USER GUIDE

MAN0144 rev 9

AERO^{BT} VAV PHONE APP

Style conventions used in this document:

UI Text: Text that represents elements of the UI such as button names, menu options etc. is presented with a grey background and border, in Tahoma font which is traditionally used in Windows UIs. For example:

`Ok`

Standard Terms (Jargon): Text that is not English Language but instead refers to industry standard concepts such as Strategy, BACnet, or Analog Input is represents in slightly condensed font. For example:

BACnet

Code: Text that represents File paths, Code snippets or text file configuration settings is presented in fixed-width font, with a grey background and border. For example:

```
$config_file = c:\CYLON\settings\config.txt
```

Parameter values: Text that represents values to be entered into UI fields or displayed in dialogs is represented in fixed-width font with a shaded background. For example

`10°C`

Product Names: Text that represents a product name is represented in bold colored text. For example

INTEGRA™

Company Brand names: Brands that are not product names are represented by bold slightly compressed text:

ABB Building Analyzer

PC Keyboard keys: Text representing an instruction to press a particular key on the keyboard is enclosed in square brackets and in bold font. For example:

[Ctrl]+[1]

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1 Introduction

WHAT IS THE Aero^{BT} APP?

Aero^{BT} is a mobile app for balancing **ABB Cylon CBV** and **FLXeon** controllers

Aero^{BT} App (version 2) is available for both **iOS®** and **Android™** and can be downloaded to your device for free from **Google Play™** or the **Apple® Store**.

You can find this App by searching for `AeroBT`

REQUIREMENTS

Android™ : device able to access the **Google Play™** store and running version `5.0` (API Level 21 - Lollipop) or later.

iOS® : device must be able to access the **Apple® Store** and must be running **iOS** `10.0` or newer.

Network : a wireless IP connection to a router on the BACnet® building system must be available.

The App will detect strategy ID versions in **CBV, CBV-N, FBVi** controllers and only list controllers that have the listed strategy ID under the About screen.

DOWNLOADING AND INSTALLATION

ANDROID™

If you are on a website that offers the App, click on the 

Icon.

Search for `AeroBT`,

then follow the directions for your device.

If you are on an Android™ device, navigate to the **Play StoreTM** App icon 

and click.

Search for `AeroBT`.

Click on the "`Get`" button and it will install on your device.

iOS®

On your **iOS®** device, navigate to the **App Store®** icon  and click.

Search for `AeroBT`.

Click on the `Get` button and it will install on your device.

After installation, the **Aero**^{BT} icon  should be visible on your device.

Click this icon to start **Aero**^{BT}

Note: **If you don't have wireless network access when you start the Aero^{BT} app, any network packets continue to go out of the cellular service until you "cold start" the app – i.e. close the Aero^{BT} app and then restart it.**

- **To close an app in Android™ OS, open `Settings` > `Apps` and click on the Aero^{BT} entry in the apps list. On the App info screen for Aero^{BT}, click the `Force Stop` button**
- **To close an app in iOS®, double-tp the home button to see recently used apps, scroll until the Aero^{BT} app is in the center of the screen, then drag the Aero^{BT} app up so that it disappears from the screen.**

Note: **On iOS® devices, the Wi-Fi Assist should be disabled, because it can cause the device to use cellular data, which will prevent connection to the BMS Wi-Fi access point.**

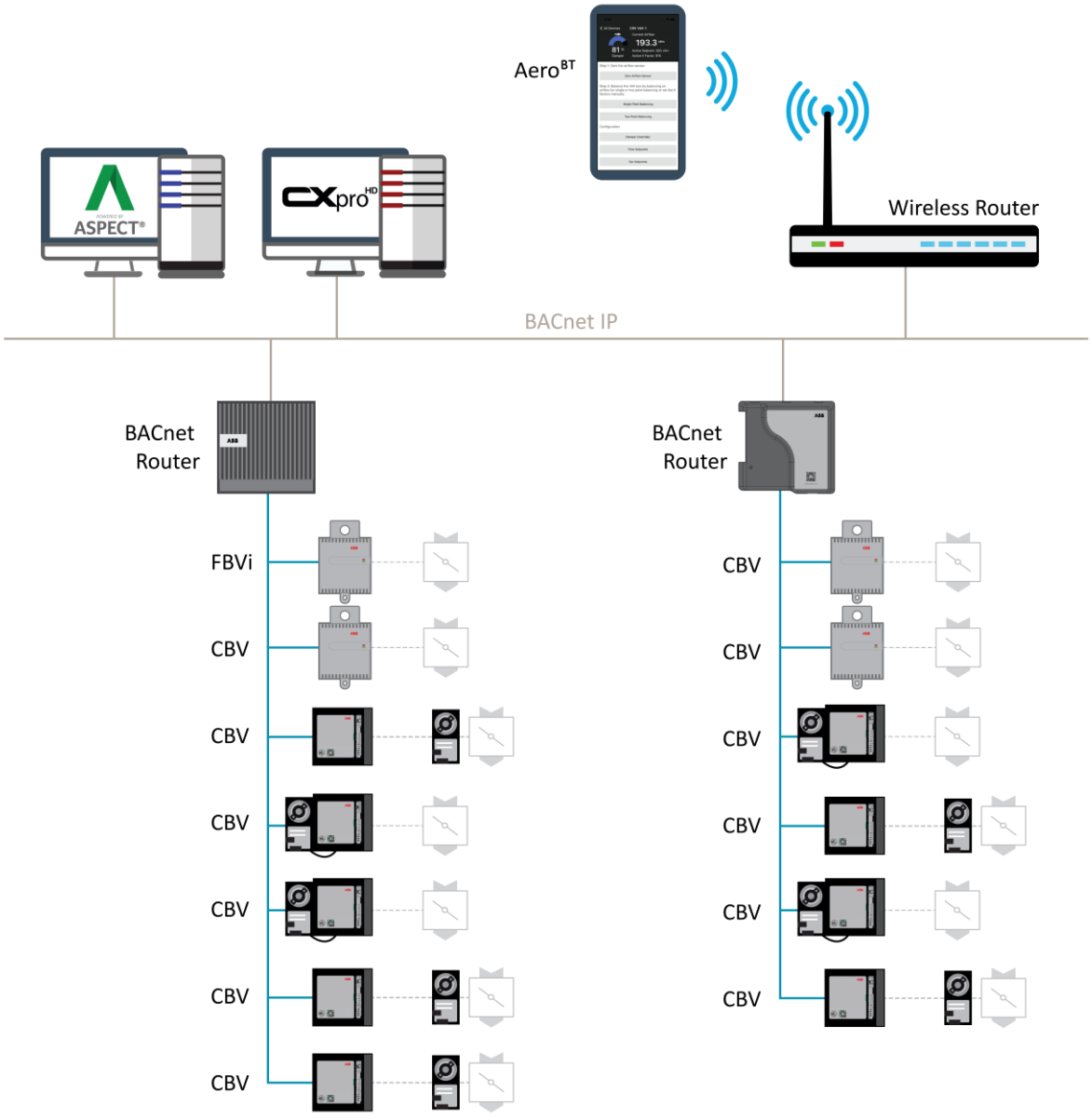
2 Application Setup

METHODS OF COMMUNICATION

BACNET® NETWORK TOPOLOGY

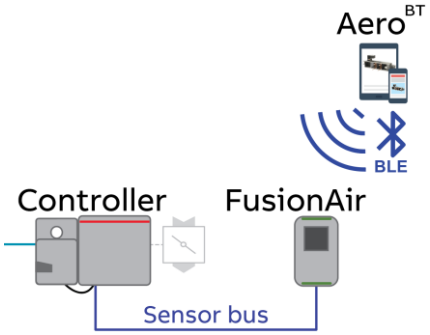
Aero^{BT} requires a wireless connection to the BMS so that the Android^{TM} or iOS® system can connect to the **ABB Cylon** devices. If no wireless connection is available, a Wi-Fi Router must be added temporarily to allow **Aero**^{BT} to access the network.

