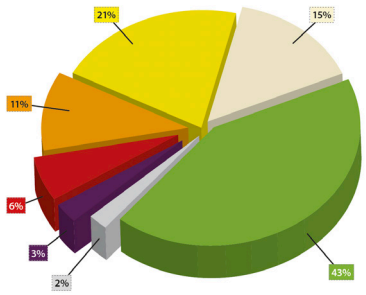
ENABLING PRECISION IN SCIENTIFIC EXPLORATION & ENVIRONMENTAL RESEARCH

Empowering Field Research and Remote Sensing for Critical Insights

The REN Series by Unitronix delivers rugged, flexible edge computing solutions designed to excel in demanding field conditions, making it an ideal choice for scientific and environmental exploration in diverse, challenging environments. From investigating climate change impacts and tracking wildlife populations to studying isolated ecosystems or assessing water quality in remote regions, the REN Series enables reliable, real-time data processing at the edge. Its robust and customisable architecture serves as a versatile "project box," empowering researchers to create tailored solutions for the unique challenges of their scientific endeavours.

Realising New Frontiers in Data Collection

In scientific and environmental research, the ability to collect and process data efficiently is vital. The REN Series supports high-throughput data processing and on-site storage, minimising delays often encountered when transmitting data to centralised facilities. With compatibility for advanced sensor arrays, REN allows researchers to deploy in remote or extreme locations, where immediate analysis can inform critical decisions—whether tracking migratory patterns, identifying rapid shifts in air or soil quality, or monitoring the health of flora and fauna in response to climate stressors.



Example Use Cases Include:

- **Wildlife and Ecosystem Monitoring:** With the potential to integrate various sensor types—such as thermal imaging, lidar, acoustic and motion sensors—the REN Series could support wildlife biologists and ecologists in monitoring biodiversity, animal migration and habitat use in remote locations. By processing data in real-time, REN might enable adaptive responses to emerging ecosystem shifts and provide a platform for supporting conservation actions.
- **Marine and Freshwater Research:** For field stations focused on monitoring water ecosystems, the REN Series might offer the computational capacity needed to process water quality metrics such as pH, salinity, and pollutant levels. This capability could assist researchers in assessing ecosystem health. While REN's seals and O-rings have been rigorously tested for water ingress resistance, underwater deployment is not recommended. Instead, REN could serve as a processing hub for data collected from shore-based stations or marine vessels used in conservation efforts.
- **Remote Climate Stations and Environmental Observatories:** In remote or extreme climates—arid deserts, mountainous terrains, or dense rainforests—the REN Series might facilitate the collection and analysis of real-time climate data. By tracking parameters such as carbon levels, atmospheric changes, and other environmental indicators, REN could support researchers in operating within harsh conditions without compromising equipment performance.

High Flexibility with Custom Configurations

The REN Series is highly adaptable to a range of project-specific configurations. Engineers and researchers have options to integrate VPX cards and modules, as well as VersaLogic's high-performance Embedded Processing Units (EPUs) and Embedded Sensor Units (ESUs) for applications requiring high data throughput, edge processing, and low-latency responses.

Key Capabilities Include:

- **Edge Processing and AI Integration:** The REN Series can be outfitted with edge AI capabilities, enabling it to perform initial analyses directly at the collection site. This is beneficial for research scenarios where raw data volumes are high and immediate filtering or anomaly detection is essential.
- **Customisable I/O and Storage Options:** With versatile expansion options, REN allows scientists to configure the system according to their connectivity and data storage needs, whether for high-capacity data logging, real-time processing, or remote transmission.
- **Rugged, Field-Tested Design:** Built for the elements, the REN's ruggedised construction, shock-resistant frame, and tamper-proof hardware secure it against extreme weather and demanding terrains, making it a trusted platform for research in remote areas.

Power and Connectivity for Extended Field Use

The REN Series might be engineered to support power-efficient operation, which could be vital for projects in isolated areas without reliable power sources. It might connect to portable power supplies, solar panels and microgrid setups, maintaining essential data processing and communication functions even in low-power environments. Additionally, the REN Series could operate over satellite and remote wireless networks to keep researchers connected, with data synchronisation and remote access options for off-site analysis.

Enabling New Discoveries, Supporting Environmental Stewardship

With its potential computing capabilities and resilient design, the REN Series might empower researchers to push the boundaries of field science. It could support scientists working on the front lines of environmental monitoring and conservation, providing a foundation for real-time insights and aiding the preservation of our planet's ecosystems.

Disclaimer:

The scenarios and applications described in this document are hypothetical in nature and intended solely for informational and illustrative purposes. Actual deployment, performance and results of the REN Series in scientific exploration and environmental research *applications may vary depending on specific configurations, environmental conditions and integration with other systems. The REN Series is provided as a customisable edge processing platform, not as a finished product; therefore, end users may need to modify, configure and integrate REN components to meet their specific requirements. All users should perform thorough testing and consult with qualified engineers to determine suitability for their intended use. Unitronix disclaims any liability for direct, indirect or consequential damages arising from the use or reliance on this document or the products described herein.*

About Us

Unitronix are an innovative engineering-capable distributor and manufacturer of rugged, embedded computing solutions for military, aerospace and high-end industrial applications. Our own innovative Rugged Embedded Nodes - REN are reusable, reconfigurable, recyclable, cutting carbon footprint and saving cost.

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