

MONITORING SOLUTION FOR EPC'S

Monitoring solutions in EPC's ensures efficiency, cost control, and risk mitigation, driving project success and client satisfaction.

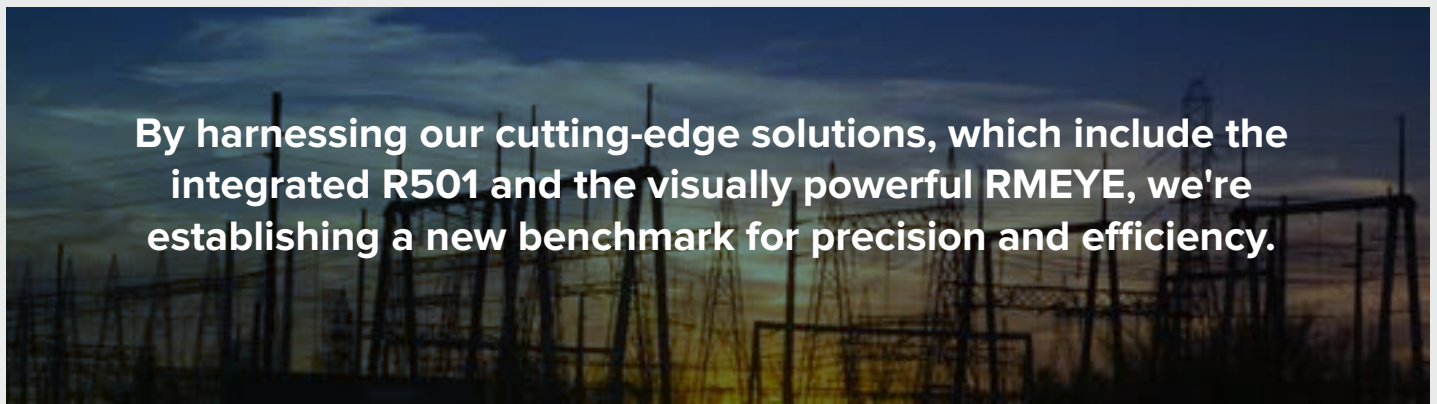
MONITORING SOLUTION IN EPC's

In EPC (Engineering, Procurement, and Construction) projects, meticulously managing the condition of electrical assets is a crucial undertaking. These assets, which encompass power distribution systems, generators, transformers, and control panels, serve as the fundamental infrastructure for industrial and construction endeavours.

Together, Rugged Monitoring and the EPC Firms will have the potential to form a formidable partnership aimed at revolutionizing electrical asset condition monitoring within the dynamic realm of EPC projects.

We at Rugged Monitoring have developed an AI-based comprehensive electrical asset condition monitoring system "RMEYE" with multiple analytical capabilities in asset condition monitoring that stands way apart in technological advancement. RMEYE is a versatile condition-monitoring solution that can offer a comprehensive analysis of various electrical assets spread across multiple industries. R501, the customizable, rack mount, comprehensive electrical asset condition monitor is designed to monitor multiple electrical assets and its parameters enable a simple and user-friendly interface.

The system along with sensors, monitors, and software (Rugged Connect/ RMEYE) is completely modular and customizable, with its rack mount design various monitoring modules can be added as per the requirements and specifications. The solution can be used for existing (retrofit applications) or new electrical assets.



Whether it's power distribution systems, generators, transformers, or control panels, these assets are the cornerstone of industrial and construction ventures. Through this holistic approach, R501 offers comprehensive, unified monitoring, while RMEYE provides advanced visual insights. Together, they enable a seamless and proactive strategy for managing electrical assets in the EPC domain, representing a substantial leap forward in enhancing reliability and performance across all fronts.





Here's why monitoring electrical assets in EPC is crucial

- Real-time project progress tracking.
- Quality assurance and deviation detection.
- Cost control and budget adherence.
- Proactive risk mitigation.
- Resource optimization and efficiency.
- Compliance and documentation management.
- Enhanced client communication and trust.
- Equipment performance evaluation and maintenance.
- Timely project scheduling and milestones.
- Environmental and safety compliance.
- Data-driven decision-making.
- Learning from historical project data.
- Competitive advantage in the EPC industry.
- Remote monitoring for geographically dispersed projects.

