

### INTRODUCTION

The high accuracy room temperature transmitter utilizes a precision curve-matched thermistor to measure temperature in an attractive, low profile wall mount enclosure. The device may also include an occupancy override button and an external communication jack. The output is available as a linear 4-20 mA, 0-5 or 0-10 Vdc signal.

### BEFORE INSTALLATION

Read these instructions carefully before installing and commissioning the device. Failure to follow these instructions may result in product damage. Do not use in an explosive or hazardous environment, with combustible or flammable gases, as a safety or emergency stop device or in any other application where failure of the product could result in personal injury. Take electrostatic discharge precautions during installation. **Do not exceed the device ratings.**

### MOUNTING

The temperature sensor mounts directly on a wall or onto an electrical wall box. For the most accurate results, units should be mounted on an inside wall to a wall box five feet from the floor. Do not mount the sensor near doors, opening windows, supply air diffusers, or other known air disturbances. Avoid areas where the sensor is exposed to vibrations or rapid temperature changes.

The cover is hooked to the base at the top edge and must be removed from the bottom edge first. Use a small Phillips screwdriver to loosen the security screw as shown in Figure 1. (Complete removal is not required). Use a screw driver to carefully pry each bottom corner if necessary. Tip the cover away from the base and sit it aside as shown in Figure 2.

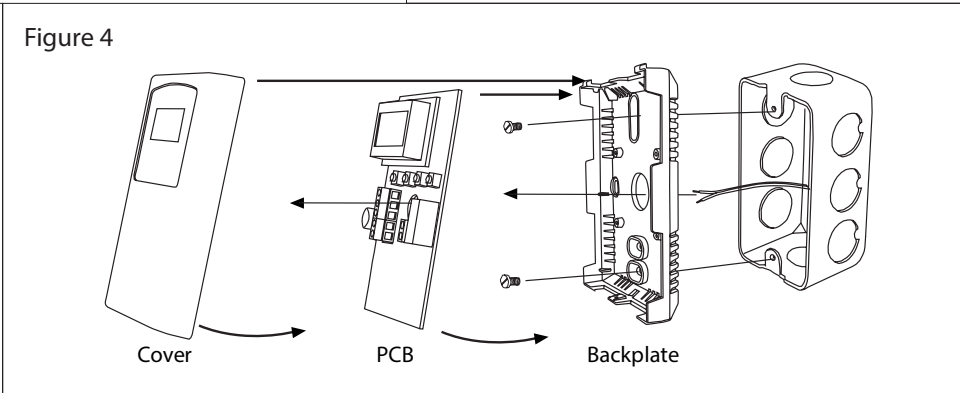
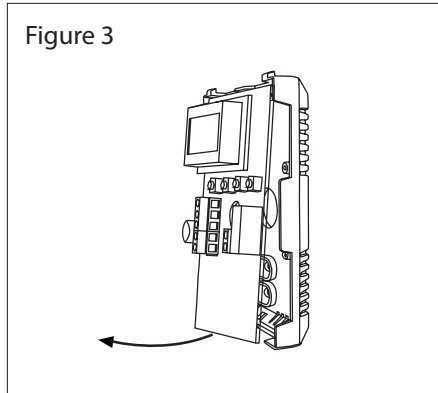
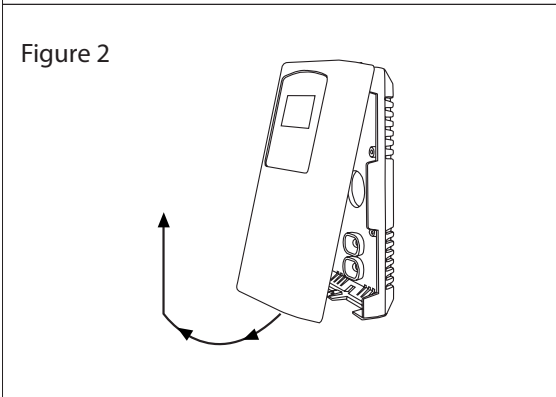
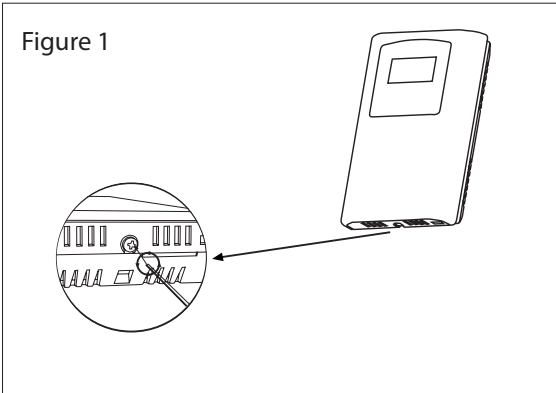
The PCB must be removed from the base to access the mounting holes. Follow usual anti-static procedures when handling the PCB and be careful not to touch the sensors. The PCB is removed by pressing the enclosure base to unsnap the latch near the bottom edge, then the PCB can be lifted out of the base as shown in Figure 3.

