

Warner Hall HVAC System Operation

For those just wanting to know a little bit about the system, this page offers a quick tutorial on how to get cooling in a space. Find the room thermostat and follow instructions.

(Note: Room 101 is located behind the door)

If the occupancy light is green.

Either from the occupancy sensor, or manually through the push button.



Then you may use the cool button. The first push will have the words “fan only” scroll across the screen.



Push the button a second time and “cool on” will scroll across the screen. Only push the button twice, and then leave it alone. Once the occupancy light goes out (which is 30 minutes of the space being unoccupied) the system shuts off the cooling.

A more in-depth explanation of how the system operates.

Building Equipment-

The building utilizes a VRF (Variable Refrigerant Flow) system for both heating and cooling. A steam converter is also available for baseboard hot water when outside air conditions are cold enough for the VRF to be less efficient in heating than using steam. An ERV (Energy Recovery Ventilator) brings 100% fresh air into the building while exhausting stale air. The air systems use MERV-13 filtration. Motion sensors are used as a means of energy savings to determine occupancy in spaces and user interaction is required to get cooling to a space.

Heating is enabled when outdoor temperatures are less than 55 degrees. If outdoor temps stay below 65 for a day or so, the heat will also be enabled until they rise above 65 degrees, at which point the heat shuts off. Cooling is enabled when outside air temperatures are above 65 degrees.

Zones-

All spaces that are heated and cooled by the VRF system are broken up into zones. Every classroom has its own zone as well as the common rooms on the 2nd and 3rd floor. Offices are grouped with two or three offices per zone. There is a building map at the end of this document showing which rooms are associated with each other.

General Concept-

Upon entering a space, the motion sensor will detect motion and put the space into an occupancy mode. The green LED will then be lit on the room thermostat. The space will remain in an occupied mode for 30 minutes after the last motion is sensed, then revert to an unoccupied mode. Once in occupancy mode, the system will adjust the room temperature set points from unoccupied set points (65 degrees for heating and 85 degrees for cooling), to occupied set points (70 degrees for heating and 77 degrees for cooling). Users can adjust their thermostat 2 degrees above or below the default occupied set points. All office zones will “remember” where the occupied set points were last left and stay there except for common spaces and classrooms which will revert the occupied set point values to default (70 & 77) upon a transition to unoccupied mode. Motion sensors will be disabled through the night from between 11 PM and 4 AM. If using a space between that time, use the thermostat occupancy button to put the space into occupied mode.

Set points/space temps-

Rooms will maintain the space temperature based on that room’s set point. For offices which share a VRF with other offices, an average temperature set point from all **occupied** offices on that zone will be used to determine the set point that the VRF will use to heat or cool, although a room will not initiate a call for heat or cool unless it is below or above that individual’s room set point. Also note that for a cooling set point, only offices that are occupied **and** have initiated cooling with the push button **and** there’s a call for cooling from their space being too hot, will then be used in the averaging calculation.

For offices, the room temperatures are averaged with other offices on the same VRF zone, and that temperature average is used as the driving factor as it tries to maintain the average set point.

VRF shutdown-

Once the outside air temperatures are below a certain temperature the VRF system will not function, and the system will use hot water baseboard. In which case, each space will be able to maintain their own set point and not use shared averages. Currently the VRF shut off temperature is 20 degrees, but this will be evaluated to understand if this threshold temperature is the most efficient/cost effective mode to operate in.

Example #1: Someone enters room 314 and they pushed the button to get cooling. They like it to be 75 so they adjust their thermostat’s set point down to 75 degrees. The system reacts, goes into cooling mode, and uses that 75-degree set point as it tries to cool room 314 to 75 degrees. Someone enters room 313 but chooses not to push the push button for cooling. The system continues to cool room 314 to 75 degrees, regardless of the room temperature in 313. Later, the person in room 313 pushes the button for cooling but doesn’t like it as cool as 75-degrees, so they adjust their thermostat to 79-degrees. The system will now try to maintain a set point of 77-degrees and it will average the room temperatures of both spaces to determine a common room temperature.

