Ultra-Zone Internet Zone Thermostat Installation Guide

Release 1.0

Excellence Without Compromise

EWC®

CONTROLS INC.

Part No. 600-01100-100, Rev. 1
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Technical Support

When contacting EWC Controls, Inc.® for technical assistance, please have the following information available:

- Product model and serial number.

- Type of heating/cooling system (example: gas, oil, or electric; warm air, hot water, heat pump, steam or hybrid).

- Location and number of wires attached to your Ultra-Zone™ thermostat.

For additional assistance, please contact EWC Controls, Inc. Technical Support,
9:00 AM to 5:00 PM Eastern Standard Time Monday to Friday:

Web: www.ewccontrols.com
Email: info@ewc.com
Telephone: 1-800-446-3110
Fax: 1-732-446-5362

Warranty Information

EWC Controls, Inc. warrants its products to be free from manufacturing defects in materials and workmanship under normal use for a period of 1 year for the IZT-100 and the IZT-250 model thermostats from the date of purchase or the verifiable date of installation.

EWC Controls Inc. shall not be liable to honor the terms of this warranty if the product has been used in any other application other than that for which it was intended, or if it has been subjected to misuse, accidental damage, acts of God, modification, or improper installation procedures. Furthermore, this warranty covers only products which have all original and unaltered markings and labels (serial numbers, model numbers, etc.) of manufacture. This limited warranty does not cover the repair of cracked, scratched, broken or modified plastics; other cosmetic damage; or parts that have been altered, defaced or removed; or the scratching, cracking or breakage of the product. This warranty is not transferable.

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Material Return Procedure

No merchandise may be returned for credit, exchange, or service without prior authorization from EWC Controls, Inc. To obtain warranty service for Ultra-Zone™ products, contact EWC Controls, Inc. Technical Support (1-800-446-3110) and request a Return Goods Authorization (RGA) number.

Products may be returned for credit, exchange, or service with an EWC Controls, Inc. RGA number and with proof of purchase and installation date. Enclose a note explaining the symptoms of the problem, stating the RGA number, and the name, address and phone number of the company or individual contact. Authorized returns must be shipped prepaid to EWC Controls, Inc. at:

EWC Controls, Inc.
385 Highway 33
Englishtown, NJ 07726

FCC   Model: IZT-100 and IZT-250
               Made in the USA

               This device complies with Part 15 of the FCC Rules. 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.

CSA   Power: 24VAC 45mA 60Hz
               48VDC 22mA 60Hz
               Switched power each contact: 24VAC 2A 60Hz

Overview

The Ultra-Zone Internet Zone Thermostats provide a rich set of innovative features including the ability to configure settings through a graphical interface either locally or from any remote location. The thermostats can be connected via secure wired Ethernet to a home, small business, or light commercial data network.

This guide describes how to physically install the IZT-100 and IZT-250 thermostats. Any instructions or guidelines that apply to a specific thermostat model are noted within this guide. The following model-specific features are important to note during the installation:

IZT-100

- Supports HVAC system power with 24VAC.

- Dual-Stage Fuel Burner HVAC (2h/2c).

- Single-Stage Heat Pump HVAC with auxiliary heat (2h/1c).

IZT-250

- Supports HVAC system power with 24VAC.

- Two remote thermal sensors; either Analog or Thermistor on the IZT-250.

- Dual-Stage Fuel Burner HVAC (2h/2c).

- Dual-Stage Heat Pump HVAC with auxiliary heat (3h/2c).

- Independent alarm notification on external sensors.

Installing the Thermostat

This section describes the required tools, guidelines, and installation instructions for Ultra-Zone Internet Zone Thermostats.

⚠️ **Caution** ***Preventing electrostatic discharge (ESD)** — Static electricity may cause damage to the components on the thermostat's circuit module. Do not remove the thermostat from the protective bag until you are ready to install the thermostat.*

Required Tools

The following tools are required to install the Ultra-Zone Internet Zone Thermostat:

- #1 or #2 Phillips head screwdriver.

- Drill with a 3/16" or 7/32" bit.

Installation Guidelines

Use the following guidelines to install the Ultra-Zone Internet Zone Thermostat:

Tip

If you are replacing an existing thermostat, mount the Ultra-Zone Internet Zone Thermostat in the same location as the thermostat in which you are replacing.