- If the building automation system is located on the building IT system, consult with the system IT coordinator before adding additional wireless hardware.
- If the system is on its own separate network, consult with the system integrator for IP addressing.



USING BLUETOOTH LOW ENERGY WITH FusionAir SMART SENSORS

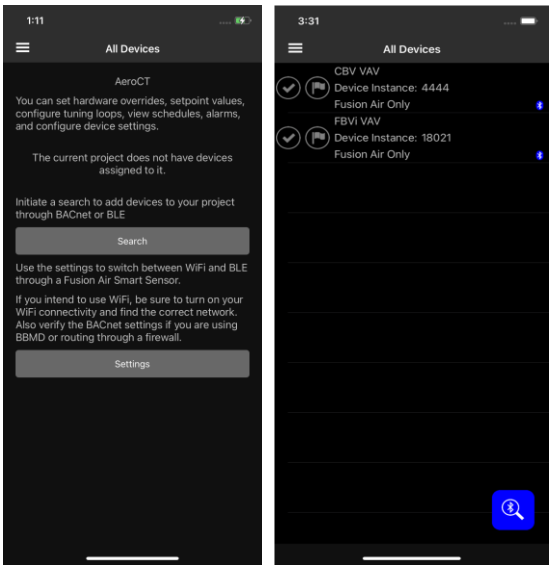
Starting with version `9.2.2` firmware of the **FLXeon** and **CB Series** and version `2.0` of **Aero^{BT}**, you may use Bluetooth Low Energy (BLE) through the **FusionAir** Smart Sensor.



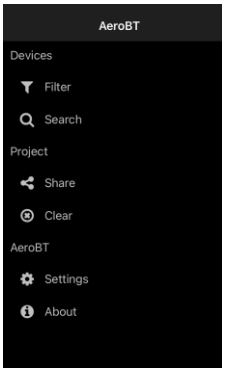
Regardless of the method of finding controllers (Wi-Fi or BLE), the same controller will be found. You may start with BLE to work with a controller. Later as Wi-Fi becomes available, you may search and find the same controller. Later still, if you need to access the controller again and would like to use BLE, you may switch to BLE and find the same controller. (The serial number of the controller is used as the key).

STARTUP – THE AeroBT DEVICES PAGE AND MENU

When the **AeroBT** app first starts, it displays the All Devices page. However, until a Search is run, the page will be empty as shown on the left. The page will show the devices discovered to this point in time as shown on the right.



All project functions are accessed from the **AeroBT** Menu (or from an empty home page as shown above), which is opened by clicking the ☰ icon at the top left of the All Devices page



There are two ways to start to populate the list of controllers, Wi-Fi and Bluetooth Low Energy through a **FusionAir** Smart Sensor attached to your controller.

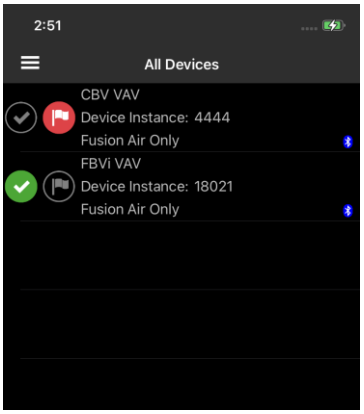
For Wi-Fi, there are two steps to get your devices listed:

1. Configure the **BACnet®** settings
2. Search the network

For BLE, each controller accessed through a **FusionAir** Sensor is added to the list if that controller has not been accessed through Wi-Fi. There are several steps to find the next device to work with.

1. Search for FusionAir Smart Sensors
2. Select the sensor you want to connect to
3. Enter the correct commissioning pin
4. Work with the controller. When complete, you will see the device added to the All Devices page.

When controllers are found, they are displayed on the All Devices page:



For each Device found the following will be listed here:

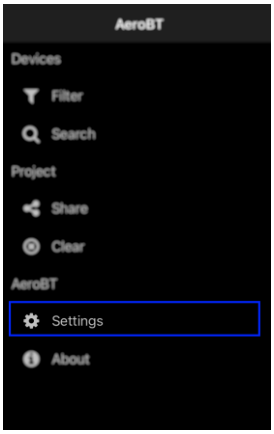
- Device Name
- Network Number
- Mac Address
- Device Instance

To access a Device, tap the Device name in the list.
To mark a Device for review at a later stage, you can toggle the Flag icon . Use the Filter option Filter on the main menu to sort by flag.

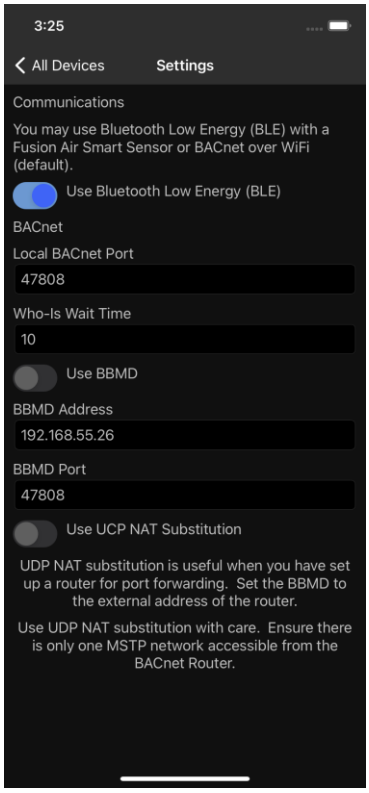
To mark a Device as 'Finished', click the Check icon Use the Filter option Filter on the Main Menu to sort by check.

The small Bluetooth icon indicates devices that have been found through Bluetooth but not yet through Wi-Fi. When switching to Wi-Fi, search again and if the controller is found with the same serial number, the Bluetooth icon will be removed indicating it can be edited though Wi-Fi. At this point, you may use either Wi-Fi or BLE for accessing the controller. You may sort by controllers only found through BLE.

SETTINGS



The Settings option allows **Aero^{BT}** to be configured to access a specific BACnet network.



Use Bluetooth Low Energy (BLE) – To use BLE, toggle this option on. Wi-Fi will not be used to search for and communicate with controllers. Instead, **FusionAir** Smart Sensors will be used to communication with the controller the sensor is connected to.

Local BACnet Port – For Wi-Fi, this must match the local BACnet Port on the BACnet router. This should be the standard BACnet Port number by default.

> **Note:** **if you change the Local BACnet Port, the Aero^{BT} app must be shut down (see *Downloading and Installation on page* 5) and restarted in order for the port to engage.**

Who-Is Wait Time. This is the time the system waits for a device to respond with an I-am message.

Use BBMD - Toggle to use BBMD if needed.

BBMD Address – this should be the IP address of the controller used as a gateway. This could be for example a BACnet® router, a **FBXi**, **CBXi**, a **MATRIX Series** device, or a **NEXUS Series** device.

