The background of the slide is a large image of a power transmission tower and its associated lines. The tower is a complex metal lattice structure, and the lines stretch across the frame. The sky is a deep blue with some white clouds. A bright sun is visible in the upper right, creating a lens flare effect across the image.

Improving Power System Performance Through Advanced Cable Condition Monitoring

Leveraging IoT and AI in Cable Condition Monitoring



RM's Solution for Power Cables

Electric cables serve as the lifelines of industrial, commercial, and residential power systems, ensuring seamless and uninterrupted power delivery. However, over time, cables are subjected to various stressors including thermal overload, mechanical damage, environmental conditions, and aging, which can compromise their integrity and performance.



Effective electric cable condition monitoring is essential for pre-emptively identifying potential issues, preventing costly downtime, and enhancing the safety of electrical systems.

By leveraging advanced monitoring technologies, it is possible to detect early signs of degradation and implement timely maintenance strategies, thereby extending the lifespan of cables and ensuring operational continuity.

Detect
early signs



Maintenance
Strategies



Extending
Lifespan



Operational
Continuity





Rugged Monitoring offers customized, cost-effective solutions designed to enhance the reliability of power system by providing advanced notifications of potential asset failures. Our approach focuses on detecting possible failure modes in electrical assets and notifying customers about these early-stage issues.

The failure modes of cable systems, terminations, and joints can be effectively identified, and our monitoring system is specifically designed to detect these failure modes with high accuracy.



Power Cable: Failure Mode Analysis

Power cables can be divided into three subsystems



Cable Subsystem

Includes cable with all its components like Conductor, Conductor Shield, Insulation, Insulation Shield, Metallic Shield, and Outermost Jacket.



Cable Termination

Including all termination accessories



Cable Joints

Including all joint accessories and Cable Link Box with SVL

Insulation

- Water Treeing
- Void and Contaminants
- Protrusions from the Shields
- Cracking of embrittled insulation
- Aging / Overall Degradation

Metallic Shield / Neutral

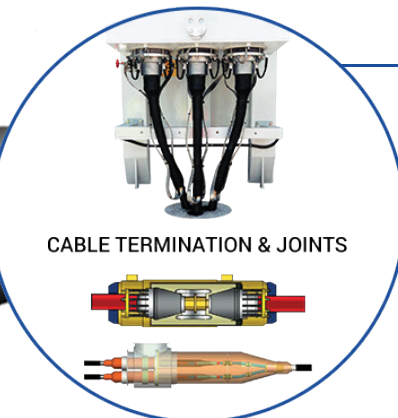
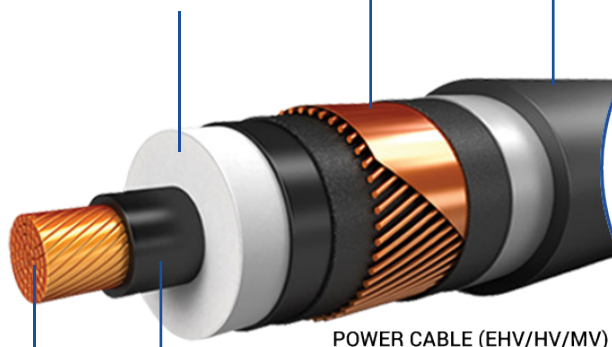
- Damaged Shield
- Overheating

Jacket / Sheath

- Cracks on the Sheath

Termination/Joints

- Overheating
- Discolored /BurntConductor
- Discolored /BurntInsulator
- BadConnectorCrimps
- Cross Threading of the Elbow Probe
- Broken Stud in Bushing Well



