User Guide

Tracer® TU Balancing Tool

⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

September 2024 **BAS-SVU049D-EN**

Introduction

Read this manual thoroughly before operating or servicing this unit.

Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.
NOTICE	Indicates a situation that could result in equipment or property-damage only accidents.

⚠ WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury.

All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

⚠ WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury. Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, MUST follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- **Before installing/servicing this unit, technicians MUST put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). ALWAYS refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.**
- **When working with or around hazardous chemicals, ALWAYS refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labelling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.**
- **If there is a risk of energized electrical contact, arc, or flash, technicians MUST put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, PRIOR to servicing the unit. NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

⚠ WARNING

Follow EHS Policies!

Failure to follow instructions below could result in death or serious injury.

- **All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.**
- **Non-Trane personnel should always follow local regulations.**

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Revision History

- Added Symbio™ controllers in the document.
- Updated Special Installation Requirement: .NET Framework 4.7 section in Installing the Balancing Tool chapter.
- Updated Results of the Installation in Installing the Balancing Tool chapter.
- Updated following sections in Starting a Balancing Tool Session chapter:
  - The Startup Task Panel
  - Connection Components
- Updated Figure 11 (The main Balancing Tool tabs) in Balancing Tool Interface Navigation and Controls chapter.
- Updated following sections in The Balancing Tool Screens chapter:
  - Unit Summary Screen
  - Flow Calibration Screen
  - The Unit Configuration Screen
  - The Alarms Screen
  - The Controller Status Screen

Table of Contents

What’s New in Release 10.0?

This section summarizes the new features and enhancements added in the edition of the Tracer® TU Balancing Tool issued with Tracer® TU V10.0. If you are new to the Balancing Tool, read this Getting Started Guide to get an overview of the service tool you will use everyday in your work as an air and water balance technician.

- Support for Tracer® SC+.

  Tracer® TU supports the new Tracer SC+ hardware. Because Tracer TU now supports both the existing Tracer SC hardware and Tracer SC+, this document uses the following terms:

  – Tracer SC and Tracer SC+ are both referred to as the System Controller.

  – The Tracer SC User Interface and Tracer Synchrony (the new Tracer SC+ user interface) are referred to as the System Controller User Interface.

  – The Tracer SC/SC+ with Core application license (or CPC application license) was previously referred to as an Application-SC. It is now referred to as Tracer SC/SC+ (app) controller.

  – The Tracer SC with Base license was previously referred to as a Base-SC. It is now referred to as Tracer SC/SC+ (base) controller.

  – The specific product names are used only if the discussion applies to one of the products or the name occurs in an existing document title.

- Support for the new Tracer SC+ communication links:
  – Three RS-485 links that can be configured for BACnet® MS/TP or Modbus® RTU.
  – A Wi-Fi interface and Wi-Fi Setup Wizard that enables Wi-Fi access to Tracer® Synchrony.
- The Startup Task Panel includes a new Discovery Options box you can use to enable discovery of all devices on the same link when connecting to one unit controller.

Tracer® TU Balancing Tool Overview

The Tracer® TU Balancing Tool is specifically designed for the air and water balance specialist. It supports air and water balancing tasks and provides the information and functions you need for balancing purposes.

Capabilities

You can use the Balancing Tool to perform the following tasks:

- Get a quick overview of equipment operation.

  The Unit Summary screen displays some key indicators of current VAV box, blower coil (BC), fan coil (FC), unit ventilator (UV), and water source heat pump (WSHP) performance.
- Override the air valve, ventilation (outside air) damper, fan, and water valve of VAVs, FCs, BCs, UVs, WSHPs.
  - Use the Air Flow Override dialog box to safely override the VAV air valve to full open (or alternatively to full closed, maximum flow, or minimum flow).
  - Use the Fan Override, Fan Override ECM, or Fan Override PSC to turn the fan to On and adjust the ECM fan speed (if configured), or select a fan stage (Auto, Low, Medium, High) on certain WSHPs with PSC fan motors so you can proceed with air balancing and testing the air flow and distribution.
  - Override the Hot Water Valve, Chilled Water Valve, Economizer Valve, and Isolation Valve to the open position for a specific amount of time using the Hot Water Valve Override, Chilled Water Valve Override, Economizer Valve Override, and Isolation Valve Override dialog boxes. When the specified duration expires, the water valve returns to its normal position.
  - Use the Ventilation Damper Override dialog box to override the outside air damper of Fan Coils, Blower Coils, and Unit Ventilators.
- Override multiple air valves, water valves, and fans.

  Use the Balancing Tool Facility View to override air valves, hot water valves, isolation valves (WSHPs only), and fans for the entire communication link or a subset of devices you select on the Device Navigation Tree. Once you activate an override for a group of devices, you can then check the status of all devices in the group to be sure they are acting in the expected manner.
- Calibrate the hot deck air valve and cold deck air valve of dual duct VAVs.

  Tracer® TU presents the Hot Deck Air Valve Balancing Steps dialog box when you are calibrating a hot deck air valve. This dialog box is a slightly different version of the Calibrate Air Valve dialog box.
- Generate a Facility Report.

  The report captures all the information listed for the devices on the current Facility View in a spreadsheet (.CSV) format.
- Review the equipment configuration.

  Examine the equipment configuration settings on the Unit Configuration screen (for VAV boxes, the Air Damper Opens (directional) settings are adjustable).
- View active alarms.

  View active alarms with related information in sortable columns. Information includes date and time, the affected point, a brief description, the notification class under which the alarm was sent, and whether or not acknowledgment is required.
- View controller and expansion module status.

  View basic information about the controller, such as name, version, hardware part number, and the application build number on the Controller Status screen. The screen also lists any expansion modules currently installed along with their communication status.

- Check the status of installed programs.

  View program information on the Controller Status screen. The grid presents program names, status, run type (for example, Scheduled or One Time), how frequently the program runs, how long the program takes to run, and any error conditions.
- Access any UC210/UC400/Symbio™ controllers on a link from another UC210/UC400/Symbio controllers on the same link using Single Link Access, or use BACnet® Discovery to access UC210/UC400/Symbio controllers on any network in a facility.

Laptop Requirements

Your laptop must meet the following hardware and software requirements:

- 4 GB RAM.
- 1024 x 768 screen resolution.
- Ethernet 10/100 LAN card.
- An available USB 2.0 port.
- Windows 10 Anniversary Edition operating system (32–bit or 64–bit).
- Microsoft .NET Framework 4.8 or later (auto-installed if not present).
- Microsoft Visual C++ Redistributable for Visual Studio 2015, 2017, and 2019 (v142) (auto-installed as required for TGP2 and the legacy Trane USB driver).

Notes:

- *Tracer® TU is designed and validated for this minimum laptop configuration. Any variation from this configuration may have different results. Therefore, support for Tracer® TU is limited to only those laptops with at least the configuration previously specified.*
- *In addition, for optimal Tracer® TU performance the following features are recommended:*
  - *8 GB RAM.*
  - *A 7200 RPM hard disk drive or a solid state drive.*
- *To view the Balancing Tool Getting Started Guide (pdf format), download the Adobe Acrobat Reader DC from https://get.adobe.com/reader/.*

Installing Tracer® TU Balancing Tool

This section explains how to obtain the Tracer® TU Balancing Tool installation file and install your licensed version of the software on your PC.

Contact your local Trane sales office to order Tracer® TU Balancing Tool.

Special Installation Requirement: .NET Framework 4.7

An Internet connection is required during Tracer® TU V10.0 installation to enable installation of Microsoft .NET Framework 4.7. The installation procedure you encounter depends on the level of the Windows operating system on your PC.

Windows 10

The Windows 10 Anniversary Update or higher is required for this upgrade. If you are running a lower version of Windows 10, first install the Anniversary Update. See \https://www.microsoft.com/en-us/download/details.aspx?id=55170.

Installation Procedure

When you have obtained the Balancing Tool installation USB flash drive, complete the following steps to install the software.

Note: *Installing the Balancing Tool requires Administrator account privileges. Before you attempt to install the software, you should verify that the installing user-id has these privileges. See your software administrator for assistance.*

1. Place the installation flash drive in a USB port.

   The installation should start automatically. If the installation does not start automatically, perform the following steps:

   a. Click **Start** in the bottom left corner of your screen.

   b. Click **Run**.

   c. Browse to the location of the installation file **(Tracer TU Setup.exe)** and click **Open**.

   d. Click **OK** on the Run dialog box.

   A Welcome dialog box appears.

2. Click **Next**.
3. Click **I accept . . .** to accept the License Agreement after reviewing it.
4. Click **Next** to accept the default installation location (C:\Program Files\Trane\Tracer® TU).

   (You can click **Change** to specify an alternate location before clicking Next.).

5. Select **Anyone who uses this computer** or **Only for me** on the User Profile dialog box.
6. Discontinue any connection between your PC and a Trane controller before starting the installation.
7. Click **Install** on the Ready to Install Tracer® TU dialog box.
8. Click **OK** if you see a message box indicating that the Microsoft .NET run-time files are out of date. This software is required to run the Balancing Tool.

   Note: *Extra steps may be required if you are installing the Balancing Tool on a Windows 7 or higher machine and Microsoft .NET 4.7 must also be installed as part of the installation. When .NET 4.7 is finished installing, you are prompted to restart your machine. After the restart, you must start the installation once again (by clicking the Tracer® TU Setup.exe file) to resume and complete product installation. You may then be prompted to install an additional Redistributable file as well.*

9. Click **Continue Anyway** if the dialog box warning you that the software has not passed Windows Logo testing appears.
10. Click **Finish** to complete the installation process.

Special Situation: Stopping the Tracer® TU Service

In rare circumstances, when you are upgrading Tracer TU from an earlier release, you may see the following message:

Service Tracer TU Service could not be stopped.

The message box includes the Retry and Cancel options.

If you encounter this message, perform the following steps:

1. Open the Windows Task Manager by pressing **Ctrl-Alt-Delete** and then clicking the **Task Manager** button.
2. Go to the **Process** tab.
3. Find and select **EvoUSB.exe**.
4. Click **End Process**.
5. Return to the message dialog box and click **Retry**.

The Tracer TU upgrade installation will continue.

Results of the Installation

The installation routine places all system files in different locations depending on whether a 32–bit system or a 64-bit system is installed.

- For Windows 10 64-bit systems, the Tracer® TU system files are placed under the Program Files (x86) folder (C:\Program Files (x86)\Trane\Tracer® TU).
- For Windows 10 32-bit systems, the Tracer TU system files are placed under the Program Files folder (C:\ProgramFiles\Trane\Tracer® TU).

The installation also places an icon on your desktop and a Tracer TU program item (**Trane>Tracer TU> Tracer TU**) in your Programs list on the Start Menu.

Starting a Balancing Tool Session

When you have installed the Balancing Tool, start a Balancing Tool session by connecting your PC to the controller and starting the software.

