

Gas Insulated Switchgear Monitoring Solution

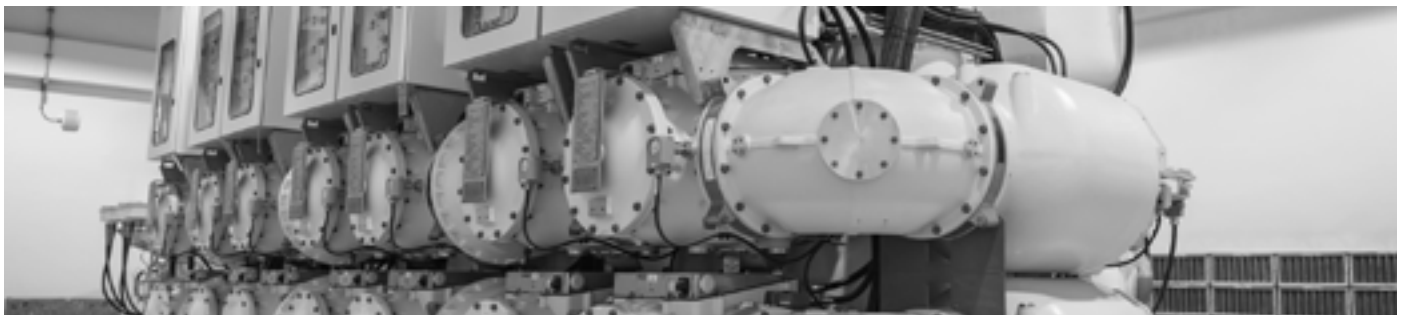
Designed for Diverse Utility and Industry Applications

Achieve increased asset value with improved productivity and utilization

Electrical switchgear plays an important role in operating the electrical power system safely with high reliability. Malfunction in switchgear operations can lead to severe failures in transformers and other connected electrical assets. The switchgear failures may lead to damage of electrical assets, unplanned outages, as well as cost and resources. Monitoring and tracking their performance are important for an efficient and increased asset lifetime.

Rugged Monitoring offers an advanced comprehensive condition monitoring solution for various switchgear systems from; sensors, monitors to software which can monitor and analyze the performance of switchgear equipment. Depending on specific operating requirements and application, we customize our condition monitoring solutions for Gas Insulated Switchgear.

Our condition monitoring system can be installed and integrated in new installations as well as in existing switchgears. Our advanced condition monitoring solution provides operators with valuable insights about switchgear systems enabling them to increase asset effectiveness.



Temperature Monitoring

The increasing demand for electric power and growing renewable energy sources call for the need to protect power systems from huge failures that could lead to a prolonged shortage of power supply. To ensure a continuous supply of power, condition monitoring of Switchgears becomes utmost important.

Overheating caused by uneven loads on circuits, or loose or damaged connections will lead to catastrophic failure's and thereby reduce the life span of the equipment. Temperature rises in switchgear and switchboard components can occur suddenly, often causing thermal run-away, resulting in burning, melting and destruction of components. Periodic visual inspections are always expensive and require special safety considerations and are unlikely to detect these conditions in time.