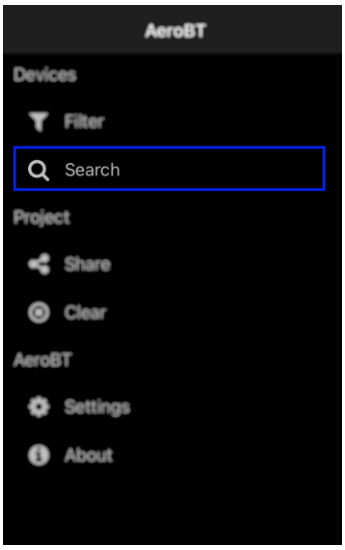
BBMD Port – the BACnet Port on the BACnet Router to be used for who-is messages using BBMD.

Use UDP NAT Substitution – used when the router is using port forwarding.

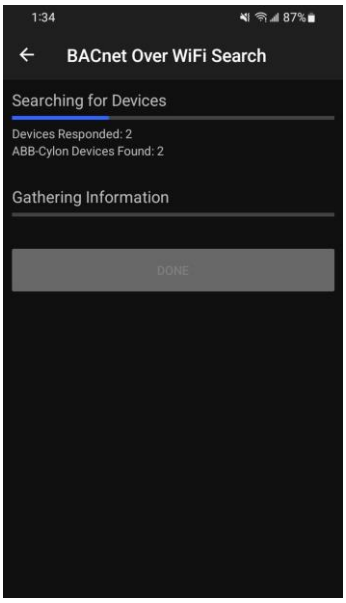
> **Note:** **BBMD is needed if Who-Is messages are transferring between two network segments. Only one BBMD per subnet is allowed. If more than one BBMD is setup for a subnet, network issues will result.**

SEARCH

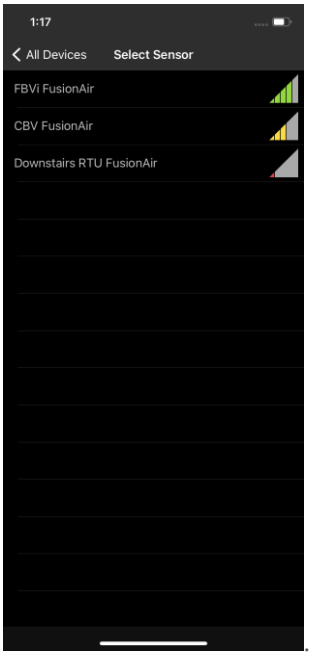
The Search option will search for controllers through Wi-Fi or **FusionAir** Smart Sensors through BLE.



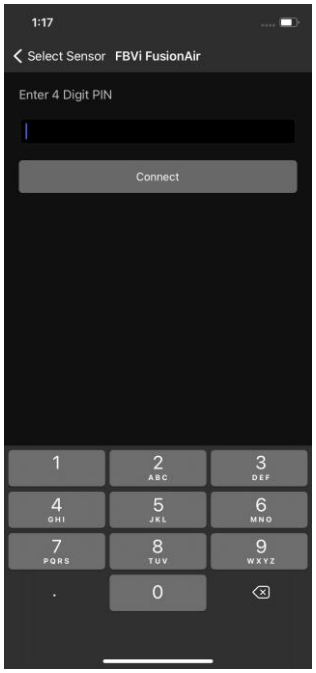
When configured for Wi-Fi, the Search option allows you to search the network for Controllers. When controllers are found, they will be added to the All Devices page.



When configured for BLE, the Search option shows a list of **FusionAir** Smart Sensors in the area. You may search for new **FusionAir** sensors using the search button on the All Devices page.

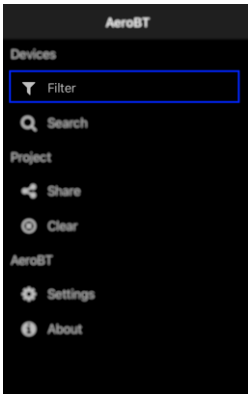


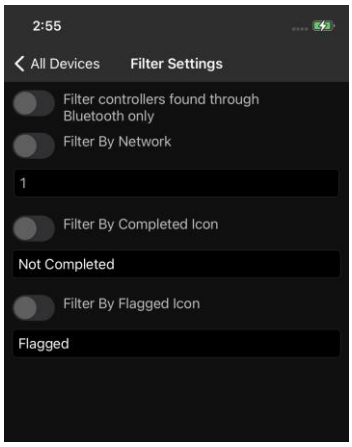
After selecting a sensor, enter the correct commissioning pin.



You will be able to work with the controller and after completion, the controller will be added to the All Devices page.

FILTER



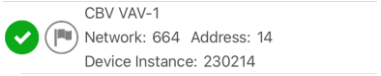


The All Devices list returned by a search can be filtered by the following:

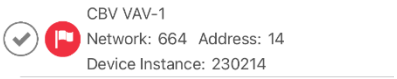
Controllers only found through Bluetooth Only

Network Number

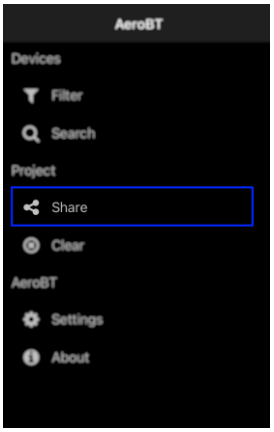
Checkmark (Completed) Icon toggled `ON` or `OFF`



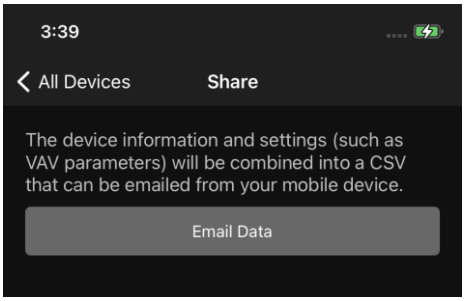
Flag Icon toggled `ON` or `OFF`



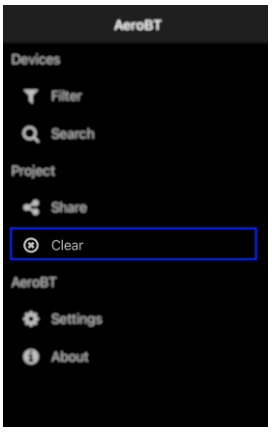
SHARE



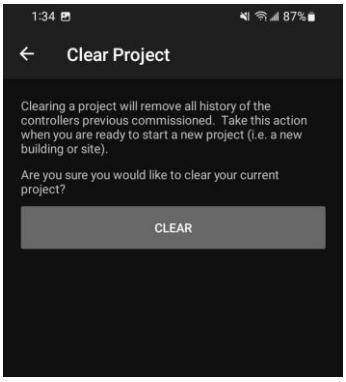
You can email the report findings on the balanced VAV boxes by clicking the Email Data button and selecting the email app on your device from which you wish to send out the reports.



