# Operation Guide CT50

Radio((⸱))Thermostat

Radio Thermostat Company of America

To turn your CT50 ON, press the MODE button on the right side. This cycles the CT50 through HEAT, COOL, AUTO and OFF modes.

The CT50 programmable communicating thermostat operates via a high-quality, easy-to-use touch screen. To program or adjust your CT50, simply touch your finger firmly to the screen. The screen will automatically light up and you will hear a "beep." The screen will respond differently to different types of touches, so you may want to experiment by touching it different ways, finger, fingernail, etc. Do not use a sharp or metallic device; it will scratch the screen.
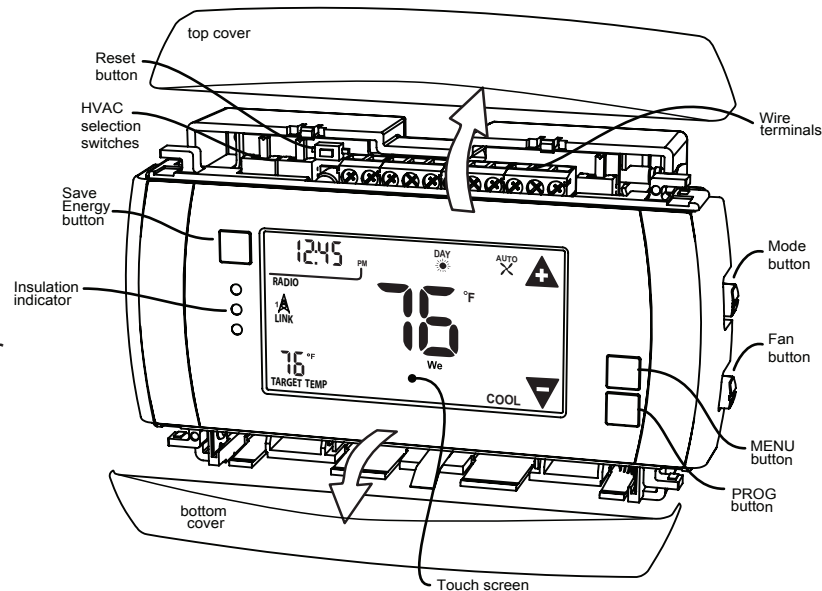
Statement of use: 100% Compatible with all popular residential HVAC systems; 24VAC single, two stage conventional heating systems (gas/oil/electric), heat pumps, single stage or with auxiliary heat (electric or fossil), zoned forced air and zoned hot water (2 or 3 wire), millivolt systems (with a 18-24 AC or DC source), one or two stage cooling, and hybrid systems.

1014-011-001

top cover

Reset button

HVAC selection switches

Save Energy button

Insulation indicator

Wire terminals

Mode button

Fan button

MENU button

PROG button

bottom cover

Touch screen

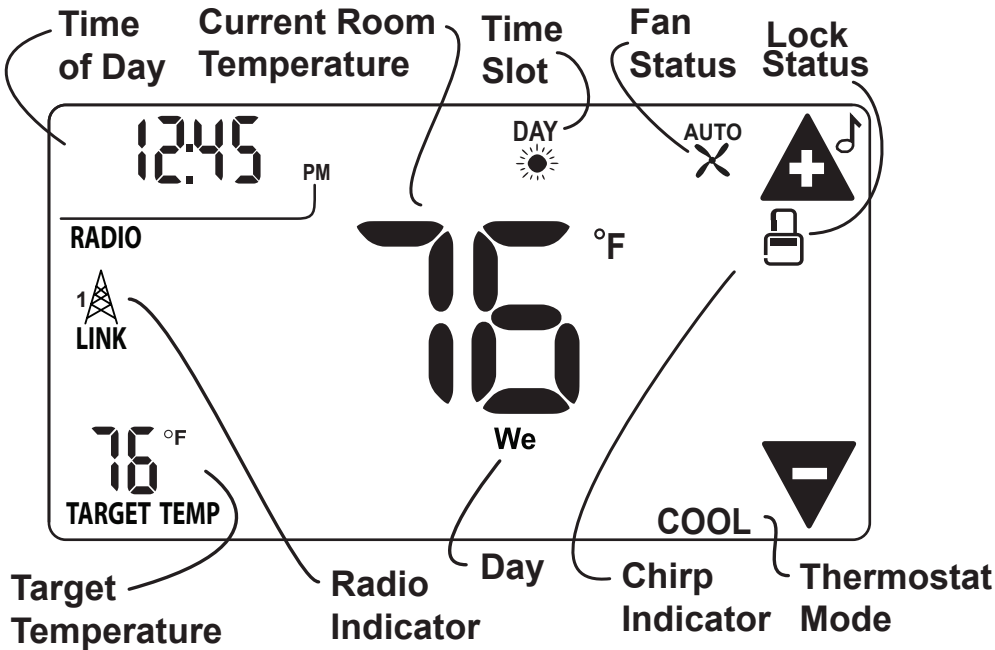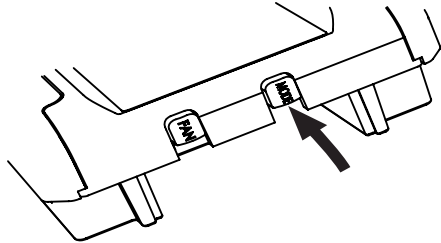**ENGLISH**

