IS-ZW-TSTAT-300
Advanced Thermostat
Installation Guide

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Contact information
For contact information, see www.interlogix.com.

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Introduction

The IS-ZW-TSTAT-300 programmable communicating thermostat operates via a high-quality, easy-to-use touch screen.

Figure 1: IS-ZW-TSTAT-300

WARNING: To avoid electrical shock and to prevent damage to the furnace, air conditioner, and the thermostat, disconnect the power supply before beginning work. This can be done at the circuit breaker.

Caution: Your thermostat is a precise instrument, handle it with care:

- Turn off electricity to the HVAC system before installing or servicing the thermostat or any part of the system.
- Do not turn electricity back on until work is completed.
- Do not short (jumper) across electrical terminals at the control on the furnace or air conditioner to test the system. This may damage the thermostat.
- All wiring must conform to local codes and ordinances.

This thermostat is designed for use with three AA alkaline batteries and/or 24 VAC C wire (or a 12 to 24 AC or DC source) and millivolt gas systems. Each thermostat relay load should be limited to 1.0 A; higher amperage may cause damage to the thermostat.
Tools
You will need a small Phillips screwdriver and a drill with a 3/16-in. (4.8 mm) bit for wall mounts.

Location
For replacement installations, mount the thermostat in place of the old thermostat. A new location will require moving your wiring.

For new installations and relocating the thermostat, follow these guidelines:

• Locate the thermostat on an inside wall, about 5 ft. (1.5 m) above the floor, and in a room that is used often.

• Do not install the thermostat where there are unusual heating conditions, such as: in direct sunlight; near a lamp, radio, television, radiator register, or fireplace; near water pipes in a wall; or near a stove on the other side of a wall.

• Do not locate in unusual cooling conditions, such as on a wall separating an unheated room; or in a draft from a stairwell, door, or window.

• Do not locate in a damp area. This can lead to corrosion that will shorten thermostat life.

• Do not locate where air circulation is poor, such as in a corner; in an alcove; or behind a door.

• Do not install the thermostat until all construction and painting has been completed.

• This thermostat does not require leveling.

Remove the old unit
Caution: Read the instructions carefully before removing any wiring from the existing thermostat. Wires must be labeled before they are removed. There is no standard color code. When removing wires from their terminals, ignore the color of the wires and label them by the lettered terminal where they are screwed.

Switch off electricity to the heating and cooling systems, and then follow these instructions.

1. Remove the cover from the old thermostat. Most are snap-on types and simply pull off. Some have locking screws on the side or front. These must be loosened. Do not remove wires. Note the letters printed near the terminals. Attach labels (enclosed) to each wire for identification.

2. Label wires one at a time. You must label all the wires before you proceed.
3. With all wires labeled, remove them from the old unit. Make sure the wires do not fall back inside the wall. You can wind them around a pencil to keep them from falling.

4. Loosen all screws on the old thermostat and remove it from the wall.

Figure 2: Labeling wires

Wiring

Make sure your wires are labeled. This may require you to find the other end connection for each wire on your heating or air conditioning equipment and read the label there. See “Wire reference chart” on page 16 for more information on wire labels from different HVAC system makers.

Note: The thermostat runs on three AA alkaline batteries and/or the C wire if available. If you do not have a C wire, you can run a new wire from the HVAC or use a standard 12 to 24 VAC or VDC wall transformer. An external power source is required when using a radio module.

Note: If you have both RH and RC you need to remove the jumper wire between these two terminals (see Figure 3 on page 5).

Prepare the wires

Follow these guidelines for safe and secure wire connections:

- You will need at least 2.6 in. of wire for each connection to the thermostat. If you do not have enough wire, splice additional wire to allow enough slack.
- Terminals accept 16 to 22 AWG wire.
- Fan out wires below the mounting hole (see Figure 3 on page 5).
- Remove insulation 1/8 in. from the tip of each wire (see Figure 3 on page 5).
- When handling, take care not to damage the labels for each wire.
Identify your wiring diagram

Select the reference wiring page with your wiring diagram and set-up information.

