

PRO[®] T731W(O)

Pro1 Technologies
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Hours of Operation: M-F 9AM - 6PM Eastern

Thermostat Application Guide

Description	
Gas or Oil Heat	Yes
Electric Furnace	Yes
Heat Pump (No Aux. or Emergency Heat)	Yes
Heat Pump (With Electric Aux.)	Yes
Heat Pump (With Gas Aux.)	No
Multi-Stage Systems	No
Heat Only Systems - Floor or Wall Furnace	Yes
Cool Only Systems	Yes
High and Low Fan Speed	Yes
Millivolt	No
Emergency Heat	No
Conventional Single Stage Furnace	Yes
Geothermal	Yes

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Power Type

Battery Power
Hardwire (Common Wire)
Hardwire (Common Wire) with Battery Backup

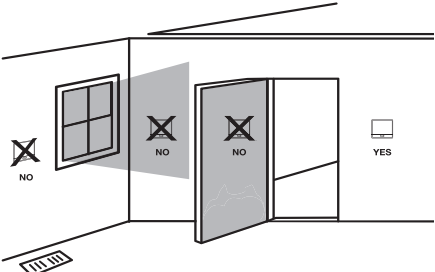
A trained, experienced technician must install this product.

Carefully read these instructions. You could damage this product or cause a hazardous condition if you fail to follow these instructions.

Una version en español de este manual se puede descargar en la pagina web de la compañía.

Wall Locations

The thermostat should be installed approximately 4 to 5 feet above the floor. Select an area with average temperature and good air circulation.



Installation Tip

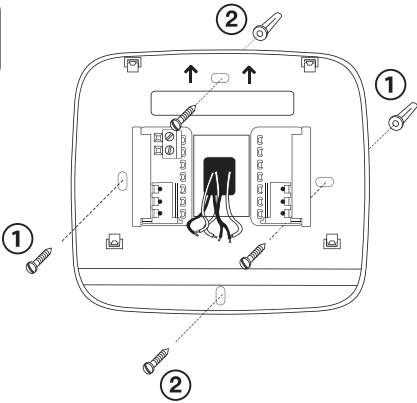
Pick an installation location that is easy for the user to access. The temperature of the location should be representative of the building.

Do not install thermostat in locations:

- Close to hot or cold air ducts
- That are in direct sunlight
- With an outside wall behind the thermostat
- In areas that do not require conditioning
- Where there are dead spots or drafts (in corners or behind doors)
- Where there might be concealed chimneys or pipes

Subbase Installation

- ① Horizontal Mount
- ② Vertical Mount



For vertical mount put one screw on the top and one screw on the bottom.
For horizontal mount put one screw on the left and one screw on the right.



Installation Tip: Electrical Hazard

Failure to disconnect the power before beginning to install this product can cause electrical shock or equipment damage.



Mercury Notice

All of our products are mercury free. However, if the product you are replacing contains mercury, dispose of it properly. Your local waste management authority can give you instructions on recycling and proper disposal.

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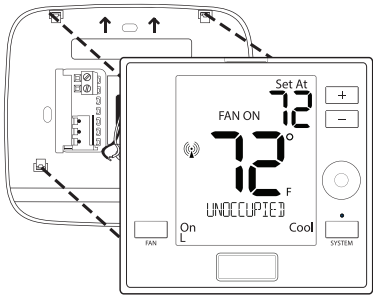
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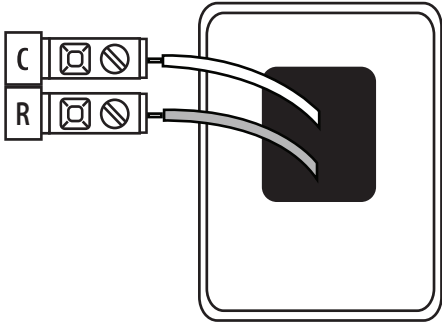
Installation Tips

Mount Thermostat

Align the 4 tabs on the subbase with corresponding slots on the back of the thermostat, then push gently until the thermostat snaps in place.