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

- Install the CAT5/CAT5E/CAT6 cabling from the wiring center to the thermostat installation site.

- Install the thermostat in an area or room with adequate air circulation and where there are no unusual heating/cooling conditions, such as: sunlight, near a lamp, radio, television, radiator register, or fireplace; near hot water pipes in a wall; near a stove on the other side of the wall, on a wall separating an unheated room; or in a draft from a stairwell, door, or window; in a corner or alcove; or behind an open door.

- Install the unit after all construction work and painting is complete.

- Install the unit in an unobstructed location where there are no objects on the wall above or below the thermostat or other obstructions (such as furniture) restricting vertical airflow.

- It is not necessary for the thermostat to be level.

Caution

Prior to installing or servicing the thermostat, turn off electricity to the entire HVAC system; do not turn electricity back on until all work is complete.

Do not jumper wires together to test the system. This may cause harm to your HVAC system and damage the thermostat, and therefore void the warranty.

All wiring must conform to local codes and ordinances. The distance between CAT5/CAT5E/CAT6 cables and HVAC cables should be a minimum of one inch.

Before you Begin

If you are removing an existing thermostat, EWC recommends that you label each connection as you remove the wiring. You will use these same wires (and labels) when you connect the Ultra-Zone Internet Zone Thermostat (page 4).

Use the following steps to remove an existing thermostat:

1 Turn off power to the entire HVAC system or the fuse/circuit breaker panel.

2 Remove the cover from the existing thermostat. If the cover does not snap off when pulled firmly from the top or bottom, check for a screw(s) that may be used to secure the cover.

3 Disconnect each wire. Label the wires with the terminal designation from the existing thermostat. Place the label about 1/2" away from the end of the wire to allow for stripping of the ends.

Note
Note: *If this is a new installation, obtain the wire designations from the HVAC installer.*

4 Remove the existing thermostat from the wall.

Installing and Wiring the Thermostat

This section describes a two-step installation process in which you install (or mount) the thermostat base plate and wire the thermostat.

Installing the Base Plate

Perform the following steps to mount the thermostat base plate on the wall:

1 Review the Installation Guidelines on page 2 and position the base plate in an appropriate location on the wall. Ensure the location allows you to access and pull the wires through the opening in the base plate.

2 Using a pencil, mark the center of the screw holes on the left and right side, and bottom center of the base plate.

3 Remove the base plate from the wall and drill three holes at the marked locations: for drywall, drill 3/16" holes; for plaster, drill 7/32" holes.

4 Gently tap the wall anchors (included in the packaging) into the drilled holes until they are flush with the wall.

5 Pull the wires through the base plate and position the base plate over the screw holes.

6 Attach the base plate to the wall using three 1" screws (included in the packaging).

Wiring the Base Plate Terminals

This section describes how to wire the base plate terminals.

Fuel Burner HVAC

Use the instructions in this section and refer to Table 1 and Figure 1 to wire the base plate for Fuel Burner HVAC. Refer to the labels you placed on the wires when you removed the existing thermostat (page 1).

Table 1 lists the standard HVAC terminal label and the corresponding EWC label required to support the Single-Stage and Dual-Stage application.

Table 1   Fuel Burner Terminal Conversion Chart

Standard Terminal	EWC Terminal	IZT-100 and IZT-250
R, RH	RH	24VAC source
RC	RC	24VAC source
C	C	24VAC common[a]
W, W1	W1	Stage 1 heat relay
Y, Y1	Y1	Stage 1 cool relay
W2	W2	Stage 2 heat relay
Y2	Y2	Stage 2 cool relay
G	G	Fan relay
-	S1+ or CM	Contact closure common (IZT-250 only)
-	H	Contact closure, Normally Open or Normally Closed (IZT-250 only). See Table 7.

[a] The 24VAC common must be in the same AC phase as the 24VAC source (RH or RC). If the thermostat is connected to RH only, or RH and RC then C must be the RH common. If the thermostat is connected to RC only then C must be the RC common.

Figure 1 shows an example of a Single-Stage (shown in yellow) and Dual-Stage (shown in blue) HVAC system connecting to an EWC base plate.

