RUGGED
MONITORING
MONITORING SIMPLIFIED

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
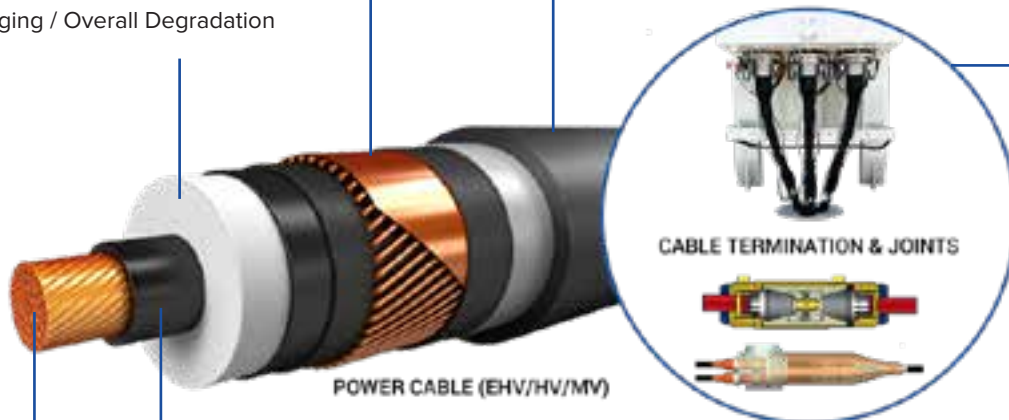
- Cracks on the Sheath

Termination/Joints

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

CABLE TERMINATION & JOINTS
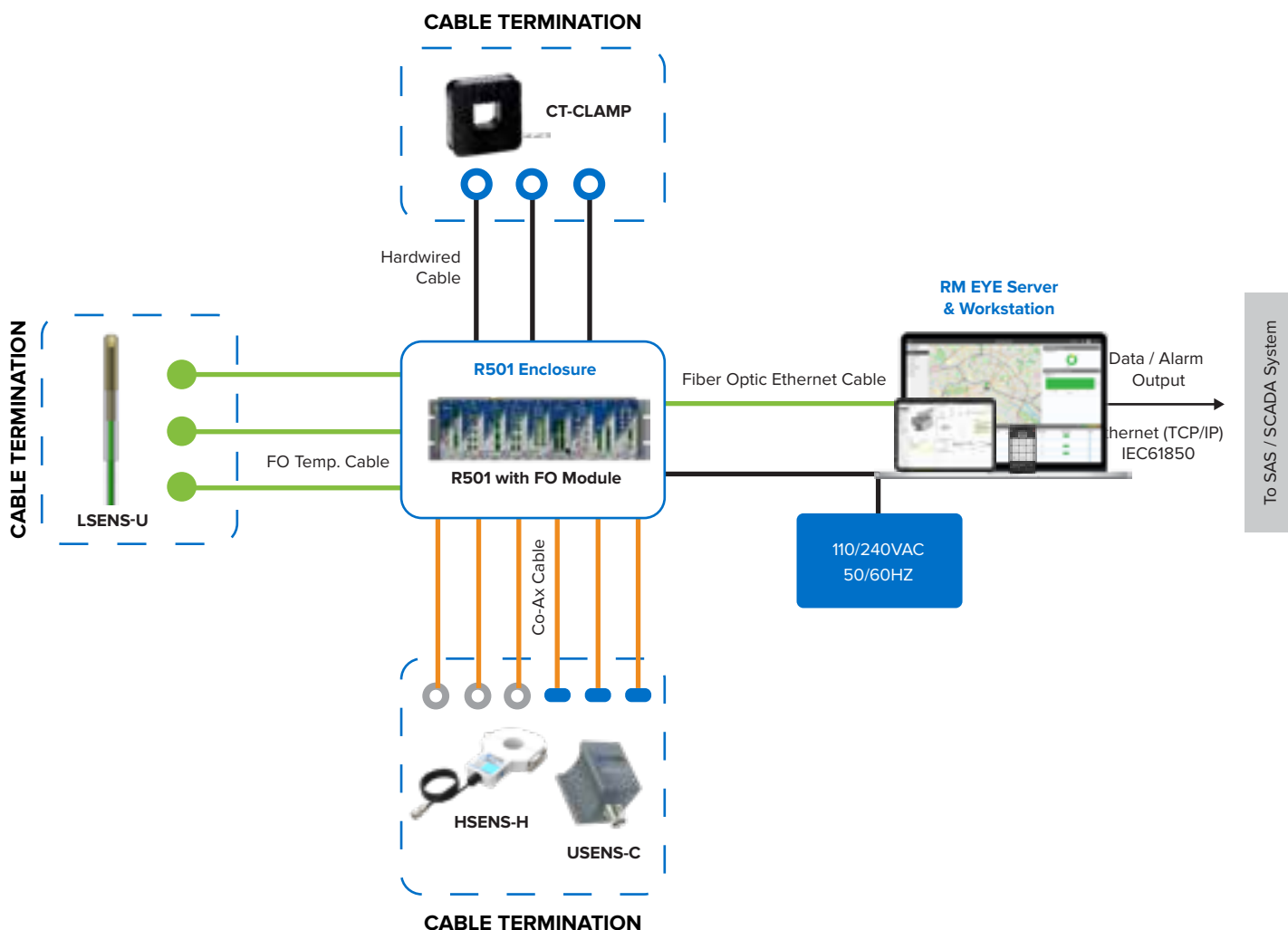
POWER CABLE (EHV/HV/MV)