Set the PCB aside until the base is mounted on the wall. For added protection, place the PCB in the supplied anti-static bag.

Mount the base by screwing it to an electrical box or directly to the wall as shown in Figure 4.

After the base is screwed to an electrical box or the wall using the appropriate holes, remove the PCB from the anti-static bag, feed connection wires through center hole and place the top of the PCB into the PCB holders on the backplate and snap the bottom of the PCB into place as shown in Figure 4.

Make wire connections as per the Wiring Illustrations on Page 2 and install decorative cover by placing the top of the cover into the cover holder on the top of the backplate and snapping the bottom into place as shown in Figure 4. Tighten security screw with a screwdriver.



# WIRING

Deactivate the 24 Vac/dc power supply until all connections are made to the device to prevent electrical shock or equipment damage. Follow proper electrostatic discharge (ESD) handling procedures when installing the device or equipment damage may occur.

Use 22 AWG shielded wiring for all connections and do not locate the device wires in the same conduit with wiring used to supply inductive loads such as motors. Connect the cable shield to ground at the controller only. Make all connections in accordance with national and local codes.

Connect the plus dc or the ac voltage hot side to the POWER terminal. The power supply common is connected to the COMMON terminal. The device is reverse voltage protected and will not operate if connected backwards. It has a half-wave power supply so the supply common is the same as the signal common. Several devices may be connected to one power supply and the output signals all share the same common. Use caution when grounding the secondary of a transformer or when wiring multiple devices to ensure the ground point is the same on all devices and the controller.

The analog output is available on the TEMP OUT terminal. For 4-20 mA output type, all outputs operate in the Active mode and do not require a loop power supply. This means **the signal current is generated by the transmitter and must not be connected to a powered input or device damage will result.** Check the controller Analog Input to determine the proper connection before applying power. All output signals are referenced to the COMMON terminal.

The device is also available with field-selectable 0-5 or 0-10 vdc voltage signal outputs which connect directly to a high impedance analog input. In either case the terminal designations are the same and the signals are referenced to COMMON.

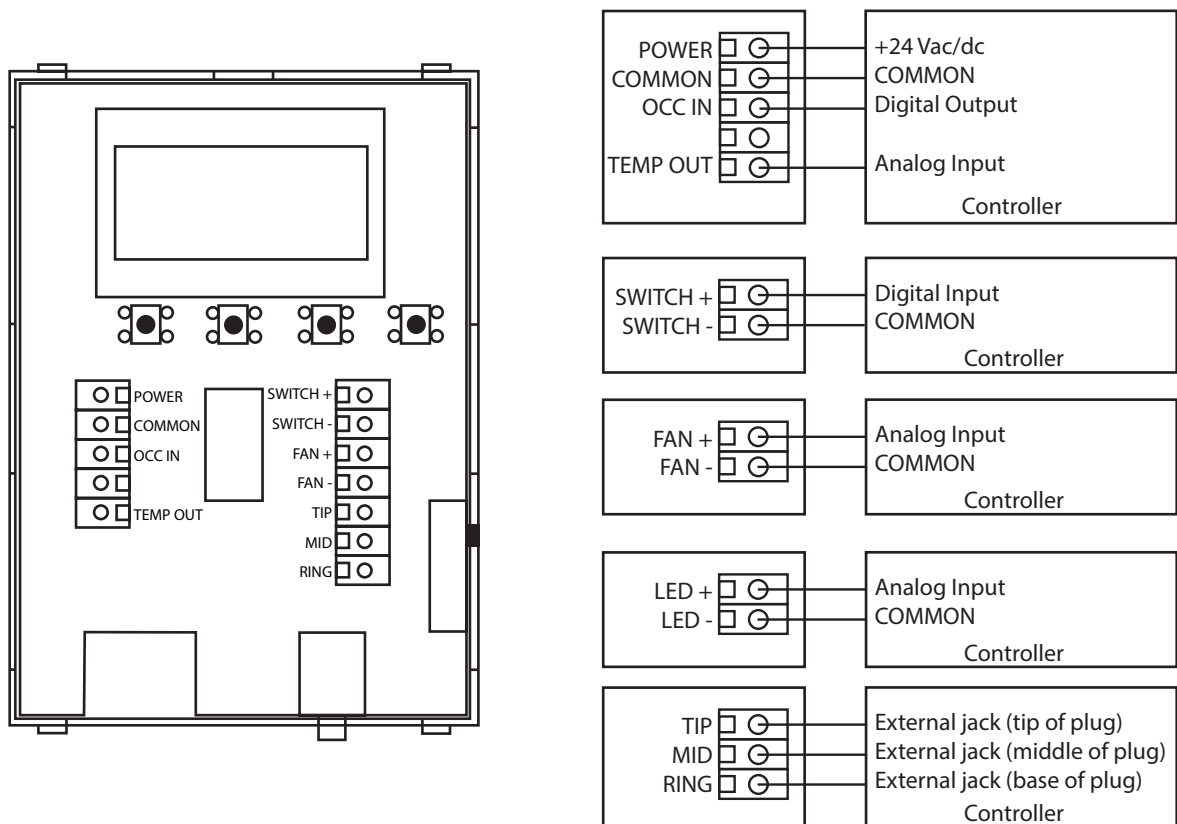
The OCC IN terminal is a digital input that controls the OCC segment on the LCD to indicate an occupied condition. It can be connected to a 0-5V digital signal or a dry contact signal. This is usually an active low input signal and requires that the OCC IN terminal be shorted to COMMON to activate the input.