- “Two-wire heat, gas millivolt or 24 VAC system (C, W, RH):” on page 11
- “Three-wire heat (C, W, RH, G):” on page 12
- “Four-wire heat/cool (C, W, Y, RH, G)” on page 12
- “Five-wire heat/cool (C, W, Y, RH, RC, G)” on page 13
- “Four-wire heat pump without AUX heat (C, B or O, Y, RH, G):” on page 13
- “Five-wire heat pump with AUX heat (C, B or O, W2, Y, RH, G):” on page 14
- “Two-stage heat and two-stage cool (C, W2, W, Y, Y2, RH, G):” on page 15
- “Three-wire zoned hot water (W, RH, [A]):” on page 15

The C wire is optional, but preferred for all installation (shown as a dotted line in the wiring diagrams listed above). Some radio modules will require the 24 VAC C wire power.

If your combination of wires is not listed, you can use the “Wire reference chart” on page 16 to determine your connections, contact customer support for help.

Fan out wires with the thermostat below the wall opening so that the C wire is above the C terminal, the W wire above the W terminal, etc. This allows the thermostat to fit snug to the wall. Wires will position behind the thermostat and up over the terminal area. Do not bunch wires behind the thermostat. Feed any slack back into the wall opening.
Caution: Do not allow wires to touch each other or parts of the thermostat.

Connect your wires

Connect the labeled wires only to a terminal with the same letter label. Insert the wire in the terminal well and tighten the screw securely.

Note: If you prefer, you can mount the thermostat to the wall first, and then connect the wires.

The thermostat can be externally powered with a power source rated 12 V to 24 V AC or DC, at 300 ma or greater. If used, connect to the C and RH terminals (no polarity).

Mount the thermostat to the wall

1. Hold the thermostat against the wall, with the wires coming over the top above the terminal block. The thermostat will cover the hole in the wall. Position the thermostat for best appearance.

2. Mark first and drill a 3/16 in. (4.8 mm) hole for the insert at each screw location, then mount the unit.

3. Attach the thermostat to the wall with the screws provided. If you are mounting the thermostat to sheet rock or if you are using the old mounting holes, use the plastic anchors provided.
Figure 5: Mounting the thermostat

Figure 6: HVAC selection

**HVAC selection**

- If you have conventional heat, set the HVAC Type switch to NORM (normal).
- If you have a heat pump system, set the HVAC Type switch to HP (heat pump).
- If you have normal gas or oil heat or if you have a heat pump with gas or oil AUX heat, set the Heat Type switch to GAS.
- If you have normal electric heat or if you have a heat pump with electric AUX heat, set the Heat Type switch to ELEC.
Install the batteries

Install three AA alkaline batteries (required) following the marked polarity in the battery compartment. Put the lower battery in negative end first against the spring, then push the positive end in. Then insert the last two batteries as shown below.

Figure 7: Battery installation

Special battery warning

• Always replace the batteries as soon as the “Low Batt” flashes. The thermostat is a battery-powered device. You must be responsible to replace the batteries before they run out.

• Even if the “Low Batt” indicator does not flash, you should always replace the batteries at least once a year. Replacing the batteries also helps to prevent leakage that can corrode and damage the thermostat.

• If you are leaving your home for a month or more, you should replace the batteries as a precaution against battery failure in your absence.

• Failing to replace the batteries, when necessary could cause the thermostat to lose power or malfunction. If the thermostat loses power, then the thermostat will not control the temperature which could result in your HVAC system not functioning as you intended and lead to possible damage from overheating or excessive cooling.
  • If the thermostat batteries fail with the heat OFF, this could result in no heat and possible frozen or broken pipes and water damage.
  • If the thermostat batteries fail with the cool OFF, this could result in no cooling and could cause possible damage or excessive temperatures.

• Always use new alkaline batteries.
To complete the installation

Press the Reset button (under the top cover, see Figure 1 on page 2) to implement the HVAC switch selections.

With all the wires connected, it is time to turn the AC power back on. Do this at the breaker you used to switch it off. The thermostat will power-up in the OFF mode. Your thermostat is not configured to operate your HVAC system yet. You must now configure your thermostat for your HVAC system.

HVAC setup

1. Make sure the thermostat is powered up and the MODE button is set to OFF. The HVAC selection switches should already be set (see “HVAC selection” on page 7).

2. With mode in OFF, press the Menu button


4. On the HVAC setup screen, use the +/- icons to select the HVAC number.

The LCD display will show your selection and indicate the number of stages you have selected. During setup, 2nd stage will blink when both heat and cool have 2nd stages.

