USER'S GUIDE

CERV2 Touchscreen Interface

Integrated & Remote Controller

MADE IN AMERICA
MANUFACTURED WITH SOLAR ENERGY

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Rev 2.0 - 06/11/2025

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Controller Overview

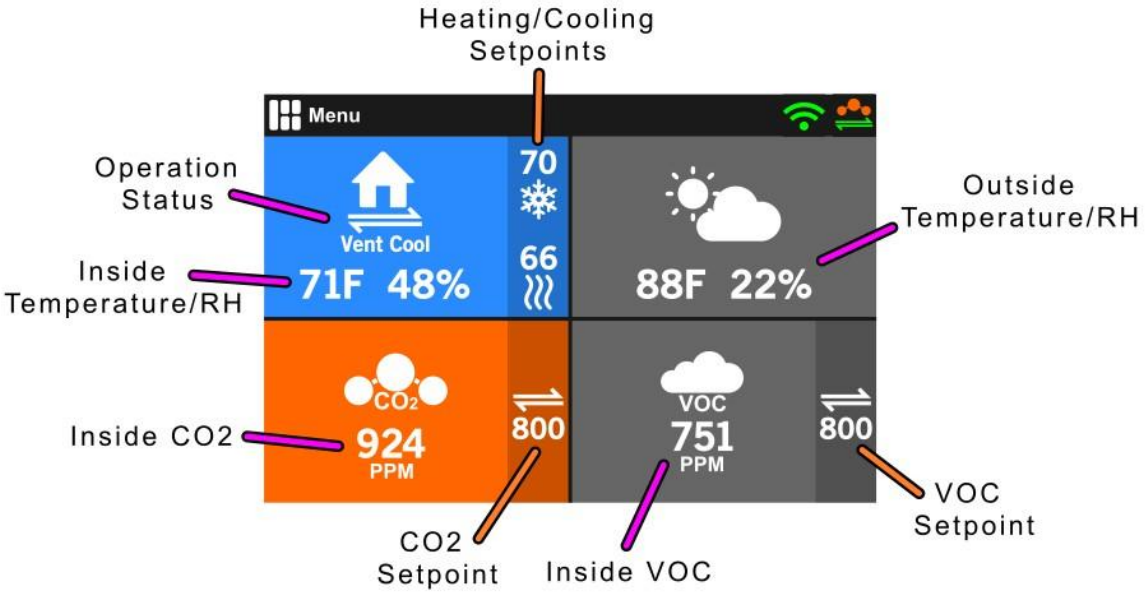
The CERV's integrated touchscreen interface and optional wireless touchscreen controller puts control of your indoor air quality literally into your hands, providing a gateway to the most advanced air quality management system available today. While the CERV uses complex algorithms and computations to optimize your indoor air quality, the touchscreen interface was built to be simple, easy to read, and intuitive. From the controller, you can easily view real time air quality and comfort conditions in your home and configure the CERV's settings or auxiliary devices. This guide serves as a reference to allow you to maximize your understanding of how to configure the CERV to serve you best. Refer to the CERV Operation Manual for more information on the CERV's system components, modes of operation, and recommended settings.

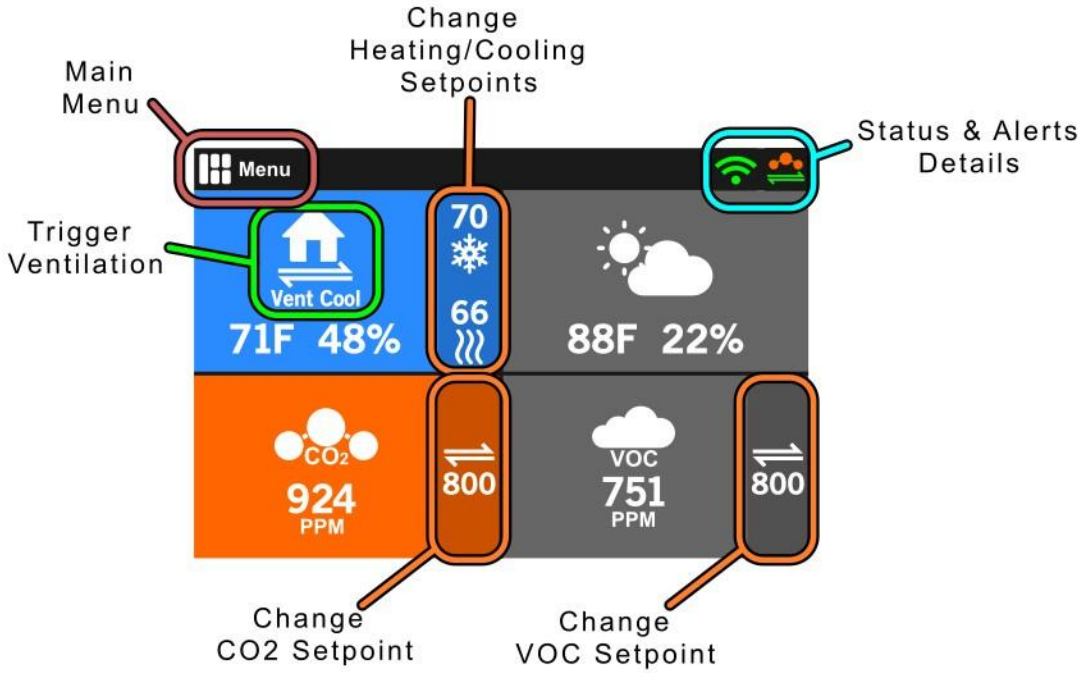
Contents

Home Screen

Overview:

The Home Screen displays the current temperature, relative humidity, CO2, VOC, and status of the CERV. It additionally provides quick access to other screens, such as Heating, Cooling, and Air Quality Setpoints, Trigger Ventilation, Status and Alerts, and the Main Menu.





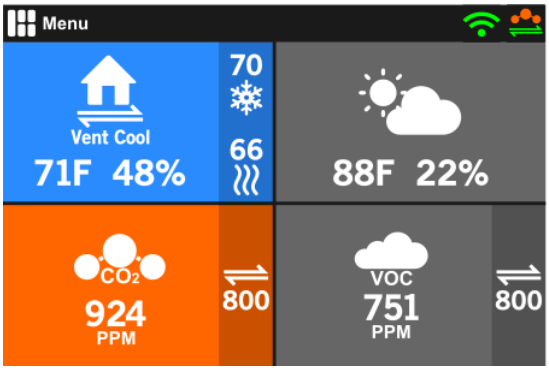
Depending on the installed system add-ons (such as the Particulate Defense option or Outdoor VOC Defense option), your home screen may appear slightly different. More information on those can be found in their respective sections further in this document.

The background color of the quadrants, along with some of the icons, will change depending on the CERV's current operating mode. The possible modes are:

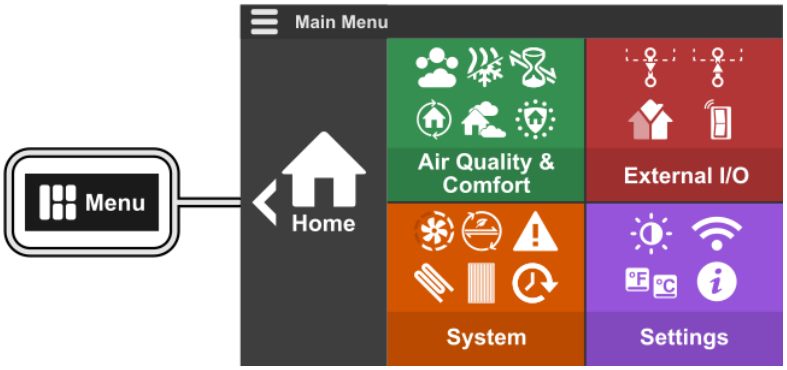
- **Assess** – The CERV is recirculating air throughout the house in order to obtain current readings of the home's overall health and comfort. If the CERV is within all setpoints and does not need to ventilate, heat, or cool, it will revert to its standby "Energy Saver" mode, or Air Purification mode (if enabled). Assessment is 2 minutes in duration and time between assessments depends on the Assessment Interval (section below).
- **Vent Heat, Vent Cool, Ventilation** – The CERV will ventilate the home for various reasons. The CO2/VOC levels may have risen above setpoint, a wireless ventilation switch was triggered, a timed ventilation event may have been started, or the CERV may be using outside air to heat or cool the home. If the home is within the heating and cooling setpoints, but the CERV is ventilating, the home quadrant will be green and the current Mode will show Ventilation. The quadrant may be red or blue if the CERV is heating or cooling while in ventilation mode.
- **Recirc Heat, Recirc Cool** – If ventilation is not needed, but the inside temperature is outside the bounds of your heating or cooling setpoint, the CERV will go into a recirculation heating or cooling mode. The home quadrant will appear red or blue depending on heating or cooling mode.
- **Air Purify** – *Previously known as Recirculation.* When the CERV does not need to heat, cool, or ventilate, instead of entering Energy Saver mode, it can continue to recirculate air using the indoor fan, helping to provide additional filtration and air purification using its integrated high efficiency filters and CERV-UV Ultraviolet Air Sanitization option.
- **Energy Saver** – The CERV has determined that the air quality is acceptable and the inside temperature is satisfactory. It will conserve energy by turning off the fans and heat pump. The screen will be gray while in this standby mode. The CERV fans will come on periodically for the assessment period.

Other Notes:
The colors of the CO2 and VOC quadrants (bottom left and bottom right) indicate when the CERV detects high levels of pollutants which require ventilation. These quadrants will change from gray to orange when the CO2 or VOC levels go above their respective setpoints (found on the right side of those quadrants).

HOME SCREEN



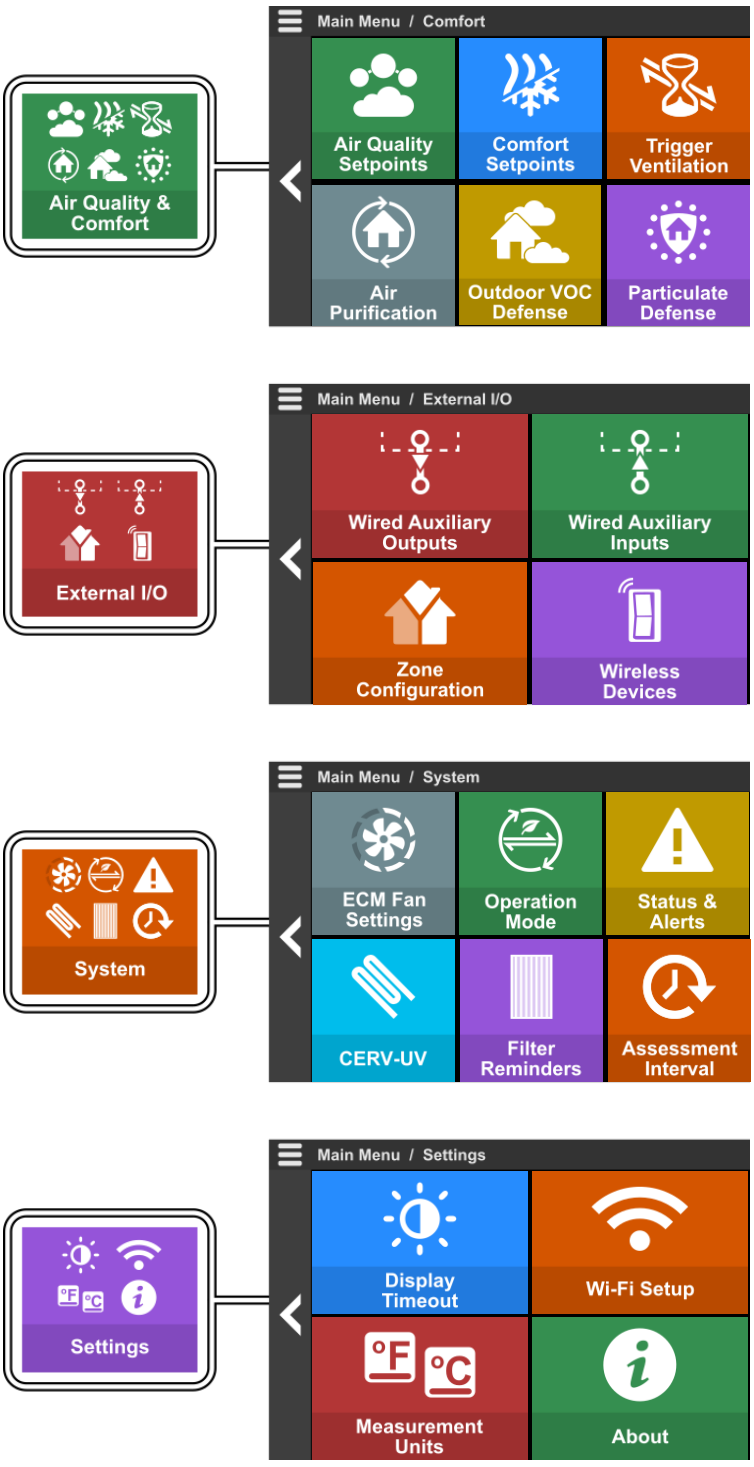
MAIN MENU



The CERV's Main Menu allows the user to configure the system for their home, from IAQ Setpoints to External Devices.

Main Menu

The following figure shows how each section of the main menu breaks out into configuration screens. For the digital version of this document, the buttons below are clickable and will take you to the applicable section (note: Chrome for Android may not allow internal links).

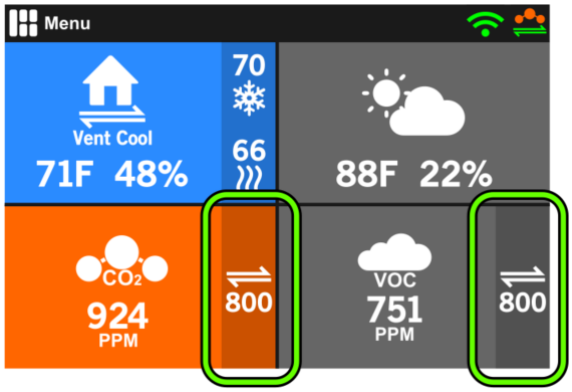


Air Quality Setpoints

Return to Main Menu

The CERV constantly monitors both CO2 and VOC levels (with independent sensors), allowing it to control ventilation based on air quality setpoints. When the CO2 or VOC levels rise above their setpoints, the CERV will ventilate with fresh air until the air quality is acceptable again.

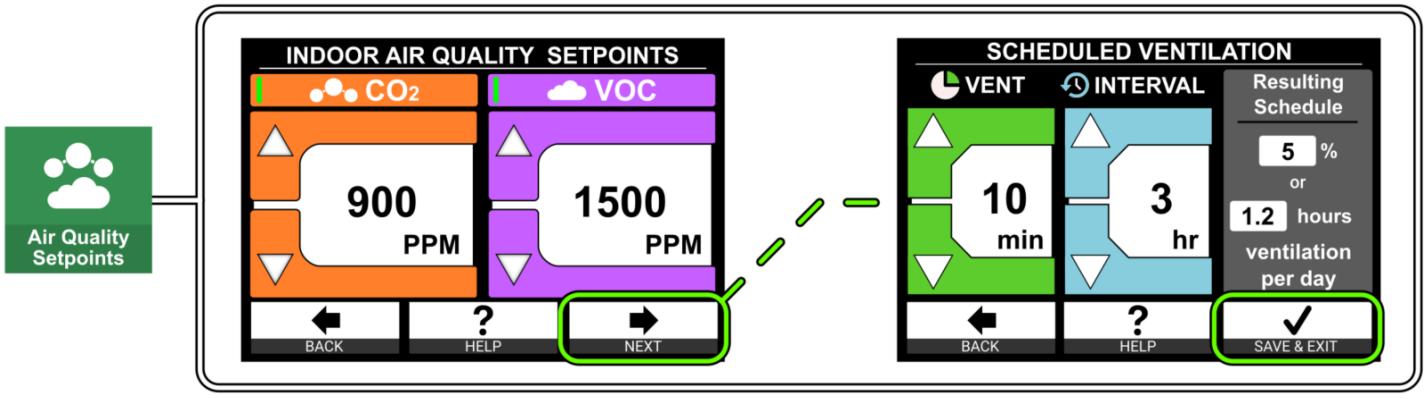
Home Screen & Status Icons



In addition to the main menu, the home screen features shortcuts (highlighted in green) to configure the air quality setpoints.

