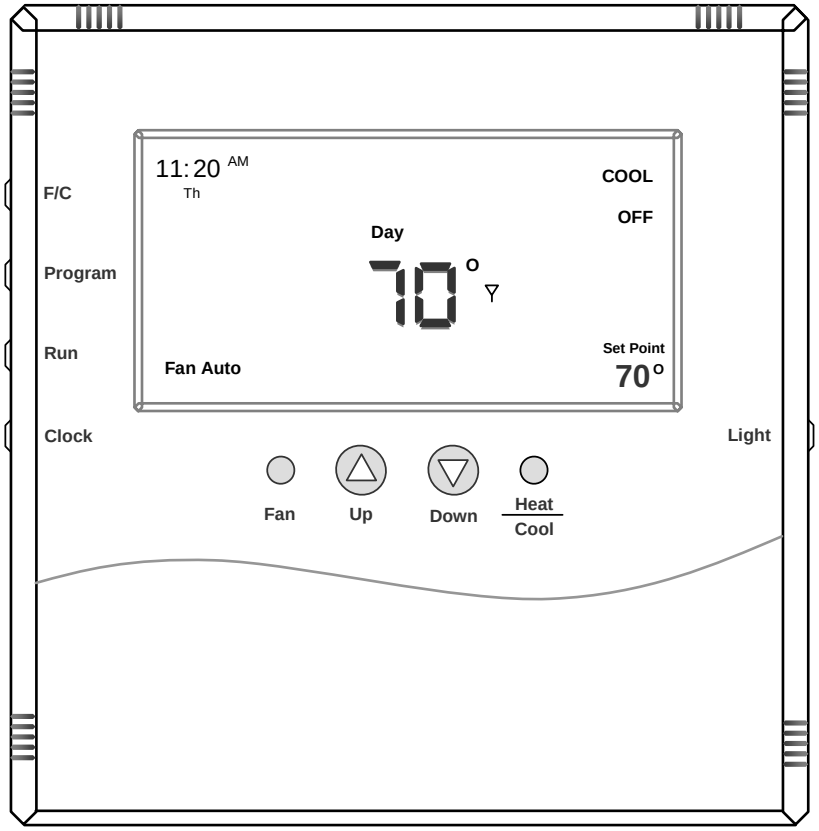
Pub No. 12401-051707

T9000 Wireless Thermostat
User Setup Guide



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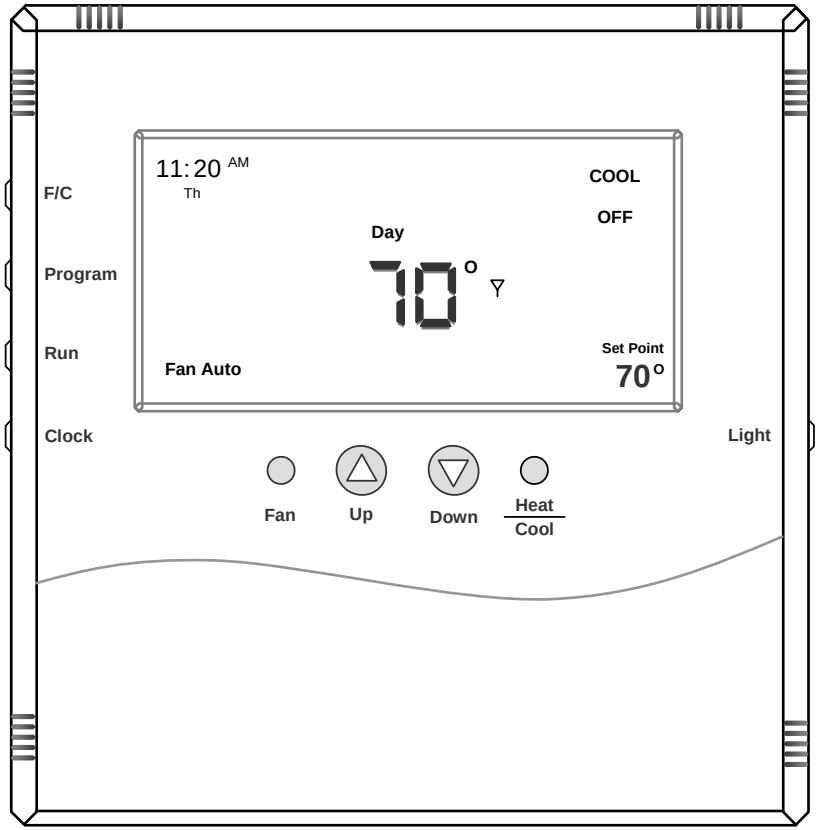