Note: *The Balancing Tool operates only when you are connected to a UC210/UC400/Symbio™ controllers directly or via System Controller pass-through.*

You can access and connect to UC210/UC400/Symbio controllers in the following ways:

- Direct physical connection using a USB cable "Connecting to a UC210/UC400/Symbio™ Controllers or System Controller with a USB Cable ," p. 11).
- Direct physical connection to a System Controller using an Ethernet cable (See "Connecting Directly with an Ethernet Cable," p. 16).
- Network connection using an IP address over the local area network (LAN) on which the System Controller resides, or an Internet connection from a remote location through a firewall or router to access a System Controller, and the controllers on its wired and wireless links. (See "Using a LAN Connection," p. 13, which follows in this section.) Use BACnet® Discovery for access to all devices on a BACnet®/IP network. (See "BACnet® Discovery," p. 18).
- Connection through a zone sensor using the Tracer® TU Communication Adapter. See the *Tracer® TU Communication Adapter User Instructions* (X39641115-01*x*), which is included with the product.
- Indirect connection from one device to another using the Single Link Access feature. (See "Connecting Through Single Link Access," p. 16).
- Wireless connection to a network device in an established wireless network. (See " Connecting to Devices on Wireless Networks," p. 19).

When you click the **Tracer TU** desktop icon or the **Trane >Tracer TU** program item on the Start menu, the Balancing Tool Startup Task Panel appears (See "The Startup Task Panel," p. 12)

Connecting to a UC210/UC400/Symbio™ Controllers or System Controller with a USB Cable

Connecting to a controller directly with a USB cable is recommended whenever possible, because a USB connection provides the best performance.

Perform the following steps to connect to a UC210/UC400/Symbio controllers or system controller:

1. Connect your Type A/B USB cable directly from your laptop to a UC210/UC400/Symbio controllers or system controller.
2. Click either the **Tracer TU** desktop icon or the **Tracer TU** item on the Start menu.

   Note: *Observe existing USB standards for cable length (for more information go to relevant Web sites resulting from search terms, such as USB standard cable length).*

Driver Installation

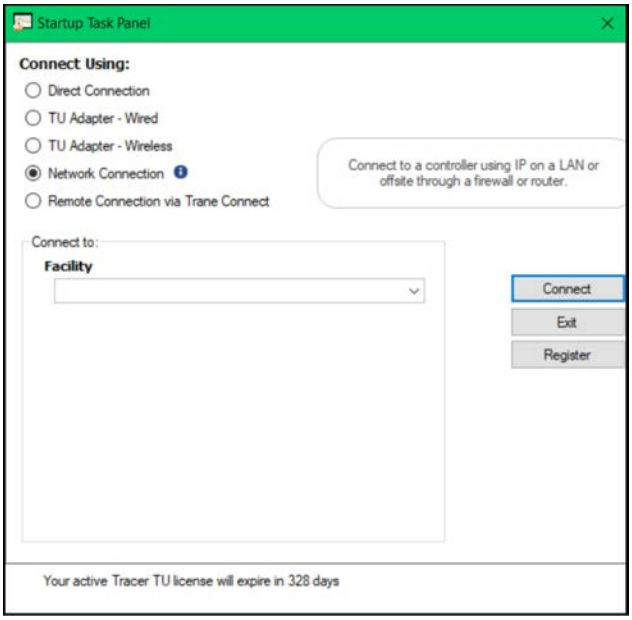
The first time you connect to a controller, the appropriate driver is installed automatically. A small message box that indicates the installation is taking place appears at the bottom of your screen near the system tray. This message is followed by a successful installation message.

Note: *If you encounter an error condition or message during this installation process or during the subsequent connection steps, see " Balancing Tool Installation and Connection Error Conditions," p. A–1 for corrective actions.*

The Startup Task Panel

After you have completed the startup procedure, the Balancing Tool displays the Startup Task Panel.

Figure 1. The Startup Task Panel



The Balancing Tool pre-selects the radio button that corresponds to the connection method you are using, so you can either first select a facility or click the **Connect** button immediately. If you connect to a controller directly with a USB cable, you can select a Discovery Option as shown in the previous figure.

When you connect to a UC210/UC400/Symbio controllers controller, the Unit Summary screen appears as shown in "Unit Summary Screen," p. 23.

Note: *If you first connect through a System Controller, a security dialog box appears on which you must enter a user name and password. You can then select the device you want to work with on the Device Navigation Tree (see "Connecting to a System Controller and Its Devices," p. 14).*

Connecting to a Device Through a Network or Ethernet Cable

You can connect to a UC210/UC400/Symbio™ controllers indirectly through its parent System Controller using a network connection or an Ethernet cable. While this type of connection is convenient, performance is somewhat slower than a direct USB connection.

Using a LAN Connection

To use a LAN connection, you create a link to a facility in Tracer® TU.

Note: *The term facility corresponds to an individual System Controller that acts as a central point of control for all devices on its links, including Tracer® SC/SC+ (base) controllers. (The main System Controller is referred to as an Tracer® SC/SC+ (app) controller).*

To create a link to a facility, you need to know the IP or DNS address assigned to the System Controller you want to access. You can create a link to the facility on the Startup Task Panel in two ways:

- Use the Add New Facility Connection option to create a persisting link, which you can access from the Startup Task Panel. (See "Adding a Facility," p. 13).
- Manually enter an IP address or DNS name on the Startup Task Panel to link to a System Controller on a one-time basis. (See "Using the Manual Entry Option," p. 14).

Adding a Facility

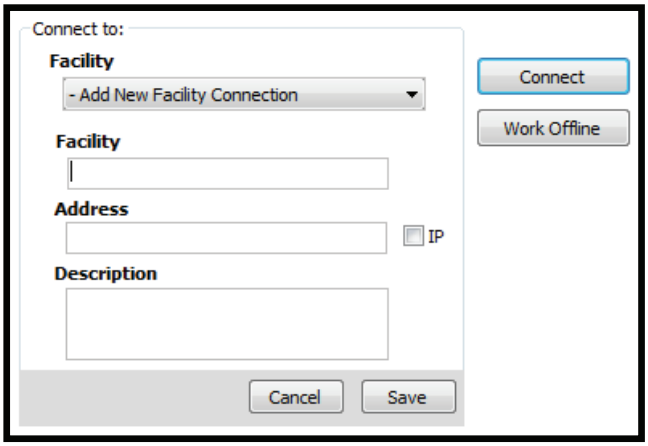
1. Click either the **Tracer TU** desktop icon or the **Tracer TU** program item in the Tracer® TU group on the Start menu.

   The Balancing Tool splash screen appears briefly followed by the Startup Task Panel dialog box.
2. Select the **Network Connection** radio button.

   The Facility drop-down selection box appears.
3. Select **Add New Facility Connection**.

   A set of entry boxes appear in which you can specify the name of the Facility, its address (URL or IP), and a brief description.

Figure 2. Add new facility connection box on the startup task panel

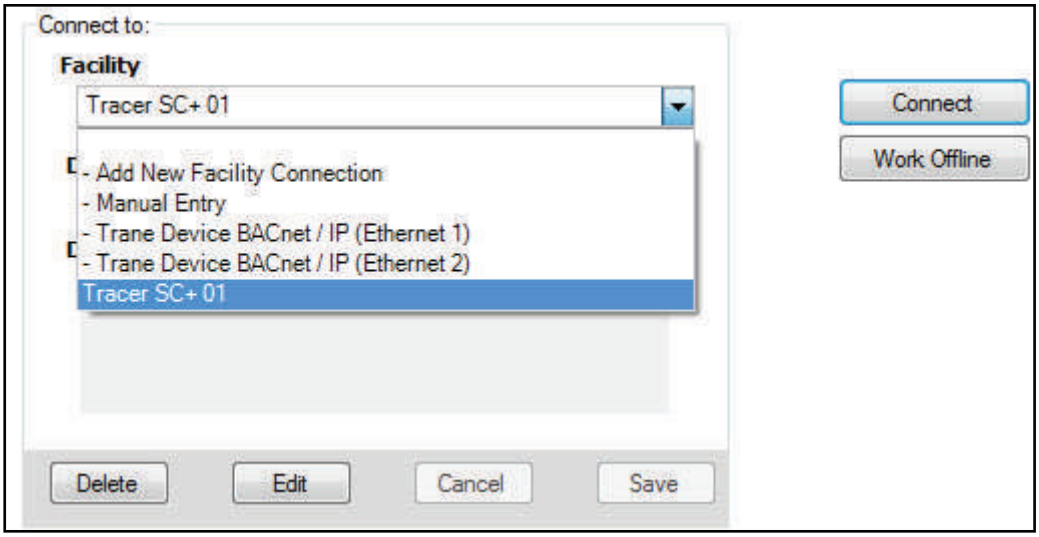


4. Enter the name of the System Controller you want to access.
5. Enter a DNS address or an IP address.
6. Specify a port if your site uses a specific port other than the default 80.

   Note: *You can specify a secure connection (HTTPS) by selecting the IP check box and specifying port 443. However, be aware that using a secure connection slows Tracer® TU performance.*
7. Click **Save**.

   Each facility you create is saved and can then be selected from the Facility drop-down list.

Figure 3. Selecting a system controller from the facility drop-down list

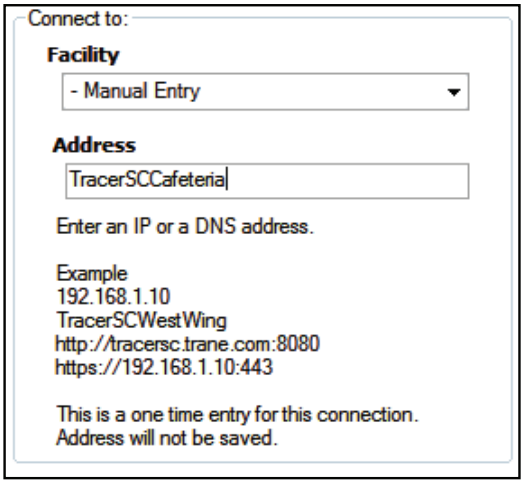


Using the Manual Entry Option

You can specify a facility on a one-time basis without creating a facility entry on the Startup Task Panel.

1. Select **Manual Entry** on the Facility drop-down list.
2. Enter an IP or DNS address in the entry box as shown in the following figure.

Figure 4. Using the manual entry option on the startup task panel



3. Continue with the steps described in “Connecting to a System Controller and Its Devices,” p. 14.

Connecting to a System Controller and Its Devices

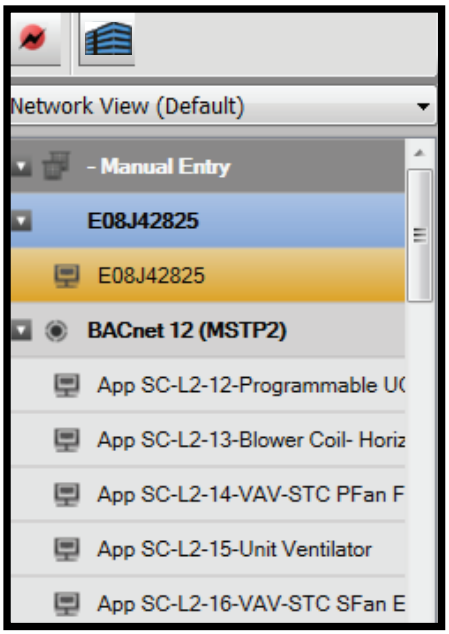
1. Select the facility you have just created or any existing facility on the drop-down list.
2. Click **Connect**.

