



Installation, Start-Up, and Operating Instructions

Part Number 33CS250-RC

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IMPORTANT: Read entire instructions before starting the installation. Leave installation instructions with owner after performing installation.

SAFETY CONSIDERATIONS

Read and follow manufacturer instructions carefully. Follow all local electrical codes during installation. All wiring must conform to local and national electrical codes. Improper wiring or installation may damage thermostat.

Recognize safety information. This is the safety alert symbol . When the safety alert symbol is present on equipment or in the instruction manual, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, and CAUTION. These words are used with the safety alert symbol. DANGER identifies the most serious hazards which will result in severe personal injury or death. WARNING signifies a hazard which could result in personal injury or death. CAUTION is used to identify unsafe practices which would result in minor personal injury or property damage.

GENERAL

The wireless, 7-day, commercial, programmable thermostats maintain room temperature by controlling the

operation of an HVAC (heating, ventilation, and air conditioning) system. Separate heating and cooling set points and auto-changeover capability allow programming of 4 different time periods for energy savings.

All thermostats allow up to 4 time/temperature settings to be programmed per 24-hr period. Each thermostat stores programs for 7 independent days. Batteries are required for operation. During power interruption (batteries removed) the internal memory stores configuration and comfort schedules for an unlimited time. The clock will need to be reset everytime power is lost (batteries changed).

The wall mounted or hand-held transmitter sends its signal to a receiver installed near the HVAC unit. Each transmitter and receiver can be given a separate house code for multiple thermostat applications. Up to 4 transmitters can send information to one receiver device.

The thermostat can be configured to accept several different equipment configurations, including heat pump operation.

IMPORTANT: The transmitter and receiver are factory configured with a house code of 0. If more than one set of wireless transmitters and receivers are used in the same location, the house codes must be different for the thermostats to communicate properly.

INSTALLATION

Install Batteries — Two AA lithium batteries are included with the transmitter. Remove the back cover and install batteries. To ensure proper operation, only use AA lithium batteries as replacements.

Select Transmitter Location (Optional) — The transmitter is wireless and no mounting or wiring of the transmitter is required. However, if a mounting location is desired for the transmitter, the transmitter should be mounted:

- approximately 5 ft from the floor
- close to or in a frequently used room, preferably on an inside partitioning wall
- on a section of wall without pipes or ductwork
- where temperature operating limits are within 41 to 104 F (5 to 40 C)
- where humidity operating range is within 0 to 95% relative humidity, non-condensing

The thermostat should **NOT** be mounted:

- close to a window, on an outside wall, or next to a door leading to the outside
- where exposed to direct light and heat from a lamp, the sun, a fireplace, or any other temperature-radiating object which may cause a false reading

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

- close to or in direct airflow from supply registers or return air grilles
- in areas with poor air circulation (such as behind a door or in an alcove)

Mount Transmitter (Optional)

IMPORTANT: If the transmitter is replacing an existing thermostat and will be mounted in the same location, the wiring from the unit must be run to a different location where the receiver is mounted. The transmitter is **NOT** wired to the unit. The receiver is wired to the unit and processes the signals received from the transmitter.

1. If an existing thermostat is being replaced:
 - a. Remove existing thermostat from the wall.
 - b. Disconnect wires from existing thermostat. Remove wiring.
 - c. Discard or recycle old thermostat.
NOTE: Mercury is a hazardous waste and must be disposed of properly.
2. Remove the transmitter cover from wall plate (mounting base) to expose mounting holes. See Fig. 1.
3. Level mounting base against wall and mark wall through the 2 mounting holes in base.
4. Drill two $\frac{3}{16}$ -in. mounting holes in wall where marked.

⚠ CAUTION

Be careful not to drill into wiring in wall. Electrical shock could result.

5. Secure mounting base to wall with 2 screws and anchors provided.
6. Seal hole in wall to prevent drafts.
7. Re-attach transmitter cover to back plate.