Figure 1 — T9000 Front View

INTRODUCTION

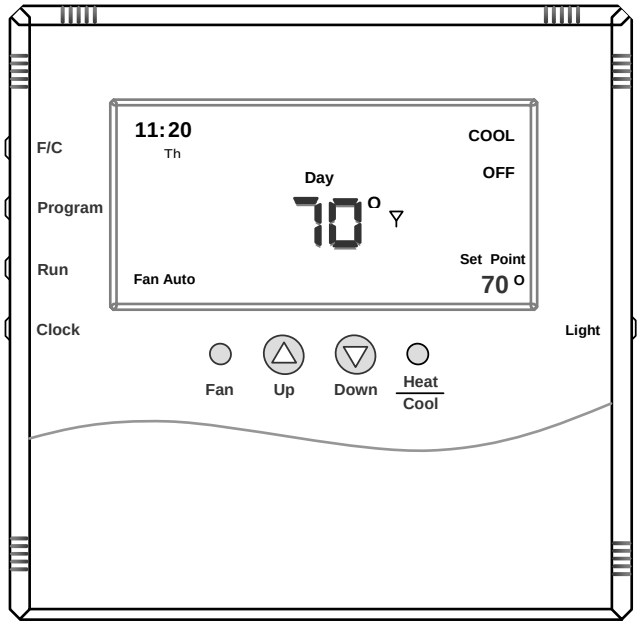
The T9000 Wireless Temperature Control is a two-part wireless thermostat system designed to provide precision temperature control without the installation labor and expense of wiring. Powered by AA batteries, the thermostat can operate continuously for approximately 18 months, and can be mounted in any suitable location that will provide good temperature control. A large LCD display (Figure 1) provides the user with current room temperature, set point temperature, time, program interval, and other system status information. In hotel applications, programming, clock set up buttons and associated display information are typically not displayed. The second part of the T9000 system is called a Remote Control Node or "RCN". An RCN interfaces with the HVAC equipment, and communicates with its thermostat using unlicensed 900 MHz, radio frequency energy. At the time of installation, the T9000 thermostat is linked to one or more RCN controls. The thermostat and RCN that have been linked will not interfere with, or be affected by any other thermostat or RCN in adjacent rooms, apartments, or neighboring homes.

BATTERIES

Installing / Changing

A low battery icon [- +] will light on the thermostat display when the batteries are within approximately one week of being exhausted. The T9000 is designed to use standard AA size 1.5 volt alkaline batteries. If the batteries become completely depleted, the heating/cooling system will go to the" OFF" state.

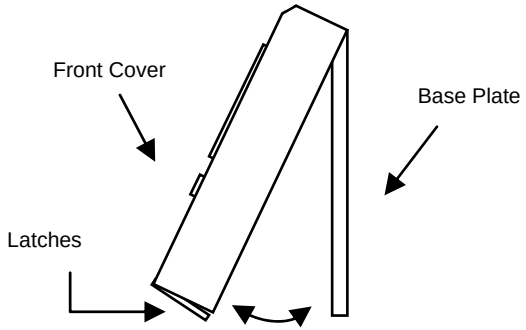
Figure 1 — T9000 Front View



Replacing Batteries

To open the thermostat, use both hands, press the two push-tabs on the bottom of the thermostat housing with your thumbs while pulling the front of the thermostat away from the base - Figure 2.

Figure 2 — Opening Thermostat



The T9000 operates with either 2 or 4 AA batteries. Four (4) batteries double the time between battery changes (the average user can expect 1 to 1.5 years of battery life). Batteries are paired, one set on top of the other (see Figure 3).

