



EcoWave Featuring the EcoTouch

Installation, Operation & Maintenance Guide



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Company Headquarters:

Telkonet, Inc.
20800 Swenson Drive
Suite 175
Waukesha, WI 53186
P (414) 223-0473
F (414) 258-8307

Customer Support:

(800) 380-9640
Email:
ecosmartsupport@telkonet.com

EcoSmart Sales:

(888) 703-9398
Email
sales@telkonet.com

Introduction

Conventions Used in this Guide



This is an informational tip, used to convey relevant but not necessarily urgent information.



This is a warning, used to convey important information.



This is a strong warning, used to convey urgent and often safety-related information.

Chapter Names

Main chapters in this manual will have headings in large green font as shown above. Main chapter names also appear in the footer.

Sub-Chapter Names

Within the main chapters will be relevant sub-chapters, which are presented with bold, black headings as shown above.

Footers

Footers contain the document name, chapter name, document version number and page number, as shown here:



Procedure: Steps Described Here

Procedural Steps are indicated as such in the heading, which begins with the word, "**Procedure:**" as shown above. The steps are outlined as shown in the following example:

- Step 1** Navigate to the Config Menu > Alert Setup.
- Step 2** Click the **Add New Alert Trigger** button in the top left corner of the Alert Setup Screen.
- Step 3** Enter a descriptive **Alert Name**.

Introducing a New Screen

When a screen is introduced, a screen print is provided. Below the screen print will be its location and an explanation of the screen's intended purpose as shown in this example:



Screen and Tab Names

Screen and Tab names are underlined, as shown in this example:

The Thermostat Status Screen shows all rooms and their status information at a glance.

Field Names

Field names appear in bold font; field explanations appear next to the field name as shown in this example:

- Device** Select the device type.
- Position** The order in which attached devices are associated.
- MAC Address** MAC address of the attached device.

Field Selection Choices

Field selection choices are in italics as shown in this example:

Select the **Alerting Device Type** from the dropdown menu. Choices are: *All Thermostats*, *All Pipe Sensors*, *Single Device* and *Outdoor Temperature*.

The ">" Symbol

The ">" symbol is used to describe a menu choice and command selection. For example:

Configuration Menu > Alert Setup means click on the Configuration Menu, then click on Alert Setup.

Tables

Tables provide visual presentations of related data such as hardware components and explanations as shown in this example:

Pin	Label on Backplate	Function
1	iaculis	Lorem ipsum dolor sit amet.
2	velit	Fusce pharetra risus eu nibh consequat volutpat.
3	sagittis	Uisque laoreet augue eu elit dignissim feugiat.

Troubleshooting

Assistance with troubleshooting begins with the red header as shown above.

EcoWave Package Overview

The EcoSmart Energy Management System

The EcoSmart Energy Management System reduces HVAC energy consumption without interfering with occupant comfort.

EcoSmart thermostats such as the EcoTouch automatically learn and adapt to the heating and cooling patterns of each room. For example, a room on the east side of a building will receive direct sunlight in the morning and will either need less HVAC heating or more HVAC cooling. However, as the day progresses, the room will need more HVAC heating or less HVAC cooling as it moves into the shade. An EcoSmart thermostat will continually monitor the room, learn its patterns, and adjust its heating and cooling profiles accordingly.

EcoSmart thermostats also learn and adapt to occupant schedules. When a room is unoccupied, the EcoTouch will enter an energy saving mode, allowing the room to drift away from the desired set point. During this drift period, the thermostat will operate the HVAC unit less often, reducing energy costs. When the room becomes occupied again, the RecoveryTime™ technology built into each EcoTouch will return the room to the set point without occupant interaction.

The EcoWave is available in several configurations to address specific requirements of multiple applications including hotel, classroom, office, university dormitory, military residence hall, retail, public area, convention center, and a wide variety of commercial and industrial spaces.

The firmware of standalone EcoWave thermostats is identical to the firmware of networked versions. Standalone Thermostats can be networked by adding a network module to the base units at any time.

Programming features used during installation, maintenance, and troubleshooting are available in the on-screen Maintenance Menu.

Regulatory Compliance

FCC ID: XV6SS6560

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.

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 the 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 to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or experienced radio/TV technician for help.

EcoWave Package Overview

In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of the manufacturer could void the user's authority to operate the equipment.

To satisfy RF exposure requirements, this device and its antennas must operate with a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

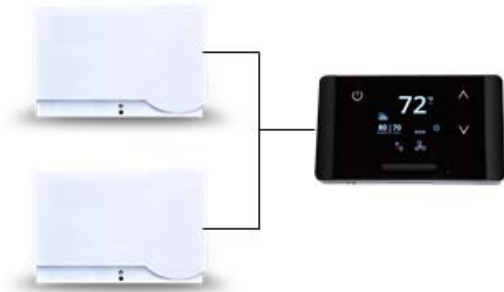
Overview: EcoWave Remote Thermostat/Controller Package

The EcoWave package is comprised of two hardware components as shown below. Together they form a wireless programmable controllable thermostat. It can be easily installed on packaged terminal air conditioners, fan coils, heat pumps, split systems, and more. With software-based relay control and fan speed configuration, programming setup is simple and fast.

 EcoTouch	• Display unit • Place in optimum location for temperature measurement and ease of occupant use
 EcoSource	• HVAC Controller • Install in or on HVAC unit • Accepts association with 15 total compatible wireless devices • Each compatible wireless device can be associated to multiple EcoSources

Accommodates a Variety of Configurations

EcoWave Package Overview



The EcoWave Package can be configured for many different HVAC scenarios. For example:

One EcoTouch can control multiple HVAC systems, each equipped with an EcoSource, but all directed by a single EcoTouch display unit. This type of installation reduces the complexity of running multiple HVAC units in a single large space and eliminating the potential of opposing modes forcing equipment to compete against each other.



Multiple EcoTouches can control one HVAC system, equipped with one EcoSource.

The wiring interface conforms to industry standards. Telkonet can develop specific wiring diagrams, if a complete specification is provided for the HVAC unit(s) in use at the site.

EcoSource Installation

EcoSource

Wiring

The EcoSource controller connects to the HVAC system via standard wiring conventions, using 12-277VAC voltages supplied by the HVAC equipment. The EcoSource can accept three different power sources, which assist in scenarios where different components (heat, fan) are powered by different voltages. This simplifies installation on units such as fan coils.

The EcoSource accepts standard thermostat wiring, typically 14-22 AWG. Wiring conventions follow industry standards; however, it is important to note that the relay configuration is dynamic and can be modified at the factory or in the field.

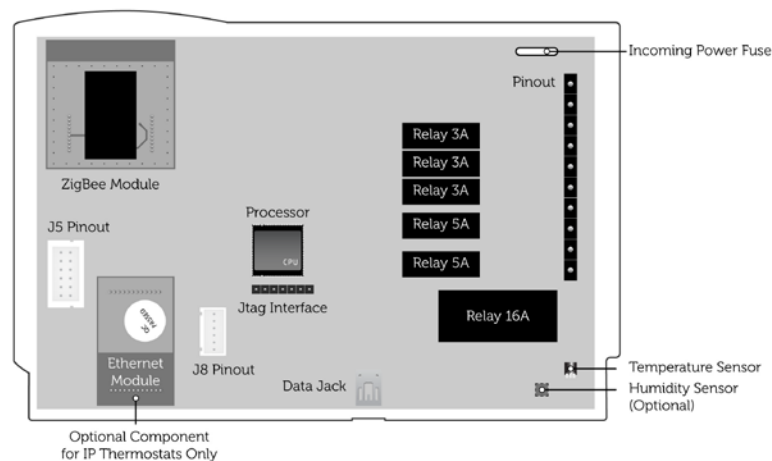


Figure 1: Internal View EcoSource



If the EcoSource will be mounted inside a metal HBS unit or in a room with a large amount of metallic equipment that may cause RF interference, an external antenna may be necessary.

EcoSource Installation

High/Low Voltage Options

High Voltage Installation Option (page 6)	Low Voltage Installation Options (page 14)
- High Voltage is defined as 48 volt or greater. - There are two installation options: <u>JBOX with Vertical Mud Ring Mount</u>: requires adapter plate as shown in Figure 2. <u>Factory HVAC Mount</u>	- There are 3 options; select based on code and desired look: <u>Drywall mount</u>: no conduit required; no JBOX adapter plate required. <u>JBOX with Vertical Mud Ring Mount</u>: requires adapter plate as shown in Figure 2. <u>JBOX with Horizontal Mud Ring Mount</u>: requires wing nut, hole must be drilled in backplate; no JBOX plate required.

