



## Installation Instructions NT-ODT Outdoor Serial-Stat Remote Sensor

### Introduction

The NetworkThermostat NT-ODT is designed to sense outdoor air and send this information by digital communications to the thermostat. The outdoor temperature can be displayed on the thermostat. Additionally, only one NT-ODT is needed for each NetworkThermostat Network Adapter. In heat-pump applications it can also be used to control the balance point and the auxiliary heat lockout temperatures.

### Installation of Outdoor Sensor Only

1. Install the thermostat according to the instruction manual supplied with it. Check that the thermostat is operating. (The display will show the correct temperature.)
2. Select a location for the outdoor probe that will give accurate readings. Do not locate the probe where it will be influenced by sunlight. The north side of the building or under the shadow of the eaves is often a good location. Avoid locations such as near exhaust vents, dryer vents or other sources of heat.
3. Mount the probe on the outside of the building using the screw and wall anchor provided so that the tip is well away from the surface of the wall. The cable may be routed directly through the wall or bent at the probe and routed along the surface to enter at a more convenient place.
4. Locate the sensor box indoors in a controlled air space near the probe. The cable with the probe is about 6 feet long. Additional 2-conductor cable may be spliced on if necessary to increase the length.
5. Open the sensor case by depressing the button on the bottom edge of the case until the latch releases. Remove the cover by pulling it out and up at the bottom.
6. Remove the board from the subbase by pulling back the latch that holds it at the center bottom.
7. Mount the subbase over the wires coming out of the wall using the two screws and anchors provided. Drill size for the wall anchors is 1/4 inch. The angled corner on the subbase should be in the bottom right. Snap the board back into the subbase. Check to be sure that the latch holds the board properly.
9. Strip 1/4 inch of insulation from the two wires coming from the probe to the sensor box. Connect the wires to terminals 1 and 2. Polarity is not important on the probe.
10. Install Category 5 (CAT5) UTP cable from the thermostat to the outdoor sensor box. **CAUTION:** Remove the thermostat from the subbase while wiring the sensor to prevent damage from live wires.
11. Strip 1/4 inch of insulation from the three wires coming from the thermostat. Install the wires in the terminals using the Table below. Push any extra wire back into the wall cavity.  
  
RS+V = Green with White Stripe  
RS2 = White with Green Stripe  
RS1 = Brown with White Stripe
12. Note the wire color going to each terminal. The order of the wires on the thermostat are not the same as the sensor.
13. Connect the wires on the thermostat subbase to the terminals labeled RS2, RS1 and RS+V. Make sure that each terminal on the sensor is wired to the terminal with the same name on the thermostat.
14. Mount the thermostat on the subbase and check to be sure that it is showing the temperature. It may take a few seconds to stabilize.
15. Press the *OUTDOOR* button on the thermostat. The outdoor temperature should be displayed with the tree and thermometer icon

16. Reinstall the cover on the outdoor sensor by hooking it on the top and snapping the bottom into place.

### Using Multiple Sensors

Only one outdoor sensor may be installed with a thermostat. However, up to six indoor sensors may also be connected for indoor remote sensing and temperature averaging. Refer to the instructions with the indoor sensor for connecting multiple sensors. The outdoor sensor may be connected with one or more indoor sensors in the same way that an indoor sensor is wired. The only difference in wiring is the additional two wires from the probe which go to terminals 1 and 2.

### Heat Pump Applications

If the sensor is being used with a heat pump thermostat with auxiliary heat, the thermostat can be configured to disable the use of auxiliary heat during warm weather and to lock out the compressor when the outdoor temperature is too cold. This can make the most efficient use of energy.

At warmer temperatures, a heat pump will operate much more efficiently than the auxiliary heat. It can save energy to disable auxiliary heat in some cases; for example, when returning from setback on a mild day. The temperature above which auxiliary heat is disabled is the auxiliary lockout temperature or high balance point.

Air-to-air heat pumps become less efficient as the outdoor temperature drops. The temperature at which it becomes more efficient to use auxiliary heat instead of the heat pump is the balance point or low balance point.