   A security dialog box appears that prompts you for a user name and password. When the Balancing Tool is connected, you can now see the Device Navigation Tree pane on the left side of the Balancing Tool window. All the devices on the System Controller’s links are listed in the Device

Navigation Tree. (See "The Device Navigation Tree Pane" section in the *Tracer® TU Balancing Tool Help* for additional information about complex networks that use a primary System Controller (Tracer® SC/SC+ (app) controller) with System Controllers that act as routers (Tracer® SC/SC+ (base) controllers).

In addition, you have the option of using the BACnet® Discovery feature to discover Unit Controllers on the wider BACnet®/IP network and include them in group override operations using the Facility View. See the “Accessing Devices Using BACnet® Discovery” TOC book in the *Tracer® TU Balancing Tool Help* for details.

Figure 5. Device navigation tree pane showing the system controller and its network devices

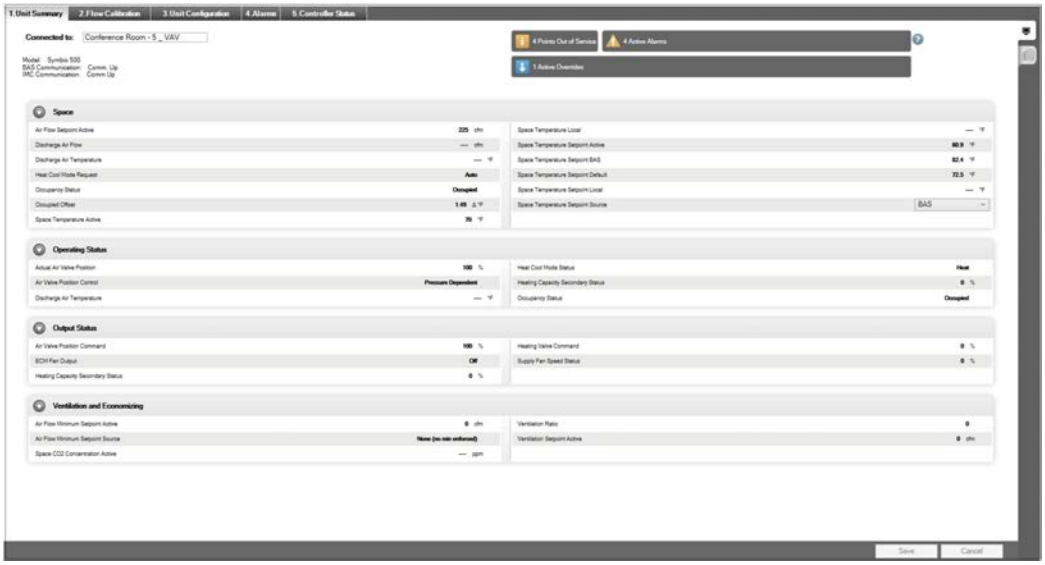


3. Right-click the device you want to work with on the tree and select **Connect to Device**.

   The Unit Summary screen for that device appears as shown in Figure 6, p. 16. (It may take the Balancing Tool a minute or two to download and populate the screen with the point values).

   You can navigate to any of the other Balancing Tool screens (Flow Calibration, Unit Configuration, Alarm, and Controller Status) by clicking the tabs along the top of the screen or selecting them from the Utilities menu. (See the *Tracer® TU Balancing Tool Help* for detailed descriptions of these screens.

Figure 6. Unit Summary Screen



For complete information on connection methods including wireless connections, see the "Connecting to and Disconnecting from a Controller" section in the *Tracer® TU Balancing Tool Help*.

Connecting Directly with an Ethernet Cable

To connect to a System Controller directly with an Ethernet cable :

1. Select the **Network Connection** radio button on the Startup Task Panel. (See “The Startup Task Panel,” p. 12).

   The Facility drop-down selection box appears.
2. Select **Trane Device BACnet / IP Ethernet 1** or **Ethernet 2** depending on which port you are using.
3. Click **Connect**.

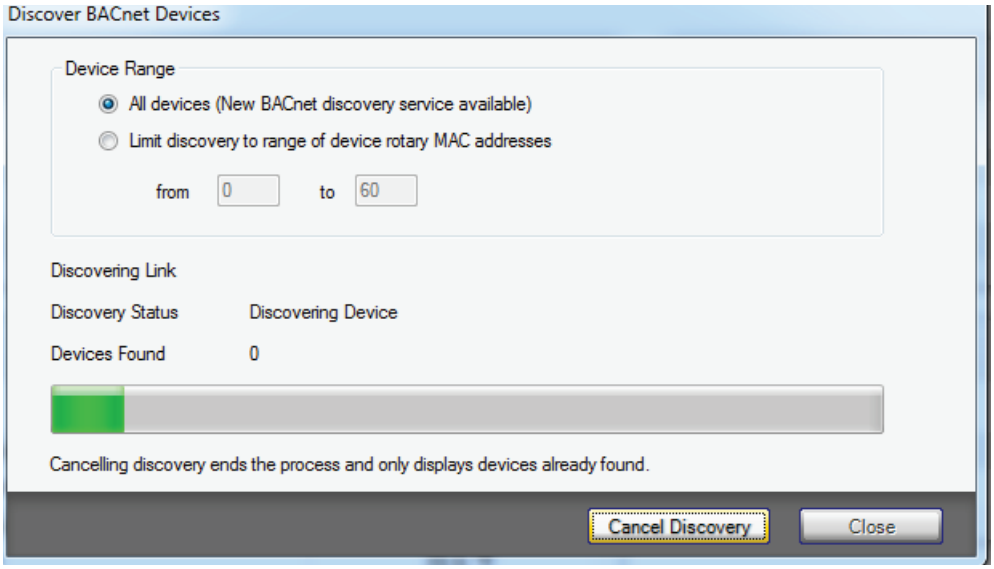
   The Unit Summary screen appears. The connection is established for the session and is maintained until you disconnect from the controller or exit out of Tracer® TU.

Connecting Through Single Link Access

You can connect to a UC210/UC400/Symbio™ controllers on a single MS/TP link and then from that connection point, discover, access, and perform service on other UC210/UC400/Symbio controllers controlled VAV boxes, blower coils, fan coils, unit ventilators, and water source heat pumps on that same link. The UC210/UC400/Symbio controllers accessed from the connection point is termed the target device.

When you direct connect to a network devices UC210/UC400/Symbio controllers with a USB cable, select the **Discover other devices on the same link** option on the Startup Task Panel to start device discovery. (See “The Startup Task Panel,” p. 12). Each discovered device is displayed on the Device Navigation Tree. Click the controller name to connect to the device.

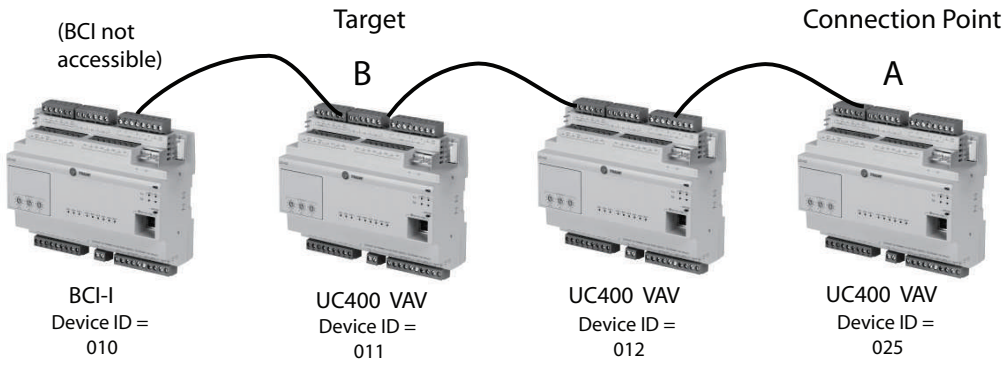
Figure 7. The discover BACnet® devices dialog box



Example

For example, you can connect to a UC400 A on a link and discover the UC400 VAV B on the same link. A is the connection point and B is the target.

Figure 8. Single link access connection point and target



Considerations

Here are a few facts about Single Link Access to keep in mind:

- If you connect to a UC210/UC400/Symbio™ controllers within a link controlled by a System Controller and discover the other devices on that link, the System Controller is also discovered and appears in the Device Navigation Tree. However the System Controller is not accessible for reasons of security. To access the System Controller, you must log into it directly.
- Viewing Trane BACnet® devices with the existing System Controller pass-through feature remains available and unchanged. No new discovery capability has been added to the System Controller.
- The Balancing Tool Single Link Access feature is restricted to UC210/UC400/Symbio controllers. However, it cannot access UC400s controlling devices other than VAV boxes, unit ventilators, blower coils, fan coils, or water source heat pumps.

See the “Accessing Devices on a Single Link” section of the *Tracer® TU Balancing Tool Help* for a detailed example.

BACnet® Discovery

BACnet® discovery is a rapid device discovery method supported on UC210/UC400/Symbio™ controllers and System Controllers that have Tracer® TU V8.6 firmware or higher levels installed. Device discovery occurs in a much shorter time compared with the existing Single Link Access feature.

Start BACnet® Discovery by clicking the **Tools** menu and selecting the **BACnet Network/Device Discovery** option.

Features

BACnet® discovery includes the following unique features:

- Ability to discover all other Tracer® SC/SC+ (app) controllers and their installed devices on a BACnet®/IP network when the Balancing Tool is connected to one of the Tracer® SC/SC+ (app) controllers in the same BACnet®/IP network.
- Automatic discovery of all devices on a link when Tracer® TU is connected to a unit controller on that same BACnet® link.
- Ability to specify which BACnet® links (networks) you want to discover on the BACnet® Discovery dialog box.
- Display of uninstalled devices under a separate heading in the Device Navigation Tree.

  Note: *If a device is later installed on a System Controller, it is displayed under the proper node and network.*
- Discovery of uninstalled BACnet®/IP devices

The Discovery Process

As devices on the networks are discovered, they appear in the Device Navigation Tree with their rotary numbers and device IDs displayed. A progress indicator displays the approximate completion rate of discovery processing. When all devices have been discovered, Tracer® TU performs a final update of all device information.