High Voltage Installation

(For Low Voltage Installation instructions, see page 14).

Mounting Preparation

The back plate type must be defined as low or high voltage prior to shipment.

EcoSource High Voltage Installation



Figure 2: Telkonet JBOX Adapter Plate

For all high voltage installations a single gang mud ring must be mounted VERTICALLY on a JBOX. A Telkonet JBOX Adapter Plate (see Figure 2) is required for all JBOX installations.



EcoSource High Voltage Required Equipment

- EcoSource (P/N: SS6500)
- EcoTouch (P/N: SS6560)
- High Voltage Backplate
- Telkonet High Voltage JBOX Adapter
- Two #6-32 1" screws
- Four #5 ½" coarse thread screws
- Voltmeter
- Level
- Phillips screwdriver
- UL rated insulating tape
- Wire stripper
- Wire cutter
- Wire nuts

EcoSource High Voltage Installation

Installation Steps

Step 1 Ensure the JBOX has been installed with a vertical single gang mud ring. See Figure 3.

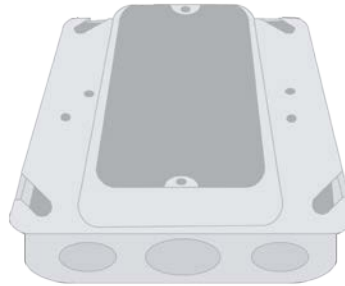


Figure 3: Vertical Single Gang Mud Ring

- Step 2 Turn off power at EcoSource or mounting location using a disconnect switch or breaker lockout/tag out on appropriate breaker panel.
- Step 3 Test that power is off by using a voltmeter.
- Step 4 Strip the LINE wire back 0.25 inches.
- Step 5 Cap the LINE wire with a wire nut or electrical tape.
- Step 6 Cut the COMMON wire so the copper is flush with the insulation.
- Step 7 Strip all wires except for COMMON back 0.25 inches.



Reminder: For all high voltage installations, a single gang mud ring must be mounted **VERTICALLY**.

Step 8 Determine which end of the adapter plate should be installed as the top, and which end should be installed as the bottom. As shown in Figure 4, the notch in the main display should be in the upper left corner, and the smaller, vertical rectangle should be in the lower right corner.

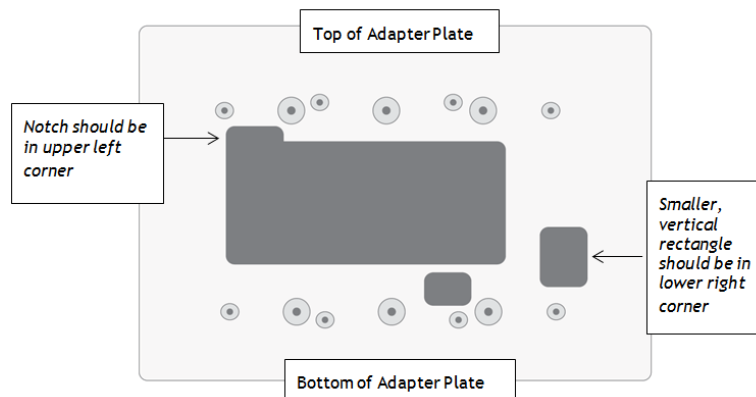


Figure 4: Determine Top & Bottom of Plate

Step 9 Level the high voltage Telkonet JBOX adapter plate and mount to the mud ring with two #6-32 1" screws. See Figure 5.

EcoSource High Voltage Installation

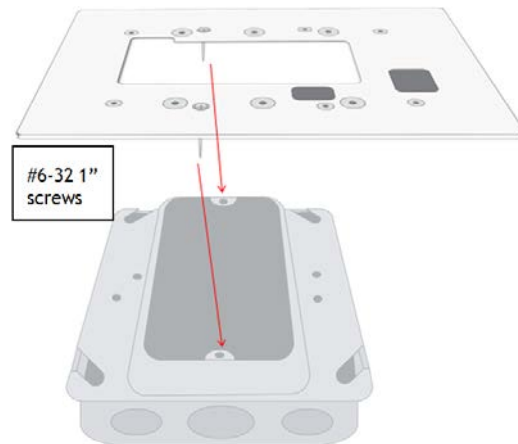


Figure 5: JBOX, Mud Ring, Adapter Plate

- Step 10 Remove the safety screw from the left side of the thermostat using the hex wrench. See Figure 6.

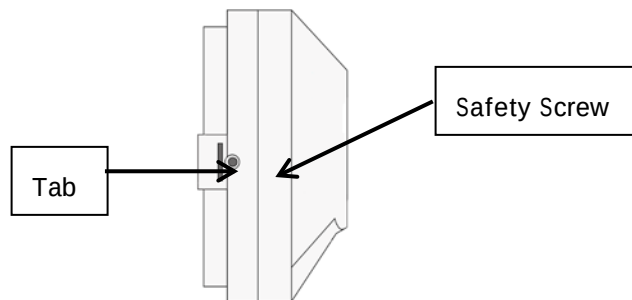


Figure 6: EcoSource Side View

- Step 11 Separate the high voltage back plate from the thermostat: Use a flathead screwdriver to GENTLY press the tab next to the screw hole to allow the thermostat to pop open.
WARNING: Using too much force can break the tab.
- Step 12 Place thermostat backplate against the JBOX adapter plate. The adapter plate and backplate holes should align if both are correctly oriented.



Thermostat wiring cannot touch or be placed in close proximity to the J7 pins! This can occur if the wiring enters the thermostat from the J8 hole and is placed diagonally, directly over the J7 pins.

- Step 13 Connect each 16-gauge wire (pre-installed on the thermostat's high-voltage back plate) to the matching functional wire within the JBOX, using appropriately sized wire nuts or a NEC-

EcoSource High Voltage Installation

approved electrical connection inside the junction box. If a site-specific wiring diagram was provided, refer to this for wiring. If no diagram was provided, refer to Figure 7.

. (If controlling proportional valve or ECM fan, see Appendix A.) Any unused wires must be capped according to NEC standards.¹



For variable output connections, see Appendix A on page 39.

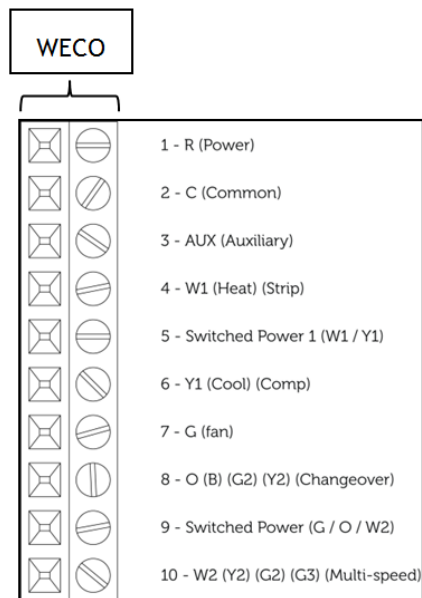


Figure 7: Wiring

¹ The High Voltage backplate comes with R, Switched Power 1 and Switched Power 2 jumped together with a Red Wire nut. These can be connected to the same power source assuming all controlled Fans and Valves will be controlled at the same voltage that will be powering the thermostat. If a different voltage will be used for any of the Controlled elements of the HVAC then the appropriate power source should be connected to the Switched Power 1 (W1, Y1) and Switched Power 2 (G, O, W2) terminals.

EcoSource High Voltage Installation

Table 1-Wiring:

Pin	Label on Backplate	Function
1	R (Power)	12-277VAC power from HVAC, used to power the thermostat
2	C (Common)	AC Common
3	AUX (Auxiliary)	User defined
4	W1 (Heat) (Strip)	Heat call or strip heat call (depends on programming)
5	Switched Power 1 (W1/Y1)	Provides alternate power for W1 and Y1
6	Y1 (Cool) (Comp)	Cool/Compressor call
7	G (Fan)	Fan Call - Low speed
8	O (B) (G2) (Y2) (Changeover)	Multi-use - depends on programming and site requirements: • Changeover • 2nd Stage Fan • 2nd Stage Cooling
9	Switched Power 2	Provides alternate power for G, O, and W2
10	W2 (Y2) (G2) (G3) (Multi-speed)	Multi-use - depends on programming and site requirements: • 2nd stage heat • Electric heat (for HPs with strip heat, etc.) • Emergency heat

Step 14 Carefully push the wired connections back into the JBOX.

