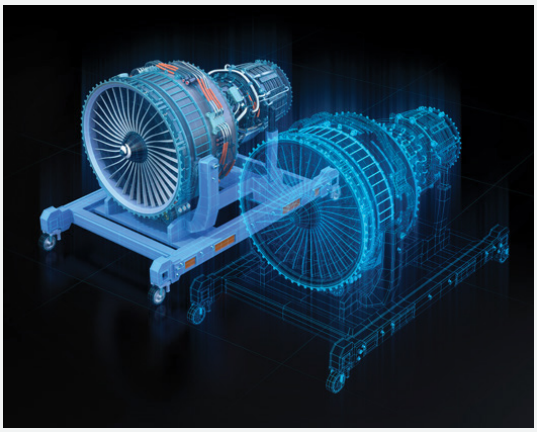
RUGGED MONITORING

MONITORING SIMPLIFIED

Manage and Reduce Your Risk with Condition Monitoring for Motors and Generators

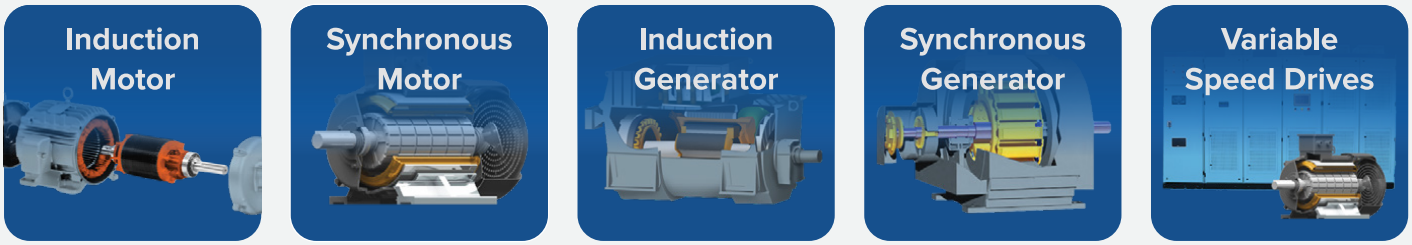
Constantly monitor the critical parameters of your rotating machines now from anywhere

RM's Solution for Motors and Generators



Motors and Generators are complex electro mechanical systems exposed to different stress factors. Condition Monitoring of high voltage motors and generators which are in continuous operation is very important. Any fluctuation in Voltage, Current and Frequency leads to damage of the rotating machine with unplanned outages as well as cost and resources. Continuous monitoring and tracking the performance of heavy-duty motors and generators are important for an efficient and increased asset lifetime.

Rugged Monitoring offers an advanced comprehensive condition monitoring solution for your motors and generators. The specifically designed algorithms analyze the data, providing deeper insights into the condition and performance of the monitored asset. The solution includes precisely designed sensors, monitors and comprehensive monitoring software that provides online, offline data, alarms and analytics. Depending on specific operating requirements and application, we customize our condition monitoring solutions for:



What Can Be Monitored

Load, Power

- Load/ Over Current
- Active/ Reactive Power
- Power Factor

Temperature Monitoring

- Bearing Temperature
- Ambient Temperature
- Winding Temperature
- Cooling Air Temperature

Partial Discharge Monitoring

- PD Localization
- PD Detection
- PD Severity Analysis

Winding Temperature

- Inlet Temperature
- Outlet Temperature
- Intelligent Cooling Control
- Cooling Efficiency

