

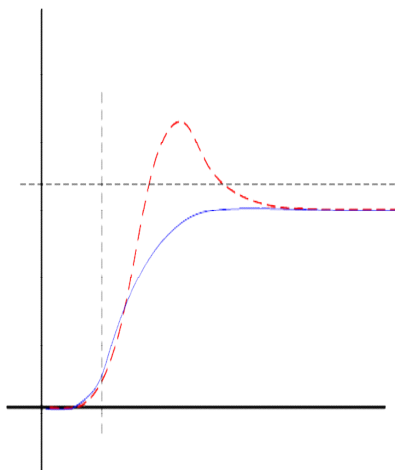
# TTC-1000

## Monitor With Confidence™

- Liquid Temperature
- Winding Hotspots
- LTC Differential
- Ambient Temperature
- Load Current
- High-Precision RTDs
- No Calibration Required, Ever.



### Complete Monitoring for Your Power Transformer



“Smart Grid” Ready

Load Based Pre-Cooling

Track LTC Position for Complete LTC Monitoring

SCADA Communications

Consolidate Alarms with Mini-RTU Capability

Simple to Configure

Highly Cost Effective & Easy to Install

Lifetime Warranty

TM

# TTC-1000

Intelligent Transformer Temperature Control

## Available in 2 Mounting Options

- Panel Mount**  
7.2" W x 3.558" H x 6" D  
Aluminum Chassis
  - For mounting within the transformer control cabinet.  
(As shown on cover)
- NEMA 4X Enclosure**  
15.25" H x 7" W x 5.25" D  
304 Stainless Steel
  - For mounting on the exterior of the transformer, typically used for retrofit applications.  
Heater option available.



NEMA 4X Enclosure

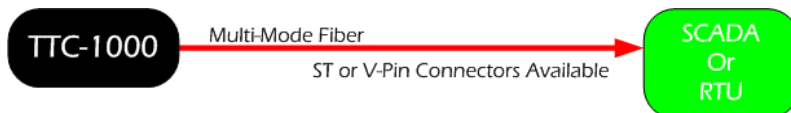
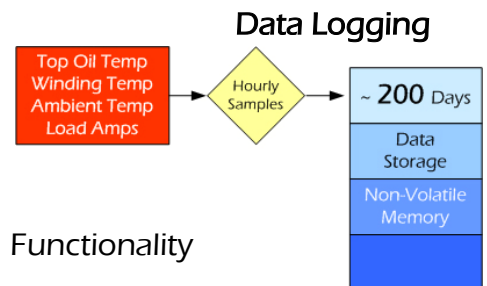


## Monitor **Critical** Temperatures

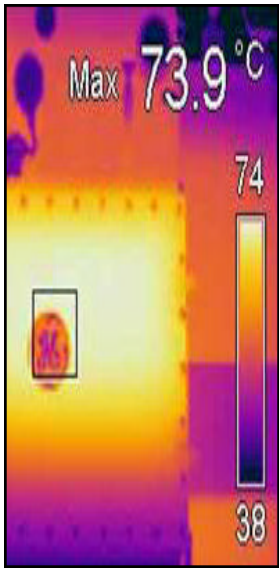
- Up to **3** Temperature **Probes** (-35 to 160 °C)
- **Set Points** for Alarms & Fan Control
- Up to **3** Calculated Winding **Hotspot** Temperatures
- Monitor **Ambient** Temperature to Calculate **Loss-of-Life**
- Up to **2** **LTC** Differential Temperatures Simultaneously
  - **Mag-Mount Probes** Available

## Collect Data & Communicate It

- Temperature, Load, and Min/Max **Data Logging**
- LTC Position & Differential Temp **Data Logging**
- Up to **4** Analog Outputs (0 to 1 **OR** 4 to 20 mA)
- Up to **14** Optically Isolated Digital Inputs for **Mini-RTU** Functionality
- **DNP3.0** Level 1 or **MODBUS RTU** Communications via Multi-Mode **Fiber**



**Advanced Power Technologies**



## “On-Line” LTC Monitoring

LTCs are a critical **Point of Failure** on your transformer...