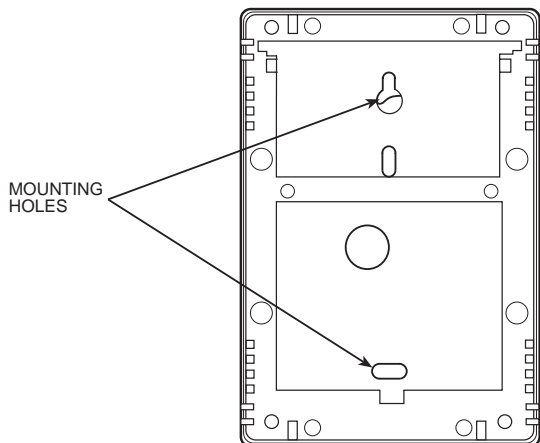


Fig. 1 — Transmitter Backplate

Set Clock — The user can change the time and day displayed on the transmitter. Press and hold the Mode and Override buttons simultaneously for at least 2 seconds. The transmitter will be in Set Clock mode. The display will show the Set Up annunciator. The number of the Set Up step is shown in the upper right corner. The current time will blink on and off. Current Time is Set Up Step 1. Press the UP ARROW and DOWN ARROW buttons until the correct time is shown. Hold down the buttons to quickly move through the time display. The AM and PM annunciators will automatically

change. To ensure the schedules are properly followed, make sure that AM or PM is correct for the time chosen. Hold down the Override button while pressing the UP or DOWN ARROW buttons to scroll through by hours instead of minutes. When the correct time is shown, press the Mode button to modify the day of the week. The current day will blink on and off. The Day of the Week is Set Up Step 2. Press the UP ARROW and DOWN ARROW buttons until the correct day is shown. Press and hold the Mode and Override buttons again for 2 seconds to exit the Set Clock mode. If no button is pressed for 60 seconds, the display will automatically return to normal operation.

Configure Advanced Set Up — To enter into the advanced set up screens of the transmitter, press and hold the Mode and Override buttons for at least 5 seconds. The set up step number is shown in the top right corner of the transmitter screen. Use the Mode button to advance through the steps. See Table 1. Press the Mode and Override buttons at the same time to exit the Advanced Set Up mode. If no button is pressed for 60 seconds, the display will automatically return to normal operation.

NOTE: See Set Clock section above for information on Advanced Set Up steps 1 and 2.

ZONING SYSTEM (Step 3) — The Zoning System configuration configures the thermostat for use in a zoning system. If the thermostat is being used in a zoning system, set the configuration to YES. If the thermostat is not being used in zoning system, set the configuration to NO. The default is NO.

HOUSE CODE (Step 4) — The house code is used by the transmitter and receiver to identify that they are used together. If more than one transmitter is used, all transmitters must have the same house code number as the receiver. If separate receivers and transmitters for different equipment are used near each other, they should be configured with different house codes. The default is 0. The range is 0 to 63.

NOTE: More than one receiver can be used on jobs where the furnace and air conditioner are not wired together. Two separate receivers can be used with one wired to the furnace and one wired to the air conditioner, which can both be controlled by the same transmitter. These receivers must have the same house code.

UNIT ID NUMBER (Step 5) — The unit ID number is used when more than one transmitter is used with a receiver. When more than one transmitter is used with a receiver, each transmitter must be given a different unit ID number. This allows the receiver to keep track of which transmitter sent the last command. This transmitter will control the unit until a different transmitter sends a command to the receiver. The default is 1. The range is 1 to 4.

NOTE: Advanced Configuration steps 6, 7, 9, 11 are only available for transmitters configured with Unit ID Number 1.

FAN MODE (Step 6) — The fan mode is used to configure fan operation. If Fan On is selected, the fan will run continuously during the Occupied schedule (except when Mode is switched to OFF). The fan will be off during unoccupied schedule except during heating or cooling operation.

If Auto is selected, the fan will operate only during heating or cooling operation. The default is Auto.

DEADBAND (Step 7) — The Deadband is the difference in temperature above the cooling set point or below the heating set point that the thermostat will wait before turning on the first stage of heating or cooling. For example, if the cooling set point is 82 F and the deadband is 2 degrees F, the first stage of cooling will not be energized until the temperature reaches 84 F. The range of values is 1 to 6 degrees. The default is 2.

SET POINT MINIMUM DIFFERENCE (Step 8)—The minimum difference between heating and cooling set points can be user-configured. The range is from 0 to 6 degrees. The default is 2. The minimum difference is enforced during Auto-changeover and Program On operation.

