

# TRACENET™ TN SERIES CONTROL AND MONITORING SYSTEM



THERMON The Heat Tracing Specialists®



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## INTRODUCTION

Heat trace has become increasingly important for efficient and reliable operation of industrial process plants. This is true for both freeze protection (winterization) systems and those maintaining higher process temperatures.

Process specifications call for increased heat tracing surveillance with high reliability, increased safety, more efficient energy management and lower operating costs.

## ENVIRONMENTALLY TOUGH

The world's appetite for oil and gas continues to grow, and there are challenges for systems to operate in harsh arctic environments.

Likewise, the demands on electrical heat trace controls and monitoring systems for refineries and chemical plants in harsh desert climates are increasing.

**TraceNet systems are proven to operate in ambient temperatures as low as -40°C or as high as +60°C.**

## THERMON'S SOLUTION

The NEW TraceNet system is an extension of the proven Thermon TC101, TC202, and TC1818 control and monitoring systems. TraceNet introduces modular construction that provides:

- Design Versatility
- Reduced Assembly Times
- Reduced Fabrication Cost
- Easy Expansion for the Future.
- Resistance to Vibration and Shock



## REDUCED FIELD WIRING

To reduce field wiring, RTD Sensors can be multiplexed via CAN bus back to a central panel. Repeaters can be located in the "RTD POD" to extend the ranges beyond the standard 300 m.

Remote "RTD POD's" can be employed to maximize multiple RTD sensors.

## LOWER TOTAL COSTS

For some companies the issue is design simplicity; for others lower installation costs. Owners continue to call for preventive maintenance to reduce downtime, provide efficient energy management, and lower operating costs. TraceNet accomplishes all of these objectives!



# WITH OVER 50 YEARS OF EXPERIENCE THERMON HAS THE SOLUTION FOR YOUR HEAT TRACING NEEDS

## CONTROL

TraceNet allows each six-circuit control module to operate independently and provides several different control options:

- On/Off Control
- On/Off Control with Soft Start
- Proportional Control and/or
- APC (Ambient Proportional Control)

## LOAD SHED

TraceNet systems provide load shedding to reduce facility energy consumption with one of five different priority levels assigned for each controlled heat trace circuit. TraceNet load shed functions can be scheduled routinely during periods of peak energy demand or can be manually activated on an event-by-event basis.

**TraceNet controls up to 180 circuits operating from 100 to 600 Vac**

## MONITORING

- Low & High Temperature Alarms (including independent high temp trip function)
- Up to 6 RTD sensors per heat trace circuit
- Low & High Heater Current Alarms (with high current trip function), and
- High Ground / Earth Leakage Current Alarm (with separate trip function)

**Up to 6 RTD sensors per heater or 540 sensors from a single TraceNet touch screen monitor.**

## Reduced Energy Consumption = Lower Operating Costs

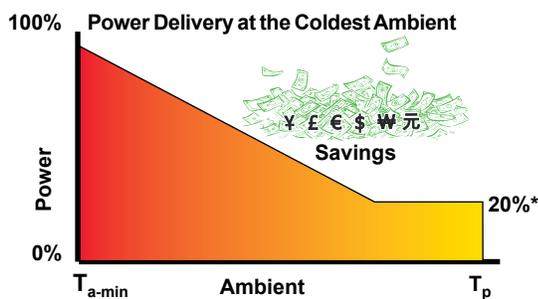
Electrical heat trace is designed based on heat losses during the coldest ambient conditions expected. In some cases this may represent miles of pipe in an arctic environment requiring several hundred kilowatts of electrical power.

Conventional ambient control uses one or two sensors to energize contactors for all connected heat trace

whenever ambient temperatures fall to the thermostat set-point. This commonly accepted method of control delivers at or nearly 100% of the total heating capacity, *even if it's only a few degrees below the control set point.*

Ambient Proportional Control (APC) provides the logic to deliver 100% of the power *only* at the lowest possible ambient temperature. Realistically this might only occur once every few years. At other times the power delivery is proportional to the actual ambient temperature, thereby reducing the average energy consumed.