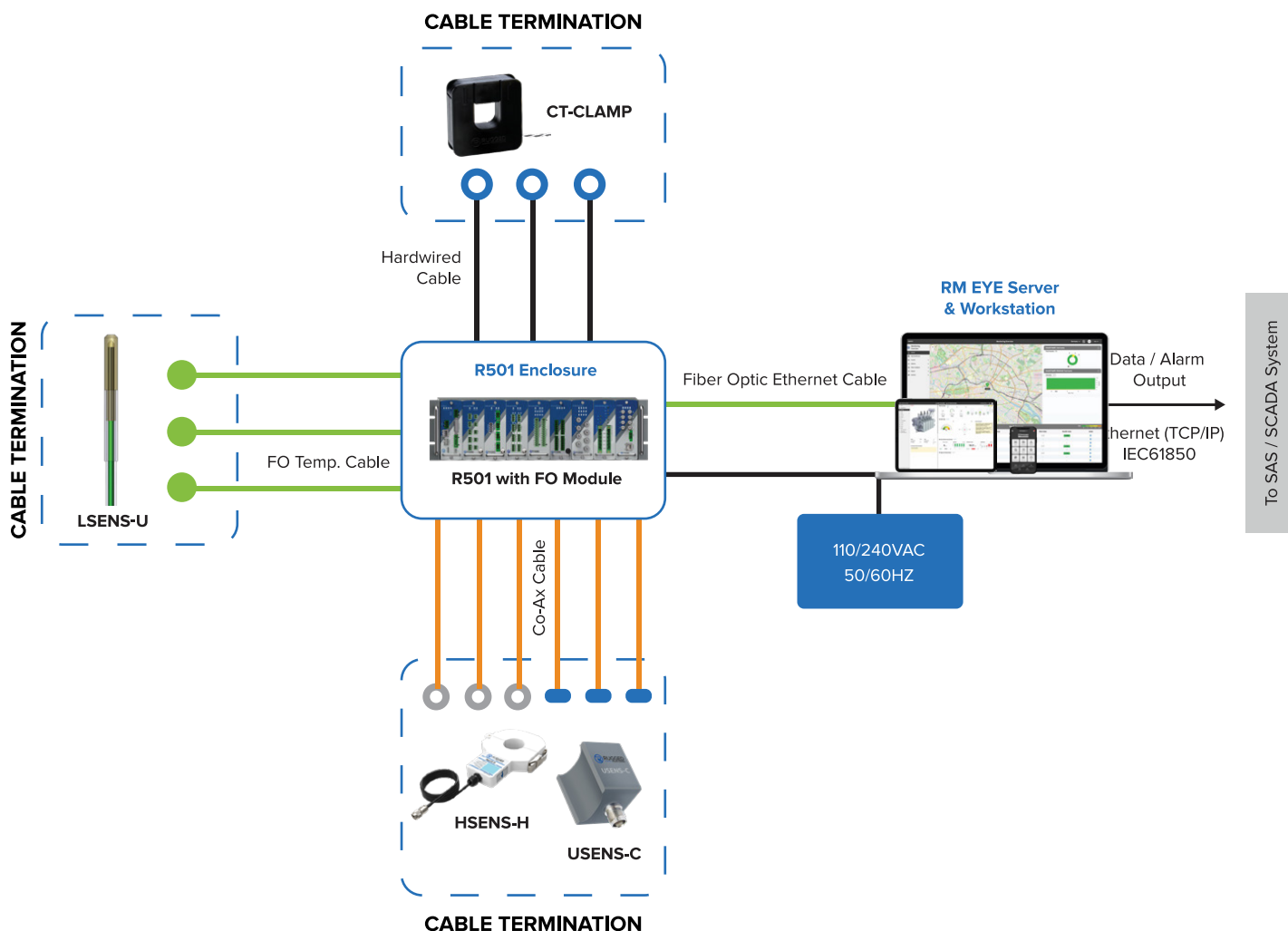
Conductors

- Very little can go wrong with a properly designed conductor
- Corrosion in some unusual cases
- Delamination on Conductor

Insulation Shield (Semicon)

