

# T401

**Recommended for increased asset lifetime  
with highly reliable performance and  
reduced operational risks**

Transformer



Gas Insulated Switchgear



MV Panel Switchgear



Air Insulated Switchgear



Rotating Machines



Power Cable



**Robust | Reliable | Responsive**

# T401 Recommended for increased asset lifetime with highly reliable performance and reduced operational risks



**T401 is the most advanced monitoring solution designed to monitor different electrical assets with its simple and user-friendly interface.**

T401 along with various sensors for monitoring different parameters and software provides condition monitoring of electrical assets by focusing on preventing asset failures and downtime. With our comprehensive monitoring solution, the health of assets can be determined and also maintenance activities can be scheduled and prioritized. The system along with sensors, monitors, and software (Rugged Connect/ RM EYE) is completely modular and customizable as per the specifications. The solution can be used for existing (retrofit applications) or new electrical assets.

## What can be monitored



**Transformer Monitoring**  
(Oil Filled / Dry type)



**Motors/Generators Monitoring**  
(DOL / VFD)



**Cable Monitoring**  
(EHV / HV / MV)



**Switchgear Monitoring**  
(GIS / AIS / MV Panel)

Our T401 gives state-of-the-art condition monitoring solution for industries with huge electrical infrastructure. It can analyze the data and obtain the predictive diagnostics to detect any serious faults before a breakdown occurs. T401 is precisely designed to monitor wide range of electrical asset types and to provide a greater visibility into the assets. The T401 can acquire data and can easily integrate with existing third-party systems through serial communication like RS-485/ SFP (Gigabit Optical Ethernet). The T401 monitor comes with condition monitored software (Rugged Connect/ RM EYE) which is designed to cater the needs of various commercial, industrial, and utility applications.

The complete solution provides remote monitoring by sending alerts to operators about fault conditions at an early stage and provides vital health information before any serious fault occurs.

RUGGED MONITORING has a team of experts to provide customization to its sensors, monitors and software in very short time.