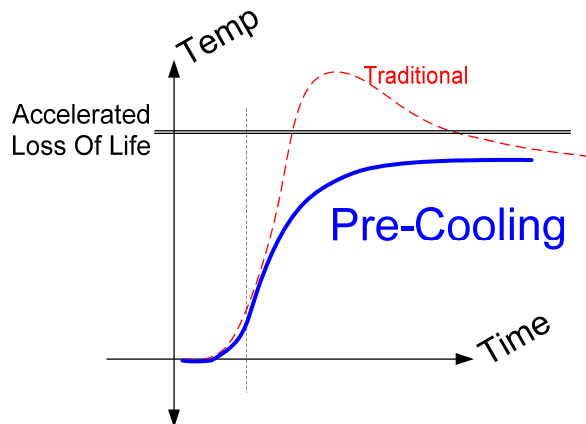
*What is your LTC doing right NOW?*

- **Continuous** LTC Differential Monitoring (-20 to +20 °C)
- Patented **Dual-Algorithm** LTC Condition Monitoring™
  - **Protect** Against Dangerous “Coking” Contacts
  - Alarm for **Rapid LTC Heating** Events
- Patented *Sensorless* LTC **Position** Monitoring™
  - Know with Certainty Which Taps are Getting Hot
  - Monitor Tap Change **Operate Times** and Alarm

## Cool Your Transformer

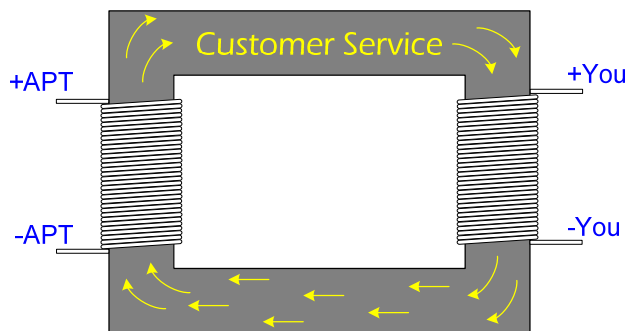
With Confidence...

- Patented **Load Pickup Cooling**™
  - Transformer **PRE-Cooling**
  - **Extend** Transformer **Life**
  - Longer Short-Term Overloads
  - **Sustain** Paper Insulation **DP** Levels
  - Ideal for **Wind Farm** Load Cycles
- Up to **8** Form C Relay Outputs
  - **Control** Fans and Pumps



## Additionally...

- **Exceptional** Customer Service
  - Periodic Fan **Exercising**.
  - Fan Bank **Alternate** Feature
    - Built In Self Check
- Dedicated Form B **Device Alarm** Relay
- Easy to use, Excel-Based Setting Templates



# TTC-1000 Model Option Table

Select **One** Option from each Feature Matrix

## Ordering Information

TTC-1000 - **U** **V** **W** **X** **Y** **Z**

### Mounting

Panel Mounting	0
NEMA 4X Enclosure	3
NEMA 4X w/ Heater	4

### Extra Auxiliary CTs

0	No Extra Auxiliary CTs
1 - 8	1 or More Extra Auxiliary CTs (Enter Number of Extra CTs)

### Analog Outputs, DNP & MODBUS

	Communications	DNP 3.0	MODBUS RTU
No Analog Outputs	0	5	1
1 Analog Output	2	6	9
2 Analog Outputs	3	7	A
3 Analog Outputs	4	8	B
4 Analog Outputs	G	S	T
1 Isolated Analog Output	C	H	M
2 Isolated Analog Outputs	D	J	N
3 Isolated Analog Outputs	E	K	P
4 Isolated Analog Outputs	F	L	R

