Field Assistant v9.0

User Guide

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Important changes are listed in **Document revision history** at the end of this document.

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What is Field Assistant?

Field Assistant is a standalone tool you can install on your computer or laptop to access a single Open or i-Vu® XT or TruVu™ controller, several controllers, or a network of Open or i-Vu® XT or TruVu™ controllers and routers. You do not need to be connected to the Internet. You can communicate with the devices using local access or over an IP network.

NOTE A Field Assistant system allows a maximum of 750 Open controllers. Field Assistant does not work with CCN.

Field Assistant basics

In Field Assistant, you can use a Local Access connection. Or, you can use an IP connection to access an entire network of routers and controllers.

After you have connected to a router or controller, you can:

- Upload parameters and source files (control programs, drivers, graphics, .touch files, and BACview® files) from the controller to Field Assistant
- Commission and start up equipment
- Adjust setpoints and other control parameters
- View current trends stored in the controller
- Set and change schedules in the controller
- Run preconfigured reports that display locked values, points list, network I/O, alarm sources, equipment and controller status, and test and balance configuration
- Use the Snap and ViewBuilder applications to edit or create new control programs and views
- Download programs, schedules, parameters, and BBMD tables to controllers
- Export updated source files

To use Field Assistant, you must understand these terms:

Source Files	Includes any or all of the following files: • Control programs (.equipment) • Graphics (.view) • Screen files (.touch, .bacview) • Drivers (.driver)
Parameters	Editable properties within a control program or driver
Import	Brings files into Field Assistant. Import source files (sourcefiles.zip) from the **Field Assistant Launcher**. **NOTE** Your manufacturer or representative must supply the source files.

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Export	Takes source files from your Field Assistant system to use in another system. Export source files (sourcefiles.zip) from the **Field Assistant Launcher**.
Download	Sends source files, schedules, or parameters from Field Assistant to the controller.
Upload	Retrieves source files or parameters from the controller and stores them in Field Assistant.

Field Assistant Tools

Develop and configure graphics and a system database for your Field Assistant system using the following Field Assistant tools, downloaded from your Tech Tools USB drive.

Use...	To...
ViewBuilder	Create or edit graphics
EquipmentBuilder	Build or edit control programs (.equipment files) for programmable controllers. Can also produce graphics, sequence of operation, and screen files
Alarm Notification Client	Receive a message on any networked computer that is running the Field Assistant Alarm Notification Client application
Virtual BACview®	View and change property values and the controller's real time clock
BBMD Configuration Tool	Configure BACnet/IP Broadcast Management Devices (BBMDs) **NOTE** If your system has multiple routers that reside on different IP subnets, you must set up one router on each IP subnet as a BACnet/IP Broadcast Management Device (BBMD).
MSTP Capture Tool	Capture BACnet traffic on MS/TP. It is intended for situations where Carrier Control Systems Support needs a network capture to troubleshoot communications.
Test & Balance	• Calibrate airflow in a VAV or VVT Zone controller • Calibrate the static pressure in a VVT Bypass controller • Commission air terminals • Override reheat and terminal fans **NOTE** Use Test & Balance to manipulate the controllers associated with an air source, but not the air source itself, or heating and cooling equipment, such as chillers and boilers.
Snap	Build custom control programs using individual blocks of programming code called microblocks
LonWorks Integration Tool	Generate the microblock addresses automatically for third-party LonWorks points
AppLoader	Use to download .clipping files to restore factory defaults and check **Module Status** (Modstat) through the Rnet port

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Computer and operating system requirements for Field Assistant

The computer should have at least:

- A dual core processor
- 4 GB RAM
- 5 GB free disk space
- A communications link of 10 Mbps or higher
- Windows® 10 Professional (64-bit)

The Field Assistant application will work with slower computers and slower links, but the results may not be satisfactory.

Field Assistant v6.5 and later only uses an Apache Derby database. If you have an Access database from a Field Assistant version previous to v6.5 that you want to use in v7.0 or later, see *Converting Access databases to Derby* (page 4).

The memory requirements will vary based on the:

- number of pieces of equipment and device instances
- size of the control programs

For this size system...	**With this number of...**		**The computer should have at least a dual core processor and...**				
	Instances of equipment and devices [1]	Physical Points and Display Objects	Passmark Total Score [2]	Passmark Single-threaded Score	RAM Minimum/ Recommended	JVM Memory Minimum/ Recommended	Operating system
Small	0 - 250	0 - 1000	2000	800	4 / 4GB	1 / 1GB	64-bit server
Medium	250 - 1000	1000 - 5000	3000	1000	4 / 8GB	2 / 4GB	64-bit server
Large	1000 - 10,000	5000 - 50,000	5000	1400	6 / 12GB	4 / 8GB	64-bit server
Huge	more than 10,000	more than 50,000	6500	1600	16 / 16GB [3]	12 / 12GB	64-bit server

[1] Total number of control programs and controllers-+.

