

Rapid Balance 6.1

User Guide

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Rapid Balance 6.1

Rapid Balance is a software program that will balance VAV HVAC devices.

The following devices can be balanced using this program

XL10 VAV Devices

Spyder/WEBS/ILC/Lynx VAV Devices

Stryker VAV Devices

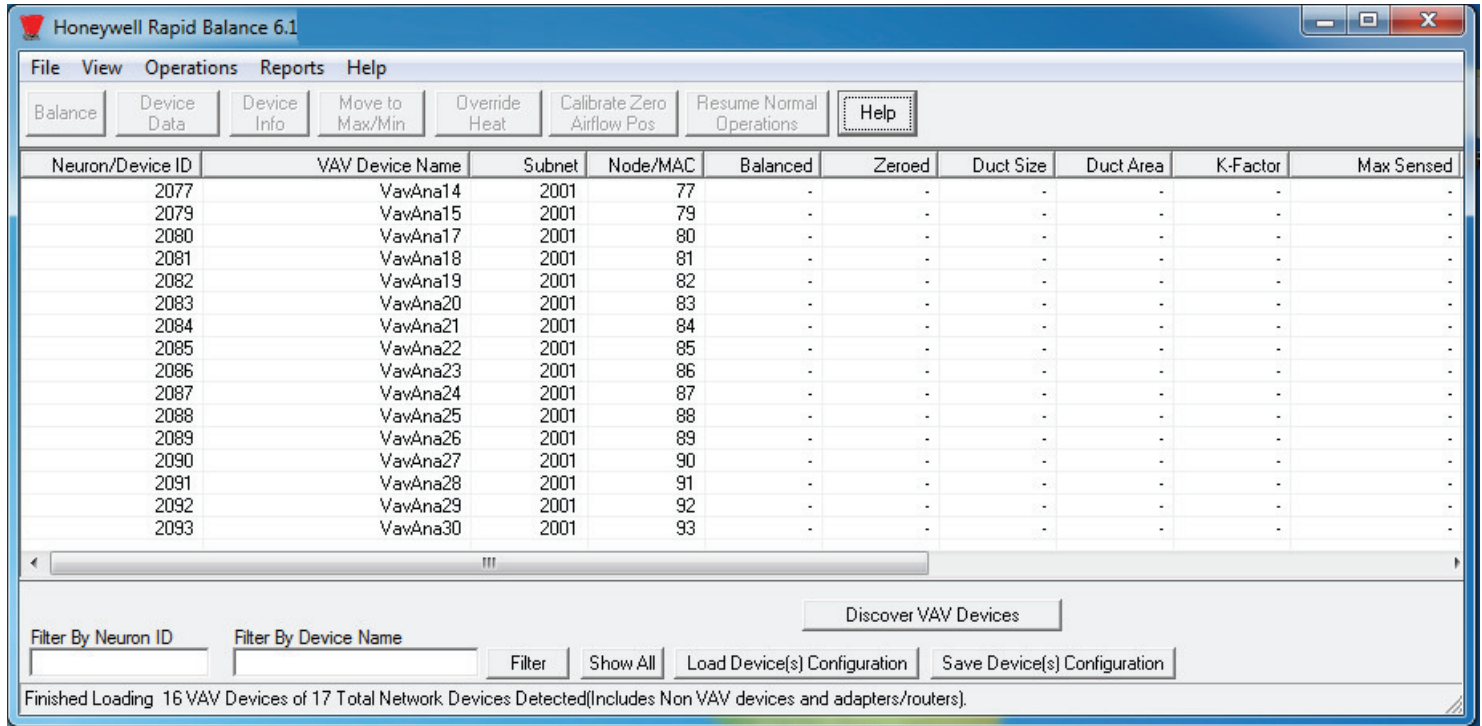
CP-7XXX Devices

Main Screen (Device List)

Introduction

When the VAV Balancing Application is started the opening dialog screen is displayed and is similar to the opening dialog screen shown in figure 1. During the initialization of the opening dialog box, a list of VAV devices located on the network will be displayed.

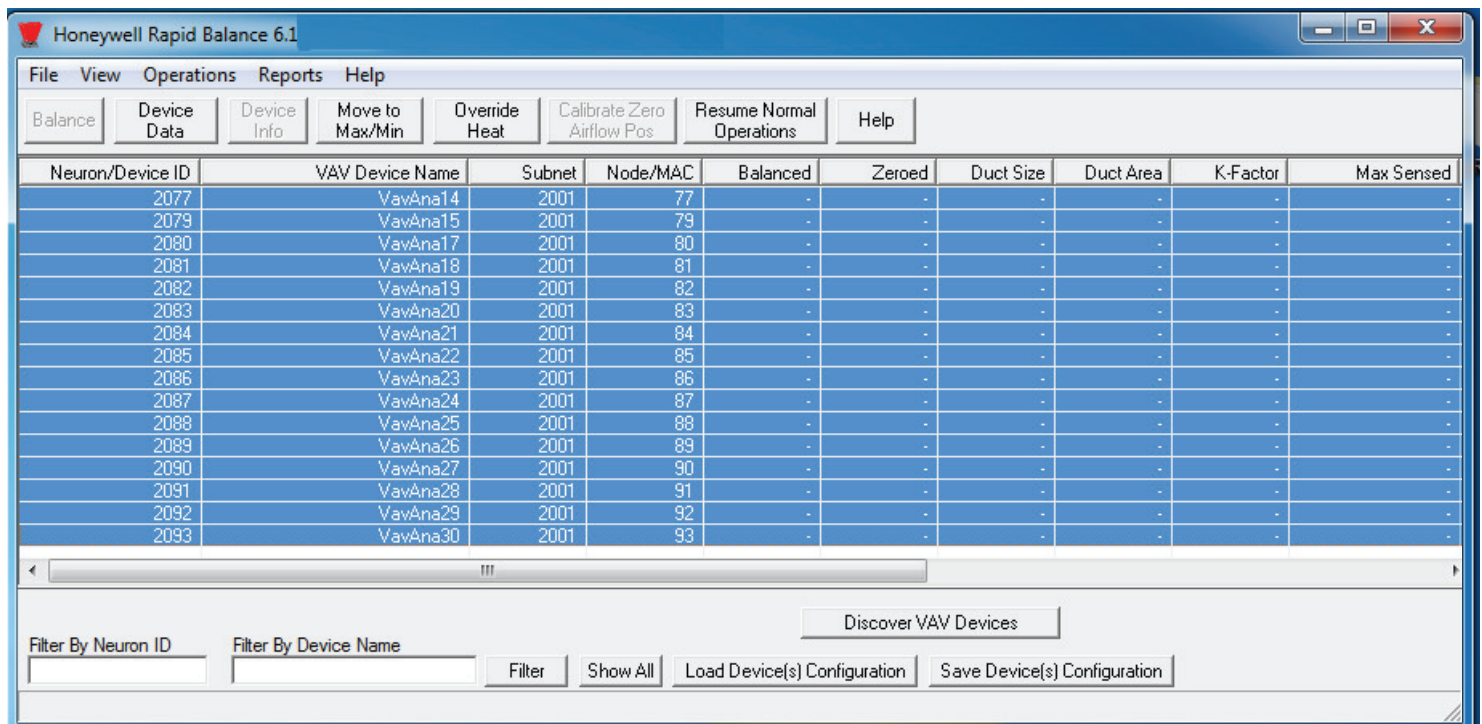
Only the Neuron/Device ID, Device Name, Subnet and Node/MAC will be displayed in the initial scan.



The screenshot shows the Honeywell Rapid Balance 6.1 application window. The 'Device Data' tab is selected, displaying a table of 30 VAV devices. The table columns are: Neuron/Device ID, VAV Device Name, Subnet, Node/MAC, Balanced, Zeroed, Duct Size, Duct Area, K-Factor, and Max Sensed. All devices are currently in the 'Not Balanced' state. Below the table, there are filter fields for Neuron ID and Device Name, a 'Discover VAV Devices' button, and buttons for 'Filter', 'Show All', 'Load Device(s) Configuration', and 'Save Device(s) Configuration'. A status bar at the bottom indicates 'Finished Loading 16 VAV Devices of 17 Total Network Devices Detected(Includes Non VAV devices and adapters/routers)'.