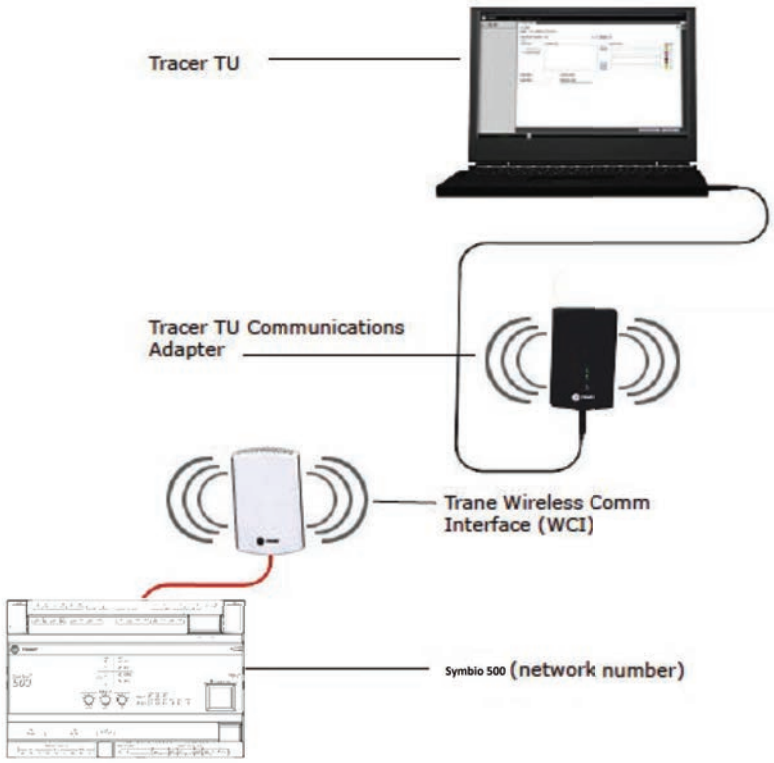
Connecting to Devices on Wireless Networks

The Trane® Air-Fi® Wireless Communications Interface (WCI) enables wireless communication between Trane® System Controllers, unit controllers, and wireless sensors. The WCI replaces the need for communication wire in all system applications.

Connection Components

You can connect to any wireless UC210/UC400/Symbio™ controllers in a network by using the Tracer® TU Communication Adapter (Wired/Wireless) in wireless mode. You can then discover, access, and perform balancing tasks on the device to which you are connected or another member device in the network. This capability provides the flexibility and convenience you need to finish jobs in less time.

Figure 9. Wireless access through the Tracer® TU communication adapter



See the "Connecting to and Disconnecting from a Controller" section in the *Tracer® TU Balancing Tool Help* for detailed instructions on how to connect to a controller in a wireless network.

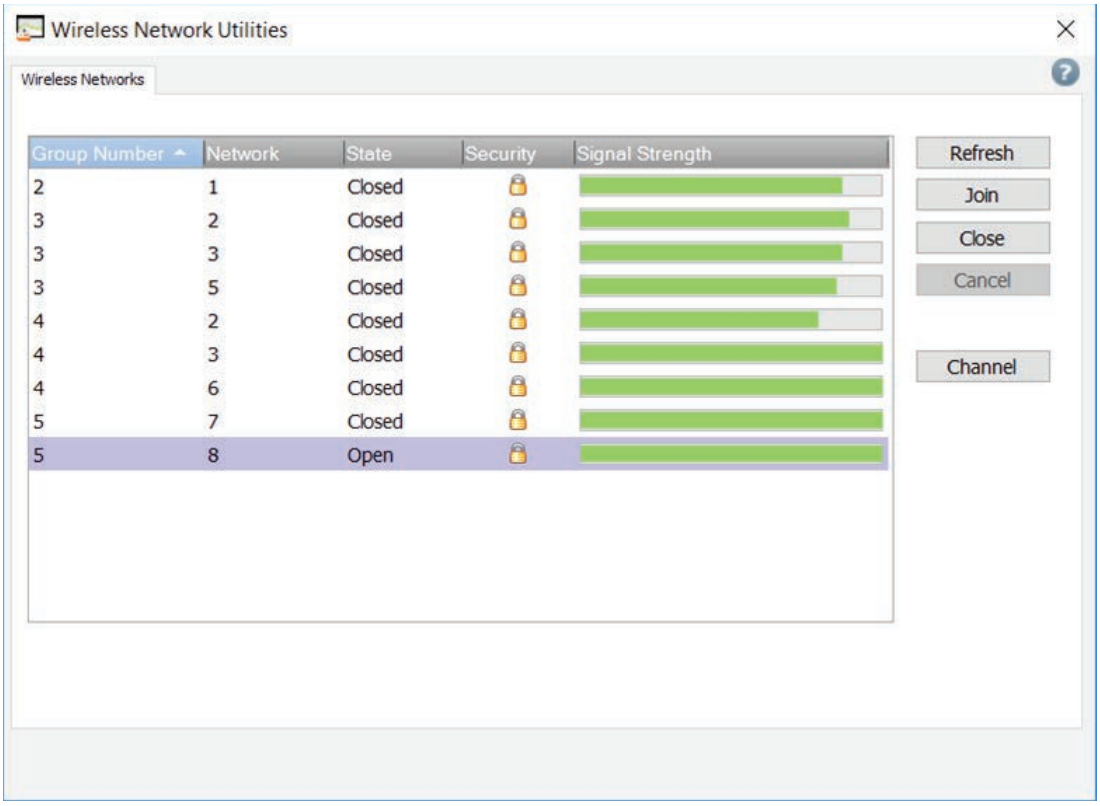
Accessing Wireless Networks

Perform the following steps to access devices on a wireless network:

1. Connect the Tracer® TU Adapter (Wired/Wireless) to your PC with a USB cable.
2. Start Tracer® TU and select the **TU Adapter -Wireless** option on the Startup Task Panel.
3. Click **Connect**.

   Tracer® TU displays the Wireless Networks dialog box shown in the following figure.

Figure 10. Wireless Network Utilities

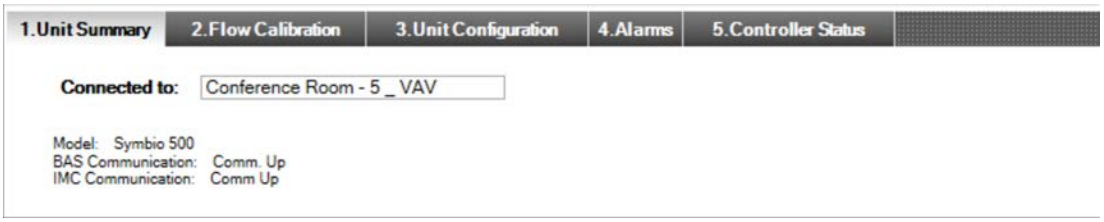


You can then join one of the displayed networks. An open padlock indicates a network that has no System Controller and does not require log-in credentials. A closed padlock indicates a secure network coordinated by a WCI attached to a System Controller .

Balancing Tool Interface Navigation and Controls

Click any one of the five main screen tabs to select and display the corresponding screen. The selected tab turns white as shown in Figure 9, p. 19.

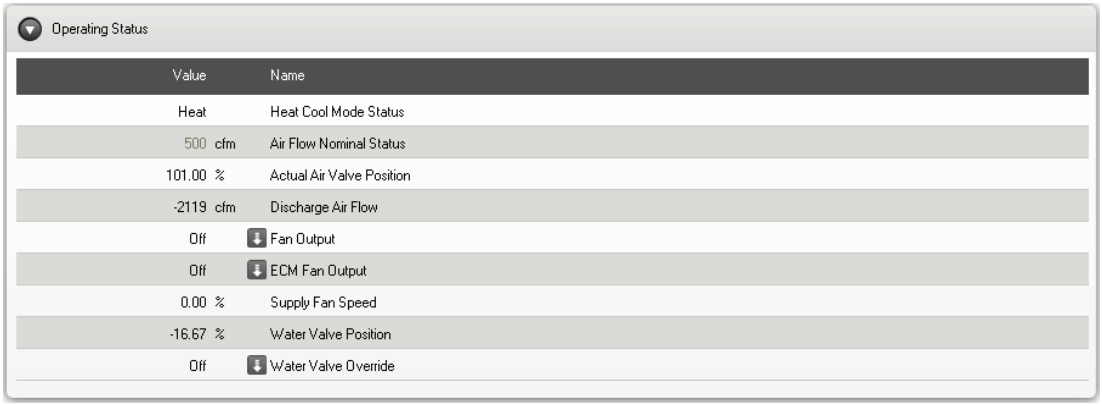
Figure 11. The main Balancing Tool tabs



Expanding Boxes

Most of the main screens are subdivided into expanding and contracting boxes that allow you to focus on the particular task or points you want to work with. The Operating Status box on the Flow Calibration screen is shown in the following figure. It displays view-only air flow, fan, and water valve settings. Notice that the arrow icon on top at the left is pointing down. The arrow points down when the expanding box is open and to the right when the box is collapsed. Use the arrow icon on each heading bar to expand and display its contents. Click the icon again to collapse the box and hide its contents.

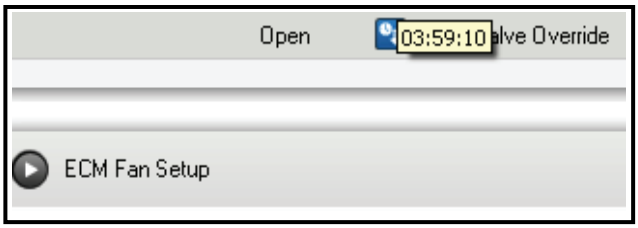
Figure 12. The Operating Status expanding box on the Flow Calibration screen



The Override Icon

The Operating Status box displays a gray, down arrow icon alongside the points that you can override, as shown in the Operating Status box in the previous figure. In the following figure, the water valve has been overridden to Open. The blue icon marks the active override. The small clock image in the icon indicates that a duration limit (time limit) is in effect. The point is reset to its normal value when the specified time expires. (The remaining time is displayed in a tooltip when your mouse moves over the icon.)