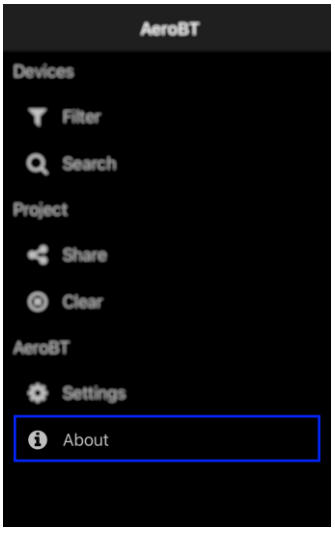
CLEAR



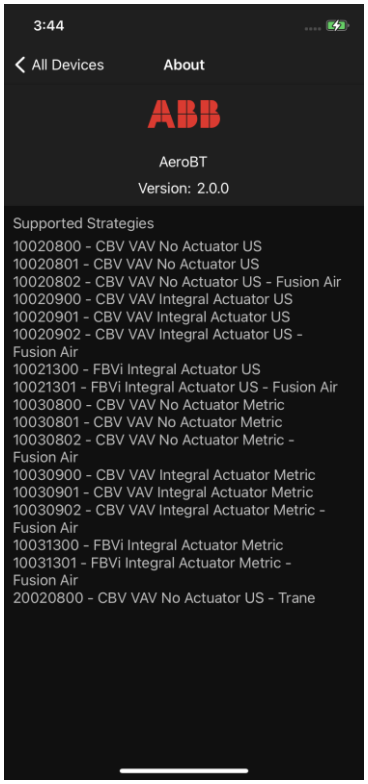
The Clear option removes all history of the controllers that were commissioned previously on this **AeroBT** instance. This might be used for example to clear a finished floor.



ABOUT



The About option displays the **Aero^{BT}** version number. The supported strategies are also listed on this page.

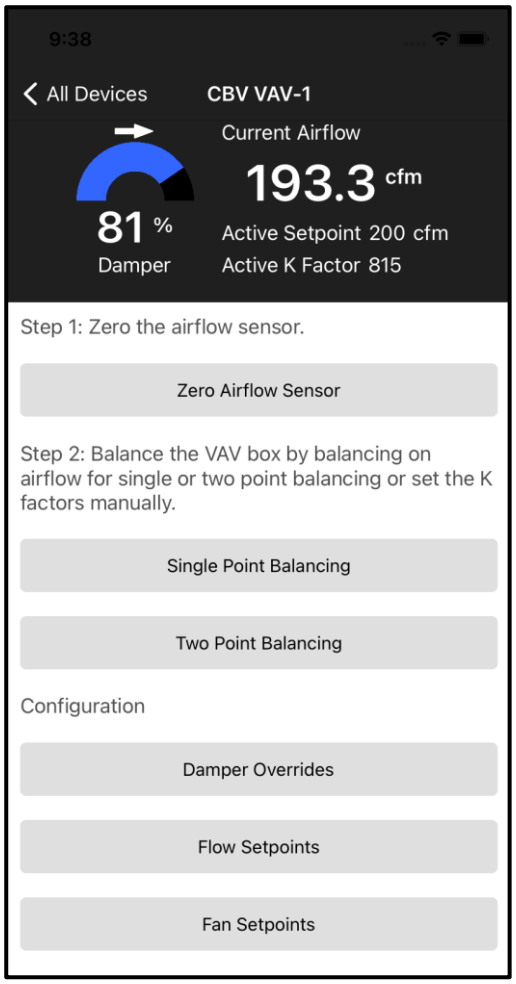


3 Balancing VAVs

BALANCING VAVS

DEVICE MAIN SCREEN

When you select a Device for the All Devices list, the Device's Main Screen is displayed:



CBV VAV-1	Device Name
	Damper Direction
81 % Damper	Damper Position
Current Airflow 193.3 cfm	Active Airflow
Active Setpoint 200 cfm	Active Airflow Setpoint
Active K Factor 815	Unit K Factor

ZERO AIRFLOW SENSOR – close the damper 100% and calculate the offset during operation.

SINGLE POINT BALANCING – balance the vav to its max airflow setpoint.

TWO POINT BALANCING – balance the vav to both its min and max airflow setpoint.

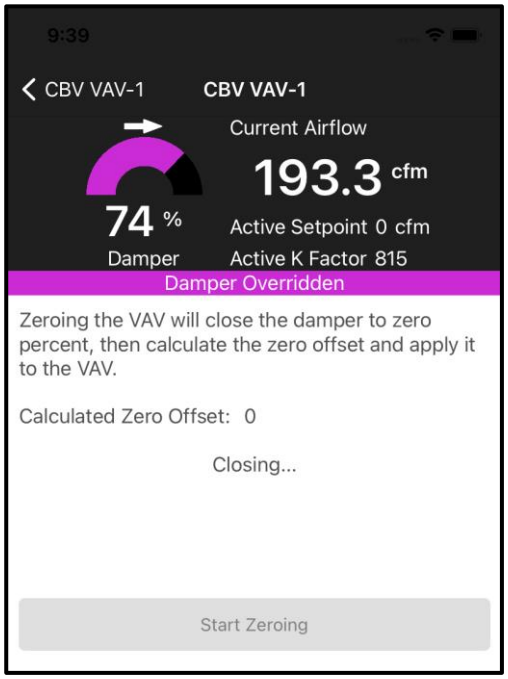
DAMPER OVERRIDES – User can override different damper positions.

FLOW SETPOINTS – User can set airflow setpoints.

FAN SETPOINTS – User can set fan setpoints

ZERO AIRFLOW SENSOR – FBVi AND CBV

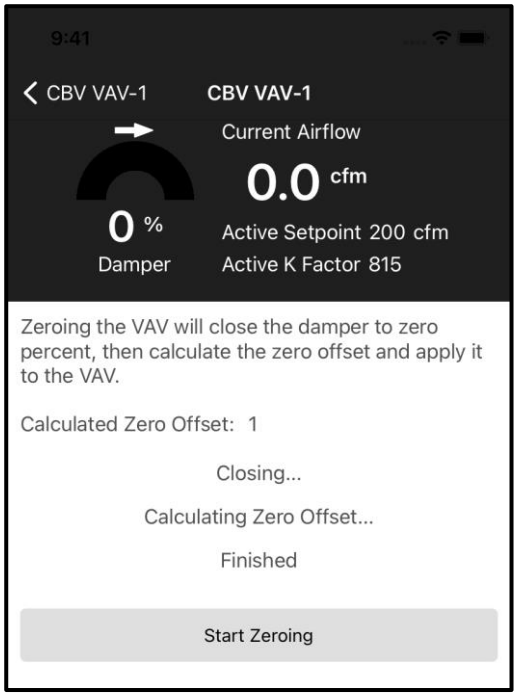
Clicking the ZERO AIRFLOW SENSOR button on the Device Main Screen opens the Zero Airflow screen:



Click the START ZEROING Button

- The damper will close to 0%
- The strategy will calculate the zero offset
- The damper will be released.
- When the damper has been overridden, the color will change from yellow to purple to indicate its status.

At any time, if you click the back arrow <, the system will stop and release back to auto control.