Figure 1   Single/Dual Stage HVAC Connections
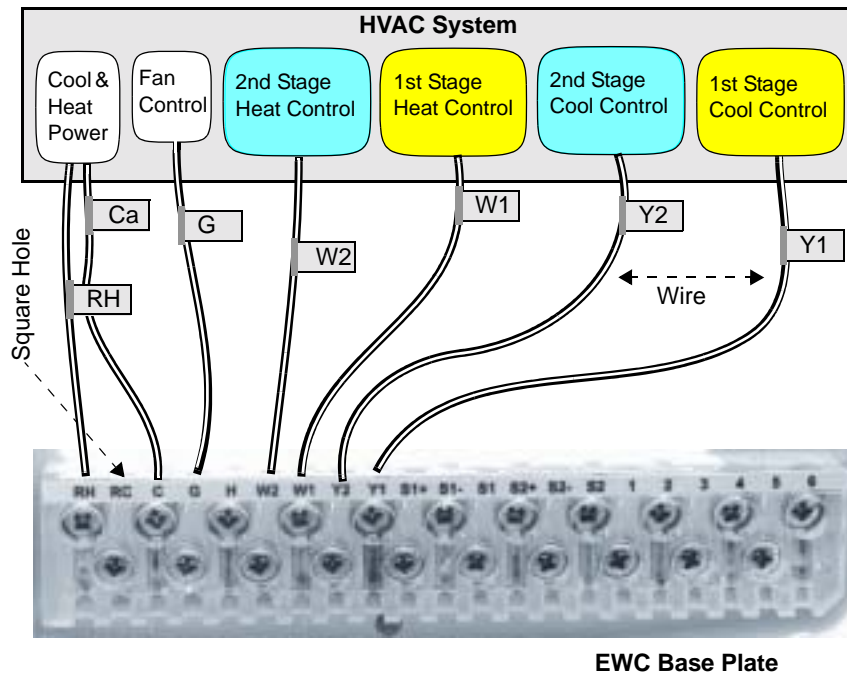
EWC Base Plate

1   Use Table 1 to match the letter of your existing thermostat wire to the corresponding terminal letter on the EWC base plate.

2   Strip the wire insulation 3/8" (9.5 mm) from the wire ends. A strip gauge is provided on the base plate label. Verify that the wire ends are straight. To avoid damaging the labels, use caution when handling the wires and push any excess wire back into the wall.

3   Using Figure 1 as a guide, connect the labeled wires to the terminal post with the corresponding letter on the EWC base plate. For example, connect the wire labeled "W1" to the W1 terminal post.

Loosen the terminal post screw used to secure the wires. Insert the wire straight down into the square hole and secure the corresponding screw to the wire.

⚠
Caution

To avoid damage to the EWC base plate, stop unscrewing the terminal post screws when you feel a slight stop or resistance.

4   Verify that the wire is securely attached to the terminal post in the base plate by gently tugging on the wire.

Heat Pump HVAC

Use the instructions in this section to wire the base plate terminals for Heat Pump HVAC.

Note	*You must know the type of Reversing Valve (RV) in your heat pump. See the user manual for your heat pump for more information.*

To wire the base plate terminals for Heat Pump HVAC, refer to the labels you placed on the wires when you removed the existing thermostat (page 1). Use Table 2 and Figure 2 and Table 3 and Figure 3 to complete the wiring.

Table 2 lists the standard HVAC terminal label and the corresponding EWC label required to support the Single-Stage Heat Pump application.
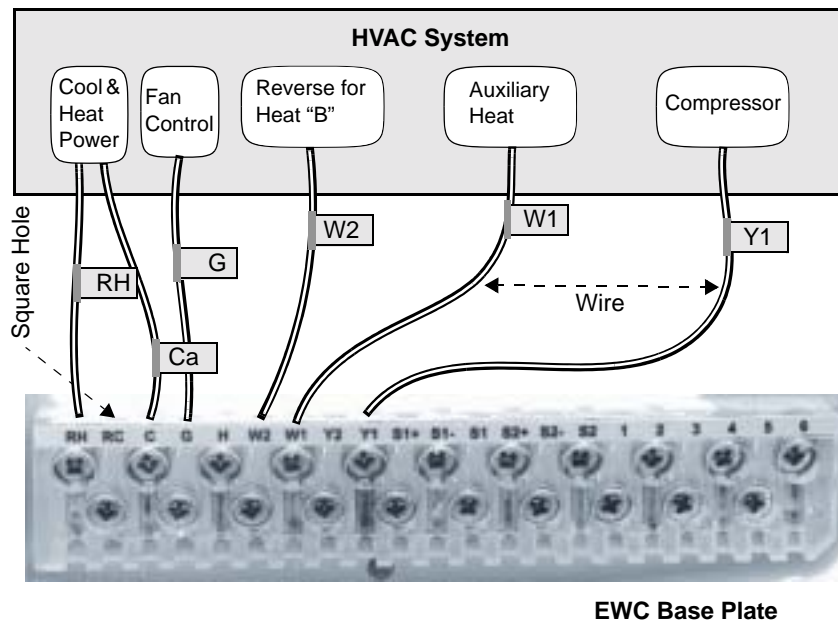
Table 2   Single-Stage Heat Pump Terminal Conversion Chart

