



# T301

## Rugged Fiber Optic Temperature Monitor



Aerospace



Industrial



Oil & Gas



Energy



Emobility



Defense

**Rugged, Compact and Robust Temperature Monitoring System for Continuous Online Monitoring and Testing**

# T301 Rugged Monitoring Temperature Monitor



**Rugged design, designed for reliability, multichannel fiber optic temperature monitor for Industrial and Laboratory applications.**

Drivers :



USB



LABVIEW



MATLAB



PYTHON

The Rugged Monitoring T301 is a multi-channel fiber optic temperature monitor with precision measurement for Industrial and Laboratory applications. The T301 Fiber optic monitor combines compact form factor and user friendly interface in the monitor and software. It is designed to operate reliably in extreme EMI, RFI, Microwave and high voltage environments. The T301 has a measuring range from -271 °C to +300 °C. The system offers complete immunity to RFI, EMI, Chemical, microwave radiation, and high voltages making it an optimal choice for environments where the limitations of conventional temperature sensors / monitors impact usage in extreme conditions. The system is based on proven zero-drift GaAs technology and designed for Plug and Play operation.

The T301 is designed to collect data and to easily integrate into existing systems through serial communication like RS-485 or Gigabit Optical Ethernet. The T301 monitor comes with Rugged Connect software which is designed with the needs of Test Platform or Industrial Process monitoring integration needs. It has the data integration capability of multiple test platforms. Rugged Connect software is designed to collect data from 256 channels simultaneously. Plug and Play functionality provides the flexibility to interchange sensors without the inconvenience / concerns of calibration. Rugged Monitoring has a dedicated team for application specific customizations for fiber optic sensors, monitor configuration and software integration to simplify the data collection of testing and monitoring applications.

## Applications

- Transformer Hot Spot monitoring
- Industrial process control and monitoring
- Electric Vehicle and Battery Testing
- Medical Equipment testing (MRI, PETSCAN, NMR)
- Commercial Grade Microwave Radiation
- Food and Beverage Processes

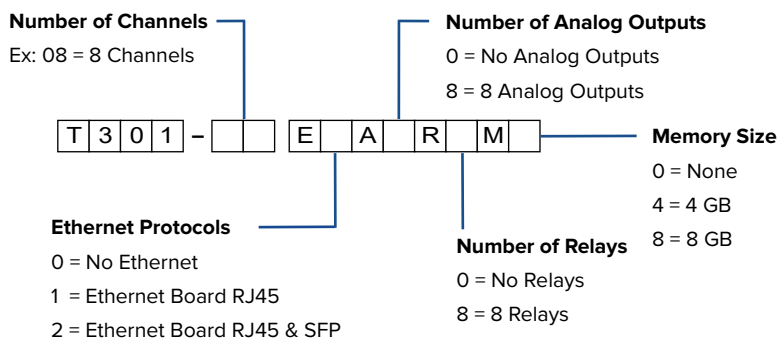
## Features

- Rugged, Compact Design
- 4 to 24 Channels, Expandable
- Plug and Play, No field calibration
- Best in class EMI, ESD Immunity
- 8 Programmable relays, Form - C
- Software designed to be interfaced with other testing platforms

## Benefits

- No shift over time, high stability
- Robust packaging
- Each Monitor comes with a complete NIST calibration Certificate
- Software designed for integration into test platforms
- Robust datalogging and analytics
- Customizable according to customer specific applications
- Suitable for OEM-type applications.

