ROOM SERIES

Installation & Operation Instructions

A/TT-RSO-LCD

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

PRECAUTIONS

- **DO NOT RUN THE WIRING IN ANY CONDUIT WITH LINE VOLTAGE (24/120/230 VAC).**

GENERAL INFORMATION

The A/TT-RSO-LCD is a temperature transmitter product family intended for room applications. Optional features, if selected, provide useful features often desired in room applications, including setpoint and override outputs. Both the temperature transmitter and the setpoint transmitter functions support 4-20mA, 1VDC to 5VDC, and 2VDC to 10VDC output options. The setpoint function also supports resistance output options, with or without an offset resistance. The override function provides a normally open dry-contact switch output for occupancy indication.

MOUNTING INSTRUCTIONS

Separate the cover from the base. The ACI/LCD is shipped as a two-piece unit. The LCD Module must be unplugged from the 10 pin connector before the base of the sensor may be mounted. Attach the base directly to the wall or to a standard 2" x 4" junction box using the (2) #6-32 x 1" screws provided.

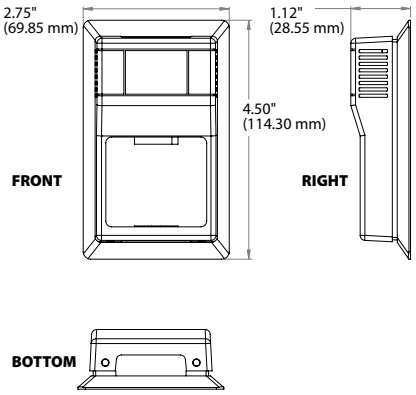
Take care when mounting. Check local code for mounting height requirements. Typical mounting heights are 48-60" (1.2-1.5 m) off the ground and at least 1.5' (0.5 m) from the adjacent wall. The sensor should be mounted in an area where air circulation is well mixed and not blocked by obstructions - see **FIGURE 2** (next page).

For optimal readings, follow these tips:

- Avoid confined areas such as shelves, closed cabinets, closets, and behind curtains.

FIGURE 1: ROOM DIMENSIONS

ROOM, VERSION 1 [R]



MOUNTING *(Continued)*

- Eliminate and seal all wall and conduit penetrations. Air migration from wall cavities may alter temperature readings.
- Do not install near heat sources, eg: lamps, radiators, direct sunlight, copiers, chimney walls, walls concealing hot-water pipes.
- A thermally-insulated backing should be used when fitting to solid walls (concrete, steel, etc.).
  ACI part: A/ROOM-FOAM-PAD
- Do not install on external walls.
- Avoid air registers, diffusers, vents, and windows.

Refer to the wiring instructions (p. 1-2) to make necessary connections.

LCD Installation

The LCD Module should then be gently inserted into the

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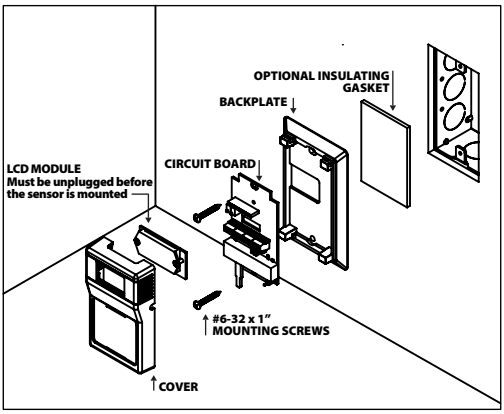
MOUNTING *(Continued)*

10 pin connector. Tighten the cover down, using the (2) 1/16" Allen screws located in the bottom of the housing. Take care to make sure the LCD module lines up with the enclosure LCD window. The LCD module can be bent if adjustments are needed. A 1/16" Hex driver is needed to secure the cover to the base.

Note: If mounting an TT-RS/O(with setpoint), you must mount to standard 2" x 4" junction box. It cannot be surface mounted. The set point PCB is located on back of enclosure.

FIGURE 2: MOUNTING



WIRING INSTRUCTIONS

PRECAUTIONS

• Transmitter is powered by 24 VDC only.

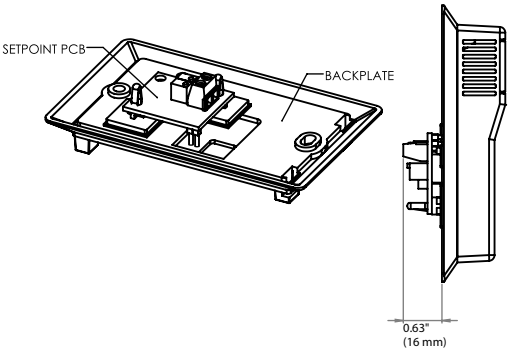
• Remove power before wiring. NEVER connect or disconnect wiring with power applied.