Battery Installation

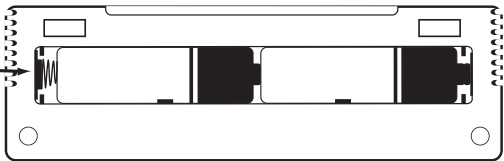


Battery installation is optional if thermostat is hardwired (R and C terminal connected to 24V power).

Important:

High quality alkaline batteries are recommended. Rechargeable batteries or low quality batteries do not guarantee a 1-year life span.

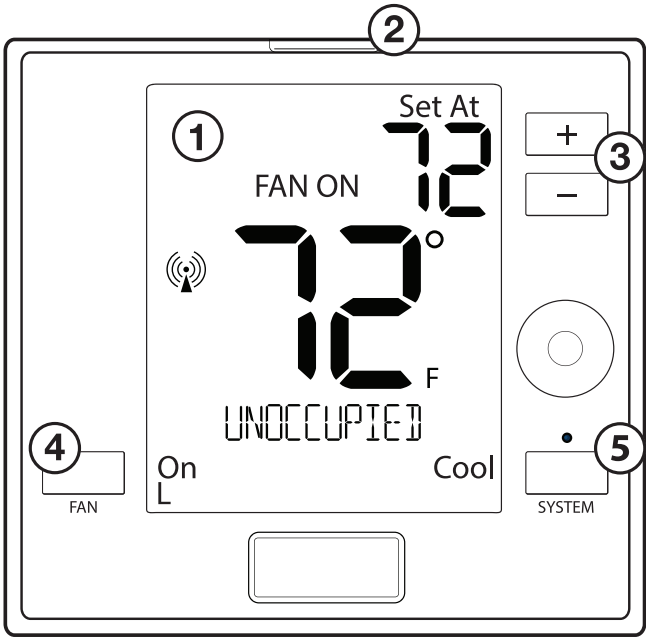
Insert 2 AA Alkaline batteries (included). High quality alkaline batteries are recommended.



Located on the back of thermostat.

Thermostat Quick Reference

Getting to know your thermostat



- ① LCD
- ② Glow in the Dark Light Button
- ③ Setpoint Buttons
- ④ Fan Button
- ⑤ System Button

The diagram shows a thermostat display with the following elements:
- Top left: Icons for Wi-Fi, COOL ON, HEAT ON, FAN ON, and STAGE 1+2.
- Top right: 'Set At' followed by a digital display showing '88'.
- Center: A large digital display showing '88'.
- Bottom left: 'On LHM AutoPrev'.
- Bottom right: 'OffHeat NextCool'.
- Bottom center: A row of 12 small icons representing different thermostat functions.
- Callout 1: Points to the large digital display.
- Callout 2: Points to a 'LOW' battery indicator.
- Callout 3: Points to the 'COOL ON', 'HEAT ON', and 'FAN ON' indicators.
- Callout 4: Points to the 'Set At' display.
- Callout 5: Points to the 'STAGE 1+2' indicator.

1 Indicates the current room temperature

2 Low Battery Indicator: Replace batteries when this indicator is shown.

3 System Operation Indicators: COOL ON, HEAT ON or FAN ON will display when the COOL, HEAT, or FAN is on.

4 Setpoint: Displays the user selectable setpoint temperature.

5 Stages: Indicates the stages of heat that are active.

Caution: Electrical Hazard

Failure to disconnect the power before beginning to install this product can cause electrical shock or equipment damage.

Warning:

All components of the control system and the thermostat installation must conform to Class II circuits per the NEC Code.

Installation Tip

Do not overtighten terminal block screws, as this can damage the terminal block. A damaged terminal block can keep the thermostat from fitting on the subbase correctly or cause system operation issues.

Max Torque = 6in-lbs.

Wiring

- If you are replacing a thermostat, make note of the terminal connections on the thermostat that is being replaced. In some cases the wiring connections will not be color coded. For example, the green wire may not be connected to the G terminal.
- Loosen the terminal block screws. Insert wires then retighten terminal block screws.
- Place nonflammable insulation into wall opening to prevent drafts.