CYCLES PER HOUR LIMIT (Step 9) — The number of times that heating or cooling can be energized per hour can be configured. Set the variable to “d” for no limit. Set the variable to “d1” to disable the 5-minute compressor lock-out. The variable can also be set from 2 to 6 cycles per hour. The default is 6.

▲ CAUTION

The “d1” configuration is used for service and troubleshooting procedures only. Do not use for normal operation. Damage to air-conditioning equipment may result.

BACKLIGHT DISPLAY (Step 10) — The display backlight can be set to ON (always on) or OFF (turn off 8 seconds after last button pressed). The default is ON.

NOTE: The transmitter display backlight can only be set to ON (always on) if a dedicated power source is connected to the transmitter. If the transmitter is using batteries, the configuration cannot be set to ON.

PRE-OCCUPANCY PURGE TIMER (Step 11) — The pre-occupancy purge allows fresh outside air to be brought into the space before the Occupied 1 time period. The timer limits the amount of time that the purge can operate. The timer can be set from 0 to 3 hours with 15-minute intervals. The default is 0 hours (disabled).

FAHRENHEIT/CELSIUS OPERATION (Step 12) — The transmitter can be set to operate in Fahrenheit or Celsius degrees. Set the variable to “F” for Fahrenheit operation. Set the variable to “C” for Celsius operation. The default is “F.”

SECURITY LEVEL (Steps 13 to 15) — The Security Level limits the actions that the user can perform at the transmitter. There are 4 security levels. When the security level is set to “0,” no security will be in effect. When the security level is set to “1,” the set point range is limited by the settings of Steps 14 and 15. When the security level is set to “2,” the set point range is limited by the settings of Steps 14 and 15 and the Program On mode is always in effect. When the security level is set to “3,” the set point range is limited by the settings of Steps 14 and 15, the Program On mode is always in effect, and set point changes are prohibited. The default is 0.

Security Maximum Heat Set Point (Step 14) — If the Security Level is not set to 0, the maximum heating set point will be in effect. The user will not be allowed to set the heating set point over the specified value. The range of values is 35 to 99 F (1 to 37 C). The default is 80 F (27 C).

Security Minimum Cool Set Point (Step 15) — If the Security Level is not set to 0, the minimum cooling set point will be in effect. The user will not be allowed to set the cooling set point below the specified value. The range of values is 35 to 99 F (1 to 37 C). The default is 65 F (18 C).

Program Thermostat Schedules — Before programming the thermostat, plan the thermostat daily schedule. The schedule is divided into 7 days (Monday through Sunday). Each day has from 2 to 4 time periods (Occupied 1, Occupied 2, Occupied 3, Unoccupied) depending on the configuration of the thermostat. Each occupied time period has a start time, stop time, heating set point, and cooling set point. The unoccupied time period has a heating set point and a cooling set point. The unoccupied time period is active when ever an occupied time period is not active. Fill in Table 2 as an aid to programming the daily schedules.

Table 1 — Advanced Set Up Configuration

STEP	DESCRIPTION	RANGE	DEFAULT
1	Time of Day	12:00 AM - 11:59 PM	12:00 AM
2	Day of the Week	Sunday through Saturday	Monday
3	Zoning System	No/Yes	No
4	House Code	0 - 63	0
5	Unit ID Number	1 - 4	1
6*	Fan Mode	Auto/Fan On	Auto
7*	Deadband	1 - 6 degrees	2
8	Forced Minimum Temperature Difference	0 - 6 degrees	2
9*	Cycles per Hour	d, d1, 2 - 6	6
10	Thermoglow™ Backlight	Off/On	On
11*	Fan Purge Timer	0:00 - 3:00	0:00
12	Temperature Units	F/C	F
13	Security Level	0 - 3	0
14	Maximum Allowable Heat Set Point	35 - 99 F (1 - 37 C)	80 F (27 C)
15	Minimum Allowable Cooling Set Point	35 - 99 F (1 - 37 C)	65 F (18 C)

*Only available on transmitter with Unit ID Number configured to 1.