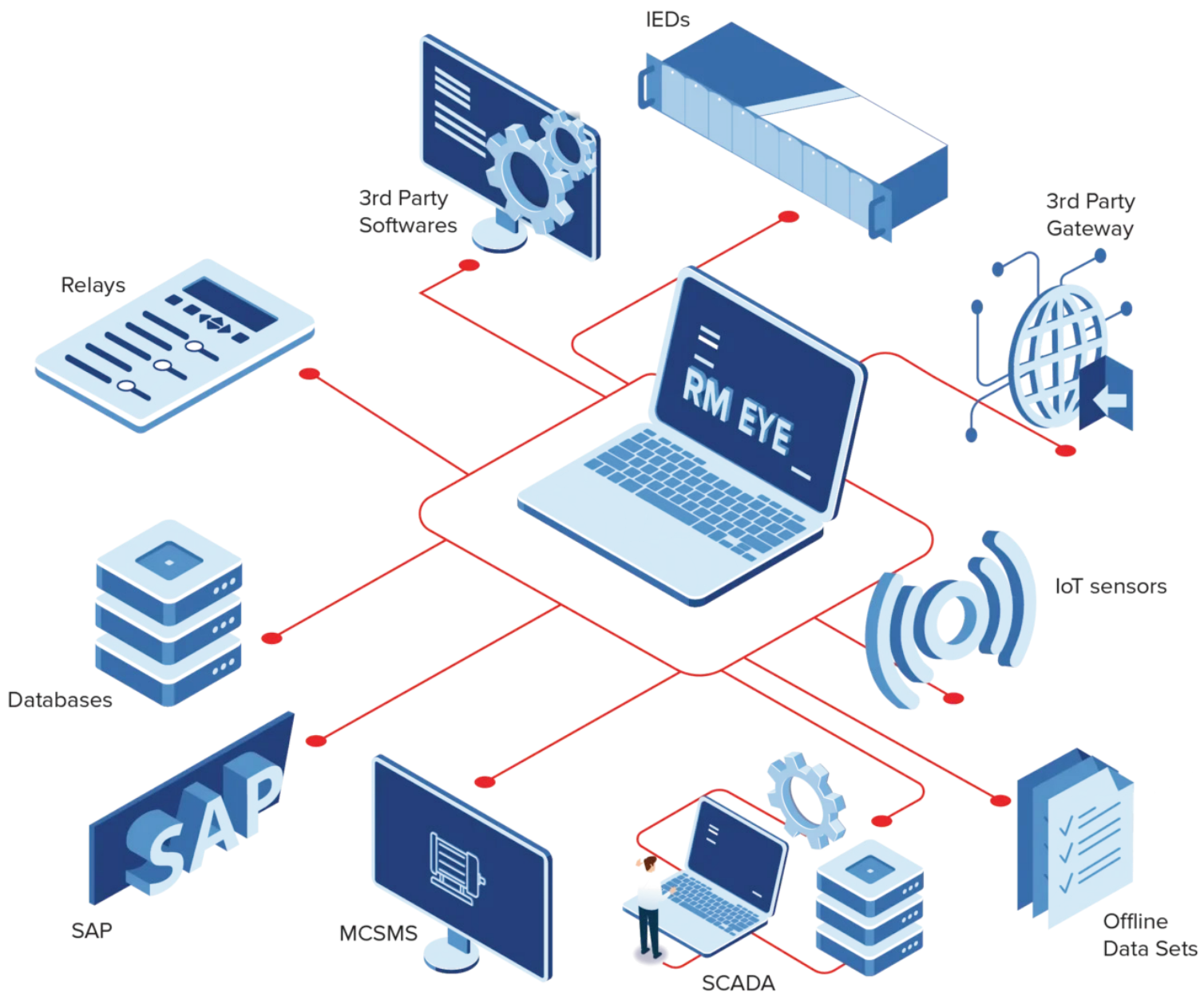
- Small air pockets
- Loose bonding with Insulation
- Discolored Metal
- Protrusions on the semicon
- Burning/Arcing