Control Screens

🏠 HOME Screen

Before you operate the CT50 please get familiar with these basic control screens. All the CT50 functions are accessed through these screens: HOME, MENU, PROGRAM and MANUAL. The CT50 touch screen technology allows you to select (by touching) an item and change it using the +/- arrows or the time arrows.

The simple **HOME** screen is displayed when the unit is operating.

Touching the HOME icon 🏠 on another screen will always return you to this screen.

To set a Mode:
Press the mode button on the side. The CT50 will step through the modes HEAT, OFF, COOL, OFF and AUTO in order. The LCD shows what mode you are in.

Time of Day

Current Room Temperature

Time Slot

Fan Status

Lock Status

12:45 PM

DAY

AUTO

RADIO

76 °F

1 LINK

We

76 °F

TARGET TEMP

COOL

Target Temperature

Radio Indicator

Day

Chirp Indicator

Thermostat Mode

MENU Screen

The **MENU** screen is the gateway to many functions or settings of the CT50. It is displayed when you press the MENU button. [See page 10 for details]

Set Time
Touch this area to set the time of day.
Left arrow goes back, right arrow goes forward.

Filter Timer set
Touch and hold 5 sec to change.

Chirp set
Touch this to turn the audible chirp on or off.

Differential to set for 2nd Stage start.

Temperature Swing set

Set °C -°F
Touch this to set temp display units.

Lock Program
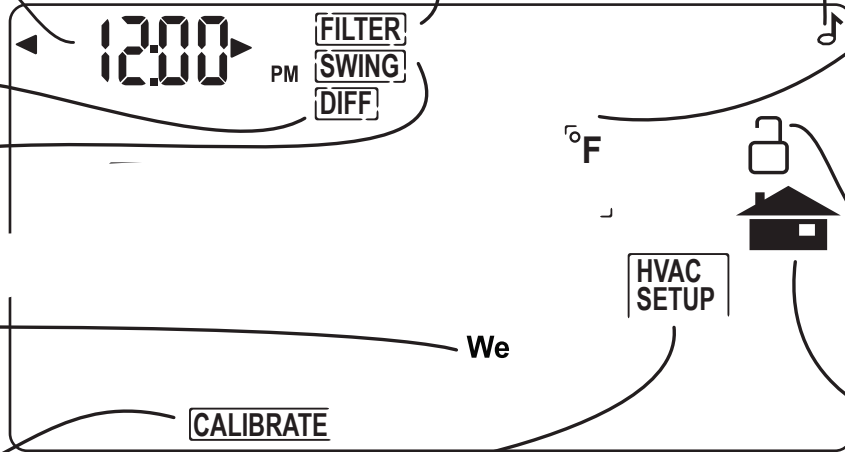Touch for 5 sec to lock or unlock.

Set Day
Touch this area to set the day of the week.

Calibration control
Use this to calibrate your LCD display match to another thermometer.

HVAC SETUP
Touch this in OFF mode to configure the unit to work with your HVAC system.

Return to **HOME** screen.

12:00 PM
FILTER
SWING
DIFF
°F
We
HVAC SETUP
CALIBRATE

PROGRAM Screen

The **PROGRAM** screen sets the CT50 control for your home HVAC system. Press PROG for to access it. After that it is displayed when you press the PROG button. [See page 8 for details]

Set Time Slot
Touch this area to set the Time Slot you want to program.