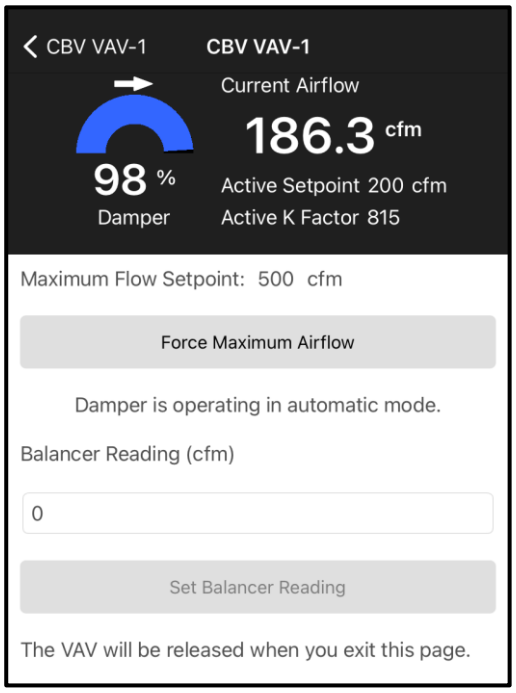
After the calculation is finished, the Calculated Zero Offset will be shown.

The damper color will change back from purple to blue to indicate that the system is back in auto mode.

When finished, leave the screen by pressing the back arrow <. This will also release any overrides.

SINGLE POINT BALANCING – FBVi AND CBV

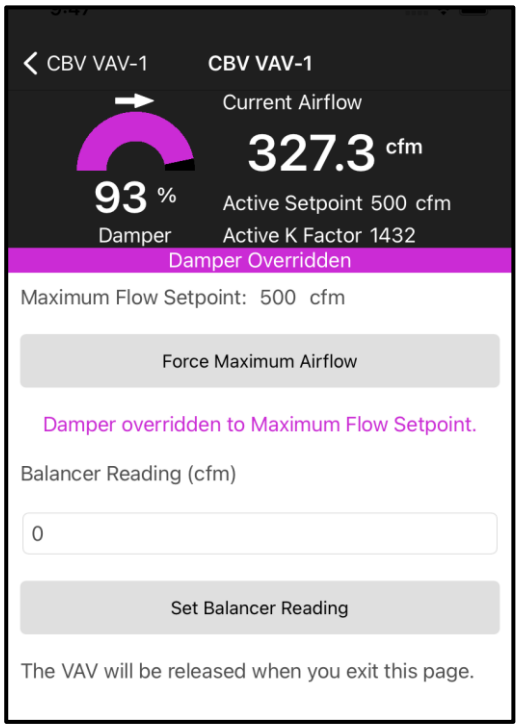
Clicking the BALANCE MAX AIRFLOW button on the Device Main Screen opens the Balance Max Airflow Screen:



Step 1 – Verify your maximum flow setpoint. This can be set by returning to the main screen and selecting FLOW SETPOINTS

Step 2 – Click the FORCE MAXIMUM AIRFLOW Button.

The Active Setpoint display will change to the Maximum Flow Setpoint.



The color of the damper position will change to purple, indicating the unit is not in auto mode and is being overridden.

Step 3 – after the airflow has settled, take a balancer reading, and enter the cfm reading into the Balancer Reading input box. The K Factor will be re-calculated.

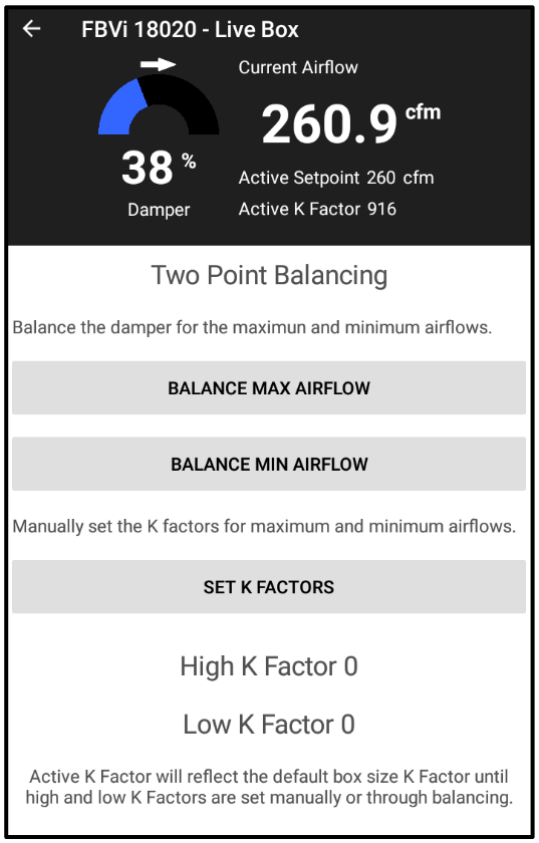
> **Note:** **In the CBV, the K Factor will go to a random number from the set K Factor during the first balance run.**
>
> **In the FBVi, the initial K Factor will be set by the Box Size setpoint.**

Step 4 - Once the balancer reading has been entered, click the SET BALANCER READING button to send the information to the controller.

When finished, leave the screen by pressing the back arrow <. This will also release any overrides.

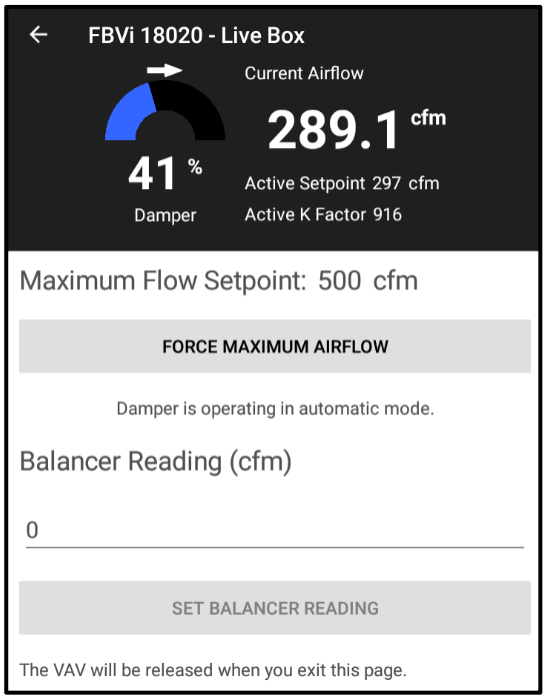
2-POINT BALANCING – FBVI

Clicking the TWO POINT BALANCING button on the Device Main Screen opens the Two Point Balancing Screen:



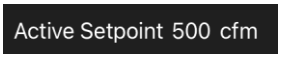
Step 1 – Verify your maximum flow setpoints and minimum flow setpoints. This can be set by returning to the Main Screen and selecting FLOW SETPOINTS

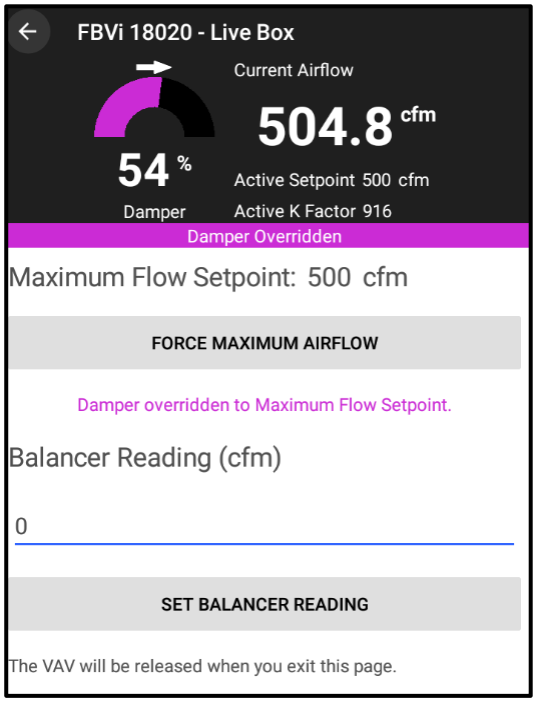
The High K Factor and Low K Factor will show the current calculated K Factors after balancing. If not balanced, the Active K Factor will reflect the pre-determined K Factor based on the box-size selected.