The override switch output is a dry-contact and is available on the SWITCH + and SWITCH - terminals. It is typically connected to a low-voltage digital input on the controller to indicate room occupancy or override when the button is activated.

The resistive fan speed output signal is available on the FAN + and FAN - terminals and has five positions

The external jack is internally connected to a three-pin terminal block labeled TIP, MID, and RING to accept a stereo phono plug for remote communication with the controller.

Figure 6



## START-UP

Verify that the transmitter is properly wired and connections are tight. Apply power and note that the LCD will begin displaying the temperature levels. All the output signals will also be available immediately after start-up.

## LCD DISPLAY

The device is configured to display the temperature continuously. The Setup Menu can be used to modify the displayed information. The device supports four temperature ranges that may be selected in the menu. The default is 0 to 35°C but this may be changed to 32 to 95°F and the output signal will stay the same. Also the temperature range may be changed to 0 to 50°C or 32 to 122°F and the output signal scaling will change to match the display.

## OUTPUT

The temperature output is scaled such that 4-20 mA (or 0-5 or 0-101 Vdc) equals either 0 to 35°C, 32 to 95°F, 0 to 50°C or 32 to 122°F depending on which range is selected in the menu. The factory default range is 0 to 35°C.

## SETUP MENU

The menu has several items as shown below, and the device cover must be removed to access the menu. To enter the menu, press and release the <MENU> key while in normal operation. Each press of the <MENU> key will save any changes made and advance to the next menu item. The <UP> and <DOWN> keys are used to make changes to program variables by scrolling through the available options.

Setup Menu operation is explained below, and the factory default values are shown. Note that any items that are not applicable to the hardware configuration will be skipped in the Setup Menu.

<MENU> Press and release to enter the SETUP menu

### 1. CELSIUS / FAHRENHEIT



The temperature scale defaults to Celsius (°C). It can be changed to Fahrenheit (°F) by using the <UP> or <DOWN> keys. This setting will affect other parameters.

<MENU> Press to advance to next menu item

### 2. TEMPERATURE RANGE



Two temperature ranges are available for both °C and °F, 0 to 35°C (32 to 95°F) or 0 to 50°C (32 to 122°F). Use <UP> and <DOWN> keys to change.

<MENU> Press to advance to next menu item

### 3. TEMPERATURE OFFSET



Use <UP> and <DOWN> to add or subtract an offset to the temperature output signal and display. The default is 0 but can be changed from -9 to +9°F for temperature calibration

<MENU> Press to advance to next menu item

### 4. OCC REVERSE



Use <UP> and <DOWN> to add or subtract an offset to the temperature output signal and display. The default is 0 but can be changed from -9 to +9°F for temperature calibration.

<MENU> Press to advance to next menu item

### 5. BACKLIGHT ENABLE



Use the <UP> and <DOWN> keys to enable or disable the LCD backlight. bL1 = backlight on, bL0 = backlight off.

