Proliphix Internet Managed Thermostat (IMT) Installation Guide

Release 1.0

<table>
<tr><td>Technical Support</td><td>When contacting Proliphix, Inc. for technical assistance, please have the following information available:</td></tr>
</table>

Technical Support

When contacting Proliphix, 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 gravity).

- Location and number of wires attached to your Proliphix thermostat.

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

Web: www.Proliphix.com
Email: support@Proliphix.com
Telephone: 1-866-475-4846
Fax: 978-692-3378

Warranty Information

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Proliphix 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.

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Authorized returns must be shipped prepaid to Proliphix at:

Proliphix, Inc.
3 Lan Drive
Suite #100
Westford, MA 01886

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Return shipping charges following repair of items under warranty shall be paid by Proliphix via standard ground carrier. In the event that repairs are found to be non-warranty, return shipping charges will be paid by the purchaser.

FCC

Model: IMT550c and IMT550w
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.

Overview

The Proliphix Internet Managed Thermostat (IMT) provides a rich set of innovative features including the ability to configure settings through a graphical interface either locally or from any remote location. The "c" model suffix thermostats can be connected via secure wired Ethernet to a home, small business, or light commercial data network, while the "w" model suffix thermostats support 802.11 b/g connections.

This guide describes how to physically install the IMT. Table 1 describes the model-specific features that are important to note during the installation:

Table 1   IMT Features

Model	Wired Ethernet	802.11 b/g wireless	Humidity Sensing	Aux Relays (2)	Power Method(s)
IMT550c	X		X	X	■ EPA ■ PoE ■ HVAC
IMT550w		X	X	X	■ EPA ■ HVAC

Installing the Thermostat

This section describes the required tools, guidelines, and installation instructions for the IMT.

⚠️ **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 Proliphix thermostat:

■ #1 or #2 Phillips head screwdriver.

■ Drill with a 3/16" or 7/32" bit.

■ Punchdown tool (included with the thermostat).

■ Terminal block screw driver (included with the thermostat).

Installation Guidelines

Use the following guidelines to install the IMT:

Tip

If you are replacing an existing thermostat, mount the 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 for model IMT550c. This is not required for the IMT550w model (802.11 b/g wireless).

- 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, Proliphix recommends that you label each connection as you remove the wiring. You will use these same wires (and labels) when you connect the IMT. See Wiring the Base Plate Terminals (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 the owners manual for removal procedures.

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   *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.

Inserting the Battery

Insert the battery that is shipped with the thermostat before installing the thermostat on the wall. The battery needs to be inserted to ensure the time of the thermostat remains accurate during a power outage. See Figure 3 on page 7 for battery location and orientation.

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.

Note   *There are four mounting holes on the backplate that allow for mounting in a single vertical or horizontal oriented single gang electrical box using only two screws. If you are installing the backplate on drywall directly, then use three screws.*

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 two or 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. Use the instructions in this section and refer to:

■   Table 2 and Figure 1 on page 5 to wire the IMT base plate terminals for Fuel Burner HVAC. A Fuel Burner typically burns fossil fuel like oil or gas and does not have a wire used as a reversing valve.

■   Table 2 and Figure 2 on page 6 to wire the IMT base plate terminals for Heat Pump HVAC. A Heat Pump configuration always has a wire used to control a reversing valve.

Refer to the labels you placed on the wires when you removed the existing thermostat. See page 1.

Note   *Some newer Heat Pumps use traditional Fuel Burner wiring schemes without a Reversing Valve (RV). Therefore, you may have to use a Fuel Burner wiring scheme to control your Heat Pump. Refer to your Heat Pump manual for wiring details.*

You must know the type of Reversing Valve in your heat pump. Refer to your Heat Pump manual for more information.

Table 2 lists the standard HVAC terminal label required to support the single-stage and dual-stage Fuel Burner and Heat Pump applications.