Terminal Designations

	Heat Pump System 1 HEAT 1 COOL / 2 HEAT 1 COOL	Conventional System 1 HEAT 1 COOL / 2 HEAT 1 COOL
R	Transformer Power	Transformer Power
C	Transformer Common	Transformer Common
B	Changeover Valve Energized in HEAT	Energized in HEAT
O	Changeover Valve Energized in COOL	Energized in COOL
GL	Fan Relay, Low	Fan Relay, Low
GH	Fan Relay, High	Fan Relay, High
W	Second Stage of HEAT	Second Stage of HEAT
Y	First Stage of HEAT and COOL	First Stage of COOL

Important

The low battery indicator is displayed when the AA battery power is low. If the user fails to replace the battery within 21 days, the screen will only show the low battery indicator but maintain all functionality. If the user fails to replace the batteries after an additional 21 days (days 22-42 since first "low battery" display) the setpoints will change to 55°F (Heating) and 85°F (Cooling). If the user adjusts the setpoint away from either of these, it will hold for 4 hours then return to either 55°F or 85°F. After day 63 the batteries must be replaced immediately to avoid freezing or overheating because the thermostat will shut the unit off until the batteries are changed.

Wiring Note:

The base module is packaged with labeled thermostat wire. Wire appropriately into the PTAC board terminals.

Note:

The thermostat and Base Module come factory linked (communicating) out of the box. However, if the link is lost, use the process on page 14 to re-link the devices.

Caution: Electrical Hazard

Failure to disconnect the power before beginning to install this product can cause electrical shock or equipment damage.

Warning:

All components of the control system and the thermostat installation must conform to Class II circuits per the NEC Code.

Power supply

Jumper (not supplied) to connect GL and GH terminals.

Thermostat must be set to O and B to match the changeover valve, O is the cool changeover valve, B is heat changeover valve.

The Aux Heat Relay is energized as the second stage of heat.

Wiring Tips

C Terminal

The C (common wire) terminal does not have to be connected when the thermostat is powered by batteries.

Wire Specifications

Use shielded or non-shielded 18-22 gauge thermostat wire.

Note:

The base module may be mounted using adhesive tape, such as double-sided tape or hook and loop strips. The base module must be hardwired (C & R terminals connected to 24V power). Use secondary source of securement to prevent module from dropping into condenser drain pan.

Connecting to a PTAC:
When connecting the Base Module to a PTAC, refer to the PTAC manufacturer instructions to enable remote thermostat operation.

Note:

Most PTAC systems support two speed fan operation. In a single speed fan PTAC system or conventional single speed fan system, a jumper should be installed between GL and GH on the thermostat.