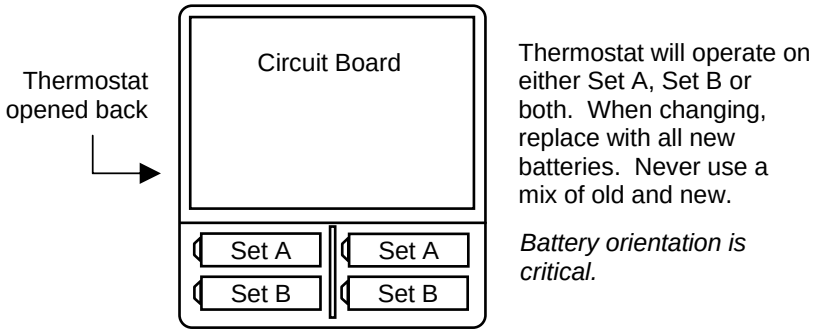


Figure 3 — Battery Location

Note: *Do not mix old and new batteries. When batteries are changed, replace them all at the same time.*

Programmed data for heating, cooling and time of day will be lost when all, batteries are removed or depleted and will have to be re-entered along with resetting the clock. To avoid this, batteries can be replaced one set at a time before they are depleted. However, after the first set is replaced, *immediately replace the second set with new batteries*.

MOUNTING

Find a suitable location for mounting your thermostat, preferably an interior wall, centrally located within the conditioned space at about 5' above the floor. Try not to locate the thermostat in a place where it could be exposed to heat such as warm air vents or in a place where it could be exposed to direct sunlight.

Wall-Mount

The T9000 back mounting plate provides six (6) mounting holes. The upper and lower holes on the vertical centerline will match up with screw positions of a standard electrical switch box or drywall mounting ring.

Step 1

Remove the back plate from the thermostat housing, (Figure 2) and use it to mark locations for mounting holes. While operation of

the thermostat is not affected by orientation, we recommend using a level across the top or side of the base plate to ensure a professional installed appearance.

Step 2

Drill 3/8" holes and insert drywall fasteners (#6 screws recommended) and fasten the back plate to the wall.

Back Stand

Located on the back of the housing is a built-in hinged stand support. This feature permits the thermostat to stand on a flat surface such as a table or shelf, in the event that permanent mounting to a wall is not desired.

BUTTONS

A four button cluster is located on the front of the T9000.

Figure 4 — Front Button Cluster

These buttons are used in adjusting fan operation, changing the set point temperature up or down and changing the operating mode of the thermostat. (Figure 13 provides definition of all button and display items.) Figure 5 shows the display items that are changed by these four buttons in normal operation.

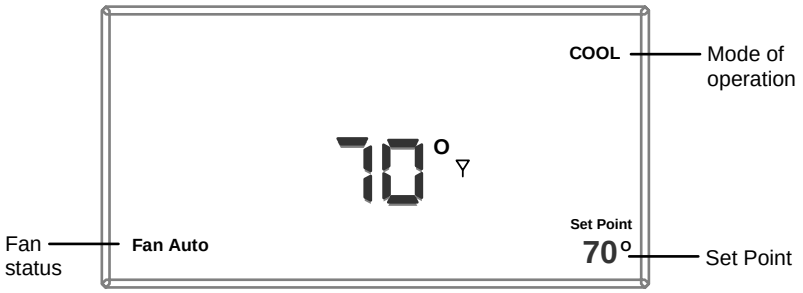


Figure 5 — General Operation Display

Note that the UP, DOWN and HEAT/COOL buttons are also used in setting the clock, programming the thermostat and linking to nodes — covered later in this manual.

Four buttons located on the left side of the thermostat (Figure 1) control display of temperature in either Fahrenheit or Celsius, programming, clock setup and control of whether the thermostat is under manual or program control.

- F / C - Toggles Fahrenheit Celsius display
- Program set up button
- Run – Sets program or manual mode of operation
- Clock set up button

BACKLIGHT

A single button on the right side of the thermostat activates the display backlight. When pressed, the backlight will illuminate the display briefly and turn off. If other buttons are pressed immediately after the backlight button, the display will stay

illuminated until a few seconds after all button activity has ended. Backlighting takes significant energy from the batteries and should be used sparingly. Frequent use of the backlight function will noticeably reduce battery life.

SETTING THE CLOCK

In all set up modes the T9000 will blink the display item you are about to change. The UP and DOWN buttons change settings, the HEAT/COOL button is used to move to the next item.

To set the clock, you will use the buttons marked CLOCK, UP, DOWN, and HEAT/COOL.

Step 1

Press the CLOCK Button. The hour digits will blink. Press the UP or DOWN button to change the hour. Note that AM / PM will change as you roll the hour past 12. Be sure to set the hour properly for AM or PM. Press the HEAT/COOL button to keep the hour you've just set and to move to minutes.

Step 2

The Minute digits will now be blinking. Press the UP or DOWN button to change to the desired minute. When the correct minute is flashing press HEAT/COOL.