► Risk Mitigation

Monitoring electrical assets, such as voltage, current, temperature, and power quality, proactively identifies anomalies. Early detection enables timely preventive actions, minimizing the risks of equipment failure, electrical hazards, and costly downtime.

► Optimal Performance

Effective monitoring ensures that electrical assets operate at their optimal performance levels. By tracking key performance indicators, project managers can identify areas of improvement and implement energy-saving measures. This leads to reduced operational costs and enhanced overall project performance.

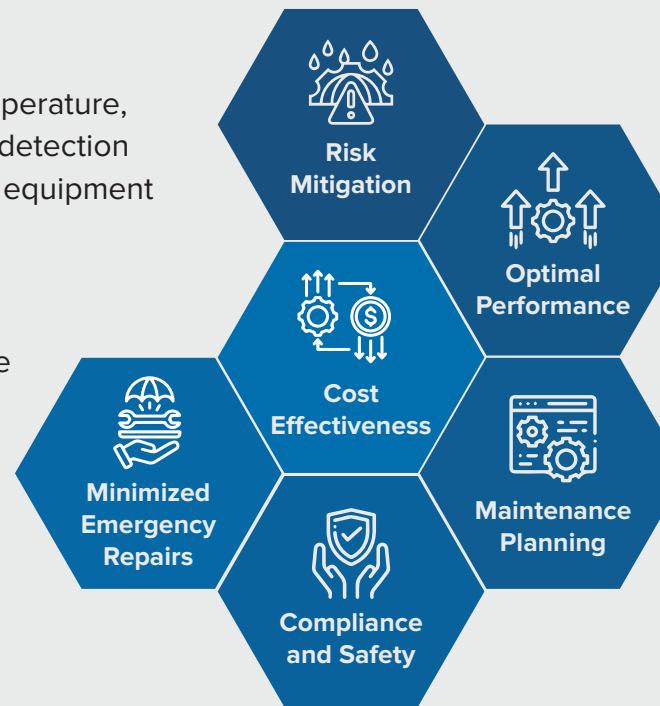
► Cost Effectiveness

Implementing Electrical Asset Condition Monitoring is a cost-effective strategy for EPC companies. It not only reduces operational expenses but also enhances overall project efficiency, ensuring sustainable and successful outcomes.

► Minimized Emergency Repairs

Reactive maintenance, driven by unexpected failures, is costlier with urgent responses and higher labour and parts expenses. Condition-based monitoring mitigates the frequency of these emergencies.

Monitoring electrical assets in EPC projects is essential for risk reduction, performance optimization, and data-driven decision-making. Proactive monitoring assures reliability, minimizes downtime, and enhances overall project success.



► Maintenance Planning

Monitoring electrical assets yields essential data for predictive maintenance, enhancing asset longevity and reducing unexpected downtime through proactive health tracking.

► Compliance and Safety

Monitoring electrical assets ensures compliance with safety regulations by assessing grounding, insulation, and safety interlocks, enhancing workplace safety and minimizing accident risks.



TRANSFORMER

Rugged Monitoring offers advanced monitoring solution for transformers to increase asset life and gain higher ROI

1 Transformer Condition Monitoring

Complete Transformer Condition Monitoring System

- Hot Spot Temperature Monitoring
- Partial Discharge Monitoring
- Bushing Monitoring (Tan Delta and Capacitance)
- OLTC Contact Wear & Monitoring
- Cooling System Monitoring
- Dissolved Gas Analysis



R501

2 Fiber Optics Temperature Sensor & Monitor

Rugged high dielectric FO sensors (TSENS), T301 monitor with PRP redundancy, and accessories



3 Bushing Sensor & Monitor

Cost effective solution for Bushing tan-delta, capacitance, transformer PD monitoring



4 PD sensors & Monitors

Wide range of PD sensors (HF, UHF, Acoustic) & Monitors for periodic testing & online monitoring.