Neuron/Device ID	VAV Device Name	Subnet	Node/MAC	Balanced	Zeroed	Duct Size	Duct Area	K-Factor	Max Sensed
2077	VavAna14	2001	77	-	-	-	-	-	-
2079	VavAna15	2001	79	-	-	-	-	-	-
2080	VavAna17	2001	80	-	-	-	-	-	-
2081	VavAna18	2001	81	-	-	-	-	-	-
2082	VavAna19	2001	82	-	-	-	-	-	-
2083	VavAna20	2001	83	-	-	-	-	-	-
2084	VavAna21	2001	84	-	-	-	-	-	-
2085	VavAna22	2001	85	-	-	-	-	-	-
2086	VavAna23	2001	86	-	-	-	-	-	-
2087	VavAna24	2001	87	-	-	-	-	-	-
2088	VavAna25	2001	88	-	-	-	-	-	-
2089	VavAna26	2001	89	-	-	-	-	-	-
2090	VavAna27	2001	90	-	-	-	-	-	-
2091	VavAna28	2001	91	-	-	-	-	-	-
2092	VavAna29	2001	92	-	-	-	-	-	-
2093	VavAna30	2001	93	-	-	-	-	-	-

Select all the devices in the scan by holding down the shift key and using the mouse



The screenshot shows the same Honeywell Rapid Balance 6.1 application window, but now all 30 devices in the table are highlighted with a blue background, indicating they have been selected. The interface elements, including the menu bar, toolbar, filter fields, and status bar, remain the same as in the previous screenshot.

Neuron/Device ID	VAV Device Name	Subnet	Node/MAC	Balanced	Zeroed	Duct Size	Duct Area	K-Factor	Max Sensed
2077	VavAna14	2001	77	-	-	-	-	-	-
2079	VavAna15	2001	79	-	-	-	-	-	-
2080	VavAna17	2001	80	-	-	-	-	-	-
2081	VavAna18	2001	81	-	-	-	-	-	-
2082	VavAna19	2001	82	-	-	-	-	-	-
2083	VavAna20	2001	83	-	-	-	-	-	-
2084	VavAna21	2001	84	-	-	-	-	-	-
2085	VavAna22	2001	85	-	-	-	-	-	-
2086	VavAna23	2001	86	-	-	-	-	-	-
2087	VavAna24	2001	87	-	-	-	-	-	-
2088	VavAna25	2001	88	-	-	-	-	-	-
2089	VavAna26	2001	89	-	-	-	-	-	-
2090	VavAna27	2001	90	-	-	-	-	-	-
2091	VavAna28	2001	91	-	-	-	-	-	-
2092	VavAna29	2001	92	-	-	-	-	-	-
2093	VavAna30	2001	93	-	-	-	-	-	-

All of the device data will be displayed/loaded after selecting all of the devices and pressing the "Device Data" button

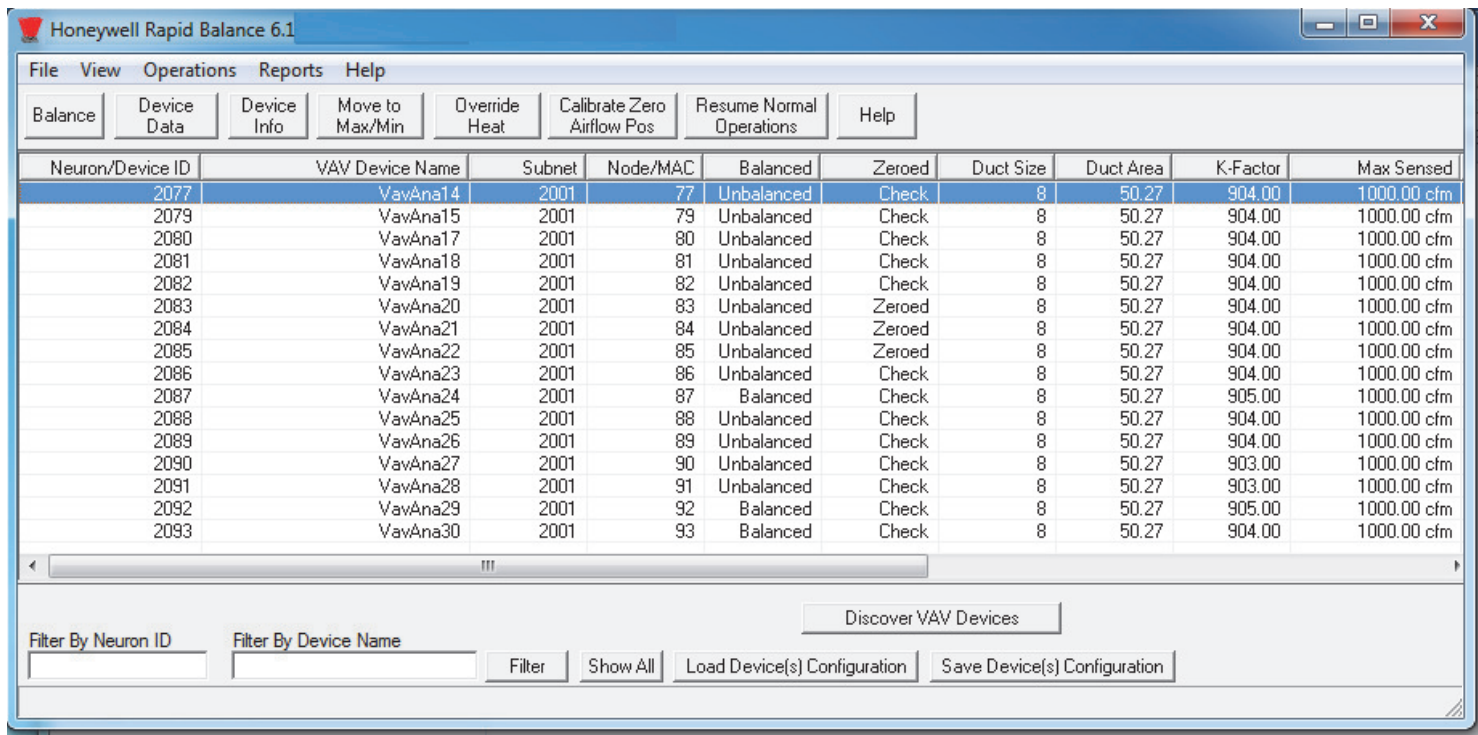


Figure 1: Opening Dialog Screen

Overview

The opening dialog provides the user with the main interface to the network of VAV devices. Through the screen the user can balance any VAV device and exercise various related operations.

The menu bar located directly under the dialog box name allows the user direct access to all functions supported by this tool, various commonly used functions can also be accessed through the tool bar located directly underneath the menu bar. Icons displayed on the tool bar allow direct access to an operation without the need to penetrate a menu.

The next section of the opening dialog displays all devices discovered on the network using the filter parameters selected by the user. When a device is discovered on the network that matches the filtering parameters, its Neuron/Device ID is displayed along with any other device parameters selected by the user in the view/[column](#) Menu option.

Filtering of the displayed list of devices is possible by either Neuron/Device ID or Device Name.

The final area of the opening dialog screen is the status bar. Here information is displayed on the current operation and status of the application.

Finally, menu items and tool icons are enabled or disabled (grayed out) based on the number of devices selected. If a single device is selected in the device list, then menu and tool bar operations that are allowed for single devices will be enabled. Any other menu or tool bar operation that does not apply to a single device is disabled (grayed out). If more then one device is selected, then only those operations that can be applied to multiple devices are enabled.

Discovering Devices

The Discover VAV Devices button will clear the contents of the device grid and search the LON or BACnet network for devices. To increase the speed of discovery, only the Neuron/Device ID, device name, subnet and node/MAC address will be displayed. To load the remaining information, select one or more devices on the grid and press the "Device Data" button.

Loading and Saving Device Scans

Once all devices have been discovered the device list can be saved to a file to be re-loaded at another time. It is recommended that the device scan be saved after all of the device information has been loaded, this will ensure that all of the device type information can be saved. Device scans do not save the current status of the device, such as setpoints and balance status, etc. To ensure that the grid always has the most current information, use the "Device Data" button to update the device(s) information to the device grid.

Selecting Devices

Devices displayed in the opening dialog box can be selected simply by clicking the mouse on the row the desired device is located in. Multiple devices can be selected using standard Microsoft Windows conventions. Holding the control key while clicking on a row will add that device to the currently selected devices. Holding the shift key down while selecting a row will add all devices between the current selected device and the last selected device.

Note that if no device has been selected, none of the operations available are enabled. A device must be selected before balancing or other operations can be conducted.