Return HOME
When programming is complete touch this to run your program and return to the HOME screen.

Set Program Time
Touch this area to set the time of day you want each time period to start.
Left arrow goes back, right arrow goes forward.
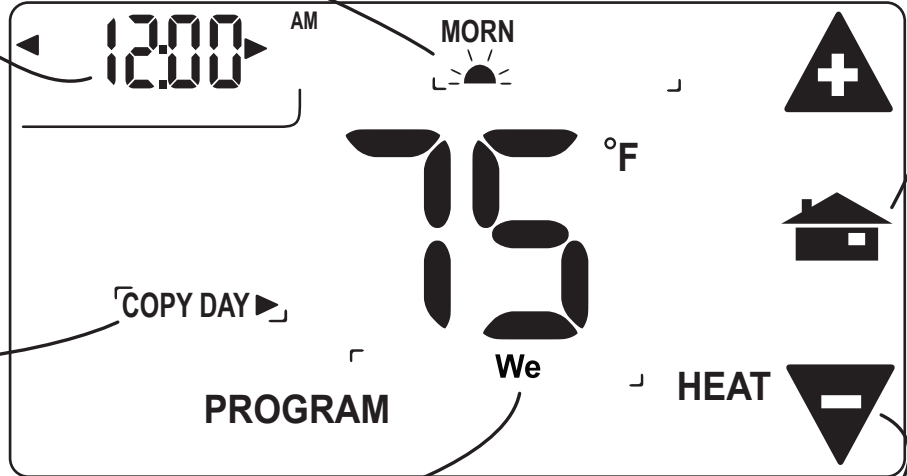[Touch and hold for fast set.]

Copy
Touch this area to copy current day's program to the next day.

Set Program Day
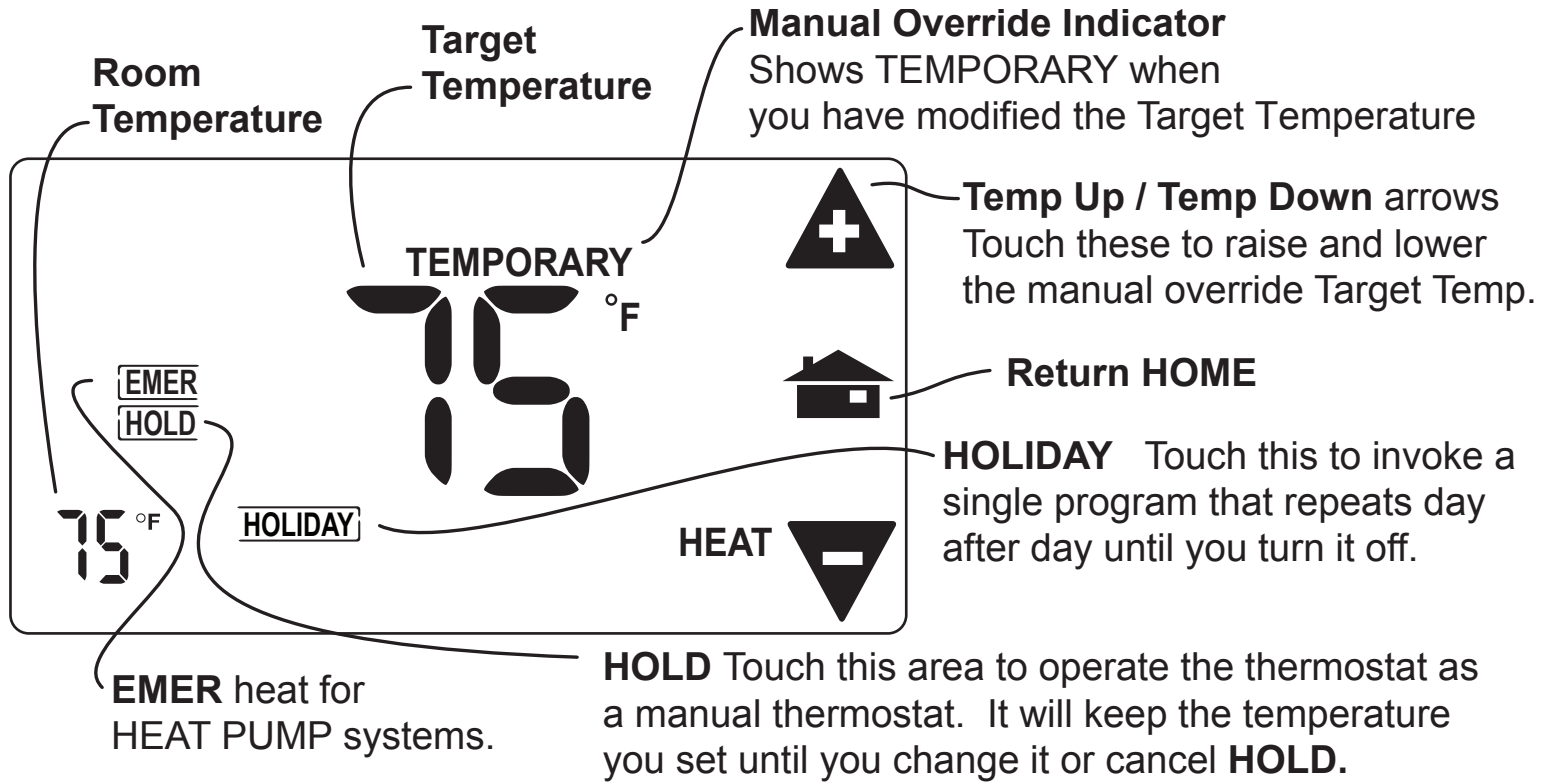Touch this area to set the day of the week you want to program.