5 Dissolve Gas Analyzer

Easy integration with all DGA systems available in industry.

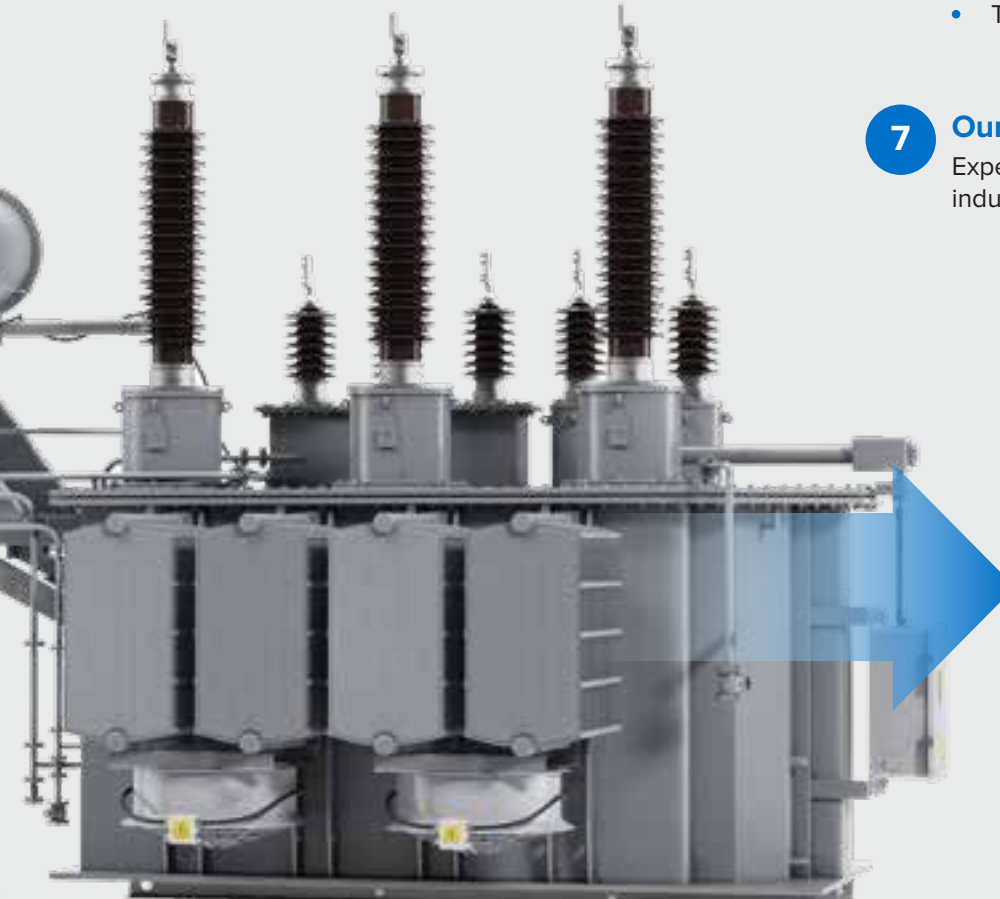


6 Condition Monitoring Software

- Health Assessment Analytics
- Transformer Health Index
- Transformer Risk Index
- Transformer Criticality Index

7 Our Services

Expert Reporting & Recommendations from industry experts.



Monitoring Software
RM EYE

MEDIUM VOLTAGE SWITCHGEAR

Monitoring and tracking switchgear performance is important for an efficient and increased asset lifetime

1

Switchgear Condition Monitoring

Complete Switchgear Condition Monitoring system such as

- Real Time Temperature Monitoring
- PD Monitoring
- Switching system monitoring
- SF6 monitoring
- Moisture monitoring



R501

4

Condition Monitoring Software

- Health Assessment Analytics
- Switchgear Health Index
- Switchgear Risk Index
- Switchgear Criticality Index



2

Fiber Optic Temperature Sensors & Monitors

Highly dielectric Temp sensors & cyber security proof monitors



3

PD Monitoring

Cost effective PD sensors & monitors for busbar, breaker & cable termination compartments



5

Our Services

Expert Reporting & Recommendations from industry experts.