Figure 8: HVAC setup screen

If you have a normal HVAC system and you want fast temperature recovery:

- Heat and Cool Select 1
- Two-stage Heat, one-stage Cool Select 2
- Two-stage Heat, two-stage Cool Select 3

If you want efficient (but slower) recovery:

- Two-stage Heat, one-stage Cool Select 4
- Two-stage Heat, two-stage Cool Select 5
If you have a heat pump HVAC system:

- Heat pump with AUX heat (Fast Recovery) Select A
- Heat pump with AUX heat (Efficient Recovery) Select B
- Heat pump no AUX heat Select C

**Note:** For two-stage systems your thermostat can recover from a temperature setback in two ways:

- Fast Recovery - this uses your 2nd stage to bring the house to target temperature. This may use slightly more energy.
- Efficient Recovery - This uses the 2nd stage to bring your house to within a few degrees of the target temperature and then uses the 1st stage to go the last bit. (Refer to the Operating Guide for information about setting the differential). This is more efficient.

**Testing the installation**

Follow these procedures to verify you have correctly installed the thermostat.

**To check the fan (if you have the G wire):**
1. Press the FAN button to turn the fan ON.
2. Verify that air is blowing from the system.
3. Press the FAN button again to return to AUTO.

**To check heat:**
1. Set the mode to HEAT by pressing the MODE button until HEAT is displayed.
2. Touch the temperature display to bring up the Manual screen.
3. Touch the + icon and raise the target temperature to 90°F; allow the system 2 minutes to respond.
4. Verify that heat is blowing from the system.
5. Return the target temperature to a normal setting.
6. Return mode to OFF by pressing the MODE button.

**To check cool (do not operate AC if the outside temperature is below 65°F):**
1. Set the mode to COOL by pressing the MODE button until COOL is displayed.
2. Touch the temperature display to bring up the Manual screen.
3. Touch the - icon and lower the target temperature to 50°F; allow the system 5 minutes to respond.

4. Verify that cool air is blowing from the system.

5. Return the target temperature to a normal setting.

6. Return mode to OFF by pressing the MODE button.

**Note:** If you have a heat pump, leave the thermostat in OFF mode for 4 minutes before checking cool.

If you have labeled and connected your wires and followed the correct HVAC setup, and your system still does not operate, contact technical support.

**Statement of use**

This thermostat can be used with three AA batteries, 24 VAC (C wire), 24 VAC adapter, heating and cooling systems, and millivolt heating. It cannot be used with line voltage systems. This thermostat is digital and your desired heat or cool temperatures can be set on the large touch screen with the +/- buttons. A minimum 4-minute off time protects the compressor from damage.

This thermostat runs on three AA batteries. The thermostat can be externally powered with a power source from 12 to 24 VAC or VDC, at 300 mA or greater. If used, connect to the C and RH terminals (no polarity). The 24 VAC “C” wire is on the other side of the 24 VAC heating transformer and can be found where the other thermostat wires connect at the wall or at the furnace. Do not use the common or ground side of the line voltage.

**Wiring diagrams**

**Two-wire heat, gas millivolt or 24 VAC system (C, W, RH):**

1. Connect the R (or RH) wire to the RH terminal. This connects the power.
2. Connect the W wire to the W terminal. This connects the heat.
3. Set the HVAC Type switch to NORM and the Heat Type switch to GAS.

Your HVAC system is now connected to the thermostat.
Three-wire heat (C, W, RH, G):
1. Connect the R (or RH) wire to the RH terminal. This connects the power.
2. Connect the W wire to the W terminal. This connects the heat.
3. Connect the G wire to the G terminal on the thermostat. This connects the fan.
4. Set the HVAC Type switch to NORM and:
   - If you have gas or oil heat, set the Heat Type switch to GAS.
   - If you have electric heat, set the Heat Type switch to ELEC.

Your HVAC system is now connected to the thermostat.

Four-wire heat/cool (C, W, Y, RH, G)
1. Connect the RH or R wire to the RH terminal. This connects the power.
2. Connect the W wire to the W terminal. This connects the heat.
3. Connect the Y wire to the Y terminal. This connects the compressor.
4. Connect the G wire to the G terminal. This connects the fan.
5. Set the HVAC Type switch to NORM and:
   - If you have gas or oil heat, set the Heat Type switch to GAS.
   - If you have electrical heat, set the Heat Type switch to ELEC.
Your HVAC system is now connected to the thermostat.