Standard Terminal	EWC Terminal	IZT-100 and IZT-250
R, RH	RH	24VAC source
RC	RC	24VAC source
C	C	24VAC common[a]
W, W1	W1	Auxiliary heat relay
Y, Y1	Y1	Compressor relay
B	W2	RV activate for heat relay
O	Y2	RV activate for cool relay
G	G	Fan relay
-	S1+ or CM	Contact closure common (IZT-250 only)
-	H	Contact closure, Normally Open or Normally Closed (IZT-250 only). See Table 7.

[a] The 24VAC common must be in the same AC phase as the 24VAC source (RH or RC). If the thermostat is connected to RH only, or RH and RC then C must be the RH common. If the thermostat is connected to RC only then C must be the RC common.

Figure 2 shows an example of a Single-Stage Heat Pump HVAC system, with a "B" type reversing valve connecting to an EWC base plate.

Figure 2   Single-Stage Heat Pump HVAC Connections

EWC Base Plate

Note: A heat pump is either a reverse for heat "B" or reverse for cool "O" model. The Ultra-Zone IZT-100 uses Y2 for reverse cool and W2 is used for reverse heat.

Table 3 lists the standard HVAC terminal label and the corresponding EWC label required to support the Dual-Stage Heat Pump application.

Table 3   Dual-Stage Heat Pump Terminal Conversion Chart

Standard Terminal	EWC Terminal	IZT-250
R, RH	RH	24VAC source
RC	RC	24VAC source
C	C	24VAC common[a]
W, W1	W1	Auxiliary heat relay
Y, Y1	Y1	Compressor relay stage 1[b]
B, O	W2	RV activate for heat/cool relay[c]
Y2	Y2	Compressor relay stage 2[d]
G	G	Fan relay
-	S1+ or CM	Contact closure common
-	H	Contact closure, Normally Open or Normally Closed. See Table 7.

[a] The 24VAC common must be in the same AC phase as the 24VAC source (RH or RC). If the thermostat is connected to RH only, or RH and RC then C must be the RH common. If the thermostat is connected to RC only then C must be the RC common.

[b] Provides stage 1 heat or cool depending on the activation of the RV.

[c] The RV is either activate for heat (B terminal) or activate for cool (O terminal). You can program this function on the relay output through the web interface and the LCD screens. Consult your HVAC installer about the RV type for your heat pump.

[d] Provides stage 2 heat or cool depending on the activation of the RV.

Figure 3 shows an example of a Dual-Stage Heat Pump HVAC system, with reversing valve activated for heat or cool, connecting to an EWC base plate.