Step 3

One of the seven day icons (Mo, Tu, We, Th, Fr, Sa, Su) will now blink, press UP or DOWN until the correct day icon is displayed and press HEAT/COOL.

Step 4

Press the CLOCK button to keep all clock changes you've made and resume normal operation.

THERMOSTAT PROGRAMMING

The T9000 provides four program periods: Morning, Day, Evening, and Night. The time and temperature can be set for each period. Upon initial power up the T9000 loads time and temperature program default parameters for weekday and weekend days.

The default program parameters conform to Energy Star guidelines and are a good point from which to start. Default settings are:

WEEKDAY DEFAULT PROGRAM TIMES AND TEMPERATURES			
Period	**Time**	**Heat**	**Cool**
MORNING	6:00 AM	70°	75°
DAY	8:00 AM	62°	83°
EVENING	6:00 PM	70°	75°
NIGHT	10:00 PM	62°	78°

WEEKEND DEFAULT PROGRAM TIMES AND TEMPERATURES			
Period	**Time**	**Heat**	**Cool**
MORNING	8:00 AM	70°	75°
DAY	10:00 AM	62°	83°
EVENING	6:00 PM	70°	75°
NIGHT	11:00 PM	62°	78°

Separate heating and cooling programs can be entered. The mode of the thermostat is displayed in the upper right corner of the LCD screen. Figure 1 for instance shows a thermostat in COOL mode. The mode the thermostat is in when the PROGRAM button is pressed is the mode that will be controlled by that program. If in the COOL mode as shown in Figure 1, the program entered will be stored as the program for cooling.

To program the thermostat, you will use the PROGRAM, HEAT/COOL, UP, and DOWN buttons.

Step 1

Press the PROGRAM button to put the thermostat into the programming mode. The display will blink all of the day of the week icons. Pressing the UP or DOWN button will toggle between (weekday) icons and the (weekend) icons. Ensure the display is blinking the days you want to program. Press HEAT/COOL.

Step 2

Next the Morning period will blink. Use the UP or DOWN button to toggle through Morning, Day, Evening, or Night, stopping at the period you want to program. Press HEAT/COOL.

Step 3

Next, the hour of the day will blink. This is the starting hour of the period you have selected. Use the UP or DOWN button to change the selected hour start time. Press HEAT/COOL.

Step 4

The minute of the day will blink next. This is the starting minute in the hour. Use the UP or DOWN button to change the minute digits to the desired setting. (Note that minutes change in five-minute increments.) Press HEAT/COOL.

Step 5

The desired set point will now be blinking. This is the temperature you want the thermostat to go to at the time of day you have selected. Press the UP or DOWN button to change the set point temperature to what you want. Press HEAT/COOL.

This completes the programming of the first period of the day.

Step 6

If you started with the Morning time period, the next period, Day, will now be blinking. Follow steps two, three, four, and five for each period you wish to program.

NAVIGATING

You can quickly step through to a specific item you want to change by pressing the HEAT/COOL button until what you want to change is flashing. When the item you want to change is flashing, use the UP or DOWN button to adjust.

EXITING PROGRAM MODE

Pressing the PROGRAM button at anytime will exit out of the programming mode, save your changes to memory and return you to normal thermostat operation.

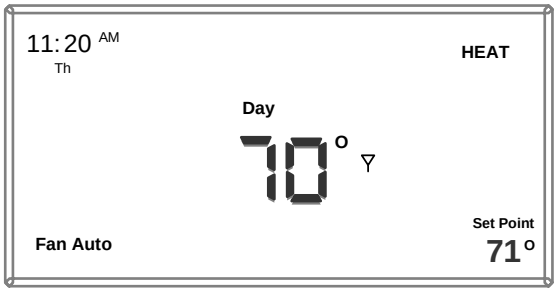


Figure 6 – Program Mode Display

RUN BUTTON – Program / Manual Operation

The RUN button toggles the thermostat between manual operating mode and program operating mode. When in the program mode your thermostat responds to the times and temperatures programmed.

Figure 6 shows a thermostat running in program mode. One of the four periods, in this case “Day”, is displayed, letting you know which period of the day the program is in. When in manual mode as shown in Figure 7, the period of the day is not displayed. Instead, the word “Hold” will be displayed above the Set Point temperature, indicating the thermostat is holding that temperature.