Menu Bar

The menu bar allows access to all application and device functions. The menu bar is separated into different categories. The categories and menu items within the categories are:

File Menu: [Preferences](#) ... - Displays the applications Preferences dialog box

Exit – Disconnect from the echelon/BACnet network and close application.

Note: If the application is exited without running any of the report options in the [Reports](#) menu, then all information for the current displayed devices will not be saved to disk for review.

View Menu: Refresh Device List – Updates the current list of devices based on current filter parameters.

[Columns](#) ... - List of displayable device parameters.

Operations Menu: [Balance](#) ... - Displays the balancing dialog box. This item only applies to single device selections.

[Device Information](#) ... - Displays device parameters that are relevant to device airflow. This item applies to one or more devices.

[Move to Specific Damper Position](#) ... - Displays the damper command dialog box. This item only applies to single device selections.

[Move to Specific Airflow Position](#) ... - Displays the Airflow command dialog box. This item only applies to single device selections.

[Calibrate Zero Airflow Position](#) ... - Displays the Calibrate Zero command dialog box. This item only applies to single device selections.

[Move to Max/Min Airflow Positions](#) ... - Displays the Max/Min command dialog box for one or more devices.

[Override Heat](#) - Displays the command dialog box to override heat values for one or more devices.

[Reports](#) Menu: All – Save all device information for all displayed devices to the specified file.

Selected – Save all device information for selected devices to the specified file.

Balanced – Save all device information for any device whose balanced column is set to balanced.

Unbalanced – Save all device information for any device whose balanced column field is set to unbalanced.

Zeroed – Save all device information for any device whose zeroed column field is set to zeroed.

Unzeroed – Save all device information for any device whose zeroed column field is set to unzeroed.

Unconfigured – Save all device information for any device whose configured column field is set to unconfigured.

Tool Bar

The tool bar allows direct access to more common device functions without the need for menu access. The tool bar shortcuts provided in the application are:

[Balance](#) – Displays the Balancing dialog box. The balance icon is only enabled for single device selections.

Device Data - Loads all device data for the highlighted device(s) on the device grid.

[Device Info](#) - Displays device parameters that are relevant to device airflow. This icon is enabled whenever one or more devices are selected.

[Move to Max/Min](#) - Displays the Max/Min command dialog box for one or more devices.

[Override Heat](#) - Displays the command dialog box to override heat values for one or more devices.

[Calibrate Zero Airflow Position](#) ... - Displays the Calibrate Zero command dialog box. This item only applies to single device selections.

Resume Normal Operations - Returns the device(s) selected on the device grid back to normal or automatic operations.

Help – Displays this help file.

Preferences Screen

The preference screen allows the user to configure the tool for communications, Engineering Units and Domain information related to the Echelon Network and BACnet devices. The basic dialog box is shown in figure 2.

The Preferences dialog box is organized into several sections:

- Communications:**
 - Radio buttons: ☐ NONE, ☐ USB LON, ☒ BACnet/IP
 - USB LON Device: Dropdown menu showing "LON1"
 - USB LON Node Address: Text field with "124" and range "(1 - 127)"
- LON Search Device Domain Info:**
 - Radio buttons: ☒ Zero Length Domain (Default), ☐ Non-Zero Length Domain (LNS), ☐ Niagara Domain Mode
 - Non-Zero Domain Length (1-6): Text field with "1"
 - Service Pin Domain: Button
 - Enter non-zero domain values in Hexidecimal (0-FF) and set unused values to Zero: Row of six text fields with values "2C", "0", "0", "0", "0", "0"
- BACnet/IP Settings:**
 - Lowest Search Device ID: Text field with "0" and range "(0 - 4194302)"
 - Highest Search Device ID: Text field with "10000" and range "(0 - 4194302)"
 - Search Retries: Text field with "1" and range "(0 - 10)"
 - PC Ethernet Adapter: Dropdown menu showing "Realtek PCIe GBE Family Controller"
 - PC Ethernet Adapter Full Description: Text field showing "Realtek PCIe GBE Family Controller"
 - PC Ethernet Adapter IP Address: Text field with "192.168.1.106"
 - BACnet/IP UDP Port: Text field with "BAC0" and range "(0 - FFFF) in Hexadecimal"
- Engineering Units:**
 - Radio buttons: ☒ English, ☐ Metric, ☐ Metric - Asia

Buttons at the bottom: OK, Cancel, Apply, Help

Figure 2: Preferences Configuration Dialog Box

Communications

Communications defines the type of interface used to connect with the communications bus. These are the different types of network interface devices currently in use.

None - No device defined.

USB – This is an external USB Lon device which is connected to the PC's USB port. The PC must also have the Echelon LDV driver set installed. If the USB device or the LDV driver set is not detected this selection will be disabled. Once selected, select the USB device instance from the listbox. The default is "LON1", but the PC may have addition names for the device.

BACnet/IP – This is an external Contemporary Controls BACnet/IP to MS/TP adapter. The adapter must be connected to the PC's Ethernet port or be present on the PC's local area network.

Engineering Units

The balancing tool allows the use of English and Metric Engineering Units with the following units applied to all sensed measurements based on the selection.

English

Flow Volume – cubic feet per minute (cfm)

Flow Velocity – feet per minute (fpm)

Temperature – degrees Fahrenheit (F)

Metric

Flow Volume – liters per sec (lps)

Flow Velocity – meters per second (mps)

Temperature – degrees Centigrade (C)

Metric-Asia

Flow Volume – cubic meters per hour (m3h)

Flow Velocity – meters per second (mps)

Temperature – degrees Centigrade (C)

LON Search Device Device Domain Info

The Device Domain is an advance setting for Echelon networks. The default settings are the typical settings required for a Honeywell network system. Changes to this setting should only be made by personal familiar with the Echelon network.

BACnet/IP Settings

Lowest Device ID Search

Highest Device ID Search

Search Retries

These parameters determine the address ranges to be searched when searching the BACnet network for devices. The larger the value between the high and low addresses, the longer it will take to find all the controllers when doing a search. The search retries field allows for retrying the search to make sure all the device are found.

PC Ethernet Adapter

PC Ethernet Adapter Full Description

PC Ethernet Adapter IP Address

This dropdown listbox will allow selection of all available PC Ethernet adapters. This will allow for the selection of a Ethernet adapter that is connected to the BACnet/IP router which may be different from the local network.

BACnet UDP Port

This text box will allow an alternative to the standard BACnet/IP router port. This value must match the BACnet/IP router port on the external router device. The default value for this port is BAC0 (the 0 is a zero not the letter O).

Balance on Maximum/Minimum Airflow Position Screen

The balancing dialog box allows the user to balance the maximum and if required the minimum airflow for the selected VAV controller. Procedurally, the balancing routines are the same for both the maximum and the minimum. It is highly recommended that the maximum airflow balancing for a VAV always be performed. However, balancing of the minimum airflow, though recommended, is not required. The dialog box initial display screen is shown in figure 3.

The screenshot shows a software window titled "Balance Device" with a standard Windows-style title bar (minimize, maximize, close buttons). The window contains the following elements:

- Parameters and Values:**
 - Neuron/Device ID: 2077
 - VAV Device Name: VavAna14
 - K-Factor: 904.00
 - Damper Position: 15 percent
 - Sensed Airflow: 501.15 cfm
 - Measured Airflow: [input field] cfm
 - Max Airflow Setpoint: 775.00 cfm
 - Min Airflow Setpoint: 350.00 cfm
- Buttons:**
 - K Factor Setup:** Located to the right of the K-Factor value.
 - Apply Measured Flow:** Located to the right of the Measured Airflow input field.
 - Change Max Setpoint:** Located below the Max Airflow Setpoint.
 - Change Min Setpoint:** Located below the Min Airflow Setpoint.
 - Start K Factor:** Located at the bottom left.
 - Set Balance Data to Factory Default:** Located at the bottom left, next to Start K Factor.
 - Start Max Balance:** Located at the bottom left.
 - Start Min Balance:** Located at the bottom left.
 - Resume Normal Operations:** Located at the bottom left.
 - Close:** Located at the bottom right.
 - Help:** Located at the bottom right.

Figure 3: Max/Min Balancing Dialog Box

The balancing dialog box allows balancing of both the Maximum and Minimum airflow setpoints. Information pertinent to balancing is actively updated and the airflow setpoints may be adjusted through the [change setpoint](#) buttons provided.

Balancing Procedures

Step 1 - Balancing begins when either the "Start Max Balance" or "Start Min Balance" is pressed. When balance has begun, the status of the balancing operation is displayed in the status bar at the bottom of the dialog box. The initial message displayed indicates that the controller is seeking the required airflow setpoint.