Step 15 Mount pre-wired 16 gauge SS6000 backplate on top of JBOX adapter, using four #5 ½" coarse thread screws. See Figure 8.

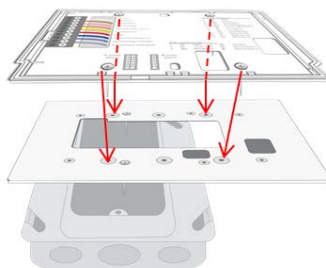


Figure 8: Backplate on Adapter Plate

Step 16 Ensure no airflow from JBOX or wall cavity is able to seep into the thermostat through the wire harness. Telkonet recommends the use of UL caulk or UL rated insulating tape as shown in Figure 9 to avoid false temperature readings.

EcoSource High Voltage Installation

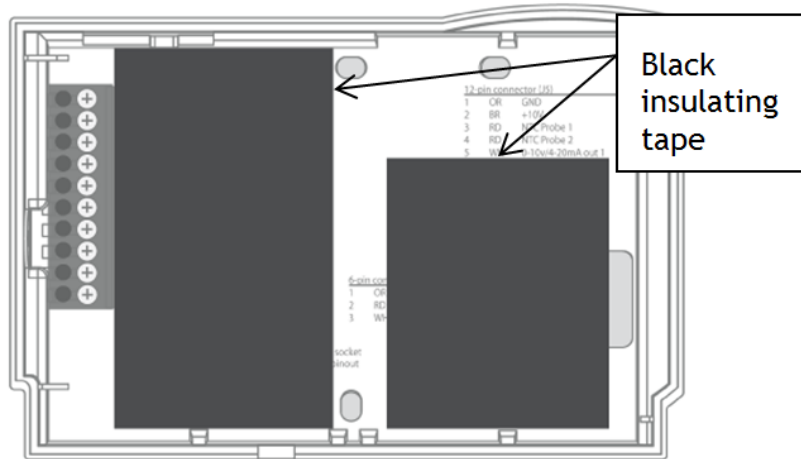


Figure 9: Backplate with UL-Rated Insulating Tape

Step 17 Line up the hinges on the thermostat to the notches on the backplate:

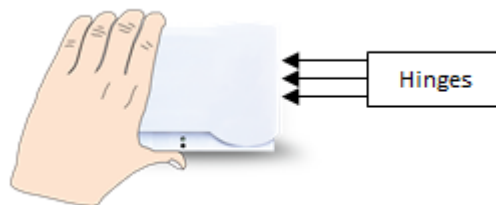


Figure 10-Line Up Hinges on Right

Step 18 Press the right side of the thermostat tightly against the back plate.

Step 19 Slowly bring the left side toward the wall. Use care not to force the faceplate closed. If you encounter resistance, check to make sure no wires are pinched between components.



Caution: the metal pins (as shown in Figure 11) can be bent when replacing faceplates if too much force is used.

EcoSource High Voltage Installation



Figure 11: Metal Pins

- Step 20 Return the electrical circuit to operation. Remove all lockouts or tags from the circuit breaker and enable any disconnects.
- Step 21 Verify the EcoSource thermostat display is active.
- Step 22 Test all components to make sure that you can engage both the heat and air conditioning, and all supported fan settings (high, low, etc.). Wiring is complete.
- Step 23 Once the thermostat has been snapped onto the backplate, use a hex wrench to insert the safety screw.

EcoSource Low Voltage Installation

Low Voltage Installation



Always ensure power has been turned off before starting installation.

EcoSource Low Voltage Required Equipment

- EcoSource (P/N: SS6500)
- EcoTouch (P/N: SS6560)
- Voltmeter
- Level
- Phillips Head Screwdriver
- Precision Screwdriver
- UL rated insulating tape
- Wire stripper
- Wire nuts

Additional Hardware Required for Drywall Mount

- Four 50 lb. EZ-Lock anchors and provided screws

Additional Hardware Required for VERTICAL JBOX Mount

- Telkonet JBOX Adapter Plate
- Two #6-32 1" screws
- Four 5/8" coarse thread screws

Additional Hardware Required for HORIZONTAL JBOX Mount

- Two #6-32 1" screws
- 1 Speed Nut (flat-type speed nut fastener that accommodates a #6-32 1" screw as shown in Figure 12.



Figure 12-Speed Nut

Installation Instructions Common to All Three Low Voltage Options

- Step 1 If applicable, determine the location in the room where the thermostat will be installed. (See EcoTouch Thermostat Location Planning section, page 24.)

EcoSource Low Voltage Installation

- Step 2 Turn off power at EcoSource mounting location using a disconnect switch or breaker lockout/tag out on appropriate breaker panel.
- Step 3 Test that power is off by using a voltmeter.
- Step 4 Remove the safety screw from the left side of the thermostat using the hex wrench. See Figure 13.

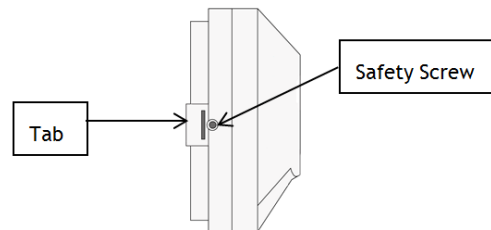


Figure 13: EcoSource Side View

- Step 5 Separate the backplate from the thermostat: Use a flathead screwdriver to GENTLY press the tab next to the screw hole to allow the thermostat to pop open. *WARNING: Using too much force can break the tab.*
- Step 6 For drywall mounting instructions, go to Step 7.
For JBOX vertical installation instructions, go to Step 19
For JBOX horizontal installation instructions, go to Step 30



Thermostat wiring cannot touch or be placed in close proximity to the J7 pins! This can occur if the wiring enters the thermostat from the J8 hole and is placed diagonally, directly over the J7 pins.

Drywall Mounting Instructions

- Requires four 50 lb. EZ-Lock anchors and provided screws

- Step 7 Hold backplate against wall at appropriate height. Using a pen, level-mark your 4 holes.
- Step 8 Use appropriate drill for anchor and insert anchors into holes.
- Step 9 Screw backplate to the wall and into the anchors. Re-check that it is still level.
- Step 10 Strip the LINE wire back 0.25 inches.
- Step 11 Cap the LINE wire with a wire nut or electrical tape.
- Step 12 Cut the COMMON wire so the copper is flush with the insulation.
- Step 13 Strip all wires except for COMMON back 0.25 inches.
- Step 14 Verify the wiring now looks similar to Figure 14.

EcoSource Low Voltage Installation

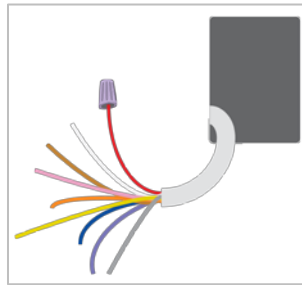


Figure 14-Wiring

- Step 15 Starting at the bottom of the terminal block and working up, use a precision screwdriver to secure each of the wires into the appropriate pins on the terminal block. Low voltage only: Using 20-18 gauge wire, leave a minimum of 8" of spare wire exposed from the wall for connection directly to the thermostat's back plate screw terminals.
- Step 16 Low voltage only: Ensure backplate has appropriate jumpers between R, SW1 and SW2. If installing on a heat pump, ensure there is a jumper between Y1 and W1. See Figure 15.