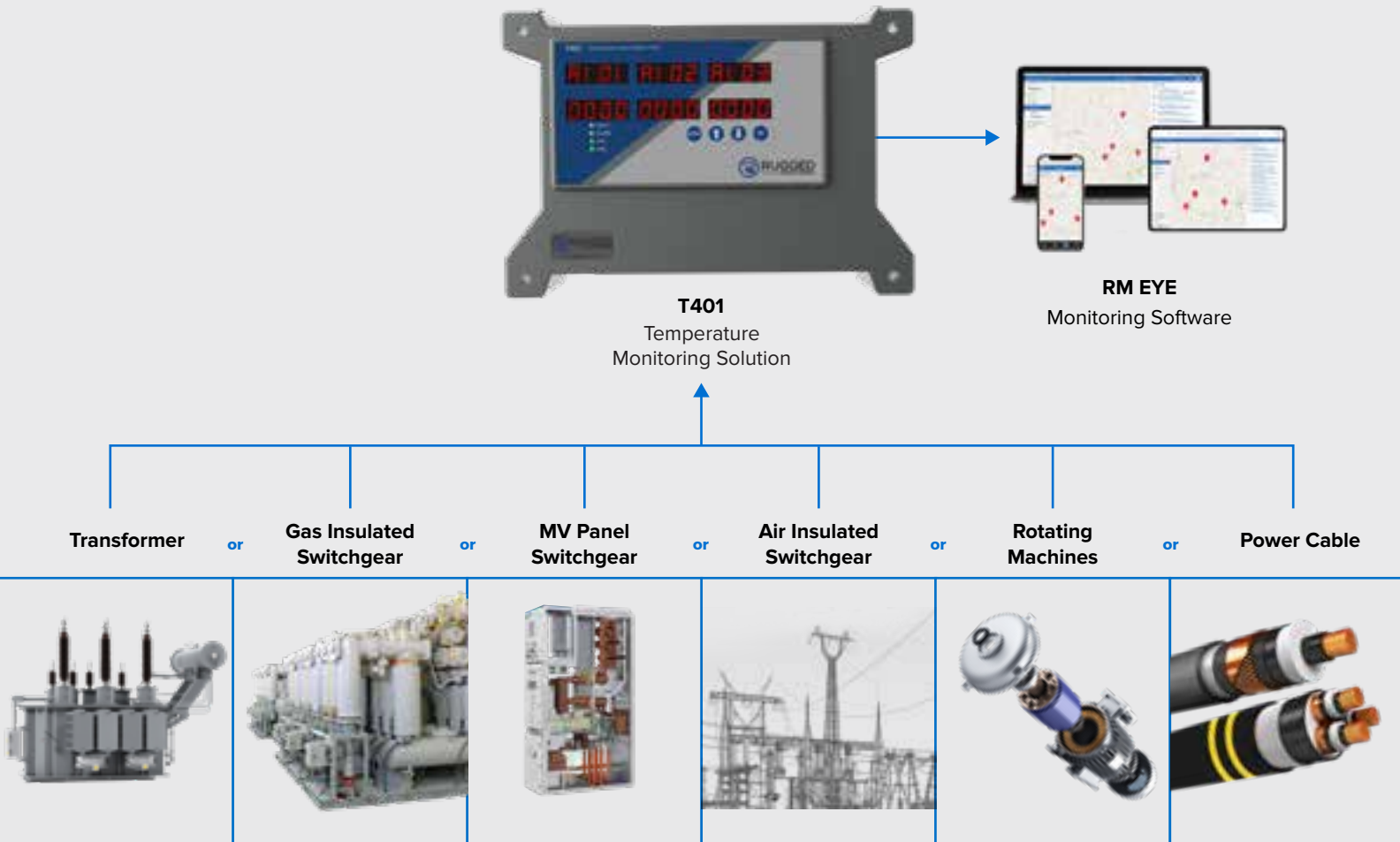
## Features

- Expandable up to 8 Analog / Digital channels (More Technical Features)
- Up to 8 programmable Form-C relays
- No field calibration required
- Plug and play connections
- Compact and rugged design
- Best in class EMI and ESD immunity

