TM Series

Wireless Busbar Temperature Monitoring

TM 2700

Busbar Temperature Sensors

DLY Electronic

TM 2700

Always-ON Thermography for your Busbars

Wireless Busbar Temperature Monitoring

TM Series Introduction

The TM Series (TM 2700) delivers continuous, in-panel visibility of thermal risk at busbar joints and terminals. Strap-on, battery-powered sensors measure surface temperature every few seconds and report to a panel-mounted Field Intelligent Device (FID). The FID displays live channel values and forwards data over RS-485 Modbus to EMS or plant SCADA for trends, thresholds, and alarms.

The Need for Temperature Monitoring

Hidden temperature rise at bolted joints is an early precursor to arcing and failure. Continuous sensing fills the gaps between periodic IR inspections and provides an auditable record for safety and insurer reviews.

- High currents and continuous loads concentrate stress at joints and links.
- Even small temperature deltas at a lug often precede derating and eventual failure.
- Manual IR inspection rounds are periodic snapshots; they miss off-hours build-up.
- A simple, retrofit sensor at the busbar or the joint gives you the earliest signal for proactive management.

Key Benefits of TM Series

- **Current-vs-Temperature Visualizations:** Correlate load and heat to spot loose connections, phase imbalance, and fix overloads early.
- **Condition-based Monitoring:** Live color states turn complex data into clear insights for action, reducing noise and speeding response.
- **No rewiring:** Wireless strap-on sensors make it ideal for retrofit or space-constrained panels.
- **Actionable Alarms:** Set high/low points and get alerts over SMS/email; optional **trip/feeder-OFF** through authorized IIoT control.

Local FID

Field Information Device

Wireless Sensors

BUSBARS

Cloud & SCADA Integration for
Continuous Busbar Monitoring

TM Series Wireless Operation

Sensors mounted on each phase/joint sample temperature every few seconds and communicate with a panel-mounted FID. TM 2700 supports up to 27 sensors. The FID displays live temperatures and is enabled with RS-485 Modbus for integration with Theiox™ IoT EMS or local plant SCADA. Dashboards provides graphical current-versus-temperature overlays, color-coded states, configurable thresholds, and SMS/Email notifications with acknowledgment tracking.

IoT Real-time Monitoring

Secured IoT Cloud Platform

Network Gateway

Field Information Device [FID]

Wireless Sensors
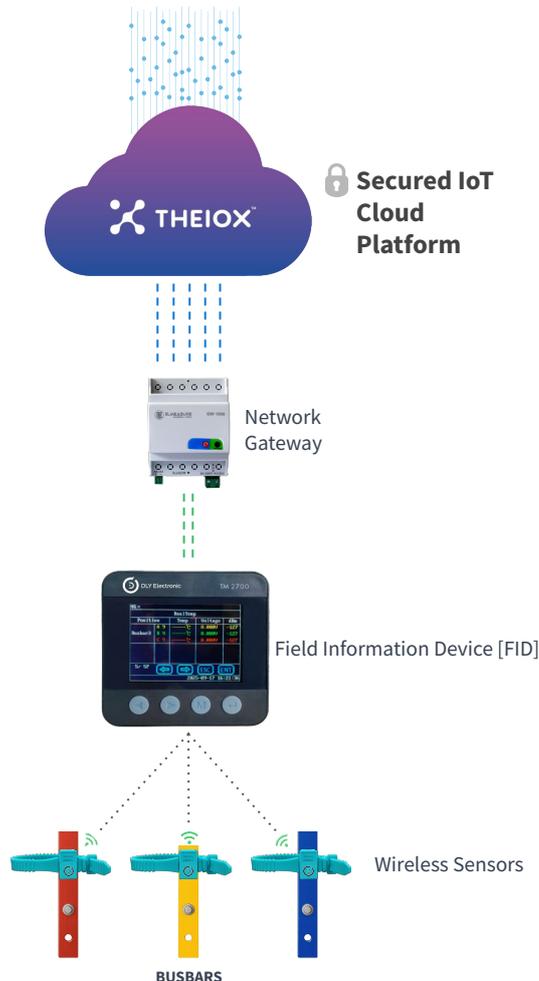
BUSBARS

Continuous Thermal Assurance for Critical Applications.

Audit-ready busbar monitoring for assured safety and uptime.

Continuous thermal monitoring at busbar joints and terminals reduces electrical risk and unplanned downtime. TM Series enables early alerts, clear trends and an auditable history across diverse operating environments.


Industrial/Heavy Machineries

Frequent starts, vibration, and sustained high currents drive gradual heating at lugs and links. The wireless sensors monitor these points continuously and report to the FID, which integrates over RS-485/Modbus with plant SCADA. Trends highlight loosening joints or overload conditions, enabling scheduled tightening during maintenance windows instead of emergency repairs.

