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

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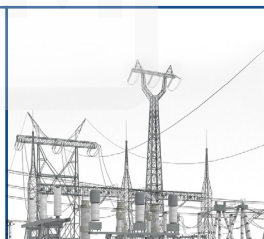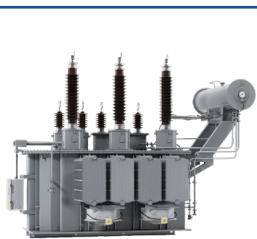

T401
Temperature
Monitoring Solution
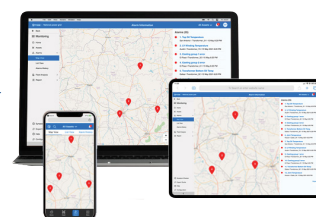
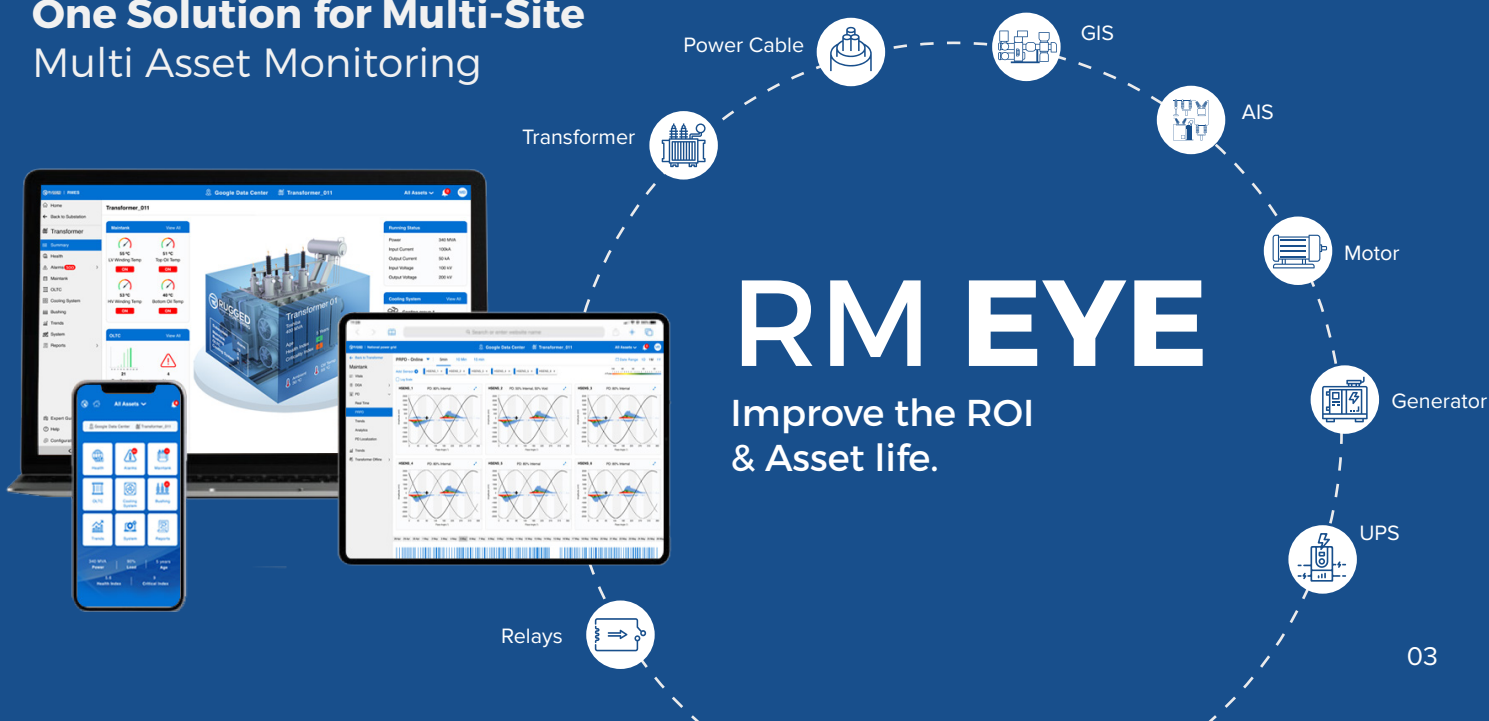**RM EYE**
Monitoring Software

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.