Monitoring Software
RM EYE

GAS INSULATED SWITCHGEAR (GIS)

Reliable monitoring solution for all the critical parameters in GIS

1 Switchgear Condition Monitoring

Complete GIS condition Monitoring system such as

- PD Monitoring
- SF6 Monitoring
- Breaker Monitoring
- Disconnecter Monitoring
- CT/VT Monitoring



R501

4 Breaker / Disconnecter Monitoring

Realtime monitoring of switching mechanism and control cubical

- Trip and close timing analysis
- Stored energy Analysis
- Travel Curve Analysis
- Contactwear analysis



2 GIS PD Monitoring

Highly sensitive and custom designed PD sensors and monitors for new and retrofit GIS.



5 Condition Monitoring Software

- Health Assessment Analytics
- GIS Health Index
- GIS Risk Index
- GIS Criticality Index

3 SF6 Monitoring

- Analytics for reducing SF6 filling cost & One Click SF6 emission reporting
- SF6 Leak Rate
- SF6 Time to Refill
- SF6 Time to Lockout
- Moisture / Dewpoint



6 Our Services

Expert Reporting & Recommendations from industry experts.



Monitoring Software
RM EYE



ROTATING MACHINES (DOL MOTOR, VFD MOTOR, GENERATOR)

Turnkey monitoring solution with greater diagnostic capability to analyze crucial parameters of your rotating machines

1 Rotating Machine Condition Monitoring

Complete Rotating Machine Condition Monitoring system such as

- Current signature analysis (CSA)
- PD Monitoring
- Temperature Monitoring
- Vibration monitoring
- Flux monitoring
- Air gap monitoring



R501

2 PD monitoring

Wide range of capacitive couplers and advanced PD monitors for direct online (DOL) & variable frequency Driven (VFD) machines



3 FO Temperature Sensors & Monitors

T301 - For Hot Spot Temperature monitoring with PRP redundancy and OEM agnostic features

- Stator Winding
- Hot Spot Monitoring



4 Integration with other monitoring system

Faster & Easy integration with motor monitoring system available in the industry (CSA, Flux, Vibration, Air gap)

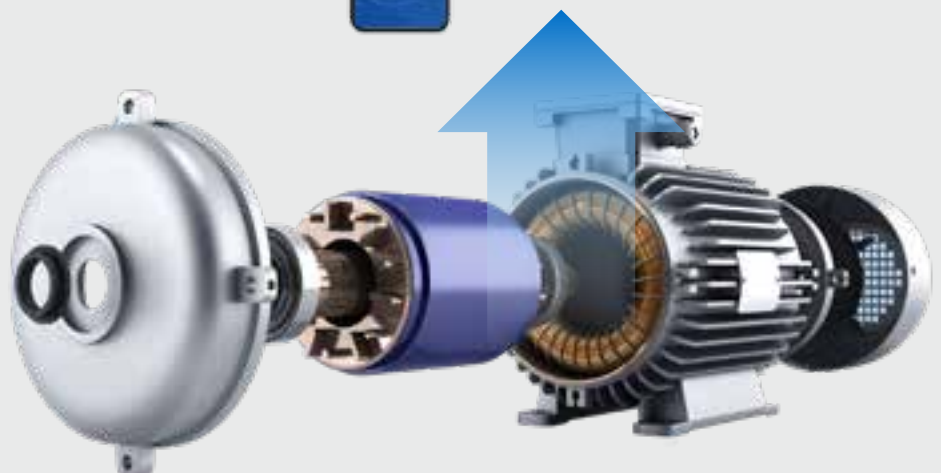
5 Condition Monitoring Software

- Health Assesment Analytics
- Rotating Machines Health Index
- Rotating Machines Risk Index
- Rotating Machines Criticality Index

6 Our Services

Expert Reporting & Recommendations from industry experts.