Note: At any time during the balancing process the "Resume Normal Operations" button may be pressed, and the controller is resorted to normal operation and no changes in the controllers balancing parameters are made to the controller.

Step 2 - When the controller has reached the required setpoint, the status bar message indicates that the user should now enter the measured airflow in the text box and the "Apply Measured Flow" button is enabled. The user should manual measure the airflow of the VAV terminal and enter this value into the text box provided in the dialog box.

Step 3 - Pressing the "Apply Measured Flow" completes the balancing.

Note: If at any time during the balancing operation the Balancing Dialog Box is closed, the controller is restored to normal operation and no changes are made to the controller's balancing parameters.

Start K-Factor

This button will Start the K-Factor calculation procedure

Note: At any time during the balancing process the "Resume Normal Operations" button may be pressed, and the controller is resorted to normal operation and no changes in the controllers balancing parameters are made to the controller.

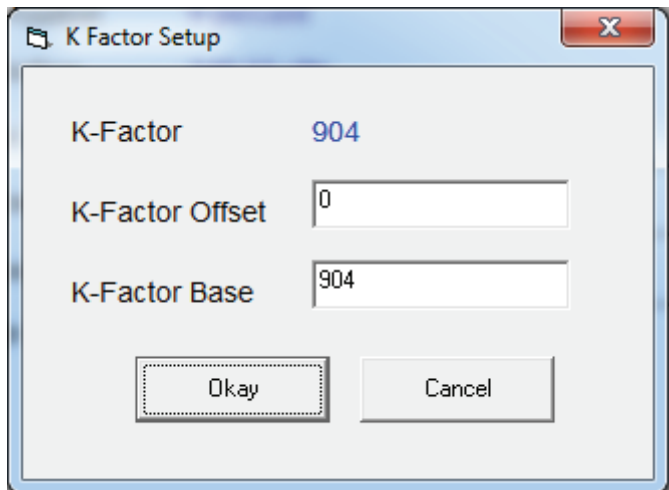
Set Balance Data to Factory Default

This button will reset all of the balancing parameters including the K-Factor to factory settings.

K-Factor Setup

Pressing the "K-Factor Setup" will allow the direct modification of the K-Factor value. This can be used if the K-Factor is out of range or to set it to a desired starting value for balancing.

The K-Factor will be the sum of K-Factor Base + K-Factor Offset. ($K\text{-Factor} = K\text{-Factor Base} + K\text{-Factor Offset}$)

A screenshot of a software dialog box titled "K Factor Setup". The dialog has a light blue border and a red close button in the top right corner. Inside, there are three labels with corresponding input fields: "K-Factor" with a value of "904" in blue text, "K-Factor Offset" with a text box containing "0", and "K-Factor Base" with a text box containing "904". At the bottom, there are two buttons: "Okay" and "Cancel".

K-Factor	904
K-Factor Offset	0
K-Factor Base	904
<div>Okay Cancel</div>	

Change Setpoint Screen

The change setpoint dialog screen is displayed whenever the user desires to make changes to either the maximum or minimum airflow setpoints during the balancing process. The "Change Maximum Airflow Setpoint" dialog box is shown in figure 11 below. A similar dialog box is displayed for the minimum setpoint.

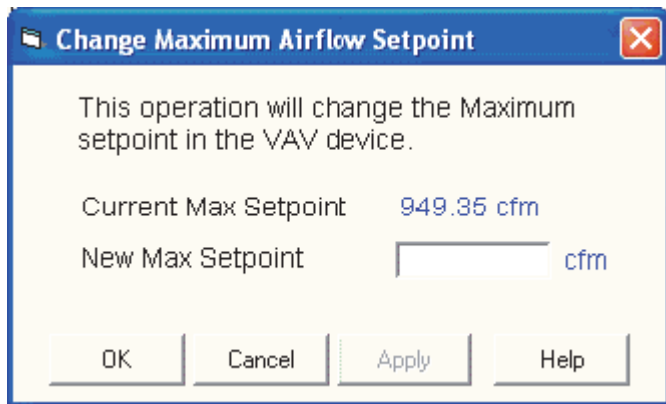
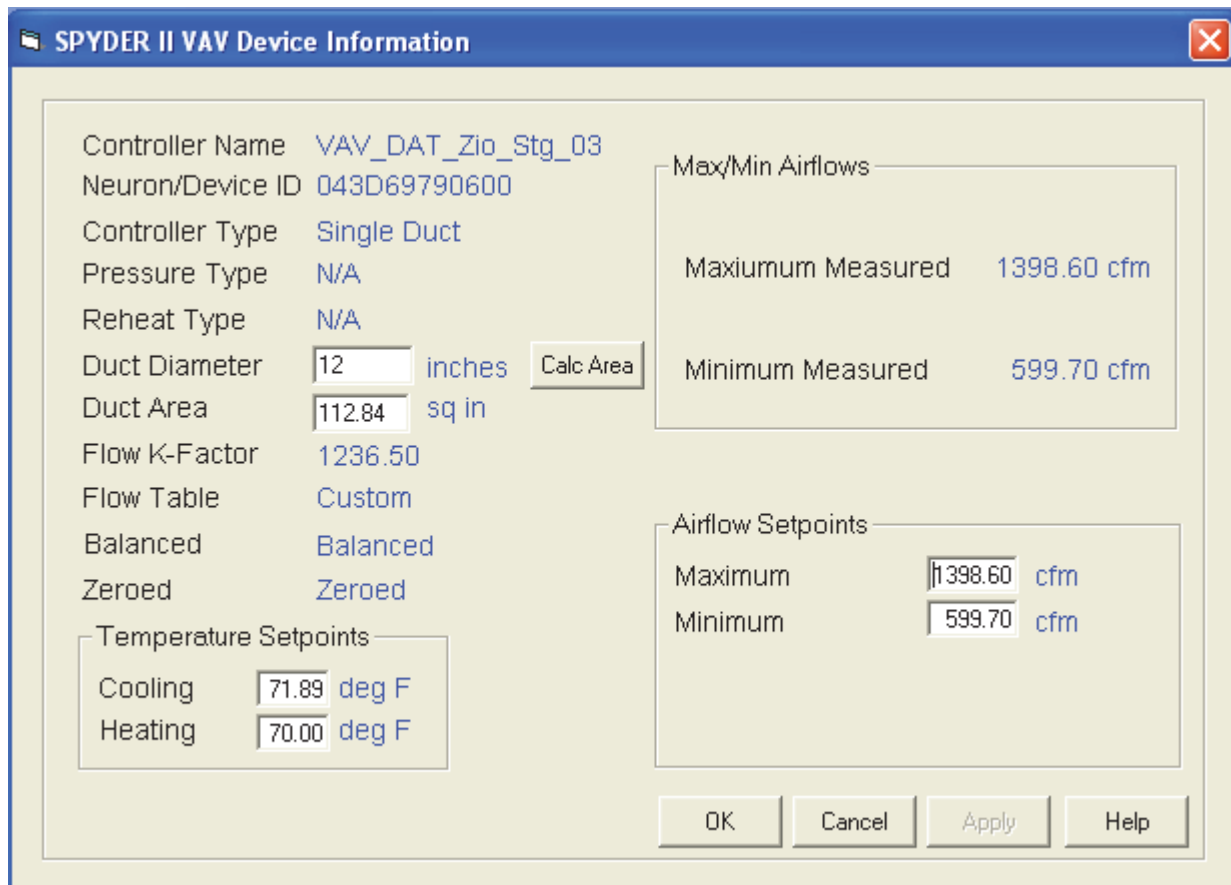


Figure 11: Change Maximum Airflow Setpoint Dialog Box

To change the setpoint, simply enter the desired setpoint in the text box and press the "Apply" or "OK" button. To discard the setpoint, press the "Cancel" button.

Device Information Screen

The device information dialog box displays the controller information in a format that relates each value to the equivalent area of controller operation that the value effects. This screen also allows the adjustment of the basic airflow and temperature setpoints. Figure 10 shows the Device Information Screen dialog box.