Temp Up / Temp Down
Touch these to raise and lower each Target Temp.
[Touch and hold for fast set.]

12:00 AM

MORN

75 °F

COPY DAY ►

We

PROGRAM

HEAT

MANUAL Screen

The **Manual Screen** control screen is where you can make temporary changes to your CT50's operation. From the Full HOME screen, touch the main temperature display to use this screen. [See page 13 for details]

Room Temperature

Target Temperature

Manual Override Indicator
Shows TEMPORARY when you have modified the Target Temperature

TEMPORARY

75 °F

EMER

HOLD

HOLIDAY

75 °F

HEAT

Temp Up / Temp Down arrows
Touch these to raise and lower the manual override Target Temp.

Return HOME

HOLIDAY Touch this to invoke a single program that repeats day after day until you turn it off.

EMER heat for HEAT PUMP systems.

HOLD Touch this area to operate the thermostat as a manual thermostat. It will keep the temperature you set until you change it or cancel **HOLD.**

Simple HOME Screen 🏠 Make this simple HOME screen the default

for your CT50, switch the mode to OFF and hold the PROG button for 12 seconds. This Simple HOME screen gives you limited access to the CT50's features, only the target temp can be changed. [To return to the regular HOME screen switch the mode to OFF and hold the PROG button for 12 seconds.]