### Multi-Mode Fiber 12 Optically Isolated Digital Inputs Extra RS-232 Port

	No Digital Inputs No RS-232 Port	12 Digital Inputs	Extra RS-232 Port	12 Digital Inputs & Extra RS-232 Port	
0	5	1	7	No Fiber	
3	6	4	8	Multi-Mode Fiber for DNP or MODBUS	
9	B	A	C	V-Pin Multi-Mode Fiber for DNP or MODBUS	

### Temperature Probe Channels & Auxiliary CT

	No Auxiliary CT	1 Auxiliary CT
1 Temperature Probe Channel	1	3
2 Temperature Probe Channels	2	4
3 Temperature Probe Channels	6	7

### Form C Relay Outputs 2 Optically Isolated Digital Inputs Sensorless Tap Position Monitoring (TPM)

	No Digital Inputs No Tap Position Monitoring	2 Digital Inputs	Tap Position Monitoring (TPM)	
0	2	■	4 form C Outputs	
1	5	6*	6 form C Outputs (* 2 inputs with TPM)	
8	■	9	8 form C Outputs	

### Additional Specifications:

- Operating Temperature Range:** -50 °C to +85 °C, 95% Relative Humidity (non condensing)  
38 to 290 VDC or 120 VAC
- Universal Power Supply:**
- Winding Temp Measurement Range:** -35 °C to +180 °C
- Temperature Measurement Accuracy:** Avg error over entire range ± 1 °C.  
Absolute error at any temperature ± 1.5 °C.
- Output Contact Rating:** 30 amps make for 250 msec,  
10 amps continuous at 250VAC.
- Optically Isolated Inputs:** Operates from 38 to 290 VDC or  
24 VAC to 260 VAC.  
External wetting voltage required.
- Alarm Contact Rating:** 0.4 amp continuous at 290 VDC (NEMA),  
0.15 amp continuous at 290 VDC (Panel)
- Analog Output:** Selectable, 0 to 1 mA or 4 to 20 mA.  
Maximum load 10,000  
Ohms (0 to 1mA), 510 Ohms (4 to 20 mA).
- Communications Interfaces:** Front Panel Mounted RS-232  
DB-9 Null Modem Interface
- SCADA Interface:** DNP3.0 Level 1 Protocol using half duplex  
RS-485 interface, Multi-Mode or V-Pin fiber optics.
- Current Measurement Range:** 0 to 50 A
- Surge Withstand/Fast Transient:** Relay outputs and station battery inputs:  
ANSI C37.90.1  
ANSI C37.90.2,  
IEC 801-2
- Timers:** Output Pickup Timer, and Load Pickup Timer:  
0 to 255 seconds
- EMI Withstand:**
- Electrostatic Discharge:**

### TTC-PROBE - X Y - Z Z Z

Probes must be ordered separately from the main TTC-1000 unit

#### Probe Type

Probe Type	0	1
Ambient Temperature Probe (50 ft lead)	0	0
Universal Well Probe w/ Snap Elbow <sup>†</sup>	0	1
Magnetic Surface Mount Probe	0	2
ANSI C57 Well Probe w/ Snap Elbow	0	5
Universal Well Probe Liquid Tight Ready <sup>†</sup>	1	1
ANSI C57 Well Probe Liquid Tight Ready	1	2
5/16" Well Probe w/ Snap Elbow	2	1
1/4" Well Probe w/ Snap Elbow	3	1
Ceramic Probe for Dry Types 160 <sup>†</sup>	5	1

NOTE: †  
Handles thermometer  
well diameters of:  
-0.375 inches  
-0.500 inches  
-0.625 inches  
-0.700 inches

#### Additional Lead Length

ZZZ Probe lead length  
(10 to 250 feet).  
Enter 3 digit length.  
Example: 050

NOTE: A 10 ft. lead length is automatically included, with the exception of the Ambient probe which is 50 ft. Add additional lead length as needed.

Retrofit Mounting Bracket available for NEMA 4X enclosure option P/N 80001000167:

## Advanced Power Technologies

[www.AdvPowerTech.com](http://www.AdvPowerTech.com)

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