[2] For more information, see www.CPUbenchmark.net.

[3] For a huge system with minimal user activity, the average piece of equipment or instance device requires approximately 300KB of server RAM. Contact Carrier Control Systems Support for server sizing recommendations.

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Converting Access databases to Derby

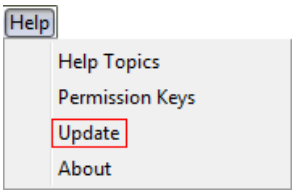
Field Assistant v6.5 and later creates sites using Derby databases. Older versions of Field Assistant created sites using Access, which is not compatible with Field Assistant v6.5 or later. In order to open v6.0 or older Field Assistant sites created with Access, these sites must be converted to Derby by using the Field Assistant v6.0 database conversion file. This update file is located on the Tech Tools v7.0 USB drive.

CAUTION This update can only be applied to Field Assistant v6.0. If you are upgrading from a pre-6.0 version, you must first install Field Assistant v6.0 and upgrade all of your Field Assistant systems to v6.0. Then you must install Tech Tools v7.0 and use the following instructions to convert your databases through v6.0. You cannot open a system in v7.0 until you have converted them.

1. Open the Field Assistant v6.0 Launcher screen.

   NOTE Do NOT click the arrow to start a system.

2. From the Field Assistant v6.0 Launcher, click **Help** > **Update** to open the **Apply Update** dialog.



3. On the **Apply Update** dialog, in the **Update File** field, browse to the Tech Tools v7.0 Installation USB drive, open **FA60_DB_Migration_Update** > **WS60_Migrate_Access_To_Derby.update** file and click **Select**.
4. Click the **Apply and Restart Now** or **Update with Restart Later** button.
5. From the Field Assistant v6.0 Launcher, click **Help** > **Database Upgrade Utility**.

   NOTE This option appears only after applying the update file.

6. In **Target Coversion Directory**, browse to the i-Vu_Tools_7.0\webroot folder and click **Select**.
7. In **Systems To Convert**, browse to your i-Vu_Tools_6.0\webroot folder and click **Select**. You can use the Shift or Ctrl key to multi-select databases.

   CAUTION You must get your database(s) from the webroot directory only. If, for instance, you have files on a USB drive, you must first place them on your computer in the i-Vu_Tools_v6.0\webroot folder. No other path is accepted.

8. Click the **Start Conversion** button.

   NOTES

   - The top progress bar **Overall conversion progress** displays the progress of all of the databases you selected. The total conversion is finished when the bar reaches the end.
   - The two lower bars show the conversion progress of each database.

9. When complete, click **Exit**.
10. Close the Field Assistant Launcher v6.0.
11. You can now start your systems in the Field Assistant Launcher v7.0. See *Getting Started* (page 5).

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Getting started

1. If you will be using a database from a pre-v6.5 version of Field Assistant, you must first convert the Access database to a Derby database. See *Converting Access databases to Derby* (page 4) for details.
2. *Set up your computer and browser* (page 5).
3. Do one of the following:
   Connect to a controller's Local Access port (Open device only) (page 8)
   Connect to a controller over an IP network (Open device or i-Vu® XT or TruVu™ device) (page 7)
4. Start Field Assistant. Field Assistant finds and displays the controller you are connected to, as well as, any other controllers on its local network.
5. *Upload source files from a controller* (page 10).
6. Start up, commission, or change parameters, programs, or drivers as needed. See *Working with equipment* (page 20).
7. *Export source files from the Field Assistant Launcher* (page 11) to use in the i-Vu® Standard, Plus, or Pro application.

To set up a computer and web browser to view Field Assistant

Click **Allow popups** when prompted.

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To connect to a controller through the Service Port (i-Vu® XT or TruVu™ device only)

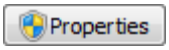
Enable DHCP on your computer and then connect the i-Vu® XT or TruVu™ controller's Service Port to your computer. The Service Port may be an Ethernet port or a USB port, depending on which controller you are connecting to.

CAUTION See the controller's Technical Instructions to be sure to use the correct port.