Conductors

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

Insulation Shield (Semicon)

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

Schematic Diagram

CABLE TERMINATION

CT-CLAMP

Hardwired Cable

CABLE TERMINATION

LSENS-U

FO Temp. Cable

R501 Enclosure

R501 with FO Module

Co-Ax Cable

Fiber Optic Ethernet Cable

RM EYE Server & Workstation

Data / Alarm Output

Ethernet (TCP/IP) IEC61850

To SAS / SCADA System

110/240VAC 50/60HZ

HSENS-H

USENS-C

CABLE TERMINATION
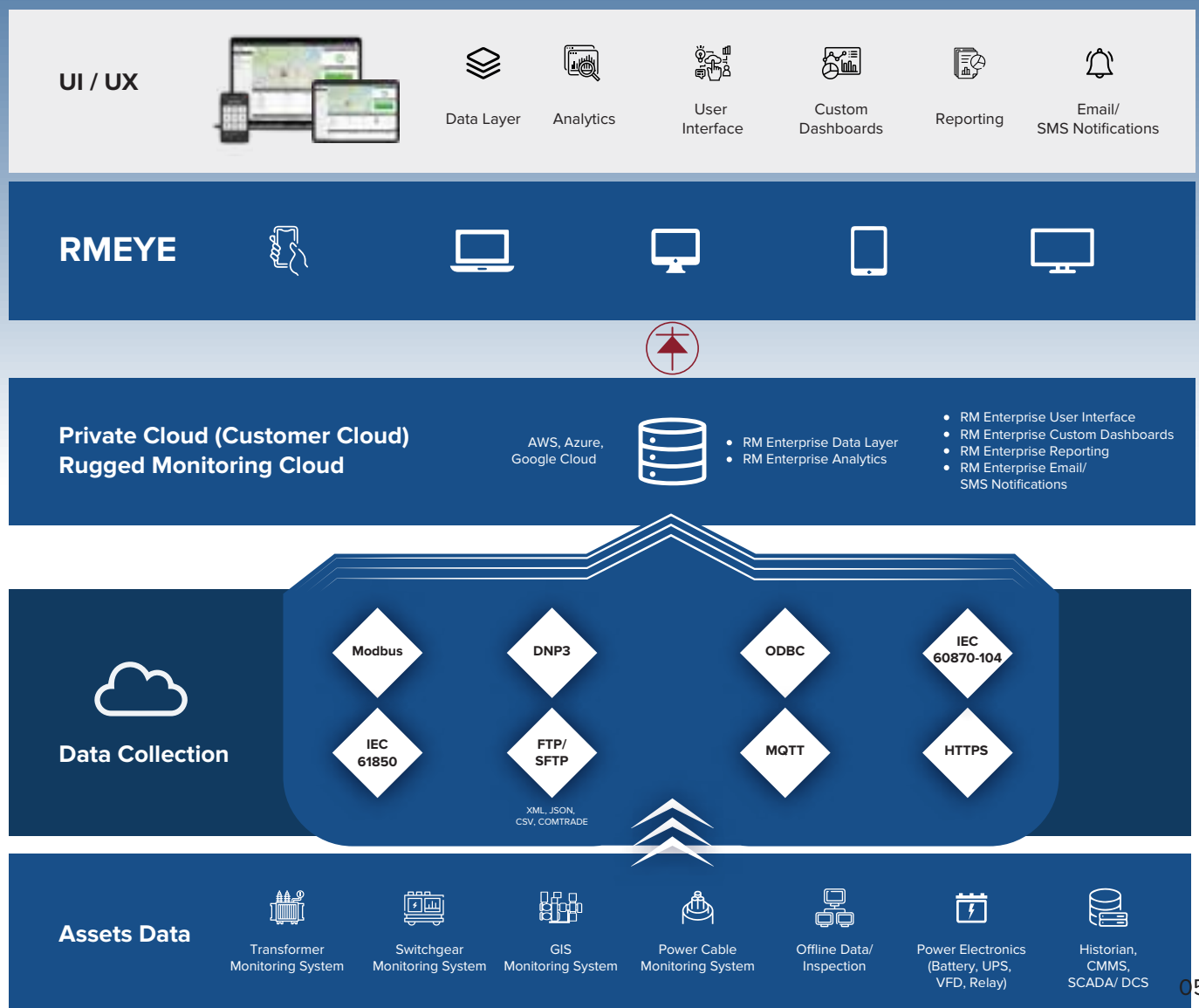
RM EYE Enterprise APM Suite

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

UI / UX

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

RMEYE

Private Cloud (Customer Cloud)
Rugged Monitoring Cloud

AWS, Azure, Google Cloud

- RM Enterprise Data Layer
- RM Enterprise Analytics

- RM Enterprise User Interface
- RM Enterprise Custom Dashboards
- RM Enterprise Reporting
- RM Enterprise Email/ SMS Notifications

Data Collection

Modbus | DNP3 | ODBC | IEC 60870-104

IEC 61850 | FTP/ SFTP | MQTT | HTTPS

XML, JSON, CSV, COMTRADE

Assets Data

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

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.

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.

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

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**

Head Office

🇨🇦 **Canada**

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

📞 +1-418-767-0111

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

Certification

| ISO 9001 | ISO 14001 | ISO 45001/ OHSAS 18000 | Llyod'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.

ℹ 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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