When ventilation is needed due to CO2 or VOC setpoints, their respective quadrants on the home screen will be colored orange. Additionally, the top right Status and Alerts bar will show their corresponding icons (From left to right, ventilation due to CO2, VOC, and Scheduled Ventilation).

Configuration Screen



Indoor Air Quality Setpoints:

The CERV's CO2 setpoint and VOC setpoint can be configured independently, allowing for greater control of indoor air quality. The button above both CO2 and VOC setpoints can be toggled to enable or disable that setpoint. If the setpoint is disabled, the CERV will not use that parameter for indoor air quality control (it will still measure and report the sensor reading).

Scheduled Ventilation:
Scheduled Ventilation allows the CERV to set a minimum amount of ventilation (even if IAQ sensors do not call for ventilation). If the CERV is ventilating due to other sources (CO2, VOC, wireless switches, etc.) these may count as time credit towards this scheduled vent period.

Recommendations

Studies have shown that levels above 1000PPM can indicate that a home may have detectable odors as well as negative effects on productivity, alertness, and general comfort. In some rare cases, outside air may be more polluted than the air inside your home. In this case bringing in outside air will increase the pollution level inside, rather than decrease it. This could be due to neighbors burning leaves, wood burning stoves, etc. In this type of situation, you may choose to disable the CERV's affected CO2 or VOC sensor until the situation is resolved. Alternatively, consider the Particulate Defense option or Outdoor VOC Defense option to automatically prevent this type of negative feedback loop.

Both CO2 and VOC setpoints include a 100ppm deadband. For example: if the CO2 setpoint is 900ppm, and the indoor CO2 rises above 900ppm, it will ventilate until the CO2 sensor reads 800ppm. The CO2 may then drift back up to 900ppm before starting to ventilate again.

While the CO2 and VOC sensors in the CERV generally detect most air quality issues, in some cases occupants may detect odors that the system may not. As a supplement to the normal on-demand ventilation using the internal sensors, Scheduled Ventilation can be set to provide a fixed amount of fresh air regardless of the IAQ levels detected by the CERV.

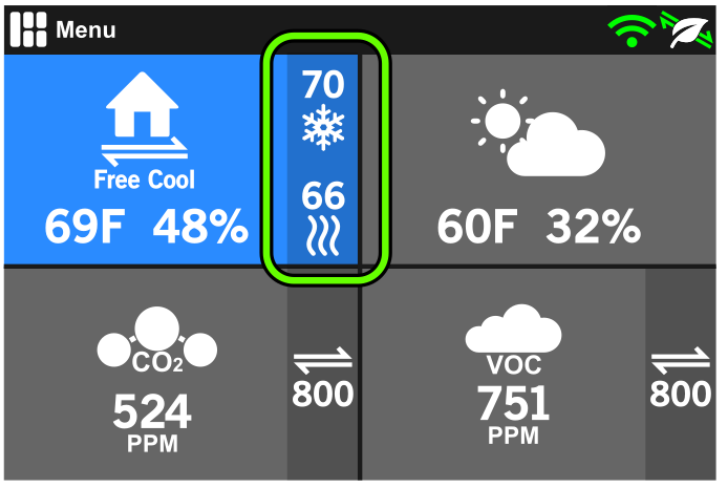
Comfort Setpoints

Return to Main Menu

In addition to managing air quality, the CERV can use its integrated heat pump to exchange energy (like an ERV/HRV) and provide supplemental heating and cooling when ventilation is not needed. The Heating and Cooling setpoints function just like a standard thermostat's setpoints.

Additionally, the CERV can detect when the outside conditions are beneficial for its Free Cooling Economizer (ventilation without energy exchange).

Home Screen & Status Icons

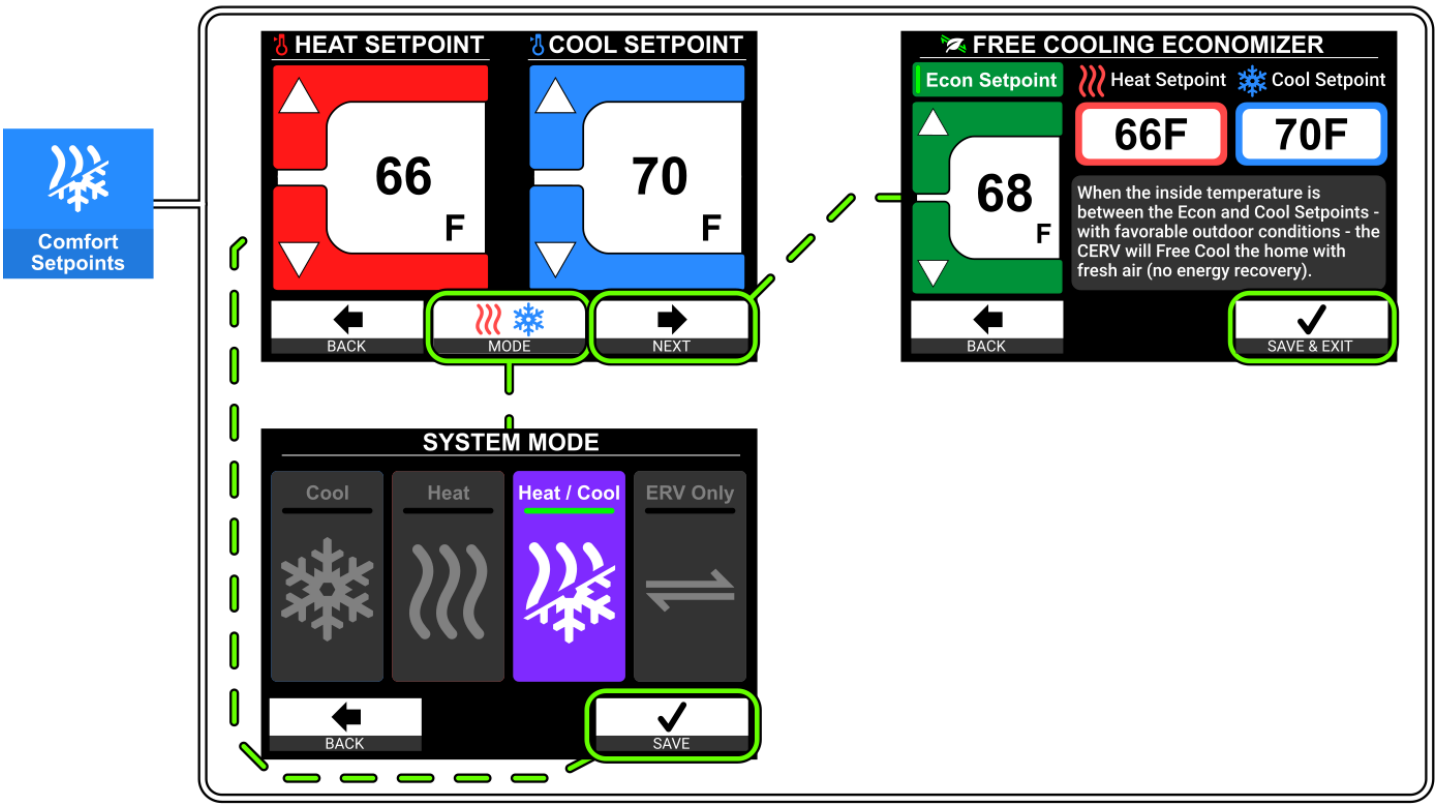


In addition to the main menu, the home screen features a shortcut (highlighted in green) to configure the Comfort Setpoints.

When the system is heating or cooling due to the comfort setpoints, the top left quadrant of the home screen will be colored red or blue.

When Free Cooling Economizer is active, the top left quadrant of the home screen will display the text: "Free Cool" and the Status & Alerts will show the Free Cooling Economizer status icon (below).

Configuration Screen



Heat & Cool Setpoints:

By default, the system is configured for Heat / Cool (Dual Setpoint) Mode. This allows the user to set both heating and cooling setpoints – when the indoor temperature rises above the Cool Setpoint, the CERV will use the heat pump to cool, and vice versa for the Heat Setpoint. If the indoor temperature is between the two setpoint values, the system will only use the heat pump to recover energy while ventilating.

Note: To prevent frequent cycling between heating and cooling modes, a separation of 2 degrees between Heat and Cool setpoints exists. The setpoints contain a +/- 1 degree deadband – for example: if the cooling setpoint is 70 degrees, the CERV will start cooling once the indoor temperature reaches 71 degrees, and cool until the indoor temperature is lowered to 69 degrees. The indoor temperature may then drift back up to 71 degrees before cooling again.

System Mode:

Cool: Cool Setpoint is enabled, Heat Setpoint is disabled. The system will cool (Recirc or Vent) if indoor temperature rises above the Cool Setpoint.

Heat: Heat Setpoint is enabled, Cool Setpoint is disabled. The system will heat (Recirc or Vent) if indoor temperature falls below the Heat Setpoint.

Heat / Cool: Both Heat and Cool Setpoints enabled (see logic above). If the indoor temperature is between the two setpoint values, the system will only use the heat pump to recover energy while ventilating.

ERV Only: Both Heat and Cool Setpoints are disabled. The system will only use the heat pump to recover energy while ventilating.

Free Cooling Economizer:

The Free Cooling Economizer is a feature that allows the CERV to take advantage of cooler night time temperatures in the summer and swing seasons. By ventilating with fresh air (without exchanging energy) the CERV can help cool the home. The CERV monitors the indoor and outdoor temperatures and relative humidities to ensure that it does not increase your home's humidity when it brings in the cooler outside air.

Econ Setpoint for Heat or ERV Only System Modes

The Econ Setpoint is configured as a set temperature value. If outdoor conditions are beneficial for Free Cooling, and the inside temperature is between the Econ Setpoint and Cool Setpoint, the system will allow Free Cooling. The setpoint may be turned on or off by toggling the button above the up/down arrows.

Recommendations

Configuration for the comfort settings can vary from household to household and user preferences. When setting heat/cool setpoints, be aware of how other heating and cooling systems in the home may be configured (for example, ductless heat pumps, radiant, etc.). Generally, if other systems are in use, the CERV's heat/cool setpoints may be set in a similar manner. The CERV's temperature and indoor air quality sensors are all located within the unit, so the return air temperature is often a representation of the overall home conditions (as opposed to temperature in a specific room).

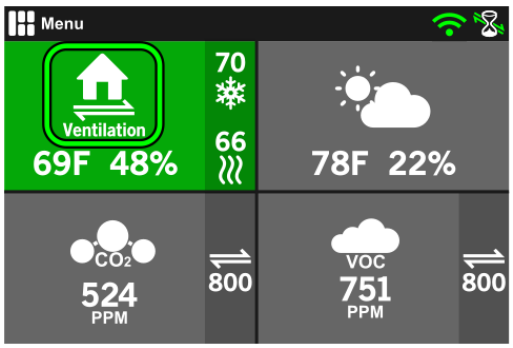
Alternatively, if supplemental heating and cooling by the CERV is not desired, the ERV Only mode can be used to configure the CERV more like a traditional ERV/HRV system. This setting will ensure that the CERV is only using its heat pump to exchange energy when necessary. ERV Only mode also permits the Free Cooling Economizer, if needed.

Trigger Ventilation

Return to Main Menu

The Triggered Ventilation feature allows you to immediately trigger a ventilation event for a set amount of time, regardless of IAQ sensors or external devices. This can be useful, for example, to preemptively begin ventilating before pollutants or moisture have had time to make their way to the CERV's internal sensors.

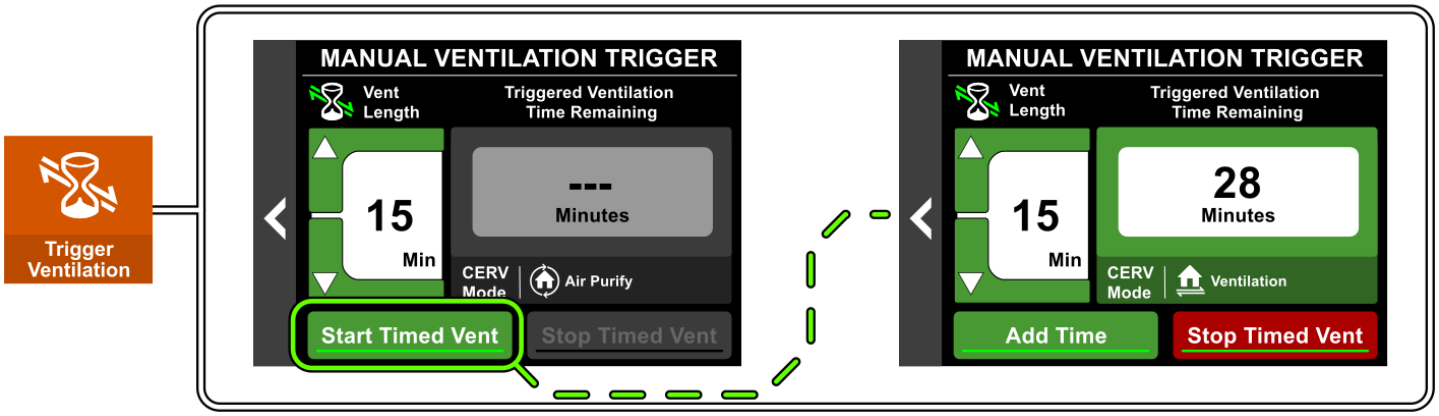
Home Screen & Status Icons



In addition to the main menu, the home screen features a shortcut (highlighted in green) to trigger ventilation.

When ventilation is manually triggered, the home screen's Status & Alerts will show the following icon:

Configuration Screen



Start Timed Event:

Select the desired amount of time to ventilate, and then press Start Timed Vent. The CERV will immediately begin to ventilate, and the remaining time will update on the screen.

Add Time: When a timed ventilation event is already occurring, additional time may be added to the countdown.

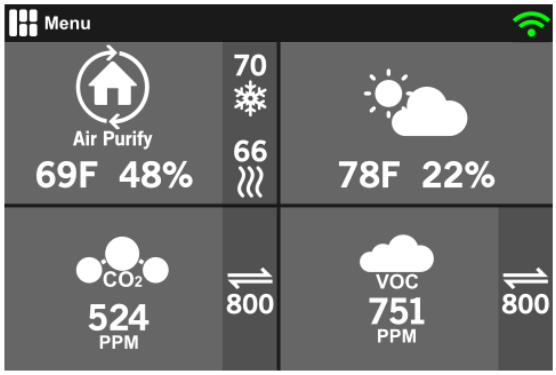
Stop Timed Vent: Cancel the timed ventilation event, and resume the previous mode of operation.