Figure 3   Dual-Stage Heat Pump HVAC Connections

EWC Base Plate
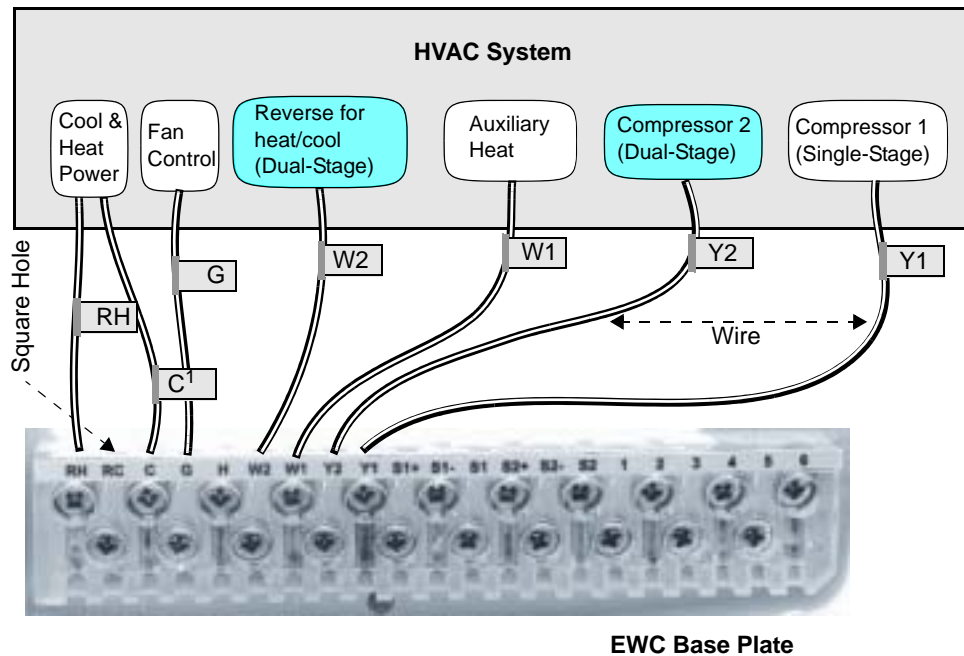
Configuring Remote Sensors for the IZT-250

The Ultra-Zone Internet Zone Thermostats provide two remote (external) sensor ports. This release supports Analog and Thermistor sensors (go to www.ewccontrols.com for a complete list of supported sensors).

Analog sensors convert temperature measurements as Fahrenheit degrees to a voltage which can be sensed by the thermostat. Analog sensors are active devices which require power from the thermostat. The Analog sensor is polarized and must be connected as shown in Table 4.

Thermistor sensors are passive devices which represent thermal measurements as electrical resistance. Thermistors do not require power from the thermostat. The Thermistor sensor is not polarized; either lead can be connected as shown in Table 4.

Table 4 lists the external sensor port Analog and Thermistor connections. Only one sensor can be connected to each port.

Table 4   Remote Sensor Port Connections

EWC Terminal	Analog Sensor	Thermistor Sensor[a]	Contact Closure Sensor
S1+	Do Not Use	Do Not Use	Do Not Use
S1-	COM	Sensor 1, Either lead	Contact Closure 1, Either lead
S1	T20	Sensor 1, Either lead	Contact Closure 1, Either lead
S2+ or S+	+V for S1 and S2 sensors	Do not use	Do not use
S2-	COM	Sensor 2, Either lead	Contact Closure 2, Either lead
S2	T20	Sensor 2, Either lead	Contact Closure 2 Either lead

[a] *Do not connect either lead to the S1+, S2+ or S+ terminal when using a Thermistor sensor.*

Connecting CAT5/CAT5E/CAT6 Wiring for Ethernet Networks

The label located on the inside of the base plate (see Figure 4) shows several color-coded wiring schemes for Ethernet CAT5/CAT5E/CAT6 connections.

To wire the Ethernet network, refer to Figure 4 and match the label number to the EWC base plate number for CAT5/CAT5E/CAT6 color coding.

⚠ **Caution** *All wiring must conform to local codes and ordinances. The distance between CAT5/CAT5E/CAT6 cables and HVAC cables should be a minimum of one inch.*

Figure 4 shows an Ethernet CAT 5 wiring example.

Figure 4   Ethernet CAT5/CAT5E/CAT6 Wiring
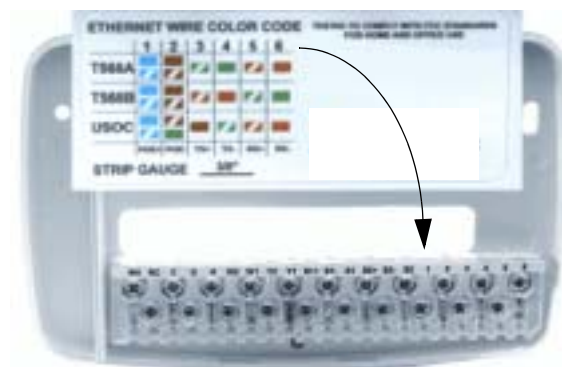
T568A	**T568B**
1 White-blue and blue ends stripped and twisted	1 White-blue and blue ends stripped and twisted
2 White-brown and brown ends stripped and twisted	2 White-brown and brown ends stripped and twisted
3 White-green	3 White-orange
4 Green	4 Orange
5 White-orange	5 White-green
6 Orange	6 Green

Figure 5 shows the RJ-45 Ethernet plug pinout assignments for the T568A and T568B wiring standards.