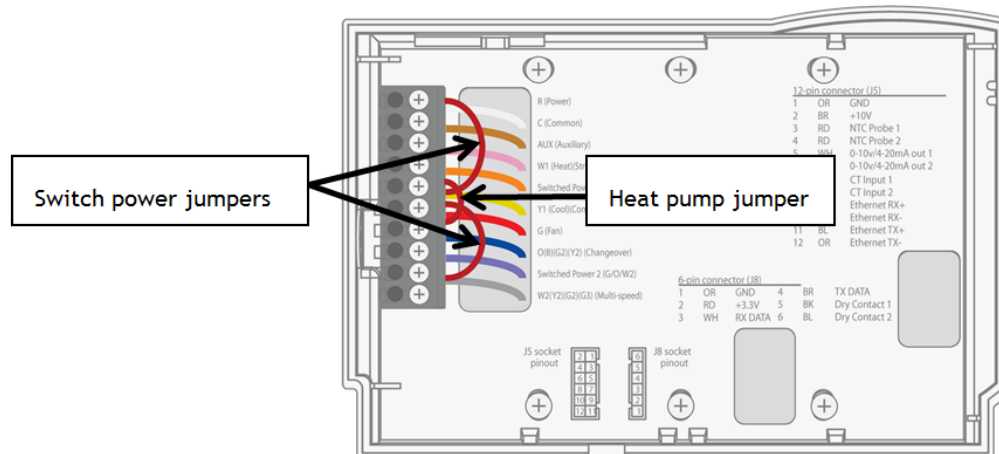


Figure 15: EcoSource Backplate with Appropriate Jumpers

- Step 17 Verify each wire is secure by gently tugging on it.
- Step 18 Continue to Step 41

JBOX Using Vertical Mud Ring Instructions

- Requires Telkonet JBOX Adapter Plate and two #6-32 1" screws

- Step 19 Strip the LINE wire back 0.25 inches.
- Step 20 Cap the LINE wire with a wire nut or electrical tape.
- Step 21 Cut the COMMON wire so the copper is flush with the insulation.
- Step 22 Strip all wires except for COMMON back 0.25 inches.

EcoSource Low Voltage Installation

- Step 23 Determine which end of the adapter should be situated on top, and which end should be situated on the bottom. As shown in Figure 16, the notch in the main display should be in the upper left corner, and the smaller, vertical rectangle should be in the lower right corner.

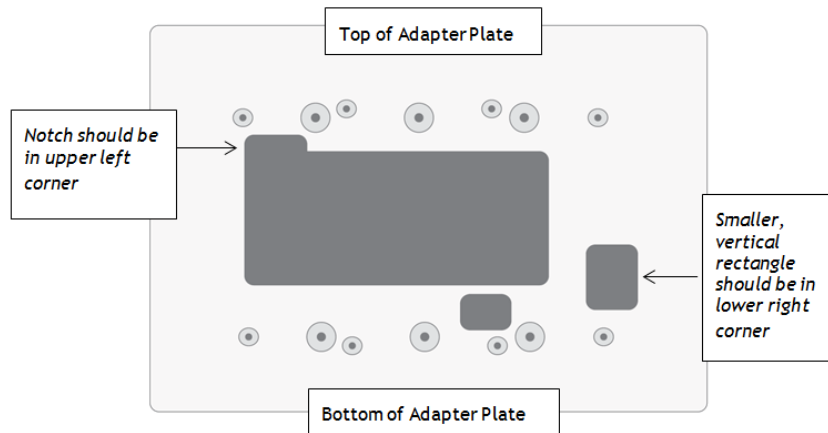


Figure 16: Determine Top & Bottom of Plate

- Step 24 Mount the Telkonet JBOX adapter plate to the mud ring with two #6-32 1" screws. See Figure 17.

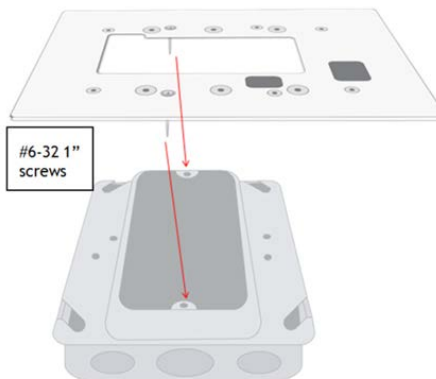


Figure 17: JBOX, Mud Ring & Adapter Plate

- Step 25 Mount SS6000 backplate on top of JBOX adapter, using four #5 1/2" coarse thread screws. See Figure 18.

EcoSource Low Voltage Installation

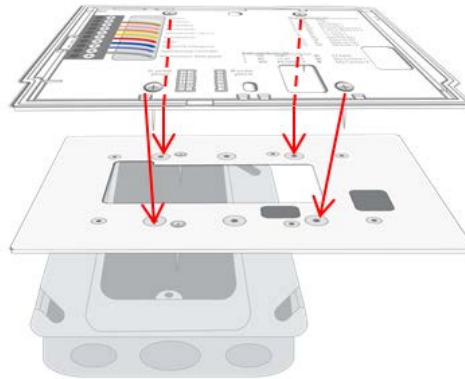


Figure 18: Back Plate on Adapter Plate

Step 26 Connect each WECO terminal to the matching functional wire within the JBOX. Refer to Figure 19 and Table 2. (If controlling proportional valve or ECM fan, see Appendix A.) Any unused wires must be capped according to NEC standards.

WECO		
		1 - R (Power)
		2 - C (Common)
		3 - AUX (Auxiliary)
		4 - W1 (Heat) (Strip)
		5 - Switched Power 1 (W1 / Y1)
		6 - Y1 (Cool) (Comp)
		7 - G (fan)
		8 - O (B) (G2) (Y2) (Changeover)
		9 - Switched Power (G / O / W2)
		10 - W2 (Y2) (G2) (G3) (Multi-speed)

Figure 19: Wiring



For variable output connections, see Appendix A on page 39.

EcoSource Low Voltage Installation

Table 2: Wiring

Pin	Label on Backplate	Function
1	R (Power)	12-277VAC power from HVAC, used to power the thermostat
2	C (Common)	AC Common
3	AUX (Auxiliary)	User defined
4	W1 (Heat) (Strip)	Heat call or strip heat call (depends on programming)
5	Switched Power 1 (W1/Y1)	Provides alternate power for W1 and Y1
6	Y1 (Cool) (Comp)	Cool/Compressor call
7	G (Fan)	Fan Call - Low speed
8	O (B) (G2) (Y2) (Changeover)	Multi-use - depends on programming and site requirements: • Changeover • 2nd Stage Fan • 2nd Stage Cooling
9	Switched Power 2	Provides alternate power for G, O, and W2
10	W2 (Y2) (G2) (G3) (Multi-speed)	Multi-use - depends on programming and site requirements: • 2nd stage heat • Electric heat (for HPs with strip heat, etc.) • Emergency heat

- Step 27 Low voltage only: ensure backplate has appropriate jumpers between R, SW1 and SW2. If installing on a heat pump, ensure there is a jumper between Y1 and W1. See Figure 15 on page 16.
- Step 28 Ensure no airflow from the JBOX or wall cavity is able to seep into the thermostat through the wire harness. Telkonet recommends the use of UL approved caulk or UL rated insulating tape to avoid false temperature readings. Figure 20 illustrates sections of insulating tape on the backplate, covering the wall opening.
- Step 29 Continue to Step 41

EcoSource Low Voltage Installation

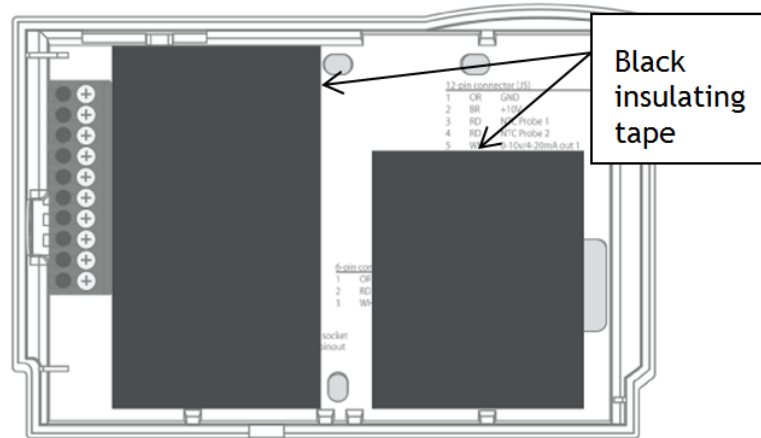


Figure 20: EcoSource Backplate with UL-Rated Insulating Tape

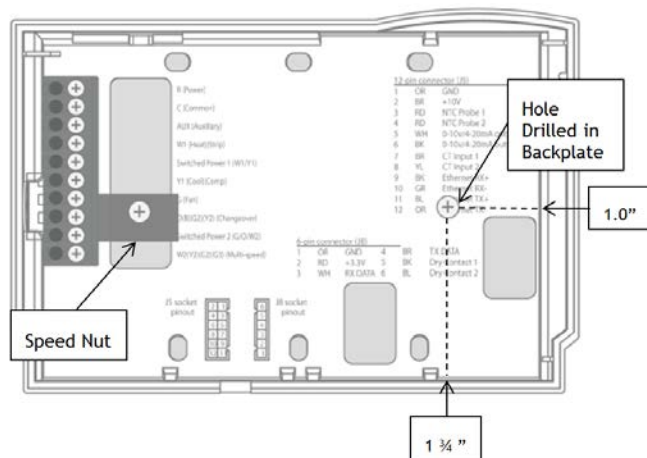
JBOX Using Horizontal Mud Ring **Instructions** (Preferred method for low voltage new construction)

Requires:

- Speed nut that accommodates a #6-32 1" screw.
- two #6-32 1-inch screws
- 1 hole to be drilled into backplate (drilling performed onsite or by Telkonet Production prior to shipping if requested in advance.)