In manual mode you can adjust to the desired temperature using the UP and DOWN buttons, and the thermostat will maintain that temperature until you change it again.

Figure 7 – Manual Mode Display

CHANGING TEMPERTATURE WHILE RUNNING A PROGRAM

You can always change the temperature up or down while a program is running. However, when the program moves to the next period, the program set point temperature for that period will take effect. For instance, assume the current program period is Evening, with a programmed temperature of 70°, and the next period, Night, is programmed for 65°, scheduled to start at 11:00 PM. If during the Evening time period you desired the space to be warmer, you could press the UP button to raise the temperature set point. The thermostat will hold that temperature until the next program period, at which point the temperature will adjust to the programmed temperature set point for that period. In this case the Night period is set for 11:00 PM and 65°.

INSTALLING AND REMOVING NODES

A T9000 thermostat and Remote Control Node will not operate as a system until they are linked together through the installation process. The linking process binds one or more control nodes to a thermostat so that they will communicate with each other as a control system. Up to eight nodes can be linked to a single thermostat. Until linked, a control node will not operate. Once linked, a control node will only respond to its specific thermostat. The thermostat and RCN that have been linked will not interfere with or be affected by any other thermostat or RCN in adjacent rooms, apartments, or neighboring homes. Linking information is stored in non-volatile memory — It is not necessary to re-link the thermostat and RCN if the thermostat batteries are removed or after a power outage.

Installing Nodes

If multiple installation teams are installing and linking thermostats at the same time, coordinate the activity to avoid the possibility of installers simultaneously attempting to perform the linking process. Because this is an RF system, installers in nearby rooms/areas where it is possible RF overlap could exist run the risk of interfering with each other. Installation and linking activity going on around a system already installed will not interfere with it.

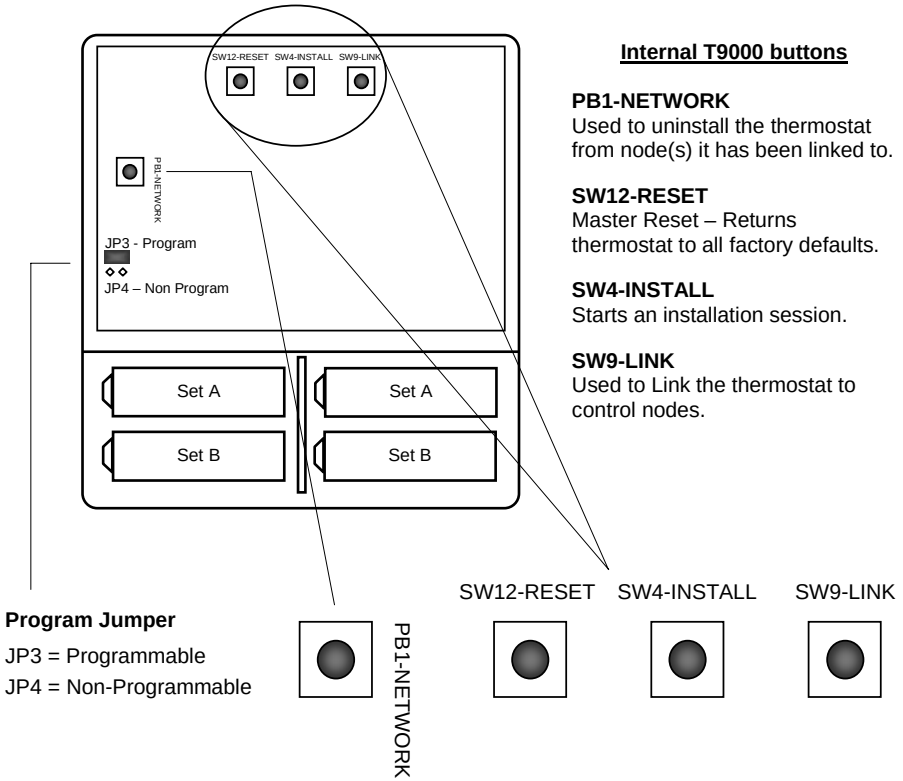
Refer to Figure 8 for inside thermostat button and jumper locations and functions.

Step 1

Press the SW4-INSTALL button inside the thermostat. The display will change to the Install Session screen shown in Figure 9, with the ‘Install’ Icon blinking.

The display always blinks the item that is active and can be changed.

Figure 8 – Internal Buttons



Internal T9000 buttons

PB1-NETWORK
Used to uninstall the thermostat from node(s) it has been linked to.

