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## Performing ZN line test and balance using WebCTRL

You can use WebCTRL to calibrate a ZN line control module's flow sensor during test and balance. Each VAV terminal unit (VAV box) must be controlled by a control program that uses an Airflow Control microblock. Control programs for dual duct boxes require two Airflow Control microblocks.

Follow the process below to perform test and balance on one or more VAV boxes.

▼ Expand all ▶ Collapse all

### 1 [▼ Define airflow source rules in SiteBuilder](#)

SiteBuilder uses a special source rule type to group the Airflow Control microblocks served by each air source.

1. Select **Tree > Add Custom Source Tree**.
2. Type a name in the **Custom Tree Name** field.
3. Click the **Source Rules** tab.  
**NOTE** Source tree rules define network communications between pieces of equipment in the source tree and enable SiteBuilder to link network points with the correct BACnet objects.
4. Click **Add**.
5. Click the **Data Target MB Type** cell, then select **T&B Airflow**.
6. Click the **Parent MB Reference Name** cell, then type the reference name of the static pressure BACnet Analog Input microblock in the parent air source.
7. Click the **Child MB Reference Name** cell, then type the reference name of the Airflow Control microblocks.
8. Add more source tree rules if necessary.  
**NOTE** For SiteBuilder to construct the source tree, you must add a rule for each parent/child reference name combination found in the tree.  
**TIP** To simplify source tree rules, standardize your parent/child microblock reference name naming convention.
9. Click **OK**.
10. Click the newly created source tree tab.
11. Drag and drop your parent equipment from the **Geographic** tree to the source tree.
12. Drag and drop a child piece of equipment from the **Geographic** tree onto its parent item in the source tree.
13. Repeat steps 11 and 12 until you have a complete source tree.

### To add, edit, and delete source rules

#### NOTES

- Adding a new rule, rather than editing an existing rule, preserves existing source links.
  - The control programs in the ALC Standard Application Library use the default source tree rules. ALC recommends that you do not change the default rules.
1. Select a source tree.
  2. Double-click the system to open the **System Properties** dialog box.
  3. Select the **Source Rules** tab.
  4. Do one of the following:
    - Click **Add** to add a new rule.
    - Double-click a table cell to edit its content.

- Click in a row, then click **Delete** to delete a rule.


5. Click **OK**.

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## 2 [▼ Set initial values for test and balance](#)

The test and balance procedure calibrates the airflow sensor by comparing raw sensor readings to measured air flows at different flow rates (damper positions).

Follow the steps below to set up initial values for each airflow microblock.

1. On WebCTRL's **GEO** tree, select the system level.
2. Click the menu button , then select **Airflow Configuration**.
3. Change the desired design properties.

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## 3 [▼ Calibrate the zero flow point \(Auto Zero\)](#)

Use the following steps to calibrate the zero flow point.

1. To prevent damage to equipment, ensure that the parent air source is turned off.
2. On WebCTRL's **GEO** tree, select the flow control point under the piece of equipment that you want to test and balance.
3. Click the **Details** tab.
4. Click **Global Damper Commands**.
5. Select the airflow dampers you want to set. (Use Ctrl+click, Shift+click, or both.)
6. Click **Zero Flow**.
7. Wait for the status message to indicate that Auto Zero is complete.

After Auto Zero is complete, use other global commands to set the VAV boxes to another mode to prepare the system for flow calibration. There are many different ways to do this, and it is up to the test and balance technician to decide how to operate the system while calibrations are performed. The goal is to have a system at a steady static pressure that is near the design operating conditions. The air source should not be restarted until the VAV boxes have been commanded to a state where some dampers are open. Some suggested modes are:

- Set all VAV boxes to control to the occupied minimum setpoint.
- Set a subset of VAV boxes to damper full open and the remaining VAV boxes to damper closed.
- Set all VAV boxes to automatic control.

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## 4 [▼ Calibrate each VAV box](#)

After the air source and associated VAV boxes are controlling to the state determined above, calibrate each VAV box. You must calibrate each VAV box at **Zero Flow** and **Cool Max Airflow** or **Heat Max Airflow**. For improved accuracy, calibrate additional points such as **Dampers Full Open** and **Occupied Min Airflow**. When calibrating additional points, follow the numeric order shown under **Damper command**.

**NOTE** Some systems cannot maintain design static pressure until test and balance is performed. To raise the air source's static pressure, close some VAV dampers or have them control to the occupied minimum setpoint.

1. Click the damper position you want to calibrate.
2. Wait for the damper to quit moving as indicated by the status message on the **Properties** page.
3. Measure the airflow from the VAV box that you are calibrating.

4. Under the **Test and Balance** section, type the measurement into the **Measured Flow** field next to the damper command.
5. Click the arrow to copy the current reading, or type the raw sensor reading.
6. Click **Accept**.
7. To calibrate additional points, repeat steps 1 through 6 for each calibration point.
8. When the desired calibration points are complete, return the VAV box to the mode it was in previously until you finish calibrating all VAV boxes.
9. After you calibrate all the VAV boxes, return all the VAV boxes to **Automatic Control** using the **Global Damper Commands** button.

**NOTE** If you leave a VAV box in any test and balance mode other than Automatic Control for more than 12 hours without any additional calibration activity, the VAV box resumes automatic control.

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