RUGGED MONITORING

MONITORING SIMPLIFIED

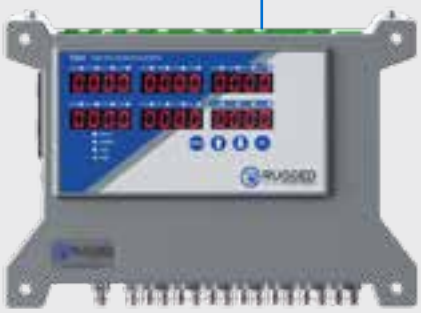
T501

Advanced Monitoring Solution for Multiple Electrical Assets

Transformer	Gas Insulated Switchgear	MV Panel Switchgear	Air Insulated Switchgear	Rotating Machines	Power Cable
					

Robust | Reliable | Responsive

T501 Advanced Monitoring Solution for Multiple Electrical Assets



Rugged, Most Versatile and Multi-Channel monitoring solution, Capable of monitoring various electrical Assets: Basic Asset Monitoring, Fibre Optic Temperature Monitoring, Partial Discharge, Bushing, OLTC, Load, Power, and more...

T501 is the most advanced monitoring solution designed to monitor multiple electrical assets types with its simple and user-friendly interface. T501 along with customized sensors for specific requirement 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. The system along with sensors, monitors, and software (Rugged Connect/ RM EYE) is customizable as per the specifications. The solution can be used for existing (retrofit applications) or new electrical assets.

Our T501 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 major breakdown occurs. T501 is precisely designed to monitor all electrical asset types and to provide a greater visibility into the assets.

- Simple visualization & easy to configure
- Equipped with most accurate & advance health assessment analytics
- Range of communication options and protocol support; ethernet redundancy (PRP)
- Highly secure, web server-based visualization and configuration software

Applications

Transformer Monitoring (Oil Filled / Dry type)

Motors/Generators Monitoring (DOL / VFD)

Cable Monitoring (EHV / HV / MV)

Switchgear Monitoring (GIS / AIS / MV Panel)

Benefits

- Improved asset reliability
- Accurate predictive analysis
- Access asset data from anywhere
- Increased asset lifetime
- Highest return on investment
- Field upgradable with no device downtime

System Architecture

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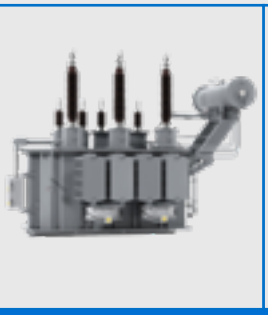
T501
Temperature
Monitoring Solution

RM EYE
Monitoring Software

Transformer or **Gas Insulated Switchgear** or **MV Panel Switchgear** or **Air Insulated Switchgear** or **Rotating Machines** or **Power Cable**






One Solution for Multi-Site
Multi Asset Monitoring

RM EYE

Improve the ROI
& Asset life.

T501 **FEATURES**

Comprehensive Features to Meet Market Demand

Relay Outputs

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

Power input

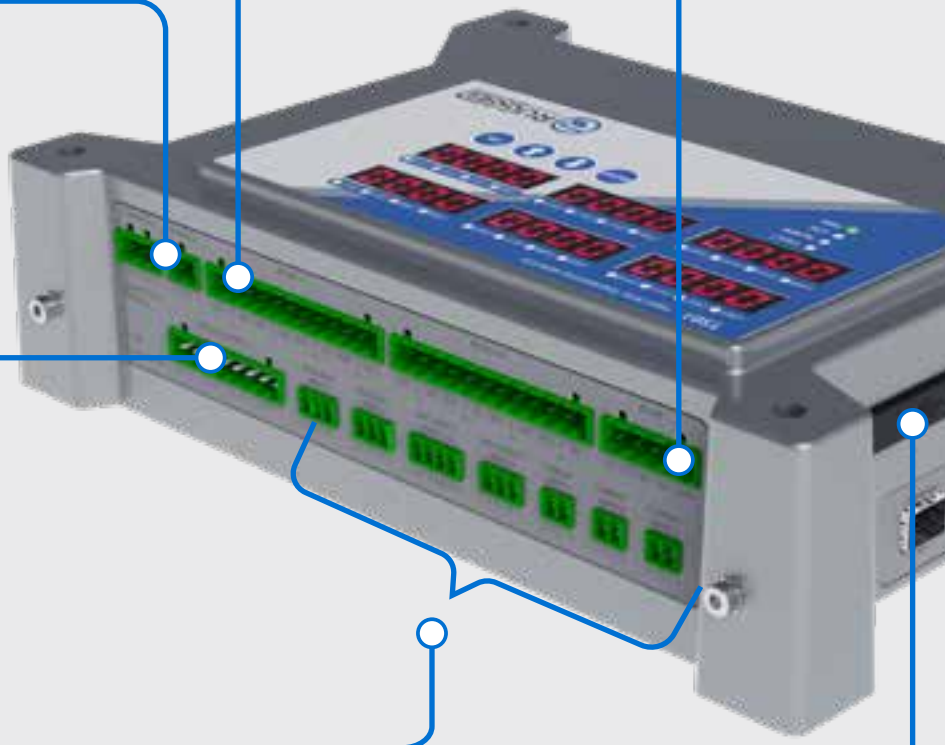
- 24 / 48 Vdc
- Power Supply Unit / Adaptor provided as Accessories (OPTIONAL)

