TEMPERATURE TRANSMITTER BOARD ONLY

Installation & Operation Instructions

Phone: 1-888-967-5224
Website: workaci.com

GENERAL INFORMATION

The ACI Transmitter Board Only Series features a two-wire, 4 to 20 mA loop powered output signal with optional 3-Wire voltage output signals available. Sensors are not included with the board only transmitter because they are designed to be used with any existing 100 or 1000 Ohm Platinum RTD sensor with a 385 temperature coefficient. Temperature span and sensor type must be specified when ordering. All ACI/TT and TTM temperature transmitters can be powered from either an unregulated or regulated 8.5 to 32 VDC power supply.

MOUNTING INSTRUCTIONS

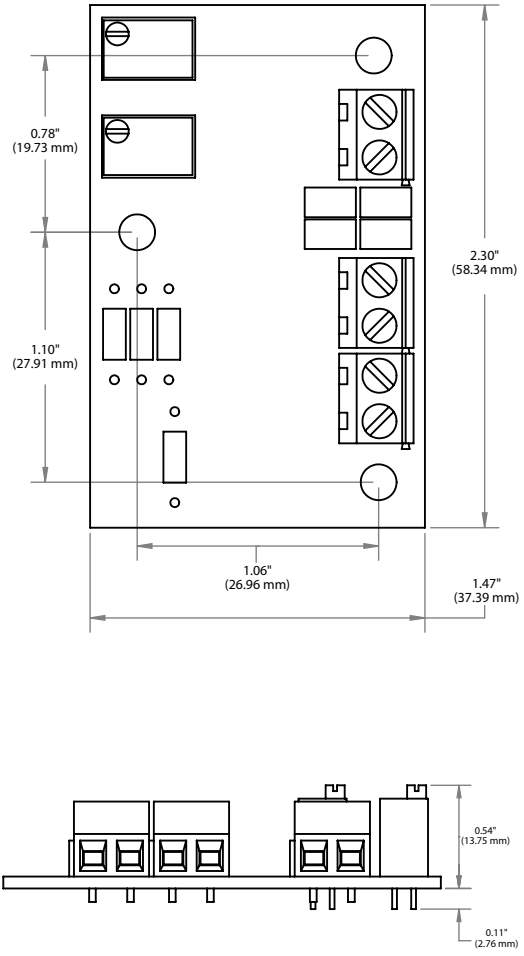
ACI's Board Only transmitters are supplied with adhesive standoffs for mounting. The transmitter needs to be mounted in environments with ambient temperatures between -40 to 85 °C (-40 to 185 °F) -- see **SPECIFICATIONS** (p. 5). Insert the adhesive standoffs into the holes located on the PCB. Remove the backing from the adhesive standoffs, and mount to surface see **Figure 2** (p. 2).

WIRING INSTRUCTIONS

PRECAUTIONS

- **Transmitter is powered by 24 VDC only.**
- **Remove power before wiring. NEVER connect or disconnect wiring with power applied.**
- **When removing the shield from the sensor end, make sure to properly trim the shield to prevent any chance of shorting.**
- **When using a shielded cable, ground the shield ONLY at the controller end. Grounding both ends can cause a ground loop.**
- **If the 24 VDC power is shared with devices that have coils such as relays, solenoids, or other inductors, each coil must have an MOV, DC Transorb,**

FIGURE 1: TT BOARD ONLY DIMENSIONS



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WIRING INSTRUCTIONS
(Continued)

PRECAUTIONS *(Continued)*

Transient Voltage Suppressor (ACI Part: 142583), or diode placed across the coil or inductor. The cathode, or banded side of the DC Transorb or diode, connects to the positive side of the power supply. Without these snubbers, coils produce very large voltage spikes when de-energizing that can cause malfunction or destruction of electronic circuits.

Open the cover of the enclosure. ACI recommends 16 to 26 AWG twisted pair wires or shielded cable for all transmitters. Twisted pair may be used for 2-wire current output transmitters or 3-wire for voltage output. Refer to **FIGURE 4** (p. 3) for wiring diagrams. All wiring must comply with local and National Electric Codes. All ACI TT and TTM temperature transmitters can be powered from either an unregulated or regulated 8.5 to 32VDC power supply. The TT and TTM DO NOT support an AC input. All TT and TTM temperature transmitters are reverse polarity protected. After wiring, attach the cover to the enclosure.