### Ambient Proportional Control (APC)



$T_p$  = Pipe Maintain Temperature

$T_{a-min}$  = Minimum Ambient Temperature

\* **Note:** No less than 20% power delivery when energized to maintain electrical current monitoring functions.

**Ambient Proportional Control (APC) reduces operating costs up to 50% when compared to conventional ambient control.**

Higher process temperatures can also be controlled with APC with reasonable accuracy. This approach may not reduce operating cost, but it significantly reduces the number of temperature sensors and control circuits.

**Ambient Proportional Control (APC) lowers installed costs when compared to line sensing control for each process flow path.**



# TRACENET™ TN SERIES

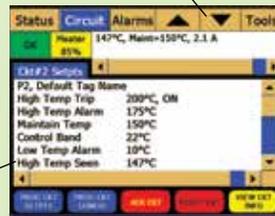
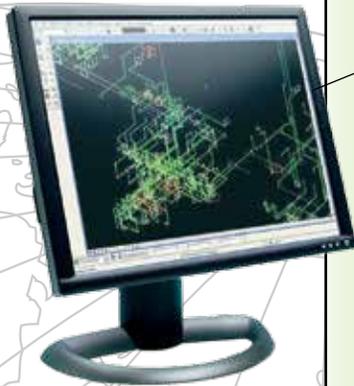
## CONTROL AND MONITORING SYSTEM



### COMMUNICATIONS

- Ethernet Direct to DCS
- Modbus RTU

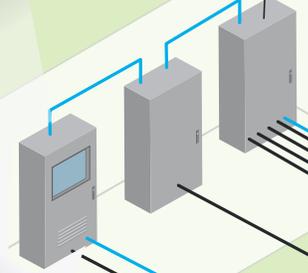
TRACEVIEW  
NETWORK EXPLORER  
(HOST PC)



TSM 1  
Touch Screen

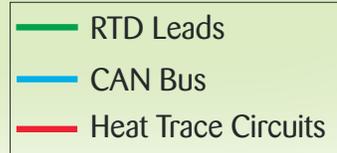
### Ordinary (Non-Hazardous) Area

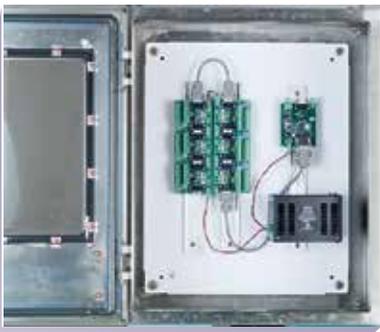
Heat Trace Panels With or Without  
Power Distribution and/or  
Control Relays (in MCC)



