

ISOLATED/SPECIALIZED THERMOCOUPLE INTERFACE

- Very compact design, available in DIN Rail and NEMA 4X enclosures.
- FTT-10A network interface with temperature information available using multiple Standard Network Variable, SNVT, formats.
- Wide operating voltage range of 10 to 32 VDC with a typical input current of 55 mA.
- High quality removable terminal blocks on all power and network connections.
- Cold junction compensation via Class A platinum RTD.
- Extremely low input current, 10 Pico Amps typical, and very high input impedance of 20 M Ohm
- Electronics have extremely high temperature stability and low drift.
- Analog to Digital converter has 24-bit resolution.
- Two status LEDs provide quick visual indication of runtime status conditions.
- Compatible with XCO's FTLD and CT2 Continuous Thermocouple sensors.
- -40 to 85 C operating temperature range with maximum input voltage of 24 VDC.
- Initial support for K-type, -200 to 1372 C, and planned support of a wide variety of standard thermocouple types.
- High precision thermocouple polynomial calculations to ITS-90.

DESCRIPTION

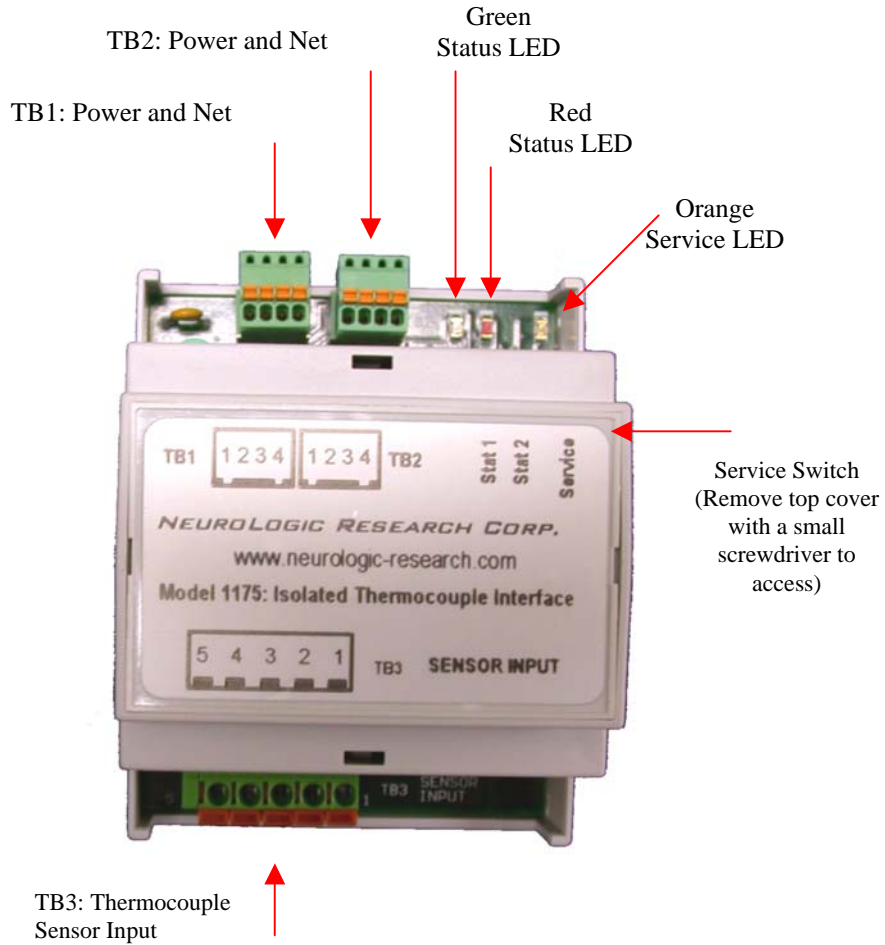
The Model 1175 is an Isolated Thermocouple Network Interface with unique and specialized features. It is available in a DIN Rail mount or NEMA 4X enclosure. Unlike most thermocouple interfaces, the Model 1175 has very high input impedance and extremely low input current in the Pico Amps. The electronics use a precision A Class platinum RTD for cold junction compensation. A very high-resolution 24-bit converter that continuously compensates itself for offset and gain errors as well as provide 50/60 Hz noise rejection.

The Model 1175 has been tested with XCO Corporation's FTLD and CT2 Continuous Thermocouple sensors. These are unique sensors that could extend for several hundred feet and measure the highest temperature along their entire length. The Model 1175 is particularly well suited for use with these sensors due to its excellent performance, very high input impedance, and extremely low input current. Please visit the www.xco.com website for more information on this product.

Finally, the Model 1175's Thermocouple input is isolated from the DC input power supply. This allows it to be used with grounded thermocouple as well as non-grounded types.