Air Purification

Return to Main Menu

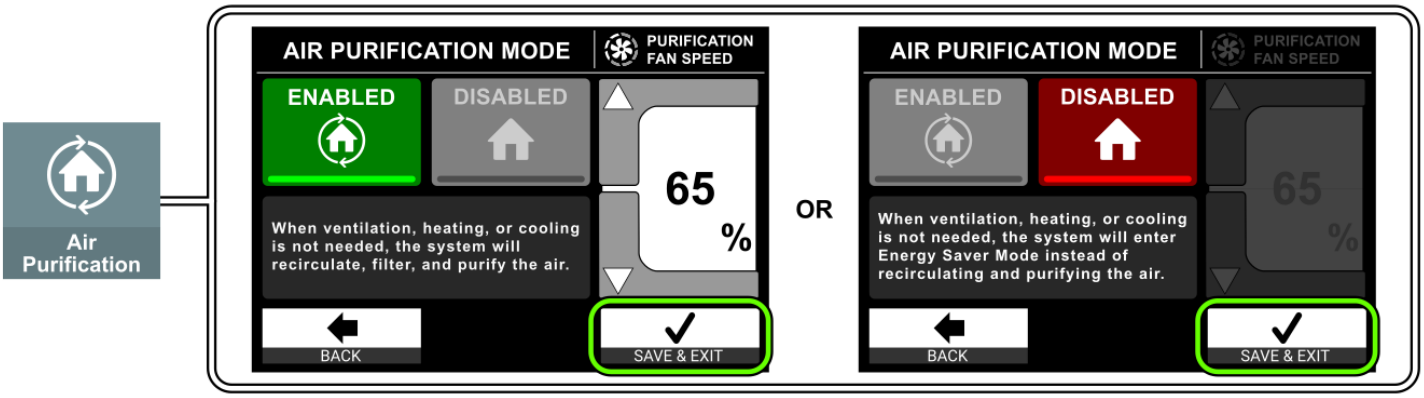
If the CERV does not need to heat, cool, or ventilate: instead of entering Energy Saver mode the CERV can continue to recirculate air throughout the home, helping to provide additional filtration and air purification using its integrated high efficiency filters and CERV-UV Ultraviolet Air Sanitization option. In Air Purification mode, only the indoor supply fan remains on.

Home Screen Status



When Air Purification Mode is active, the CERV's Home Screen will display "Air Purify" (top left quadrant), and show a recirculating symbol around the house icon.

Configuration Screen



Enabled: When ventilation, heating, and cooling is not needed, the system will recirculate, filter, and purify the air.

Disabled: When ventilation, heating, and cooling is not needed, the system will enter Energy Saver Mode instead of recirculating and purifying the air.

Purification Fan Speed: Fan speed setting to use when the CERV is in Air Purify mode. This will typically be around (or slightly lower) than the Normal Operation fan speed.

Recommendations

Recirculation and filtering the air in Air Purification Mode can be an incredibly useful tool to help remove particulates from the air. Build Equinox recommends to set Air Purification Mode to Enabled.

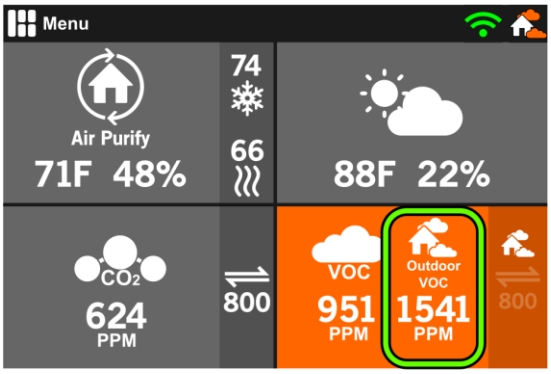
Outdoor VOC Defense

Return to Main Menu

The Outdoor VOC Defense option allows the CERV to measure VOC levels in the fresh air entering the CERV from outside. An Outdoor VOC Prevention function can be set by the user to allow the CERV to disable ventilation during times when the outside VOC level is higher than inside. This is especially useful in locations where wildfires or other outside pollutants are a concern. When outdoor VOCs rise above the CERV's VOC setpoint, the CERV can run with restricted ventilation based on options selected in the configuration screen.

Note: After powering the CERV, the VOC sensor takes approximately 15 minutes to warm-up. During this period, the sensor will read 400ppm.

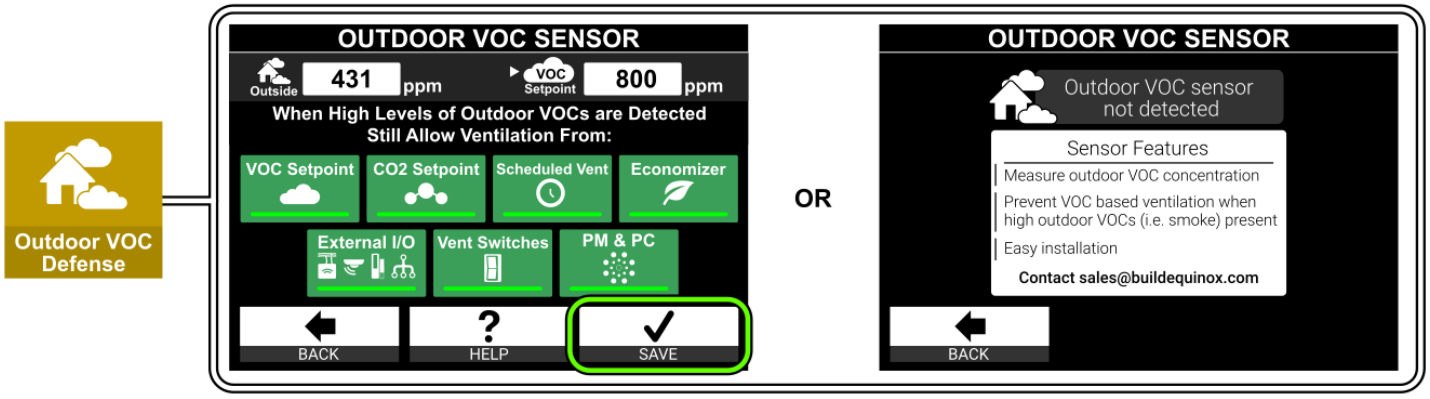
Home Screen & Status Icons



In addition to the main menu, the home screen features a shortcut (highlighted in green) to configure the Outdoor VOC Sensor. When Outside VOC Defense occurs, the system will run in Air Purify mode, filtering and recirculating the air inside the home. The CERV's home screen Status & Alerts will display the High Outdoor VOC icon, as shown below.

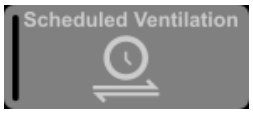
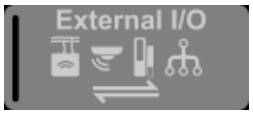
If ventilation is restricted due to the high outdoor VOCs (in the case above, VOC Setpoint is disabled during high outdoor VOC events), the icon will show above the disabled setpoint.

Configuration Screen



Outdoor VOC Defense Control Options

When outdoor VOCs rise above the CERV's VOC setpoint (outdoor air is polluted):

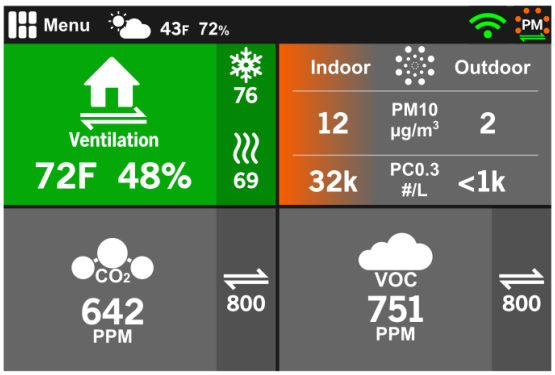
	CERV still ventilates to keep indoor VOCs below setpoint. Remote VOC sensors can still trigger Ventilation.
	Prevent ventilation due to high indoor VOC levels. Remote VOC sensors do not trigger Ventilation.
	CERV still ventilates to keep indoor CO2 below setpoint. Remote CO2 sensors can trigger Ventilation.
	Prevent ventilation due to high indoor CO2 levels. Remote CO2 sensors do not trigger Ventilation.
	A ventilation schedule (ex. vent 10 min every hour) still allows the CERV to vent periodically.
	Even with a ventilation schedule configured, the CERV will not ventilate.
	If outdoor temperature and relative humidity are beneficial, the CERV may ventilate to help heat or cool.
	The CERV will not ventilate to help boost heating or cooling.
	Status Monitors (ACT, motion detectors, etc), auxiliary inputs, and remote RH sensors may still trigger ventilation. If these devices are used for bathroom ventilation, it is recommended to keep this enabled.
	Status Monitors (ACT, motion detectors, etc), auxiliary inputs, and remote RH sensors will not trigger ventilation.
	Wireless Ventilation Switches may still be used to trigger the CERV to ventilate. If these devices are used for bathroom ventilation, it is recommended to keep this enabled.
	Wireless Ventilation Switches will not trigger ventilation when pressed.
	Indoor Particulate Sensor (Particulate Defense Option) may be used to trigger the CERV to ventilate.
	Indoor Particulate Sensor (Particulate Defense Option) will not be used to trigger the CERV to ventilate.

Particulate Defense

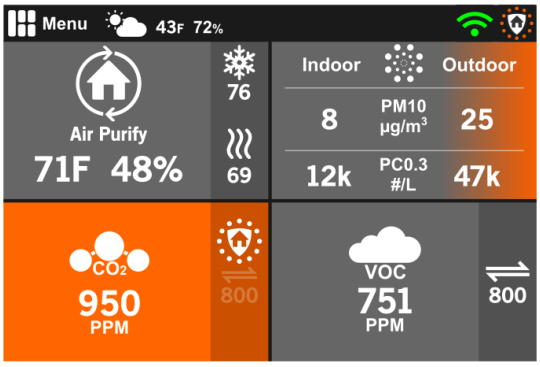
Return to Main Menu

The Particulate Defense option for the CERV is designed to actively monitor and respond to airborne particulate levels in both indoor and outdoor environments. By utilizing high-precision sensors, the system continuously measures particulate concentrations in the airstreams, allowing it to intelligently adapt its ventilation and filtration operation to maintain optimal indoor air quality.

Home Screen & Status Icons

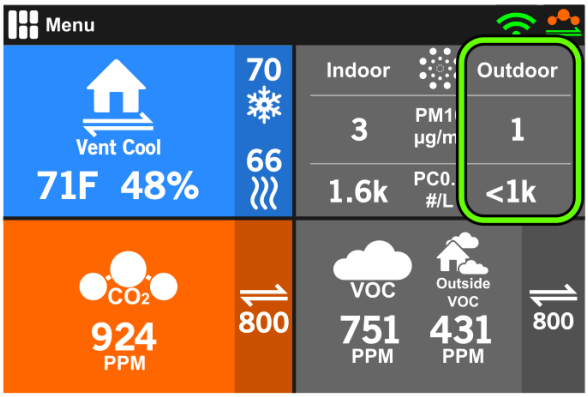


When indoor particulate levels exceed **10 µg/m³ in mass (PM10) or 40,000 particles per liter in count (PC0.3)** - thresholds identified as poor indoor air quality (IAQ) by Build Equinox's standards - the CERV activates ventilation mode. The following status icons will appear in the status bar at the top right corner of the Home Screen to indicate ventilation due to elevated inside PM or PC. The left side of the particulate data quadrant will also turn orange during this time.



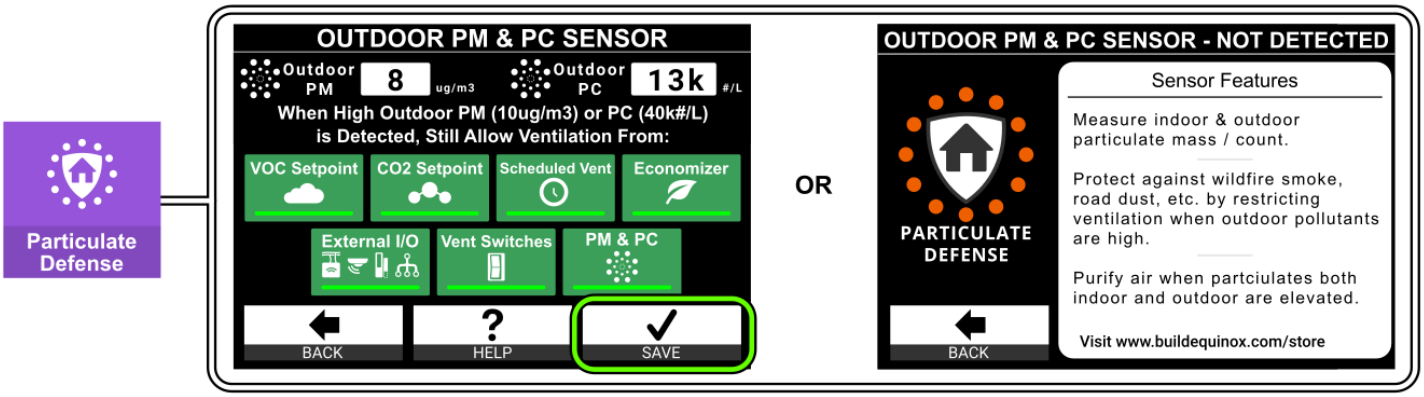
If outdoor particulate levels elevate above these same **10 µg/m³** and **40,000 #/L** limits, the CERV will enter Particular Defense Mode, and use air purification to recirculate indoor air over its high-efficiency filters to remove the particulates. When this is active, the Status & Alerts bar will show the Particulate Defense icon, shown below.

If ventilation is restricted due to the high outdoor particulates (in the case above, CO2 Setpoint is disabled during high outdoor particulate events), the icon will show above the disabled setpoint.



In addition to the main menu, the home screen features a shortcut (highlighted in green) to configure the Outdoor Particulate Defense functionality.

Configuration Screen



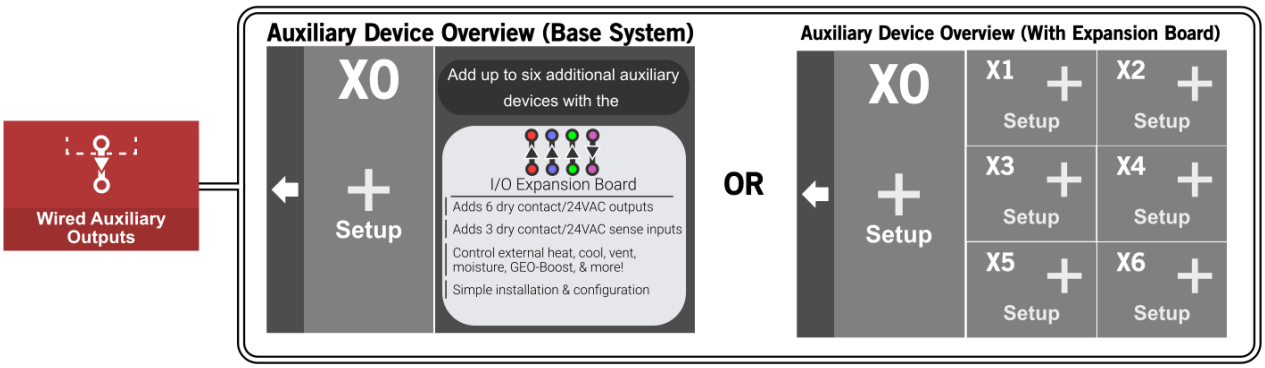
Particulate Defense Control Options

The configuration for Particulate Defense is nearly identical to that of the Outdoor VOC Defense section. Options that are left enabled will still be used as ventilation triggers for the CERV when outdoor particulates are elevated.