**Figure 11: Four-wire heat/cool**

![Four-wire heat/cool diagram]

**Five-wire heat/cool (C, W, Y, RH, RC, G)**
1. Connect the W wire to the W terminal. This connects the heat.
2. Connect the Y wire to the Y terminal. This connects the compressor.
3. Disconnect the jumper between the RH and RC terminals.
4. Connect the RH wire to the RH terminal and the RC wire to the RC terminal. This connects the power.
5. Connect the G wire to the G terminal. This connects the fan.
6. Set the HVAC Type switch to NORM and:
   - If you have gas or oil heat, set the Heat Type switch to GAS.
   - If you have electrical heat, set the Heat Type switch to ELEC.

Your HVAC system is now connected to the thermostat.

**Figure 12: Five-wire heat/cool**

![Five-wire heat/cool diagram]

**Four-wire heat pump without AUX heat (C, B or O, Y, RH, G):**
1. Connect the O wire to the O terminal or the B wire to the B terminal. This connects the change-over valve. If you have both O and B, connect only the
O wire to the O terminal and do not connect the B wire to the B terminal (see "Wire reference chart" on page 16 under Trane for B wire terminal).

2. Connect the Y wire to the Y terminal. This connects the compressor.
3. Connect the R wire to the RH terminal. This connects the power.
4. Connect the G wire to the G terminal. This connects the fan.
5. Set the HVAC Type switch to HP (heat pump) and set the Heat Type switch to ELEC.

Your HVAC system is now connected to the thermostat.

Figure 13: Four-wire heat pump without AUX heat

Five-wire heat pump with AUX heat (C, B or O, W2, Y, RH, G):

1. Connect the O wire to the O terminal or the B wire to the B terminal. This connects the change-over valve. If you have both O and B, connect only the O wire to the O terminal and do not connect the B wire to the B terminal (see "Wire reference chart" on page 16 under Trane for B wire terminal).
2. Connect the W2 wire to the W2 terminal. This connects the AUX heat.
3. Connect the Y wire to the Y terminal. This connects the compressor.
4. Connect the R wire to the RH terminal. This connects the power.
5. Connect the G wire to the G terminal. This connects the fan.
6. Set the HVAC Type switch to HP (heat pump) and:
   - If you have gas or oil AUX heat, set the Heat Type switch to GAS.
   - If you have electric AUX heat, set the Heat Type switch to ELEC.

Your HVAC system is now connected to the thermostat.
Two-stage heat and two-stage cool (C, W2, W, Y, Y2, RH, G):
1. Connect the W wire to the W terminal. This connects the 1st stage heat.
2. Connect the W2 wire to the W2 terminal. This connects the 2nd stage heat.
3. Connect the Y wire to the Y terminal. This connects the 1st stage cool.
4. Connect the Y2 wire to the Y2 terminal. This connects the 2nd stage cool.
5. Connect the RH or R wire to the RH terminal. This connects the power.
6. Connect the G wire to the G terminal. This connects the fan.
7. Set the HVAC Type switch to NORM and:
   If you have gas or oil heat, set the Heat Type switch to GAS.
   If you have electric heat, set the Heat Type switch to ELEC.
Your HVAC system is now connected to the thermostat.

Three-wire zoned hot water (W, RH, [A]):
For solenoid valve or motor valve, connect the wires based on the diagrams below to the correct terminal on the thermostat. Use only in Heat mode. The third
Wire on your valve may be called, 6, Y, or G (see “Wire reference chart” on page 16).