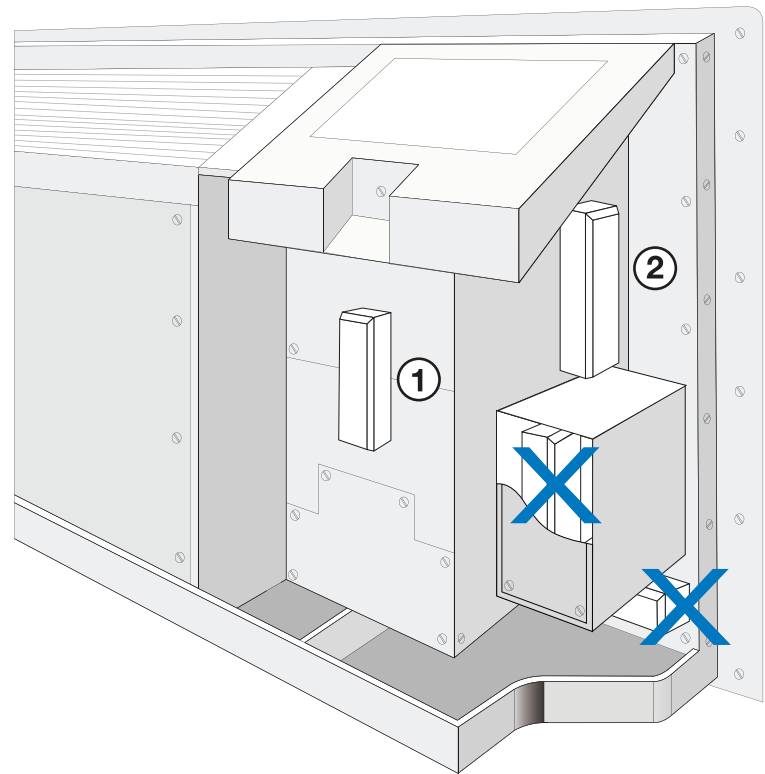
Typical 1H/1C System: 2 Speed Fan

The diagram shows a terminal block with terminals R, Y, W, C, GL, and GH. Wires connect these terminals to a compressor relay, heat relay, fan low relay, and fan high relay. A jumper is shown between GL and GH. The fan relays are connected to a 24V power source (L1, L2) and a common return (R).

Base Module - PTAC Installation

Range between the thermostat and the base module is up to 100 feet with no obstructions and up to 50 feet through standard building materials. To optimize the range try placing the base module with no metal between it and the thermostat.

The base module is designed to be mounted behind the front grille of a packaged terminal air conditioner (PTAC). Refer to the PTAC manufacturer’s manual for instruction to remove the front grille. Check clearance to ensure the fit of front grille after base module installation. See below for a few location recommendations.



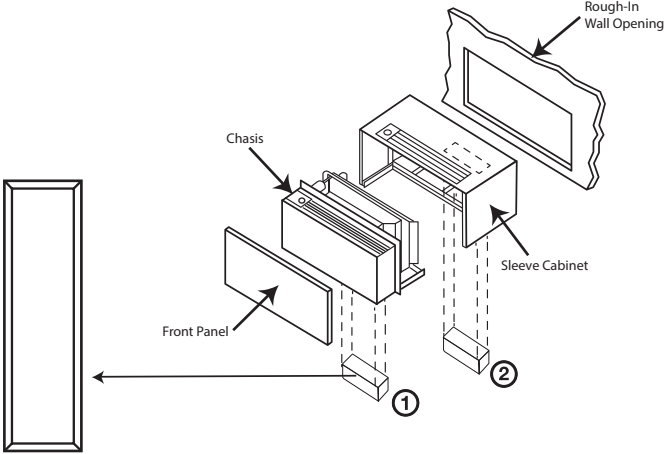
- 1 Front Mount:
Inside PTAC
Housing
- 2 Side Mount:
Inside PTAC
Housing

When Working With A Vertical Unit

1. Do not mount Module inside the cabinet of the unit, or in a metal enclosure.
 2. Mount on the outside of the unit to maximize wireless communication.
-

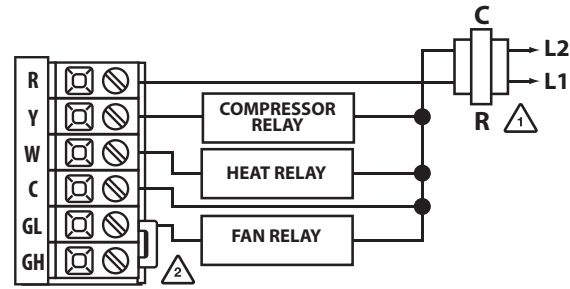
When Working With A Metal Sleeve Cabinet, Room Cabinet, or PTAC Cover

1. If cabinet has open bottom, mount the module just inside the cabinet as close to the open bottom as possible without placing it in danger of being bumped or touched by furnishings, vacuum, etc.
2. Another good module location would be on the underside of the top of the cabinet or cover. Directly behind the open Louver/Grill.