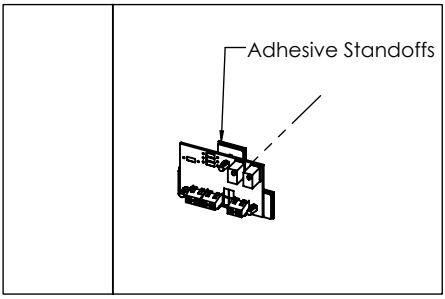
Note: All RTD's are supplied with (2) or (3) flying lead wires. ACI's transmitters are supplied with a 2 pole terminal block for RTD sensor connections. When wiring a 3 wire RTD, connect the (2) common wires (same color) together into the same terminal block see **FIGURE 3** (bottom).

Note: Adding extra wire length between the sensor and transmitter board may affect accuracy.

The minimum voltage at the transmitter power terminal is 8.5V after load resistor voltage drop.

- 249 Ω load resistor (1-5 VDC output) = 13.5 V min supply voltage
- 499 Ω load resistor (2-10 VDC output) = 18.5 V min supply voltage

FIGURE 2: ADHESIVE MOUNTING



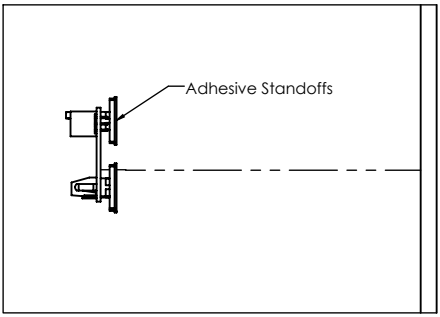


FIGURE 3: 3 WIRE RTD

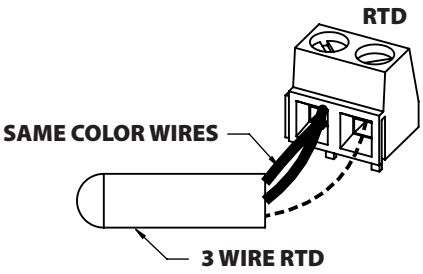


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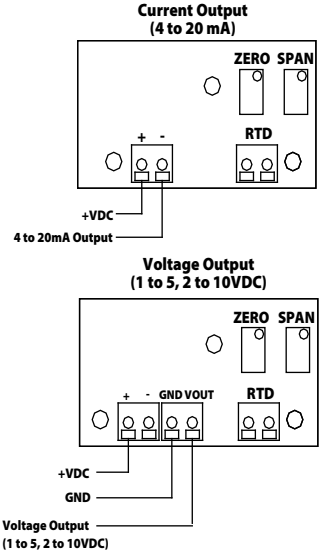
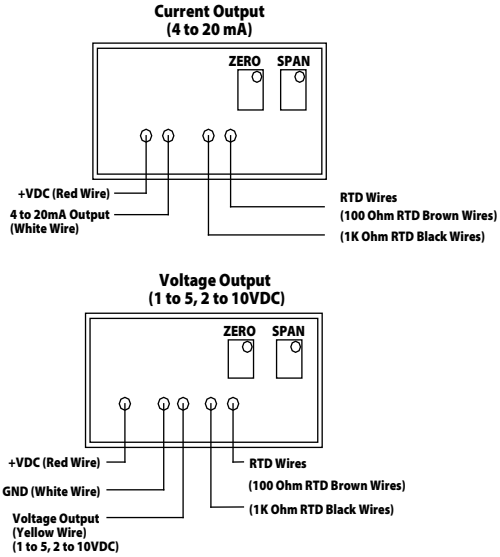
FIGURE 4: WIRING DIAGRAMS

STANDARD UNITS



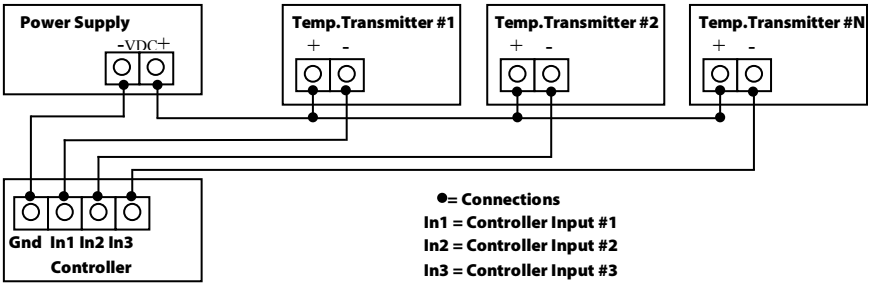
POTTED UNITS



FORMULA FOR NUMBER OF TRANSMITTERS

Several transmitters may be powered from the same supply as shown in **FIGURE 5** (bottom). Each transmitter draws 25mA; refer to the following equation to obtain the number of permissible transmitters: ***[# Transmitters] = [Current] / (25 mA)***.