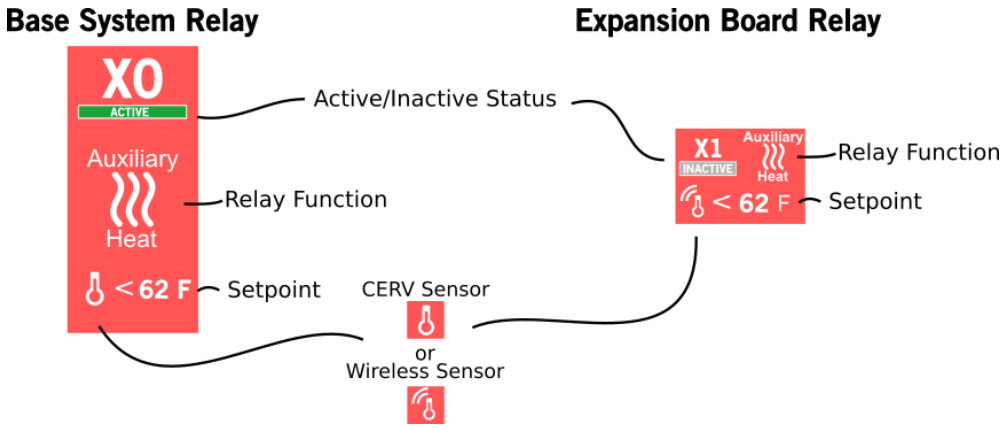
Wired Auxiliary Outputs

Return to Main Menu

The CERV can control external auxiliary devices with different functions through its built in Auxiliary Relay Output, or optional Expansion Board. The base system's Auxiliary Relay is identified as X0, while the optional expansion board (if applicable) identifies as X1-X6.

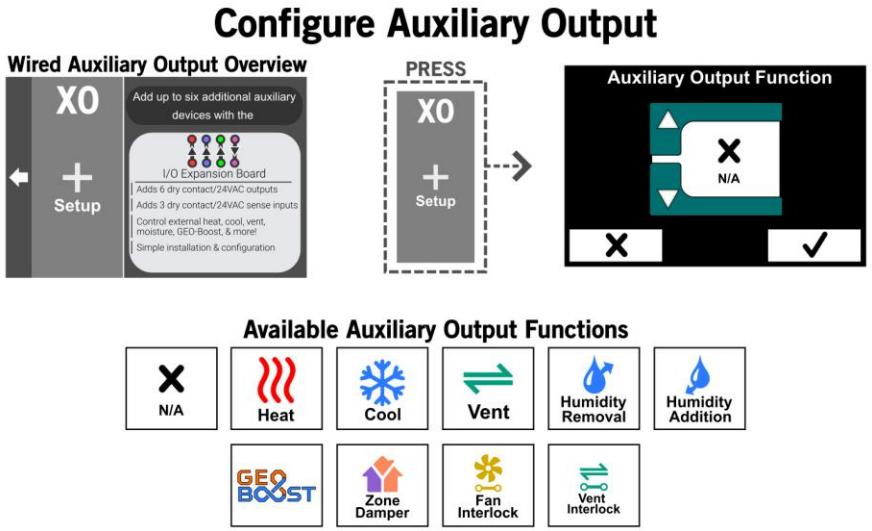


Once an output is configured, the Auxiliary Output Overview will display the current configuration and status of any configured auxiliary outputs. The diagram below details the information shown for each device.

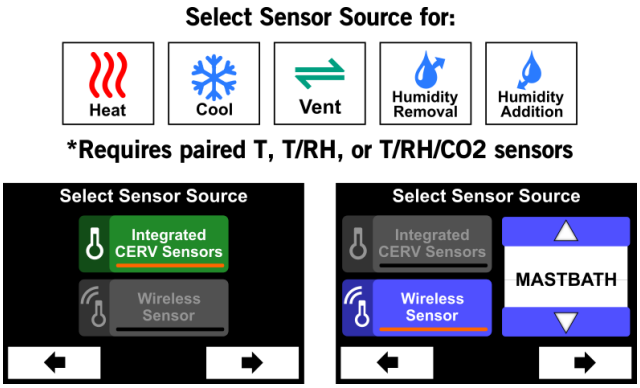


Configuration:

To set up a new auxiliary output, simply tap on the button corresponding to the desired device. Similarly, if you wish to change the configuration of an existing device, just tap the device.



For some of the auxiliary output functions, you may wish to link the device to a wireless temperature, temperature/RH, or temperature/RH/CO2 sensor instead of the CERV's built in sensors. If there are no wireless sensors paired with the CERV, the wireless relay will automatically be configured to use the CERV's built in sensors.

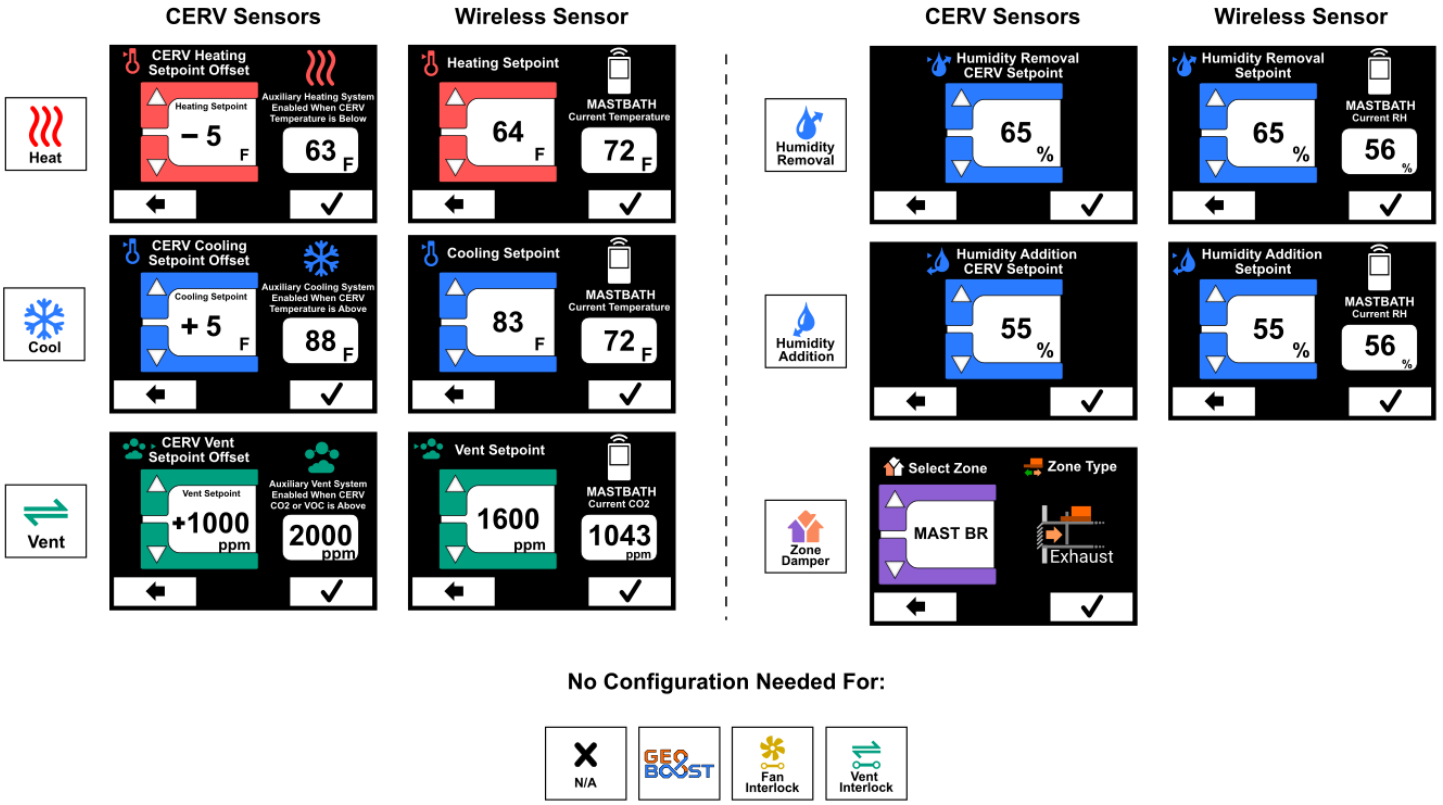


When the Integrated CERV Sensors option is chosen for heating, cooling, or ventilation, the "activation" setpoint for the device is chosen as an offset from the CERV's current heating, cooling, or ventilation setpoint. Consider the following example: Your CERV is configured with a heating setpoint of 65, cooling setpoint of 75, and ventilation setpoint of 1000ppm.

- A **heating device** with offset of -2 would activate when the CERV is heating and the indoor temperature drops below 63
- A **heating device** with offset of 0 would activate whenever the CERV is heating
- A **cooling device** with offset of +2 would activate when the CERV is cooling and the indoor temperature rises above 77
- A **cooling device** with offset of 0 would activate whenever the CERV is cooling
- A **ventilation device** with offset of +100 would activate when the CERV is ventilating and the CO2/VOCs rise above 1100
- A **ventilation device** with offset of 0 would activate whenever the CERV is ventilating

Alternately, if the Wireless Sensor option is chosen, the "activation" setpoint for the device will be a distinct value, independent of the CERV's current mode and setpoints. Care should be taken, therefore, to ensure that setpoints are chosen in a way that does not result in conflicts between the CERV's heating/cooling/ventilation operation and the external devices (i.e. CERV is heating, while a remote device is cooling). When the Wireless Sensor option is used, the sensor's name and current reading will appear to the right of the setpoint selection area.

Auxiliary Output Configuration Settings



No Configuration Needed For:

The Zone Damper configuration consists of selecting the zone you would like to control with this device. If no zones have been configured yet, a button will appear which will take you to the Zone Configuration screen.

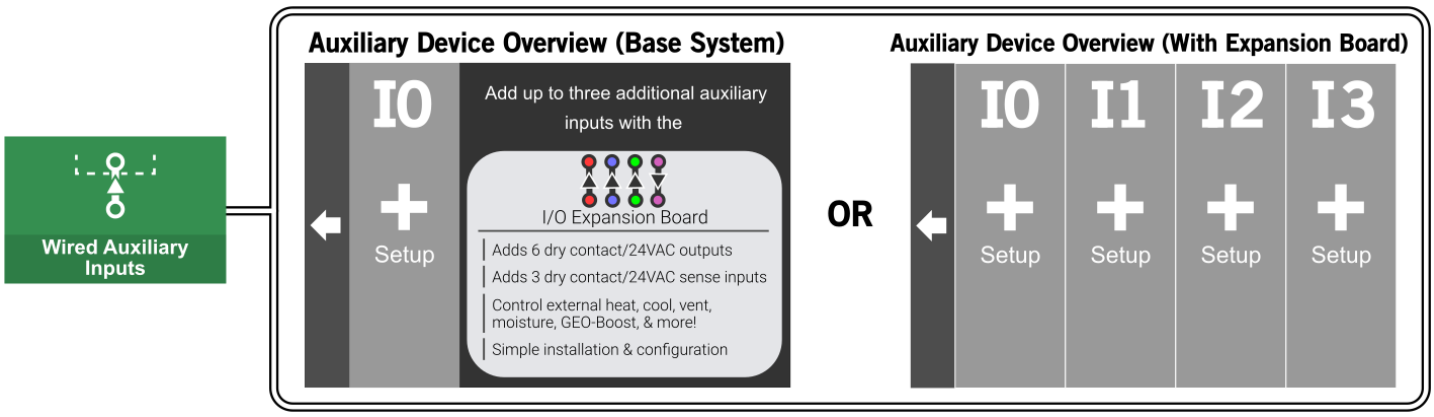
When the Geo Boost, Fan Interlock, and Vent Interlock options are chosen, no setpoint configuration is needed. The Geo Boost uses the CERV's internal temperature sensors to determine the most beneficial conditions to enable or disable the glycol pump. Fan Interlock enables the relay whenever the fans of the CERV are operating. Vent Interlock enables the relay whenever the CERV is in any kind of ventilation mode (Vent Heat, Vent Cool, Free Cool Economizer, etc.)

Unless otherwise stated, the CERV Installation Manual should be used for installing any auxiliary device.

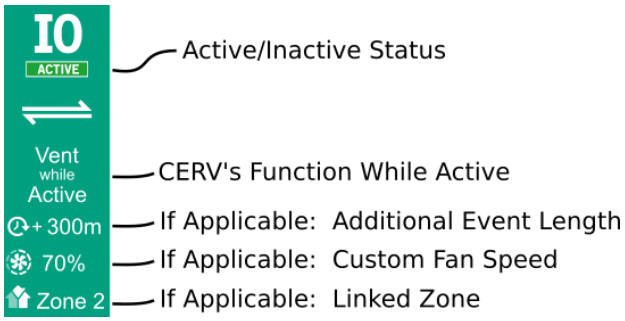
Wired Auxiliary Inputs

Return to Main Menu

The Wired Auxiliary Input option allows an external device to influence the function of the CERV through either a 24VAC input or dry contact. **NOTE: 24VAC/DRY CONTACT selection is configured with the small slide switch on the left side of the control board under the front plastic cover. All wiring should be done with the CERV's power cord disconnected from mains.** Once the control wiring is complete, the input can be configured as follows.

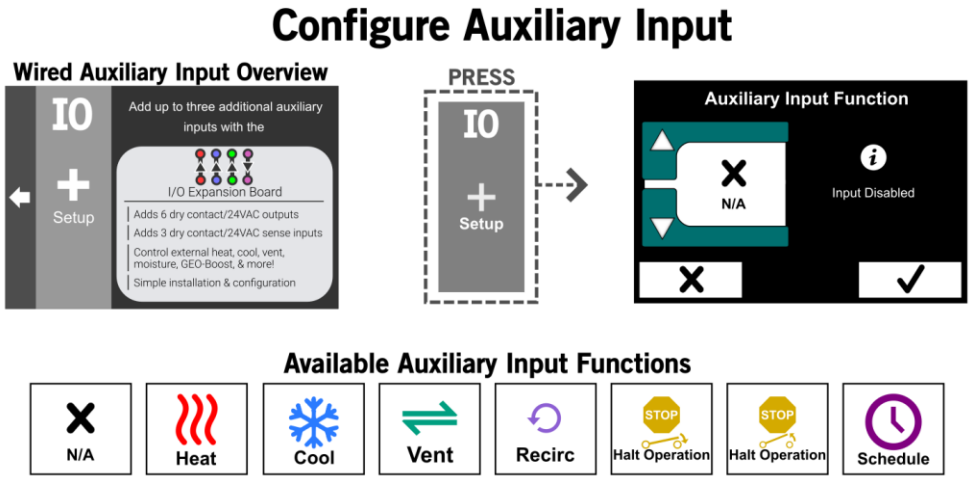


Once an input is configured, the Auxiliary Input Overview will display the current configuration and status of any configured auxiliary inputs. The diagram below details the information shown for each device.