SW12-RESET
Master Reset – Returns thermostat to all factory defaults.

SW4-INSTALL
Starts an installation session.

SW9-LINK
Used to Link the thermostat to control nodes.

Step 2

The UP button on the front of the thermostat is used to toggle between the following two choices:

Install — Install a Node
Remove — Uninstall ALL Nodes

(The Remove option will be discussed later.)

Press HEAT/COOL to select Install.

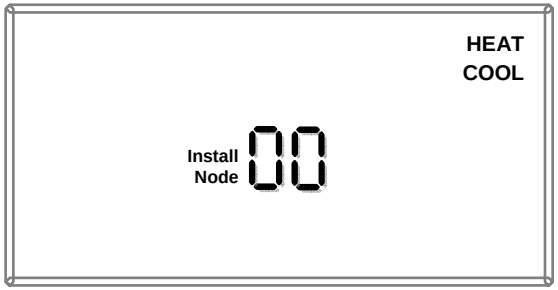


Figure 9 – Install Setup Display

Step 3

The node number digits will now flash. Use the UP button to set the node number you wish to install 0-7. If this is the first node or only node to be installed to this thermostat leave the node number at zero.

Press the HEAT/COOL button to select the node number.

Step 4

After selecting the node number, the HEAT and/or COOL icon will flash in the upper right hand corner of the display as shown in Figure 9.

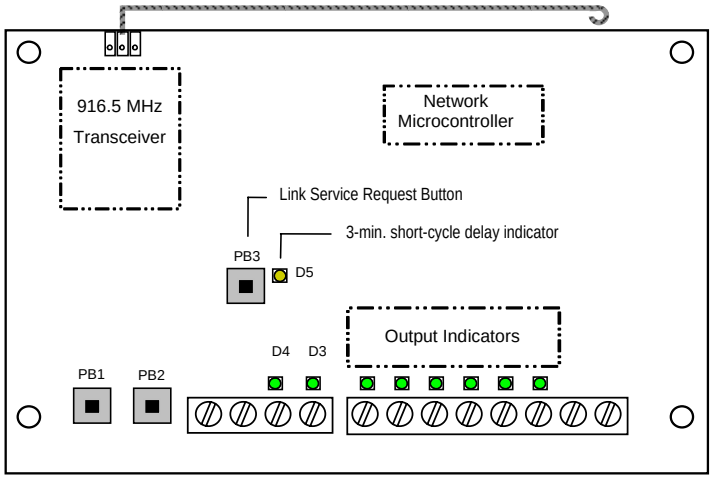
Press the HEAT/COOL button.

At this point all selections have been made and nothing on the display should be blinking. You are now ready to install a node.

Step 5

Press the SW9-LINK button on the back of the thermostat printed circuit board and within 5-seconds activate a Link Service Request on the control node you are installing by press PB3 (Figure 10).

Figure 10 – PTAC Wireless Control Node



When the SW9-LINK button is pressed, the thermostat will display a “Please Wait” message (see Figure 11) in the bottom right corner of the LCD while it searches for a node. You have several seconds to initiate a Link Service Request at the control node. Often it is easiest to have the thermostat in your hand while you are near by the node. The thermostat will link with the first node it hears that initiates a Link Service Request. It is for this reason that multiple installations must be coordinated. (See note in Installing Nodes section.) Once the thermostat finds a node, linking information is exchanged, the “Please Wait” message is extinguished and a “Good” message will appear as shown in Figure 11.