Table 2 — Daily Schedule Planner

DAY OF THE WEEK	SCHEDULE			
	Occupied 1	Occupied 2	Occupied 3	Unoccupied
	Start / Stop / Heat / Cool	Start / Stop / Heat / Cool	Start / Stop / Heat / Cool	Heat / Cool
Monday	/ / /	/ / /	/ / /	/
Tuesday	/ / /	/ / /	/ / /	/
Wednesday	/ / /	/ / /	/ / /	/
Thursday	/ / /	/ / /	/ / /	/
Friday	/ / /	/ / /	/ / /	/
Saturday	/ / /	/ / /	/ / /	/
Sunday	/ / /	/ / /	/ / /	/

NOTE: The cooling temperature set point must be higher than the heating temperature set point. (The temperature difference may be changed in the advanced set up configuration.)

PROGRAMMING MODE — To program the daily schedules, perform the following procedure:

1. Enter programming mode by pressing and holding the Mode and UP ARROW buttons for 2 seconds. The Occupied 1 annunciator will appear on the thermostat display. Use the UP ARROW and DOWN ARROW buttons to set the maximum number of Occupied periods for each day. The thermostat can be set to 1, 2, or 3. After the number of Occupied periods has been selected, press the Mode button. See Fig. 2.
2. The cooling set point for Occupied 1 will be displayed. Use the UP ARROW and DOWN ARROW buttons to raise or lower the cooling set point until the desired temperature is shown. The range of acceptable values is 35 to 99 F (1 to 37 C). Press the Mode button to continue. See Fig. 2.
3. The heating set point for Occupied 1 will be displayed. Use the UP ARROW and DOWN ARROW buttons to raise or lower the heating set point until the desired temperature is shown. The range of acceptable values is 35 to 99 F (1 to 37 C). Press the Mode button to continue. See Fig. 2.
4. The cooling set point for Unoccupied will be displayed. Use the UP ARROW and DOWN ARROW buttons to raise or lower the cooling set point until the desired temperature is shown. The range of acceptable values is 35 to 99 F (1 to 37 C) or “OF” (no unoccupied cooling). Press the Mode button to continue.
5. The heating set point for Unoccupied will be displayed. Use the UP ARROW and DOWN ARROW buttons to raise or lower the heating set point until the desired temperature is shown. The range of acceptable values is 35 to 99 F (1 to 37 C) or “OF” (no unoccupied heating). Press the Mode button to continue.
6. The day of the week will be shown. Use the UP ARROW and DOWN ARROW buttons to change the day of the week until the desired starting day is shown. Possible choices are M (Monday) through S (Sunday). Press the Mode button when the desired day is shown.
7. The Start Time for Occupied 1 will be displayed. Use the UP ARROW and DOWN ARROW buttons to raise or lower the time until the desired Start Time is shown. Press the Mode button to continue. See Fig. 3.
8. The Stop Time for Occupied 1 will be displayed. Use the UP ARROW and DOWN ARROW buttons to raise or lower the time until the desired Stop Time is shown. Press the Mode button to continue.



Fig. 2 — Setting Occupied 1 Set Points

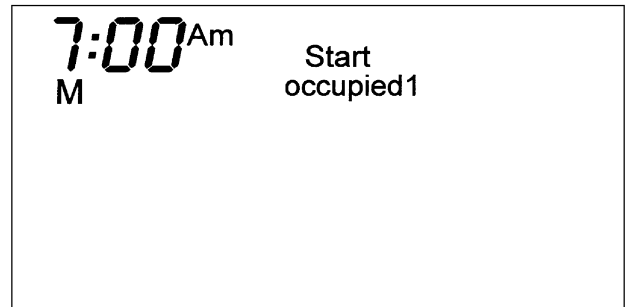


Fig. 3 — Start Time Display

9. The On/Off icon will be displayed. Use the UP ARROW to turn the Occupied 1 period ON for this day. Use the DOWN ARROW to turn the Occupied 1 period OFF for this day.
10. Repeat Steps 2 through 9 to program the remaining schedule for Occupied periods 2 and 3.
11. The Copy command can be used to copy the previous day's schedule if the schedules are the same. The copy command becomes available after all the occupied periods are programmed in a day. Use the UP ARROW to change the copy command to YES. Use the DOWN ARROW to change the copy command to NO. Press the Mode button when the choice has been made. See Fig. 4.