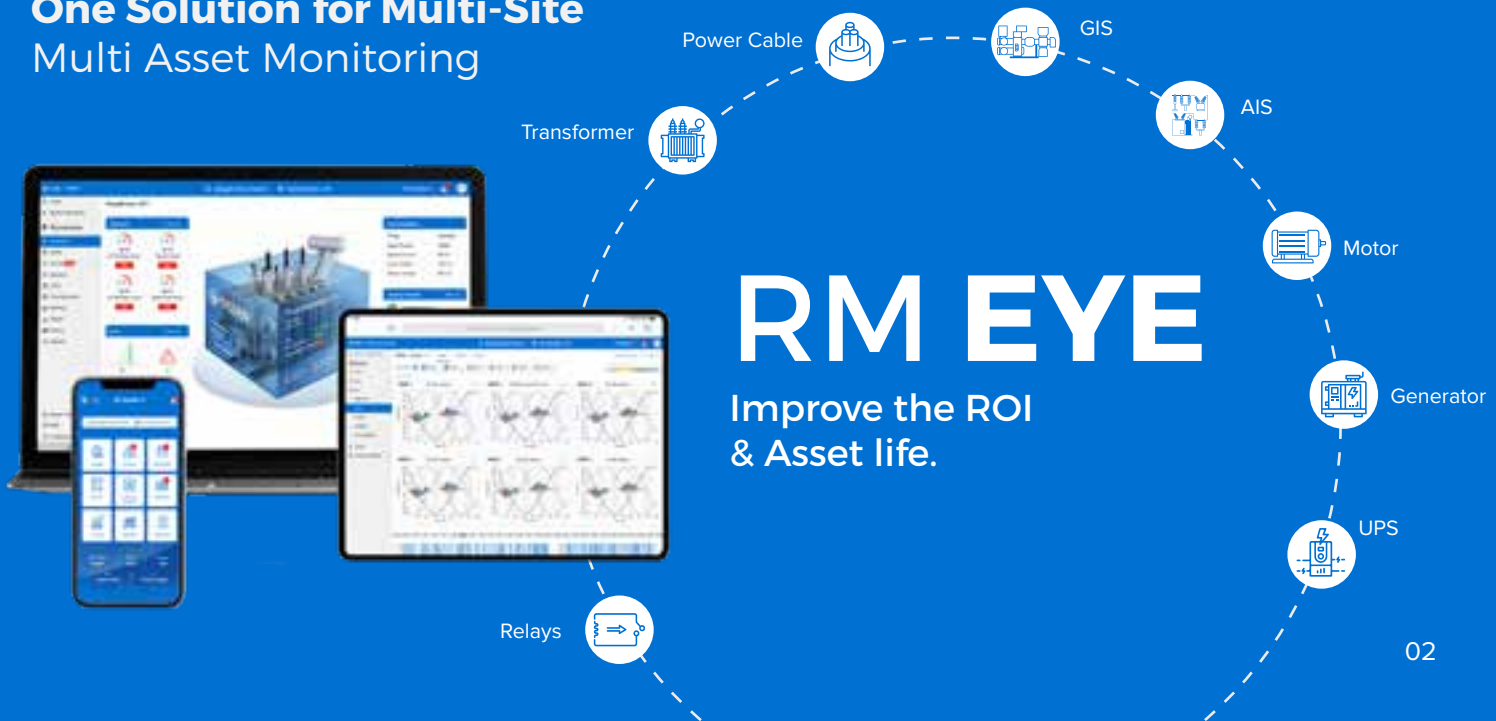
## Benefits

- Avoid unplanned outages
- Reduced risk of catastrophic failure
- Increased asset lifetime
- Reduced Maintenance Costs
- Ensuring reliable operation
- Seamless Integration

## System Architecture



## One Solution for Multi-Site Multi Asset Monitoring



# T401 FEATURES

Comprehensive Features to Meet Market Demand

## Power input

- 24 / 48 Vdc
- Power Supply Unit / Adaptor provided as Accessories (OPTIONAL)

## Relay Outputs

- 08 x Form C Relay contacts
- NO-C-NC
- Cooling control
- Alerts / Alarms

## Analog Outputs

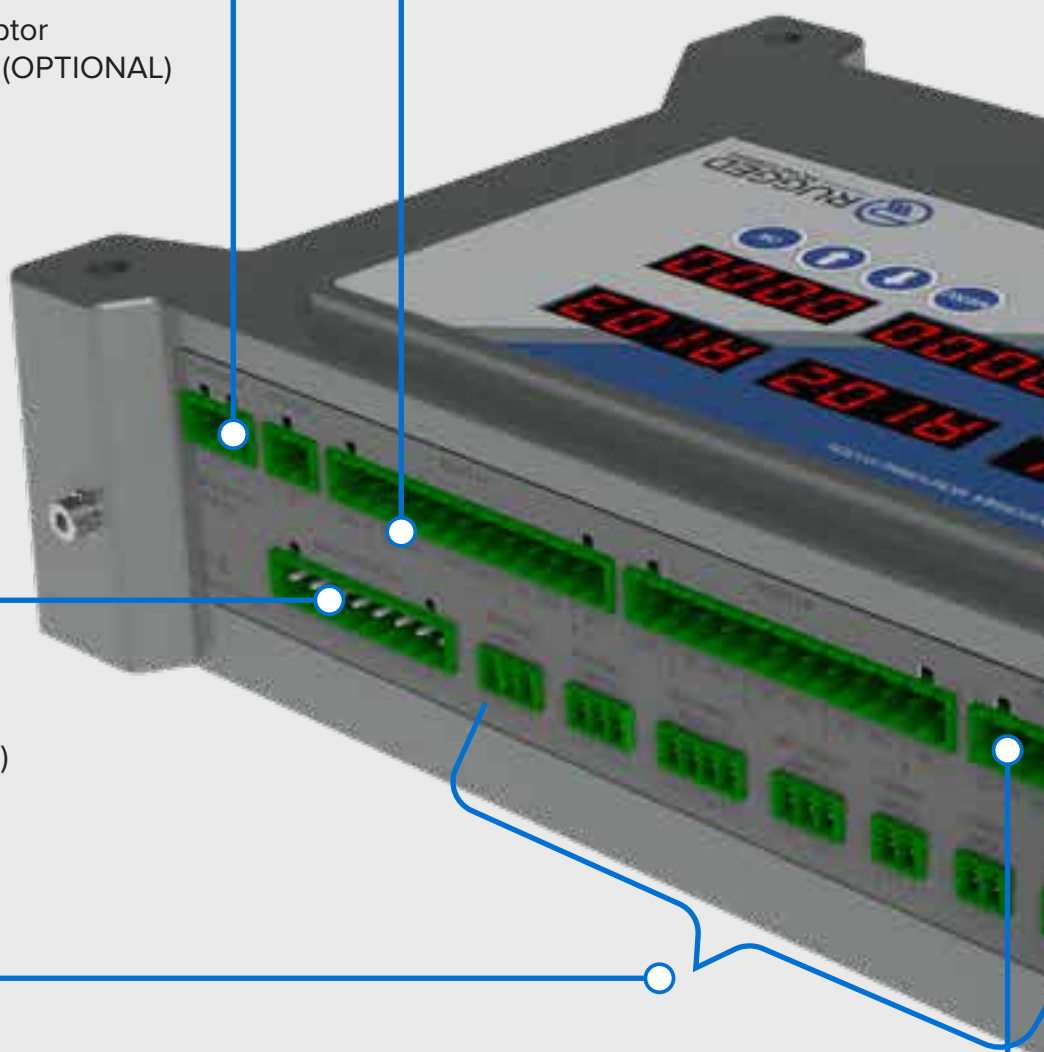
- 04 x User Programmable
- Current Output (4-20mA)
- Voltage Output (0-5V/0-10V)