Analog Outputs

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

Serial Port (R485)

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



Analog / Digital Inputs

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

USB Port

- Configuration & Troubleshooting
- Data Export
- MicroSD Card

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

Ethernet Ports

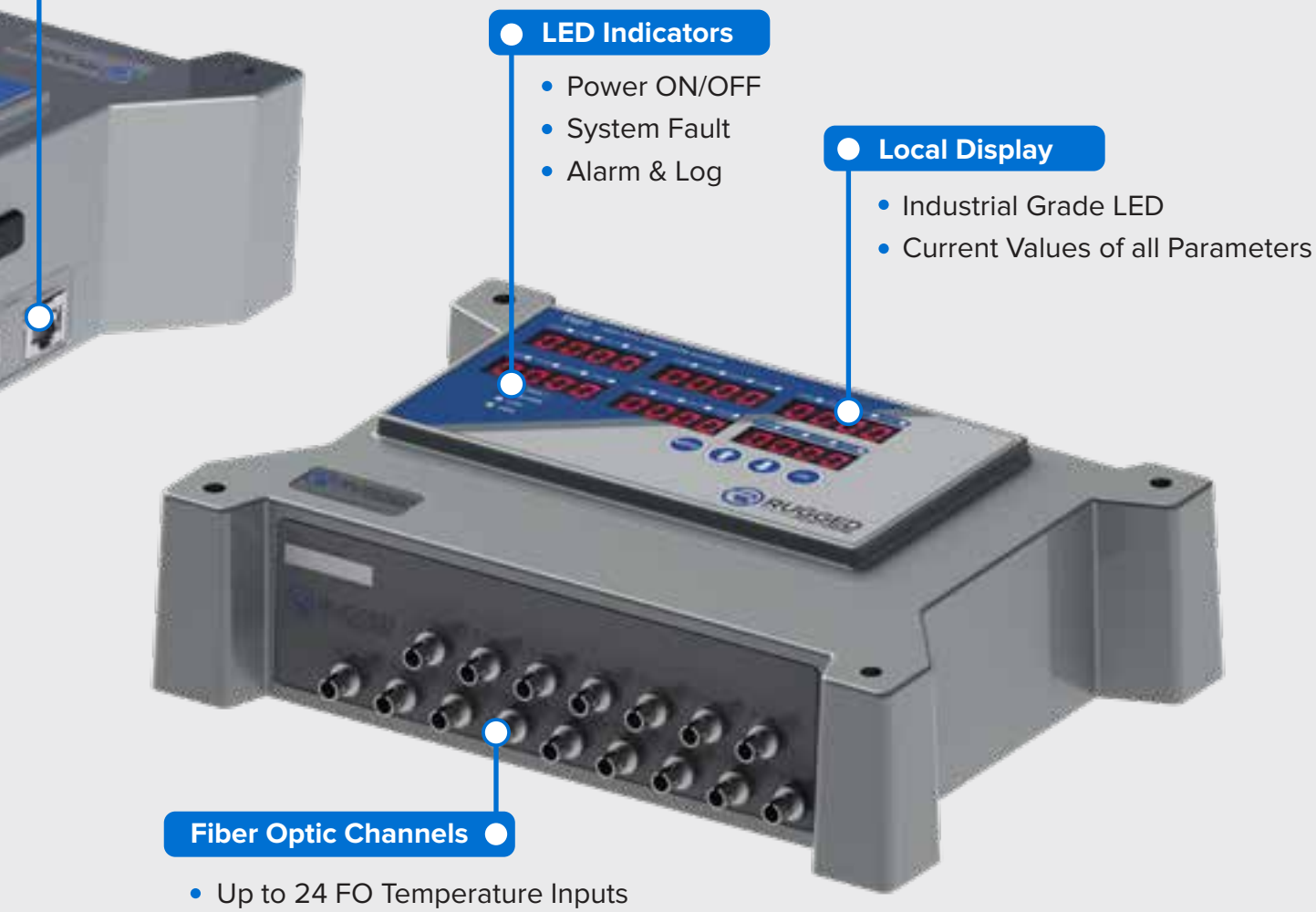
- 02 x configurable Ports (RJ-45/SFP)
- Full Redundancy
- PRP Protocol
- Modbus, DNP3.0, IEC60870-104 and IEC 61850