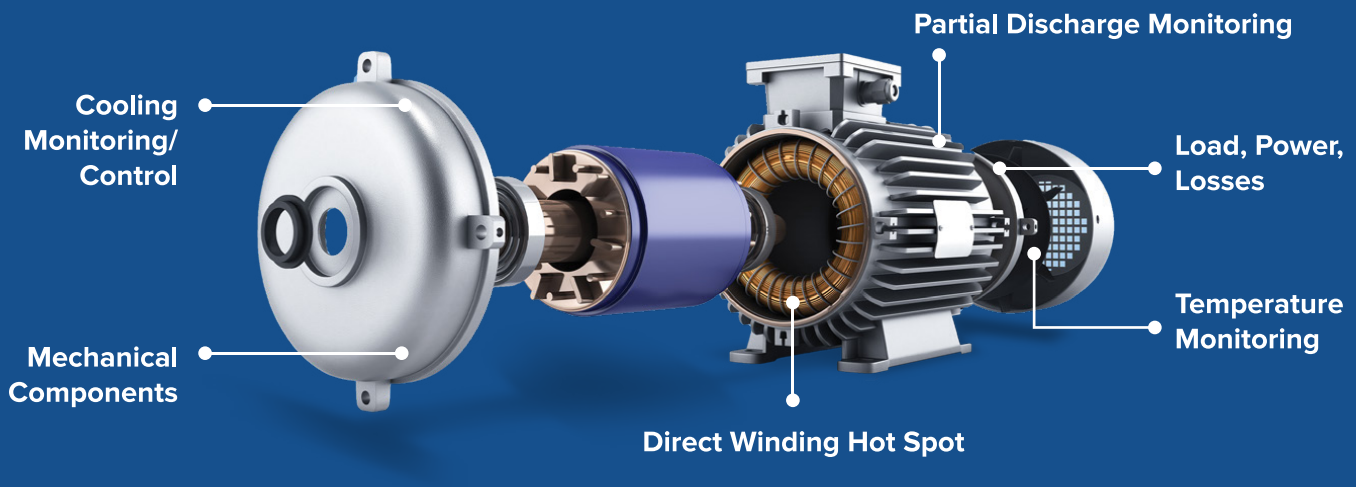
Direct Winding Hot Spot

- Stator Winding Hot Spot

Mechanical Components

- Machine Vibration
- End Winding Vibration
- Current Signature Analysis
- Flux Monitoring
- Greasing condition of bearings, bearing & driven application vibrations

Schematic Diagram of Induction Motor

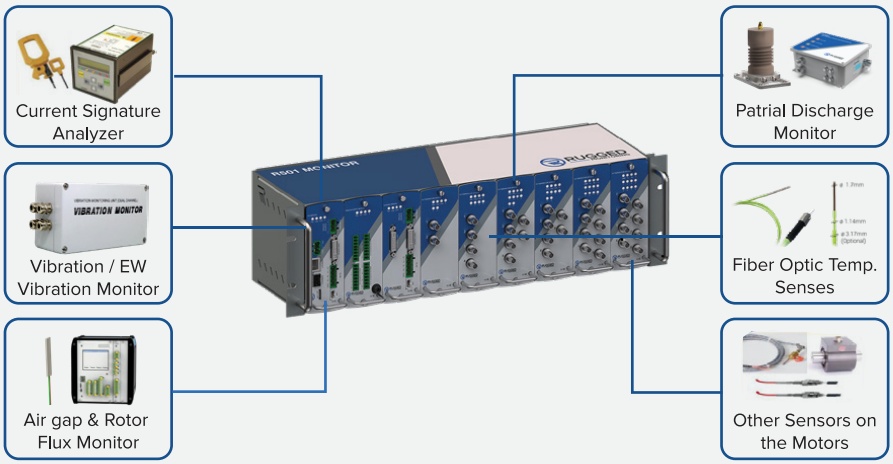


Types of Monitoring in Rotating Machines

Partial Discharge Monitoring
Insulation related faults
(Stator insulation, end winding, slot discharges, contamination, micro sparking, etc.)

Current Signature Monitoring
Entire machine faults (Rotor faults mainly, stator faults, looseness of wedges, power monitoring) except insulation condition)

Other Monitoring
Noise measurement, alignment measurement, greasing monitoring, running hour monitoring, etc.

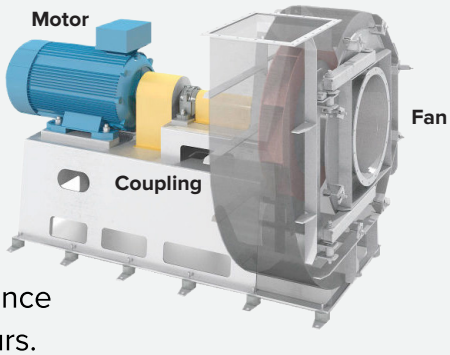


Flux Monitoring
Magnetic field measurement between stator & rotor or say rotor flux monitoring

Temperature Monitoring
All phases of the winding, DE side, NDE side, terminal box, coupling, etc.

