

Proliphix Internet Managed Thermostat (IMT) 350c/350w Installation Guide

Release 1.0



P R O L I P H I X

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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

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Proliphix, Inc.
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Westford, MA 01886

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Overview

The Proliphix Internet Managed Thermostat (IMT) 350c/350w 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 to your network with a CAT5/CAT5E/CAT6 Ethernet cable, while the "w" model suffix thermostats support 802.11 b/g network connections.

This guide describes how to physically install the IMT350. [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	Power Method(s)
IMT350c	X		X	<ul style="list-style-type: none">■ EPA■ PoE■ HVAC
IMT350w		X	X	<ul style="list-style-type: none">■ HVAC 24v w/Common■ HPA (HVAC Power Adapter)

An Overview about how to Power your IMT350w Internet Managed Thermostat

Overview

While the thermostat is wireless from the perspective of how it connects to your network, it is still wired to your HVAC system in the same manner as any standard 24v interfacing thermostat. For a typical heating and cooling system you would have wires that are used to supply 24v into the thermostat on the RH terminal and then switch that 24v back out the W1 heat control wire, Y1 for cool, G for fan. (W2 Heat stage 2 and Y2 Cool stage 2 if you have a dual stage capable system). If you have a heat pump there would be additional wires for your reversing valve and possible an auxiliary heat source and lastly an additional compressor control wire if your heat pump is dual stage capable.

There are two primary methods to power your IMT350w described below.

Using a Common Wire

Historically for many commercial grade thermostats there has been a need to provide an amount of power that is not practical using standard battery technology. To solve this problem there is an additional wire that is connected to the HVAC system's 24v transformer which is known as the "Common". By using a wire that is connected to the Common terminal on the transformer, you can complete a power circuit and use the 24v HVAC transformer as the source to power your IMT.

Your current thermostat may or may not have a wire connected as a Common. If it is available, then you are all set and can use the HVAC Common method to provide power to your IMT350w thermostat. It is possible to still use this method if you have either a spare wire in the HVAC wiring bundle that is not currently being used or you might be able to pull an additional wire from the HVAC system to your thermostat and use that as the Common.



Any wiring required to add a common wire in your HVAC system should be done only by a qualified professional. Please consult with your HVAC technician or your local electrician for further assistance.

If you cannot provide a Common to your thermostat then you will have to look at the alternative method of powering your thermostat using an HPA (HVAC Power Adapter).

HPA (HVAC Power Adapter)

The HPA is a device that will take the fan wire (G) from your existing thermostat wiring and reuse it by making it behave as a Common. What this means that that your fan will be tied to your Y1 Cooling relay so that when the call for cool starts a single relay (Y1) would energize the air conditioner compressor and the fan together. Detailed installation instructions for the HPA can be found in the HPA Installation Guide.

The advantage of this method is that it can provide power to the thermostat when you are not able to provide a Common in addition to your existing wiring if you have a fan control wire (G). The disadvantage to this method is that you will lose independent control of your fan meaning you will not be able to turn the fan on or off without turning on your air conditioning.



Installing an HPA should be done only by a qualified professional. Please consult with your HVAC technician or your local electrician for further assistance.

Installing the Thermostat

This section describes the required tools, guidelines, and installation instructions for the IMT350.



***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.
- Terminal block screw driver (included with the thermostat).

Installation Guidelines

Use the following guidelines to install the IMT350:



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 IMT350c. This is not required for the IMT350w model (802.11 b/g wireless).

Before you Begin

- 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.



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 \(page 5\)](#).

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 9](#) 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 3](#) 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 all four 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 7](#) 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 8](#) 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 3](#).



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 (reverse for cooling or reverse for heating) 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	Single Stage Heat Pump
C ^a	24VAC common	24VAC common
RH	24VAC hot	24VAC hot
RC	24VAC hot	24VAC hot
W1	Heat	Auxiliary Heat
W2 ^b	not used	RVS O/B
Y1 ^c	Cool	Compressor
G	Fan	Fan