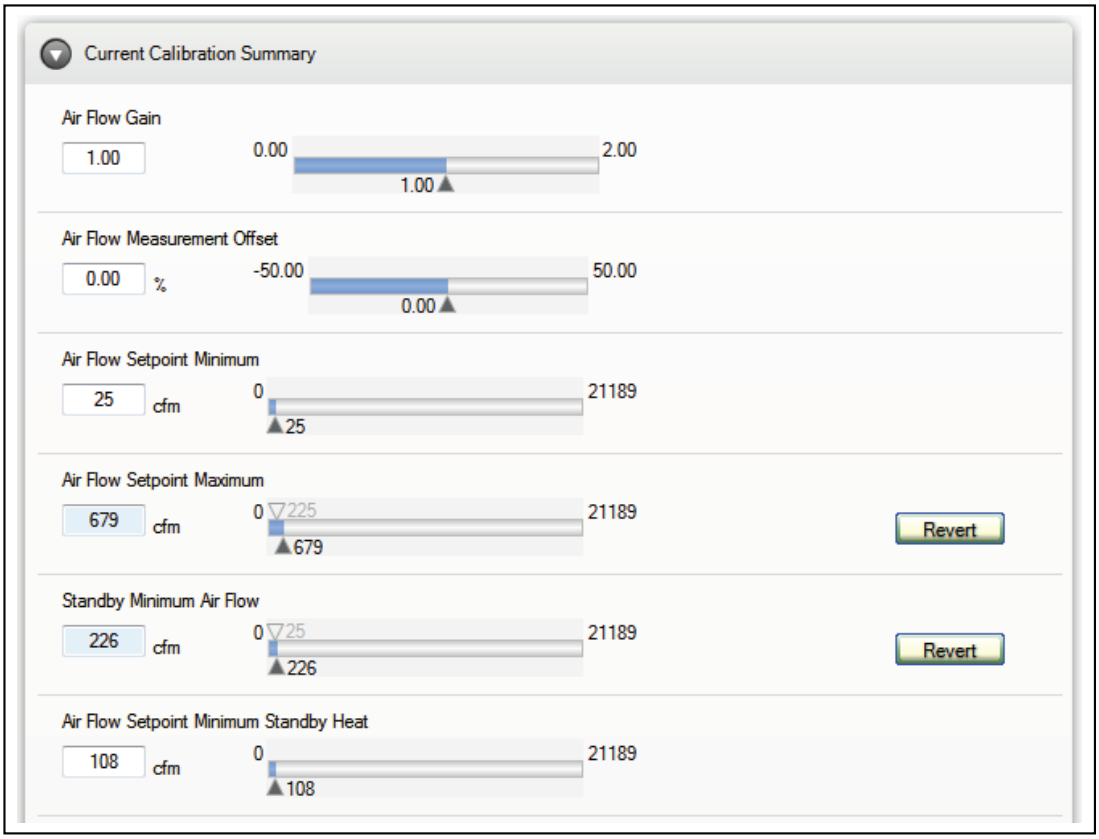
Figure 13. The override icon on the Operating Status box



Adjustable controls

VAV boxes include three types of adjustable controls on the Current Calibration Summary box. You can enter a new value in the entry box on the left, or you can use the slider to the right. The Revert button appears when you make a change to the current value. Click Revert to return to the last saved value, which is displayed in faded text on the slider bar as shown in the following figure.

Figure 14. Adjustable controls on the Current Calibration Summary box supporting VAV boxes



Note: *The Revert button remains until you click Save at the bottom of the screen. Once you click Save to save the changes, the Revert button disappears.*

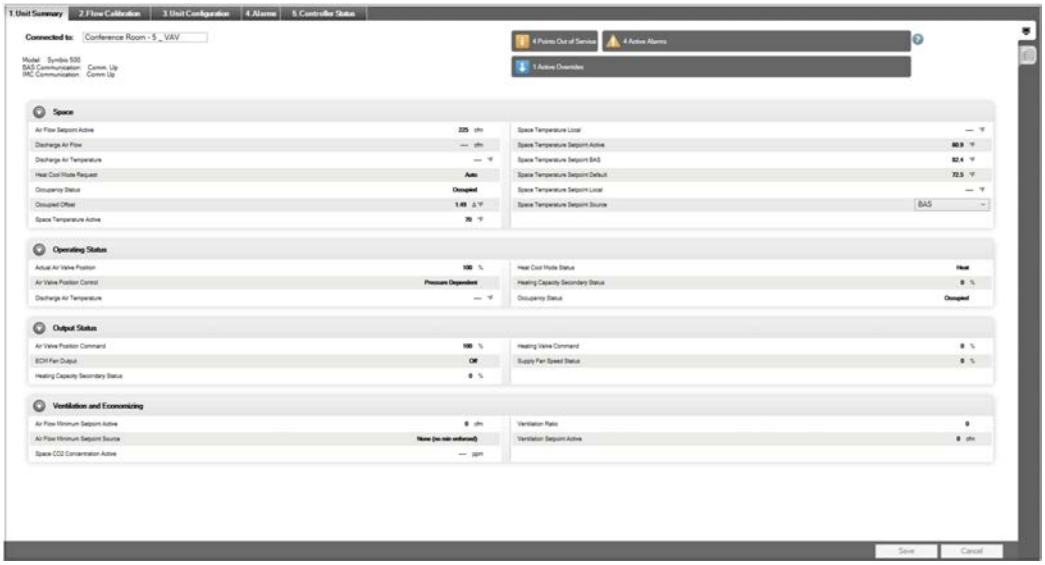
The Balancing Tool Screens

This section presents a brief tour of the main Balancing Tool screens.

Unit Summary Screen

When you connect to a controller, you first see the Unit Summary screen. The Unit Summary screen presents "at-a-glance" information about the status of the equipment. For example, you see some important status values grouped in categories. Each group of status values is contained in a labeled box. Space, Operating Status, Output Status, and Ventilation and Economizing boxes appear for a VAV box. The Balancing tool displays these boxes or other boxes in a slightly different order for unit ventilators, blower coils, fan coils, and water source heat pumps.

Figure 15. Unit Summary Screen



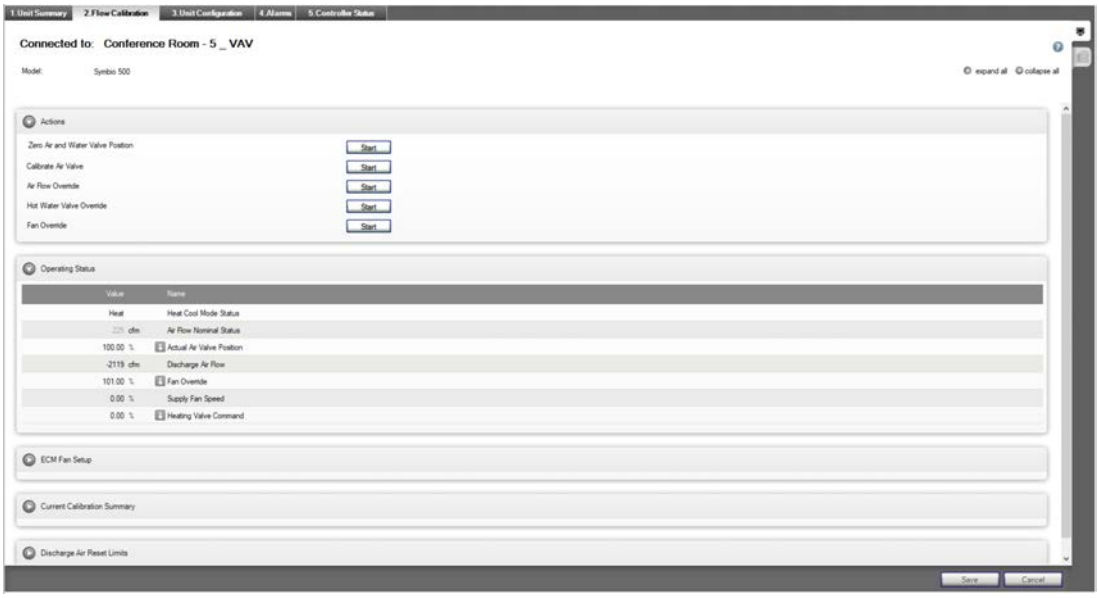
The Active Alarms alert box (upper right) indicates the number of active alarms that may require attention. When active alarms are present, the information icon displays the color of the highest priority alarm. Click the Active Alarms box to go to the Alarms screen. If there are no active alarms, no alarm icon is displayed and the text, "0 Active Alarms" is displayed.

Flow Calibration Screen

Click the second tab to see the Flow Calibration screen. This is the main working screen where you start the balancing tasks and confirm your results.

The Flow Calibration tab screen displays specific parameters related to air flow, fan, and water flow. It has the following expanding boxes: Actions, Operating Status, ECM Fan Setup (if an ECM fan exists), Current Calibration Summary (for VAV boxes), and Discharge Air Reset Limits (for VAV boxes).

Figure 16. The Flow Calibration screen



The Actions box includes screen objects you can use to launch the following tasks on an individual VAV box:

- Zero Air and Water Valve Position.

  Launches the Auto-Calibration routine to completely close the air or water valve and resets the Actual Air Valve Position point value to 0 (zero).

- Calibrate Air Valve.

  Displays the Calibrate Air Valve dialog box (see “The Calibrate Air Valve Dialog Box,” p. 26), which you can use to perform a two-point air valve calibration for an individual VAV box.

- Calibrate Hot Deck Air Valve.

  Displays the Hot Deck Air Valve Balancing Steps dialog box, which you can use to perform a two-point air flow calibration for an individual dual duct VAV box. (See “The Hot Deck Air Valve Balancing Steps Dialog Box,” p. 27).

  Displays the Hot Deck Air Valve Balancing Steps dialog box, which you can use to perform a two-point air flow calibration for an individual dual duct VAV box.

- Air Flow Override.

  Displays the Air Flow Override dialog box (Figure 19, p. 28), which you can use to safely drive the air valve to Full Open position (or, alternatively, to Full Closed, Maximum Flow, or Minimum Flow position) without the risk of recalculating calibration values.

- Water Valve Related Overrides.

  Displays one of the water valve related override dialog boxes. (The Hot Water Valve Override Start button is shown on the previous image.) You can override the Economizer Valve, Isolation Valve, Hot Water Valve, and Chilled Water Valve to the open position for a limited duration as part of a system water balancing operation. When the time duration expires the water valve is released back to its normal setting. (See “The Water Valve Override Dialog Boxes,” p. 29).

- Fan Related Overrides.

The Fan Override, Fan Override ECM, and Fan Override PSC options display the fan related overrides dialog boxes, which you can use when balancing air flow for the supported types of equipment. (See “The Fan Override Dialog Boxes,” p. 28).

- Ventilation Damper Override.

  Use this override dialog box to open the ventilation damper on all BC, FC, and UV units configured with modulating outside air dampers. The damper can be opened to an adjustable percent.

Operating Status

This box includes current settings related to air and water balancing. The gray override icons indicate that air, fan, and water valve settings can be overridden. Blue icons indicate that the settings are currently overridden. (See “The Override Icon,” p. 21).

ECM Fan Setup

(Visible if an ECM fan is configured.) This box includes flow setpoint, maximum and minimum flow settings, and a correction factor setting.

Current Calibration Summary

Presents the current values of the Air Flow Gain and Air Flow Measurement Offset along with the Minimum and Maximum Air Flow Setpoints for a VAV box. These values are adjustable using the various controls described in “Adjustable controls,” p. 22 . The following setpoints have been added to this list:

- Standby Minimum Air Flow.
- Air Flow Setpoint Minimum Standby Heat.
- Air Flow Setpoint Minimum Heat.
- Air Flow Setpoint Maximum Heat.
- Air Flow Setpoint Minimum Local Heat.