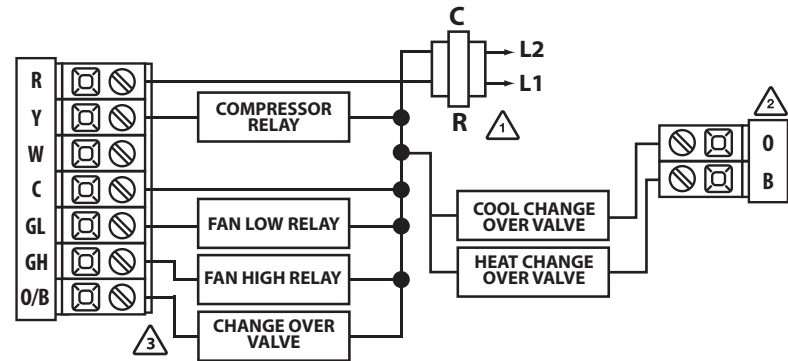


Wiring

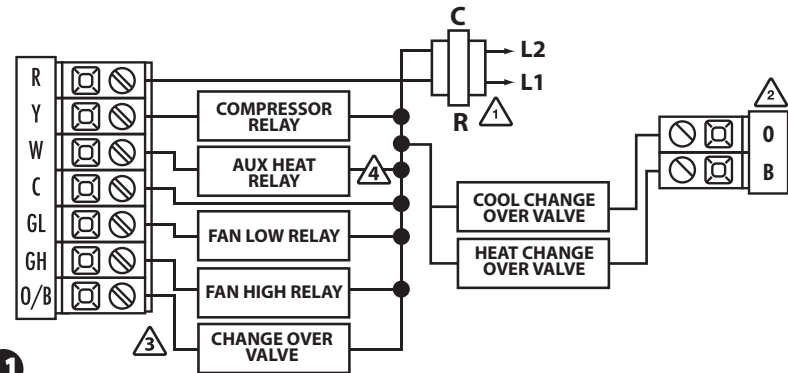
Typical 1H/1C System: 1 Speed Fan



Typical 1H/1C Heat Pump System: 2 Speed Fan



Typical 2H/1C Heat Pump System: 2 Speed Fan



Technician Setup

1. Set the thermostat system switch to **OFF**.
2. To enter Tech Setup Menu, press and hold **-** and **+** together for 3 seconds.
3. Use **-** or **+** to select desired setting for each option.
4. Tap **-** and **+** together to move next option.
5. To exit Tech Setup Menu, move system switch or wait 15 seconds.

Important Tech Setting Notes

1. Tech settings must be transferred to the basemodule.
2. The transfer happens automatically when you exit the tech menu.
3. The Screen will display “TEC SET OK” when the basemodule has received the new tech settings.

Tech Setup Steps	LCD Will Show	Adjustment Options	Default
Room Temperature Calibration	This feature allows the installer to change the calibration of the ambient room temperature display. For example, if the thermostat reads 70 degrees and you would like it to read 72 then select +2.	0	0°F
Cooling Swing	The swing setting, often called “cycle rate,” “differential” or “anticipation” is adjustable and dictates how frequently the system cycles on and off. For example: A swing setting of 0.8° will turn the cooling on at approximately 0.8° above the setpoint and turn the cooling off at approximately 0.8° below the setpoint.	0.8	0.8°
Heating Swing	The swing setting, often called “cycle rate,” “differential” or “anticipation” is adjustable and dictates how frequently the system cycles on and off. For example: A swing setting of 0.8° will turn the heating on at approximately 0.8° below the setpoint and turn the heating off at approximately 0.5° above the setpoint.	0.8	0.8°

Tech Setup Steps	LCD Will Show	Adjustment Options	Default
Fan Operation		EL = Electric for thermostat control GS = Gas for system control	Electric
Fan Speeds		1 = 1 Speed: On, Auto 2 = 2 Speed: Low (On L), High (On H), Auto 3 = 3 Speed: Low (On L), Med (On M), High (On H), Auto	2 Speed: Low High Auto
Medium Speed Fan Terminal Designation		0 or B	0
F or C		F = Fahrenheit C = Celsius	F
Display Light		OF = OFF configures the display light to come on when the light key or any button is pressed. LO = LOW configures the display light to stay on at a lower intensity until a button is	OF when battery powered / LOW when hardwired
Heat Pump		OF = OFF configures the display light to come on when the light key or any button is pressed. LO = LOW configures the display light to stay on at a lower intensity until a button is pressed and then it goes to the normal high intensity. HI = HIGH configures the display light to stay on at normal high intensity all the time.	OF when battery powered / LOW when hardwired

