



HEAVY INDUSTRY

RETHINKING COMPUTE SYSTEMS IN NEW DATA-DRIVEN HEAVY INDUSTRY APPLICATIONS: REN'S FLEXIBILITY AND CONFIGURABILITY CAN GET YOU GOING QUICKLY

Overview

The REN Series could offer a versatile, high-performance edge processing platform for heavy industrial environments. Designed with durability and flexibility in mind, the REN Series may assist with monitoring, control and predictive maintenance in sectors where equipment must withstand vibration, extreme temperatures and dust exposure. While not a finished product, REN could serve as a foundation for developing tailored solutions that integrate with industrial machinery and control systems. The configurable nature of REN allows operators to prototype and deploy systems that address specific operational challenges in manufacturing, mining and large-scale processing plants.

Scenario-Based Applications

Manufacturing Process Control and Automation

Application Hypothesis: In large-scale manufacturing facilities, maintaining operational efficiency and minimising downtime are critical. REN systems could be integrated into existing networks to locally process data from assembly lines and production machinery. By handling sensor inputs and control loops at the edge, REN might help reduce latency and improve responsiveness. With customer-selected configurations, REN may support process automation by facilitating faster decision-making, allowing operators to detect anomalies in production lines, monitor equipment health and adjust outputs as needed. The rugged build could help REN operate reliably in environments prone to vibration and airborne contaminants.

Mining Operations Monitoring

Application Hypothesis: Mining environments often present harsh conditions, including dust, shock and temperature extremes. REN units could be positioned at extraction sites to gather and process data from drilling equipment, conveyor systems and environmental sensors. This might allow for real-time analysis of equipment performance and geological data, contributing to safer and more efficient operations. The ability to configure REN with high-performance processors and multiple I/O options may enable integration with various sensor types, supporting predictive maintenance efforts and reducing unexpected equipment failures.

Energy Plant Infrastructure Management

Application Hypothesis: Power plants and industrial energy facilities require constant oversight to ensure uninterrupted energy production. By deploying REN systems within critical infrastructure points, operators might track turbine performance, cooling systems and electrical distribution networks. REN's local processing capabilities could allow operators to monitor performance metrics and detect fluctuations or inefficiencies. This may assist in minimising energy waste and prolonging equipment lifespan. The modular design could make REN adaptable to the diverse requirements of different energy sectors, from fossil fuel plants to renewable energy facilities.

Structural Health Monitoring for Large Industrial Facilities

Application Hypothesis: Industrial structures such as storage tanks, pipelines and bridges require continuous monitoring to detect wear, corrosion and structural shifts. REN units could be configured with specialised sensors to locally process strain, temperature and vibration data. This might enable early detection of material fatigue or structural issues, helping operators address maintenance needs before they escalate. The localised data processing offered by REN may reduce the need for constant cloud connectivity, allowing for reliable monitoring in remote or bandwidth-limited environments.

Connectivity and Data Management

REN's potential for extended connectivity options might support secure data transmission between industrial sites and central control rooms. Operators could configure REN with communication modules suited to their specific environments, such as fibre optic, RF or Ethernet interfaces. This may allow for real-time data exchange, supporting coordinated responses to operational changes or equipment alerts. In scenarios with limited bandwidth, REN's capacity for local data storage and processing could reduce dependency on external networks, contributing to operational continuity.

Rugged and Modular Design

The REN Series' rugged construction may allow it to function reliably in heavy industrial settings. With a modular design, customers can select processors, storage, and I/O configurations to match the needs of their operations. REN's adaptability could make it suitable for use in both legacy systems and new installations. Potential configurations include processors from VersaLogic's EPU and ESU ranges, such as the Sabretooth Xeon E, Eagle or Swift models, offering a range of performance capabilities to suit different industrial applications.

Why Consider REN for Heavy Industry?

- **Edge Processing for Harsh Environments:** REN might provide on-site data processing, reducing latency and supporting faster decision-making in rugged conditions.
- **Flexible and Configurable:** The modular platform could allow for tailored configurations to match specific industrial requirements.
- **Durable Build:** REN units are designed with ruggedisation in mind, potentially supporting long-term deployment in environments with dust, vibration and temperature extremes.
- **Reliable Connectivity:** Communication options may ensure secure data exchange between remote industrial sites and centralised facilities.
- **Prototyping and Development Tool:** As a configurable platform, REN could enable engineers to develop, test and refine solutions that address unique industrial challenges.



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 heavy industry 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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