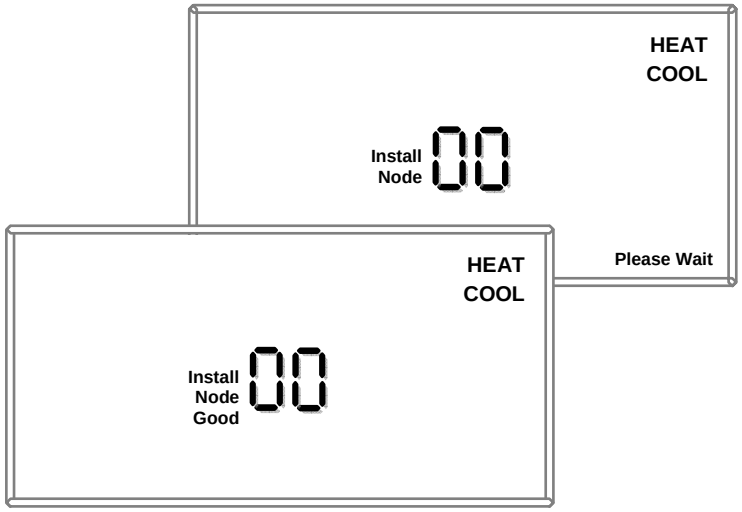


Figure 11 – Install - Link Display

If another node is to be installed to this thermostat, press the HEAT/COOL button again. The ‘Install’ icon will flash. As was done previously press the HEAT/COOL button (Step Two).
The node number will begin blinking, increment the number by one using the UP button and continue with the remaining steps.

When all nodes are installed press the SW4-INSTALL button to close the installation session and return to normal thermostat operation.

If for any reason there was a problem encountered during the final installation and linking step, a “Bad” message will be displayed. If this happens, repeat the ‘Installing Nodes’ process from the beginning. If the problem persists, perform a ‘Thermostat Installation Reset’ (covered later) and repeat the ‘Installing Nodes’ process.

Installing Multiple Nodes to a Thermostat

Multiple nodes are typically installed to a thermostat by linking each as a different number 0 – 7. If a node is not sending a signal to the thermostat for any reason such as loss of power, it will turn off the antenna symbol indicating a break in communication. The thermostat will attempt to find the missing node(s) by sending messages more often, increasing battery power drain. If in your application a node may be removed or powered down at times, consider linking all the nodes as the same node number, node 00 for instances. As long as the thermostat hears back from at least one node, it will consider the communication to be good. (See Frequently Asked Questions.)

Uninstalling Nodes

The procedure to remove will uninstall all nodes at once.

Step 1

Press the SW4-INSTALL button inside the thermostat. The Install Icon will flash. Press the UP button, to select ‘Remove’ and press HEAT/COOL to select. The HEAT and/or COOL icons will be displayed and all display items will be on steady; nothing will be flashing.

Step 2

Press the SW9-LINK button on the back of the thermostat printed circuit board. Within 5-seconds activate a Link Service Request on the control node. When the SW9-LINK button is pressed the thermostat will display the “Please Wait” message (see Figure 11) in the bottom right corner of the LCD while it searches for nodes. Once the thermostat finds its installed node(s), linking information is removed from the nodes and the thermostat, “Please Wait” message will be extinguished and a “Good” message will appear (Figure 11).

Thermostat Installation Reset

In the event there is difficulty installing a node, perform the following:

Step 1

Press the SW4-INSTALL button inside the thermostat. The Install Icon will flash. *You only need to begin the installation session to perform this reset.*

Step 2

Press and hold the PB1-NETWORK button (see Figure 8) on the inside of the thermostat board for approximately two seconds.

No response is displayed while in the Install Session screen, however, all previous installation records will be wiped from thermostat memory. You can continue from this point with the installation procedure. PB1-NETWORK will only reset the thermostat installation database when the thermostat is the Installation Session screen (SW4-INSTALL button has been pressed). Otherwise, the PB1-NETWORK button will have no effect.

Note:

A thermostat that does not have a node linked to it will display "Install Node" when in normal operation mode as indication of this (Figure 12). Once a node is linked to the thermostat, this message will no longer be displayed.

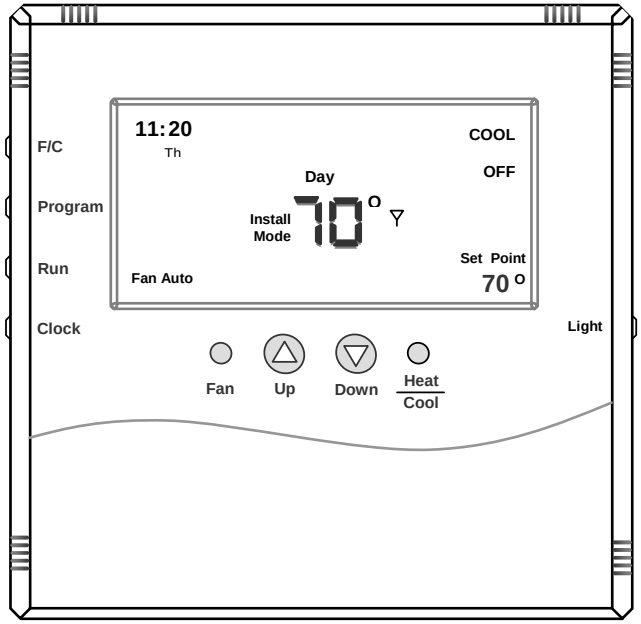


Figure 12 – unlinked Display

FREQUENTLY ASKED QUESTIONS

“Where should I locate my thermostat?”