Example #2: Someone enters room 314 and it’s 50 degrees outside. They like it to be 70 so they leave their thermostat alone. The system reacts and uses that 70-degree set point as it tries to heat room 314 to 70 degrees. Someone enters room 313 and their set point is at 72 degrees, the system will use a 71-degree set point and an average of both room temperatures will be used to determine a common room temperature.

Example #3: Someone enters room 314 and it’s 10 degrees outside. They like it to be 70 so they leave their thermostat alone. The system reacts and uses that 70-degree set point as it tries to heat room 314 to 70 degrees. Someone enters room 313 and their set point is at 72 degrees, the system will use a 72-degree set point as it tries to heat room 313 to 72 degrees.



Environmental information scrolls across the screen of all thermostats.
The cloud/sun icon on the thermostat indicate the outside air temperature.
No icon, indicates the room temperature.



Fan is operating

Occupancy Light

Occupancy Button

Set point Adjustment

Information button scrolls through unoccupied set points

Show temps in Celsius or Fahrenheit

Does not function (fan runs with occupancy)

Cooling button

Classrooms have two other parameters that scroll across the screen.

CO2 Levels



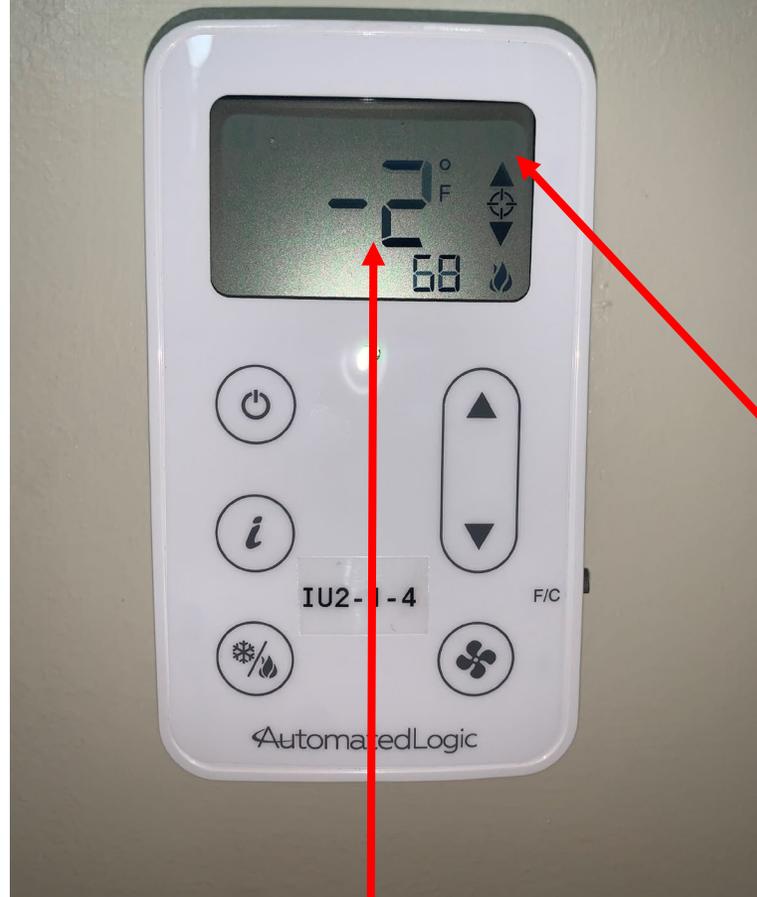
Indoor Humidity



Adjusting room set points



To adjust the set point for your space, first push the up or down button once. The current set point will be shown. Flame indicates heating and its set for 72. The green light indicates these are occupied set points.