FIGURE 5: MULTIPLE TRANSMITTER CONNECTIONS



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TROUBLESHOOTING

PROBLEM	
No Reading	• No power to board - check voltage at power terminal - should be between +8.5 and 32 VDC.
Reading too Low	• RTD wires shorted. Disconnect sensor wires from terminal block and check with ohmmeter. Reading should be close to either 100 Ω or 1000 Ω. • RTD Improper range of transmitter (too low). Check current or voltage (model dependent) - should be between 4-20 mA, 1-5 V, or 2-10 V.
Reading too High	• RTD opened. Disconnect sensor wires from terminal block and check with ohmmeter. Reading should be close to either 100 Ω or 1000 Ω. • Improper range of transmitter (too high). Check current or voltage (model dependent) - should be between 4-20 mA, 1-5 V, or 2-10 V.
Reading is Inaccurate	• **Sensor check:** Disconnect sensor wires from terminal block and check with ohmmeter. Compare the resistance reading to the Temperature vs Resistance curves located on ACI's website. • **Transmitter check:** Make sure sensor wires are connected to terminal block. Determine that the proper output is being transmitted based on predetermined span: 1. Go to ACI Website, Span to Output Page: http://www.workaci.com/content/span-output 2. Enter the low end of the span 3. Enter the high end of the span 4. Click on the output of the transmitter. This will generate a span to output chart. 5. Measure output of transmitter. 6. Compare measured output to calculated output
RF Interference	• Input power must be clean. Use twisted wires or shielded cable. RF resistant power supply. Use a shielded cable to connect the sensor - connect the shield to ground. Encase the board in a RF shielded enclosure.

WARRANTY

The ACI Board Only Series sensors and transmitters are covered by ACI's Five (5) Year Limited Warranty, which is located in the front of ACI'S SENSORS & TRANSMITTERS CATALOG or can be found on ACI's website: www.workaci.com.

W.E.E.E. DIRECTIVE

At the end of their useful life the packaging and product should be disposed of via a suitable recycling centre. Do not dispose of with household waste. Do not burn.

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PRODUCT SPECIFICATIONS

Transmitter Supply Voltage | Supply Current:	+8.5 to 32 VDC (Reverse Polarity Protected) | 25 mA minimum **250 Ohm Load:** +13.5 to 32 VDC | **500 Ohm Load:** +18.5 to 32 VDC
Maximum Load Resistance:	(Terminal Voltage - 8.5 V) / 0.020 A
Transmitter Output Signals:	**Current:** 4-20 mA (2-Wire, Loop Powered) | **Voltage:** 1-5 VDC or 2-10 VDC (3-Wires)
Calibrated Accuracy | Linearity[1]:	**Temp. Spans < 500°F (260°C):** +/- 0.2% | **Temp. Spans > 500°F (260°C):** +/- 0.5%
Temperature Drift[2]:	**Temp. Spans < 100°F (38°C):** +/- 0.04%/°F | **Temp. Spans > 100°F (38°C):** +/- 0.02%
Calibrated Temperature Spans[1]:	**Minimum Temp. Span:** 50°F (28°C) | **Maximum Temp. Span:** 1000°F (538°C)
Sensor Type Accepted | Sensor Curve:	Platinum RTD | PTC (Positive Temperature Coefficient)
Sensor Resistance Characteristics (Nominal):	**A/TT100 Series:** 100 Ohms @ 32°F (0°C) | **A/TT1K Series:** 1000 Ohms @ 32°F (0°C)
Sensor Din Standard | Temperature Coefficient:	DIN EN 60751 (IEC 751) | 3850 ppm / °C
Warm Up Time | Warm Up Drift:	10 Minutes | +/- 0.1%
Operating Temperature Range:	-40°F to 185°F (-40 to 85°C)
Operating Humidity Range:	0 to 90%, non-condensing
Connections | Wire Size:	Screw Terminal Blocks | 16 AWG (1.31 mm²) to 26 AWG (0.129 mm²)
Terminal Block Torque Rating	0.37 ft-lb (0.5 Nm) nominal
Mounting Configuration:	Three Adhesive Standoffs included
Standoff Material Type | Flammability Rating:	Nylon 66 | UL94-V2
Standoff Temperature Rating:	-40 to 85°C (-40 to 185°F)

Note[1]: Transmitter's calibrated at 71°F (22°C) nominal | **Note[2]:** Thermal Drift is referenced to 71°F (22°C) nominal calibration temperature

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