The dialog box, titled "SPYDER II VAV Device Information", contains the following fields and controls:

- Controller Name:** VAV_DAT_Zio_Stg_03
- Neuron/Device ID:** 043D69790600
- Controller Type:** Single Duct
- Pressure Type:** N/A
- Reheat Type:** N/A
- Duct Diameter:** 12 inches (with a "Calc Area" button)
- Duct Area:** 112.84 sq in
- Flow K-Factor:** 1236.50
- Flow Table:** Custom
- Balanced:** Balanced
- Zeroed:** Zeroed
- Max/Min Airflows:**
 - Maximum Measured: 1398.60 cfm
 - Minimum Measured: 599.70 cfm
- Airflow Setpoints:**
 - Maximum: 1398.60 cfm
 - Minimum: 599.70 cfm
- Temperature Setpoints:**
 - Cooling: 71.89 deg F
 - Heating: 70.00 deg F

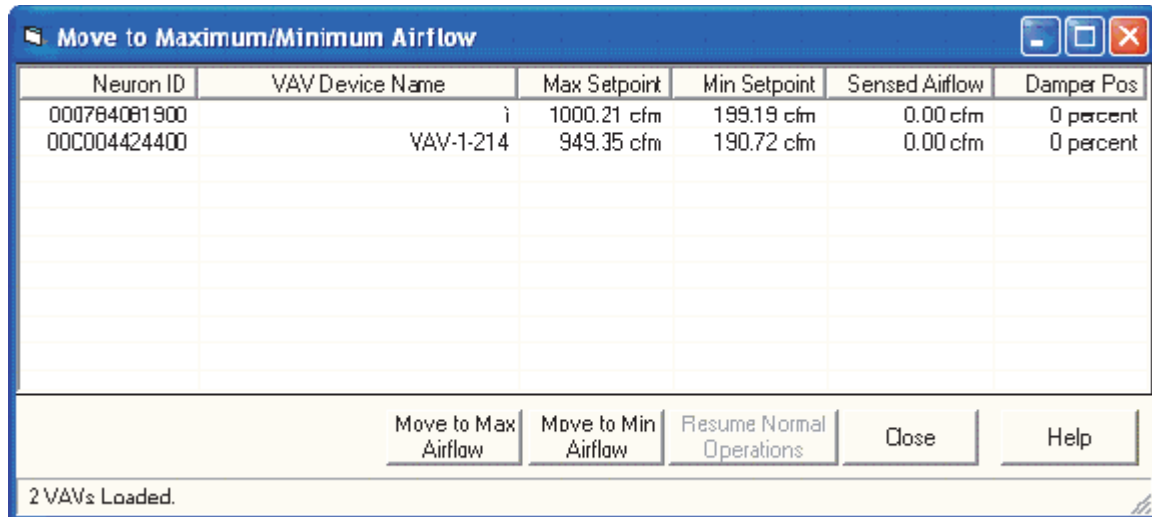
Buttons at the bottom: OK, Cancel, Apply, Help.

Figure 10: Device Information Dialog Box

When changes are made to any one of the setpoint text boxes, the "Apply" button is enabled. If the "Apply" or "OK" button is pressed, the new setpoint values are written to the controller.

Move to Maximum/Minimum Airflow Screen

The Move to Max/Min dialog box allows the selected controller or controllers to be commanded to either maximum or minimum airflow. This operation allows multiple controllers to be forced to either the maximum or minimum airflow setpoints regardless of space temperature conditions. All controllers that were selected are displayed in the dialog box as shown in figure 5.



Neuron ID	VAV Device Name	Max Setpoint	Min Setpoint	Sensed Airflow	Damper Pos
000784081900	i	1000.21 cfm	199.19 cfm	0.00 cfm	0 percent
00C004424400	VAV-1-214	949.35 cfm	190.72 cfm	0.00 cfm	0 percent

Move to Max Airflow Move to Min Airflow Resume Normal Operations Close Help

2 VAVs Loaded.

Figure 5: Max/Min Command Dialog Box

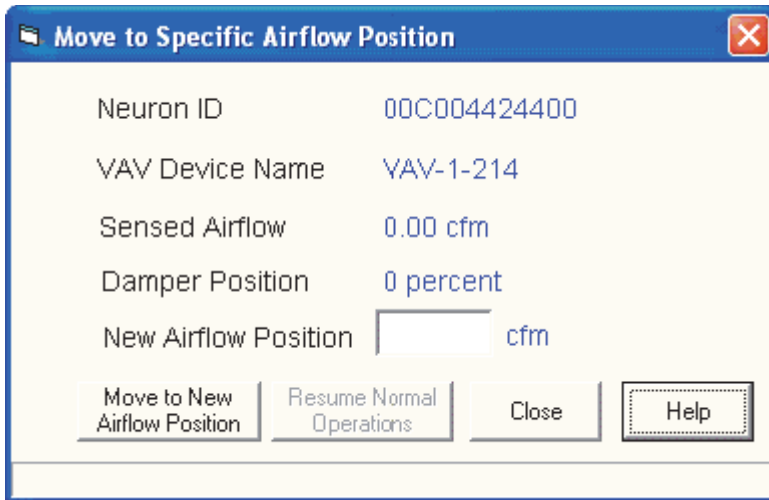
Procedures

Step 1 - Begin the Max/Min operation by pressing the "Move to Max Airflow" or "Move to Min Airflow" button. The information for each controller is actively updated in the dialog box as the controllers move to the commanded airflow setpoint.

Step2 - End the Max/Min operation by pressing the "Resume Normal Operations" button. Once the button has been pressed, all controllers revert back to normal operation.

Move to Specific Airflow Position Screen

The move to specific airflow position dialog box allows the selected controller to be commanded to a specific airflow setpoint. This operation may only be performed on a single controller; multiple controller selection is not allowed. This operation maintains a fixed airflow setpoint regardless of space temperature conditions. Select of this operation displays a dialog box similar to figure 7.



Neuron ID	00C004424400
VAV Device Name	VAV-1-214
Sensed Airflow	0.00 cfm
Damper Position	0 percent
New Airflow Position	<input type="text"/> cfm

Figure 7: Fixed Airflow Setpoint Command Dialog Box

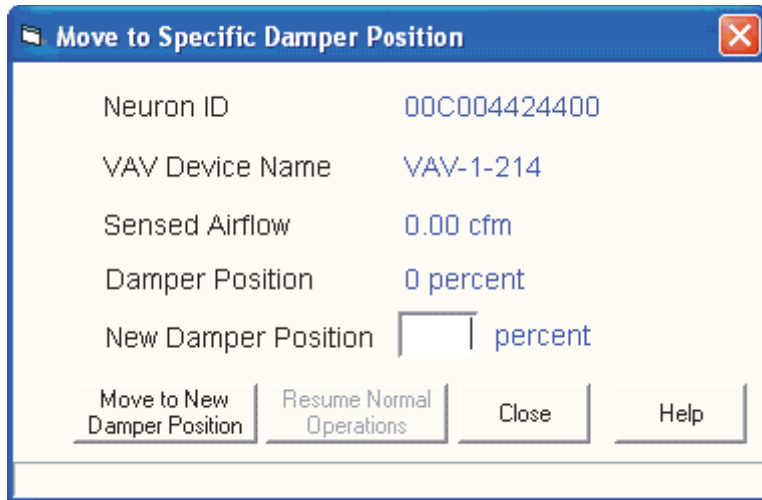
Procedures

Step 1 - Begin the fixed airflow operation by pressing the "Move to New Airflow Position" button. Once the button is pressed the VAV will control to the new fixed setpoint.

Step2 - End the fixed airflow operation by pressing the "Resume Normal Operations" button. Once the button has been pressed the controller is returned to the normal mode.

Move to Specific Damper Position

The move to specific damper position dialog box allows the selected controller to be commanded to a specific damper position. This operation may only be performed on a single controller; multiple controller selection is not allowed. This operation maintains a fixed damper position regardless of airflow or space temperature conditions. Select of this operation displays a dialog box similar to figure 6.



Neuron ID	00C004424400
VAV Device Name	VAV-1-214
Sensed Airflow	0.00 cfm
Damper Position	0 percent
New Damper Position	<input type="text" value="1"/> percent

Figure 6: Fixed Damper Position Command Dialog Box

Procedures

Step 1 - Begin the fixed position operation by pressing the "Move to New Damper Position" button. Once the button is pressed the VAV damper is moved to the indicated position and remains fixed in this position.

Step2 - End the fixed position operation by pressing the "Resume Normal Operations" button. Once the button has been pressed the controller is returned to the normal mode.

Override Heat

This screen will allow the ability to override reheat and peripheral heat for VAV devices that support this option. The following screen will be displayed allowing the modification of selected VAV device(s). Discharge air temperature values will be displayed for those devices that support discharge air temperature.