3 Phase  
Power

Ambient  
Sensing RTD

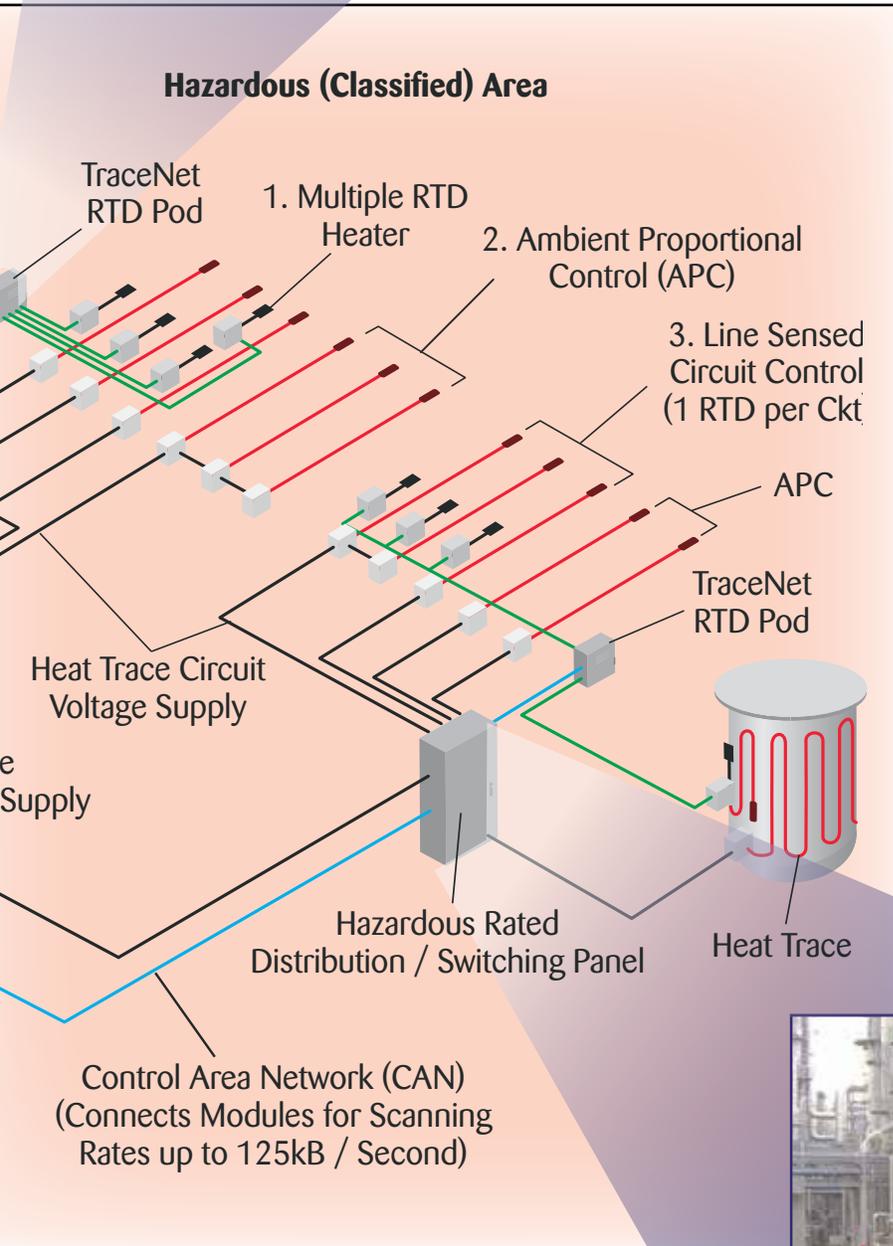




**TRACENET REMOTE "RTD-PODS" - REDUCE INSTALLATION COSTS:**

Can multiplex up to thirty-six RTD sensors to two-wire CAN bus for distances up to 300 m. Distance can be extended via CAN for greater distances where required.

- **CAN Interface Module:** CIM1 isolates CAN network and extends the network link.
- **Temperature Sensor Module:** TM6 module for up to six (6) RTD sensors per heat trace circuit for additional monitoring points.
- **Power Supply:** 24 Vdc, input from 100-240 Vac.



**TRACENET SUPPORTS ALL RTD TEMPERATURE SENSOR CONFIGURATIONS**

1. Up to six (6) RTD's per Heater
2. APC (Ambient Proportional Control) Eliminates Sensors and Reduces Cost.\*
3. Conventional Process Control with a Dedicated RTD Sensor per Heater

\* APC reduces operating cost on average of 50% over conventional ambient sensing control. Alternately APC reduces installed costs for process maintenance systems when compared to line-sensing control.





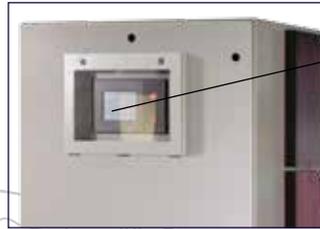
# TRACENET™ TN SERIES

## CONTROL AND MONITORING SYSTEM

### TRACENET COMPONENT CONFIGURATION

The new TraceNet system offers design simplicity and versatility. The components have been designed for easy installation, maintenance, and system expansion over the life of each installation.