Step 30 Ensure the JBOX has been installed with a horizontal mud ring.

Step 31 Unless this was done prior to shipping, drill a hole in backplate as shown in Figure 21. The horizontal distance between the hole and the inner right side of the plate should be 1.0". The vertical distance between the hole and the inner right side of the plate should be 1 3/4". The hole should accommodate a #6-32 1" screw.



EcoSource Low Voltage Installation

Figure 21: EcoSource Backplate with Speed Nut and Drilled Hole

- Step 32 Level the backplate using a pen level across the bottom of the backplate.
- Step 33 Place the speed nut on the backplate in the position shown in Figure 21, with the prongs pointing inward toward the mud ring.
- Step 34 Place the screw in the speed nut hole.
- Step 35 Drive the screw into the mud ring. Use your fingers to hold the speed nut in place, to prevent it from turning as the screw is driven. (The curve of the speed nut allows the head of the screw to be slightly recessed into the backplate.)
- Step 36 Mount the other screw in the hole on the right side of the backplate.
- Step 37 Starting at the bottom of the terminal block and working up, use a precision screwdriver to secure each of the wires into the appropriate pins on the terminal block. For low voltage, using 20-18 gauge wire, leave a minimum of 8" of wire exposed from the wall for connection directly to the thermostat's backplate WECO terminals.
- Step 38 Low voltage only: Ensure backplate has appropriate jumpers between R, SW1 and SW2. If installing on a heat pump, ensure there is a jumper between Y1 and W1. See Figure 15 on page 16.
- Step 39 Verify each wire is secure by gently tugging on it.
- Step 40 Ensure no airflow from the JBOX or wall cavity is able to seep into the thermostat through the wire harness. Telkonet recommends the use of UL caulk or UL rated insulating tape to avoid false temperature readings. Figure 20 on page 20 illustrates sections of insulating tape on the backplate, covering the wall opening.

Instructions Common to All Three Low Voltage Options

- Step 41 Hook the thermostat to the hinges on the right side of the backplate, as shown Figure 22.

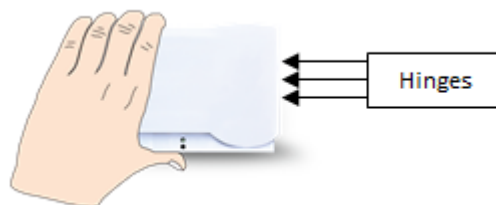


Figure 22-Line Up Hinges on Right

- Step 42 Line up the hinges on the thermostat to the notches on the backplate. Press the right side of the thermostat tightly against the back plate.



Caution: when replacing thermostats, the metal pins (as shown in Figure 23) can be bent if too much force is used.

EcoSource Low Voltage Installation



Figure 23: Metal Pins-Use Care

- Step 43 Slowly bring the left side toward the wall as shown. Use care not to force the faceplate closed. If you encounter resistance, ensure no wires are pinched between components and that no pins are bent.
- Step 44 Once the thermostat has been snapped onto the back plate, use a hex wrench to insert the safety screw in the location shown in Figure 13 on page 15.
- Step 45 Inside the PTAC, verify the GFI (if so equipped) has not been tripped.
- Step 46 Verify that the PTAC has been set to Class II (remote thermostat) operation (if applicable). Consult PTAC manual for proper procedure.
- Step 47 Reinsert and tighten the safety screw on the EcoSource.
- Step 48 Remove all lockouts or tags from the circuit breaker.
- Step 49 Return the electrical circuit to operation.
- Step 50 Verify the thermostat display is active.
- Step 51 Test all components to make sure that you can engage both the heat and air conditioning, and all supported fan settings (high, low, etc.). Wiring is complete.
- Step 52 Continue to EcoTouch Wireless Installation section.

Relay Configuration

The thermostat comes with a default relay configuration, which sets the functions of each pin. This default can be changed to one of several alternate relay configurations, which are stored in the memory of the thermostat. To change your thermostat relay configuration, specifically command #2.

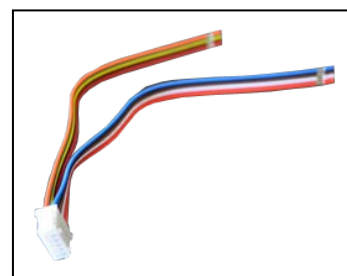
J5 Connector

The functions of the J5 Connector will vary based on the device model.

EcoSource Low Voltage Installation

Table 3: J5 Connector Pinout

Pin	Wire Color	Label on Backplate	Function
1	OR	GND	Thermostat Signal Ground (not an earth ground)
2	BR	+10V	10 Volts DC Output
3	RD	NTC Probe 1	Temperature Probe 1
4	RD	NTC Probe 1	Temperature Probe 2
5 *	WH	0-10v / 4-20mA out 1	Analog Output #1 (VO model only)
6 *	BK	0-10v / 4-20mA out 2	Analog Output #2 (VO model only)
7	BR	CT Input 1	Current Transformer Input for Amperage
8	YL	CT Input 1	Current Transformer Input for Amperage
9 †	BK	CT input 2	Current Transformer Input for Amperage
10 †	GR	CT input 2	Current Transformer Input for Amperage
11 †	BL	CT input 3	Current Transformer Input for Amperage
12 †	OR	CT input 3	Current Transformer Input for Amperage



EcoTouch Installation

EcoTouch

The EcoTouch is a remote thermostat that communicates with the EcoSource via the wireless ZigBee mesh network. It comes with a built-in temperature sensor and IR occupancy sensor. An optional humidity sensor may also have been installed into the EcoTouch.

EcoTouch Location Planning

Actual thermostat mounting height can vary between sites depending upon furnishings and aesthetic considerations. The standard recommended height is approximately 60" from finished floor. Any rooms designated as ADA should be mounted above 15" and below 48". See Figure 24.