Current Room Temperature

76 °F

76 °F
TARGET TEMP

COOL

Target Temperature

Thermostat Mode
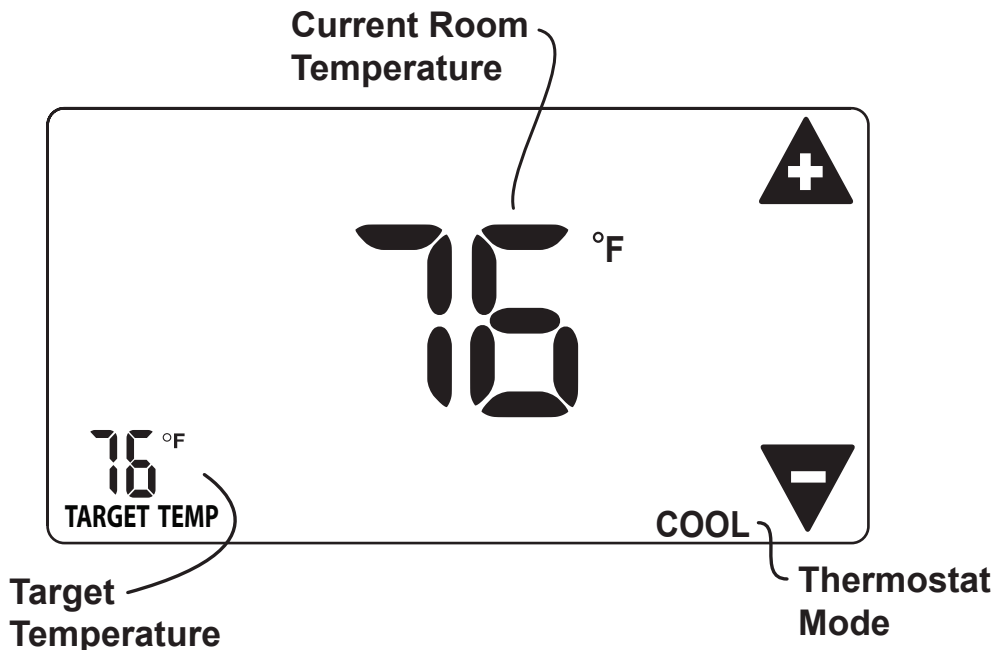
Initial Settings

Press **MENU** to access the following commands (from HOME screen).

Set day of the week
Touch the Day of the week area to cycle through the days of the week to select the current day.

Su Mo Tu We Th Fr Sa

Set time of day
Touch the Time of Day arrows to move the time selection forward or backward until it displays the current time. Touch and hold for faster setting.
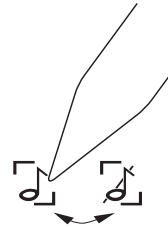
Backward Forward

Set ⁰F-⁰C display
Touch the ⁰F and it will toggle to ⁰C.

Set audible chirp
Touch the musical note icon to select the chirp or no chirp.
Return **HOME** by touching the home icon.

Run Program

The CT50 comes pre-programmed with an EPA approved program. This program is recommended by the EPA for energy efficiency. We strongly recommend that you Auto-Run this program for one week and see if it works for you. If it does not fit your needs, you can always input a custom program.
To run the EPA program, set the mode switch to HEAT or COOL.
Press the MENU button and use the arrows by the time display to set the time.
Touch the DAY area and advance it to select the present day.
Touch HOME. The unit is now running the program.

EPA	MORN	DAY	EVEN	NITE		MORN	DAY	EVEN	NITE
HEAT	6:00am	8:00am	6:00pm	10:00pm	COOL	6:00am	8:00am	6:00pm	10:00pm
All Days	70°F	62°F	70°F	62°F	All Days	78°F	85°F	78°F	82°F

TO CHANGE THE PROGRAM:

Make sure the CT50 mode is set to either HEAT or COOL, then press the **PROGRAM** button. This puts you at the **PROGRAM** screen [see page 4]. The programmed start time is displayed in the upper left. The TIME SLOT icon indicates the active TIME SLOT in the default program [MORN, DAY, EVEN, NITE]. The programmed Target Temperature is shown on main display.

The HEAT program and the COOL program are separate.

PROGRAM cont.

Select the **day** you want to program.
The day of the week starts at SU - Sunday and can be advanced to the day you want to program. Touch the day of the week area to cycle through the days of the week to the desired day.

Select the **time slot** (period) you want to program (MORN, DAY, EVEN, NITE).
Touch the time slot area to cycle through to the desired period.

Select the desired **start time** of that time slot.
Touch the time arrows to select the desired period's starting time. Hold arrow down for fast time scrolling.

Select the desired **target temperature** for that time slot.
Touch the +/- arrows to select the desired period's temperature.

To **COPY** one day's programming to the next day, touch COPY DAY once. The information for the current day will be copied to the next day which will appear on the screen. Holding down COPY for over 3 seconds will copy to all 7 days.

Touch to return to the Home screen.

MENU Screen Functions

Press **MENU** to bring up **MENU** screen.

TIME of DAY
Touch the left (backward) or right (forward) arrows next to the time display to set
the current time (1 minute per touch). Touch and hold the arrow for fast time set (15 minute jumps).

◄ **12:35** ►

DAY of Week Touch DAY area to select present day.

SWING (HVAC cycling rate) This feature allows you to set the desired variance in temperature
between the CT50 setting and the room temperature required before the heating or cooling system
will turn on—from 0.5° to 2.0° F (.25° to 1° C). For example, if SWING is set to 2.0° F and the CT50
is set to 70°F Target Temperature, the heat cycle will start when room temperature drops to 68°F.
Similarly, the cooling system will start when the room temperature increases to 72°F. The HVAC then
runs and will shut off at the Target Temperature.
To set **SWING**:
Touch SWING.
Touch the left/right arrows to set the SWING from 0.5° to 2.0°F.
The HVAC will run more frequently at .5°F and less at 2°F. Default is 1°F.