Discharge Air Reset Limits

This box contains settings that are used for Dual Max VAV boxes. When the VAV’s heating valve is open, the box flow will modulate between the flow settings to control to the Discharge Air Temp Design Setpoint. It includes the following adjustable setpoints:

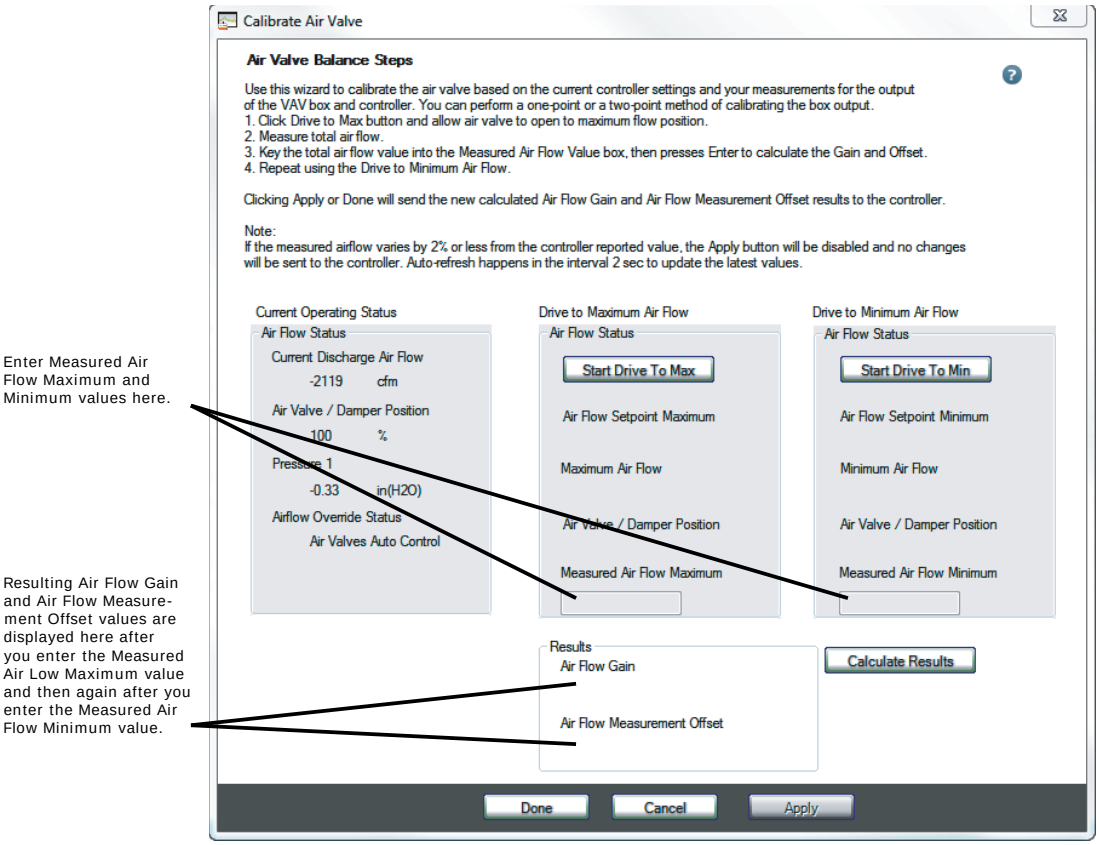
- Air Flow Setpoint Reset Min Local Heat.
- Air Flow Setpoint Reset Max Local Heat.
- Discharge Air Temp Reset Max.
- Discharge Air Temp Design Setpoint.

The Calibrate Air Valve Dialog Box

The Calibrate Air Valve dialog box appears when you click the Calibrate Air Valve **Start** button on the Flow Calibration screen. You can use this dialog box to perform a two-point air valve calibration.

Note: *Tracer® TU presents the Hot Deck Air Valve Balancing Steps dialog box when a dual duct VAV box is being calibrated. (See "The Hot Deck Air Valve Balancing Steps Dialog Box," p. 27 and "Hot Deck Air Valve Balancing Steps" (dialog box help) in the Tracer® TU Balancing Tool Help.).*

Figure 17. The Calibrate Air Valve Dialog Box



Current Operating Status Box

Initially displays the following values as of the time the dialog box is opened:

- Current Discharge Air Flow.
- Air Valve / Damper Position.
- Pressure 1.
- Air Flow Override Status.

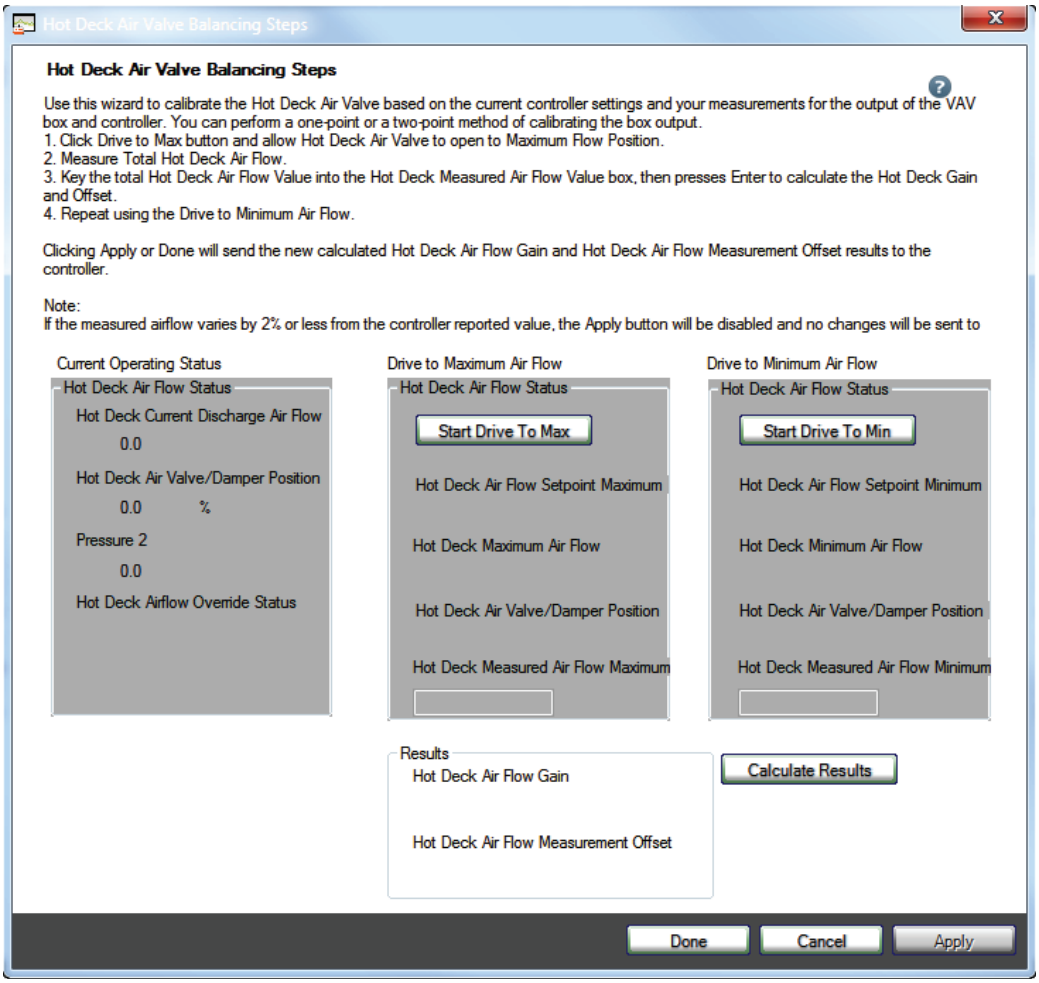
It then provides continuously updated values for these points reflecting the status of the Drive to Maximum and Drive to Minimum operations.

Note: *The changing values displayed on this screen are refreshed at the rate you specify in the User Preferences dialog box accessed from the Preferences menu.*

The Hot Deck Air Valve Balancing Steps Dialog Box

The Hot Deck Air Valve Balancing Steps dialog box is very similar to the Calibrate Air Valve dialog box. You can perform the same two-point air flow calibration for the hot deck air valve of an individual dual duct VAV box. The cold deck valve is automatically closed when you are calibrating the hot deck air valve and vice versa. See the context-sensitive help and “Calibrating the Air Valve” in the *Tracer® TU Balancing Tool Help* for detailed information.

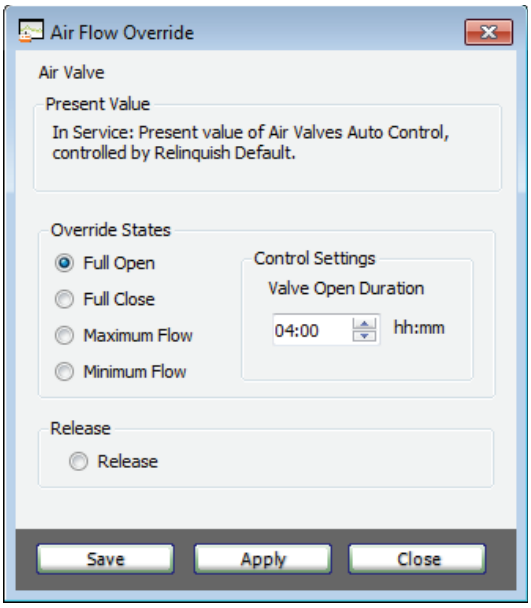
Figure 18. The Hot Deck Air Valve Balancing Steps dialog box



The Air Flow Override Dialog Box

The Air Flow Override dialog box shown in Figure 19, p. 28 appears when you click the Air Flow Override **Start** button on the Flow Calibration screen. You can use this dialog box to drive the VAV air valve (damper) to the full open, full closed, maximum air flow, or minimum air flow position for a limited time while you balance the air flow at the diffusers. Click **Apply** to start the override of the air valve while keeping the dialog box open. Click **Save** to start the override and close the dialog box.

Figure 19. The Air Valve Override dialog box

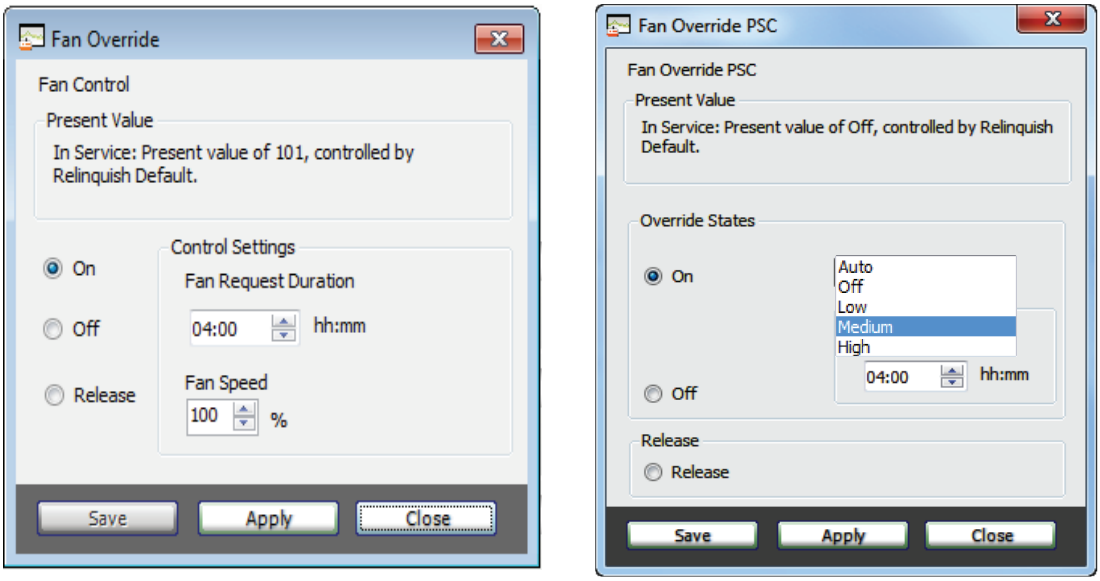


Note: *You can override the air valve on multiple VAV boxes using the Facility View. (See "Facility View," p. 32.).*

The Fan Override Dialog Boxes

The Fan Override dialog boxes appear when you click the Fan Override, Fan Override ECM, or Fan Override PSC **Start** button on the Actions box of the Flow Calibration screen. You can use these dialog boxes to override the fan On or Off for a limited time while you balance the air flow at the diffusers. In addition, you can adjust the ECM fan speed as a percentage, if an ECM fan is installed and configured, or select a fan stage (Auto, Low, Medium, or High) for a PSC fan. Click **Apply** to override the fan on while keeping the dialog box open. Click **Save** to start the override and close the dialog box.