Power Cable

GIS

AIS

Transformer

Motor

Generator

UPS

Relays

T401 **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)
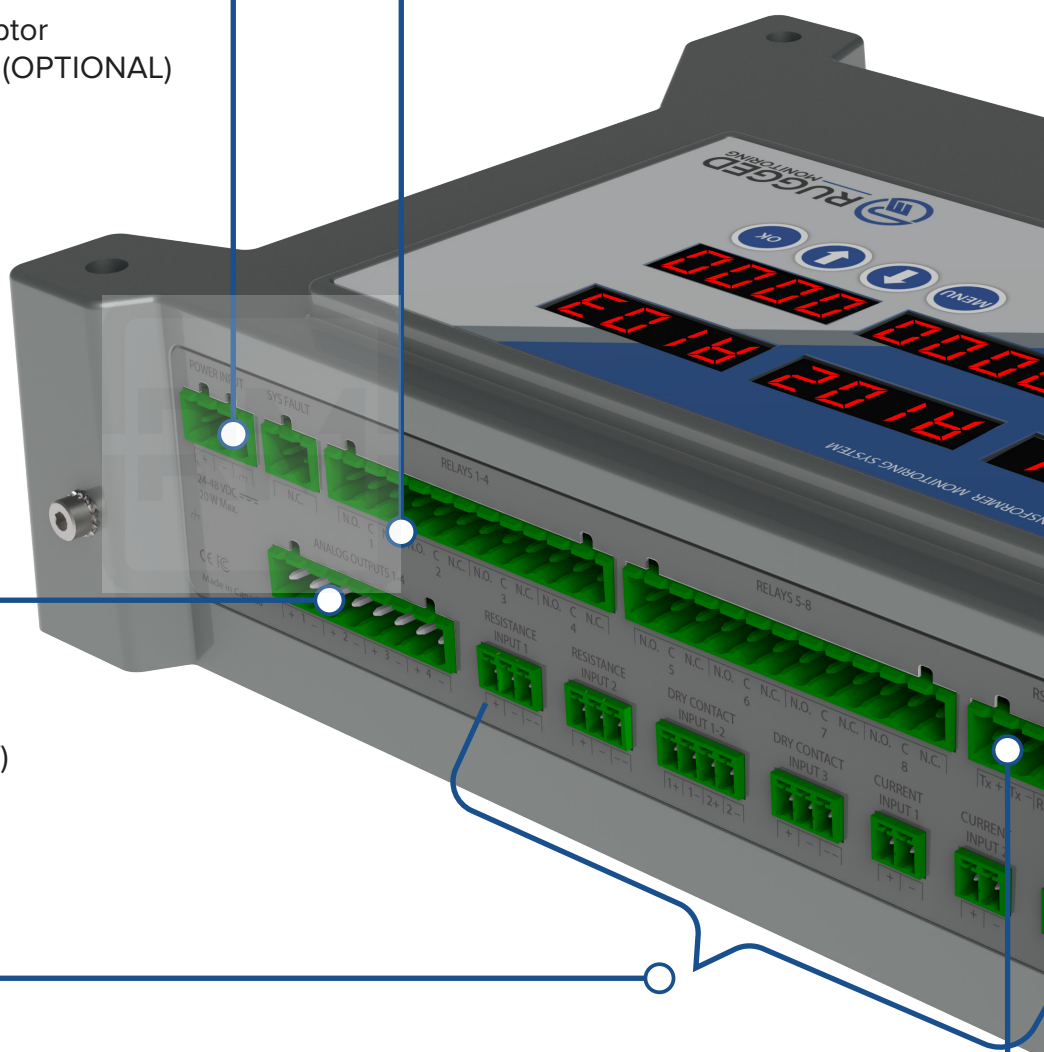
Analog Outputs

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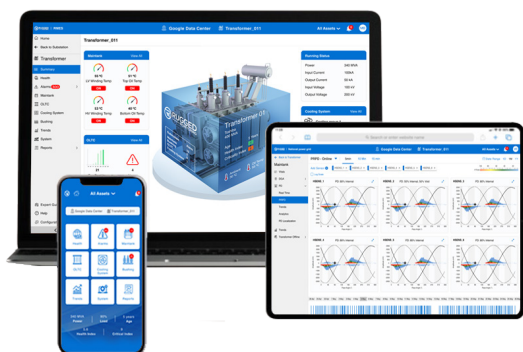- Current Output (4-20mA)
- Voltage Output (0-5V/0-10V)