Touch 🏠 to return to the MENU screen.

♪ **Chirp set** - Touch this to turn the audible chirp sound on or off.

°F
°C **Set -** Touch this to change the temperature display scale from °F to °C .

FILTER - AIR FILTER ALERT - The CT50 can be programmed to remind you when the HVAC sytem's air filter needs changing.
Touch FILTER. The display will show the usage to date.
Touch FILTER for over 3 seconds and the display will change to LIMIT.
Touch arrows to set desired usage limit before filter alert comes on home screen.
When this limit is reached, FILTER will be on home screen and the CHECK FILTER indicator lights.
Limit may be set from 0 to 999 days/99 weeks; default is 90 days/12 weeks. Touch to reset.
To reset the usage back to 0, touch usage number; touching it again restores the displayed usage.
Touch 🏠 to return to the **MENU** screen.

🔓**LOCK** (The CT50 has 2 lock modes)
Touch 🔓 icon for 5 seconds; the unit will go into the PARTIAL lock mode. The user can temporarily override the CT50 target with the +/- buttons only. (1 bar)
For FULL lock : Touch the 🔒 (1 bar) icon again for 5 seconds to go to full lock. No changes can be made in full lock 🔒 (2 bars). Once locked, the CT50 will respond just to mode and menu.

To UNLOCK , Press MENU.
Touch and hold 🔒 icon for 5 seconds for 2 bars (if not there already).
Then touch and hold the 🔒 icon for another 5 seconds. Each 5 second touch and hold must be separate.
Touch 🏠 to return to the Home screen.

CALIBRATE   Your thermostat was accurately calibrated at the factory to ±1° F of actual ambient temperature. You do have the option, however, to change the display temperature to match that of a previous thermostat, or to match another thermostat already in your home. The range of change is from -6°F to +6°F or -3°C to +3°C.

To change your Thermostat Calibration, touch **MENU** and then touch **CALIBRATE.**
Use the + / - to adjust the displayed temperature up or down, as desired.
The DELTA FACTOR that appears on the screen will also automatically increase or decrease
for each 0.5° (F or C) adjustment so you can see your change. The large display will show the
modified temerature reading that will be displayed on the HOME screen and used as the new room temperature.
Touch 🏠 to return to the Home screen.

DIFF (Used for 2 stage normal or heat pump with auxiliary only, not on screen for single stage)
The differential is the number of degrees between the room temperature and the Target Temperature at which the 2nd stage will be used. Default is 2°F.
Touch MENU and then DIFF. Use the arrows to set the DIFF.
Recommend 2°F for very cold climates and the 4°F for warm climates.

MANUAL Screen Functions

The CT50 has 4 manual override commands. The manual screen is accessed by touching the large current temperature display in the middle of the HOME screen.
IMPORTANT: The Mode must be in HEAT or COOL to access the manual screen.

TEMPORARY override   Touch the + / - arrows to select your desired temporary Target Temperature. Touch HOME to return to operation. The **TEMPORARY** icon will display indicating you have modified the Target Temperature for the current Time Slot only. It goes back to the program target at the next period. Also, when in **TEMPORARY**, if the target is set the same as the programmed target for that period, the word **TEMPORARY** will go out.

HOLD This will hold the target temperature you set indefinitely, until you turn **HOLD** off. **HOLD** will allow you to operate your thermostat as a manual thermostat. It will keep whatever temperature you set until you change it or cancel hold. Take care using the **HOLD** function as the program is now bypassed. To set a hold target temperature, touch **HOLD** and use the +/- icons to select your hold temperature. The **HOLD** icon will display on the HOME screen indicating you have changed the Target Temperature. The system will **HOLD** this temperature until you return to the manual screen and de-select **HOLD** by touching it. Hold is also canceled when you set the mode to OFF.

HOLIDAY   This is a single program that repeats day after day until you turn it off. It supersedes the

weekly program. To use it touch **HOLIDAY** on the temporary screen. The default holiday program is shown here [Default program: HEAT 70ºF all day and 62ºF at night. COOL 78ºF all day and 82ºF at night.] To modify this program, touch the PROGRAM button and then touch the DAY area until HOLIDAY appears (after SAT). The default HOLIDAY program is set as 2 time slots; all day (same target MORN, DAY and EVEN) and a different target for NITE.