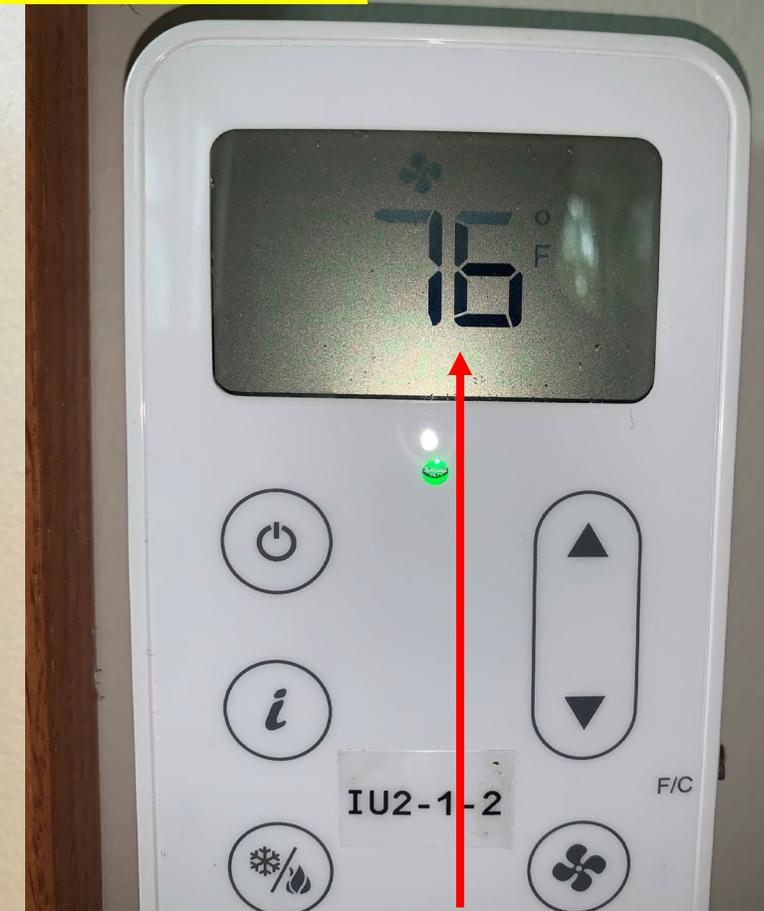


You can move your set point 2 degrees above/below the default of 70. Notice it is 2 degrees below set default.



Notice the other pictures were missing the cooling set point. Those units had not been put in cooling mode. Once in cooling mode, the heating and cooling set points will show. (Default for cooling is 77)