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What Can Be Monitored



Temperature



Power



Partial Discharge



Humidity



**Trip Close
Characteristics**



**SF6
Analysis**



**Stored Energy
Analysis**



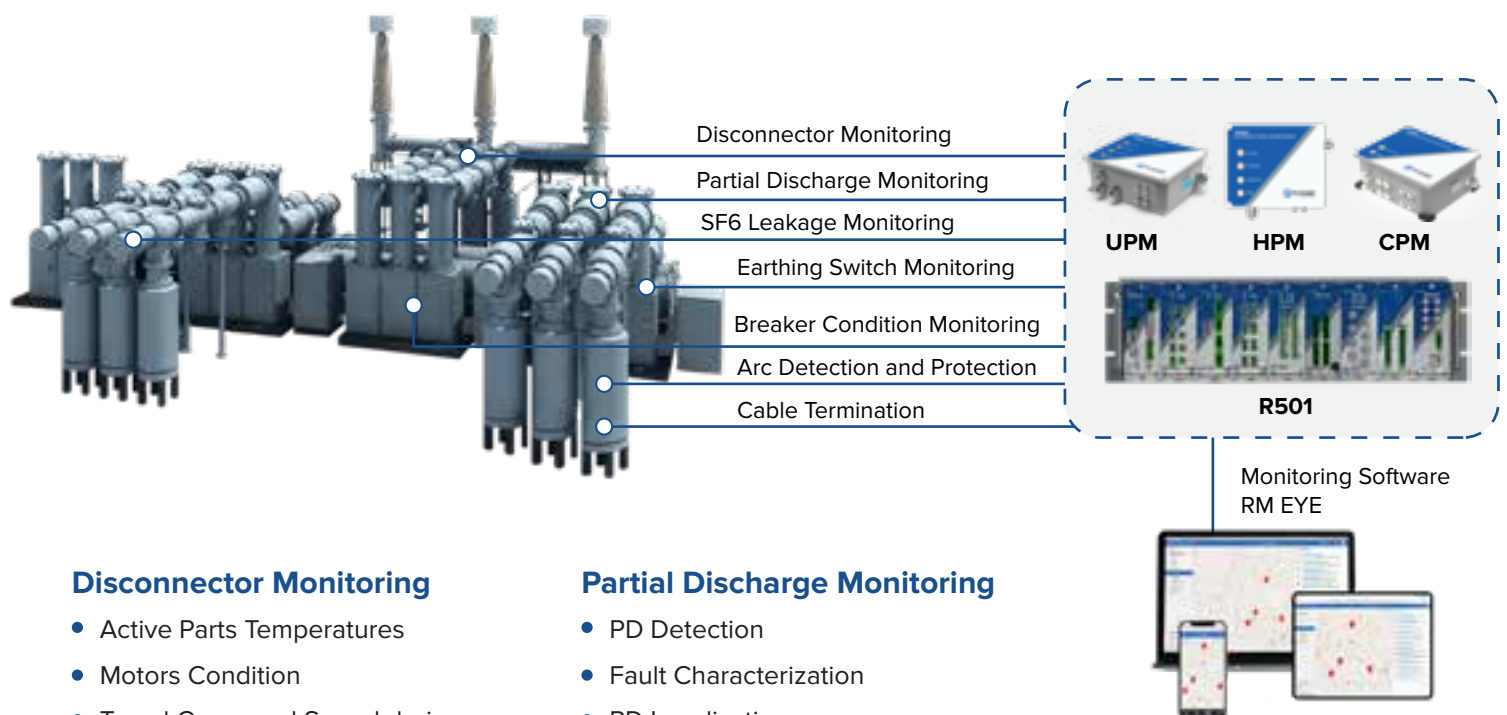
**Contact
Wear**

Partial Discharge Monitoring

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The major concern is to extract useful diagnostic data from noisy measurements (this holds especially for PD) and get global health condition/residual life algorithms. For noise recognition, while techniques are available for filtering out noise under AC sinusoidal voltage, that are based on the capability to distinguish noise from PD pulses in measurement records and, particularly, resorting to phase-resolved PD (PRPD) patterns, the same does not apply for DC and pulse-modulated (PWM) voltage waveforms.

Sample System Architecture for Gas Insulated Switchgear.



Disconnector Monitoring

- Active Parts Temperatures
- Motors Condition
- Travel Curve and Speed during Opening and Closing
- Switches / Operating Drive Condition

Earthing Switch Monitoring

- Switches / Operating Drive Condition
- Operating Mechanism
- Motor Condition
- Active Parts Temperatures

Partial Discharge Monitoring

- PD Detection
- Fault Characterization
- PD Localization
- PD Severity Analysis
- PD Test and Measurement Services

Breaker Condition Monitoring

- Operating Mechanism
- Temperature Monitoring
- Trip/Close Coil Condition
- Active Parts Temperatures
- Contact Erosion

SF6 Leakage Monitoring

- SF6 Pressure / Density
- SF6 Leak Rate
- SF6 Time to Refill
- SF6 Time to Lockout
- Moisture / Dewpoint

Arc Detection and Protection

- Arc Detection
- Arc Localization
- HV Testing and Monitoring

Features

- Most advanced remote monitoring solution with contact wear analysis
- Trip & Close Operations Time Monitoring and Analysis
- SF6 Monitoring & Analysis with versatile and scalable operation
- Get Switchgear & Bay Level Information with Quick and flexible configuration options
- Realtime and consistent monitoring solution
- Built on well-established remote and cloud-based monitoring technology
- Robust and highly reliable

Benefits

- Increased asset life with reduced unplanned outages
- Accurate alarm and alert system
- Greater diagnostic capability
- Increased ROI with reduced operation cost
- Precise fault identification
- Ability to monitor multiple switchgear systems with one software

Flexible solutions for diversified applications

We at Rugged Monitoring provide fully configurable system to meet the specific functionalities and specifications of customer.

SWITCHGEAR	GIS Only	
	GCB - Gas Circuit Breaker DTB: Dead Tank Breaker	
SENSORS	PD	USENS-G, USENS-B, USENS-W
	SF6 Leakage	Compatible with any 3 rd party Gas pressure/density sensor,
MONITORS	PD (Portable monitor)	UPM601 - P, CPM601 - P,
	Breaker Monitoring	R501 (with BCM module)
SOFTWARE & ANALYTICS	GIS PD fault classification	
	GIS SF6 leaks rate estimation, SF6 fill predictions, SF6 emission reports	
	Breaker Health Index	
	GIS- Bay Health Index	

