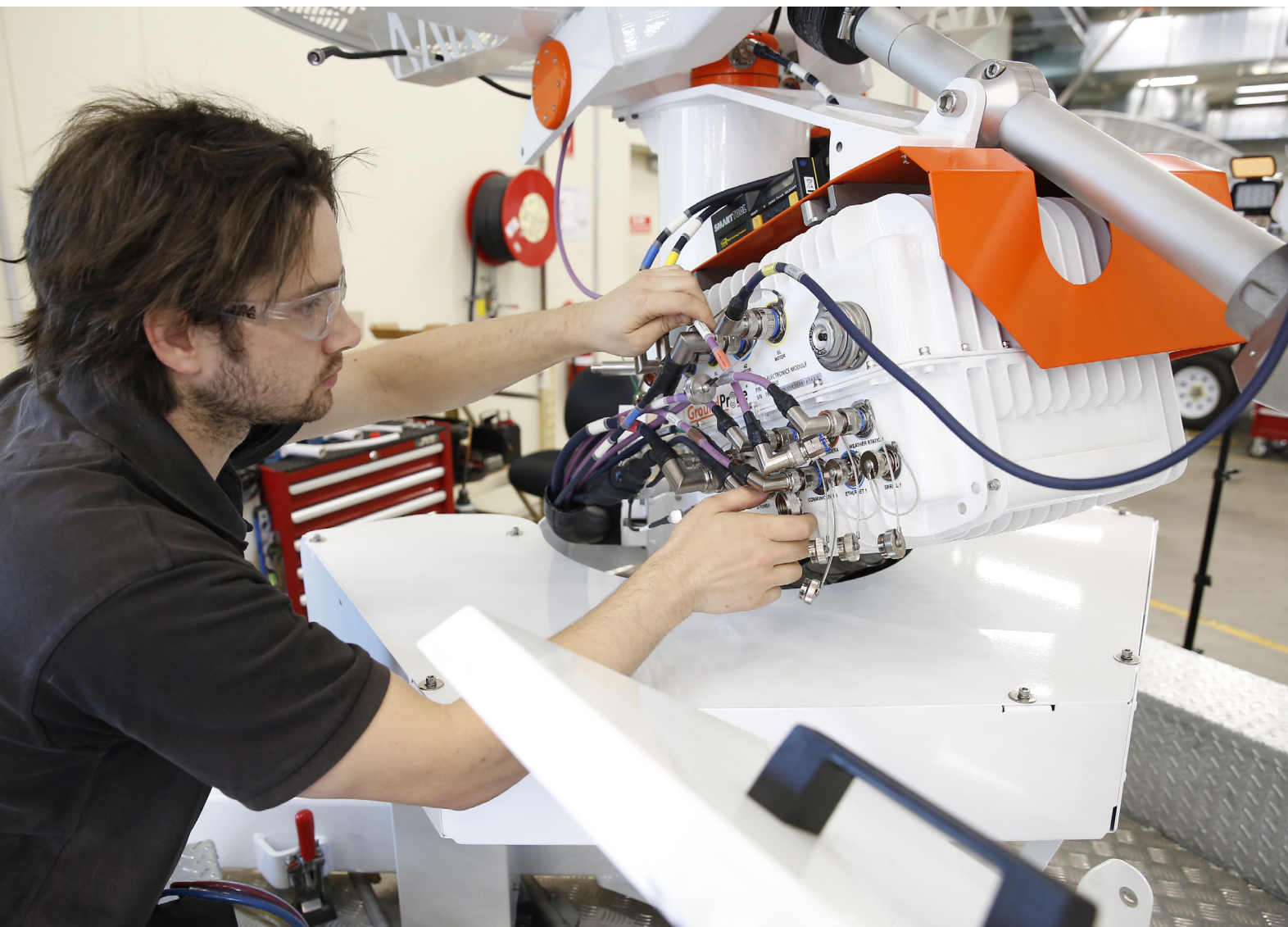
FULL-COVERAGE 360° SCANS

With a 360° scan area, the SSR-Omni is GroundProbe's full-coverage monitoring solution. By scanning a complete revolution around itself, the system provides the broadest monitoring possible. Completing a 360° acquisition every 40 seconds, new risks or deformation hotspots are discovered quickly so that users can act on them fast.

The scan area is entirely customisable to suit the needs of any mine, allowing for flexibility in deployment locations and scan times.

LONGEST RANGE

Scanning out to 5.6 kilometres with 11.2 kilometres of coverage in-pit, the SSR-Omni's long range and 360° scan area easily meets the needs of the world's biggest mines. Even at its longest range of 5.6km, the system maintains the highest resolution qualities with a sub-bench pixel size, ensuring precise, usable data.



Industry-First Imaging System with Superior Resolution

PRODUCT NEWS

The SSR-Omni is equipped with a high-resolution, panoramic imaging system unlike any the industry has seen before.