## Analog / Digital Inputs

- 08 x Configurable Inputs
- RTD (PT-100), Potentiometer
- AC Current (Clamp-On CT), DC current (4-20mA)
- Digital (Dry Contacts)
- AC/DC Voltage

## Serial Port (RS-485)

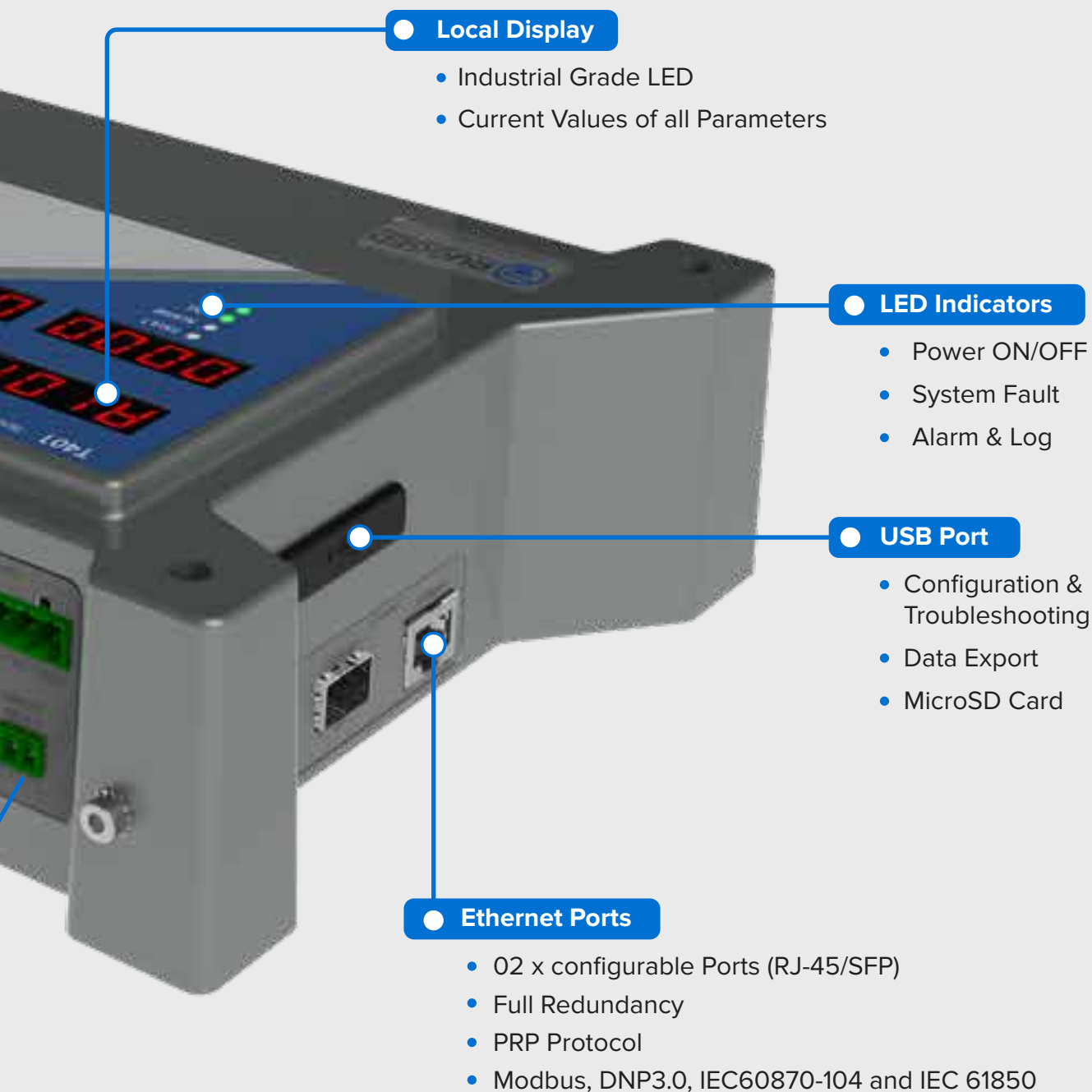
- Data Input/output Integration
- Modbus Protocol
- DNP3.0 Protocol
- IEC60870-104 Protocol