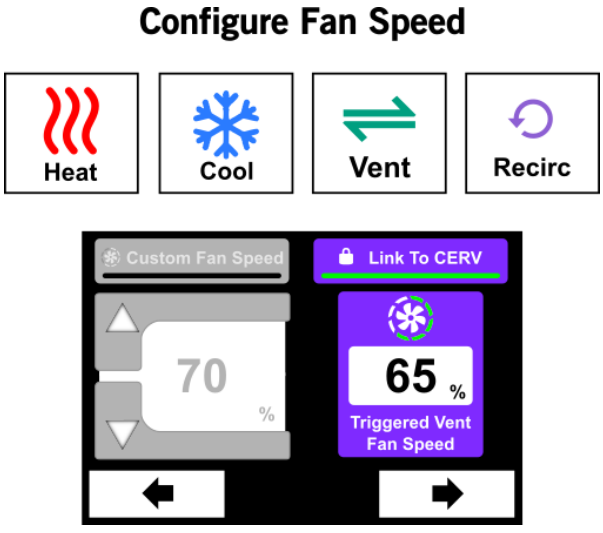
Configuration:

To set up a new auxiliary input, simply tap on the button corresponding to the desired device. Similarly, if you wish to change the configuration of an existing device, just tap the device.



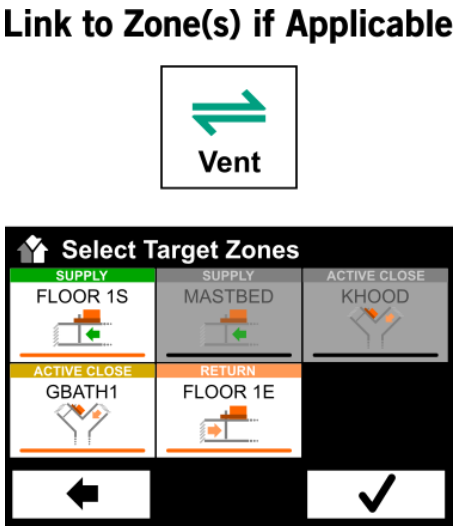
Once the wired auxiliary input is active (sensing either 24VAC at the terminals, or sensing a dry contact closure), the CERV will immediately enter the configured mode. An inactive circuit will immediately cause the CERV to exit the input's configured unless an extended time is configured for the device.

For Vent and Recirc configurations, you may select Additional Ventilation time. This means once the circuit is turned off, the CERV will continue to ventilate or recirculate for the specified time. For example, you could have a dry contact kitchen wall switch wired to the CERV, set to 30 minutes additional ventilation. After you finish cooking and turn off the switch, the CERV would continue to ventilate for 30 extra minutes to help clear out pollutants. 30 minutes after the switch is turned off, the CERV would then return to the mode it was in previously.



For heat, cool, vent, and recirc, you may select either a custom fan speed for the device, or "Link to CERV", which uses the CERV's configured fan speeds.

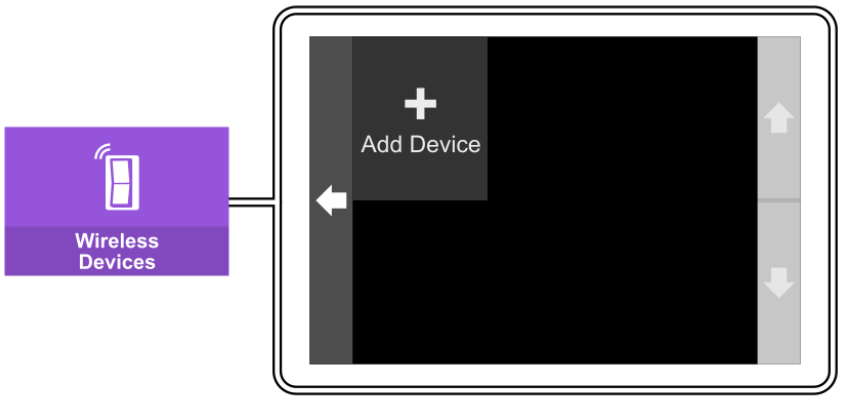
If configured for Ventilation: in the scenario where one or more Zone Dampers are used with the CERV, the homeowner may wish to pair the input to activate one or more zones. For example, if there were exhaust zones for the master bathroom, guest bathroom, and kitchen, and the input is “linked” to the master bathroom zone, triggering the input would close down the guest bathroom and kitchen zones to favor the master bathroom.



Wireless Devices

Return to Main Menu

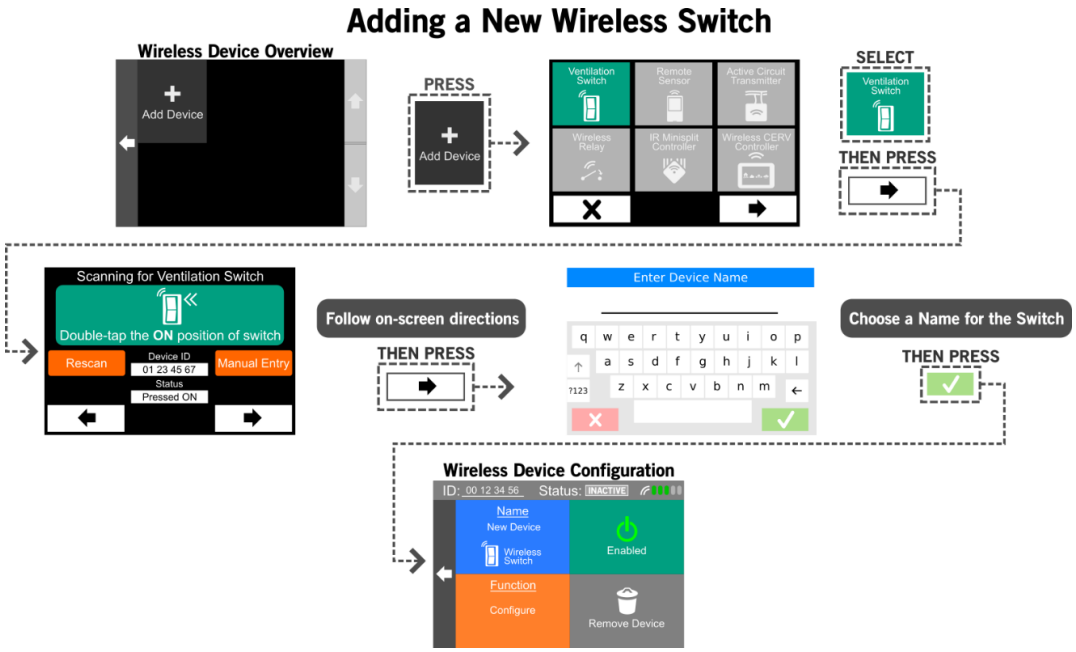
The CERV can interface with a variety of devices using its low-power wireless protocol, such as wireless switches, active circuit transmitters, wireless touchscreens, etc. To pair and configure these devices, the Wireless Devices configuration screen can be used. When pairing a device to the CERV, it is often helpful to have the wireless device located close to the CERV to ensure good communication.



Configuration:

From the Wireless Device Overview screen, adding a new wireless device is simple. You may either “actively” pair the device (pressing a button on the device when prompted), or “manually” pair the device (typing in the address of the device). There is additionally often a “Status” box which allows you to test operation of the wireless switch, active circuit transmitter, etc. Lastly, you will input a name for the device (maximum 8 characters).

Shown below is an example of pairing a new wireless ventilation switch.

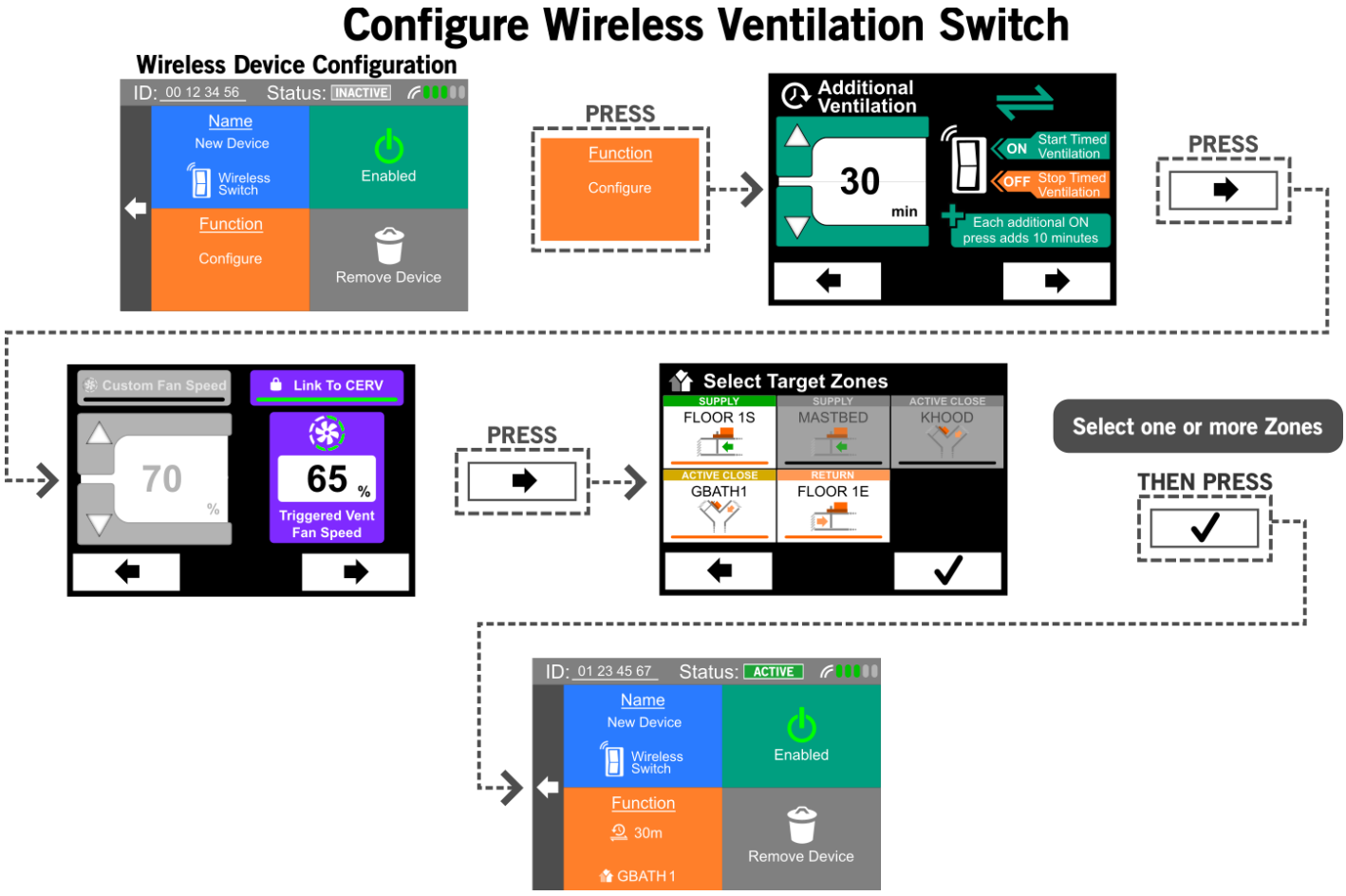


After the name is entered and the green checkbox pressed, you will be taken to the Device Configuration Screen. This is where you can rename, enable/disable the device, setup functionality, or delete the device.

Example Wireless Device Configuration – Wireless Switch:

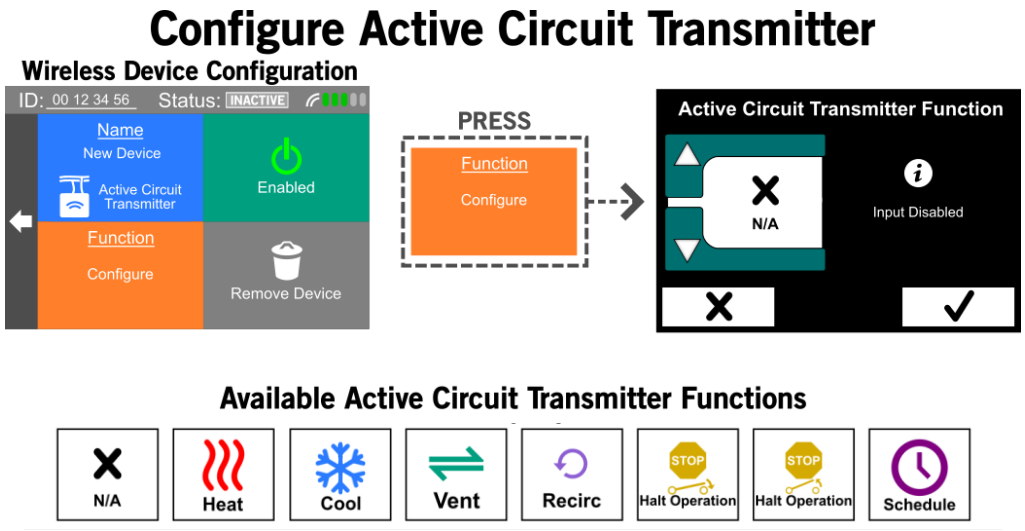
With wireless ventilation switches, there are several options to configure:

- Ventilation Length: once the wireless ventilation switch is triggered, the CERV will ventilate for the specified period of time.
- Configure Fan Speed/Link to CERV:
    - Configure Fan Speed: if this option is selected, a specific fan speed will be selected for this particular ventilation switch. Multiple ventilation switches in a home may have different fan speeds depending on location.
    - Link to CERV: if this option is selected, the switch will use the CERV's configured Triggered Ventilation Fan Speed. This fan speed setting may be configured in the ECM Fan Settings screen.
- Target Zones: in the scenario where one or more Zone Dampers are used with the CERV, the homeowner may wish to pair a ventilation switch to activate one or more zones. For example, if there were exhaust zones for the master bathroom, guest bathroom, and kitchen, and a wireless switch is "linked" to the master bathroom zone, triggering the switch would close the guest bathroom and kitchen zones to favor the master bathroom.



Example Wireless Device Configuration – Active Circuit Transmitter:

The Active Circuit Transmitter (ACT) option allows a remote circuit to influence the function of the CERV, much like the hardwired Auxiliary Input(s). The ACT can be installed along with a load, such as a light switch or kitchen vent hood, or even used with a separate system as a fan interlock or system shutoff. Once the ACT is installed, powered, and paired with the CERV, its functionality can be programmed.

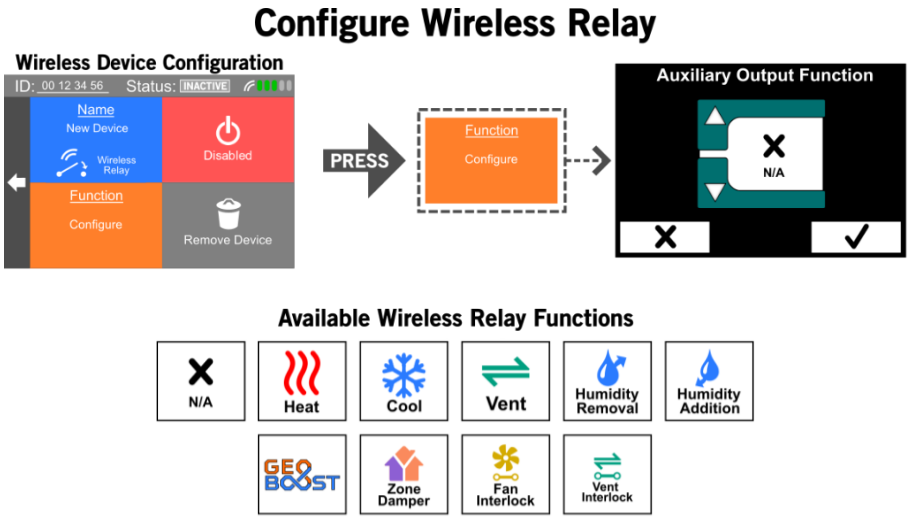


When the circuit is "active" the ACT will periodically send a signal to the CERV indicating that the circuit is on. In most cases, this will cause the CERV to suspend its current activity based on internal sensors, and instead enter the mode specified by the device's configuration. If the ACT is activated, the CERV will perform the configured function for 5 additional minutes after the circuit is turned off.