Neuron ID	VAV Device Name	Reheat Value	Peripheral Heat Value	Discharge Air Temp
043D69790600	VAV_DAT_Zio_Stg_03	Auto	Auto	111.00 deg F

Override Reheat Override Peripheral Heat Resume Normal Operations Close Help

1 VAVs Loaded.

Pressing the "Override Reheat" or "Override Peripheral Heat" button will allow the modification of the current heat value. "Auto" indicates that the device is in normal operation mode.

Override Reheat

Pressing the "Override Reheat" button will allow the modification of the current heat value.

Override ReHeat

Override Reheat Value (0 to 100)

Override Reheat Close Help

Enter the desired override value for the device.

Spyder with Venom Application:

Analog heat, the desired value would be (0 for 0% and 100 for 100%).

Staged heat, the desired value would be (0 = No Heat, 1 = Stage 1 Heat, 2 = Stage 2 Heat and 3 = Stage 3 Heat)

Spyder with Venom Application			
Max Stgs	Value to Cmd Stg1	Value to Cmd Stg2	Value to Cmd Stg3
1	1	NA	NA
2	1	2	NA
3	1	2	3

Stryker VAV Application:

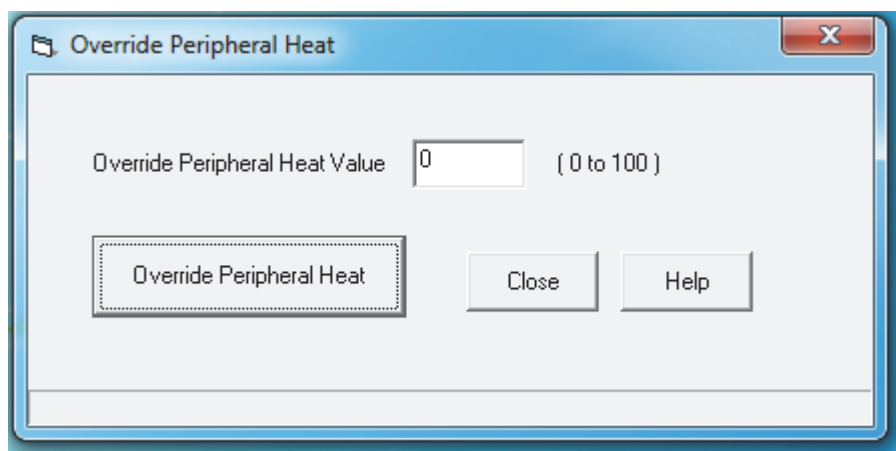
Analog heat, the desired value would be (0 for 0% and 100 for 100%).

Staged heat, the desired value would be (0 = No Heat, Heat Stages 1, 2 & 3 follow table values below for stages)

Stryker VAV Application			
Max Stgs	Value to Cmd Stg1	Value to Cmd Stg2	Value to Cmd Stg3
1	100	NA	NA
2	50	100	NA
3	33	67	100

Peripheral Heat

Pressing the Override Peripheral Heat" button will allow the modification of the current heat value.



Enter the desired override value for the device.

Spyder with Venom Application:

Analog heat, the desired value would be (0 for 0% and 100 for 100%).

Staged heat, the desired value would be (0 = No Heat, 1 = 1 Stage Peripheral)

Stryker VAV Application:

Analog heat, the desired value would be (0 for 0% and 100 for 100%).

Staged heat, the desired value would be (0 = No Heat, 100 = 1 Stage Peripheral).

Calibrate Zero Airflow Position Screen

The calibrate zero dialog box allows the selected controller to be manual zeroed thereby forcing the controller to enter a new zero value. This operation may only be performed on a single controller; multiple controller selection is not allowed. The calibrate zero dialog box is shown in figure 4.

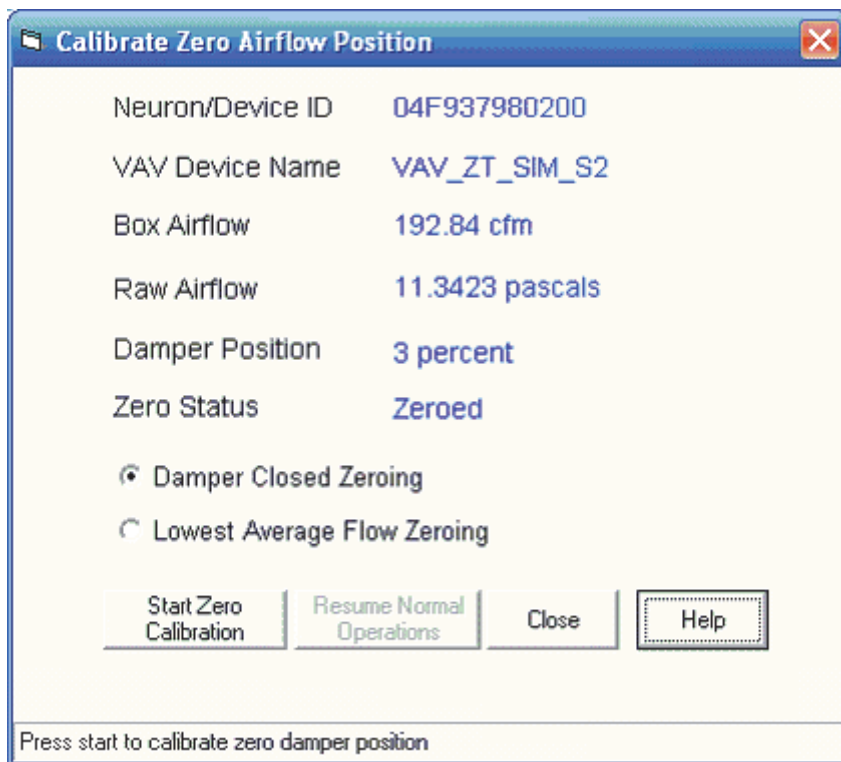


Figure 4: Calibrate Zero Airflow Dialog Box

Procedures

Step 1 - Select which zeroing method to be used.

Damper Closed Zeroing – This method will close the damper to the zero position (fully closed) and measure the airflow. It will use this measurement as the offset to zero the airflow sensor. This is the default method of zeroing.

Lowest Average Flow Zeroing – This method will close the damper and monitor the average flow from the airflow sensor. When the average flow is at its lowest value, the average lowest value will be used as the offset to zero the airflow sensor. This method can be used when the damper cannot be closed all the way or when there is no airflow present.

Step 2 - Begin the Calibrate Zero Airflow operation by pressing the "Start Zero Calibration" button. Status of the zero operation is displayed in the status bar at the bottom of the dialog box.

Note: At any time during the zero process the "Resume Normal Operations" button may be pressed, and the controller is restored to normal operation and no changes are made to the controller, however, once the calibrate zero operation is completed, the zero calibration value is saved in the controller automatically.

Step 3 - Once the Calibrate Zero operation is completed, the tool will force the controller to save the new zero calibration value.

Reports Screen

The reports dialog box allows the user to save controller information to an output file. When a report is selected from the reports menu a dialog box similar to figure 8 is displayed.

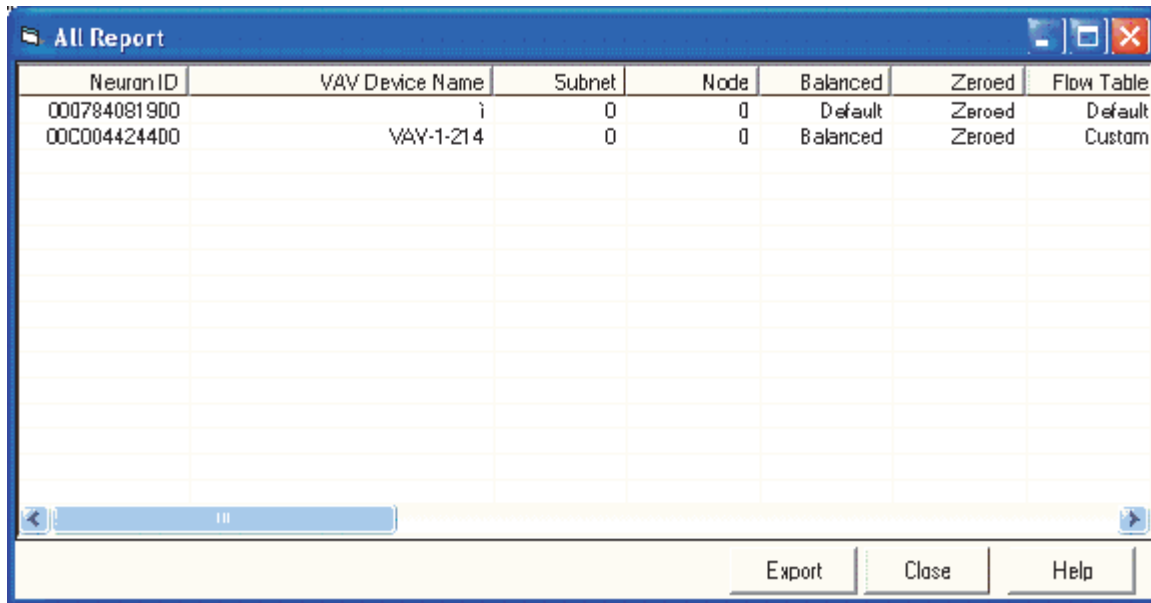


Figure 8: Report Name Dialog Box.