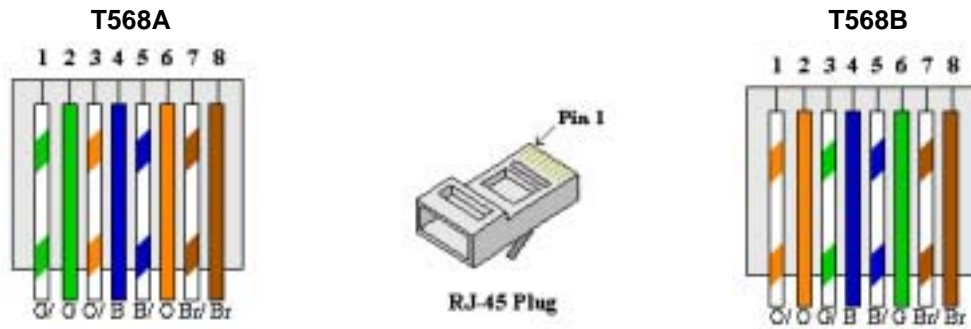**Figure 5   RJ-45 Ethernet Plug Pinout Assignments for T568A and T568B**

Table 5 describes the pinout assignments for the T568A and T568B wiring standards.

Table 5   T568A and T568B Pinout Assignments

Pin Number	T568A Wire Color	T568B Wire Color
1	Green/White	Orange/White
2	Green	Orange
3	Orange/White	Green/White
4	Blue	Blue
5	Blue/White	Blue/White
6	Orange	Green
7	Brown/White	Brown/White
8	Brown	Brown

Mounting the Thermostat into the Base Plate

The Ultra-Zone Internet Zone Thermostat contains jumpers to configure the HVAC power settings. The power settings determine which HVAC power source (RH or RC) is configured to turn on each HVAC system (cool, heat and fan). Most applications use only RH power. The Ultra-Zone Internet Zone Thermostat is shipped from the factory with the "RH Only" configuration.

Table 6 lists the possible HVAC power configurations. RC and RH are connected with J1 inserted.

Table 6   HVAC Power Configuration

| HVAC Power Configuration	J2	J1
RH only (default) – Supplies W1, W2, Y1, Y2, G	POS1	IN
RC only – Supplies W1, W2, Y1, Y2, G	POS1	IN
RH and RC – RH supplies W1, W2, G and RC supplies Y1 and Y2	POS1	OUT
RH and RC – RH supplies W1 and W2 and RC supplies Y1, Y2, G	POS2	OUT

The general purpose contact closure can be configured for Normally Open or Normally Closed. The contact closure will be in these states upon power failure or deactivation of an event. Table 7 shows the configuration of jumper J9. Figure 6 shows the location and positions of jumper J9 on the IZT-250.

Table 7   Contact Closure Configuration for Jumper J9

Configuration	J9	Pins
Normally Closed	POS1	Top and middle
Normally Open	POS2	Middle and bottom

Figure 6 shows the location of the jumpers on the thermostat circuit module. The jumper in J2 supports an Up (POS1) or Down (POS2) position. The example in Figure 6 shows the J2 jumper in the Up position. If necessary, move the jumper downward to the POS2 position.