See Wired Auxiliary Inputs for more information about configuration.

Example Wireless Device Configuration – Wireless Relay:

Wireless Relays allow the CERV to control on/off functionality of a remote device, much like an extension of the CERV's built in Auxiliary Output(s). Configuration of the wireless relay, therefore, is identical to configuration of the wired auxiliary outputs.

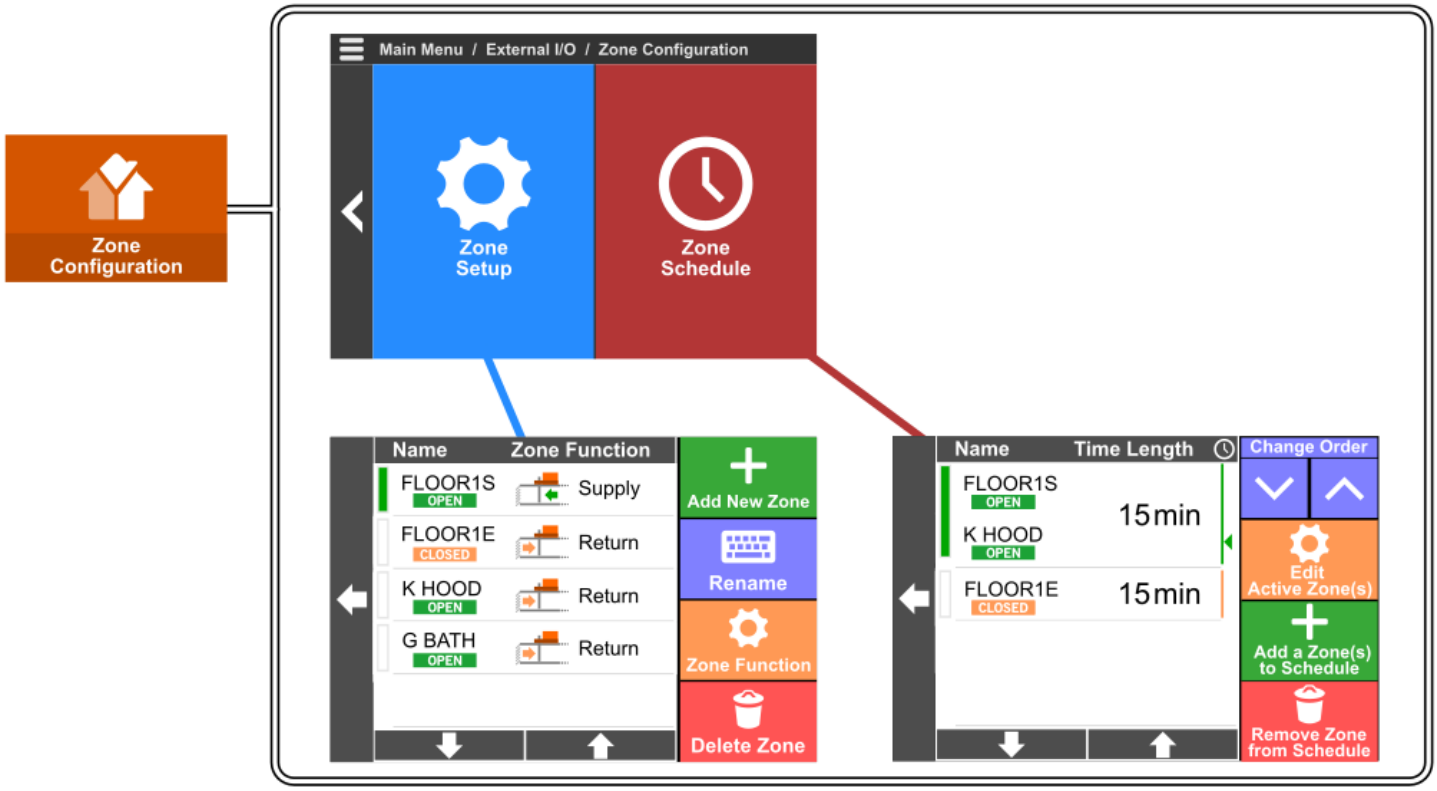


See Wired Auxiliary Outputs for more information about configuration.

Zone Configuration

Return to Main Menu

Precision zone ventilation with zone dampers provides a targeted approach to ventilation, concentrating airflow where it is most needed without necessarily requiring an overall increase in fan speed. Zones can be linked to any number of wired and wireless inputs, such as wireless switches, active circuit transmitters, motion sensors, and environmental sensors.

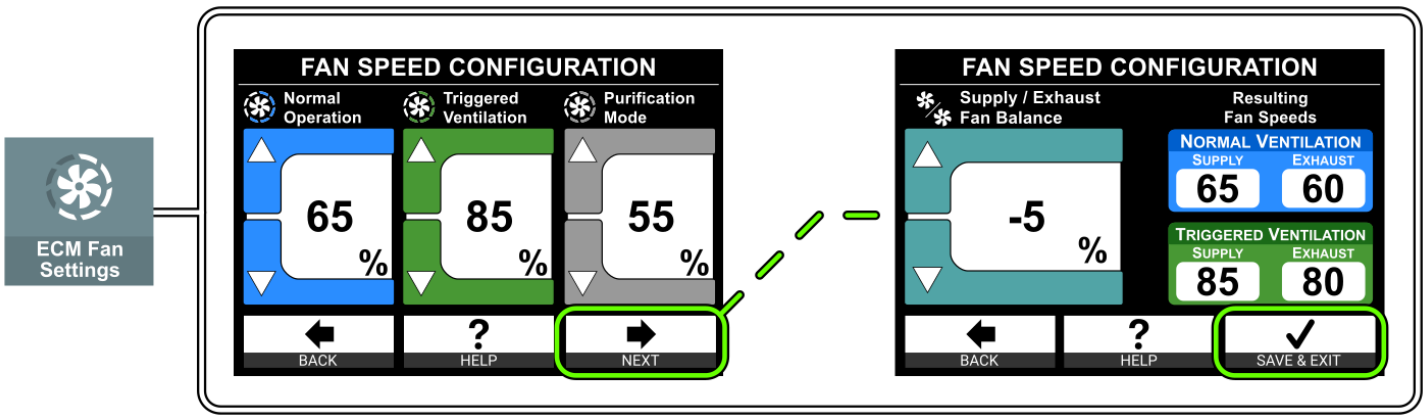


To learn more about setting up zones, schedules, and linking inputs/outputs to zones, please see our CERV Zone Option Manual.

ECM Fan Settings

Return to Main Menu

The inline fans included with the CERV can be configured to help maximize comfort and fresh air delivery to the home. The ECM supply and exhaust fans are fully speed-controllable, allowing the system to respond dynamically to ventilation events.



Configuration:

Normal Operation: The default fan speed for the CERV as it ventilates, recirculates, heats, and cools your home (determined by the integrated sensors).

Triggered Ventilation: If a wireless switch or wireless/wired input triggers a ventilation period, the fans will increase to the Triggered Ventilation fan speed setting. This fan speed setting also applies if you start a timed ventilation event from the touchscreen controller (see Triggered Ventilation section above).

Purification Mode: When no heating, cooling, or ventilation is needed, but Air Purification is enabled, the inside fan will recirculate air throughout the home. This fan speed setting allows you to recirculate at a higher or lower airflow than normal operation.

Supply / Exhaust Fan Balance: After the Normal, Triggered Ventilation, and Purification Mode fan speeds have been set, you may choose a Supply/Exhaust Fan Balance. This can be used to properly balance the system, or provide a positive or negative pressure to the home when ventilating. Please note, the fan balance only affects the CERV in ventilation modes (Vent Heat, Vent Cool, Free Cool, etc.), but not recirculation modes. The fan balance is entered as a positive or negative percentage, and applied towards the exhaust fan, as seen by the graphic above.

Recommendations:

Normal Operation: This fan setting should be chosen to achieve around 150cfm airflow to the home.

Triggered Ventilation: If you wish to purge the home as quickly as possible, this may be set up to 100%

Purification Mode: For those with noise sensitivities, a lower airflow for recirculation may be desired. To improve air quality and comfort mixing, a higher airflow could be selected.

Supply/Exhaust Fan Balance: Once ductwork has been characterized, this should be configured to achieve the desired pressurization level.

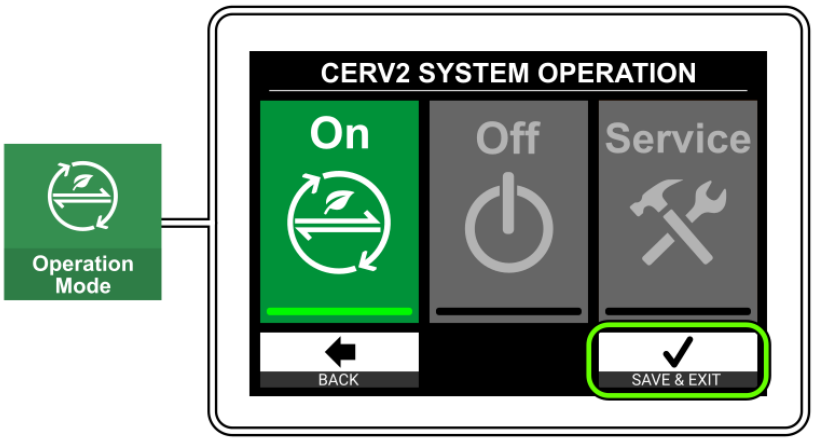
Operation Mode

Return to Main Menu

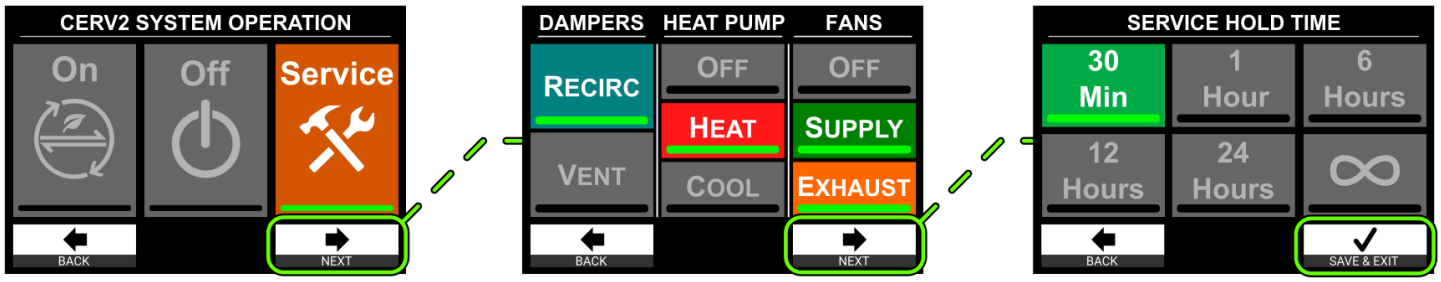
CERV Operation Mode allows the CERV to be turned on and off without switching power to the unit. In some cases, the CERV may need to be placed into Service Mode, where the system can be manually set to a specific mode, ignoring the internal system sensors. This may be useful for fan balancing, troubleshooting, etc.

Note that selecting Off does not remove power from any portion of the CERV and should not be used in servicing the unit. Electrocution can occur if the proper procedure of disconnecting power to the CERV is not followed.

Configuration:



Service Mode:



Service Mode may be used to set the CERV into a particular system configuration, while ignoring the system's internal sensors. Note that when the Heat Pump is set to either Heat or Cool, both fans will automatically be enabled. To test one fan at a time, the heat pump must be off. Lastly, select an amount of time to hold this specific configuration. When service mode is active, the home screen Status and Alerts bar will show the following icon:

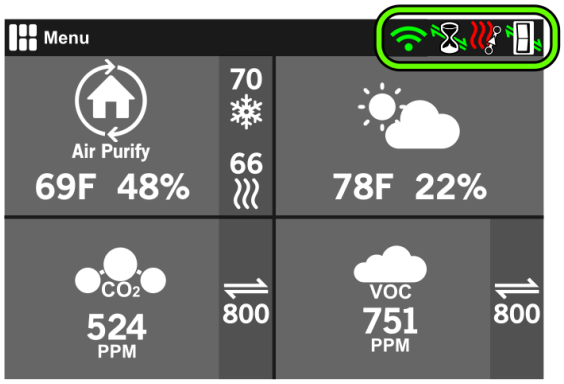
Status & Alerts

Return to Main Menu

Overview:

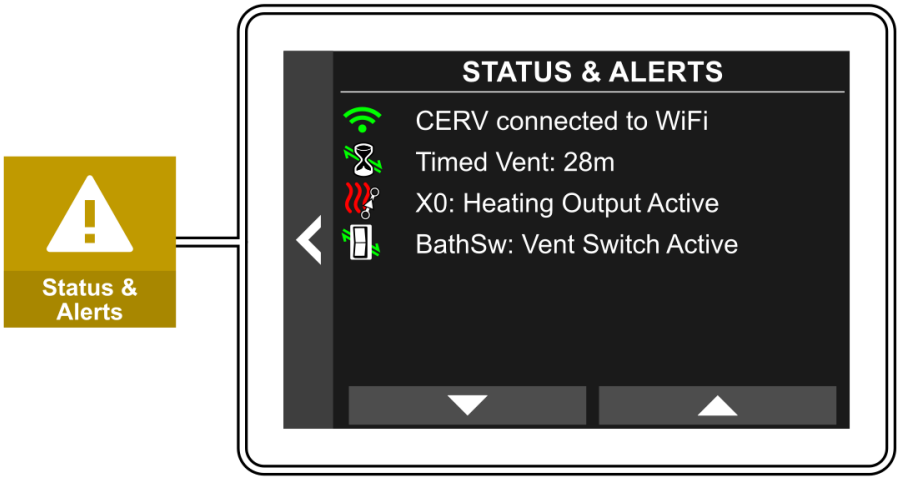
The Status & Alerts screen provides information regarding the current operation of the CERV, such as Wi-Fi connection status, auxiliary devices, wireless switches, etc.

Home Screen & Status Icons:



In addition to the main menu, the home screen features a shortcut (highlighted in green) to view the details of the status and alerts.

Configuration:



There is a large array of status icons that may be present on the Status and Alerts screen depending on how the CERV is operating, what input and output devices are controlled by the CERV, and if there are any potential issues with the CERV.

Alerts:

If the CERV detects that there is a problem with the system, such as a malfunctioning sensor, an error symbol icon  will appear in the status bar. On the Status & Alerts screen an error reference code or message will be displayed on the line with the yellow warning symbol. Possible errors are as follows:

E1 - Return Temp Sensor: Return Air Temperature Sensor (sensor board below the Return Air Filter) is experiencing an error. This could be due to a faulty sensor, water damage (dripping water from duct), or perhaps a sensor module (CO2, VOC, particulate) that is plugged in incorrectly. It may also be present along with the CO2 and VOC sensor errors, as those sensor modules are plugged into the sockets of this sensor board. Check for anything visibly wrong, and contact Build Equinox if necessary.