RM EYE Enterprise APM Suite

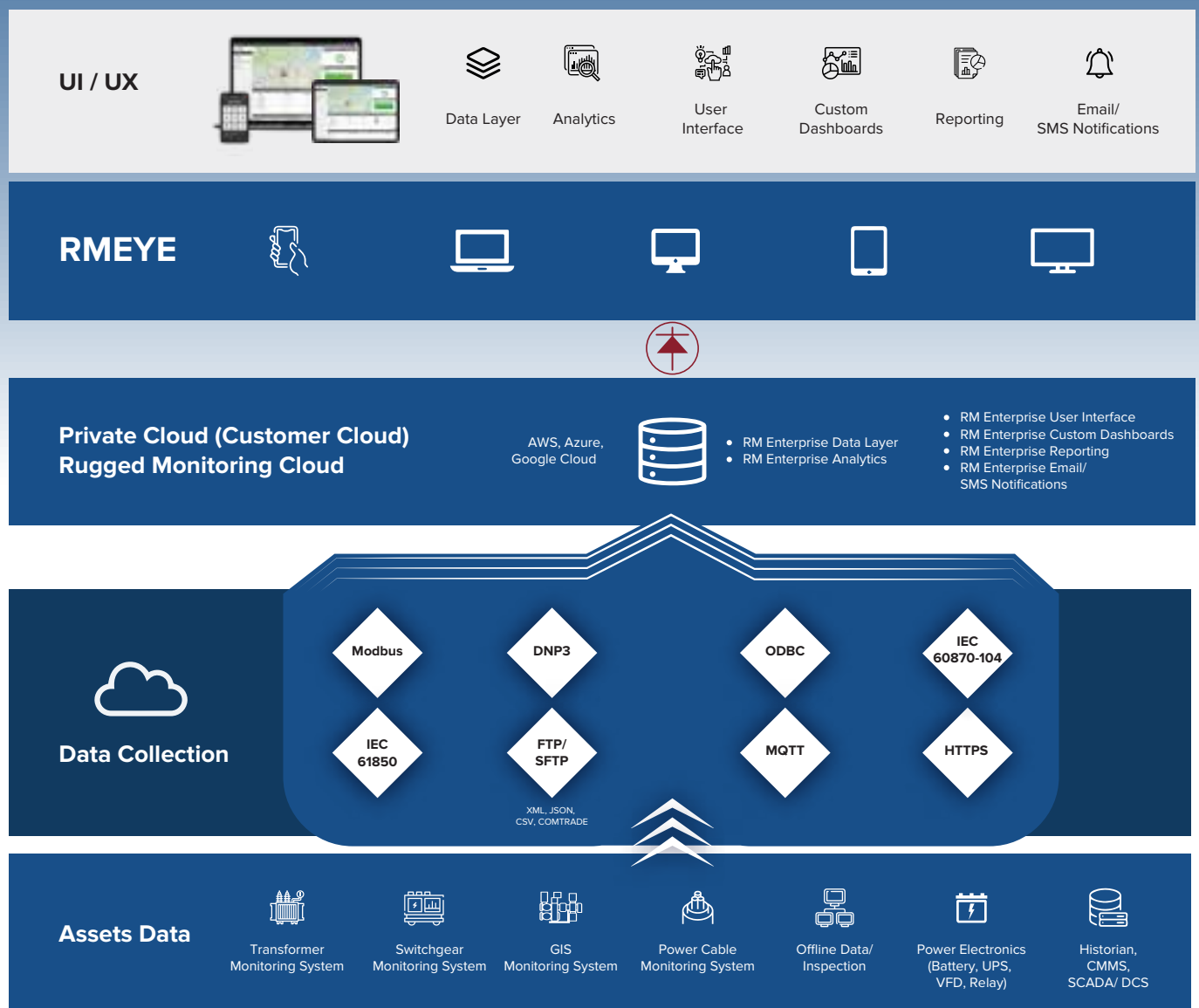
RM EYE is our advanced Asset Performance Management (APM) system designed to provide a scalable and future-ready solution undergoing digital transformation.

With AI-powered data intelligence, it offers comprehensive health indices for various assets across multiple locations. RM EYE surpasses traditional condition monitoring and facilitates a shift from reactive maintenance to predictive maintenance, maximizing asset lifespan and boosting ROI.

With its real-time remote monitoring capabilities, RM EYE equips experts, operators, SMEs, and engineers with real-time insights that support more informed, data-driven decisions. Through a combination of offline, periodic, and online assessments, it effectively lowers maintenance costs, helps avert unexpected failures, and enhances overall operational efficiency.



RM EYE' Architecture



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: IEC 61850, MODBUS, MQTT**
- **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**

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

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.



Money Matters

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



Meeting Deadlines

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



Our Presence **Across the Globe**



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Asia Pacific | China | India | Middle East and Africa | Europe | North America | Latin America

Certification



ISO 9001



ISO 14001



ISO 45001/
OHSAS 18000



Lloyd's
Register



ATEX
Certification



NIST
Certification

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.



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