Figure 6   Thermostat Jumper Locations
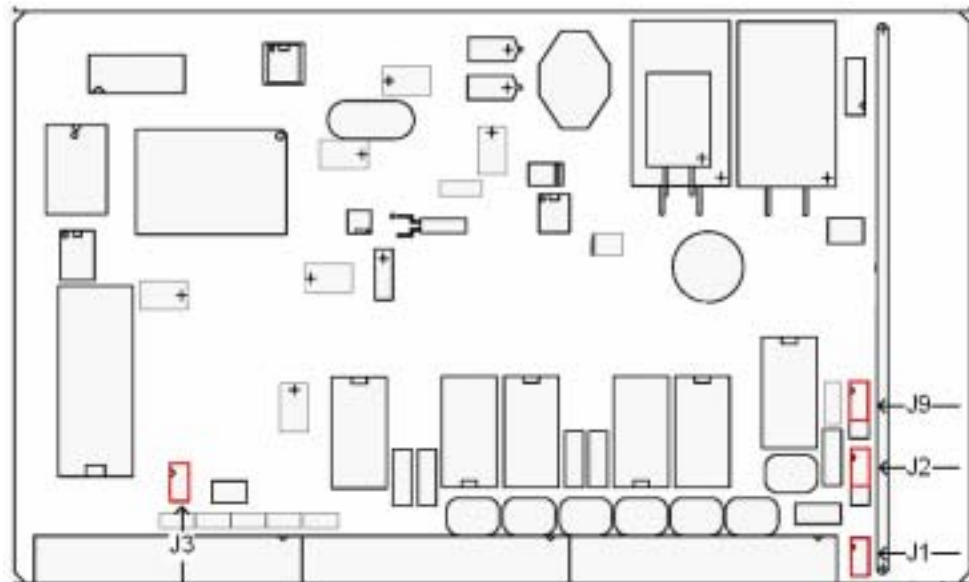
Prior to mounting the thermostat into the base plate, verify that the jumpers on the thermostat are configured for your application (see Table 6).

To mount the thermostat into the base plate:

1   Mount the thermostat into the base plate (see page 3) by inserting the top two hinges into the corresponding receptacle holes in the top of the base plate.

2   Snap the bottom of the thermostat securely into the base plate.

Verifying the Thermostat's Operating Status

This section describes the procedures you can use to verify that the heat, cool, and fan controls are operating properly on your thermostat. Before you begin, verify that the HVAC system's power is set to "**On**" and press **HVAC** on the thermostat panel.

Testing the Heat Controls

1 Press **HVAC**.

2 Press **Mode**. A menu list appears.

3 Use the **Up** and **Down** arrows on the right side of the panel to select **Heat**.

4 Press **Select**.

5 Press **Back**.

6 Continuously press the **Up** arrow until the heat set point is higher than the temperature reading. The heat relay should click and the HVAC system should activate the heat.

Testing the Cool Controls

1 Press **HVAC**.

2 Press **Mode**. A menu list appears.

3 Use the **Up** and **Down** arrows on the right side of the panel to select **Cool**.

4 Press **Select**.

5 Press **Back**.

6 Continuously press the **Down** arrow until the cool set point is lower than the temperature reading. The cool and fan relays should click and the HVAC system should activate the cool and fan.

Testing the Fan Operation

1 Press **HVAC**.

2 Press **Fan**. A menu list appears.

3 Use the **Up** and **Down** arrows on the right side of the panel to select **On**.

4 Press **Select**. The fan relay should click and the fan should turn on.

Logging In to the Thermostat Via your PC

Log in to the TMI as the Administrator as follows:

1 Assign an IP address to your new thermostat via your DSL or Broadband Router.

2 Enter the IP address into the address bar on your Internet browser.

3 Enter the username: **admin**

4 Enter the password: **admin** (default)

See the *Ultra-Zone IZT-100 Configuration Guide* for more information.

What's Next?

Tip	**After you install the thermostat, continue with the *Configuration Guide* to configure thermostat settings and the *Remote Management Guide* to manage the thermostat remotely via the EWC Remote Management server. You can access these guides at www.ewccontrols.com in the User Manuals area.**

Troubleshooting

Use Table 8 to troubleshoot potential issues with your thermostat.

Table 8   Troubleshooting Tips

Condition	Possible Cause
LCD display is blank	■ Verify that the Common from the primary transformer source (either RH or RC) is connected to the C terminal. ■ Either RH or RC (24v source) must be connected. ■ Verify the HVAC system is powered on.
HVAC heat does not activate when tested	■ Verify you increased the heat set point higher than the temperature reading and the thermostat is in heat mode (see page 13). ■ Verify the HVAC system is powered on (page 13).
HVAC cool does not activate when tested	■ Verify you decreased the cool set point lower than the temperature reading and the thermostat is in cool mode (see page 13). ■ Verify the HVAC system is powered on (page 13).
HVAC fan does not activate when tested	■ Check the base plate wiring (see page 4 or page 6). ■ Verify the HVAC system is powered on (page 13).