E2 - Outside Temp Sensor: Fresh Air Temperature Sensor (sensor board below the Fresh Air Filter) is experiencing an error. This could be due to a faulty sensor, water damage (dripping water from duct), or perhaps a sensor module (VOC, particulate) that is plugged in incorrectly. Check for anything visibly wrong, and contact Build Equinox if necessary.

E3 - VOC Sensor: VOC Sensor Module (plugged into sensor board below the Return Air Filter) is experiencing an error. This could be due to a faulty sensor, water damage (dripping water from duct), or the sensor module may be plugged into the sockets of the Return Air Temperature Sensor incorrectly. Check for anything visibly wrong, and contact Build Equinox if necessary.

E4 - CO2 Sensor: The CO2 Sensor Module (plugged into sensor board below the Return Air Filter) is experiencing an error. This could be due to a faulty sensor, water damage (dripping water from duct), or the sensor module may be plugged into the sockets of the Return Air Temperature Sensor incorrectly. Check for anything visibly wrong, and contact Build Equinox if necessary.

E5 - Supply Fan: The Supply Fan's tachometer indicates that the fan motor may not be spinning. This could perhaps be due to a loose wire (power, control, or tach), water damage, or something else. Please contact Build Equinox for the Fan Troubleshooting Guide for further diagnosis.

E6 - Exhaust Fan: The Exhaust Fan's tachometer indicates that the fan motor may not be spinning. This could perhaps be due to a loose wire (power, control, or tach), water damage, or something else. Please contact Build Equinox for the Fan Troubleshooting Guide for further diagnosis.

E7 - Heat Pump: The Inverter's digital controller is indicating that the heat pump may not be operating properly. Please contact Build Equinox for the Heat Pump Troubleshooting Guide for further diagnosis.

E8 - 24V Power: The CERV contains an internal 24V transformer for powering damper motors and valves, and the control board is indicating that there may be an issue with this power. Please contact Build Equinox for the 24V Power Transformer Troubleshooting Guide for further Diagnosis.

_____ - No Signal: A wireless sensor (temperature, relative humidity, CO2, etc.) has not communicated with the CERV in at least 20 minutes. This could be due to a dead battery, or interference in the wireless signal of the sensor to the CERV. Check the sensor battery, and move the sensor close to the CERV to see if this error resolves. If the issue is due to interference in the wireless signal, consider a Wireless Signal Repeater.

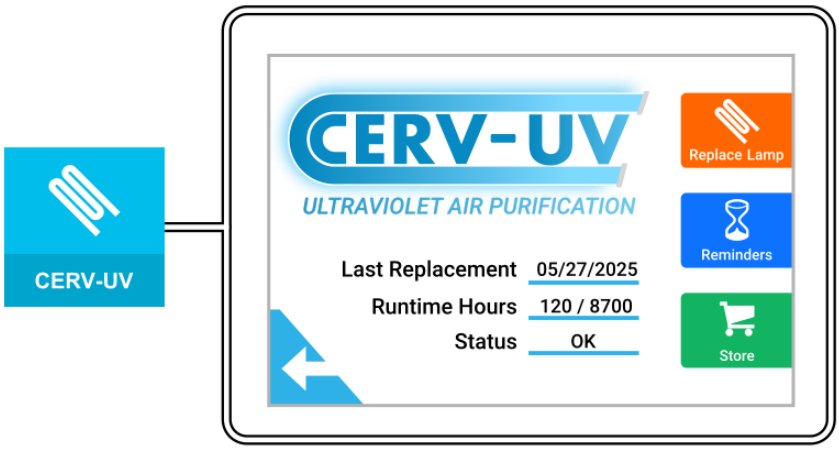
CERV-UV

Return to Main Menu

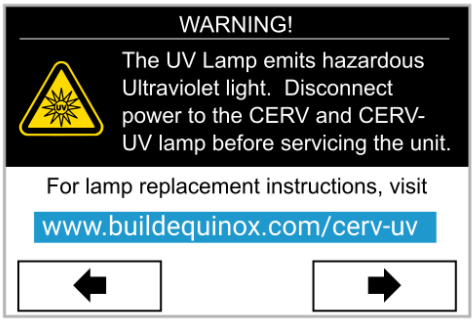
The CERV-UV option is the first and only UV-C light system designed specifically for installation into an ERV ventilation system. CERV-UV delivers 18 Watts of UV-C power to efficiently destroy microbes in the air as it circulates through a CERV smart ventilation system. The CERV-UV option may be factory installed, or installed into an existing CERV.

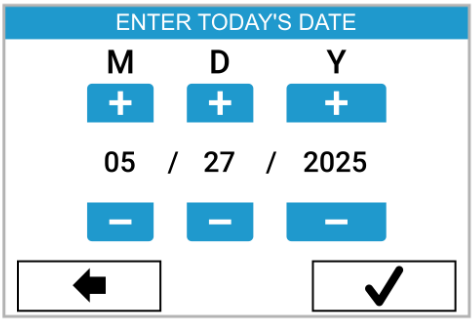
When the CERV-UV lamp replacement reminders are enabled, the home screen's Status and Alerts bar will show the CERV-UV icon indicating the status of the UV lamp. Please note that the reminders are based purely from operation time, the CERV does not know whether or not a lamp is actually installed. When the running operation time is below the replacement time, it will show the standard icon (left), and when the time has exceeded the replacement time it will show a small alert icon next to the lamp (right).

Configuration:



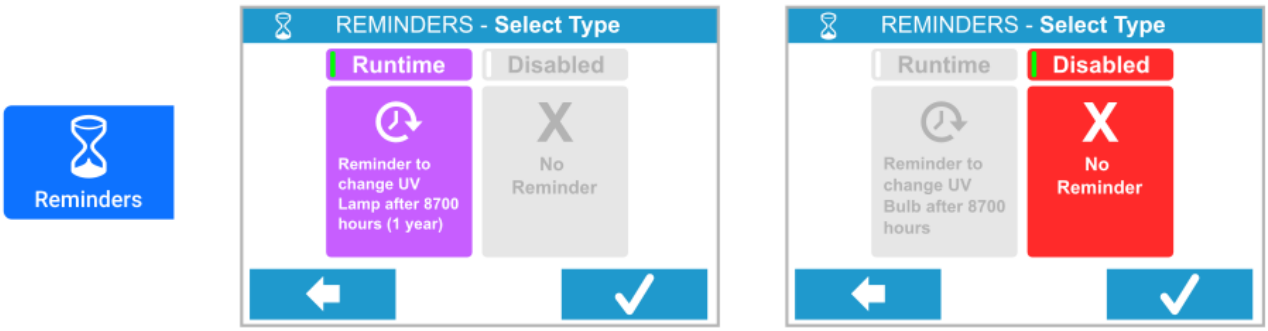
Replace Lamp





When first setting up the CERV-UV reminders (or replacing a lamp), you may reset the reminder with the Replace Lamp button. Please note – the UV Lamp power supply must be unplugged before replacing the lamp.

Reminders



To setup CERV-UV reminders, press the Reminders Button, select Runtime, and press the check box. The CERV-UV lamp is rated for 8700 hours (1 year), so the CERV will monitor the operation time of the lamp and display a notification when it is time to replace.

Store

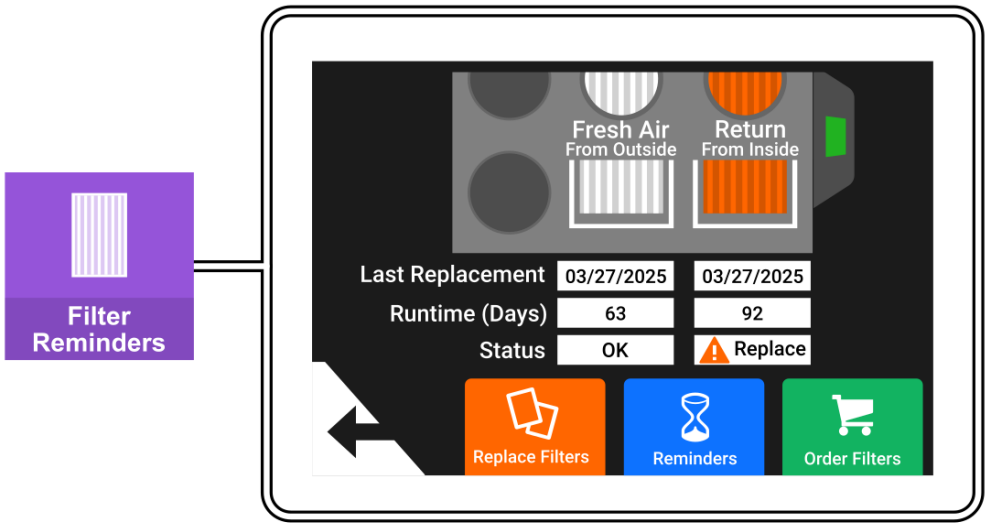
Replacement UV lamps may be purchased on the [Build Equinox Store]

Filter Reminders

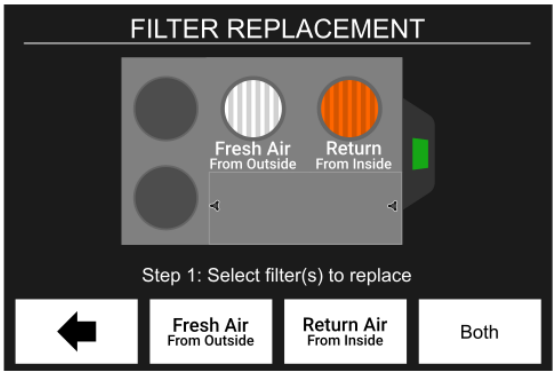
Return to Main Menu

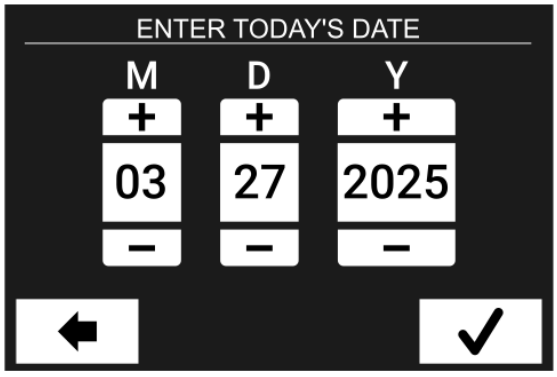
Regular filter maintenance is important in keeping the inside air healthy and free from particulates as well as allowing for peak system operating efficiency. When the filter replacement reminders are enabled, the home screen's Status and Alerts bar will show the filter icon indicating their status. Please note that the reminders are based purely from operation time, the CERV does not know how dirty the filters are. When the running operation time is below the replacement time, it will show the standard icon (left), and when the time has exceeded the replacement time it will show a small alert icon next to the filter (right).

Configuration:



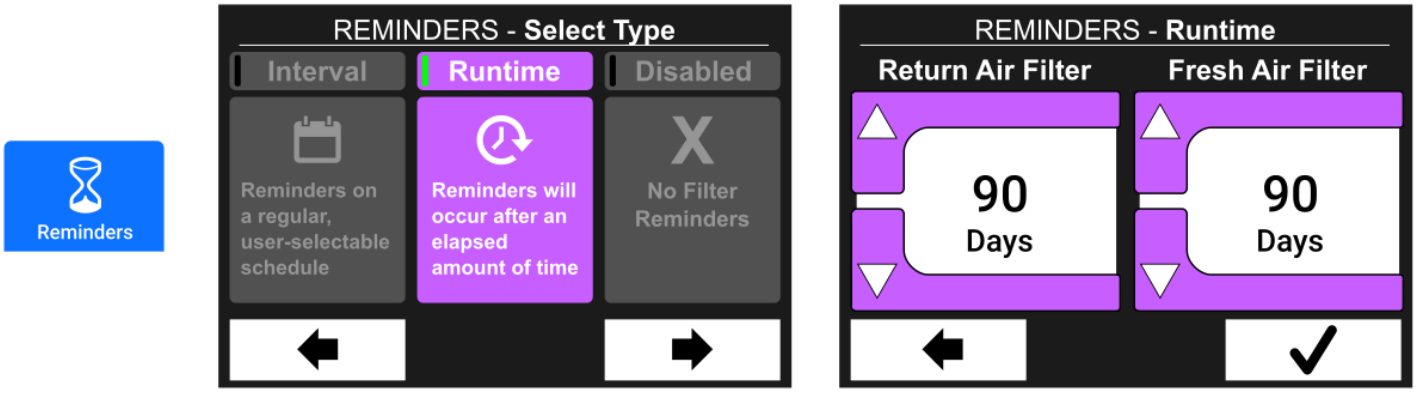
Replace Filters





When first setting up the CERV filter reminders (or replacing filters), you will reset the reminder with the Replace Filters button. The screen will guide you through the steps to access and replace the filter(s).

Reminders



Interval: The CERV will notify that a filter replacement is needed as soon as the specified time has elapsed, regardless of whether or not the CERV's fans were running.

Runtime: The CERV will monitor the runtime of air flowing through both the return and fresh air filters independently. When each filter has accumulated the specified amount of runtime, it will notify that a filter replacement is needed.

90 Days is the recommended maximum amount of runtime before replacing filters in the system. Depending on indoor and outdoor conditions, filters may become restricted before this 90-day period, so it is important to regularly check filters.

Store

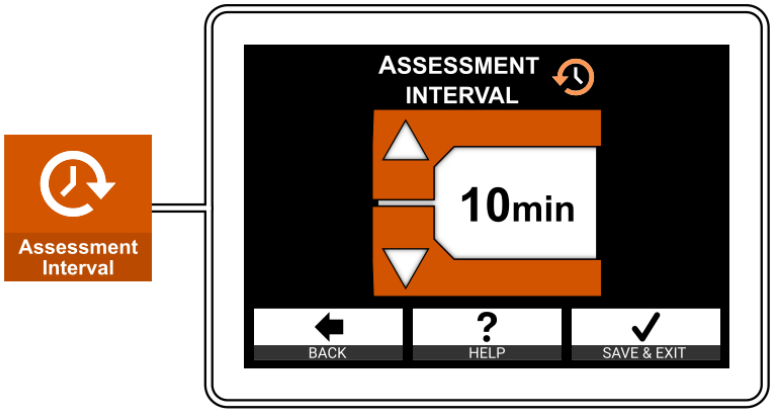
Replacement UV lamps may be purchased on the [Build Equinox Store]

Assessment Interval

Return to Main Menu

When heating, cooling, and ventilation setpoints are all satisfied the CERV can enter Energy Saver Mode or Air Purification Mode. The system will stay in this mode for the interval set by the Assessment Interval period before performing an assessment of indoor and outdoor conditions. During the assessment, both supply and exhaust fans are activated to move air while taking sensor readings. If setpoints remain satisfied the CERV will return to Energy Saver or Air Purification for another Assessment Interval period.

Configuration:



By default, the CERV is set to an Assessment Interval of 10 minutes, which means that after 10 minutes in Energy Saver Mode or Air Purification Mode, the CERV will perform an assessment to see if any heating, cooling, or ventilation adjustment is needed. The Assessment Interval can be increased to prolong the time between assessments from 10 minutes up to a maximum of 120 minutes.