To display the high and low balance points, while holding down the *OUTDOOR* button, press the *FAN* button. The display will indicate the high or low balance point and the selected temperature. Press *OUTDOOR* again to toggle between the two settings.

The factory settings allow the use of the heat pump and auxiliary heat over the entire temperature range of the outdoor sensor.

Adjust either setting using the up and down arrow keys. Consult a qualified installer or the heat pump manufacturers' instructions for appropriate settings.

**CAUTION:** Do not set the high balance point below the low balance point as this will create a dead band with no temperature control.

### Using One Outdoor Sensor for Network Broadcasting

When used in conjunction with the NetworkThermostat Command Center Software and a network adapter (NT-SSA2 or NT-SSA2/CLK), only one outdoor sensor is needed for each network adapter in the system.

Connect the outdoor sensor as described above and then use the software to configure the network adapter. Select the thermostat address that the outdoor sensor is connected to and then turn on the broadcast command.

The network adapter will now acquire the outdoor temperature data from the selected thermostat and broadcast the data to all of the other thermostats connected to the network adapter.

### Troubleshooting

**Thermostat has no display:** Check 24VAC supply. Check for miswiring between thermostat and sensor. Incorrect wiring can damage the thermostat and transformer or blow a fuse in the equipment.

**Thermostat reads AC:** AC power is disconnected.

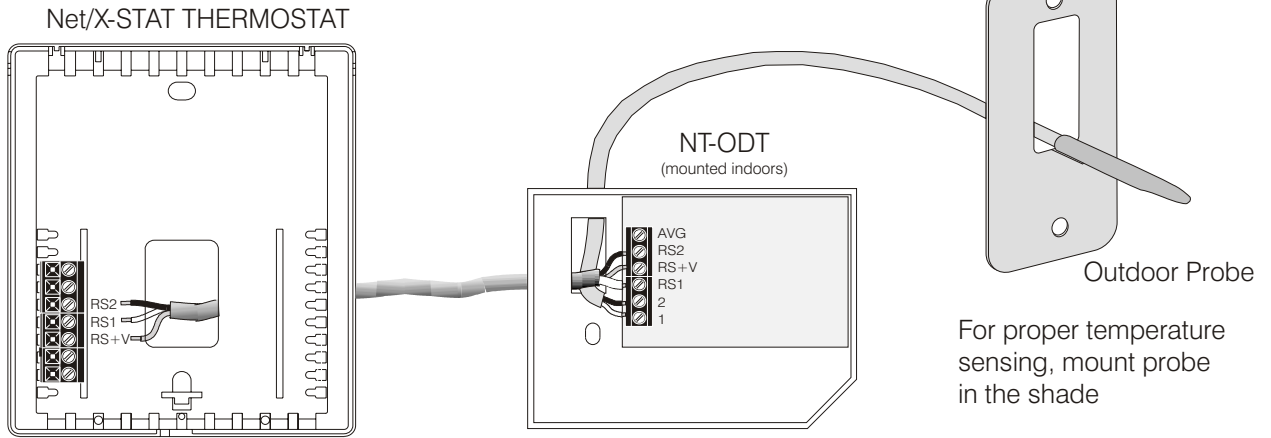
**Display shows two dashes when outdoor button is pressed:** Sensor not connected properly. Check wiring between thermostat and sensor. Check that sensor is not an indoor sensor. (The indoor sensor has a thermistor sticking out from the bottom right corner of the board.)

**Thermostat displays very high outdoor temperature:** Wires on the probe are touching (shorted together). Separate them.