40MP PANORAMIC CAMERA WITH DAY/NIGHT CAPABILITIES

The SSR-Omni's on-board imaging system is 40 megapixels in resolution, captures a 180° panoramic view in one take and features 21 levels of zoom.

With its panoramic capabilities, the system can capture the whole 360° scene quickly for ease of deployment and instantly updated photos on demand.

High sensitivity lenses, together with its true IR Cut night vision and innovative pixel binning, allow the camera to perform strongly in low-light scenes.

The SSR-Omni's camera is also impact and weather resistant. With an IP66 rating, the system is protected from the harsh mining environment.

Heaters and blowers within the camera ensure condensation and extreme enviros are managed, allowing for crisp imaging in temperatures ranging from -40° to +55° and across all humidity conditions.



REMOTE INSPECTION WITH DUAL-FEED, LIVE VIDEO

STREAMING

Through the SSR-Omni's on-board 40MP imaging system, users can conduct remote, real-time inspections, 180 degrees at a time.

It features dual-feed, live video streaming and forensic zooming capabilities, with both the complete 180° panoramic video view and the zoomed area of interest shown simultaneously on the one screen.

Users control the SSR-Omni's camera remotely through the SSR-Viewer software, allowing them to inspect areas of concern without having to enter the pit.

Remaining at their desk, users can zoom in live in real time or after an event with historical video and image playback, to inspect and analyse areas of interest before, during and after a collapse.



Ultra-Precise Positioning, In-Built Tilt Sensing and Auto-Georeferencing

PRODUCT NEWS

Equipped with an all-in-one GNSS, gyro sensor, magnetometer and tilt-metre, ultra-precise information about the radar's geospatial positioning is provided.

CENTIMETRE-LEVEL PRECISION AND AUTO-GEOREFERENCING

The SSR-Omni is equipped with an all-in-one GNSS with state-of-the-art algorithms built in, giving its users information about their radar's location, alignment and tilt with centimetre-level precision for automatic georeferencing of data.

17 years of data collection and analysis with the largest database of wall folders in the industry tells us that approximately a third of all radars deployed are placed on slopes that are moving.

The advanced positioning instrument allows the system to detect when it is deployed on a moving slope, distinguishing the movement from that of the wall being monitored, ensuring the highest data accuracy.

With geospatial positioning technology built-in, the radar's location is also automatically georeferenced in SSR-Viewer.



SSR-Omni and SSR-Viewer 9

PRODUCT NEWS

Like all our slope stability monitoring hardware, SSR-Omni is fully compatible with SSR-Viewer, GroundProbe's patented, market-leading analysis software.

SSR-Omni users have full access to all the features that our SSR customers have become accustomed to – such as its powerful data visualisation, charting and analysis tools - but with some added bonus features.

NEW INDUSTRY-DISRUPTING ATMOSPHERIC ALGORITHM

With the launch of the SSR-Omni, GroundProbe is proud to introduce our new patent-pending atmospheric algorithm. It's a new way of thinking that our data scientists have been working on for three years.

We've drawn on our long history of data capture and processing experience, as well as the biggest database of wall folders in the world, to develop and refine our latest algorithm. A radical departure from current atmospheric correction methods, the new algorithm manages atmospherics better than ever before to deliver the cleanest data possible for users.

3D PIXEL SELECTION IN THE STUNNING DTM VISUALISATION

GroundProbe's 3D pixel selection tool allows for full analysis and charting capabilities in our 3-dimensional visualisation. The deformation heatmap of data is overlaid on the 3D model of the scene, and users have the ability to select individual or groups of pixels for analysis.

All of GroundProbe's powerful charting tools within SSR-Viewer – including deformation, coherence and velocity analysis – are displayed on the one screen beside the 3D-visualised data and model of the scene for full analysis capabilities.

DATA AND IMAGE CO-REGISTRATION, MARKET-LEADING

VISUALISATIONS

In SSR-Viewer, high-definition images are co-registered with the data generated by the SSR-Omni, a technique unique to GroundProbe. The data is visualised as a deformation heatmap and linked directly to the image, providing spatially co-located information of every point.

SSR-Omni users can choose between two of our renowned data visualisation methods for analysis – 3D DTM View or Plan View. By clicking on any part of the image, movement can be reviewed and assessed live.

BEST-IN-CLASS ANALYSIS TOOLS AND FULL ALARMING

Offering the rapid, precise analysis of data to detect trends, and the ability to send alerts for immediate action, the SSR-Omni has access to all of SSR-Viewer's powerful analysis and alarming tools.

The extensive charting library provides users with the ability to correlate data to identify trends, and forecast collapse using inverse velocity theory. The SSR-Omni's alarming capabilities are networked, stackable and accurate, and trigger on any device anywhere in the world, in real time.



From the products we develop, to the slope monitoring solutions we tailor, our vision is making mining safer.

MAKING MINING SAFER

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