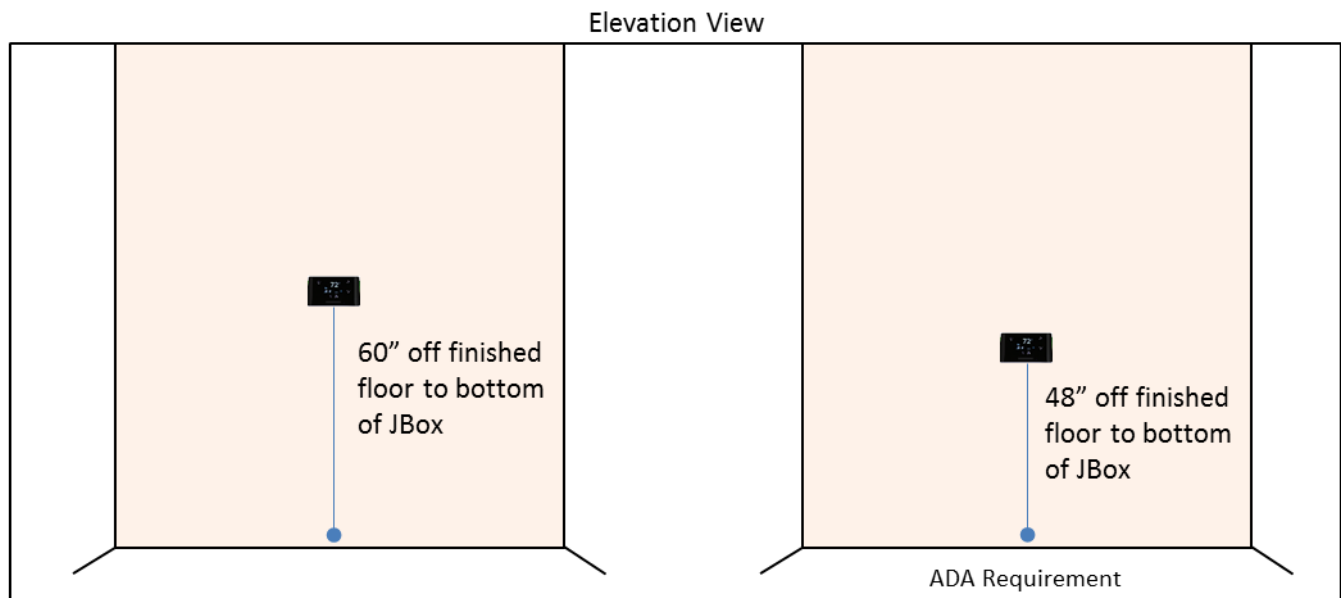


Figure 24: Mounting Height

EcoTouch Installation

Table 4: EcoTouch Mounting-Best Practices

Mounting Considerations	Best Practice	
Distance to Occupant	If the occupants will likely be stationary... (e.g. sleeping in bed)	Position within 0 – 9 feet of their expected location.
	If the occupants will move occasionally... (e.g. working at desk)	EcoTouch: within 9-18 feet of their expected location
	If the occupants will move regularly... (e.g. walking in hall)	EcoTouch: within 18-25 feet of their expected location
Line of Sight	Should not have its line of sight to the EcoSource partially obstructed by grills, registers, or spinning fan blades.	
	EcoTouch has 140° wide horizontal viewing angle	
	Should point toward main sleeping area	
	If no door contacts or remote occupancy sensors are used in the guest room then the bed should always be positioned within a 12' radius from the front of the thermostat	
Other Considerations	Should be mounted on a wall away from heat or cold sources that could affect its temperature reading. This includes direct sunlight, outside-facing walls with poor insulation, walls with hot and cold riser piping, and walls near radiators.	
	Where possible, mount on an inside wall.	
	If a suitable location without a heat or cold source is not available, contact a Telkonet Project Manager.	
	Should be mounted <u>on</u> the wall, not set <u>into</u> the wall. This will ensure that the backplate provides proper airflow.	

EcoTouch Installation

Installation



EcoTouch can accept 24VAC or 12-14VDC on J2.



Use wire harnesses with red and black stripped wires and JARD J4021F transformers, both provided by Telkonet. (Exceptions may apply in certain circumstances.)

- Step 1 Review table on page 25 to determine where the EcoTouch will be mounted.
Step 2 Remove the security screw from the EcoTouch (see Figure 25).



Figure 25-Security Screw

- Step 3 Separate the backplate from the EcoTouch by sliding the backplate to the right and the front plate to the left (approximately ¼ inch), as shown in Figure 26.

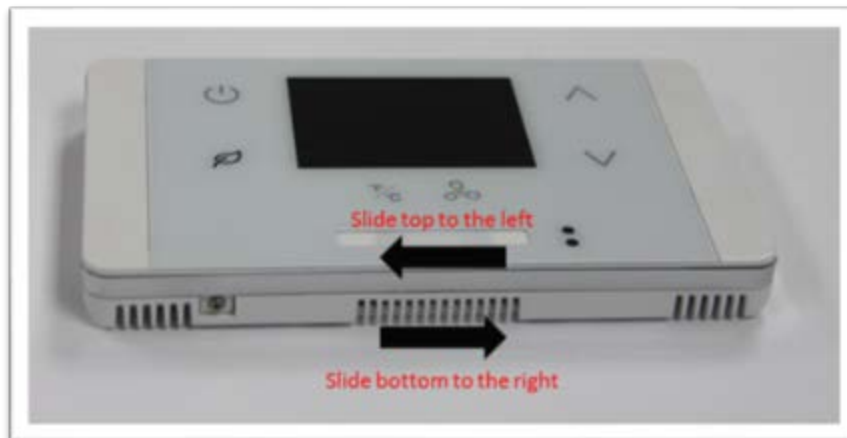


Figure 26: Slide Top Left, Bottom Right

EcoTouch Installation

Step 4 Lift the front plate up and off of the back plate as shown in Figure 27.

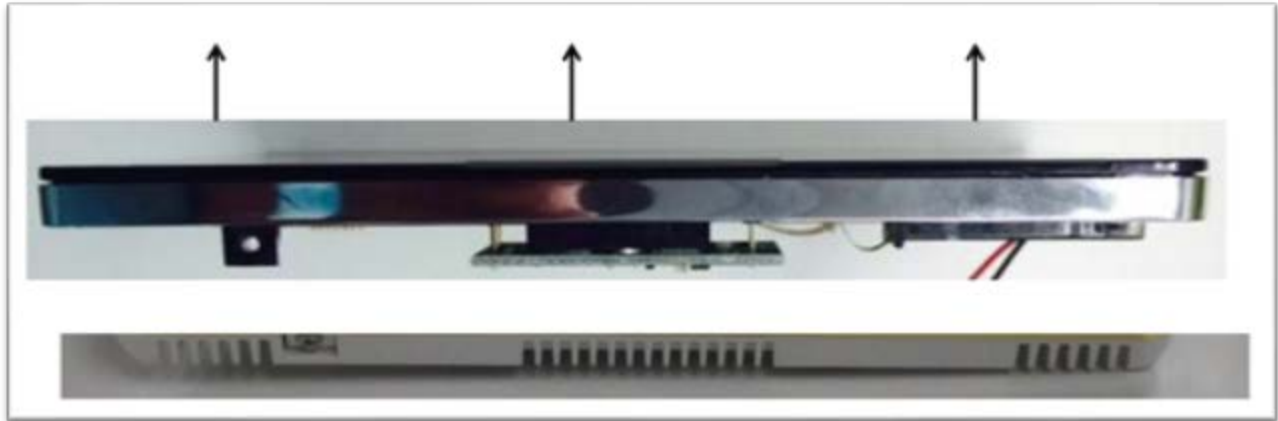


Figure 27: Lift Up and Off

- Step 5 Level the backplate on the wall.
- Step 6 Mark the placement for the mounting screws.
- Step 7 Mount the backplate to the wall using the mounting screws.
- Step 8 Note the J2 pin as shown in Figure 28; this is the pin to which you will connect power.
- Step 9 Note the J2 wires coming out from the wall.
- Step 10 You will attach the J2 wires to the J2 pin.

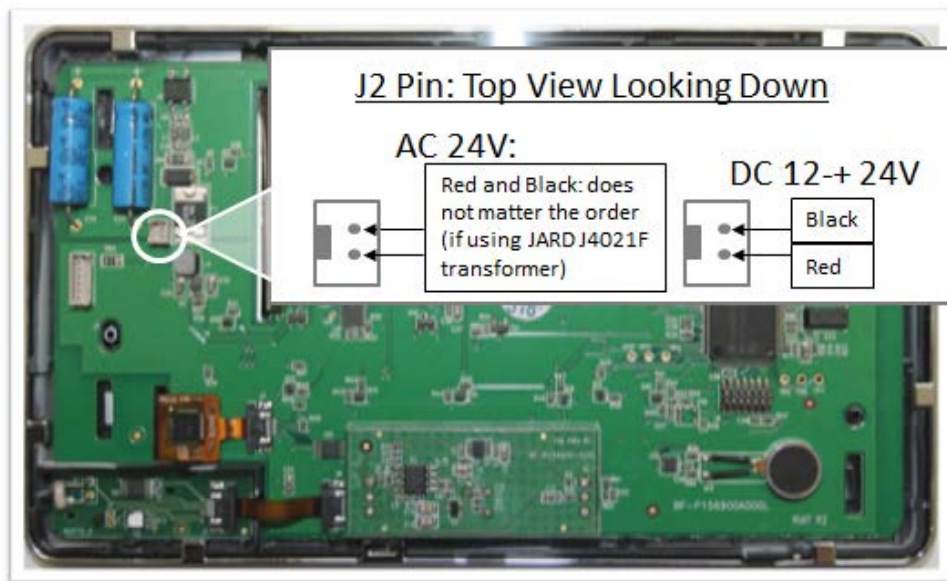


Figure 28: J2 Pin

EcoTouch Installation

-If your power is an AC 24V transformer, then connect the red wire and black wire to the top 2 pins; it does not matter whether the red wire is on top and the black wire is in the 2nd slot from the top, or vice versa.

-If your power is a 12-24VDC installation, then connect the black wire to the top pin (this is the “Ground” or “Common” pin) and connect red wire to the 2nd pin-the pin just below the top pin (this is the “Power” pin).

Step 11 Place the cover over the backplate, about ¼ inch to the left as shown in Figure 29.