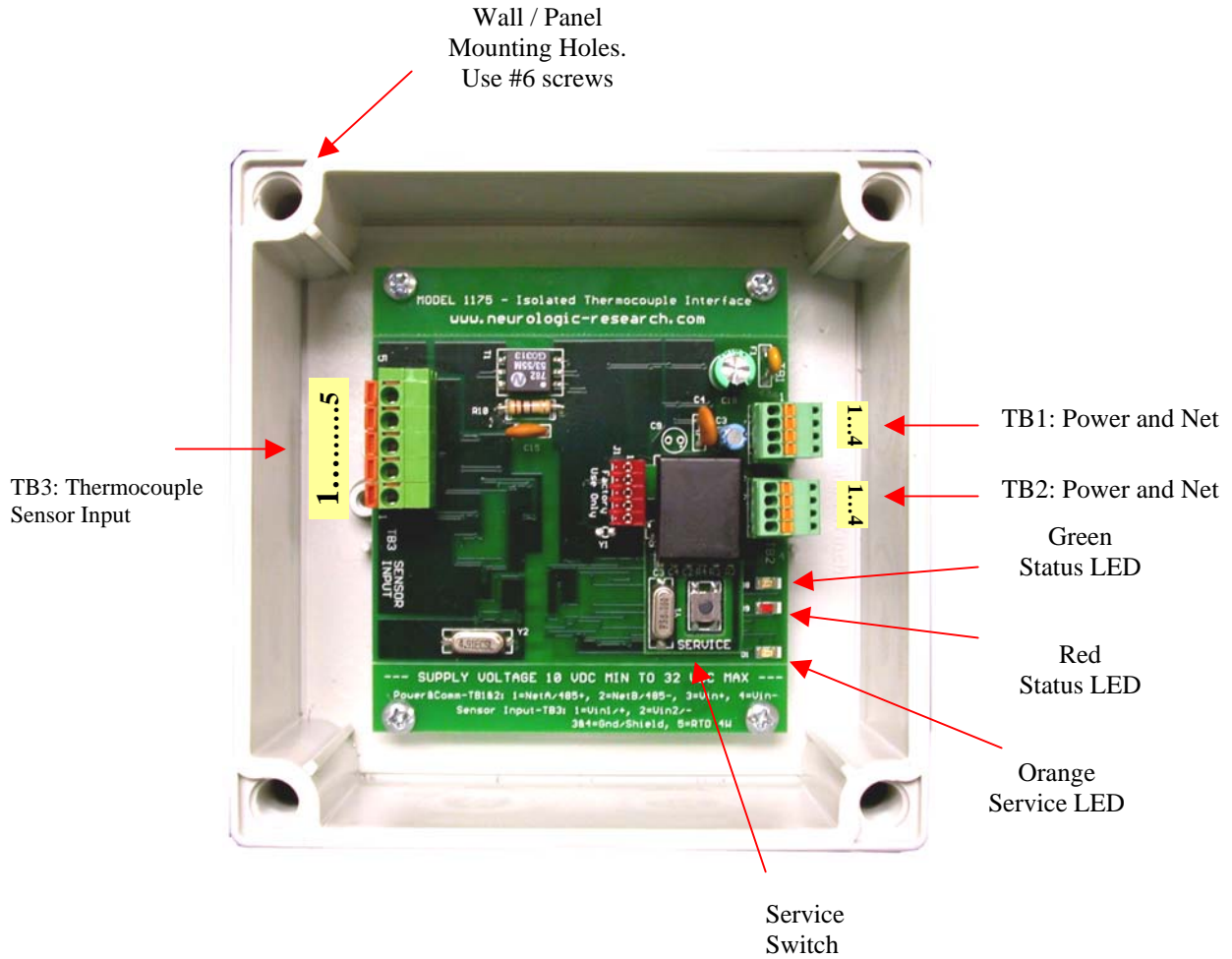
DIN Rail Enclosure

The DIN Rail Enclosure allows mounting on a standard 35 mm DIN Rail. Please see the diagram below. Note, you must remove the top cover with a small screwdriver to access the Service Switch.