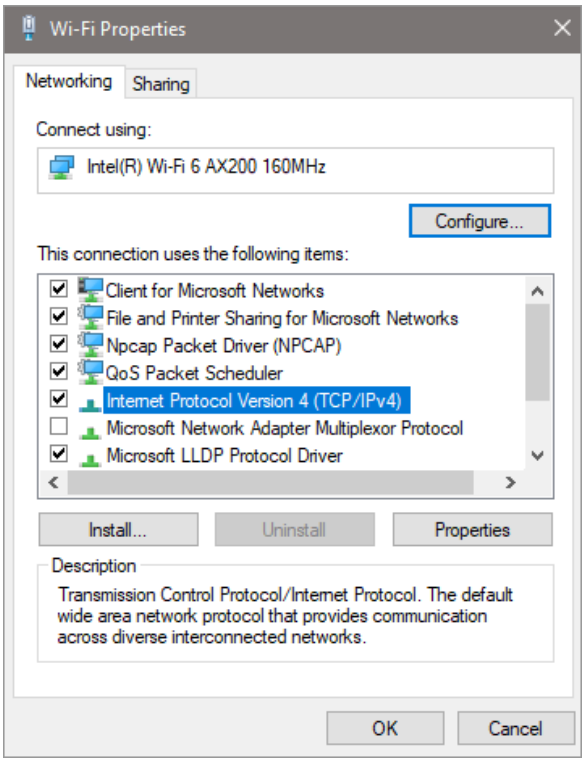
Enable DHCP on your computer

1 Click **Start** > **Control panel** > **Network and Internet** > **Network and Sharing Center**.

2 Under active networks, double-click your **Connections** link to open **Status**.

3 Click the **Properties** button 

and then double-click **Internet Protocol Version 4 (TCP/IPv4)**.



4 Check **Obtain an IP address automatically** and click **OK** to close the window.

5 Click **OK** again.

6 Click **Close**.

7 Leave the **Network and Sharing Center** page open. You will use it again later.

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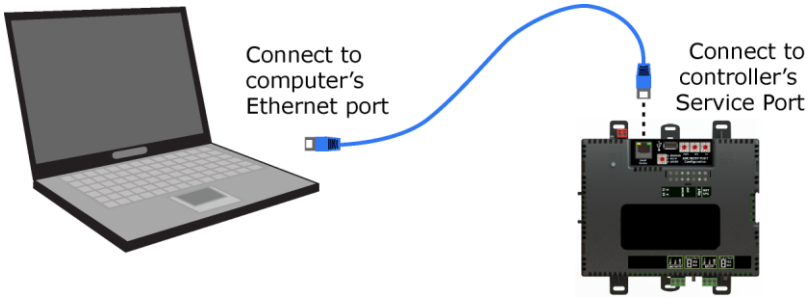
Connect to the i-Vu® XT or TruVu™ device's Service Port

1 Connect an Ethernet cable from your computer to the i-Vu® XT or TruVu™ controller's Service Port, as shown below.



2 Open a web browser on the computer.

3 Navigate to http://local.access or http://169.254.1.1 to see the controller setup pages.

NOTE If you do not see the pages, review the previous steps. Check your Ethernet cable and make sure DHCP is set.

To connect to a controller over an IPv4 network (Open device or i-Vu® XT or TruVu™ device)

1 Connect a CAT5 Ethernet cable to your computer and to:

- The controller's Ethernet port

  or

- A hub on the same IP network as the controller

2 Set your computer's IP parameters so that it can communicate on the controller's IP network.

3 Open **Field Assistant Launcher**, select your **Communications** type, and start your system. See Start Field Assistant.

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To connect to a controller over an IPv6 network (i-Vu® XT or TruVu™ device only)

1 Connect a CAT5 Ethernet cable to your computer and to:
   - The controller's Ethernet port

     or
   - A hub on the same IP network as the controller
2 Set your computer's IP parameters so that it can communicate on the controller's IP network.
3 Open **Field Assistant Launcher**, select your **Communications** type, and start your system. See Start Field Assistant.

To connect to a controller's Local Access port (Open device only)

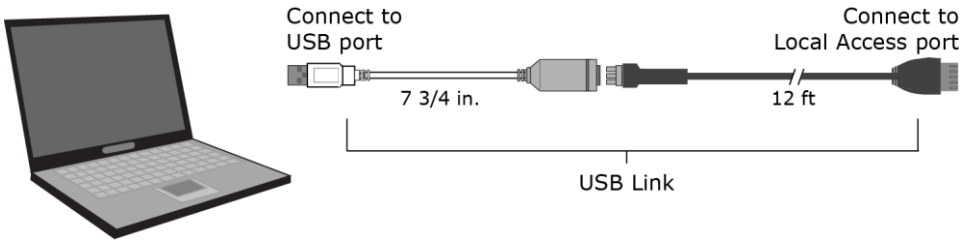
PREREQUISITE For Field Assistant to communicate with the controller, the controller must have been downloaded with at least its driver (4.x or later).

CAUTION If multiple controllers share power but polarity was not maintained when they were wired, the difference between the controller's ground and the computer's AC power ground could damage the USB Link and the controller. If you are not sure of the wiring polarity, use a USB isolator between the computer and the USB Link. Purchase a USB isolator online from a third-party manufacturer. Plug the isolator into your computer's USB port, and then plug the USB Link cable into the isolator.