You must initiate a call for cooling in order to place a room in cool mode

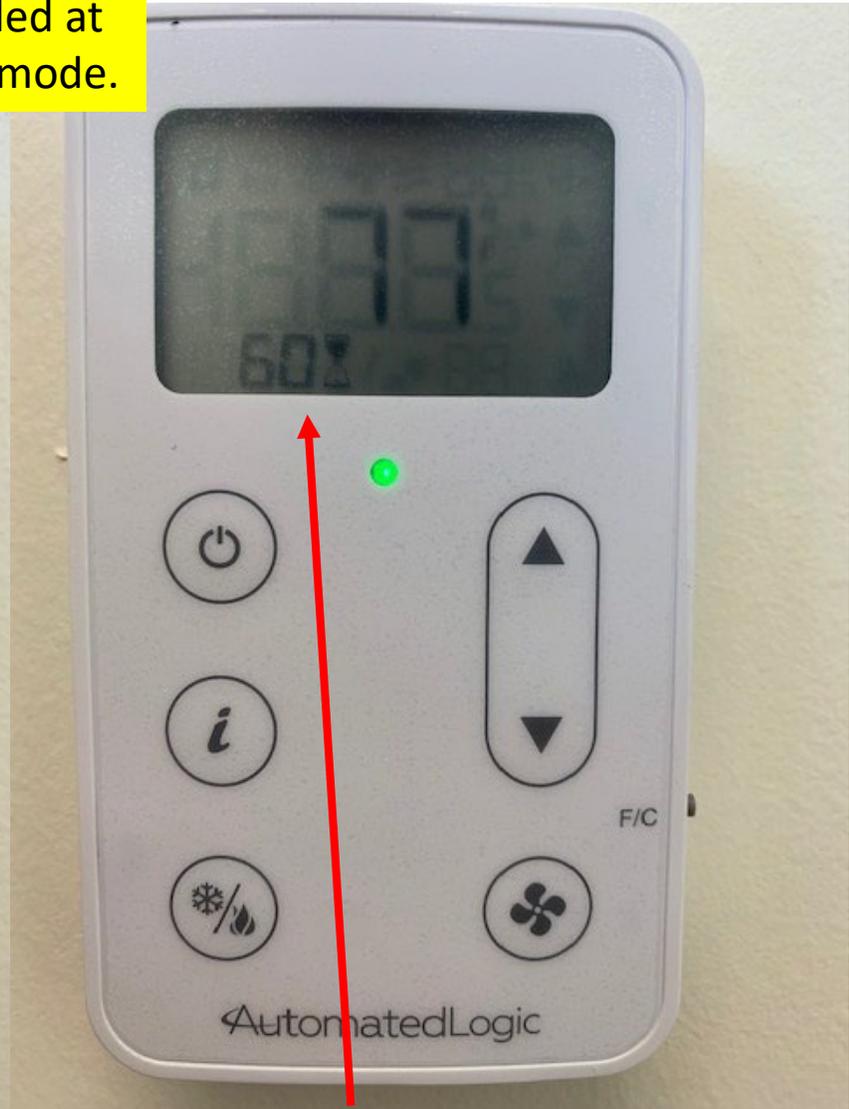
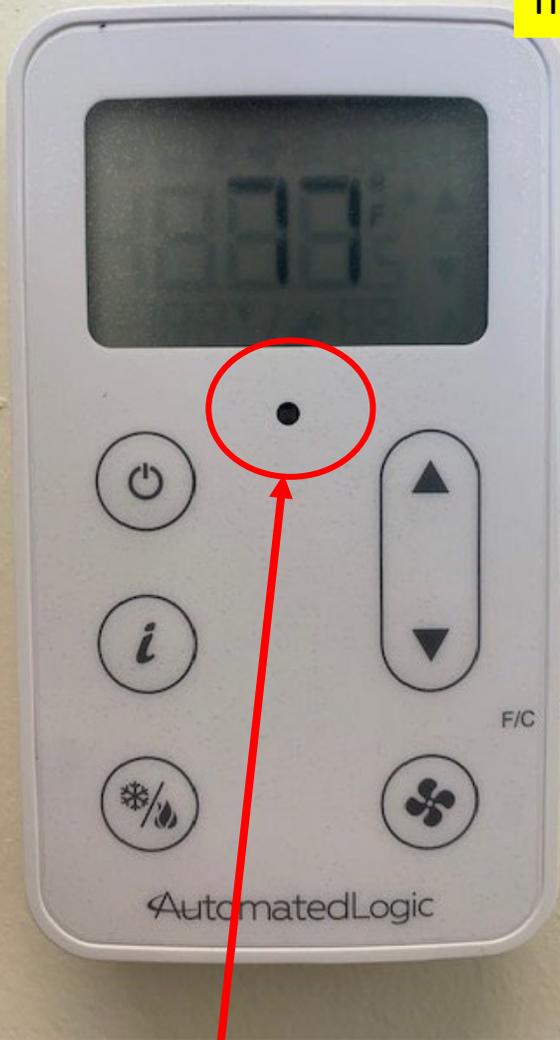


If the occupancy light is green, then you may use the cool button. The first push will have the words "fan only" scroll across the screen.

Push the button a second time and "cool on" will scroll across the screen. Only push the button twice, and then leave it alone.

After several seconds, the screen will revert to scrolling environmental information. Remember, 30 minutes after the room is vacant, the system will go to unoccupied mode and if entering the room later, you will need to push the cooling button again.

If the motion sensor for a space is broken or disabled at night, you can manually place a room in occupied mode.



Upon first entering, it takes just a few seconds for the green indicator light to come on.

If the green light does not come on, push this button once. The green light will turn on and a time of 60 will show on the screen.