• 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, 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.

FIGURE 3: PBC SETPOINT WITH BACKPLATE



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 3** (right) and **TABLE 1** (p. 3) for wiring connections. The number of wires needed depends on the application. All wiring must comply with all local and National Electric Codes.

Note: If the A/TT-RSO is selected with both the temperature and the setpoint transmitter features, 50mA is required from a single power source.

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FIGURE 4: LAYOUT

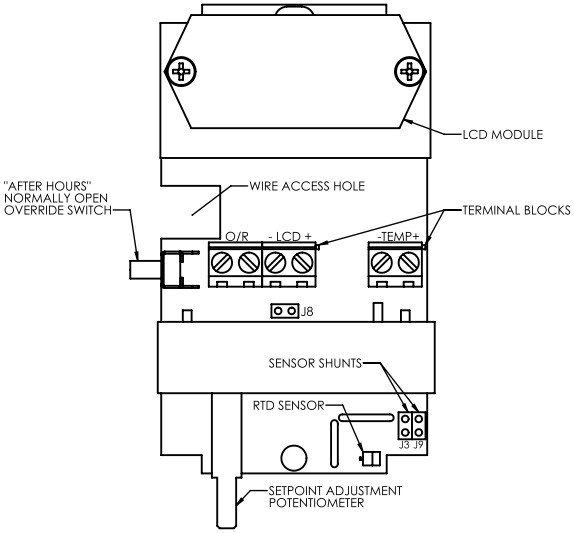
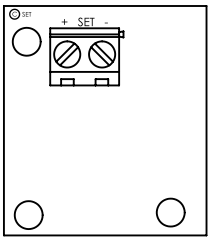


FIGURE 5: SETPOINT PCB



WIRING INSTRUCTIONS
(Continued)

Note: The A/TT-RSO temperature transmitter function and setpoint transmitter function can be operated with two power sources to allow for separate 4-20mA current loops.

Note: If the A/TT-RSO is selected with the resistance setpoint feature, the setpoint resistance supports a maximum of 0.25 Watt power dissipation capability.

All ACI TT temperature transmitters can be powered from either an unregulated or regulated 8.5 to 32VDC power supply. The TT DO NOT support an AC input. All TT temperature transmitters are reverse polarity protected. After wiring, attach the cover to the enclosure.

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

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

TABLE 1: DISPLAY TEMPERATURE TRANSMITTER

TERMINAL BLOCKS	CONNECTIONS
+ TEMP	+15-35VDC Supply Voltage
- LCD	(-) 4 to 20 mA temperature output to controller analog input
+ SET (located on back PCB)	+24VDC Supply Voltage
-SET (located on back PCB)	(-) 4 to 20 mA set point output to controller analog input
O/R	Override signal to controller analog input (N/O Dry Contact Closure)
O/R	Override signal common to controller analog input (N/O Dry Contact Closure)

Note: J8 must be installed to place the temperature transmitter in series with the loop powered LCD.

TABLE 2: DISPLAY SETPOINT OUTPUT

TERMINAL BLOCKS	CONNECTIONS
+ TEMP	+15-35VDC Supply Voltage
- TEMP	(-) 4 to 20 mA temperature output to controller analog input
+ SET (located on back PCB)	+24VDC Supply Voltage
-SET (located on back PCB)	Connect to +LCD terminal block
+ LCD	Connect to - SET terminal block
- LCD	(-) 4 to 20 mA set point output to controller analog input

Note: J8 must be removed.

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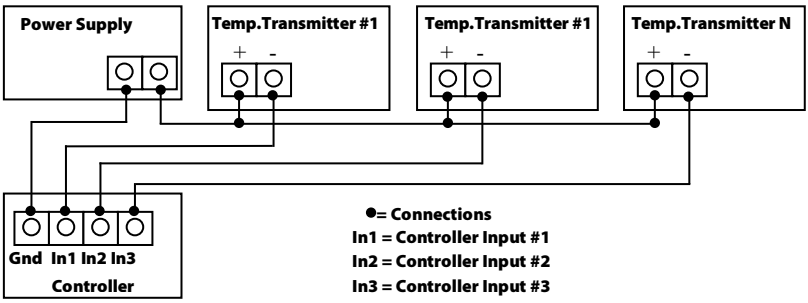
Formula for Number of Transmitters

Several transmitters may be powered from the same supply as shown in **FIGURE 4** (below). Each transmitter draws 25mA; refer to the following equation to obtain the number of permissible transmitters: ***[# Transmitters] = [Current] / (25 mA)***.

FIGURE 4: MULTIPLE TRANSMITTER CONNECTIONS



TEMPERATURE DISPLAY ADJUSTMENTS

The Temperature Display may be adjusted by adjusting the ZERO Potentiometer as shown on the above diagram. Adjust (P2) until the LCD Display reading matches your sensor if necessary. Do not adjust the SPAN pot.