Monitoring Software RM EYE



POWER CABLE

Real time monitoring of cable terminations and joints for early fault detection, notification and enables condition based maintenance of power cables

1 Power Cable Condition Monitoring

Complete Power Cable Condition Monitoring system such as

- Real Time Temperature Monitoring
- Joint PD Temperature Monitoring (cable upto 400kV system)
- PD Monitoring
- Sheath Current monitoring



T501

2 PD Monitoring

Highly sensitive and accurate PD monitoring & Fault localization



3 Temperature monitoring

Easy to install FO temperature sensors for new & retrofit terminations & joints



4 Sheath Current Monitoring

Advanced sensors & monitors for all voltage levels

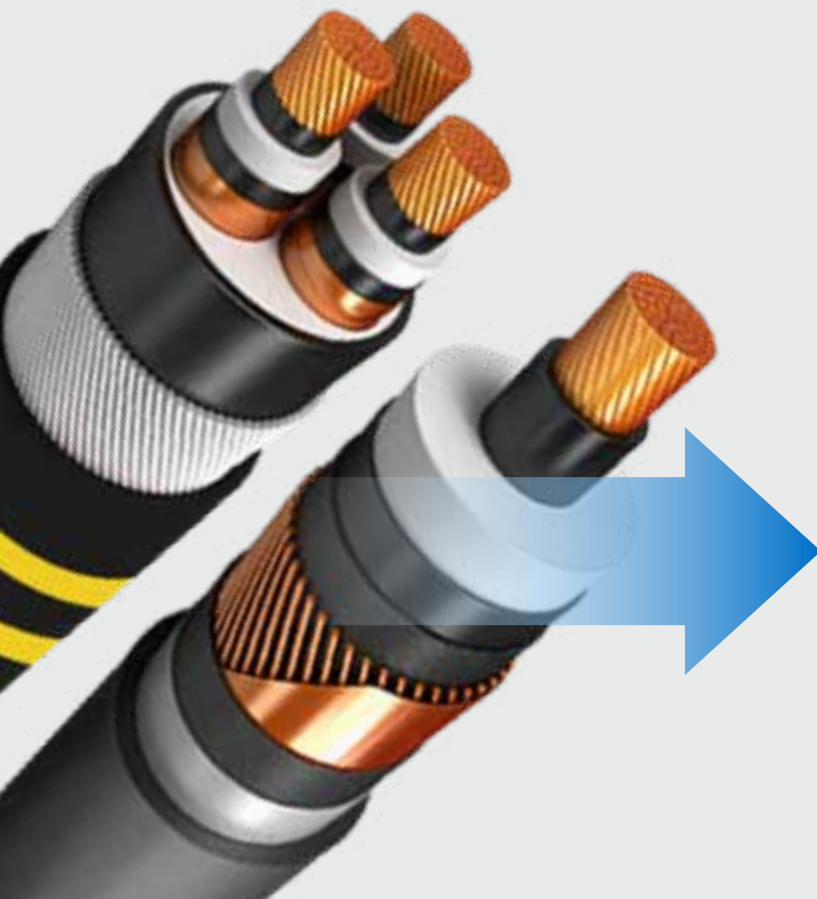


5 Condition Monitoring Software

- Health Assessment Analytics
- Power Cable Health Index
- Power Cable Risk Index
- Power Cable Criticality Index

6 Our Services

Expert Reporting & Recommendations from industry experts.



Monitoring Software
RM EYE

Assets that can be Monitored in EPC

Enable power distribution, facilitate grid integration of renewable energy, regulate voltage levels, ensure system stability, manage loads efficiently, support scalability, maintain power quality, and protect valuable assets.

Following are the electrical assets widely found in EPC projects:



Power Transformers

Enable power distribution, facilitate grid integration of renewable energy, regulate voltage levels, ensure system stability, manage loads efficiently, support scalability, maintain power quality, and protect valuable assets.

Medium Voltage Switchgear

Optimizing the medium voltage switchgear efficiency and lifespan, ongoing monitoring of key parameters like voltage, current, insulation, and temperature is vital. Early identification of potential issues enables prompt intervention and maintenance.