Schematic Diagram



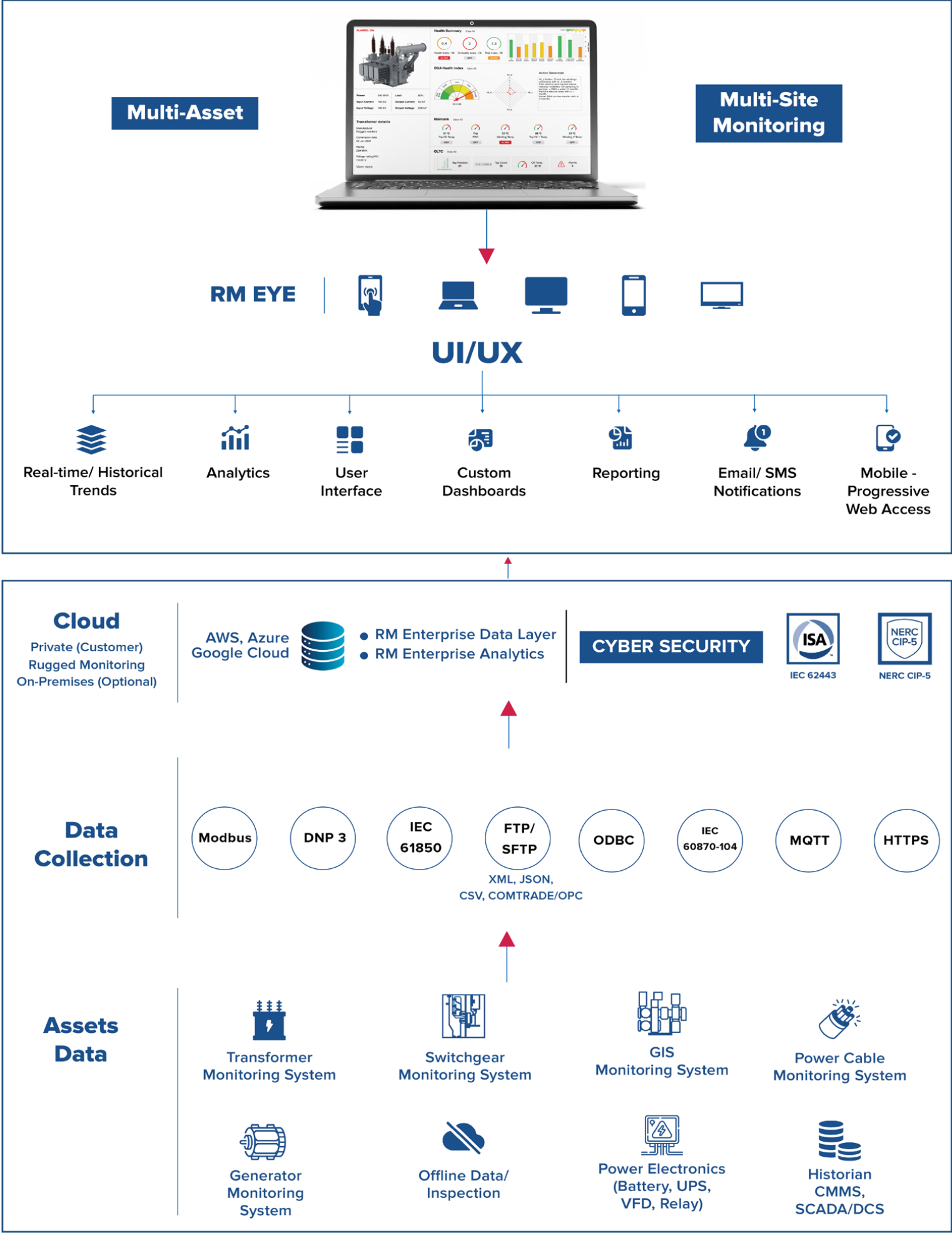
Enterprise APM Suite: RM EYE

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



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 inquiries 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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