Figure 20. The Fan Override dialog boxes

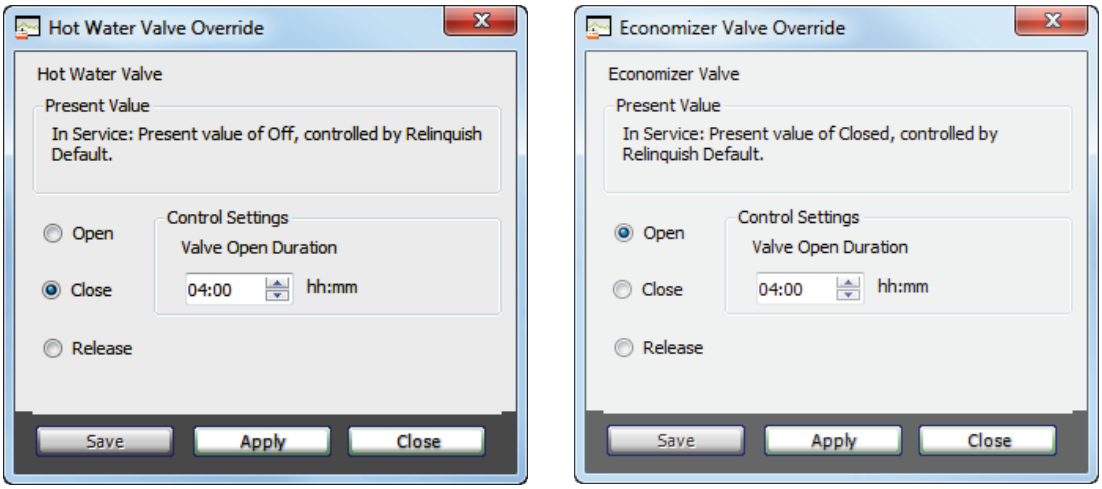


Note: *You can override the fan on multiple instances of similar devices using the Facility View. (See "Facility View," p. 32.).*

The Water Valve Override Dialog Boxes

The Water Valve Override dialog boxes appear when you click the Hot Water Valve Override, Chilled Water Valve Override, Isolation Valve Override, or the Economizer Valve Override **Start** button in the Actions box on the Flow Calibration screen. You can use these dialog boxes to override these water valves Open or Closed for a limited duration. Click **Apply** to override the water valve to Open while keeping the dialog box open. Click **Save** to start the override and close the dialog box.

Figure 21. The Hot Water Valve and Economizer Valve Override dialog boxes



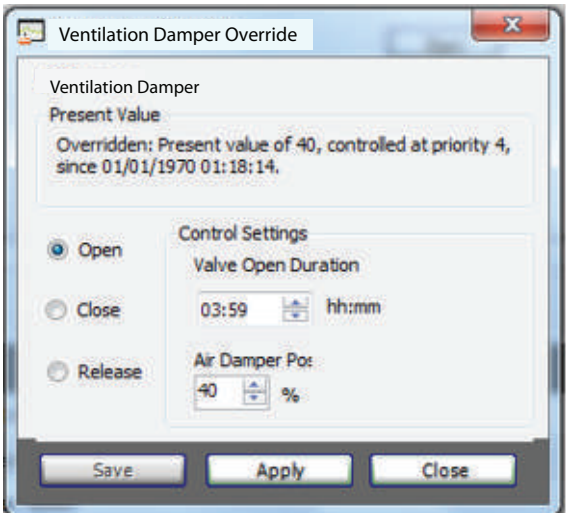
The standard default time duration is 4 hours on all of these override dialog boxes. If you wish to release the override manually, you can select **Release** and click **Apply** or **Save**.

Note: *You can override the hot water valve, chilled water valve, economizer valve, or isolation valve on multiple devices using the Facility View. (See "Facility View," p. 32.).*

The Ventilation Override Dialog Box

The Ventilation Damper Override dialog box appears when a blower coil, fan coil, or unit ventilator is configured with an outside air damper. You can temporarily override the outside air damper 'Open' to an adjustable percentage.

Figure 22. The Ventilation Damper Overrides dialog box



The Unit Configuration Screen

The Unit Configuration tab screen displays the configured options and settings appropriate for the device to which you are connected. This is a view-only screen with the exception of the Air Damper Opens (directional) and Box Size settings, which you can modify for VAV boxes.

Figure 23. The Unit Configuration screen

The expanding boxes display the following types of information:

- **Equipment Options box.**

  Lists hardware characteristics of the VAV unit. (If you change the Box Size or Air Damper Opens values, the Save button becomes active.).

- **Fan Settings box.**

  Lists settings that indicate the type of fan motor and parallel fan control, if the unit has a fan installed.

- **Reheat Settings.**

  Lists settings that indicate the characteristics of the reheat components, if heating options are installed.

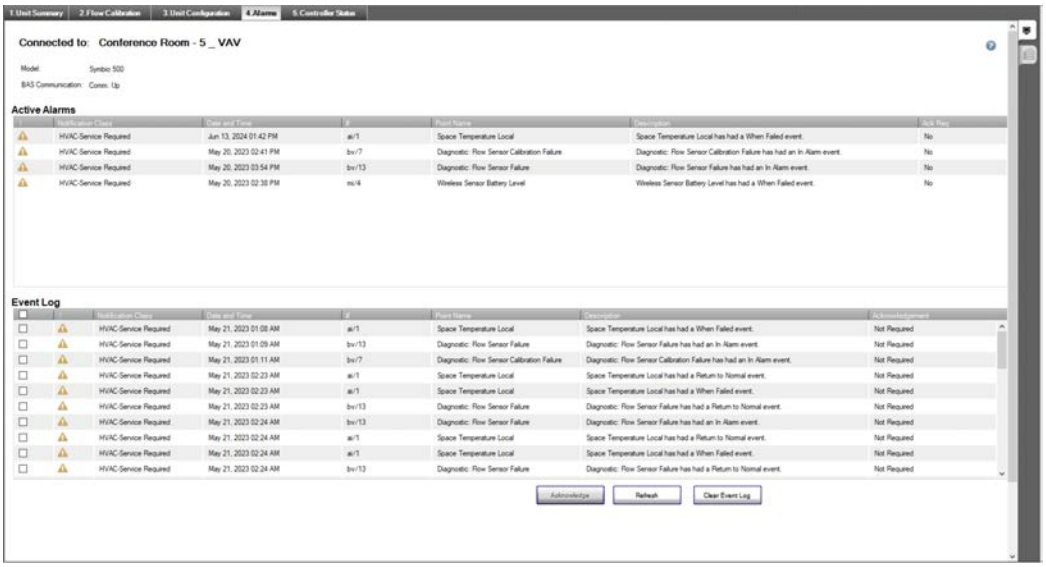
- **Sensor Options.**

  Displays unit features and components with their types or "None" if a feature/component is not configured and installed.

Alarms Screen

The Alarms tab screen displays all active alarms. Alarms are displayed in date and time order and then in order of severity. However, all columns are sortable. For example, if you prefer to view alarms by Point Name, you can click that column heading to arrange the entries in ascending or descending alpha order.

Figure 24. The Alarms Screen



The alarm icons displayed on the left side of the screen indicate the level of severity.

Red indicates an alarm requiring immediate attention.

Orange indicates a low priority alarm.

Blue indicates a normal condition.

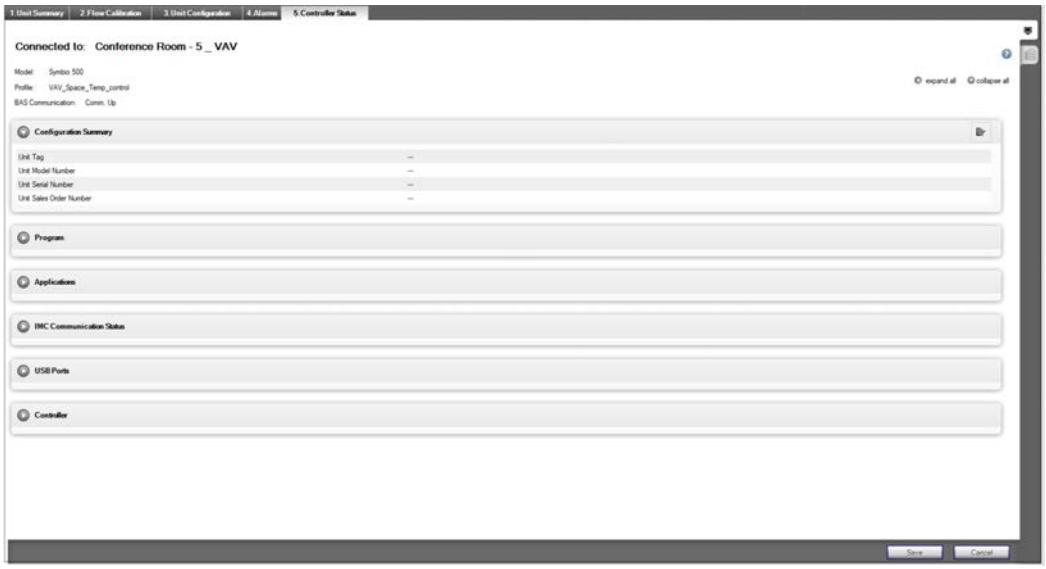
Yellow indicates a warning alarm.

The Acknowledgement column value indicates whether or not the alarm has to be acknowledged at the parent System Controller level.

Controller Status Screen

The Controller Status tab screen lists basic information about the controller, the installed programs, and any expansion modules used with the controller.

Figure 25. The Controller Status screen



Configuration Summary

Displays a quick summary of basic controller and configuration information. In addition, you can edit the Unit Tag, Unit Model Number, Unit Serial Number, and the Unit Sales Order Number by clicking the icon on the right side of the title bar.

Program

Lists all installed programs. The grid includes information about current program status (Running or Idle) and specifies whether a program is scheduled to run at a specific interval, or if it runs when triggered by an event. The Duration column indicates the length of time it takes a program to run from start to completion (one program cycle).

