

MSR^{IV} Esprit®

The Future of Slope Stability Monitoring



Designed to operate in highly volatile atmospheric conditions

MSR^{IV} Esprit® is the fastest scanning slope monitoring radar available on the market. This technology offers geotechnical engineers unmatched real-time 3D movement data of the entire scan region. MSR^{IV} Esprit® is the perfect solution for mining operations dealing with rapidly changing weather conditions and swift-moving slopes.

The MSR^{IV} Esprit® employs non-moving radar technology, scanning a fixed area encompassing 90° in Azimuth and 60° in Elevation. Instead of sweeping over individual points or slopes, the system captures the entire area instantaneously. Its scan speed of less than two seconds is the industry's fastest, producing the most accurate movement data possible. Decreasing the scan time also increases the total amount of deformation/movement that can be measured over a specific timeframe.

Mitigating atmospheric through scan time

A limitation in slope movement radars is the frequency they operate which can only measure a few millimeters between scans before going into phase ambiguity. With a scan speed of less than two seconds, fast-moving slopes are effortlessly detected and the phenomena of phase ambiguity is reduced. Smaller movement measurements are obtained much faster and with greater accuracy, resulting in the early detection of potential slope failures.

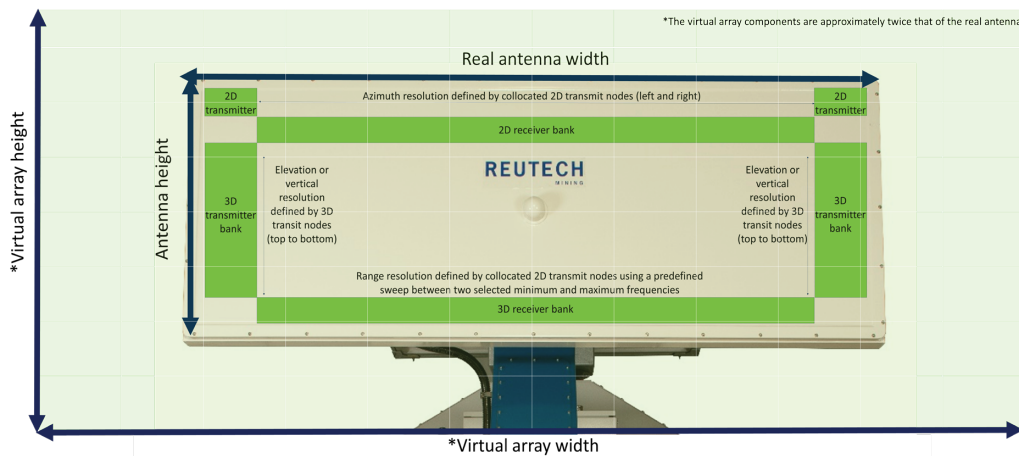
Software

The system is a staring array, meaning that the antenna is deployed in a stationary position. The resolution is highly refined with an operating range between 50 and 4 000 m. The system is fully georeferenced in order to allow for full 3D identification of alarming points.

The advantage of using a MIMO architecture is that there is continuous observation of an area by means of fast repetitive observation, as opposed to a periodic scanning of the area. This means that atmospheric change is measured at a near real time update rate, thereby enabling the effective mitigation of atmospheric interference.

MSR[™] ESPRIT is suitable for pit slope conditions where there are both highly brittle and fast moving instability, which may be complex in nature, in the form of differential movement rates across the unstable portion of the slope. Additionally, pit slopes that experience inclement weather conditions, such as temperature inversions and microclimates, will benefit from this technique of removing atmospheric-induced errors, resulting in a more accurate and precise true movement profile.

The use of a MIMO architecture enables continuous observation of an area, as opposed to periodic scanning. This enables atmospheric change to be measured at near real-time update rates, thereby enabling the effective mitigation of atmospheric interference.



Technical specifications

- Fixed scan envelope of up to 90° (Azimuth) by 60° (Elevation)
- Operating range: 50 - 4 000m (in 2 000m bins)
- Power supply:
 - Integrated generator
 - Integrated solar panels
 - External power supply inlet of:100-240V AC 50-60Hz
- Deployment in less than 30 minutes
- All-weather operation
 - Temperature: -30°C to + 55°C (-22°F to 131°F)
 - Wind: 120km/h (75mph)
- Complete remote operation through a wireless link (Wi-Fi, LTE, etc.)
- Highly customisable alarm settings