<MENU> Press to advance to next menu item

# SPECIFICATIONS

## TEMPERATURE SENSOR

- Sensor Type ..... 10K NTC Thermistor
- Accuracy .....  $\pm 0.1^{\circ}\text{C}$  ( $\pm 0.18^{\circ}\text{F}$ )
- Range .....  $0$  to  $35^{\circ}\text{C}$  ( $32$  to  $95^{\circ}\text{F}$ ) or  $0$  to  $50^{\circ}\text{C}$  ( $32$  to  $122^{\circ}\text{F}$ ) programmable
- Offset .....  $\pm 9^{\circ}\text{F}$  programmable
- Display Units .....  $^{\circ}\text{C}$  or  $^{\circ}\text{F}$  programmable
- Display Resolution .....  $0.5^{\circ} < 100^{\circ}$ ,  $1^{\circ} > 100^{\circ}$

## OVERRIDE

- Type ..... Front panel push-button available as dry-contact 2 wire output
- Front Panel Push-Button ..... N.O., 50 mA @ 12 Vdc

## COMMUNICATION

- 3.5mm Phono Jack ..... Connects to 3 pin terminal block (Tip, Mid, Ring)

## FAN SPEED SWITCH

- Range ..... Off, Auto, Low, Medium, High
- Signal ..... 0, 2, 4, 6, and 8K standard, 2 wire output (other values available)

## OCCUPIED INPUT

- Signal Type ..... Digital input, 0-5 Vdc or dry contact to common
- Logic ..... Active low or active high programmable
- Action ..... Causes "OCC" segment to light on LCD

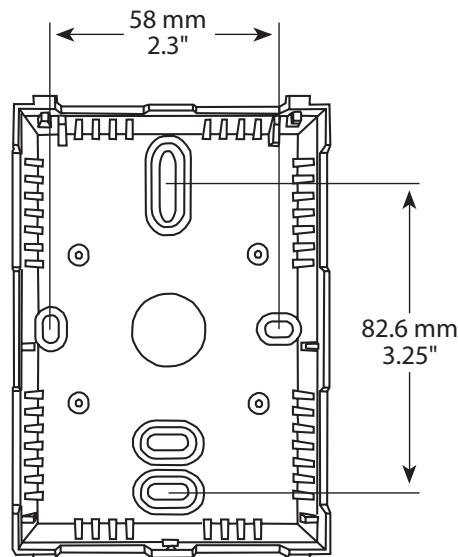
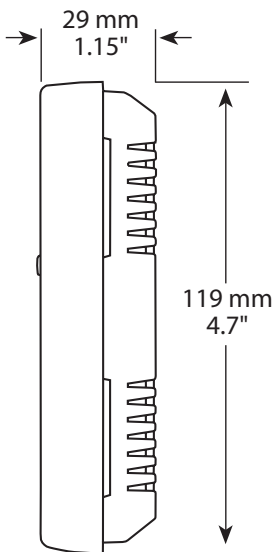
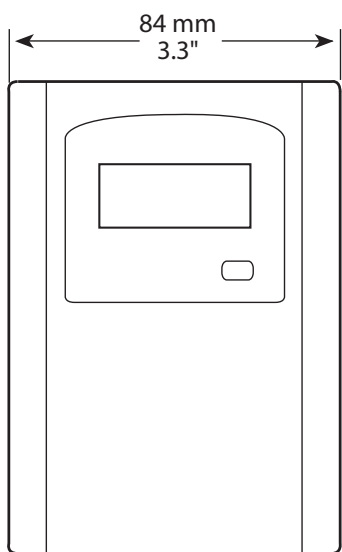
## LCD DISPLAY

- Display Size ..... 38.1mm W x 16.5mm H (1.5" x 0.65")
- Digit Height ..... 11.43mm (0.45")
- Symbols .....  $^{\circ}\text{C}$ ,  $^{\circ}\text{F}$ , OCC
- Backlight ..... Enable or disable via menu

## GENERAL

- Power Supply ..... 24 Vac/dc  $\pm 10\%$  (non-isolated half-wave rectified)
- Consumption ..... 40 mA max @ 24 Vdc
- Input Voltage Effect ..... Negligible over specified operating range
- Protection Circuitry ..... Reverse voltage and output limited
- Output Signals ..... 4-20 mA active (sourcing) or 0-5/0-10 Vdc (specify when ordering)
- Output Resolution ..... 10 bit
- Output Drive Capability ..... **Current:** 550  $\Omega$  max  
**Voltage:** 10 K $\Omega$  min
- Programming and Selection ..... Via push-buttons and on-screen menu
- Operating Conditions .....  $0$  to  $50^{\circ}\text{C}$  ( $32$  to  $122^{\circ}\text{F}$ ),  $0$  to  $95\%$  RH non-condensing
- Wiring Connections ..... Screw terminal block (14 to 22 AWG)
- Enclosure ..... White ABS, 84mm W x 117mm H x 29mm D (3.3" x 4.6" x 1.15")
- Country of Origin ..... Canada

# DIMENSIONS



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