Step 2 – Click the FORCE MAXIMUM AIRFLOW Button.

The Active Setpoint display will change to the Maximum Flow Setpoint.





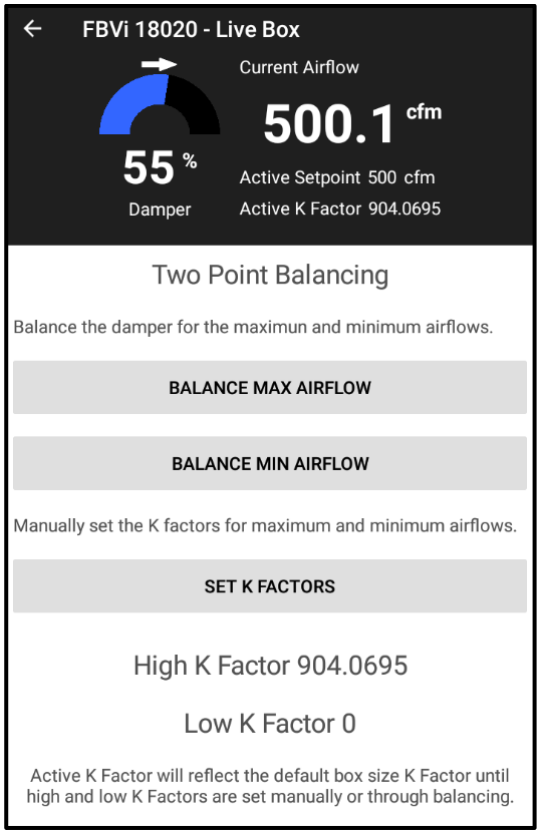
The color of the damper position will change to purple, indicating the unit is not in auto mode and is being overridden.

Step 3 – after the airflow has settled, take a balancer reading, and enter the cfm reading into the Balancer Reading input box. The K Factor will be re-calculated.

Step 4 - Once the balancer reading has been entered, click the SET BALANCER READING button to send the information to the controller.

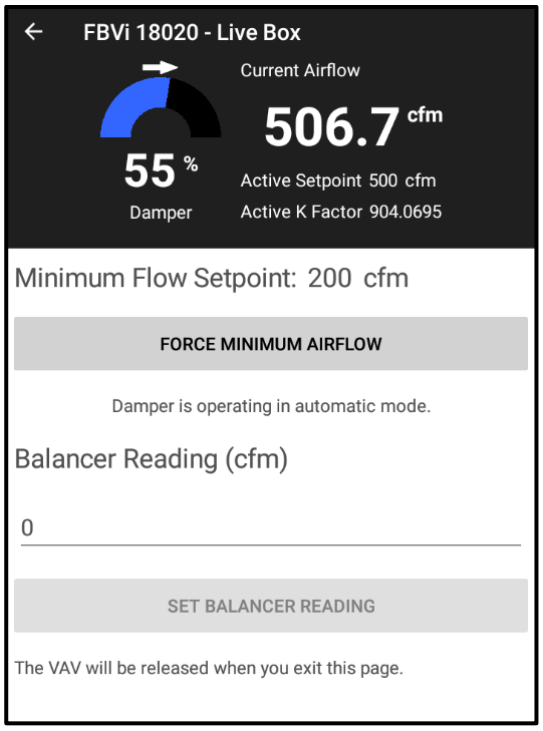
When finished, leave the screen by pressing the back arrow <. This will also release any overrides.

Note: If Low K Factor was calculated first, the Low K Factor will be used as the basepoint. If the Low K Factor was not calculated yet, the standard K Factor available with the box size will be used. Once the balancer reading is entered, the new High K Factor will be displayed.



If the max airflow has been balanced, the Active Setpoint will show the calculated maximum K Factor. It can also be read from the Two Point Balance screen.

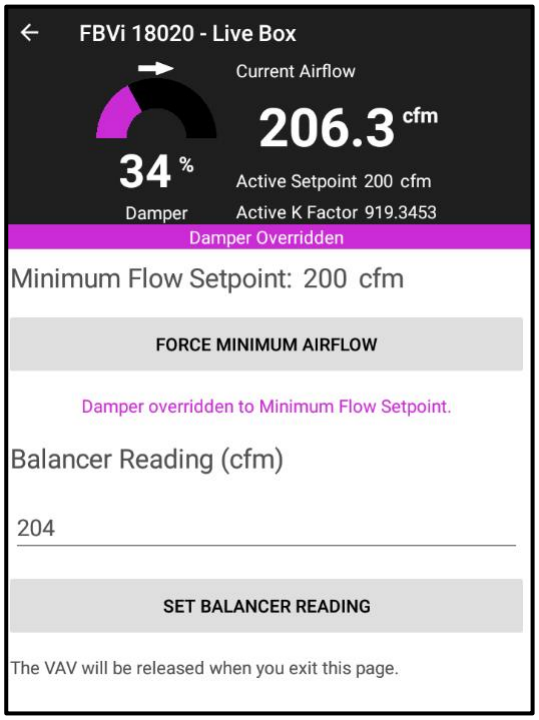
Clicking the BALANCE MIN AIRFLOW button on the Device Main Screen opens the Balance Mix Airflow Screen



Step 1 – Verify your minimum flow setpoint. This can be set by returning to the main screen and selecting FLOW SETPOINTS

Step 2 – Click the FORCE MINIMUM AIRFLOW Button.

The Active Setpoint display will change to the Minimum Flow Setpoint.



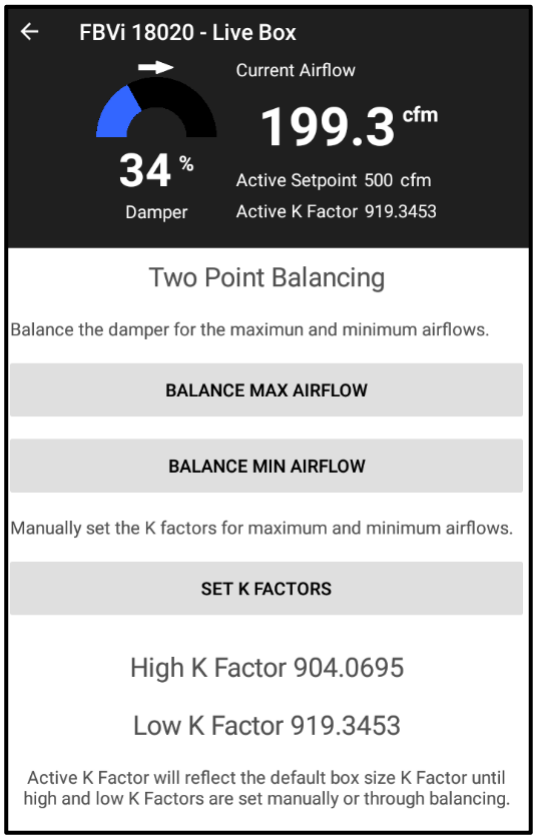
The color of the damper position will change to purple, indicating the unit is not in auto mode and is being overridden.