If NO was selected, the schedule will automatically change to the next day and the user must enter the occupied and unoccupied schedules for that day.

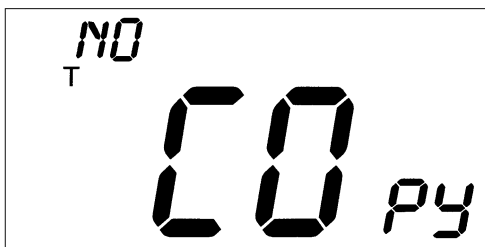


fig. 4 — Copy Command Display

NOTE: Occupied 1 schedule heating and cooling set points are the same for each day. Occupied 2 and 3 set points may be set to different values for each day of the week.

If YES was selected, the schedule will be copied to the next day. The schedule copy may be repeated until Sunday is reached. The Sunday schedule cannot be copied to Monday.

- After all the times and set points for each day have been entered, press and hold the Mode and UP ARROW buttons for 2 seconds to exit Programming mode.

NOTE: The thermostat will continue to follow the schedule until a new one is entered.

If only one occupied schedule is selected, the Occupied 2 and 3 schedules are skipped. If the start time is set later in the day than the stop time, the program will run from midnight of that day to the stop time and then from the start time to midnight. If the same start and stop times are programmed for an occupancy schedule, the thermostat will be in Occupied mode for 24 hours. If one occupied period starts or stops within another occupied period, the lower numbered schedule has priority. For example, if schedule Occupied 3 is running for 24 hours and Occupied 2 schedule comes on from 1 to 3 PM, the set points from Occupied 2 are in effect from 1 to 3 PM.

OVERRIDING THE SCHEDULE — The schedule can be overridden by pressing the UP or DOWN ARROW buttons to change the desired temperature. The thermostat will use the new set point until the next scheduled time period starts.

Calibration — Every transmitter temperature sensor is factory calibrated. Under normal circumstances there will never be a need to re-calibrate the sensor. If re-calibration must be done, perform the following procedure:

- Hold down the Mode button and press the DOWN ARROW button simultaneously for 2 seconds. All of the icons on the display screen will appear. Release the buttons.
- Press the Mode button. The current temperature will be displayed.
- Use an accurate thermometer to measure room temperature. Press the UP or DOWN ARROW buttons until the displayed temperature equals room temperature.
- Press the Mode button to return to normal operation.

Check Thermostat Operation — To check thermostat operation, perform the following procedure:

- Press the Mode button repeatedly until the Heat icon appears on the display. The thermostat is now in Heating mode.
- Press the UP ARROW button until the heating set point is 10 F (6 C) higher than the current room temperature. Heating and fan should be energized.
- Press the Mode button repeatedly until the Cool icon appears on the display. The thermostat is now in Cooling mode.

- Press the DOWN ARROW button until the cooling set point is 10 F lower than the current room temperature. Cooling and fan should be energized.
- If heating, cooling, or fan operations do not energize, check wiring and consult Troubleshooting section.

Final Checklist

- Put away tools and instruments. Clean up debris and packaging.
- Review Owner's Guide with occupant or owner.
- Leave the manuals with owner.

OPERATION

The Mode button selects the operating mode of the thermostat. If OFF is selected, the thermostat will not enter Heating or Cooling mode. If HEAT is selected, the thermostat will only enter Heating mode (if the room temperature is below the heating set point). If COOL is selected, the thermostat will only enter Cooling mode (if the room temperature is above the cooling set point). If AUTO is selected, the thermostat will enter Heating or Cooling mode based on the room temperature and the heating and cooling set points. If PROGRAM ON is selected, the stored schedule is enabled and the thermostat will follow the time period schedules stored in its memory.

NOTE: The transmitter must be configured to Unit ID Number 1 to have a programmed schedule.

Auto-Changeover — When the thermostat mode is set to AUTO or PROGRAM ON, the thermostat will provide automatic changeover from Heating to Cooling mode and Cooling to Heating mode when required. The thermostat will automatically switch to maintain the desired temperature setting. The thermostat does not need to be manually changed from heating to cooling or cooling to heating operation.