The dialog box shows all controllers included in the report and the related information for each controller. Save the report information is accomplished by pressing the "Export" button. The result is the "Save As" dialog box shown in figure 12.

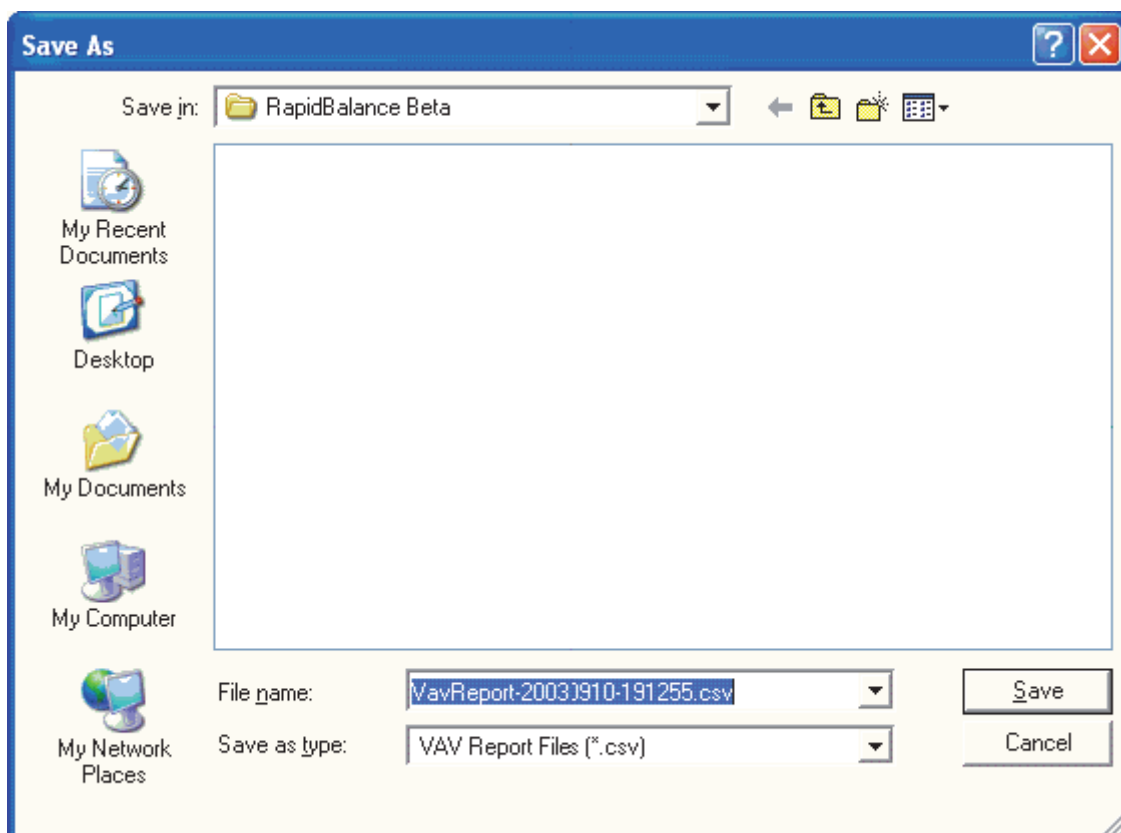


Figure 12: Save report dialog box

By entering a file name and pressing the "Save" button the report file is saved under the file name. The format of the report is an ASCII file where each row represents one of the controllers included in the report. Each field within this row represents controller information that was displayed in the reports dialog box, with each field separated by a simple coma. The field definitions are:

Neuron ID/Device ID - Device unique Neuron ID or Device ID

VAV Device Name - Device Name

Subnet - Device Subnet Number

Node - Device Node Number

Balanced - Flag that indicates if controller is balanced

Zero - Flag that indicates if controller has a valid zero

Flow Table - Flag that indicates if controller has a custom flow table

Duct Size - Equivalent standard duct diameter for duct area

Duct Area - Duct Area Stored in the controller

K-factor - Calculated Flow Table K-factor

Max Sensed - Recorded sensed air velocity for maximum airflow balancing

Max Measured - Measured air velocity for maximum airflow balancing

Min Sensed - Recorded sensed air velocity for minimum airflow balancing

Min Measured - Measured air velocity for minimum airflow balancing

Max Setpoint - Maximum airflow setpoint

Min Setpoint - Minimum airflow setpoint

Reheat Setpoint - Reheat airflow setpoint

Standby Setpoint - Standby airflow setpoint

Cooling Setpoint - Cooling space temperature setpoint

Heating Setpoint - Heating space temperature setpoint

Select Columns Screen

The select columns dialog box allows addition information fields to be added to the initial opening screen. When the check box for any of these fields check, then that column is added to the main screens controller list and the appropriate controller information is added to the field. The select columns dialog box is shown in figure 9.

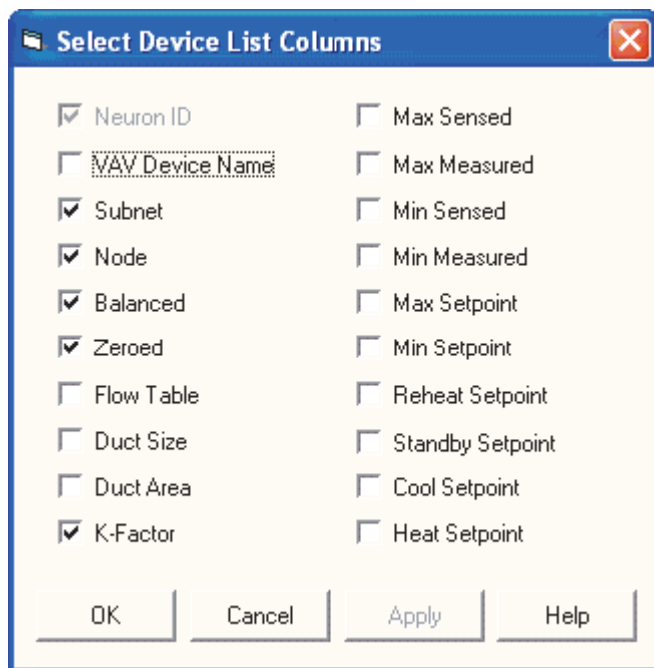


Figure 9: Select Columns Dialog Box

The selectable fields are:

VAV Device Name - Device Name

Subnet - Device Subnet Number

Node - Device Node Number

Balanced - Flag that indicates if controller is balanced

Zero - Flag that indicates if controller has a valid zero

Flow Table - Flag that indicates if controller has a custom flow table

Duct Size - Equivalent standard duct diameter for duct area

Duct Area - Duct Area Stored in the controller

K-factor - Calculated Flow Table K-factor

Max Sensed - Recorded sensed air velocity for maximum airflow balancing

Max Measured - Measured air velocity for maximum airflow balancing

Min Sensed - Recorded sensed air velocity for minimum airflow balancing

Min Measured - Measured air velocity for minimum airflow balancing

Max Setpoint - Maximum airflow setpoint

Min Setpoint - Minimum airflow setpoint

Reheat Setpoint - Reheat airflow setpoint

Standby Setpoint - Standby airflow setpoint

Cooling Setpoint - Cooling space temperature setpoint

Heating Setpoint - Heating space temperature setpoint

Adding New Program IDs and Model Names

New LON Program IDs and new BACnet Model Names can be added by adding new entries into an external file. The program ids and model names are used to identify VAV devices when searching the network for devices. The devices must be running a valid VAV application or they will not be recognized as a VAV device. After editing the file, you must close the Rapid Balance program and restart it for the new values to be recognized.