Step 3 – after the airflow has settled, take a balancer reading, and enter the cfm reading into the Balancer Reading input box. The K Factor will be re-calculated.

Step 4 - Once the balancer reading has been entered, click the SET BALANCER READING button to send the information to the controller.

When finished, leave the screen by pressing the back arrow  . This will also release any overrides.

Note: If High K Factor was calculated first, the High K Factor will be used as the basepoint. If the High K Factor was not calculated yet, the standard K Factor available with the box size will be used. Once the balancer reading is entered, the new Low K Factor will be displayed.



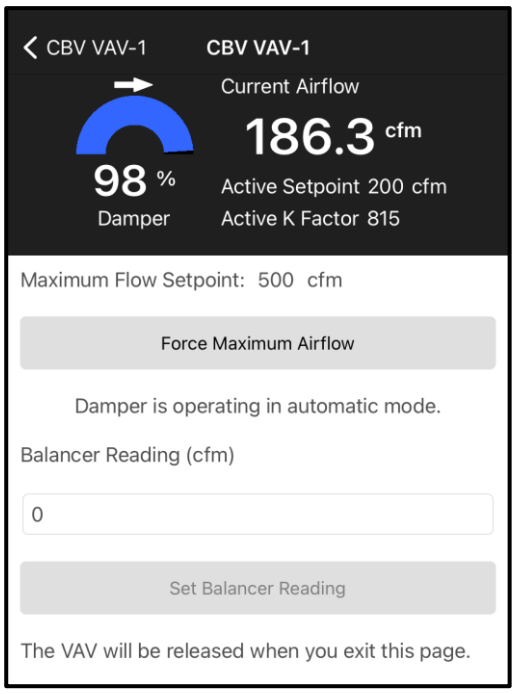
If both the min and max airflow has been balanced, the Active Setpoint will show the calculated K Factor, which will actively reset between the Low K Factor and the High K Factor.

Both calculated K Factors will appear at the bottom of the Two Point Balancing Page for easy referral.

Note: Both Low K Factor and High K Factor can be re-balanced after they have been calculated. Repeat the BALANCE MAX AIRFLOW procedure, or the BALANCE MIN AIRFLOW procedure to re-calculate.

BALANCE MIN AIRFLOW – CBV

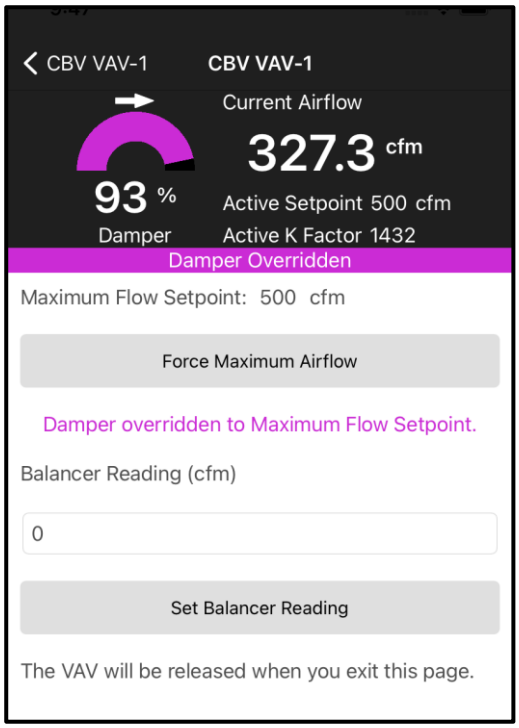
Clicking the BALANCE MIN AIRFLOW button on the Device Main Screen opens the Balance Mix Airflow Screen:



Step 1 – Verify your minimum flow setpoint. This can be set by returning to the main screen and selecting FLOW SETPOINTS

Step 2 – Click the FORCE MINIMUM AIRFLOW Button.

The Active Setpoint display will change to the Minimum Flow Setpoint.



The color of the damper position will change to purple, indicating the unit is not in auto mode and is being overridden.

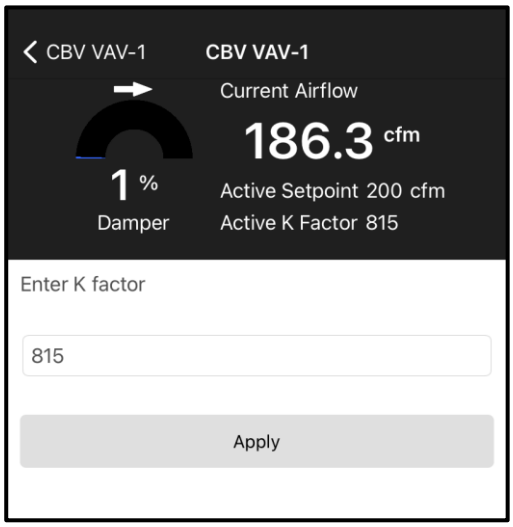
Step 3 – after the airflow has settled, take a balancer reading, and enter the cfm reading into the Balancer Reading input box. The K Factor will be re-calculated. (note K Factor will go to a random number from the set K Factor during the first balance run)

Step 4 - Once the balancer reading has been entered, click the SET BALANCER READING button to send the information to the controller.

When finished, leave the screen by pressing the back arrow <. This will also release any overrides.

SET SINGLE POINT K FACTOR - FBVi AND CBV

If balancing isn't required, you can manually configure the K Factor by clicking the SET K FACTOR button on the Device Main Screen to open the K Factor Screen.



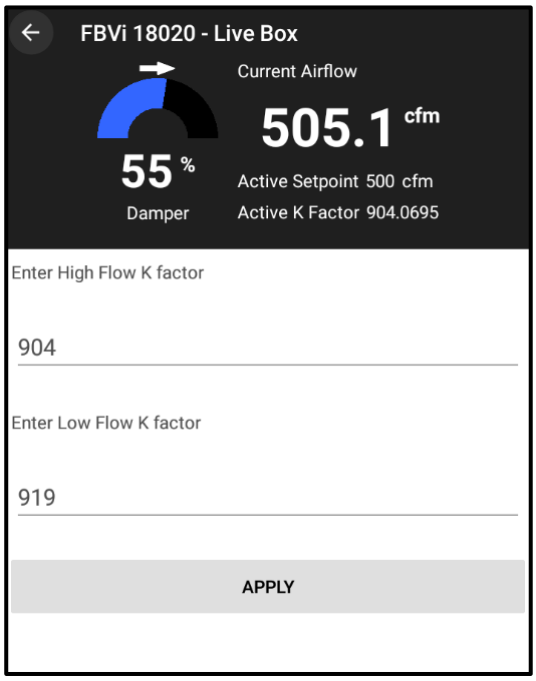
Enter the K Factor number for the VAV. This is available from a chart mounted on the side of an installed VAV, or from documentation from the unit manufacturer.

After entering the K Factor, click the APPLY button.

The active K Factor shown should change to the number entered if doing single point balancing.

SET 2-POINT K FACTOR – FBVi

If balancing is not required, you can manually configure the K Factors by clicking the SET K FACTOR button on the Two Point Balancing Screen to open the K Factor Screen.



Enter both the high and low K Factors for the VAV. For maximum flow, this is available from a chart mounted on the side of an installed VAV, or from documentation from the unit manufacturer.