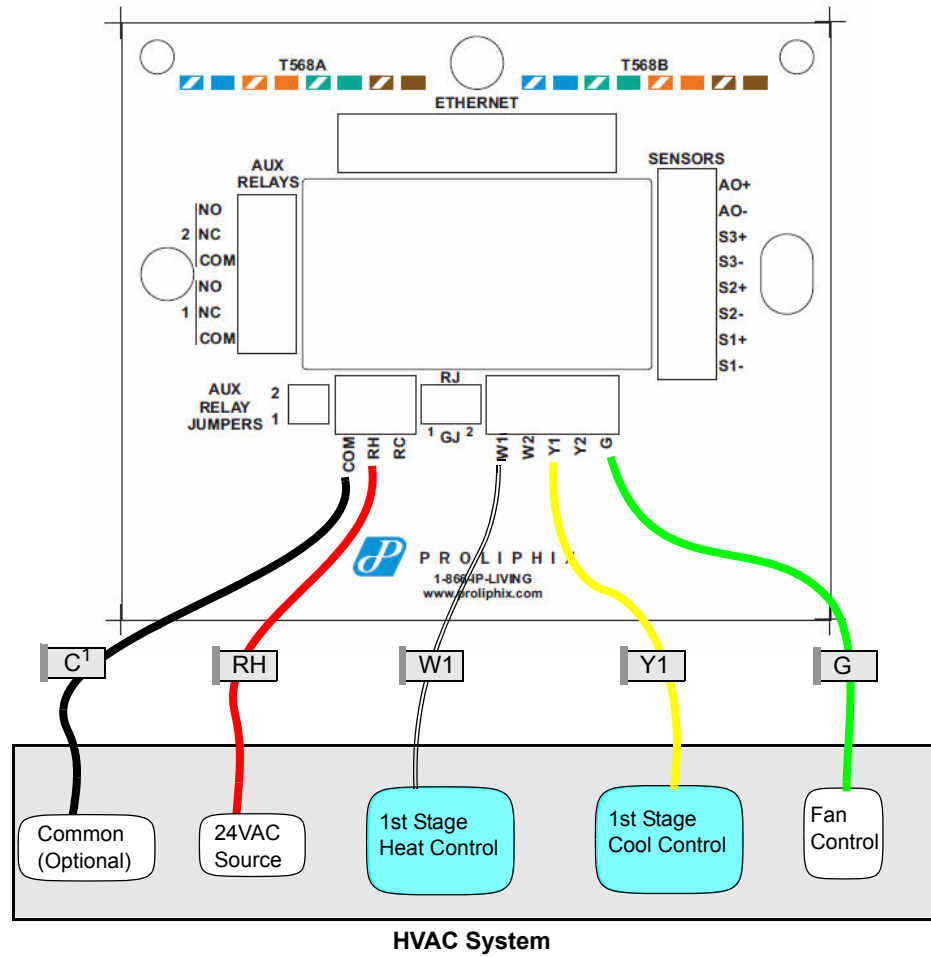
^a The 24VAC common must be in the same AC phase as the 24VAC source (RH or RC). If the thermostat is connected to RH only, or RH and RC then C must be the RH common. If the thermostat is connected to RC only then C must be the RC common.

^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.

Figure 1 shows an example of a single-stage Fuel Burner HVAC system connecting to an IMT base plate.