Table 2   Terminal Conversion Chart

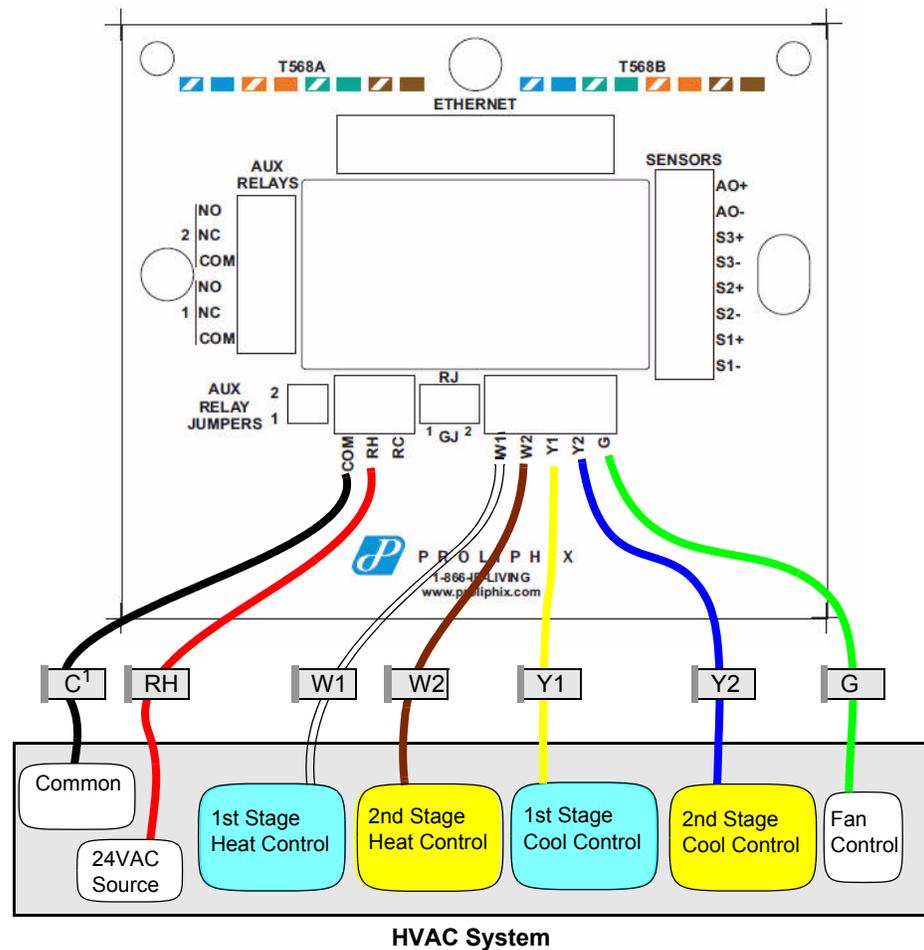| HVAC Terminal	Single Stage Fuel Burner	Dual Stage Fuel Burner	Single Stage Heat Pump	Dual Stage Heat Pump
C[a]	24VAC common	24VAC common	24VAC common	24VAC common
RH	24VAC hot	24VAC hot	24VAC hot	24VAC hot
RC	24VAC hot	24VAC hot	24VAC hot	24VAC hot
W1	Heat	1st stage Heat	Auxiliary Heat	Auxiliary Heat
W2[b]	not used	2nd stage Heat	RVS O/B	RVS O/B
Y1[c]	Cool	1st stage Cool	1st stage Compressor	1st stage Compressor
Y2[d]	not used	2nd stage Cool	not used	2nd stage Compressor

Table 2   Terminal Conversion Chart (Continued)

HVAC Terminal	Single Stage Fuel Burner	Dual Stage Fuel Burner	Single Stage Heat Pump	Dual Stage Heat Pump
G	Fan	Fan	Fan	Fan

[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] The RVS 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 RVS type for your heat pump.

[c] Provides stage 1 heat or cool depending on the activation of the RVS.