## Ordering Code



## Technical Specifications

Measurement Range	-80 °C to +300 °C (cryogenic 4 °K range optional)
Measurement range (Optional Range extensions)	Down to 2 °K / Up to +300 °C
Power Supply	24V to 48V DC, 30 W
Resolution	0.1 °C
Accuracy	±1.0 °C (±0.2 °C in relative temperature)
Scan rate	200 ms / channel
Memory	MicroSD external memory slot (Up to 2 TB)
Logging	10 years at 10 sec interval rate (8 GB)
Serial Port	RS-485 with Modbus
Ethernet Option	RJ-45 or Fiber Ethernet; Optional PRP support built-in 2 x RJ-45 or Fiber Ethernet; With advance communication protocols (IEC 61850, Modbus over Ethernet, IEC 60870-5-104 and DP3)
Fiber Optic Communication	SFP module can be added to the Ethernet option; the standard SFP module is compatible with LC fiber connectors (850 nm multimode communication with a distance capability of 550 meters)
Analog Outputs	8 fully configurable 0-10 V / 4-20 mA optional module available - Optional
Max # of Channels	256 Channels, Daisy chain up to 32 units (with Modbus)
Relays	8 Programmable Form-C Relays (5A) plus 1 system fault relay - Optional
Operating temp	-40 to 72 °C
Storage temp	-40 to 85 °C
Number of Channels	4 - 24 channels
Dimensions	10.5" x 7.4" x 2.8" 26.7W x 18.7D x 7.2H cm
Humidity	95% Non Condensing



# Fiber Optic Transformer Sensor (Tsens)

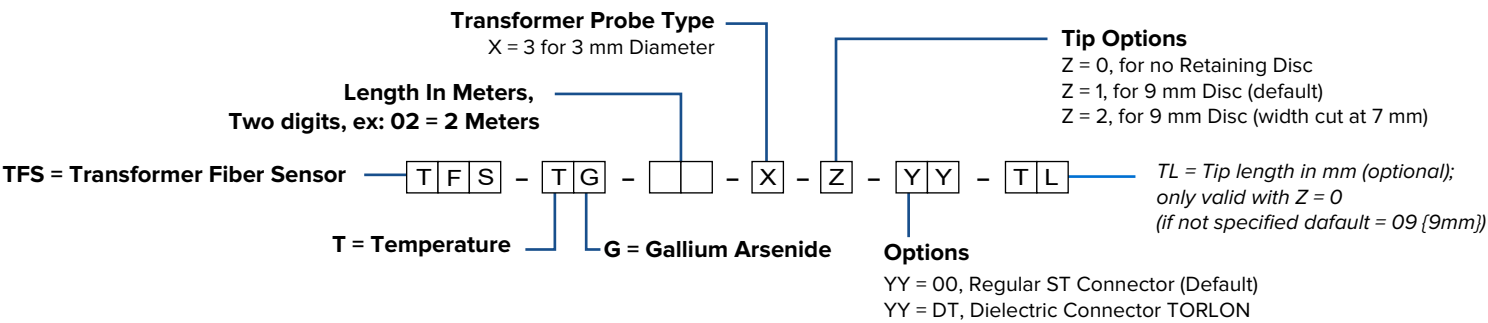
## Features

- Suitable for dry-type and oil-filled transformers
- Compatible with all types of transformer oil, including ester type
- Meets and surpasses ASTM D3426 and D-149 standards
- Extremely low PD performance
- Compatible with kerosene vapor drying process

## Specifications

- Improved design (patent pending)
- Measuring range: -80 °C to 250 °C
- Response time of ~ 1 sec
- Available in any lengths, up to 25 meters
- With industry standard ST connector
- Solid Torlon disk tip, diameter 9 mm
- Designed to exceed Transformer life

## Ordering Code



# Feedthrough

## Features

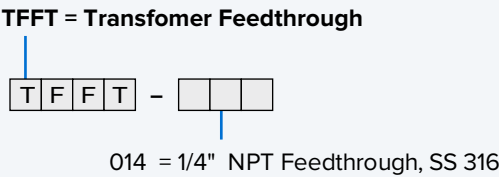
- Easy installation, No O-rings design
- Optional pre-installation in TWP
- Designed to reduce loss of light, critical to reliability



## Specifications

- Zirconia connector: Better optical transmission
- Stainless steel 316L construction
- Wide temperature and pressure ranges

## Odering Code





## Tank Wall Plate

### Features

- With O-Ring or customer supplied gasket
- Compatible with RM Interface Box (optional bolting provision)

### Specifications

- Diameter of 275 mm
- Stainless steel 316L construction
- Up to 25 feedthroughs

### Ordering Code

**Number of OFT's**  
Example: 08 = 8 OFT's

**Assembly Options**  
0 = Welded  
1 = Bolted with Viton O-ring  
2 = Bolted and Flat for gasket seal

**Interface Box (i-Box)**  
0 = No i-Box  
1 = With i-Box (bolting provision)

**TPLT = Transformer Tank Wall Plate**

Ordering Code Format: **T P L T** - **[ ] [ ]** - **A** - **I B**

## Extension Cable

### Features

- PVC sheathing (outside transformer)
- Teflon sheathing is mandatory with dielectric connector (inside transformer)