## RUGGED CONNECT SOFTWARE



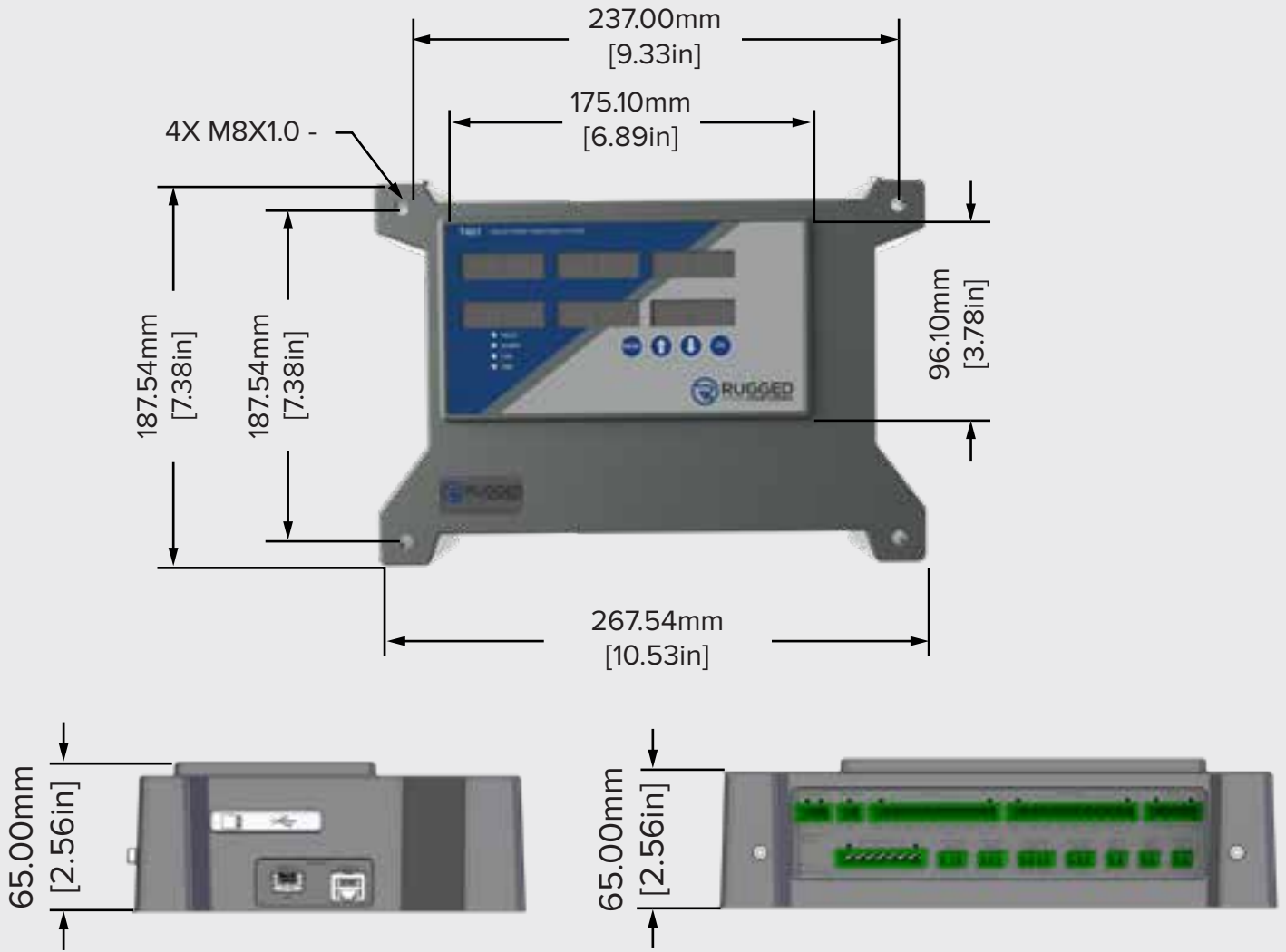
- Desktop and Web Client
- Remote Configuration
- Advanced Visualization
- Data Logging, Reporting
- Supports Industry Standard Protocols
- Customization available on request
- Secure access to data & Configuration
- Multiple Language Support