For best results, the thermostat should be located approximately five feet above the floor on an inside wall in an area with good air circulation. Avoid drafts from air ducts and windows and heat from sun light, lighting fixtures, appliances, fireplaces, etc.

“What does the antenna symbol on the display mean?”

The T9000 thermostat displays the antenna symbol as indication that it is communicating with its Remote Control Node (RCN). If communication is not established, the antenna symbol will go out.

“What do I do if the antenna symbol is no longer displayed?”

Ensure the RCN has power. Make sure the thermostat and RCN are in fact linked. Force the thermostat to talk to its RCN(s) by pushing the FAN button. If communication is successful the antenna icon will turn back on. Coincidental RF interference could cause a temporary loss of communication. In virtually all such cases, the interference is temporary.

“Can I run multiple heating or cooling loads such as electric baseboard heating and a window air conditioner with one T9000 thermostat?”

Yes. In fact one T9000 thermostat can control up to eight (8) RCNs with each being given different node numbers.

“Why would I install multiple nodes as the same number?”

If all nodes are installed as the same number and the thermostat hears from at least one, it will consider the communication good. A hotel meeting room with multiple Packaged Terminal Air Conditioner (PTAC) units is an example of when you may want to install multiple control nodes to a single thermostat using the same node number. A meeting room typically should be treated as a single temperature zone; thereby ideally it should be controlled by a single thermostat. Meeting room seating is often arranged in different configurations to suite the event taking place. At times, seating may require a PTAC to be disconnected from power to prevent it from blowing directly on people seated close by. The thermostat in this case will not continuously look for a missing node if that one unit is powered off.

“**When my a/c turns off, I can’t immediately make it run again?”**

This is normal. What you are experiencing is called an anti short-cycle delay. Because of high pressure in the air conditioning compressor system, it’s not a good idea to start your air conditioner immediately after it has just shut down. The T9000 prevents this from happening by imposing a 3-minute delay.

“I just installed the thermostat and the antenna symbol comes and goes. What should I do?”

A poor RF signal between the thermostat and one or more RCN’s is the cause. The further away the thermostat and RCN are from each other, the weaker the signal becomes. Distance and also building material, particularly metal may block signals. Changing the position of the thermostat may help.

Note: *Always seek competent professional electrical and HVAC contractor assistance when working with your heating and cooling system and the electrical wiring in your home or other property. For safety and warranty reasons, always consult with your HVAC contractor and the original equipment manufacturer before making changes to the equipment.*

“The display on my thermostat is blank. What happened?”

A blank display indicates your batteries are depleted. When the Low Battery icon comes on there is approximately one week of battery life remaining. (See BATTERIES - Installing/Changing section of this guide for information on how to change the batteries.) We recommend that when you change batteries, always use batteries that you know are fresh. Use four (4) new high quality AA batteries. If you are using the T9000 to control a heating system, we recommend as a general practice putting fresh batteries in at the start of the heating season.

“If I am away for an extended time such as vacation, how do I set the thermostat so my system does not run excessively?”

You have a couple of choices. The first is to press the HEAT/COOL button on the thermostat until the display reads “OFF." *(Particularly during the heating season, we do not recommend going to the “OFF” mode.)* The second option is to put your thermostat in manual mode by pressing the RUN button. You know that you are in the manual mode because none of the period icons, Morning, Day, Evening, or Night will be displayed. The ‘Hold” icon located above the Set Point temperature will be displayed (Refer to Figure 7). Next, adjust the set point temperature to minimize system operation. For example, you could adjust to a set point of 85º in cooling or 65º in heating, staying mindful of what your temperature selection could affect such as plants and animals that stay in your home while you are away. During the cooling season, consider humidity as well as indoor temperature. When your air conditioner runs it not only cools the air, it also removes moisture, lowering humidity. High humidity can encourage mold growth.

“Can I use another T9000 thermostat without interference?”

Yes. A T9000 thermostat and its RCN(s) will talk between themselves, but will never respond to or control another thermostat in adjacent rooms, apartments, or neighboring homes.

Figure 13 — T9000 Overview