### Specifications

- PVC sheathing (outside transformer)
- Teflon sheathing is mandatory with dielectric connector (inside transformer)

### Ordering Code

**Length in Meters, Ex: 02 = 2 Meters**

**Cable Sleeve**  
P = PVC (Default)  
T = PTFE Teflon

**FOXT = Fiber Optic Extension Cable**

**XX = ST, Metal Connector (Default)**  
**XX = DC, Dielectric Connector at one end**

Ordering Code Format: **F O X T** - **[ ] [ ]** - **P** - **S T X X**



## Interface Box

### Features

- Leak proof design (IP66)

### Ordering Code

**Transformer Interface Box** - **T I B X** - **A C C**

### Specifications

- Size 200 x 200 mm, 150 mm high
- With neoprene gasket
- Stainless steel 316L construction throughout

## Dielectric Connector

### Features

- Designed to be used inside transformers
- Great to repair probes on site
- Used to extend short probes inside Transformer

### Specifications

- Suitable for HV/EHV applications





# Asset Monitoring : Enterprise Architecture

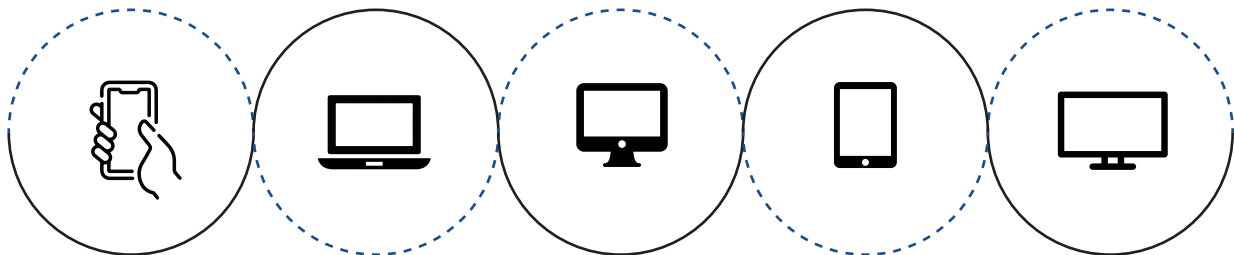
Compatible with Rugged Monitoring Enterprise Solution

## 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**

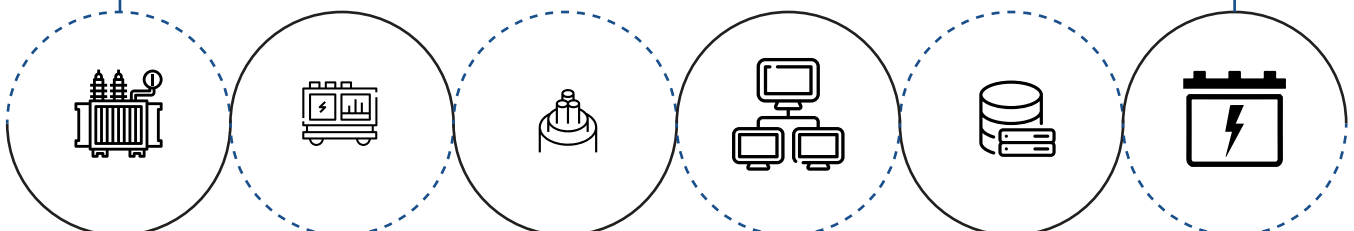
**MODBUS**

**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 Advanced Asset Performance Management System

**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: IEC 61850, MODBUS, MQTT**
- **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 Detail

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.



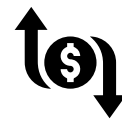
## Experts only

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





## 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.

# Certification



ISO 9001



ISO 14001



ISO 45001/  
OHSAS 18000



Lloyd's  
Register



ATEX  
Certification

# Our Presence Across the Globe



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