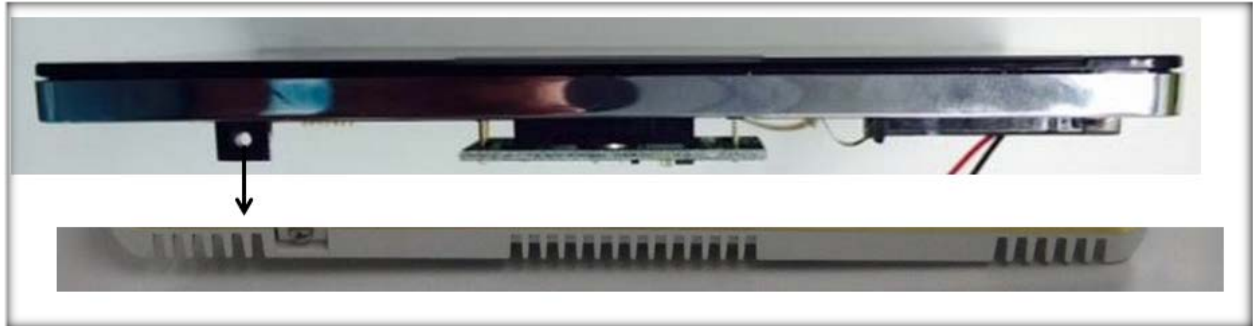


Figure 29: Replace Cover

Step 12 Slide the cover to the right to secure it.

Step 13 Screw in the security screw.

Your EcoTouch is now installed.

EcoTouch Guest Interface

EcoTouch Guest Screen Controls & User Interface

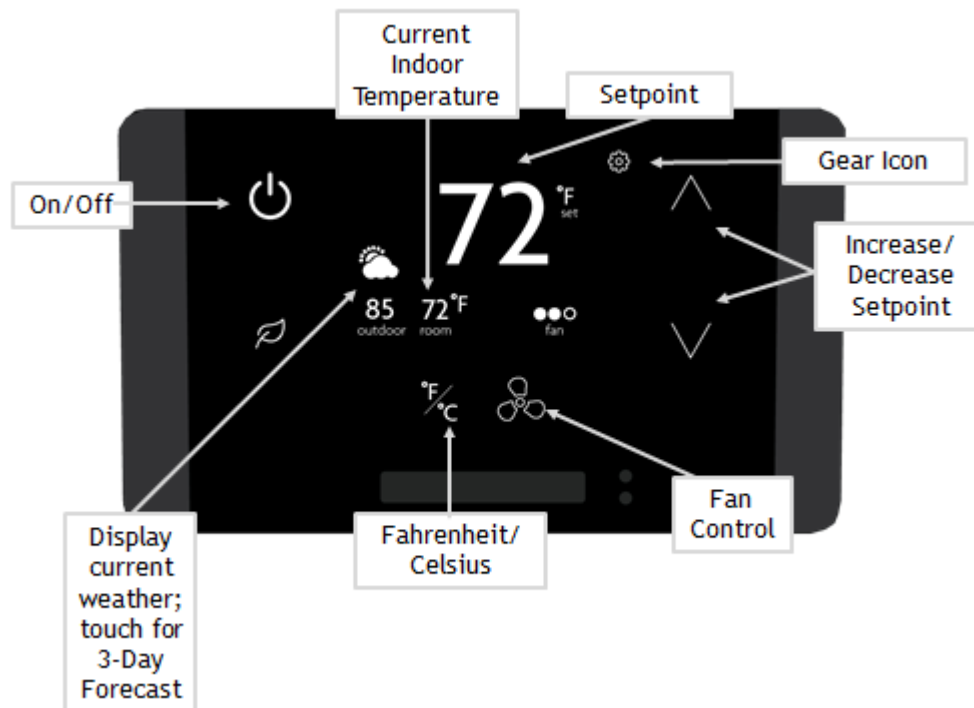


Figure 30: Guest Screen Controls

The EcoTouch front panel controls are shown below. The Administration controls can be locked out of operation, so they are not visible until a specific unlock sequence is entered. Currently this is the 3-finger tap as referenced on page 31.

On/Off	Turn the system on and off (<i>Optional: On/Heat/Cool/Off</i>)
Current Indoor temperature	Display
Setpoint	Display
Gear Icon	Adjust screen brightness; language selection (see below for details)
Increase/Decrease Setpoint	Press up and down arrows to adjust setpoint within the permitted range
Fan Control	Press to cycle through available fan speeds: Low, Medium, High, Auto
Fahrenheit/Celsius	Toggle between Fahrenheit and Celsius temperature display (not functional on 3-day forecast screen)
Current Weather	Displays current outdoor weather; touch for 3-day forecast (see below for details)

EcoTouch Guest Interface

Weather Forecast

- Provides a three day forecast
- Displays high and low temperature
- Displays weather graphic indicating weather conditions (sunny, cloudy, rainy, etc.)
- Displays day of the week
- Updates daily

Adjust Screen Brightness

Touch **Gear** icon > Touch **Display Dimming** > Select **Dim at Night** or **Off at Night** > **Back Arrow** twice to exit

Language Selection

Touch **Gear** icon > Select **Language** > Press **up/down arrows** to select English, Spanish, French or Portuguese > **Back Arrow** twice to exit

EcoTouch Pairing

Device Association



Reminder: associating devices must be done in this order:

1. Set up EcoCommander.
2. Hard wire EcoConnect coordinators to the EcoCommander.
3. Create a network via the EcoConnect coordinator.
4. Join routers (e.g. EcoSource) to the EcoConnect coordinator.
5. Pair EcoTouch to EcoSource (*see details below*).
6. Pair EcoContact to EcoSource (if applicable).
7. Pair EcoSense to EcoSource (if applicable).
8. Bind routers and end devices (such as Control4, Saflok, etc.) in the room.

Pair EcoTouch with EcoSource

1. On the EcoTouch, “three-finger tap” anywhere on the screen. (“Three-finger tap” means to touch the screen using 3 fingers, simultaneously; slightly spread out your fingers so all three fingers are recognized by the screen.)
2. The System Status screen appears.
3. Press the **Config** button.
4. Enter the password C57A
5. Touch **Enter**.
6. Touch **Pair**.
7. On EcoSource, use a paperclip or pen to press the recessed button above the LED light one time (LED will turn solid red).
8. Touch **Search on EcoTouch**.
9. EcoTouch will indicate “*Searching for a thermostat to pair...*”
10. “Success” message will appear: your EcoTouch is now paired to the EcoSource.
11. Back out of the screen by pressing **Exit**, then **Exit**, then **Exit** once again.

If fail, will show message, “**ERROR!** Failed to pair. No open EcoSource found.”

Typically the cause of the failure is that the EcoSource is not yet enabled for pairing.

Solution: Repeat the above steps, particularly Step 7.



See the Device Association Guide for detailed instructions on associating all devices.

EcoTouch Configuration Changes

EcoTouch Configuration Changes

Change Channel

1. On the EcoTouch, “three-finger tap” anywhere on the screen.
2. The System Status screen appears.
3. Press the **Config** button.
4. Enter the password C57A
5. Touch **Enter**.
6. **Touch Reconnect**
7. **Touch Search**
8. **When “Success” message appears, press Exit, press Exit on the next screen and Exit on the third screen.**

Unpair EcoTouch

1. On the EcoTouch, “three-finger tap” anywhere on the screen.
2. The System Status screen appears.
3. Touch the **Config** button.
4. Enter the password C57A
5. Touch **Enter**.
6. Touch **Unpair**.
7. Touch **Delete**.
8. *Are you sure you want to delete pairing with EcoSource?* Touch **Delete**
9. When the “No longer Paired” message appears, touch **Exit**, touch **Exit** on the next screen and **Exit** on the third screen.

Activate “Display Mode” Option

1. On the EcoTouch, “three-finger tap” anywhere on the screen.
2. The System Status screen appears.
3. Press the **Config** button.
4. Enter the password C57A
5. Touch **Enter**
6. **Touch Display/Config**
7. **Enable Demo Mode** field: touch the pencil icon to select “Y” or “N”
8. **Display Style** field: touch the pencil icon to select “Detailed” or “Minimal”
9. Touch **Exit**

FYI, touch the hamburger icon  to toggle between *Detailed* and *Minimal* display modes.

System Status Screen

(Displays Firmware Version, MAC, EPID, Channel, Address, LQI and Paired status.)

1. On the EcoTouch, “three-finger tap” anywhere on the screen.
2. The System Status screen appears.
3. Touch **Exit** when done.