SETPOINT CONTROL

Adjust slider at bottom of housing for set point control. Slide to right to increase set point temperature. Slide to left to decrease temperature control. Units can be setup from factory for Direct Acting (resistance increases when adjusted to right), or Reverse Acting (resistance decreases when adjusted to right).

OVERRIDE ADJUSTMENTS

Override will be set to Override Short Sensor (default). Adjust J3 Jumpers to change.

TROUBLESHOOTING

PROBLEM	SOLUTION(S)
Temperature Transmitter Not Working	• Power supplied to transmitter (+). Verify that there is a common ground.
4 to 20 mA Setpoint Not Working	• Power supplied to transmitter (+). Verify that there is a common ground.
Temperature Transmitter Reading High	• Verify that the (2) shunts are on the headers in the lower right hand corner.
Display Not Working	• Verify that the Jumper on J8 is on. This completes the loop from the Temperature transmitter to the display. Verify that the display is plugged in correctly.

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PRODUCT SPECIFICATIONS

SENSOR NON-SPECIFIC INFORMATION	
Number Temperature Sensing Points:	One
Housing Screw Size / Drive Size:	1/16" Allen screws (2 qty) / 1/16" Hex Driver
Override Option:	"Dry Contact" Closure (Separate Input)
Operating Temperature Range:	1.5 to 50 °C (35 to 122 °F)
Storage Temperature Range:	-40 to 65 °C (-40 to 149 °F)
Operating Humidity Range:	10 to 95% RH, non-condensing
Connections | Wire Size:	Screw Terminal Blocks (Non-Polarity Sensitive) | 16 (1.31 mm^2) to 26 AWG (0.129 mm^2)
Terminal Block Torque Rating:	0.5 Nm (Minimum); 0.6 Nm (Maximum)
Enclosure Material | Color:	**"R" Enclosure:** ABS Plastic | Beige UL94-HB
Override Contact Type | Contact Ratings:	Dry Contact "N/O" Contact | **Minimum:** 10 uA @ 1 VDC | **Maximum:** 50 mA @ 24 VDC
Set Point Accuracy:	**+/- 10% | 4-20 mA:** 4 mA (Far Left) / 20 mA Far Right (DA - Direct Acting Default) 20 mA (Far Left) / 4 mA Far Right (RA - Reverse Acting (Optional)
Sensor	
Sensor Type | Sensor Curve | Sensing Points:	Platinum RTD | PTC (Postive Temperature Coefficient) | One
RTD Tolerance Class | Sensor Accuracy:	+/- 0.06% Class A | (**Tolerance Formula:** +/- °C = (0.15°C + (0.002 * |t|)) where |t| is the absolute value of temperature above or below 0°C in °C
Din Standard | Temperature Coefficient:	DIN EN 60751 (IEC 751) | 3850 ppm / °C
Sensor Stability:	+/- 0.03% after 1000 Hours @ 300°C (572°F)
Transmitter	
Transmitter Supply Voltage | Supply Current:	+8.5 to 32 VDC (Reverse Polarity Protected) | 25 mA minimum **250 Ω Load:** +13.5 to 32 VDC | **500 Ω Load:** +18.5 to 32 VDC **"-LCD" Loop Powered:** Add +7 VDC to 250/500 Ω Load Supply Voltage above
Maximum Load Resistance:	(Terminal Voltage - 8.5 V) | 0.020 A
Output Signals:	**Current:** 4-20 mA (2-Wire Loop Powered)
Calibrated Transmitter Accuracy | Linearity[1]:	**Temp. Spans < 500°F (260°C):** +/- 0.2%
Temperature Drift[2]:	**Temp. Spans <100°F (38°C):** +/- 0.04%/°F | **Temp. Span >100°F (38°C):** +/- 0.02%
Warm Up Time | Warm Up Drift:	10 Minutes | +/- 0.1%
Connections | Wire Size:	Screw Terminal Blocks | 16 AWG (1.31 mm^2) to 26 AWG (0.129 mm^2)
Terminal Block Torque Rating:	0.37 ft-lb (0.5 N-3m) nominal
LCD Specifications	
LCD Display Inpute Signal:	4 to 20 mA Only (2-Wire Loop Powered)
LCD Display Accuracy:	+/- 1.0% of Calibrated Temperature Span or +/- Whichever is Greater
LCD Display Descriptor | Resolution:	°F (Fahrenheit) or °C (Celsius) | 3 ½ Digits (-199.9 to 199.9)
LCD Display Life Expectancy:	50,000 Hours Minimum

WARRANTY

The ACI Room Series temperature sensors 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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