## Technical Specifications

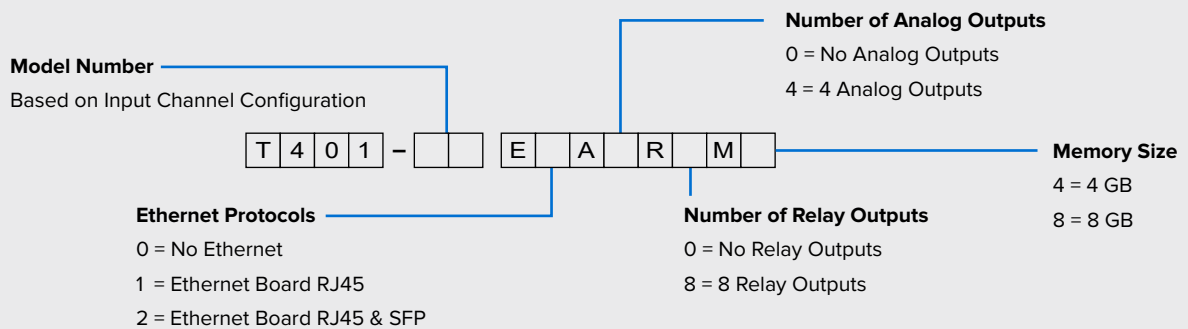
<b>POWER SUPPLY</b>	Input Power Requirement	24/48 VDC $\pm$ 10%
	Power Consumption	20 Watts
<b>ANALOG/DIGITAL INPUT MODULE</b>	# of Input Channels	08/04 Channels
	Input Channel Types	Configurable from a range of input options, RTD, AC/DC current, AC/DC voltage, Potentiometer, Dry/Powered contact switch
	Accuracy of Channels	$\pm$ 0.5% full scale input range
	Input Channel Sample Rate	1 Hz
<b>ANALOG OUTPUT MODULE</b>	# of Output Channels	04 Channels
	Output format	4-20 mA or 0-5Vdc / 0-10Vdc (Configurable for any measured / calculated value)
<b>OUTPUT RELAY MODULE</b>	# of Output Channels	08 Form C relays (5A)
	User Programmable	Yes, from Rugged Connect Software or webserver, if present
<b>DATA STORAGE &amp; CONFIGURATION</b>	Data Storage Capacity	4 or 8 GB, Industrial Grade micro-SD, extendable to 2TB
	Logging Rate	User Configurable, 1 sec interval on USB
	System Fault Indication	1 System Fault Relay, with Local LED light
	Config port	USB (to use with Rugged connect windows software)
<b>COMMUNICATION</b>	Serial Communication	01 x RS-485 (RS-232 optional converter)
	Ethernet Communication	02 Ethernet Ports, configurable to RJ-45 or SFP (Gigabit Optical)
	Redundancy	Support PRP Redundancy
	Protocol Supported	Modbus, DNP3.0, IEC60870-104, IEC61850, Other protocols provided on request
<b>EMC TYPE TESTING</b>	Conducted & Radiated Emissions	ICES-003 (2016), CISPR32 (2015), CISPR11 (2015)
	ESD and EM Field Immunity	IEC61000-4-2, C37.90-3, IEC61000-4-3, C37.90.2
	Fast Transient & Surge Immunity	IEC61000-4-4, IEC61000-4-5, C37.90.2
	Magnetic Field Immunity	IEC61000-4-8, IEC61000-4-10
	Immunity from Conducted Disturbances	IEC61000-4-6, IEC61000-4-16
	Ripple, Dips & Damped Oscillatory	IEC61000-4-17, IEC61000-4-18, IEC61000-4-29
	Safety	IEC60255-26 and CE Certified
<b>ENVIRONMENTAL AND MECHANICAL</b>	Operating Temperature	-40 to 72 °C
	Operating Humidity	95% Non Condensing
	Storage Temperature	-40 to 85 °C
	Dimensions	W26.7 cm x H7.2 cm x D18.7 cm (10.5" x 2.8" x 7.4")
	Weight	App. 1.5 to 2.0 Kg. (based on number of configuration)