EcoTouch Configuration Changes

Regular Maintenance

Under normal conditions, a correctly deployed EcoSmart series will require no maintenance.

Procedure: Visual Inspection

- Step 1** Verify that components have not been tampered with, destroyed or stolen.
- Step 2** Verify that the components are securely mounted on their respective surfaces.
- Step 3** Verify that the AC power is being supplied to the HVAC system.
- Step 4** Verify that the power/data wiring between the EcoSource and the EcoTouch are intact and connected.
- Step 5** Re-associate all sensors.

Procedure: Functional Inspection

- Step 1** Observe whether the HVAC system is operating (e.g. drive cycle) after entering the room.



In most cases, entering the room will have initiated an HVAC drive cycle after the Sensor detected occupancy. Possible exceptions:

- If the temperature in the room is within hysteresis of the HVAC setpoint, a drive cycle may not commence;
- A delay may have been programmed into the EcoSource thermostat, instructing the unit to wait for a particular duration before triggering a drive. (Although uncommon, this feature is sometimes requested by a property. In almost all cases, the delay is less than 3 minutes.)

- Step 2** If a drive cycle does not initiate within 5 minutes of entry, force a drive cycle by temporarily setting the thermostat to some arbitrary high or low temperature (ensure the HVAC mode is set correctly).



EcoSource thermostats default to *Occupied* status if communication with the Sensor(s) is lost for any reason. This permits the units to continue allowing the occupant to control the room temperature. However, in this state energy savings will be lost. If in doubt whether the sensors are associated, re-associate all Sensors.

Troubleshooting

Problem	Potential Cause	Potential Solution
HVAC unit does not operate.	Main electrical failure to the unit. Many units operate on 230 or 277VAC circuits, so although power is available to the 110VAC plugs in the room, the branch circuit supplying HVAC power may be interrupted.	Dispatch maintenance. Verify mains continuity to the unit.
	GFI within the HVAC has tripped. Some models of HVAC systems (often PTAC/PTHP units) contain integral GFI (Ground-Fault Interrupt) systems. Occasionally, often after a power outage, inrush current when power returns can cause GFIs to trip. Most times, this does not indicate issues with the unit.	Check and reset units' GFI systems.
	EcoSource has failed.	Replace the EcoSource with a known-good unit as a comparison-check. If the replacement unit functions properly, contact Telkonet and begin the RMA process. If the replacement unit does not function properly, consult a local HVAC technician to inspect your HVAC unit.
	Door contact is not connected.	Ensure that all door contacts are connected.
	Window or outside door is open.	Ensure that no monitored windows or patio doors are open.

Troubleshooting

Problem	Potential Cause	Potential Solution
Occupant returns to room and finds it too hot or too cold.	During an Unoccupied period, the EcoSmart system allows the temperature in the room to drift away from the occupants' setpoint. Telkonet's RecoveryTime technology is enabled to return the room to the occupants' setpoint within a time defined in advance by the property manager (this varies by property, but it usually between 8 and 20 minutes).	Advise the occupant to wait 8 – 20 minutes. (This is the typical range of defined recovery times requested by customers in most installations.)
"Sensor Down" message appears on thermostat.	One or more sensors have lost association to the thermostat.	Dispatch Maintenance to the room. Re-associate all sensors via procedures. Replace the batteries in all sensors within the room. Evaluate the wiring between each sensor and the thermostat.
Occupant reports HVAC shuts down while they sleep.	Sensor is not accurately detecting occupancy. This is typically seen in deployments where the bed placement within the room was changed after installation, such that the pillow area of the bed(s) is further than 10-15 feet from the sensor.	Assess the room, sensor placement, and bed location(s). Verify that the sensor(s) are deployed in accordance with the Recommended Best Practices. Corrective strategies may include: a. Moving the sensor b. Adding an additional sensor to accommodate the new room layout c. Changing the room layout d. Adjusting Sensor settings (contact Telkonet to discuss options) e. Adjusting night delay (contact Telkonet support for assistance)
Occupant reports one mode (heating/cooling) works but the other does not.	Heat pump jumper is reversed or changeover signal is backwards, or it may be that the heat/cool jumpers are reversed.	Correct jumper or changeover signal as necessary.

Troubleshooting

Problem	Potential Cause	Potential Solution
Room does not achieve setpoint within RecoveryTime.	The most common cause is that the EcoSmart system is designed to recover the temperature within a Comfort Zone. The Comfort Zone is programmable by Telkonet, and is chosen by management before installation.	Contact Telkonet Customer Support. Telkonet will research the deployment history, and determine whether a completed Settings Sheet was provided to us prior to thermostat shipment. Note that Professional Services fees may apply if a reported anomaly is later determined to have been caused by default settings when specific preferences were not communicated to Telkonet prior to device shipment.
	The thermostat may be programmed with settings not appropriate to the specific deployment scenario.	
	Often an HVAC unit is in need of servicing. For example, a unit with a failing compressor or under-charged refrigerant may not be able to efficiently return the room to the occupants' desired setpoint.	Ensure the PTAC unit is in good working order. Service and correct internal thermostat anomalies per PTAC manufacturer's recommended best practices.
	There may be a failed control circuit within the HVAC system	Ensure the PTAC unit is in good working order. Service and correct internal thermostat anomalies per PTAC manufacturer's recommended best practices.
	The setpoint cannot be achieved within the current environmental conditions. For example, on an extremely hot or humid day, the HVAC system may not be able to achieve a setpoint of 60°.	Ensure the PTAC unit is in good working order. Service and correct internal thermostat anomalies per PTAC manufacturer's recommended best practices.

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Appendix A

Appendix A

Proportional Valve Control

Applies only to the SS6000-VO model of thermostat



Figure 31-Before Connecting

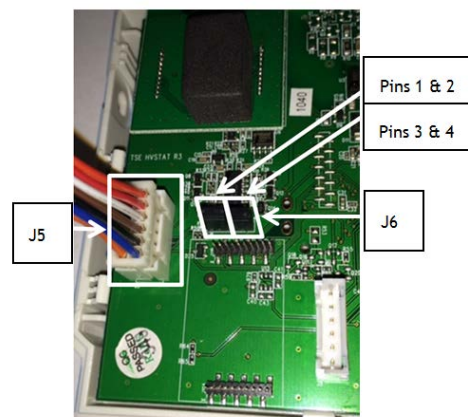


Figure 32-After Connecting

Connecting Pins

Controlling the Cooling Valve with a 0-10 Volt Signal

1. Using the J5 Molex connector, connect Pin 5 to the Valve 0-10v input line.
2. Connect pin 1 (GND) to the Common line on the valve.

Note: You must also jumper pin 1 to the 24v COMM if the valve is referencing 24v Common.

Controlling Heating Valve with a 0-10 Volt Signal

1. Using the J5 Molex connector, connect Pin 6 to the Valve 0-10v input line.
2. Connect pin 1 (GND) to the Common line on the valve.

Note: You must also jumper pin 1 to the 24v COMM if the valve is referencing 24v Common.

Controlling an ECM Fan Motor

(Firmware must be pre-setup to provide this output.)

- Using the J5 Molex connector, connect Pin 6 to the ECM Motor 0-10v input line.
- Connect pin 1 (GND) to the Common line on the ECM Motor control board.

Note: You must also connect the 24v COMM if the valve is referencing 24v Common.

Adding Jumpers

Place 2 jumpers side-by side on connector J6. (J6 is located below the radio board. See Figure 31.

- Place one jumper on pins 1 -> 2, as shown in Figure 32. Jumper 1->2 is for 0-10V; no jumper 4-20mA.
- Place the other jumper on pins 3 -> 4. Jumper 3->4 is for 0-10V; no Jumper 4-20mA.

Appendix A

Calibrate the Analog Output to 5.0V

Equipment Needed: Voltmeter

- Set voltmeter to DC Voltage.
- On J5, measure between Pin 1 (Orange) and Pin 5 (White).
- Change thermostat mode to OFF.
- Enter Advanced Command 35 01 and press ON/OFF.
- Enter Advanced Command 36 36 and press ON/OFF.
- This should cause your reading to go close to 5.0V.
- Change the value of 36 36 up or down a few values so it reads close to 5.0V. If you have to raise it more than 36 50 or lower than 36 25, then there is an issue. Contact engineering
- Enter Advanced Command 35 00
- Verify that in the OFF mode, output is approx. 0.0V.