Gas Insulated Switchgear

To ensure seamless operation and longevity of GIS, a robust monitoring system is paramount. This system oversees critical parameters within the GIS, including but not limited to voltage levels, current flow, gas pressure, and temperature. By continuously tracking these vital metrics, potential issues or anomalies can be swiftly detected and addressed.

Rotating Machines

A turnkey monitoring solution offers an all-inclusive, pre-assembled system with advanced diagnostic capabilities for analysing critical parameters in rotating machinery. It provides a comprehensive set of tools and technologies for in-depth analysis of key performance indicators, surpassing basic monitoring.



Power Cables

Real-time monitoring of cable terminations and joints is paramount in ensuring their uninterrupted performance. This proactive approach allows for early detection of potential faults or issues, providing timely notifications for necessary intervention.

Generators

Diesel or gas generators are often employed to provide backup power during construction or in areas with unreliable power supply. These assets ensure uninterrupted power availability for critical operations.













Motors and Drives

Monitoring motors and drives is crucial for seamless industrial operations. This entails ongoing assessment of key parameters like temperature, vibration, current, voltage, and power usage. Real-time tracking offers vital insights into their health.

Proper selection, installation, monitoring, and maintenance of these electrical assets are essential for ensuring reliable power supply, efficient operations, and compliance with safety standards in EPC projects.

Benefits of Monitoring

The monitoring of electrical assets in EPC (Engineering, Procurement, and Construction) projects brings a multitude of benefits, contributing to project success, efficiency, and safety. Here are some key advantages of implementing electrical asset monitoring in EPC:

-  **Early Fault Detection:** Enables early identification of faults or abnormalities, preventing them from escalating into major problems.
-  **Timely Intervention:** Allows for prompt action, minimizing downtime and costly repairs.
-  **Predictive Maintenance:** Provides valuable data for planning predictive and preventive maintenance, extending asset lifespan and reducing maintenance costs.
-  **Safety Assurance:** Ensures compliance with safety standards, reducing the risk of electrical accidents and protecting personnel and equipment.
-  **Cost Savings:** Reduces unplanned downtime and costly repairs, ultimately leading to cost savings over the project's lifecycle.
-  **Optimized Performance:** Tracks parameters like energy consumption, load balance, and efficiency, enabling project managers to implement energy-saving measures for enhanced project performance and reduced operational costs.
-  **Data-Driven Insights:** Generates actionable insights through data analytics and trending analysis, facilitating informed decisions for asset optimization, energy management, and capacity planning.
-  **Compliance Verification:** Validates adherence to electrical codes and standards, creating a safer work environment for personnel.

Monitoring electrical assets in EPC projects offers advantages like early fault detection, safety improvement, data-driven decisions, and thorough documentation. Effective monitoring ensures reliability, minimizes downtime, optimizes performance, and boosts project success.

Asset Monitoring : Enterprise Architecture

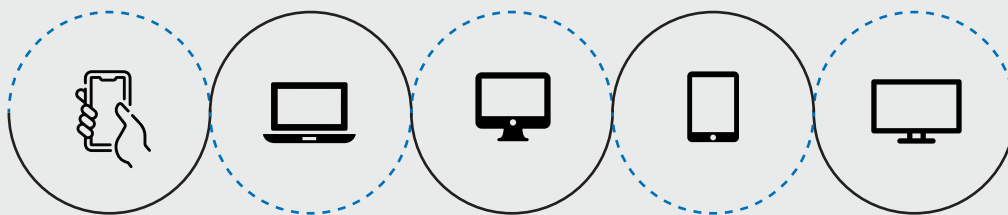
Compatible with Rugged Monitoring Enterprise Solution



UI UX

- Data Layer
- Analytics
- User Interface
- Custom Dashboards
- Reporting
- Email/SMS Notifications