EMER (in HEAT PUMP type)
If you set your CT50 for HEAT PUMP with auxiliary heat, EMER function is available on the MANUAL screen. If you touch EMER, it displays EMER|ON. Your HEAT PUMP is disabled and auxiliary heat is your sole source of heat. This manual override stays active until you toggle EMER off.   Auxiliary heat is more expensive than the heat pump so use EMER only if the heat pump cannot keep up or is defective.

Other Functions

Save Energy Button
The "Save Energy" feature on the CT50 provides a simple, easy-to-use way to help you manage your energy use. SAVE ENERGY automatically adjusts your Target Temperature up in COOL or down in HEAT by 4ºF.   To use Save Energy, press the Save Energy button in the upper left corner of the unit. The screen will now read "Save Energy".   To return to normal operation, press the "Save Energy" button again. This is useful to save energy if you are gone for a short time.

MODE Button

The mode button sets the CT50 to HEAT, COOL, AUTO, or OFF modes. Press it once to step to the next mode. If the CT50 is in OFF and you want to return to the mode you were previously in, touch the OFF indicator on screen.

COOL - This will operate the cooling portion of your HVAC system until it is turned off.

HEAT - This will operate the heating portion of your HVAC system until it is turned off.

AUTO - The CT50 TRUE AUTO mode switches automatically between heat and cool throughout the year. Unlike other manufacturers, the CT50 TRUE AUTO has no temperature or time limitations (Patent pending), just program your desired HEAT and COOL temps and select the AUTO mode. The CT50 will switch from HEAT to COOL as needed.

OFF- This takes your HVAC system "off-line" and it will not control HVAC functions.   In this mode your house may experience extreme heat or cold.

FAN Button

The fan control is normally in AUTO mode, meaning that the fan operates automatically with the HVAC system and the thermostat. When the fan button is pressed the fan goes ON; the fan will run continuously in this manual override until switched back to AUTO by pressing the FAN button again. [NOTE: Fan **ON** function is available in the OFF mode to allow simple ventilating.]

Simple Screen

This display mode limits the amount of information on screen and limits the functions to just the +/- arrows and the MENU button. To set, with mode in OFF and ...
Hold down the PROGRAM button for 12 seconds to access the limited display screen.
Hold down the PROGRAM button for 12 seconds to leave the limited display screen.

RESET button The RESET button re-boots the CT50 processor. It does not effect the user programs that have been stored in permanent memory.

Compressor Protection   The CT50 has a minimum cycle time of 4 minutes to protect your compressor in cool and in heat pump (if you have one). The Home screen will show a small clock and A/C during this time and the compressor will not come on until the 4 minute delay is over.

Communicating Thermostat

The CT50 has 2 USNAP radio ports. These allow your thermostat to communicate with other systems.

Using USNAP Radios The USNAP ports allow you to connect your CT50 to your home WiFi network. This can give you access to your home's HVAC system even when you are away [with additional web service]. It can also give you access to web based efficient energy management sites that can help you save money and protect the environment.You can connect your CT50 to a Home Automation network for HA functionality with remote access to your HVAC system and home conditions.

To Insert a USNAP radio module:
Power off the CT50. Insert the radio module in either slot on the back of the CT50.
Power up CT50.
To connect to a network follow the instructions that came with the USNAP module.

USNAP radio

USNAP port
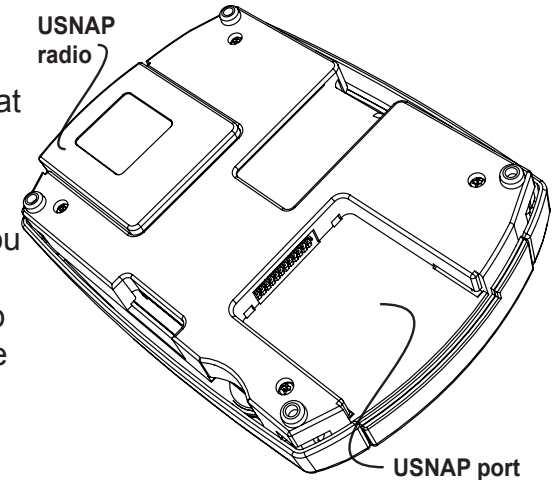
⚠ Caution

DO NOT INSERT or REMOVE USNAP radio modules if power is ON. This can damage the thermostat or radio modules.