Analog / Digital Inputs

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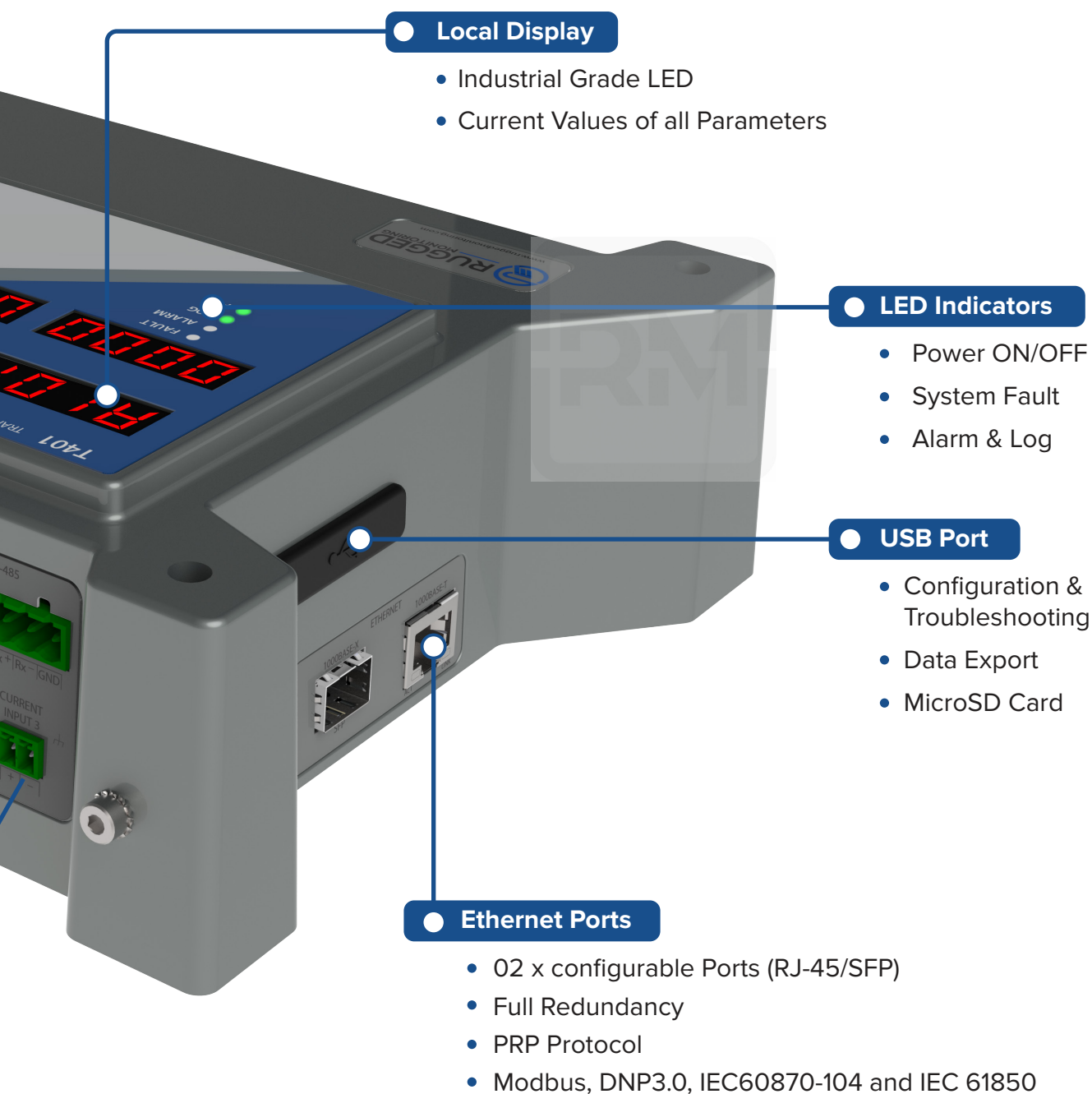- AC/DC Voltage

