

## MR5000 MONITORING RADAR

## GENERAL

Spatial Resolution	Range $\leq 0.15$ m, Cross Range $\leq 5$ mrad @100 m, 0.15 m by 0.30 m @500 m, 0.15 m by 1.50 m
Accuracy	0.1mm
Operating Range	5km
Field of View	- Horizontal 360° - Vertical 40° (support $\pm 60^\circ$ adjustment, motorized optional)
Sampling Interval	$\leq 1$ min
Data Upload Interval	Adjustable from 1 min to 24 h
Frequency Band	Ku, 15.7~17.2 GHz

## COMMUNICATION

Interface	Integrated multi-function interface with power and Ethernet connection
Network Access	Supports external router

## ELECTRICAL

Power Supply	AC power / Solar power
Power Consumption	- Average power consumption: $\leq 45$ W - Low-power consumption: $\leq 15$ W (continuous monitoring mode)
Input Voltage	220 VAC

## PHYSICAL

Weight	$\leq 10$ kg (including radar unit, pan-tilt platform, and built-in processing unit)
Size	$\leq 550 \times 260 \times 350$ mm (L $\times$ W $\times$ H)
Housing Material	Engineering-grade plastic and CNCmachined aluminum alloy

## ENVIRONMENTAL

Operating Temperature	$-55^\circ\text{C}$ to $+65^\circ\text{C}$
Waterproof & Dustproof	IP66

## MONITORING PLATFORM

## RECOMMENDED SYSTEM

Operating system	Linux / Windows
Database	- Linux: QuestDB or TDengine - Windows: QuestDB
Processor	$\geq 4$ cores
RAM	$\geq 8$ GB
Storage	1 TB or higher
GPU	NVIDIA RTX 3060 or above
Web Service	NGINX

## DEPLOYMENT

Deployment Mode	Cloud / On-premise
Access Method	Supports both client-based software and web browser-based access
Software License	Registration required

## FUNCTIONALITY

AI-powered Early Warning Engine
Multi-Sensor Data Integration
Distributed Processing Architecture
Real-time Visualization & Analysis

## SUPPORTED LANGUAGES

English
Simplified Chinese
Russian

All specifications are subject to change without notice.

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## MR5000

## SLOPE STABILITY MONITORING RADAR SYSTEM

From Slope Data to Early Action  
360° Real-Time Intelligent Monitoring



**SingularXYZ**

## APPLICATIONS

MONITOR ANY SLOPE.  
PROTECT WHAT MATTERS.

MR5000 is designed for a wide range of slope stability monitoring applications, delivering continuous, precise, and reliable data in the most demanding environments



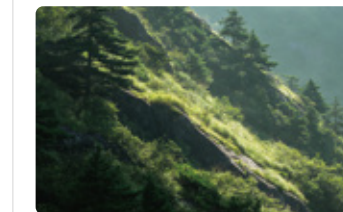
## Mining Slopes



For open-pit mines, quarries, and waste dumps, supporting safe operations and optimized excavation planning.



## Natural Slopes



For landslide-prone and unstable terrain, providing real-time monitoring and early warning to mitigate risks.



## Dams &amp; Embankments



For tailings dams and earth embankments, enabling long-term stability monitoring and early risk detection.



## Engineered Slopes



For infrastructure such as highways, railways, and construction sites, ensuring slope stability and safe operation.

MR5000 is a compact slope monitoring radar system designed for rapid deployment in medium and long-range monitoring applications such as emergency response, geological hazards, and infrastructure slopes. It provides a practical and efficient solution for continuous slope stability monitoring in challenging environments.

Combining 360° full coverage, long-range detection up to 5 km, 0.1 mm high-precision deformation measurement, and an intelligent visualization monitoring software platform, it delivers reliable and continuous monitoring performance in all-weather conditions for effective slope stability assessment and risk management.

## 360° Full Coverage Monitoring

Enables continuous 360° scanning with no blind spots for comprehensive slope deformation detection.

## 0.1 mm Measurement Accuracy

Delivers 0.1 mm deformation measurement accuracy for precise slope stability monitoring and early risk detection.

## 5 km Extended Coverage

Supports 5km long-range slope monitoring with reliable performance, making it suitable for large monitoring projects.

## 24/7 All-Weather Robust Operation

Ensures stable performance in rain, fog, and complex environments, unaffected by vegetation movement or minor disturbances.



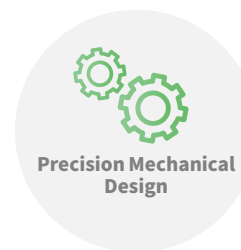
Radar Antenna Array

Mechanical Tilt Adjustment ( $\pm 30^\circ$ )

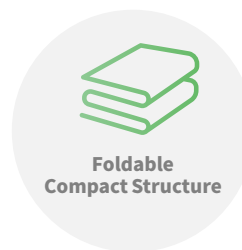
Articulated Foldable Structure

Cable Interface

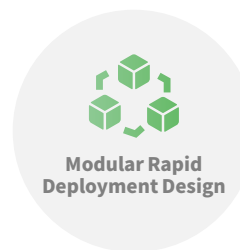
Pan-Tilt Base



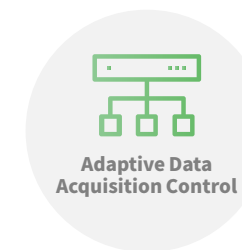
**Precision Mechanical Design**  
High-precision mechanical structure ensures stable radar rotation and consistent measurement accuracy.



**Foldable Compact Structure**  
Articulated foldable design ensures compact size for easy transport, storage, and rapid field deployment.



**Modular Rapid Deployment Design**  
Supports flexible configuration and quick setup, improving maintenance efficiency and field adaptability.



**Adaptive Data Acquisition Control**  
Dynamically adjusts data collection and transmission frequency to balance monitoring accuracy and communication efficiency.

## MONITORING PLATFORM



### High-Precision Deformation Algorithm

Advanced algorithms enhance measurement accuracy and sensitivity to subtle slope movement.



### Real-Time Visualization

Provides 3D visualization with deformation, velocity, and backscatter layers for multi-angle slope analysis.



### Distributed Processing Platform

A distributed platform enabling parallel radar data processing with integrated solving and visualization for efficient and stable operation.



### AI Intelligent Early Warning Engine

AI models analyze deformation patterns and automatically generate alerts for abnormal slope behavior, enabling proactive risk response.



### Multi-Source Data Fusion Hub

Integrates radar, visual, and other sensor data into a unified platform, breaking data silos and enabling consistent monitoring across different scenarios.



### Time-Series Data Management Engine

Built on a time-series database for efficient storage and fast retrieval of monitoring data, enabling real-time analysis and deformation tracking.



### Web-Based Remote Monitoring Access

Provides secure web access to monitoring data and dashboards, enabling remote supervision and cross-platform operation.



### System Security & Stability Architecture

Ensures reliable operation with data encryption, access control, and stable backend architecture for critical monitoring environments.