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

Figure 1 shows an example of a single-stage (shown in blue) and dual-stage (shown in yellow) Fuel Burner HVAC system connecting to an IMT base plate.

Figure 1   Single/Dual Stage Fuel Burner HVAC Connections
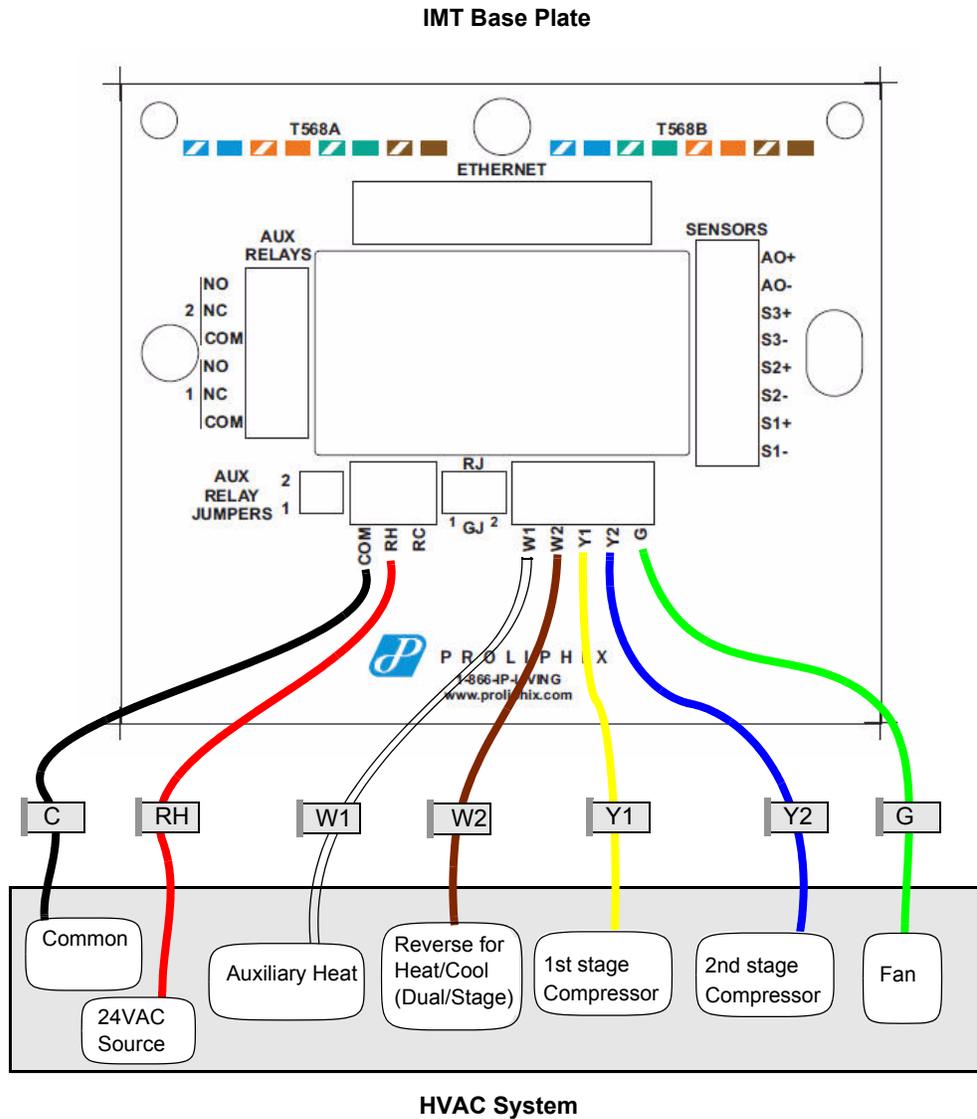

HVAC System

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Note

The wiring colors shown above are examples of commonly used colors and may differ depending on the HVAC wiring that is used.

Figure 2 shows an example of a dual-stage Heat Pump HVAC system, with reverse activate for heat/cool, connecting to an IMT base plate.