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

Local Display

- Industrial Grade LED
- Current Values of all Parameters

LED Indicators

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

USB Port

- Configuration & Troubleshooting
- Data Export
- MicroSD Card

Ethernet Ports

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

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, AC/DC voltage, Potentiometer, Dry/Powered contact switch
	Accuracy of Channels	±0.5% full scale input range
	Input Channel Sample Rate	1 Hz
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°C to 72 °C
	Operating Humidity	95% Non Condensing
	Storage Temperature	-40°C 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
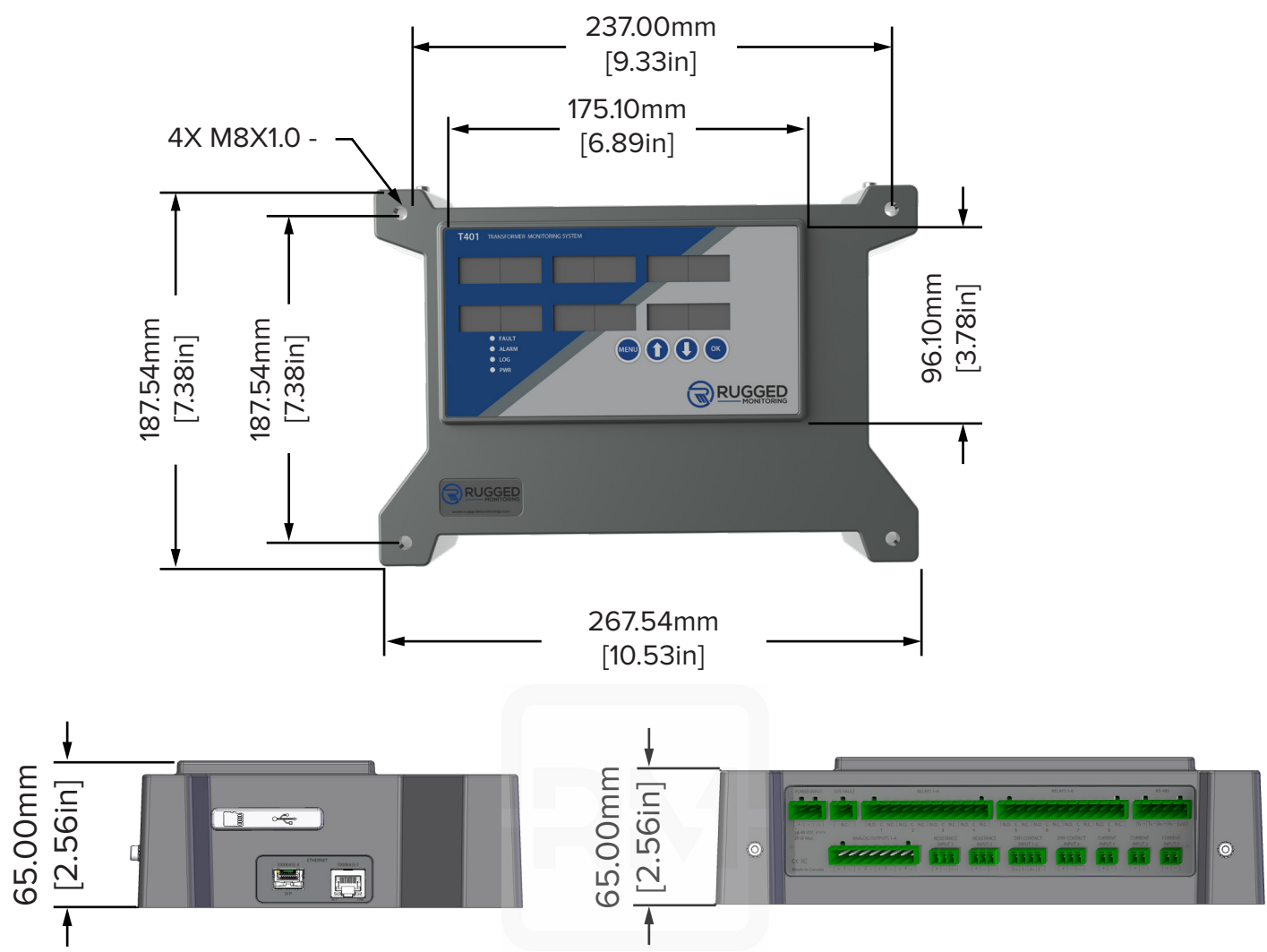
Weight : 2 Kilograms

Ordering Code

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

Model Number
Based on Input Channel Configuration

T 4 0 1 – ☐ ☐ E A R M ☐

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

Memory Size
4 = 4 GB
8 = 8 GB