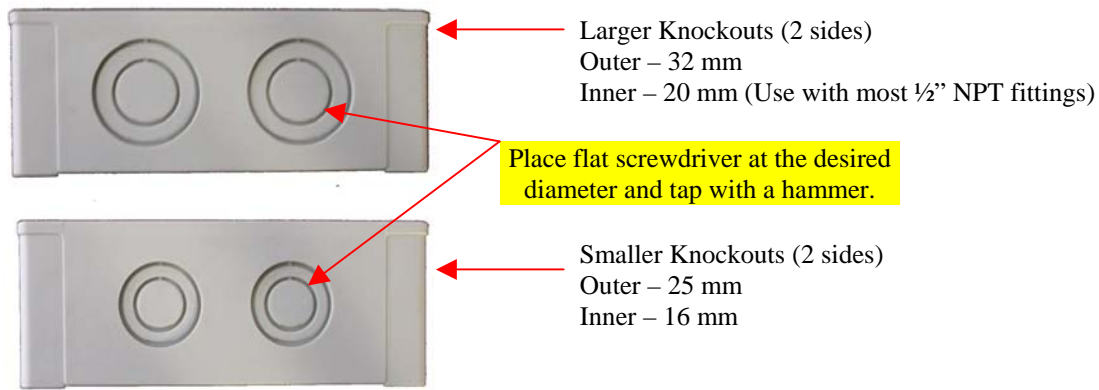


NEMA 4X Enclosure

A diagram and layout of the NEMA 4X Enclosure option is shown below. The enclosure can be wall or panel mounted and is appropriate for outdoor environments. To do so, remove the cover. See picture below. Use a #6 screw and drop into mounting holes shown below. Note, mounting holes do not violate the enclosure seal. **Please do not drill holes into the bottom of the enclosure. This voids the NEMA 4X rating.**



The sides of the enclosure have knockouts of different diameters. Please see the diagram below. The enclosure is shipped with all knockouts intact. This allows the customer to use the one most appropriate for his/her installation. Please note the 20 mm knockout should work well with 1/2" NPT conduit hubs as well as cable glands. The larger knockouts of 32/20 mm are located at top and bottom sides in the orientation shown above. **For best results, conduit entries should be attached to the bottom side.** This prevents condensation in the conduit from draining into the enclosure.



Input Power and Network Interface

The Model 1175 requires less than 55 mA of current typically and operates from 10 to 32 Volts DC.

However, power supply should be limited to 24 Volts DC maximum for operation up to 85 C.

The network interface is Echelon’s FTT-10 Free Topology Transceiver. The interface includes DC blocking capacitors for compatibility with Link Power Transceivers. The network connection is not sensitive to polarity. Please note, the Model 1175 does not include any network termination and it must be added externally.

Power and network are connected via terminal block TB1 or TB2. The two connectors are identical to allow for daisy chaining.

TERMINAL BLOCK	FUNCTION
TB1	Power and Network Connection. 1: NetA 2: NetB 3: Vin+ = Positive Input of DC Power Supply: 10-32 VDC 4: Vin- = Negative input of DC Power Supply
TB2	Same as TB1, use to daisy chain to next network node

Sensor Input

A thermocouple sensor is attached to the Model 1175 via its 5-position Terminal Block, TB3. It is labeled “Sensor Input”. A description of each position is shown below. The Sensor Input is isolated from the input power supply. It is highly recommended that shielded thermocouples be used and the shield connected to TB3-3 or TB3-4. While not required for operation, problems may be encountered in noisy industrial environments. When using the XCO FTLD and CT2 Continuous Thermocouple products, best accuracy is achieved when the sensor’s shield is connected to TB3-3 or TB3-4.

TERMINAL BLOCK	Usage
TB3	Thermocouple Sensor Input 1: Positive Thermocouple Input 2: Negative Thermocouple Input 3: Ground / Shield Thermocouple Side (Isolated from Main DC Supply) 4: Ground / Shield – Same as TB3-3 and allows attachment to earth ground 5: Future usage – Reserved for RTD support.

Status LEDs

As shown in the diagrams above, there are two status LEDs. There is a Green LED and a Red LED. They indicate the status of the Model 1175 as follows:

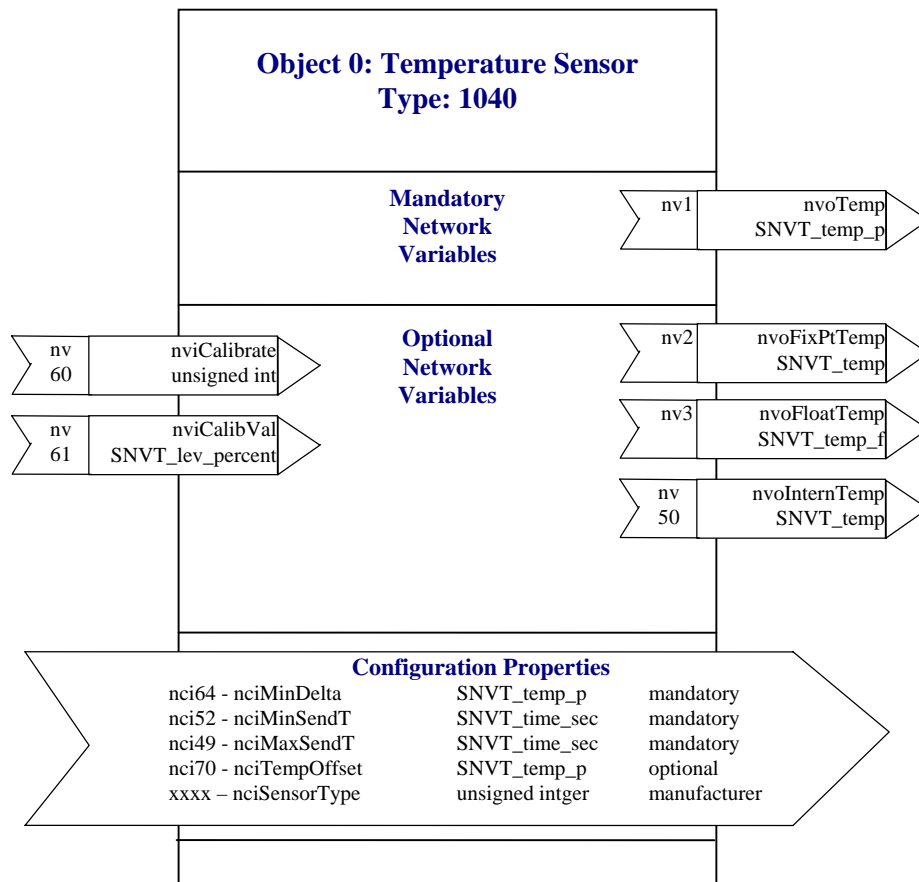
Green LED	Red LED	Condition
On	Off	Normal condition. Sensors appear to be working properly
Flashing	Off	The junction temperature is within 3 degrees of the sensor temperature. This is not necessarily an error condition. However, it will occur if the thermocouple is disconnected.
Off	On	Fault condition. Either there is a problem reading the junction temperature or the thermocouple is out of range.

NETWORK OBJECTS

The Model 1175 contains a single LONMARK sensor object with input and output data shown below. The calculated temperature is returned in multiple Standard Network Variable, SNVT, formats for maximum flexibility when binding to other LonWorks devices. The calculated temperature is available using nvoTemp, nvoFixPtTemp, and nvoFloatTemp. The nvoInternTemp network variable is the cold junction compensation temperature which can be used to also monitor the temperature of the electronics.

The nviCalibrate, nviCalibVal, and nciSensorType are reserved for future use. The nciSensorType will be used to configure the type of attached sensor. Initially, only K-type thermocouple is supported.

The nciMinDelta, nciMinSendT, and nciMaxSendT configuration network variables regulate network variable updates. The nciTempOffset configuration network variable allows the temperature to be calibrated to some other reference.



GENERAL SPECIFICATION

General

CPU	3150 Neuron @ 10 MHz
Operating Temperature	-40 – 85° C operation with 24 VDC maximum power supply -40 to 70 C operation with 32 VDC maximum power supply
Operating Humidity	0-95% Relative Humidity non-condensing
Input Power	10 to 32 VDC
Input Power Protection	Input power is fused and transient voltage protected. (Fuses do not need to be replaced)
Current Consumption	55 mA typical and 60 mA maximum.
Network Transceiver Type	Echelon FTT-10A transceiver at 78 kbps. DC blocking capacitors for LPT10 network.
Input Power and Network Wiring	Removable terminal blocks. Accepts up to 20 GA wire. Input power is reverse voltage protected. Network wiring is polarity insensitive.

Thermocouple Input

Types Supported	K type currently with support for all standard types planned
K Type Temperature Range	-200 C to 1372 C with full ITS-90 polynomial correction
Accuracy	TBD
Input Impedance	20 M Ohm
Input Current	10 pA typical
Input Offset Voltage	< +/- 5 uV maximum
Resolution	24 bits
Temperature Drift	TBD (< 5 ppm per degrees C)

Cold Junction Compensation

Type	On-board Class A Platinum RTD.
Accuracy	0.25 C typical

Dimension and Materials

DIN Rail Enclosure's external Dimension	71 mm (2.8") W x 90 mm (3.54") L x 58 mm (2.28") H
DIN Rail Enclosure's Material	Grey frame retardant Noryl UL94
NEMA 4 Enclosure's external Dimension	130 mm (5.12") W x 130 mm (5.12") L x 60 mm (2.36") H
NEMA 4 Enclosure's Material	Grey polycarbonate with translucent polycarbonate cover. Flame retardant UL94

ORDERING INFORMATION

1175	Model 1175 Isolated Thermocouple Input Network Interface		
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Code	Enclosure / Housing Options		
-0	NEMA 4X		
-1	DIN-Rail Mount		

Code	Network Communications Option		
-0	TP/FTT-10A - LonWorks		

1175	-1	-0	Model 1175 Isolated Thermocouple Input Network Interface with FTT-10 in a DIN-Rail Enclosure.
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