Tri Directional - Vibration Monitoring
DE side, NDE side of machine & applications, coupling, gear box

Monitoring will help to identify and to implement the right operation and maintenance strategy consequently preventing any break down of the machine before the end of the design life. The real time monitoring can monitor, diagnose, and predict failures on less critical but widely utilized rotating equipment, such as generators and motors. The system will help in proactive life cycle planning, minimizing maintenance costs & unplanned outages. The detailed trends from the solution help the user to get the deep insight of the system performance and aids in taking actionable decisions before a catastrophic failure occurs.



Features

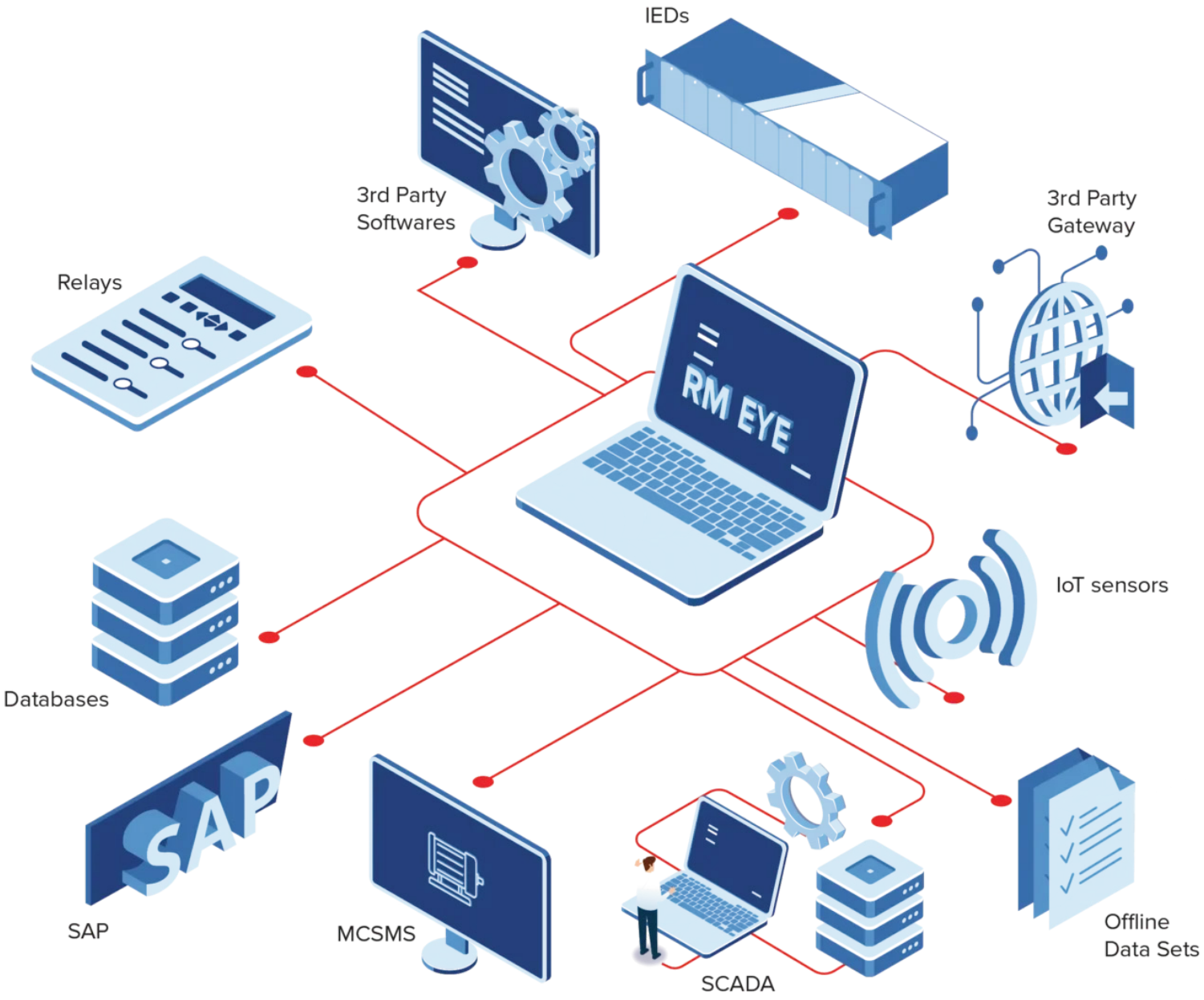
- Intelligent and customizable solution
- Unique and Reliable Prediction
- Alarms and Alerts for any potential mechanical problems
- Built on well-established remote and cloud-based monitoring technology
- Realtime Process parameters monitoring