Figure 16: Three-wire zoned hot water

Wire reference chart

<table>
<thead>
<tr>
<th>Possible wires</th>
<th>What they control</th>
</tr>
</thead>
<tbody>
<tr>
<td>R or V or VR</td>
<td>RH and RC single power for heat and cool.</td>
</tr>
<tr>
<td>RH or 4</td>
<td>RH power for heat (RH not connected to RC jumper clip removed)</td>
</tr>
<tr>
<td>RC</td>
<td>RC power for cool (RH not connected to RC jumper clip removed)</td>
</tr>
<tr>
<td>W</td>
<td>W heat control.</td>
</tr>
<tr>
<td>W2</td>
<td>W2 2nd-stage heat or heat pump auxiliary heat.</td>
</tr>
<tr>
<td>W3</td>
<td>W3 3rd-stage heat or 2nd-stage of two-stage auxiliary heat.</td>
</tr>
<tr>
<td>Y</td>
<td>Y cool control or 1st-stage of compression for heat pump.</td>
</tr>
<tr>
<td>Y2</td>
<td>Y2 2nd-stage cool control or 2nd-stage compression for heat pump.</td>
</tr>
<tr>
<td>G or F</td>
<td>G fan control.</td>
</tr>
<tr>
<td>C or X</td>
<td>C 24 VAC power (to power thermostat). Note: Trane uses B for this connection.</td>
</tr>
<tr>
<td>H</td>
<td>H external humidifier.</td>
</tr>
<tr>
<td>DH</td>
<td>DH external dehumidifier.</td>
</tr>
<tr>
<td>EX</td>
<td>EX external fresh air baffle.</td>
</tr>
<tr>
<td>B</td>
<td>B heat pump changeover (cool to heat, powered in heat).</td>
</tr>
<tr>
<td>O</td>
<td>O heat pump changeover (heat to cool, powered in cool).</td>
</tr>
<tr>
<td>B and O</td>
<td>If there are both B and O wires (Trane pump products), do not connect B to B terminal, connect B to C terminal. If not a Trane product, tape off B.</td>
</tr>
<tr>
<td>E</td>
<td>N/A emergency heat (do not connect, tape off).</td>
</tr>
<tr>
<td>L</td>
<td>N/A system monitor (do not connect, tape off).</td>
</tr>
<tr>
<td>T</td>
<td>N/A outdoor sensor (do not connect, tape off).</td>
</tr>
<tr>
<td>Lennox heat pump</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>V or VR or R</td>
<td>RH power for heat.</td>
</tr>
<tr>
<td>M or Y</td>
<td>Y cool control.</td>
</tr>
<tr>
<td>Y or W or W2</td>
<td>W2 2nd-stage heat.</td>
</tr>
<tr>
<td>F or G</td>
<td>G fan control.</td>
</tr>
<tr>
<td>R or O</td>
<td>O</td>
</tr>
<tr>
<td>X or X2 or C</td>
<td>C</td>
</tr>
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<table>
<thead>
<tr>
<th>Trane products (American Standard)</th>
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<tbody>
<tr>
<td>B</td>
</tr>
<tr>
<td>W or W1</td>
</tr>
<tr>
<td>X2</td>
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<table>
<thead>
<tr>
<th>Two-wire zoned hot water</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
</tr>
<tr>
<td>W</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Three-wire motor driven valves</th>
</tr>
</thead>
<tbody>
<tr>
<td>R or 5</td>
</tr>
<tr>
<td>W or 4</td>
</tr>
<tr>
<td>Y or G or 6 (3rd wire)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Three-wire solenoid valves</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
</tr>
<tr>
<td>W</td>
</tr>
<tr>
<td>Y or G (3rd wire)</td>
</tr>
</tbody>
</table>

**Specifications**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>24 VAC (supplied via the C wire)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batteries</td>
<td>Three AA alkaline batteries (Duracell, Energizer). Do not use rechargeable batteries.</td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>5.5 x 3.5 x 1.5 in. (140 x 89 x 38 mm)</td>
</tr>
<tr>
<td>Operating environment</td>
<td>Indoor use only</td>
</tr>
<tr>
<td>Temperature</td>
<td>32 to 104°F (0 to 40°C)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>10 to 90% noncondensing</td>
</tr>
</tbody>
</table>
Statement of use:
100% compatible with all popular residential HVAC systems; 24 VAC single, two-stage conventional heating systems (gas/oil/electric), heat pumps, single stage or auxiliary heat (electric or fossil), zoned forced air and zoned hot water (two or three wire), millivolt systems (with a 12-24 AC or DC source), one or two stage cooling, and hybrid systems.

FCC regulatory information
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.
• Increase the separation between the equipment and receiver.
• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.
FCC ID: QO8-ZWave-0210

IC regulatory information
This Class B digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation of the device.
IC: 4714A-ZWave-0210