Recommendations:

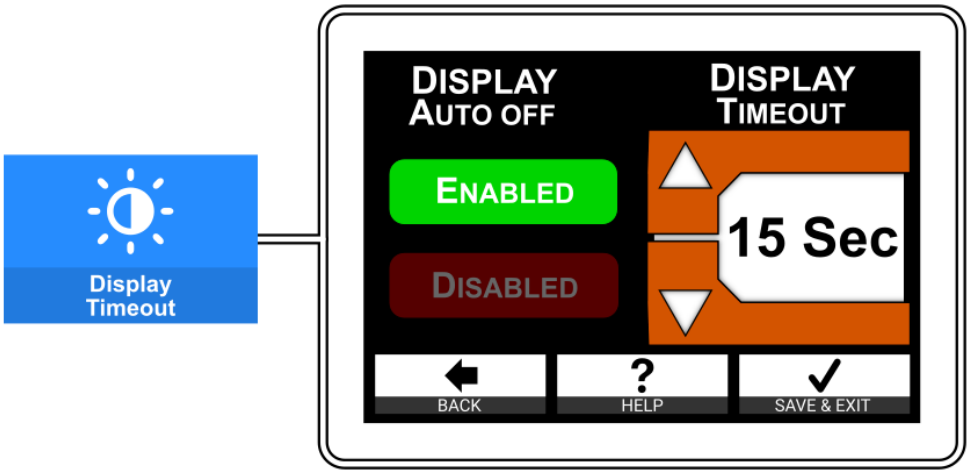
In general, the shorter the Assessment Interval the more responsive the CERV will be to detecting indoor air quality pollution events. In some cases where noise from fans turning on and off can be detected, increasing the Assessment Interval may be preferred by reducing fan cycling.

Display Timeout

Return to Main Menu

On the Display Settings screen, you can configure the auto-off feature of the screen. If there has been no interaction with the screen after the amount of time specified in Display Timeout, the touchscreen controller will turn off the screen to save power.

Configuration:



Auto Off Enabled: After the specified amount of time, the screen will turn off to save power. Tapping the screen will turn the display back on.

Auto Off Disabled: The screen will stay on indefinitely, even when there has been no activity.

Recommendations:

Auto-off may save a small amount of energy and extend the life of the touch-screen.

Wi-Fi Setup

Return to Main Menu

The CERV's built-in Wi-Fi module allows control and monitoring of your indoor air quality from your phone or computer.
Notes:

- Only 2.4ghz Wi-Fi networks are currently supported (not 5ghz)
- In addition to configuration through the touchscreen, the Wi-Fi module may also be remotely configured through your phone or computer. For more information, see the Wi-Fi and CERV-ICE Setup Guide.
- When using the Ethernet Module Option, this Wi-Fi Setup screen will simply show an SSID of "Ethernet Module" and no further configuration is needed.

Status Icons:

The Home Screen's Status and Alerts shows the current status of the Wi-Fi connection. When the connection has been successfully made, it will show a green Wi-Fi Signal icon (left). When the Wi-Fi connection is attempting to make a connection, it will show a gray Wi-Fi Signal icon (middle). When the Wi-Fi connection has not been configured, or no network is available, it will show a white Wi-Fi Signal with red X (right).

CERV-ICE Online Control & Monitoring Account Setup:

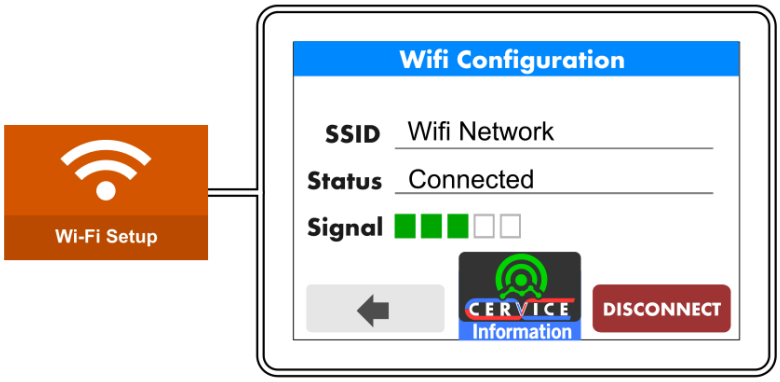
A free CERV-ICE account can be created to view data and air quality analytics for your CERV and to control your system remotely. To create an account, navigate to https://buildequinox.com/cervice/

CERV-ICE is also available as a free app in the Apple Store or Google Play. Search for CERV or click on the links below.

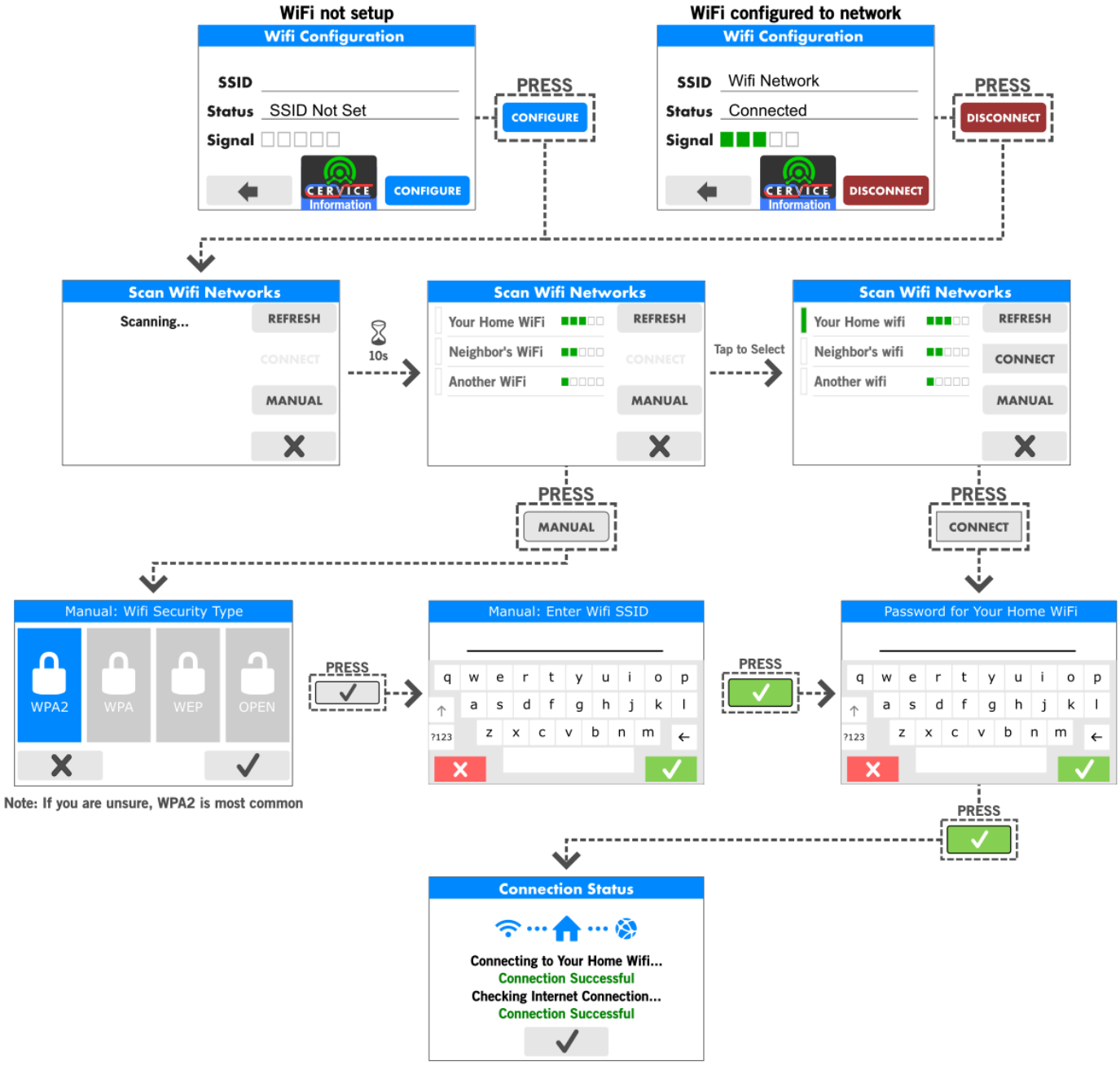
Download on the App Store

ANDROID APP ON Google play

Configuration:



The following flowchart overviews the process of connecting the CERV to your 2.4ghz wireless network.



Wi-Fi Connection Error	Probable Cause & Resolution
Couldn't Find SSID	• If Manual setup was used to connect to the Wi-Fi Network, check for misspellings in the network name and try again. • On another device (phone/laptop/etc), check that the network exists and is exactly as entered on the CERV. • The CERV currently only operates on 2.4GHz Wi-Fi networks. 5GHz Wi-Fi is not supported at this time.
Incorrect Password	• If Manual setup was used to connect to the Wi-Fi Network, check to ensure the network security is correctly set. Most modern Wi-Fi networks use WPA2. This can often be verified with on a computer or phone by examining network properties. • Ensure that the entered password is correct.
Timed out - try again	• There may be an issue with the internal Wi-Fi configuration, and the connection attempt timed out.

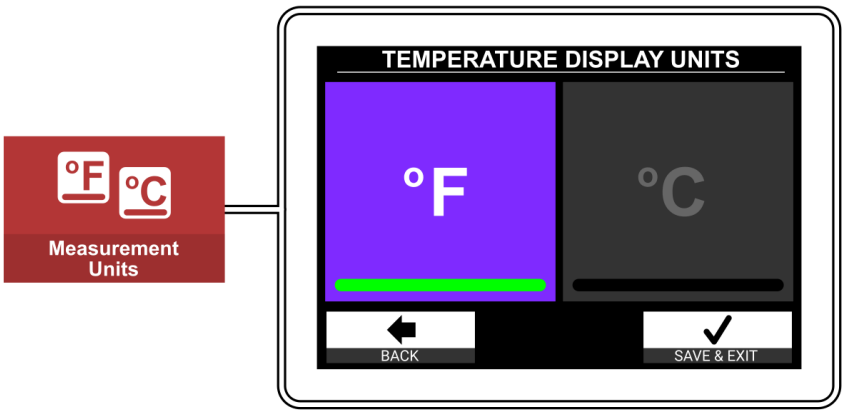
	• Press the checkbox button on the bottom of the screen, which will take you back to the “Getting Wi-Fi Status” screen. Stay on this screen for a minute to see if it was able to recover and make the connection. If not, try adding the network again as before. • If re-adding the network gives the same timed out error, try powering off the CERV, then back on, and adding the network again. Resetting power to the internal Wi-Fi could potentially resolve the issue.
No Connection to Internet Or No Connection to Server	• Connection to the Wi-Fi network was successful, but the CERV is having trouble uploading data through the internet. This often resolves itself after several minutes (depending on the network). Contact Build Equinox if this does not resolve itself.

Measurement Units

Return to Main Menu

The CERV display may be configured to show sensor temperatures in either Fahrenheit or Celsius units. Note that this only changes the units for the CERV's built-in touchscreen, when viewing the control screen and data on CERV-ICE online, you may need to configure your preferences there as well.

Configuration:



°F: All temperature readings will show as degrees Fahrenheit

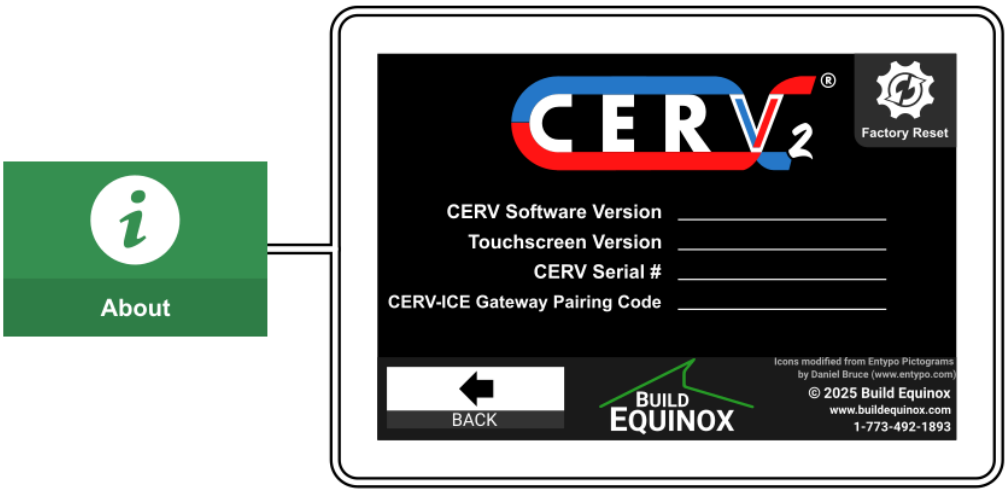
°C: All temperature readings will show as degrees Celsius

About

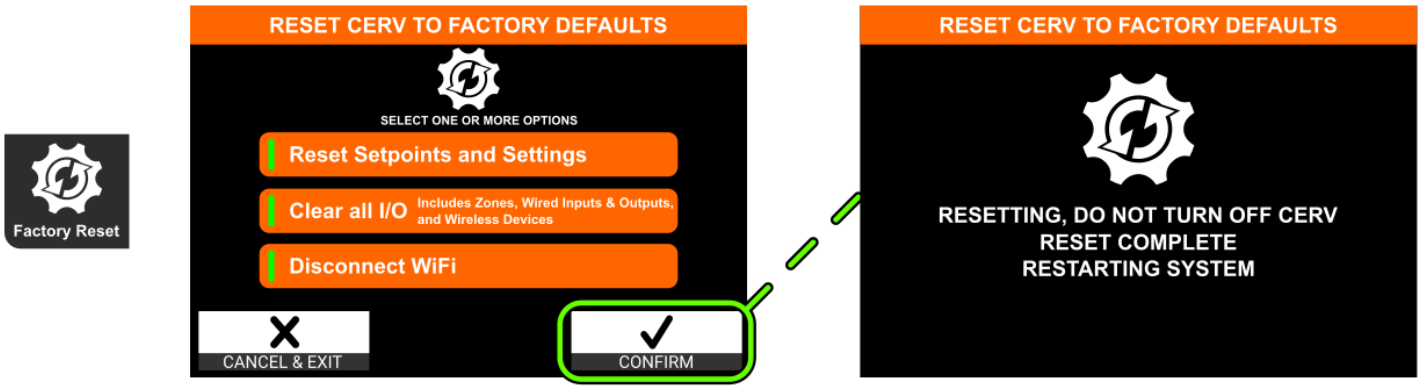
Return to Main Menu

The About Screen contains important information about the CERV, including the CERV Base System Software Version, Touchscreen Controller Interface Version, CERV Serial Number, and CERV-ICE Gateway Pairing Code. In addition to this information, the screen contains a button to factory reset the system to its defaults.

Configuration:



Factory Reset



Reset All Setpoints and Settings: The CERV's operational configuration will all be set back to default. This includes all settings under the Air Quality and Comfort and System submenus. Upon restarting, the system will default to OFF mode.

Clear All I/O: Zone configurations, wired inputs and outputs, and wireless devices will all be erased from memory.

Disconnect Wi-Fi: Clears all Wi-Fi Configuration from the Wi-Fi module on the CERV. Note – this does not delete the historical data stored online in CERV-ICE.

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