Two-Stage Operation — The second stage of heat or cool is turned on when the first stage has been on for a minimum of 2 minutes and the temperature differential from the set point is equal to or greater than the set point plus the deadband plus 2 degrees.

Fan Operation — If Fan On is selected, the fan will run continuously during occupied schedule (except when Mode is switched to OFF). The fan will be off during unoccupied schedule except during heating or cooling operation.

If Fan On is not selected, the fan will only operate during heating or cooling operation.

Electric Heat — When the Electric Heat DIP switch on the receiver is set to ON, the thermostat will turn on the fan immediately any time there is a heat demand. This feature should only be used on electric heating applications. Do not use with gas heat.

Keypad Lock — To prevent unauthorized use of the thermostat, the front panel buttons can be disabled. To disable or lock the keypad, press and hold the Mode button. While holding down the Mode button, press the UP and DOWN ARROW buttons simultaneously. The "Locked" icon will appear on the display.

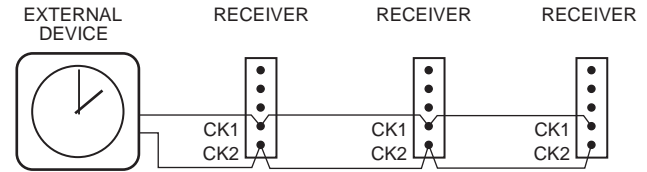
The thermostat is unlocked by performing the same procedure. Press and hold the Mode button. While holding down the Mode button, press the UP and DOWN ARROW buttons simultaneously. The "Locked" icon will be removed from the display.

Unit ID Number — If more than one transmitter (up to 4) is used with a single receiver, the transmitters must be given different Unit ID Numbers. Only the transmitter with Unit ID Number 1 may have a programmed schedule or be

configured. All configuration parameters are taken from the transmitter with Unit ID Number 1. Transmitters with Unit ID Numbers 2, 3, and 4 cannot be programmed or configured (except for set points).

When more than one transmitter is used, the receiver will only accept commands from the transmitter that was last used (button pressed). All other set points and modes from other transmitters are ignored. If the transmitter with Unit ID Number 1 has a schedule and is in Program On mode, the receiver will revert back to following the programmed schedule when a time period change occurs, even if the transmitter with Unit ID number 1 is not the current commanding transmitter.

Dry Contact Switch/External Control — A dry contact switch is provided to allow an external device to force the thermostat into Unoccupied mode. This occurs at the receiver and is not shown on the transmitter. The external device is wired to contacts CK1 and CK2. See Fig. 5.



NOTE: Do not cross wiring.

Fig. 5 — Dry Contact Switch Wiring

TROUBLESHOOTING

PROBLEM	SOLUTION
Display on transmitter not illuminated.	Check battery.
Cooling will not energize.	Select COOL mode. Decrease cooling set point to 10 degrees below room temperature. Check for 24 vac at Y1 terminal on receiver. If present, thermostat is operating correctly and problem is with receiver wiring or equipment. If 24 vac is not present, replace the thermostat. Check for Compressor Cycle per Hour Limit. Cooling may be locked out.
Heating will not energize.	Select HEAT mode. Increase heating set point to 10 degrees above room temperature. Check for 24 vac at W1/O/B terminal on receiver. If present, thermostat is operating correctly and problem is with receiver wiring or equipment. If 24 vac is not present, replace the thermostat.
When using 4 wires (R,G,W,Y) connected to receiver, the air conditioning equipment tries repeatedly to turn on, but cannot.	There is not enough power available. Connect a 270 ohm, 10 watt power resistor at the air conditioning equipment between terminals W and C on receiver.
When controlling a heat pump, heat comes on during cooling cycle.	Configure receiver for heat pump operation. (See wireless receiver installation instructions.)
When calling for cooling, both heating and cooling are energized.	The receiver is configured for a heat pump. Configure the receiver for non-heat pump operation. (See wireless receiver installation instructions.)
When controlling a commercial heat pump unit, unit runs in reverse or heating is always on.	Some commercial heat pumps require that Heat Pump option (DIP switch on receiver) is turned OFF. Check the unit installation instructions for more information.