The various modules described below are connected by CAN (Control Area Network) and can be separated by significant distances. Approved for installation in most every environment, TraceNet modules can be located in a control room, a motor control center (MCC), or in an industrial process unit.



#### Touch Screen TSM1 User Interface and Communications Module

The touch screen interface for data entry or information retrieval is simple to use. Three (3) USB ports are provided to quickly import/export large amounts of data, change control configurations, connect to a notebook PC, remote mouse or pointer device.



#### Heater Control "Power Modules"

Optimize switching life and current ratings with non-arcing solid state relays mounted on external heat sinks. Internal heat sinks, "hybrid mechanical relays" and sealed mechanical relays are also available. (Each "PM6" includes six 1 or 2-pole relays, and also provides self-test for earth-leakage current.)

#### RTD to CANBUS connections

DIN rail mounted "RTB6" for (6) RTD terminations

#### Control Module

Each "PCM6" control module independently controls up to six (6) heaters, and can be either DIN-rail (PCM6DR) or rack mounted (PDM6RM).

#### Temperature Sensor Module

"TM6" module for up to six (6) RTD sensors, and can be either DIN-rail (TM6DR) or rack mounted (TM6RM). (Note: The PCM6 and TM6 Modules shown here are rack mounted in the "BPM" Back Plane Module.)

#### Power Supply

Provides 24 Vdc from 100-240 Vac supply voltage.

#### Power Distribution

All power distribution designs are compatible with TraceNet control and monitoring systems for electrical heat trace. Sealed breakers can be installed in IP65 or NEMA 4/4X cabinets for hazardous (classified) area installations. Alternatively, standard open frame main and branch breakers can be installed in IP65 or NEMA 4/4X cabinets with purge for hazardous (classified) areas.



## OPERATOR ACCESS

The TraceNet touch-screen monitor can be located almost anywhere to serve as the interface and central communications point for multiple systems. The operator can view real time temperature and current conditions and access control & monitoring set-points throughout the CAN “Control Area Network”. Up to (180) heat trace circuits can be accessed from a single TraceNet touch screen monitor. (TSM1 shown at right.)



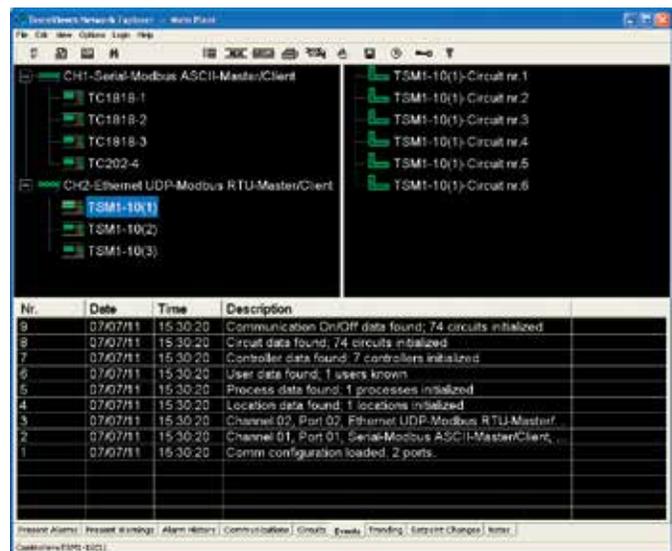
TSM1 Touch Screen Monitor

## ACCESS IN YOUR LANGUAGE

The Windows CE operating system provides for user-selected languages whenever entering data or monitoring of heat trace circuits. Almost every language can be supported.

## REMOTE COMMUNICATIONS

The TraceNet TSM1 supports communications via Ethernet directly to a DCS via Modbus RTU protocol and to a PC with TraceView Network Explorer (TVNE) installed. TVNE can interface with TraceNet and other Thermo TC controllers (i.e. TC101, TC202, and TC1818 units) through different communications channel(s). In this way, existing plant RS 485 data highway networks are integrated seamlessly with the new TraceNet networks forming a unified and integrated supervisory control and data acquisition system (SCADA).





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