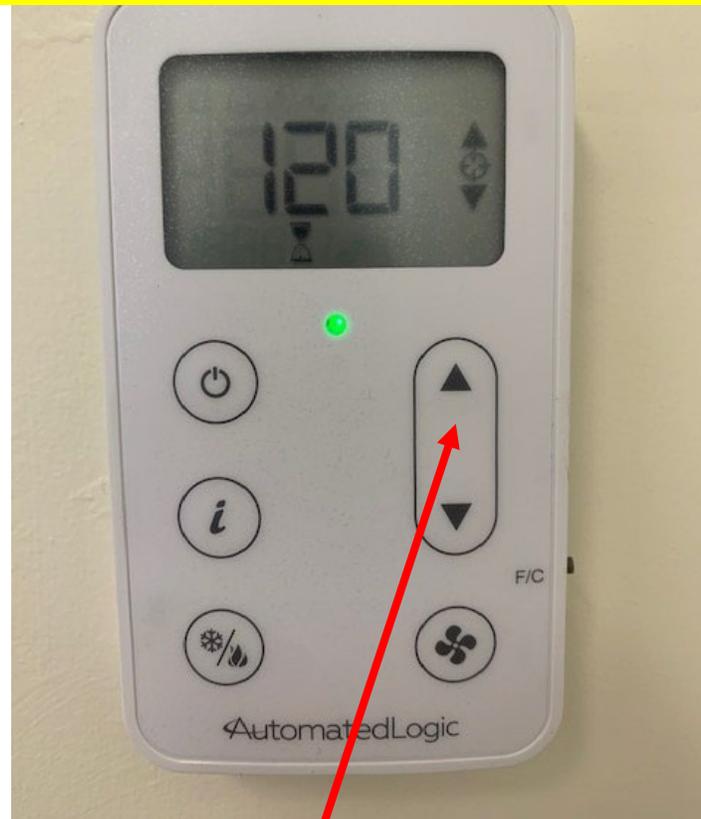
Do not push any more buttons and the room temperature will show again along with how many minutes you will have left for occupancy mode.

To adjust the amount of occupied time for a manually initiated occupied mode

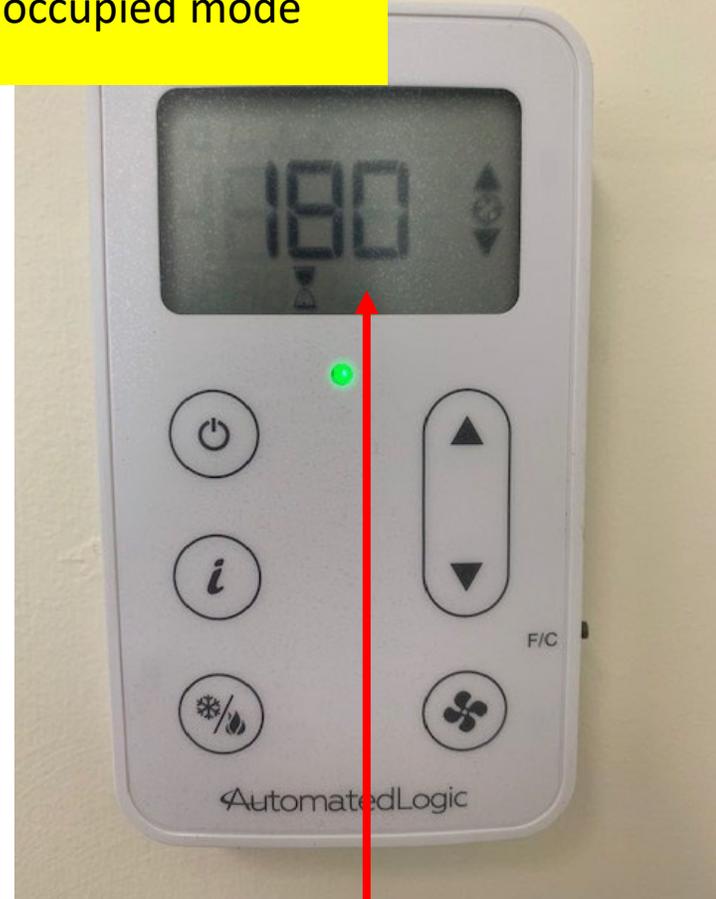
(Only used if you had to manually put in occupied mode)



If you want to stop occupied mode, push a second time and "0" will show, which puts the time to zero minutes and the system will revert to unoccupied mode.



If there is a desire to keep the system running for longer than 60 minutes, after the initial push, then use the up/down arrows. Time will increment/decrement by 60 minutes.



180-minutes will be the most at one time. Stop pushing buttons when you have the time that you wish, and the system will revert to the room temperature and begin the timed countdown.

Colors indicate zones of the VRF system that serve offices/classrooms/common spaces/hallways.
(Example: Rooms 111 & 112 is a zone and rooms 014, 015, and 016 is a zone.)

NOTE: Floors are separated so like colors on different floors do not mean that they are grouped together.