Note *The second compressor wire is not present in a single-stage heat pump.*

Figure 2   Dual-Stage Heat Pump HVAC Connections

IMT Base Plate

HVAC System

Note *The wiring colors shown above are examples of commonly used colors and may differ depending on the HVAC wiring that is used.*

To wire the base plate terminals:

1   Use Table 2 on page 4 to match the letter of your existing thermostat wire to the corresponding terminal letter on the Proliphix base plate.

2   Strip the wire insulation from the wire ends. 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 on page 5 or Figure 2 on page 6 as a guide, connect the labeled wires to the terminal post with the corresponding letter on the IMT base plate. For example, connect the wire labeled "W1" to the W1 terminal post.

4   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 Proliphix base plate, stop unscrewing the terminal post screws when you feel a slight stop or resistance.

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

Configuring Remote Sensors

The Proliphix thermostats provide three remote (external) sensor ports. The IMT supports Thermistor, 0-5v Analog, and 4-20mA Current Loop. (Go to www.proliphix.com for a complete list of supported sensors.) You must configure the two switches for each sensor to match the sensor category. See Figure 3 and Table 3 on page 8.

Figure 3 shows and example of the remote sensor switch settings.

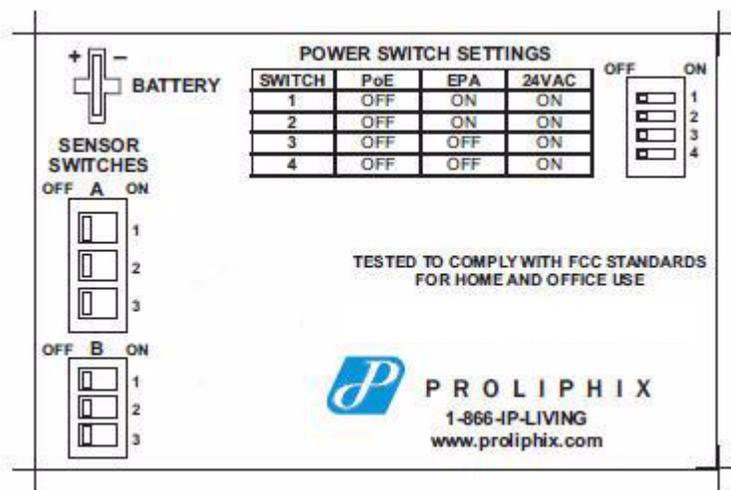**Figure 3   Remote Sensor Switch Settings - Base Plate Label**

Table 3 lists the remote sensor switch settings.

Note	*Only one sensor can be connected to each port.*

Table 3   Remote Sensor Switch Settings

Remote Sensor	Thermistor and Contact	0-5v Analog	4-20mA Current Loop
Remote Sensor 1			
A	ON	OFF	OFF
B	OFF	OFF	ON
Remote Sensor 2			
A	ON	OFF	OFF
B	OFF	OFF	ON
Remote Sensor 3			
A	ON	OFF	OFF
B	OFF	OFF	ON

Connecting CAT5/CAT5E/CAT6 Wiring for Ethernet Networks to IMT550c Thermostats

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 Proliphix base plate number for CAT5/CAT5E/CAT6 color coding.

Note	*If the other end of the CAT5/CAT5E/CAT6 cable is connected to a Proliphix EPA-20/60 Ethernet Power Adapter, follow the wiring scheme for T568A.*

⚠ 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 the RJ-45 Ethernet plug pinout assignments for the T568A and T568B wiring standards.