Benefits

- Extended Asset Lifecycles
- Turnkey solution with Remote Condition Monitoring
- Capture Trends and Increase Return on Investment
- Different dashboards for different user roles and levels
- Greater diagnostic capability
- Ability to monitor multiple rotating machines with one software

Enterprise APM Suite: RM EYE

RM EYE represents a paradigm shift in enterprise asset performance management through the condition monitoring of electrical assets. It uses an AI-driven approach to assess the health and performance of diverse assets, delivering transformative and sustainable outcomes related to their health, performance, energy efficiency, and integrity.



Rugged Monitoring's RM EYE transforms traditional time-based maintenance into a proactive approach, equipping businesses with real-time insights into the health of their electrical assets. By detecting potential issues early on it helps create a dependable and efficient predictive maintenance system.

RM EYE Architecture

Multi-Asset

Multi-Site Monitoring

RM EYE

UI/UX

- Real-time/ Historical Trends
- Analytics
- User Interface
- Custom Dashboards
- Reporting
- Email/ SMS Notifications
- Mobile - Progressive Web Access

Cloud

Private (Customer)
Rugged Monitoring
On-Premises (Optional)

AWS, Azure
Google Cloud

- RM Enterprise Data Layer
- RM Enterprise Analytics

CYBER SECURITY

ISA — IEC 62443

NERC CIP-5 — NERC CIP-5

Data Collection

Modbus | DNP 3 | IEC 61850 | FTP/ SFTP | ODBC | IEC 60870-104 | MQTT | HTTPS

XML, JSON,
CSV, COMTRADE/OPC

Assets Data

- Transformer Monitoring System
- Switchgear Monitoring System
- GIS Monitoring System
- Power Cable Monitoring System
- Generator Monitoring System
- Offline Data/ Inspection
- Power Electronics (Battery, UPS, VFD, Relay)
- Historian CMMS, SCADA/DCS

One Solution for Multi-Site Multi Asset Monitoring

RM EYE - Unified platform to monitor entire network of electrical assets

Features

- **Advanced asset health monitoring** with analysis and recommendations to increase asset effectiveness in addition to maximizing equipment uptime
- **Modern remote monitoring solutions** provide valuable insights to Multiple Assets at Multiple Sites from time to time
- **Establish a real time and consistent monitoring** by getting the right information into right hands
- **Simple and user-friendly interface** providing easy and fast access to all the features
- **Everything about the asset at one place** The raw data, analysis and recommendations
- **Advanced asset algorithms** for electrical assets to evaluate asset health
- **Advanced reporting technology with automated alerts**
- **An efficient, reliable partial discharge monitoring for all the assets**
- **A detailed comprehensive DGA analysis**
- **Built on well-established remote and cloud-based monitoring technology**
- **Quick configuration** so that you are not required to configure separately.
- **Protocols: MODBUS, MQTT, IEC61850**
- **Robust integration with 3rd party systems and devices** with industry standard protocols
- **Bulk configuration imports for fast deployment**
- **Encompasses a secure access to data and configuration**
- **QR code scanner on mobile devices**
- **Accessible on web browser and mobile app**
- **Historical data storage and on demand access** via export feature
- **Extended multilingual support** to handle product inquires or troubleshoot problems proactively
- **Systematic fleet management analysis**
- **Offline test data integration and analysis**

Why Customers Choose Us ?

Expertise You can Trust

Backed by 100+ years of experience. we understand the unique demands of critical asset management across diverse industries.

Focus on Sustainability

Our Solutions are designed to help you reduce energy consumption, minimize waste, and align with your sustainability goals.

Money Matters

We offer competitive and transparent market pricing to protect you from currency fluctuations.

Customer Centric Approach

From consultation to deployment and beyond, we are committed to delivering exceptional support, personalized service, and timely project completion.

CERTIFICATIONS

ISO 9001:2015 | ISO 14001:2015 | ISO 45001:2018 | Lloyd's Register | Atex Certification | NIST Certification

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