RM EYE



Private Cloud (Customer Cloud),
Rugged Monitoring Cloud

IEC 60870-104

IEC 61850

FTP/SFTP

- XML, JSON

- CSV, COMTRADE



Data Collection

ODBC

MODBUS

DNP 3.0

HTTPS

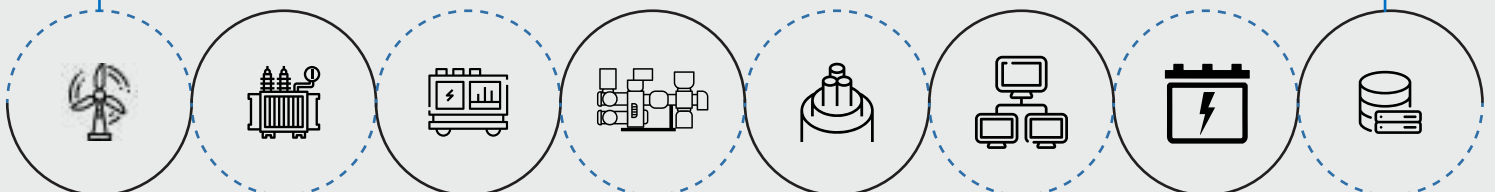
MQTT

Monitoring System

T301, O201, H201, T501, R501,

HPM601, CPM601, PD201, PD211, BM201

Asset Data



Wind mills
Monitoring
System

Transformer
Monitoring
System

Switchgear
Monitoring
System

GIS
Monitoring
System

Power Cable
Monitoring
System

Offline Data/
Inspection
Test Results

Ess/ Battery

- Historian
- CMMS
- SCADA/ DCS

One Solution for Multi-Site Multi Asset Monitoring

Manage different industrial assets on one platform without human intervention

Features

- **Advanced and Exceptional Reporting**
Technology with automated alerts
- **Modern remote monitoring solutions**
provide valuable insights to Multiple Assets at Multiple Sites on real-time
- **Robust asset health monitoring**
with analysis and recommendations support asset effectiveness in addition to maximizing equipment uptime
- **Establish a real time and consistent monitoring** by getting the right information into right hands
- **An efficient, reliable partial discharge monitoring** for all the assets
- **A detailed comprehensive DGA Analysis**
- **Lifetime Consumption details.**
- **Built on well-established remote and cloud-based monitoring technology**
- **Simple user-friendly interface** providing fast access to all the features and commands
- **Quick and easy 1 step configuration setup**
- **Encompasses a secure access to data and configuration**
- **Advanced asset algorithms** based on standard ones with new ideas
- **Systematic fleet management and analysis**
- **Extended multilingual support** to handle product inquires or troubleshoot problems proactively
- **Up System Level Reporting**
- **Industrial IoT**

Our Clients

EPCs



OEMs



Utility & Industries



Why Customers Choose Us?

RM solution, the trusted monitoring solution for over 10000+ assets across 50+ countries. We are a leading High Value Electrical Asset Monitoring Company integrating fibre optic technology to the assets.



Attention to Details

It's our attention to the small stuff, scheduling of timelines and keen project management that makes us stand out from the rest.



A plan for Success

Our Customers are well satisfied with the advisory services that we offer to help them with best in class technological performance and a long durable life.



Experts only

We bring-in our diversified experienced team with over 100+ years of experience in Asset Monitoring



Meeting Deadlines

Work with us, and you'll work with seasoned professionals – vigilant of deadlines, and committed to exceeding client expectations.



Money Matters

We protect you against currency fluctuation with competitive and fair market prices



Rugged Monitoring Services

Rugged Monitoring provides customization of sensors, monitors & software. In addition we offer on-site commissioning services, maintenance contracts and technical support to all customers worldwide.

About Rugged Monitoring

Industry's leading team of asset condition monitoring experts with 100+ years of combined experience committed to delivering customizable solutions for challenging applications. We offer a range of reliable, high performance, customizable sensors and monitoring solutions that are immune to external influence.

Certification



ISO 9001



ISO 14001



ISO 45001/
OHSAS 18000



Lloyd's
Register



ATEX
Certification

Our Presence Across the Globe



Head Office

 **Canada**

1415 Frank-Carrel, Suite
230, Quebec, QC - G1N
4N7, CANADA

 +1-418-767-0111

Asia Pacific | India | Europe | Latin America | Middle East | North America



 ruggedmon

 info@ruggedmonitoring.com

 www.ruggedmonitoring.com

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