LED Indicators

- Power ON/OFF
- System Fault
- Alarm & Log

Local Display

- Industrial Grade LED
- Current Values of all Parameters



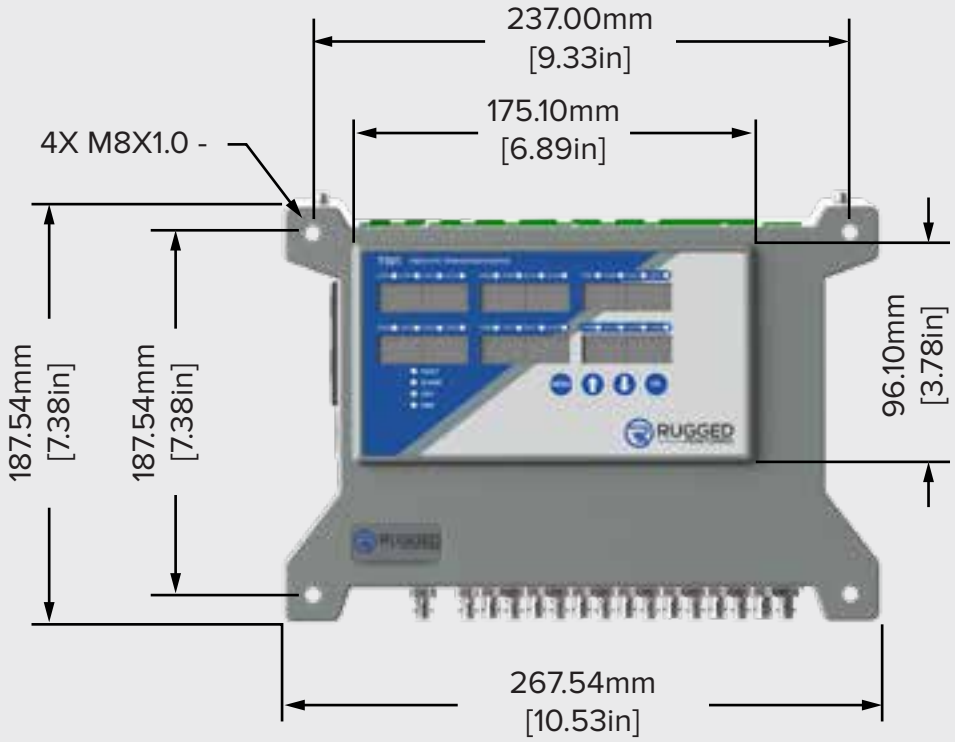
Fiber Optic Channels

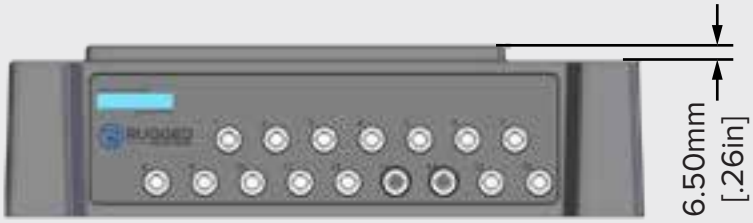
- Up to 24 FO Temperature Inputs
- GaAs based technology
- Built-In Self Test feature
- Higher Signal Strength

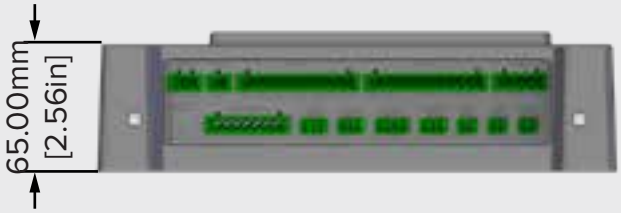
Technical Specifications

POWER SUPPLY	Input Power Requirement	24/48 VDC ± 10%
	Power Consumption	20 Watts
ANALOG/DIGITAL INPUT MODULE	# of Input Channels	08/04 Channels
	Input Channel Types	Configurable from a range of input options, RTD, AC/DC current, Potentiometer, Dry contact switch
	Accuracy of Channels	±0.5% full scale input range
	Input Channel Sample Rate	1 Hz
FIBER OPTIC MODULES	Measurement Range	-80 °C to +300 °C (cryogenic 4 °K range optional)
	Resolution	0.1 °C
	Accuracy	±1.0 °C (±0.2 °C in relative temperature)
	Scan Rate	200 ms / channel (Optional: Faster scanning rates available)
	Number of Channels	2 to 24 channels
ANALOG OUTPUT MODULE	# of Output Channels	04 Channels
	Output format	4-20 mA or 0-5Vdc / 0-10Vdc (Configurable for any measured / calculated value)
OUTPUT RELAY MODULE	# of Output Channels	08 Form C relays (5A)
	User Programmable	Yes, from Rugged Connect Software or webserver, if present
DATA STORAGE & CONFIGURATION	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)
COMMUNICATION	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
EMC TYPE TESTING	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
ENVIRONMENTAL AND MECHANICAL	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

Number of Input Channels
Ex:08 = 8 Channels

Number of Analog Outputs
0 = No Analog Outputs
4 = 4 Analog Outputs

Number of FO Channels
Ex:08 = 8 Channels

T 5 0 1 – [ ][ ] – I [ ] – E [ ] A [ ] R [ ] M [ ]

Memory Size
4 = 4 GB
8 = 8 GB

Ethernet Protocols
0 = No Ethernet
1 = Ethernet Board RJ45
2 = Ethernet Board RJ45 & SFP

Number of Relay Outputs
0 = No Relay Outputs
8 = 8 Relay Outputs

DS0058R01_T501 MA_EN_A4

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.

ruggedmon

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