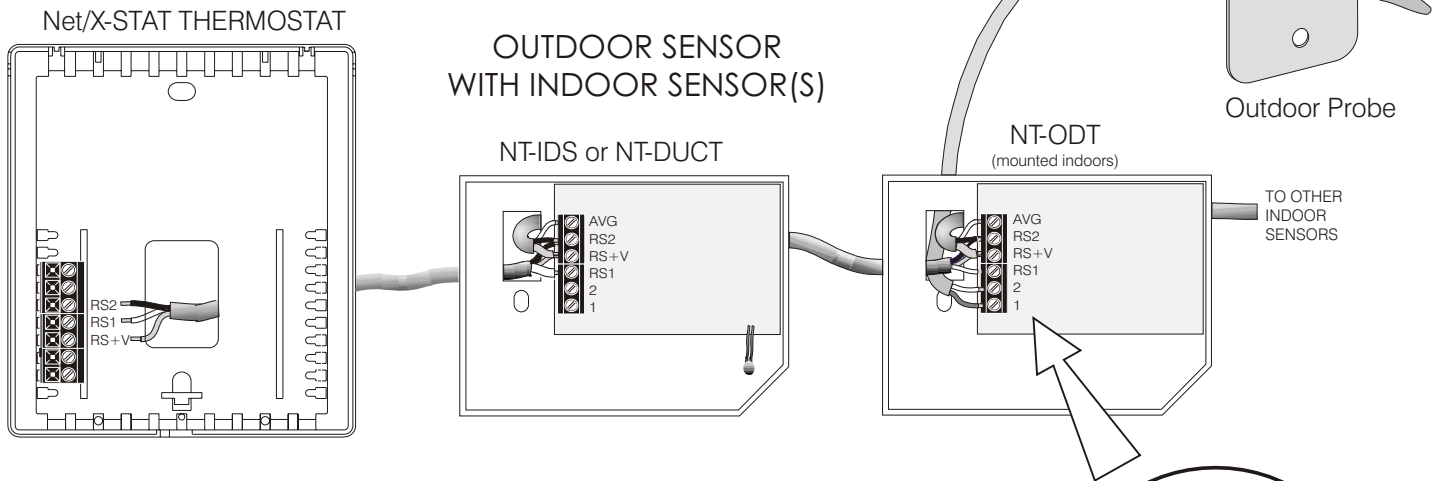
**Thermostat displays very low temperature:** Probe is not connected to sensor properly. Check probe wiring.

# NT-ODT OUTDOOR TEMPERATURE SENSOR INSTALLATION DIAGRAMS

## OUTDOOR SENSOR ONLY



## OUTDOOR SENSOR WITH INDOOR SENSOR(S)



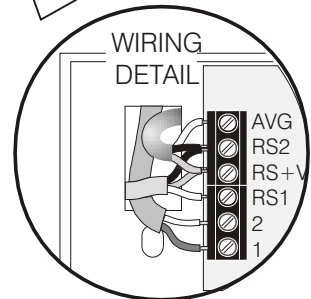
### Specifications:

Power Supply : 12 to 30 VAC or DC (24V Nominal)  
 Probe Operating Temperature : -40 to +50 Deg. C  
 Sensor Box Operating Temperature : 0 to 50 Deg. C  
 Sensor Box Maximum RH : 90 % (non-condensing)  
 Accuracy : +/- 2 Deg C from -20 to +30 Deg C  
 (+/- 4 Deg F from -4 to +86 Deg F)  
 after 30 minutes of continuous operation  
 Guaranteed Measurement Range : -30 to +47 Deg C  
 (-22 to 119 Deg F)  
 Maximum Measurement Range : -48 to +47 Deg C  
 (-55 to 119 Deg F)  
 Max Cable Length Between 2 Units: 300 Ft, with CAT 5 UTP  
 Cable Type : CAT 5 UTP  
 Max Number of Indoor Sensors in a Daisy Chain: 6  
 Max Number of Outdoor Sensors in a Daisy Chain: 1

### Note:

Outdoor sensor may be located before, after or between indoor sensors.

Refer to instructions that come with the indoor / duct sensor.



Thermo- stat	Indoor Sensor	Outdoor Sensor	Indoor Sensor	Other Sensors
-----------------	------------------	-------------------	------------------	------------------

RS+V	RS+V	RS+V	RS+V	RS+V
RS2	RS2	RS2	RS2	RS2
RS1	RS1	RS1	RS1	RS1
AVG	AVG	AVG	AVG	AVG