Establishing Communication between the thermostat & the base module

The Thermostat and Base module in this package are linked to form a network at our factory. Upon power up they will automatically begin communicating. If you wish to make any changes to the network such as adding or removing devices, please follow the instructions on this page.

How To Pair

On the Base module:

- Press the button next to the LED.
- The Basemodule will begin blinking purple for 2 minutes while it waits for a remote to join.
- Once a device joins, the LED will make 5 green blinks and return to normal operating mode.
- To add another device, repeat the process.

On the Thermostat:

- Hold the top light button for 3 seconds. The Backlight will flash 3 times. Enter the “PAIRING” tech menu and press the “+” button.
- The T731W/O will attempt to connect to a Basemodule within range
- Once paired, the LCD will display “PAIRED” when it joins with a Base module.

How To Unpair

On the Base Module:

- HOLD the button next to the LED for 5 seconds.
- The Basemodule LED will turn on for 5 seconds.
- All connected devices will be deleted.

On the Thermostat:

- Enter the “UNPAIRING” tech menu.
- Press the “+” button.
- The LCD will show “UNPAIRED”.
- The Thermostat will no longer be connected to a network.

Tech Setup Steps	LCD Will Show	Adjustment Options	Default
Change Over Valve Selection (Only displayed if Heat Pump is ON)		0 = Energized in cooling B = Energized in heating.	B
Compressor Short Cycle		ON = Turns 5 minute delay on OF(OFF) = Removes the delay	ON
Cycle Minimizer		ON OF(OFF)	OF
Heating Temperature Setpoint Limit		45.0 - 90.0° F 7.0 - 30.0° C	90°
Cooling Temperature Setpoint		45.0 - 90.0° F 7.0 - 30.0° C	45°
Enter Network		Press the “+” button to enter paring mode	N/A
Exit Network		Press the “+” button to exit the network	N/A
Network Status		Press the “+” button to scroll through the following network information: 1) signal strength (0-5) 2) Total Devices in your network 3) active devices in your network.	N/A

Base Module LED Information

The Basemodule’s LED is used to communicate information on the state of the wireless network.

- Green Blink at 3s: Normal operating mode. All devices are connected and healthy.
- Yellow Blink at 3s: Normal operating mode. One or more (but not all) remote devices are NOT reporting.
- Red Blink at 3s: Normal operating mode. ALL network devices are NOT reporting.
- White Blink at 3s: Unpaired mode. Basemodule is powered but is NOT paired to any remotes.
- Blue double blink: Transmission received from a remote.
- Purple double blink: Basemodule is in pairing mode waiting for a remote.
- Purple LED on for 5s: Basemodule has erased the entire network.
- Green 5 quick blinks: A remote has successfully been added to the basemodules network.



Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try 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 receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Technician Setup				Technician Setup					
Occupancy Models Only				Occupancy Models Only					
Tech Setup Steps		LCD Will Show	Adjustment Options	Default	Tech Setup Steps		LCD Will Show	Adjustment Options	Default
Local Occupancy Sensor	When using the Occupancy model the installer can choose to utilize the occupancy sensor to set back the room temperature while it is not being occupied.	OF OCC SENSOR	ON OF(OFF)	OF	Unoccupied Heat Setting (Only displayed if Local Occupancy Sensor is ON)	Set the heat temperature and fan operation that you would like the system to be while the space is unoccupied.	62 UNOCC COOL	Full temperature ange defined by setpoint limits. First adjust the temperature using the + and – buttons. Use the Fan button to change the fan operation.	62°
Duration of Occupancy (Only displayed if Local Occupancy Sensor is ON)	When the occupancy sensor is turned on you have the ability to set how long the thermostat will go into occupancy mode everytime a person is sensed.	8 OCC LENGTH	30 = 30 minutes, 1 = 1 hour, 2 = 2 hours, 3 = 3 hours, 4 = 4 hours, 5 = 5 hours, 6 = 6 hours, 7 = 7 hours, 8 = 8 hours, 9 = 9 hours, 10 = 10 hours, 11 = 11 hours, and 12 = 12 hours.	8	Occupancy Sensitivity Setting (Only displayed if Local Occupancy	Set the level of sensitivity of the occupancy sensor. Lowering the sensitivity will cause the sensor to respond only to larger movements.		High Sensitivity: This is the most sensitive setting and will detect very slight motions. This is the recommended setting because it will work well for nearly all applications. Will detect any movement.	
Occupied Cool Setting (Only displayed if Local Occupancy Sensor is ON)	Set the cooling temperature and fan operation that you would like the system to be while the space is being occupied.	75 OCC COOL	Full temperature ange defined by setpoint limits. First adjust the temperature using the + and – buttons. Use the Fan button to change the fan operation.	78°			Medium Sensitivity: This is the medium sensitive setting and can be used without pets setting it off.	HI	
Occupied Heat Setting (Only displayed if Local Occupancy Sensor is ON)	Set the heating temperature and fan operation that you would like the system to be while the space is being occupied.	70 OCC HEAT	Full temperature ange defined by setpoint limits. First adjust the temperature using the + and – buttons. Use the Fan button to change the fan operation.	70°			Low Sensitivity: This is the least sensitive setting and can be used in areas of major or large motions. This will not be set off by pets, small children, or people more than 20' from the sensor location.		
Unoccupied Cool Setting (Only displayed if Local Occupancy Sensor is ON)	Set the cool temperature and fan operation that you would like the system to be while the space is unoccupied.	83 UNOCC HEAT	Full temperature ange defined by setpoint limits. First adjust the temperature using the + and – buttons. Use the Fan button to change the fan operation. normal high intensity all the time.	83°					

Network Specifications

Specifications

Wireless Network Specifications

- The thermostat will attempt to pair with the first Basemodule it “hears”. Do not attempt to create more than one “pair” at the same time in the same place.
- To ensure paring success, place the T731W/O within a few feet of the Base module while pairing. Once paired, the signal strength tech menu can be used to ensure a robust wireless connection.
- Placing either device in or around large metal objects can severely degrade the wireless range.
- The wireless network will automatically recover in the event of a power loss or temporary signal loss.

Network Capabilities

- A single basemodule can support up to 7 remotes.
- If more than one Tthermostat is connected to a base module, the system will control to the last interaction
- Thermostat units will require up to 60 seconds to reflect changes elsewhere in the network.
- A base module paired with another base module will work as a “repeater”. It will match the relay state of the main base module.



Note:

Changes or modifications not expressly approved by the manufacturer could void the user’s authority to operate the equipment.

Specifications

Thermostat

The display range of temperature ... 41°F to 95°F (5°C to 35°C)
The control range of temperature..... 44°F to 90°F (7°C to 32°C)
Load rating.....1 amp per terminal, 1.5 amp maximum all terminals combined
Swing (cycle rate or differential) Heating is adjustable from 0.2° to 2.0°
Cooling is adjustable from 0.2° to 2.0°
Power source 18 to 30 VAC, NEC Class II, 50/60 Hz for hardwire
Battery power from 2 AA Alkaline batteries
Operating ambient 32°F to +105°F (0°C to +41°C)
Operating humidity 90% non-condensing maximum
Dimensions of thermostat 4.7”W x 4.4”H x 1.1”D
Frequency 916 MHz

Base Module

Load rating 1 amp per terminal, 1.5 amp maximum all terminals combined.
Power source 18 to 30 VAC, NEC Class II, 50/60 Hz
Operating ambient 32°F to +150°F (0°C to +65°C)
Operating humidity 90% non-condensing maximum