Applications

Displays the operational state of the TGP2 program engine in which all programs execute including the amount of volatile memory used for TGP2 control in the connected device and the percentage of non-volatile memory used to store TGP2 programs and the configuration in a the connected device.

Expansion Module Status

The Expansion Modules Status box appears if the controller is communicating with any expansion modules, such as the XM30 or XM70 modules. The grid columns include module type, address, and communication status.

Controller

The Controller box provides identifying information about the controller.

Facility View

You are working at a job that includes 50 VAV boxes on a single BACnet® MS/TP link. All VAVs have been installed correctly and are fully commissioned. The System Controller has not yet been installed on the single water loop serving all 50 VAV boxes. You need to override all the water valves to the open

position until the central water pump balancing task is complete. Access the Facility View by clicking the icon (shown at the upper left) to apply the override to all the VAVs you have selected on the Device Navigation Tree simultaneously in one operation. Applying overrides to groups saves time over a one-device-at-a-time approach.

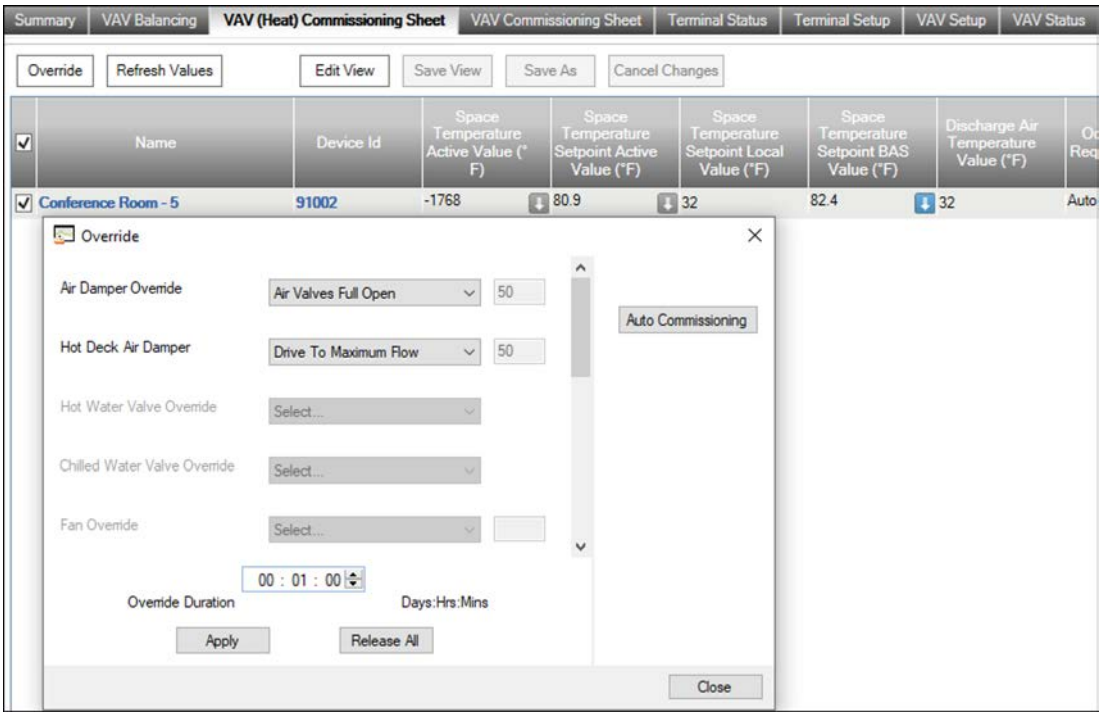
You can also use the Facility View to override air dampers, fans, and water valves on multiple instances of a single equipment type including BCs, FCs, UVs, and WSHPs.

The Facility View operates using all types of communication: wired or wireless via Single Link Access, System Controller pass-through, and BACnet®/IP. While the presence of a System Controller improves performance, the Facility View grouping feature can also function independently of a System Controller.

The Override Dialog Box

Use the Override dialog box accessed with the Override button on the Facility View to drive air valves and water valves over the entire communication link to specific positions. Once you activate an override for a group of similar devices, you can then check the status of all selected devices to be sure they are acting in the expected manner. You are then free to turn to other tasks while the override is in effect for the specified duration (seven days maximum).

Figure 26. Override dialog box launched from the facility view



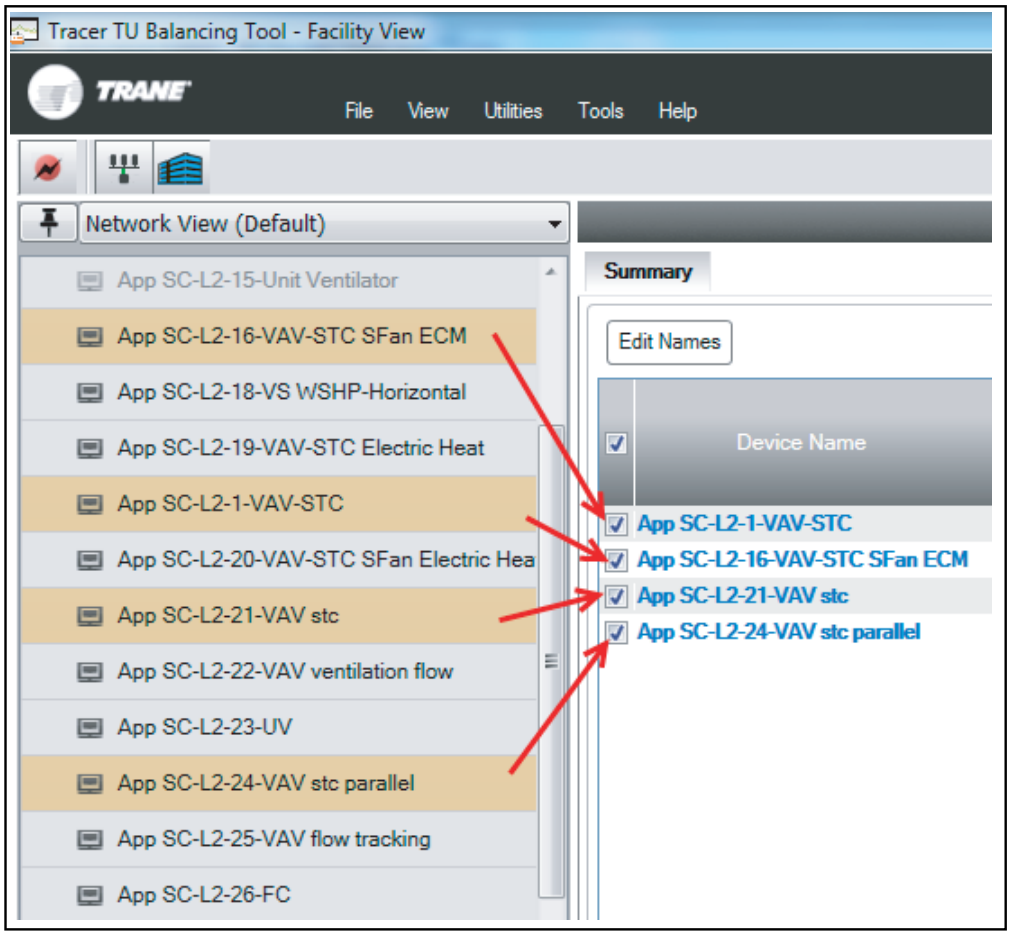
Note: *Trane® standard programs are required to perform group operations.*

Facility View Operations

More specifically, you can use the Facility View to perform the following tasks:

- Select the devices to be included in the override operation on the Device Navigation Tree and transfer them to the Facility View. (See “Specifying a Device Group on the Navigation Tree” and “Overriding Multiple Air Valves, Water Valves” and Fans” in the *Tracer TU Balancing Tool Help*).

Figure 27. Group selection and transfer to the Facility View



- Use the check boxes on Facility View to deselect or reselect items from the transferred device list.
- Override hot and chilled water valves, economizer valves, or isolation valves to Full Open or Full Closed.

  Note: *These water valve overrides apply only to equipment with reheat coils, such as VAVs, fan coils, and blower coils. It excludes air handling units.*
- Override air valves to any of the following positions: Full Open, Full Closed, Maximum Flow, Minimum Flow, or a user-defined position.

  Example: Enter a percentage open value that the air valve will drive to, such as 50% open.

  Note: *This air valve override applies only to VAV equipment types.*
- Override the ventilation damper on BC, FC, and UV units configured with modulating outside air dampers. The damper can be opened to an adjustable percent.
- Override some points included in the Facility View equipment point groups.

Note: *When viewing and working with dual duct VAV units, in the Facility View, be aware that Air Flow Setpoint Active cannot be overridden due to a priority conflict.*

- Calibrate the air valves of all selected VAV boxes using the VAV Balancing view.

In addition, Facility View performs the following operations:

- Releases overrides to automatic control for all override cases.
- Displays information pertaining to all members of a group on a status page.
- Saves the Facility View layout so each time Facility View is opened the existing views are displayed.

Accessing the Balancing Tool Help

As you work with the Balancing Tool, you can refer to the Tracer® TU Balancing Tool Help for screen descriptions and relevant procedures. You can access Help in several ways:

- Clicking the Help icon, which is located in the upper right portion of the screen.
- Clicking the Help button on many dialog boxes.
- Clicking the Help menu at the top of the application window and selecting the Help option.
- Moving your cursor over various tabs and buttons to view “tooltip text”.

The procedures in the Tracer® TU Balancing Tool Help are included under the following headings:

- Managing Your Software.
- Connecting to and Disconnecting From a Controller.
- Accessing Devices in a Single Link.
- Accessing Devices Using BACnet® Discovery.
- Viewing VAV Operation, Configuration, and Alarms.
- Balancing VAV Boxes.
- Overriding Fans and Valves.
- Working with Device Groups on the Facility View.

Appendix A. Balancing Tool Installation and Connection Error Conditions

During installation or initial connection to a controller, you may encounter an error message or error condition. The messages with corrective actions are listed in the following table.

Table 1. Tracer® TU installation and connection error conditions

Error Message/Condition	Corrective Action
Does not recognize USB hardware.	Respond as follows: • Install correct USB drivers by reinstalling the Balancing Tool using Tracer® TU Setup.exe. • If you get this message and have the correct USB drivers installed, make sure to wait for the controller to completely boot before attaching the USB cable.
The Balancing Tool does not respond, or the screen is blank.	The phrase “Connected Local USB” should appear in the lower left hand corner of the Balancing Tool. screen. If it does not, the connection has been lost. Restart the Balancing Tool. by clicking the Connection icon (lightning bolt) in the upper left of the application window.
Found New Hardware popup message	If the popup message does not appear, run the Tracer® TU installation file: **Tracer TU Setup_*x.x.xxx*.exe**.

Notes

Trane - by Trane Technologies (NYSE: TT), a global innovator - creates comfortable, energy efficient indoor environments for commercial and residential applications. For more information, please visit trane.com or tranetechnologies.com.

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