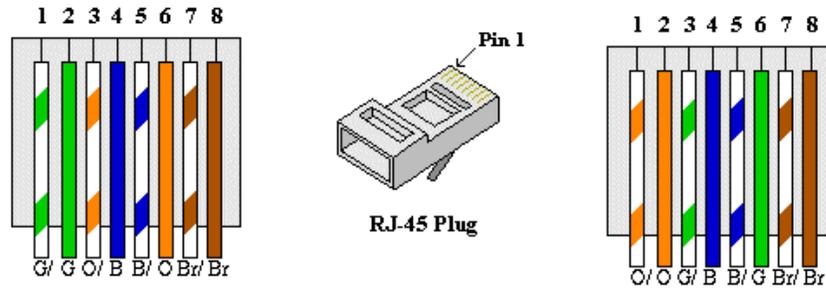**Figure 4 RJ-45 Ethernet Plug Pinout Assignments for T568A and T568B**

Table 4 describes the pinout assignments for the T568A and T568B wiring standards.

Table 4 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

Configuring Auxiliary Relay and Sensors

Table 5 describes the Auxiliary Relay connectors.

Table 5 Auxiliary Relay Connectors

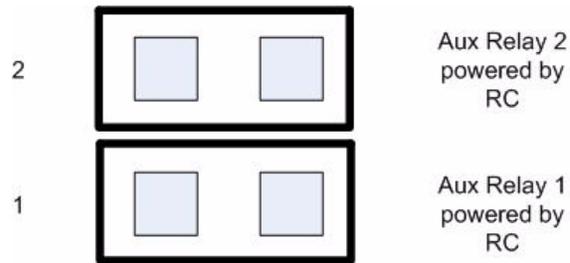| Auxiliary Relay	Description
NO1	Port 1 Auxiliary Relay Normally Open
NC1	Port 1 Auxiliary Relay Normally Closed
COM1	Port 1 Auxiliary Relay Common
NO2	Port 2 Auxiliary Relay Normally Open
NC2	Port 2 Auxiliary Relay Normally Closed
COM2	Port 2 Auxiliary Relay Common

Table 6 describes the sensor connectors.

Table 6   Sensor Connectors

Sensor	Description
S1+	Port 1 Remote Sensor Positive
S1-	Port 1 Remote Sensor Negative
S2+	Port 2 Remote Sensor Positive
S2-	Port 2 Remote Sensor Negative
S3+	Port 3 Remote Sensor Positive
S3-	Port 3 Remote Sensor Negative

Configuring Auxiliary Relay Jumpers

The Auxiliary Relays are powered from RC when the jumpers are installed. Figure 5 shows how to configure the Auxiliary Relay jumpers. Auxiliary Relay 1 and 2 can be configured independently from each other.

Figure 5   Auxiliary Relays with Jumpers

When the jumpers are removed (see Figure 6), the Auxiliary Relays are configured to use an external power source.
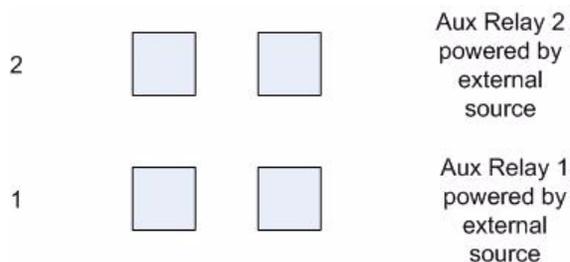
Figure 6   Auxiliary Relays without Jumpers

Table 7 describes what relays are active for the HVAC and fan state.

Table 7   Relay Matrix

	W1	**W2**	**Y1**	**Y2**	**G**
Fuel Burner					
Heat1 (1h)	X				X[a]
Heat2 (2h)	X	X			X[a]
Cool1 (1c)			X		X
Cool2 (2c)			X	X	X
Fan					X
Heat Pump					
Heat1 (1h)		X[b]	X		X
Heat2 (2h)		X[b]	X	X	X
Aux Heat (3h)	X	X[b]	X	X	X
Cool1 (1c)		X[c]	X		X
Cool2 (2c)		X[c]	X	X	X
Fan					X

[a]   If fan on heat is enabled.

[b]   If Heat Pump is a model which activates the reversing valve (B) for heat mode.

[c]   If Heat Pump is a model which activates the reversing valve (O) for cool mode.