Solar Plants / Substations

Diurnal cycles, weather, and variable generation create thermal stress on busbar joints and interconnects. The solution watches these locations around the clock, applying threshold and rate-of-rise alarms to catch emerging hotspots. Dashboards and exports provide clear evidence for operational reviews and insurer audits. Remote visibility reduces site visits and accelerates response across dispersed yards and inverter galleries.
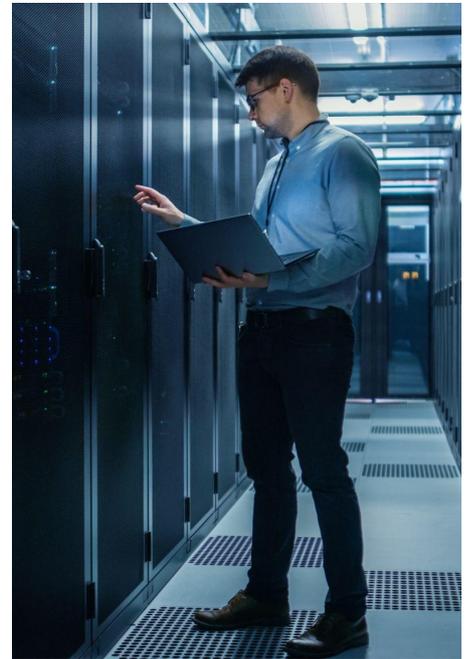
Data Centers / Telecommunication

Continuous loads in UPS, PDU, and riser busbars elevate joint temperatures long before a visible fault. The system provides uninterrupted, in-panel temperature tracking with ΔT and rate-of-rise logic, so engineers act before thresholds are exceeded. Current-versus-temperature overlays in Theiox/SCADA make root cause clear, while SMS/Email alerts escalate issues to the on-call team. Fast, retrofit installation and auditable records protect uptime and support SLA commitments.

Technical Specifications

Field Information Device [FID]	TM 2700
GENERAL CHARACTERISTICS	
Wireless frequency	2.4GHz (433MHz optional)
Max. sensors per FID	Up to 27 wireless sensors
Communication Protocol	Modbus RTU over RS485 communication interface
Communication interface	RS485 communication interface,communication distance ≤1200m (no repeater)
Baud Rate Options	1200, 2400, 4800, 9600 bps (selectable)
Default Alarm Limits	Low: -35℃, High: +85℃
Default Alerts Limits	Low: -25℃, High: +65℃
Digital Relay O/p	1× (AC 220V, 5A; Passively NO/NC)
Working Voltage	85–265V AC / 110–370V DC
Power Consumption	≤5VA
ENVIRONMENTAL CHARACTERISTICS	
Operating Temperature	-10°C to +70°C (14°F–158°F)
Humidity	≤ 90% Relative Humidity non-condensing
Altitude	Below 2500m
Insulation Resistance	≥100MΩ(Temperature is in 10~30℃, and RH <80%)
Ingress Protection	IP 20
Wireless Sensors*	
GENERAL CHARACTERISTICS	
Temperature measurement range	-25℃ up to +100℃
Measurement accuracy	±1°C (0–75 °C); ±2°C (full range)
Temperature sampling frequency	~25 seconds
Wireless frequency	2.4GHz (433MHz optional)
Wireless transmission distance	≤10 meters (2.4GHz) / ≤50 meters (433MHz)
Battery life	8 years

Characteristics of the wireless sensor alters based on the connected FID (TM 900 / TM 2700)

Mechanical Specifications

FID / Host

Code	L x h (mm)	S x Y (mm)	Minimum Distance		N
			Horizontal (mm)	Vertical (mm)	
42	120 x 120 x 65	111 x 111	120	120	80
96	96 x 96 x 65	91 x 91	96	96	80
80	80 x 80 x 65	76 x 76	80	80	80
72	72 x 72 x 65	67 x 67	72	72	80

Field Information Device [FID]

Wireless Sensor

Sensor dimension *(Main body)*	38mm x 35mm x 24mm
Sensor strap length	385mm
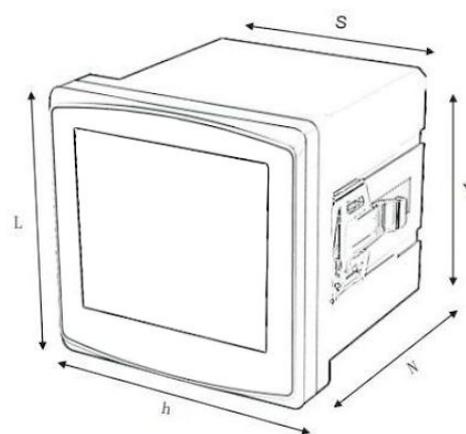
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