Product Drawing



Weight : 2 Kilograms

Odering Code



# Asset Monitoring : Enterprise Architecture

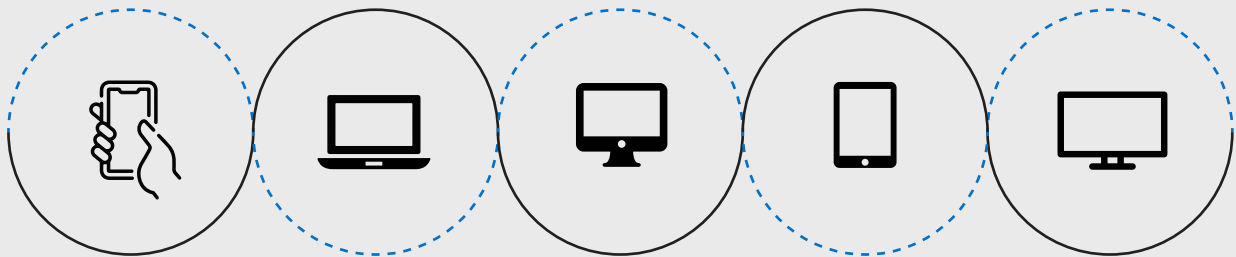
Compatible with Rugged Monitoring Enterprise Solution

## 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**

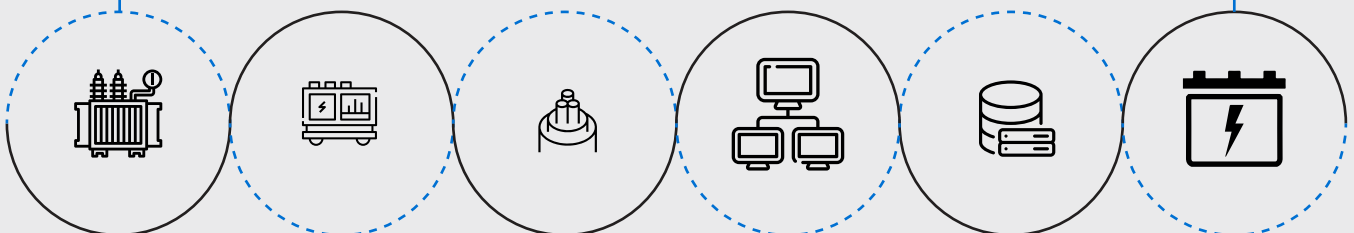
**MODBUS**

**DNP 3.0**

**HTTPS**

**MQTT**

## Asset Data



Transformer  
Monitoring  
System

Switchgear  
Monitoring  
System

Power Cable  
Monitoring  
System

- Offline Test Results
- Inspection Records
- Name Plate

- Historian
- CMMS
- SCADA/ DCS

Power Electronics  
(Battery, UPS,  
VFD, Relay)



# 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?

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



# Our Presence Across the Globe



## Head Office

 **Canada**

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

[Asia Pasific](#) | [India](#) | [Europe](#) | [Latin America](#) | [Middle East](#) | [North America](#)

## 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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 [info@ruggedmonitoring.com](mailto:info@ruggedmonitoring.com)

 [www.ruggedmonitoring.com](http://www.ruggedmonitoring.com)

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