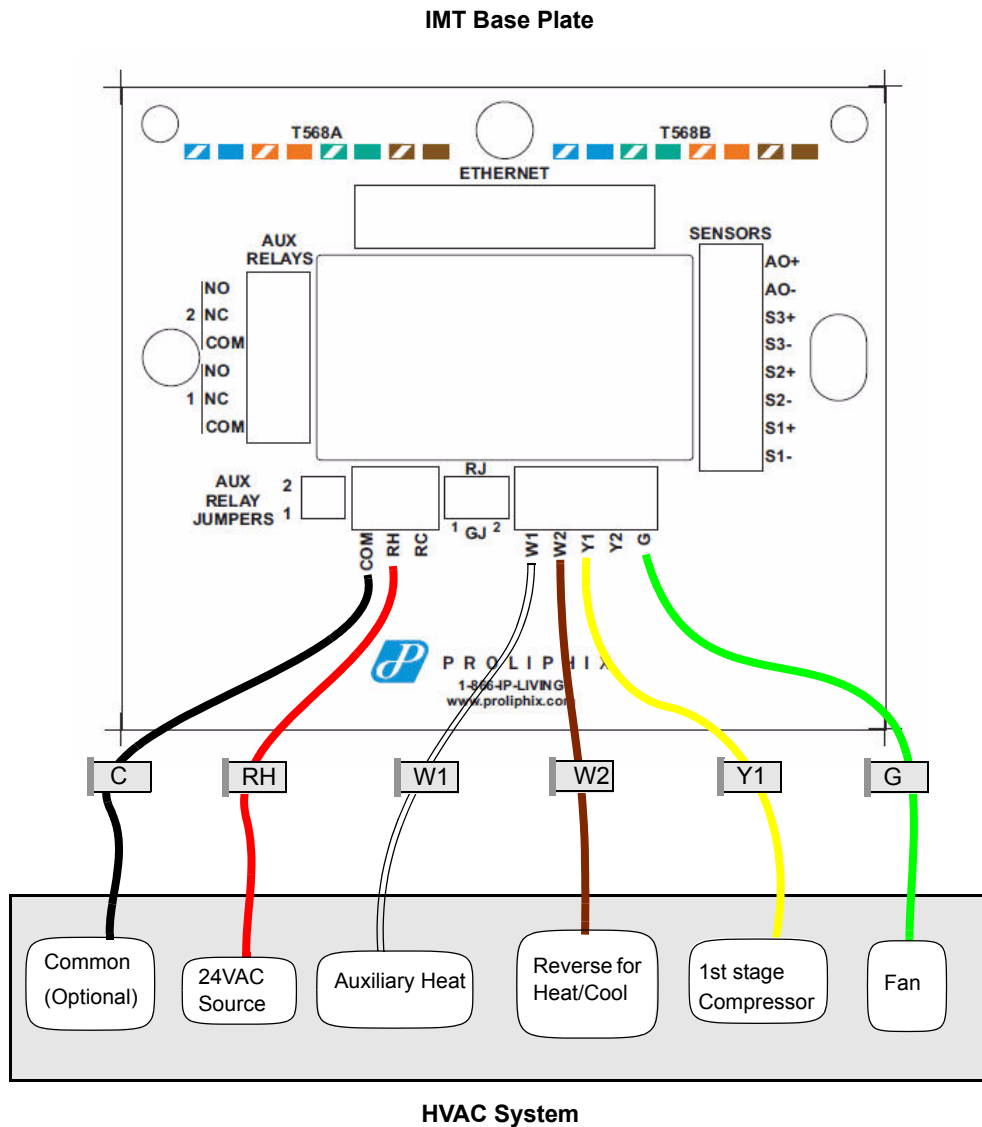
Figure 1 Single-Stage Fuel Burner HVAC Connections
IMT Base Plate



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 single-stage Heat Pump HVAC system, with reverse activate for heat/cool, connecting to an IMT base plate.

Figure 2 Single-Stage Heat Pump HVAC Connections



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 6](#) 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 7](#) or [Figure 2 on page 8](#) 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.
- 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 two remote (external) sensor ports. The IMT supports Thermistor and contact closure sensing. (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 10](#).

[Figure 3](#) shows an example of the remote sensor switch settings.

Figure 3 Remote Sensor Switch Settings - Base Plate Label

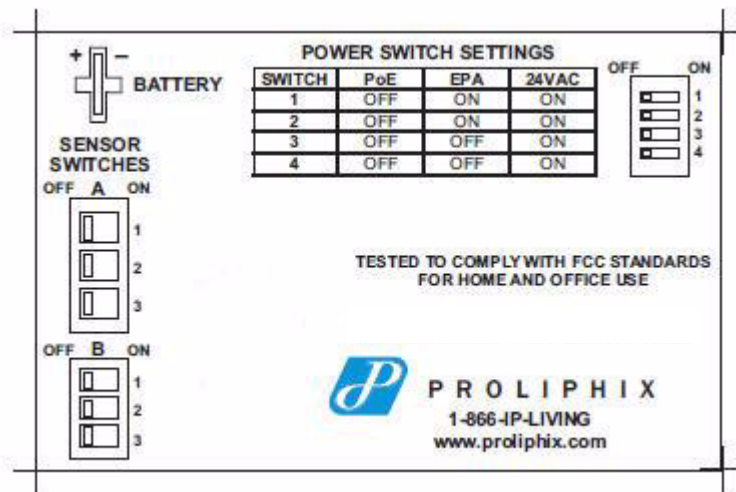


Table 3 lists the remote sensor switch settings.



Note

Only one sensor can be connected to each port.