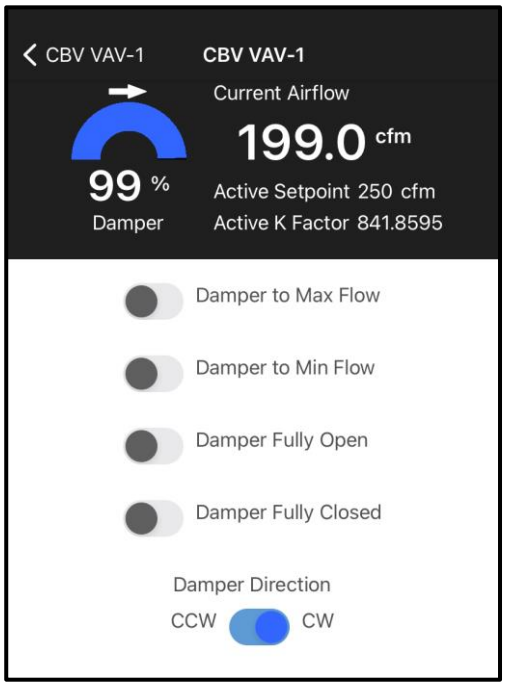
After entering the K Factors, click the APPLY button.

The active K Factor shown will reset between both the high and low K Factors based on the active flow.

Note: If there was a mistake or the box needs to be reset back to the initial box size value, enter `0` in both the High and Low factors.

DAMPER OVERRIDES - CBV

Clicking the DAMPER OVERRIDES button on the Device Main Screen opens the Damper Override screen:

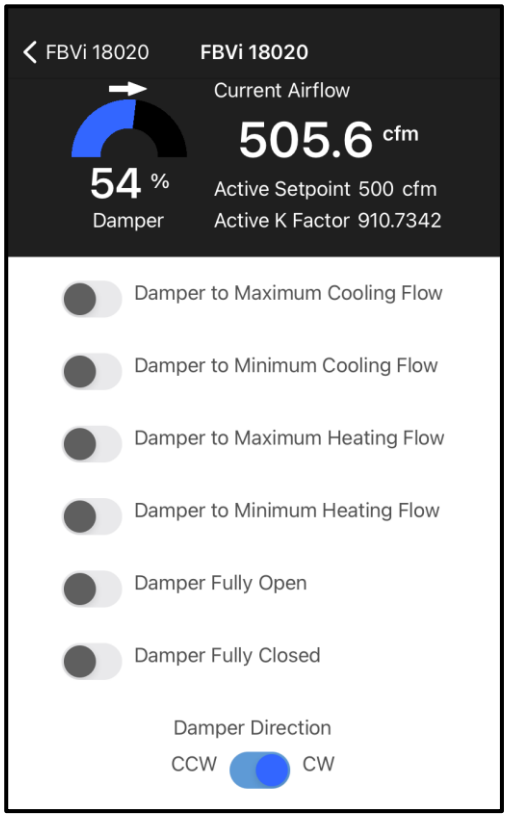


Switch to force Damper to Max Flow Setpoint.
Switch to force damper to Min Flow Setpoint.
Switch to force Damper fully open.
Switch to force Damper fully closed.
Toggle Damper direction either **C**lock**W**ise or **C**ounter**C**lock**W**ise.

When finished, leave the screen by pressing the back arrow < This will also release any overrides.

DAMPER OVERRIDES – FBVi

Clicking the DAMPER OVERRIDES button on the Device Main Screen opens the Damper Override screen:

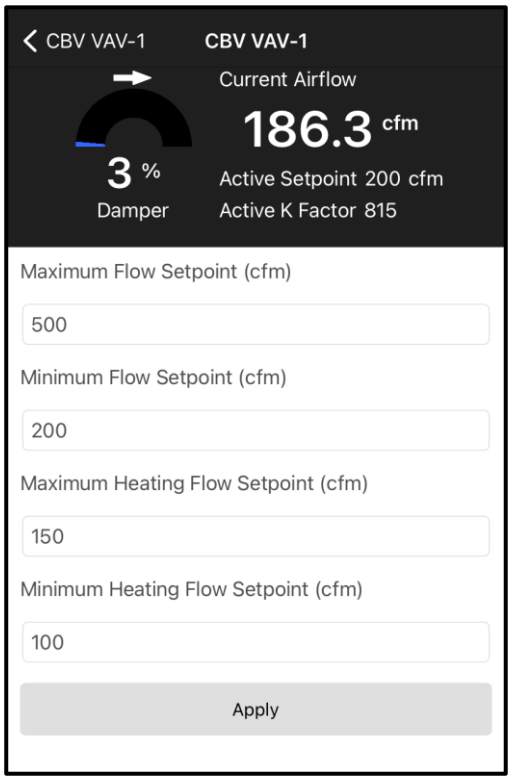


Switch to force Damper to Max Cooling Flow Setpoint.
Switch to force Damper to Min Cooling Flow Setpoint.
Switch to force Damper to Max Heating Flow Setpoint.
Switch to force Damper to Min Heating Flow Setpoint.
Switch to force Damper fully open.
Switch to force Damper fully closed.
Toggle Damper direction either **C**lock**W**ise or **C**ounter**C**lock**W**ise.

When finished, leave the screen by pressing the back arrow . This will also release any overrides.

FLOW SETPOINTS – FBVI AND CBV

Clicking the FLOW SETPOINTS button on the Device Main Screen opens the Flow Setpoints screen:



Enter the Maximum Flow Setpoint

Enter the Minimum Flow Setpoint

Enter the Maximum Heating Flow Setpoint

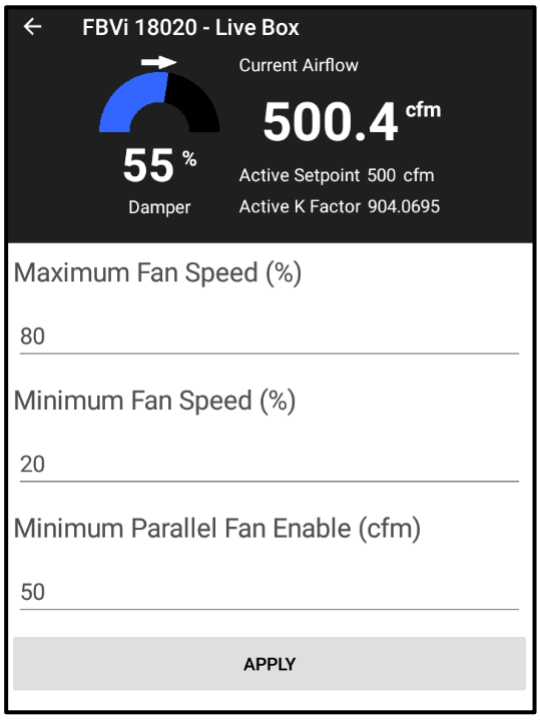
Enter the Minimum Heating Flow Setpoint

After entering the flow setpoints, click the Apply button.

When finished, leave the screen by pressing the back arrow  .

FAN SETPOINTS -FBVI

Clicking the FAN SETPOINTS button on the Device Main Screen opens the Fan Setpoints Screen:



Enter the Maximum Fan Speed Setpoint

Enter the Minimum Fan Speed Setpoint

Enter the Minimum Parallel Fan Enable.

If the airflow falls below this level, the parallel fan will be activated.

After entering the flow setpoints, click the APPLY button.

When finished, leave the screen by pressing the back arrow  .

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