The UserDefinitions.ini files is located in the following directory:

Windows XP: C:\Documents and Settings\<user name>\My Documents\RapidBalanceX.XX

Windows 7/Vista: C:\Users\<user name>\My Documents\RapidBalanceX.XX

To add a new **LON Program ID**, add the following line to the file with no spaces.

programid=<program id>,<device type>

For example:

programid=90000C520003043B,SpyderLON

will add a SpyderLON device with the Program ID of 9000C520003043B

The device type can be either SpyderLON or SpyderMicroLON.

The program id must be all upper case.

To add a new **BACnet Model Name**, add the following line to the file with no spaces.

modelname=<model name>,<device type>

For example

modelname=Spyder,SpyderBACNET

will add a SpyderBACNET device with the model name of Spyder.

The device type can be either SpyderBACNET or SpyderMicroBACNET

Log Files

A log file is maintained to record all devices that were found while searching for VAV devices. This log file can be useful when troubleshooting the network or locating missing devices. The SearchLog.txt file is located in the following directory:

Windows XP: C:\Documents and Settings\\My Documents\RapidBalanceX.XX

Windows 7/8.1/10 : C:\Users\\My Documents\RapidBalanceX.XX

Comfort Point CP-7XXX VAV Balancing

Rapid Balance allows the balancing of BACnet Comfort Point CP-7XXX devices.

Setup Procedures

Step 1 - Attach a Contemporary Controls BACnet/IP Adapter (or equivalent) to the PC's Ethernet port. Rapid Balance will also operate with the Contemporary Controls Adapter connected to the local area network to which the PC is also connected.

Step 2 - Select "BACnet/IP" as the communications option under the "File Menu:[Preferences](#)" menu item. Select the a PC Ethernet Adapter that is connected the BACnet/IP router. Change the UDP router port to the same as the BACnet/IP router if different.

Find Devices Procedures

Step 1 - Press the "Reload List" button on the bottom of the main window. It may take several seconds to find all the CP-7XXX devices on the BACnet network. It will also take several more seconds to load individual information for each device found. Please wait until loading is complete indicated on the status bar on the bottom of the main window.

Balancing Procedures

Step 1 - Highlight or click on the VAV device of interest in the controller grid list on the main window.

Step 2 - Once the VAV device has been selected, press the "Balance" button on the button menu bar. If the "Balance" button is not enabled, it means that you haven't selected a device to be balanced, refer to step 1 again.

Step 3 - The balancing window will appear after you press the "Balance" button. Balance on Maximum/Minimum Airflow Position Screen

Step 4 - Balancing begins when "Start Max Balance" is pressed. When balance has begun, the status of the balancing operation is displayed in the status bar at the bottom of the dialog box. The initial message displayed indicates that the controller is seeking the required airflow position. It may take as much as 5 minutes for the VAV device to achieve its maximum flow position. Please wait until the device has reached its maximum flow position.

Step 5 - Once the device has reached its maximum flow position, the status bar message will indicate that the user should now enter the measured airflow in the text box and the "Apply Measured Flow" button is enabled. The user should manually measure the airflow of the VAV terminal and enter this value into the text box provided in the dialog box.

Step 6 - Pressing the "Apply Measured Flow" completes the balancing for the Max Balance operation.

Step 7 - Press the "Start Min Balance" button to complete the same steps above (4-6) to balance for the minimum balance position. Again please wait for the device to achieve its minimum position before manually measuring and entering the minimum airflow position.

Step 8 - Once the Max and Min flow balancing has been completed, click "Close" to close the balance window. Exit the program or continue to balance another device as needed.

Release Notes

Release 6.1:

Discharge air temperature monitoring is available for those devices that support discharge air. The discharge air temperature can be viewed on the heat override screen. Discharge air monitoring was moved from balancing screen(in release 6.0) to heat override screen.

Fixed problem where the zeroing airflow position was indicating incorrectly that it was not zeroed.

Release 6.0:

Added increase speed in discovering devices on a LON/BACnet network. Device discovery will only display the device ID, name, subnet and node for each device. To load the remaining device data for a device, use the "Device Data" button to load the device selected on the device grid. Multiple device selection is allowed for this operation.

Added the ability to save and load device discovery data. Saving the device discovery data will allow extremely fast start up times by skipping the discovery step. Once a full discovery operation has been completed, the discovery data/list can be saved to a file. This file can be loaded at anytime to reload the device scan, saving time by not having to do a device scan again after closing the program. Note that the device parameters(device data) is not saved in the discovery data, only device ID, name, subnet and node for each device. To load the remaining device data for a device, use the "Device Data" button to load the device selected on the device grid.

Damper override will remain in effect after leaving the "Damper Override" screen. The "Resume Normal Operations" button must be used to return the device back to normal operations.

Discharge Air Temperature is now displayed on balancing screen for devices that support discharge air temperature monitoring.

Overriding Re-Heat and Peripheral Heat allows for staged heat values (0,1,2,3) to be entered as well as a 0-100% values for analog heat.

Release 5.1:

Fixed MAC Address problem that was incorrectly displaying BACnet MAC Addresses

Added Series Fan Control during balancing for Stryker LON and Stryker BACnet VAV Devices
Devices must have Series Fan option enabled on device.

Added support for Windows 8.1 and Windows 10

Release 5.0:

Updated Rapid Balance to balance Stryker BACnet VAV Devices

Release 4.6:

Updated Rapid Balance to balance Stryker LON VAV Devices

Added check to notify user if LON USB port, LON SLTA port or BACnet port is being used by another application.

Added more information on status line to show how many devices were actually detected when searching for VAV devices on a network. This additional information can be useful when trying to verify a working network connection when no devices are being shown while searching. If devices are being detected, then the network connection is working, but possibly not showing or detecting VAV devices.

Added the verification of SpyderII VAV balancing Network Variables(VAV).

The following LON Network Variables must all be present or Rapid Balance will not allow any balancing operations:

- nciTempSetpoints
- nviFlowOverride
- nviManVal
- nciStbyMinFlowSP
- nciDuctArea
- nciBalanceSetPts
- nciMinFlowSetpt
- nciMaxFlowSetpt
- nciMaxReheatFlow
- nviValveOvr
- nvoBoxFlow
- nvoDamperPos
- nvoVelSenPress

The following BACnet Analog Variables(AV) must all be present or Rapid Balance will not allow any balancing operations:

- AV1000 KFactor
- AV1001 DuctArea
- AV1002 MaxFlowSetpt
- AV1003 MinFlowSetpt
- AV1004 BalBoxZeroOffset
- AV1005 BalKFactorOffset
- AV1006 BalMaxMeasFlowAct
- AV1007 BalMaxMeasFlowSpt
- AV1008 BalMinMeasFlowAct
- AV1009 BalMinMeasFlowSpt
- AV1010 FlowOvrState
- AV1011 FlowOvrPct
- AV1012 FlowOvrFlow
- AV1013 nvoBoxFlow
- AV1014 VelSenPress
- AV1015 nvoDamperPos
- AV1016 nOvrReheatPos
- AV1017 OvrPeriphPos
- AV1020 AV_occupiedCool
- AV1021 AV_standbyCool
- AV1022 AV_unoccupiedCool
- AV1023 AV_occupiedHeat
- AV1024 AV_unoccupiedHeat
- AV1025 AV_unoccupiedheat

Release 4.5:

Fixed search problem, only one Stryker VAV device of many would be found if using SLTA interface.
Added more device information into the search log file.

Release 4.4:

Added support for VAV Stryker devices.

Added support for alternate PC Ethernet Adapters when using BACnet/IP (preferences screen)

Added support for alternate BACnet UDP port (preferences screen)

Fixed Metric and MetricAsia, options were reversed in previous releases.

Added support for addition all Program IDs and BACnet Model Names when searching for devices. An external file located in the PC users "My Documents" folder under \RapidBalance4.4\UserDefinitions.ini allows for additional Program IDs/Model Names to be added in addition to the standard values.

Release 4.3:

Updated Rapid Balance help to work with Window 7 help system.

Updated Rapid Balance to execute without the need to be run as Administrator on Windows 7 systems .

Windows 7 64bit driver problems can be corrected by allowing the drivers to be downloaded through windows when installing the Echelon USB adapter. If the drivers were installed from an older Echelon disk, open Device Manager and right click on Echelon USB Network Interface and "Update Driver" to download new 64bit drivers.

Release 4.2:

Minor bug fixes enhancing stability on BACnet networks.

Changes made to correct initial Vista 32bit, Windows 7 32bit and Windows 7 64bit problems.