> **Note**
>
> *Aux Heat is the last stage whether you have a single or dual stage heat pump.*

# Mounting the Thermostat into the Base Plate

The Proliphix 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 Proliphix thermostat is shipped from the factory with the RH and RC jumpered together.

Table 8 lists the possible HVAC power configurations.

Table 8   HVAC Power Configuration

| HVAC Power Configuration	Supplies...
RH only (default) or *RC only*	W1, W2, Y1, Y2, G
RH and RC Supplies separate	RH supplies W1, W2, G; RC supplies Y1 and Y2
RH and RC Supplies separate	RH supplies W1 and W2; RC supplies Y1, Y2, G

Figure 7   Jumper Configuration
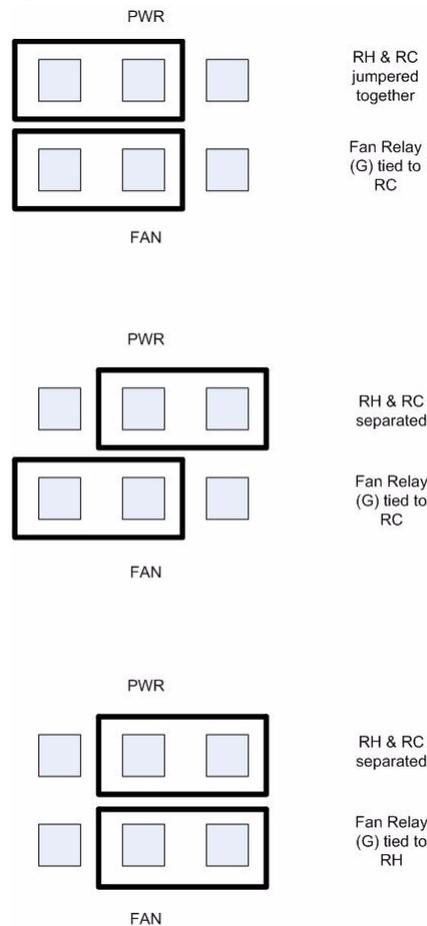
The IMT550c can be powered from different sources presented on the following Ethernet CAT5/5E/CAT6 interface (see Figure 8):

- A Power over Ethernet (PoE) source is an Ethernet router, switch, or mid-span device that complies with the 802.3af Power over Ethernet standard. (IMT550c only)

- Proliphix Ethernet Power Adapters (EPA) are multi-port power injectors capable of supplying power to either two (EPA-20) or six (EPA-60) Proliphix Network Thermostats. (IMT550c and IMT550w)

- 24VAC is power from the HVAC system which requires RH and C to both be connected to provide power to the thermostat. (IMT550c and IMT550w)

Figure 8 shows the four power sources.

Figure 8   Power Sources
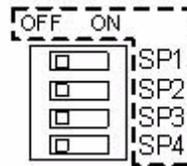
Table 9 shows how to configure the IMT for different power sources.

Table 9   Power Source Configuration

Switch	PoE	EPA	24 VAC
SP1	Off	On	On
SP2	Off	On	On
SP3	Off	Off	On
SP4	Off	Off	On

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 **HVAC** on the thermostat lcd panel is set to "**Auto"**.

Testing the Heat Controls

1 Verify the HVAC mode is set to either **Auto** or **Heat**.

2 Continuously press the **Up** arrow until the heat set point is higher than the temperature reading.

A flame icon appears, and the HVAC system activates the heat.

Testing the Cool Controls

1 Verify the HVAC mode is set to either **Auto** or **Cool**.

2 Continuously press the **Down** arrow until the cool set point is lower than the temperature reading.

A snowflake and fan icon appears, and the HVAC system activates the cool and fan.

Testing the Fan Operation

Press the fan button until the mode is set to **On**. A fan icon appears, and the fan circuit is now active.

Logging In to the Thermostat

Log in to the TMI as the Administrator as follows:

1 Enter the username: **admin**.

2 Enter the password: **admin** (default).