Table 3 Remote Sensor Switch Settings

Remote Sensor	Thermistor and Contact
Remote Sensor 1	
A1	ON
B1	OFF
Remote Sensor 2	
A2	ON
B2	OFF

Connecting CAT5/CAT5E/CAT6 Wiring for Ethernet Networks to IMT350c 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

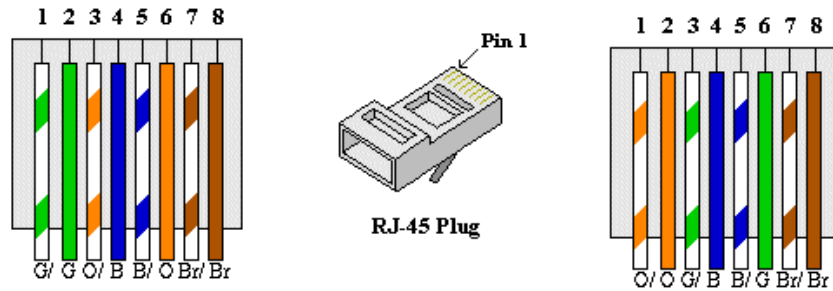


Table 4 describes the pinout assignments for the T568A and T568B wiring standards.

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

Table 5 describes the sensor connectors.

Table 5 Sensor Connectors

Sensor	Description
S1+	Remote Sensor 1
S1-	Remote Sensor 1
S2+	Remote Sensor 2
S2-	Remote Sensor 2

Table 6 describes what relays are active for the HVAC and fan state.

Table 6 Relay Matrix

	W1	W2	Y1	G
Fuel Burner				
Heat1 (1h)	X			X ^a
Cool1 (1c)			X	X
Fan				X
Heat Pump				
Heat1 (1h)		X ^b	X	X
Aux Heat (2h)	X	X ^c	X	X
Cool1 (1c)			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.

Mounting the Thermostat into the Base Plate

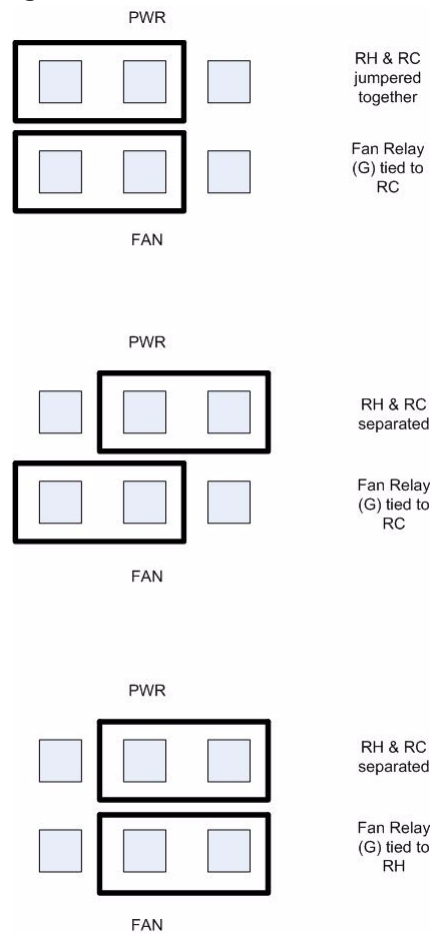
The Proliphix thermostat contains jumpers to configure the HVAC power settings. The power settings determine which HVAC power source (RH or RC) is configured to turn on each HVAC system (cool, heat, and fan). Most applications use only RH power. The Proliphix thermostat is shipped from the factory with the RH and RC jumpered together.

Table 7 lists the possible HVAC power configurations.

Table 7 HVAC Power Configuration

HVAC Power Configuration	Supplies...
<i>RH only (default) or RC only</i>	W1, W2, Y1, G
<i>RH and RC Supplies separate</i>	RH supplies W1, W2, G; RC supplies Y1
<i>RH and RC Supplies separate</i>	RH supplies W1 and W2; RC supplies Y1 and G

Figure 5 Jumper Configuration

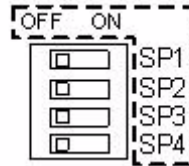


The IMT350c can be powered from different sources presented on the following Ethernet CAT5/5E/CAT6 interface (see [Figure 6](#)):

- 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. (IMT350c 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. (IMT350c and IMT350w)
- 24VAC is power from the HVAC system which requires RH and C to both be connected to provide power to the thermostat. (IMT350c and IMT350w)

[Figure 6](#) shows the four power sources.

Figure 6 Power Sources



[Table 8](#) shows how to configure the IMT for different power sources.

Table 8 Power Source Configuration

Switch	PoE	EPA	24 VAC/HPA
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 5](#)) 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 within 30 seconds, 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 within 30 seconds, 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 within 30 seconds, and the fan circuit is now active.

Logging In to the Thermostat

Log in to the IMT350 Web pages as the Administrator as follows:

- 1 Obtain the IMT350's IP address from the LCD interface.
- 2 Enter the IP address into your browser.
- 3 Log in using the default user name of **"admin"** and the password of **"admin"**.