Using a USB Link

1 If your computer does not already have the USB Link driver installed, install it before you connect the USB Link to your computer.

   NOTE The driver is installed with Field Assistant. Please refer to the Silicon Labs website and search "CP210x USB to UART Bridge VCP Drivers" for the most current device drivers.
2 Connect the computer to the local access port of the controller, ZS sensor, or an SPT sensor using the USB Link cable(s).



NOTE If using a USB isolator, plug the isolator into your computer's USB port, and then plug the USB Link cable into the isolator.

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To start Field Assistant

1 From your desktop, select **Start** > **All Programs** > **i-Vu_Tools_ x.x** > **Field Assistant**.

2 Click on the **Field Assistant Launcher** and type your **System Name**.
The **System Name** cannot:

- Begin with a number.
- Contain special characters other than a dash or an underscore.
- Exceed 40 characters.
- Contain capital letters or spaces. Use an underscore or dash between words.

3 Click **Create**.

4 If your manufacturer or representative provided source files, click Import, browse to **sourcefiles.zip**, then click **Open**.

NOTE If using local access, Field Assistant will find and display the device you are connected to and any other controllers on its local network. You must upload source files for any controllers you need to work with. See *To upload source files from a controller* (page 10).

5 Select your **System Time Zone**. Your selection applies to your current system when you click .

6 Under **Communications**, select the method you are using to connect to a controller or system:

- BACnet/Service Port - See *To connect to a controller through the Service Port (i-Vu® XT or TruVu™)* (page 6)
- BACnet/IP network - Select your IP. See *To connect to a controller over an IP network* (page 7).
- BACnet/IPv6 - Select your IPv6 address. You can edit all of the fields, if you need to. See *To connect to a controller over an IPv6 network (i-Vu® XT or TruVu™ device only)* (page 8).
- Local Access - select your USB Comm port from the drop-down list.

NOTE If you are using a USB Link (#USB-L), you must connect it to your computer and the controller before launching Field Assistant. If you do not see your Comm port, close the **Field Assistant Launcher**, make the connection, then restart Field Assistant.

7 Click to start your system.

NOTE When you click to stop your system, the **Field Assistant Launcher** disappears for a few seconds and then reappears.

To import source files

You can import and export source files from the **Field Assistant Launcher**. If the controllers have full source in them, you do not need to import the source files because you upload them from the controllers.

1 If Field Assistant is running, close the Field Assistant window and click on the **Launcher** to stop your system. The **Launcher** will disappear and then take a few seconds to reappear.

2 Click **Source Files** Import. Select the **sourcefiles.zip** file.

3 Click to start your system.

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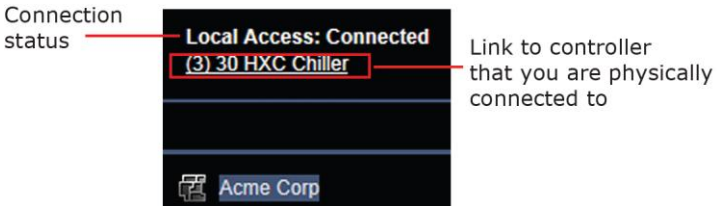
To upload source files from a controller

NOTE For best results, connect your computer to a controller on the same network segment as the controllers that you want to upload.

1 Click the link (shown below) to the controller that your computer is connected to.



2 On the **Properties** page, click Upload, and then click **OK**.

NOTE If a message appears stating that a file is missing, you must stop and import the source files provided by your manufacturer or representative. Follow these steps:

a) Close Field Assistant.

b) Click on the **Launcher** to stop your system. The **Launcher** will disappear and then take a few seconds to reappear.

c) Click **Source Files** Import. Select the **sourcefiles.zip** file.

d) Click to start your system.

e) Click Upload.

f) Return to Step 1.

3 Start up, commission, or set parameters as needed. Perform the services required. See *Working with equipment* (page 20).

4 If you have more controllers, move your USB Link cable to the next controller or to a controller on another network, then repeat steps 1–3.

NOTES

- To upload more than one controller at the same time, select the System on the navigation tree, then go to the **Devices** page > **Manage** tab. Select the controller(s) you wish to upload in the list on the page.

  Ctrl+click to multi-select, or enable **Select all.** Select **Upload All Content**, then click Upload.

- After uploading, we recommend that you give each controller a unique name by selecting the router level in the navigation tree and going to **Devices** page > **Manage** tab. Click in the **Name** field to edit.

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To export source files

1. Close the Field Assistant window.
2. In the **Field Assistant Launcher**, click to stop your system.
3. Click

.
4. Browse to a location where you want to save the source files.

   NOTE Do not change the extension (sourcefiles.zip).
5. Click **Save Files**.

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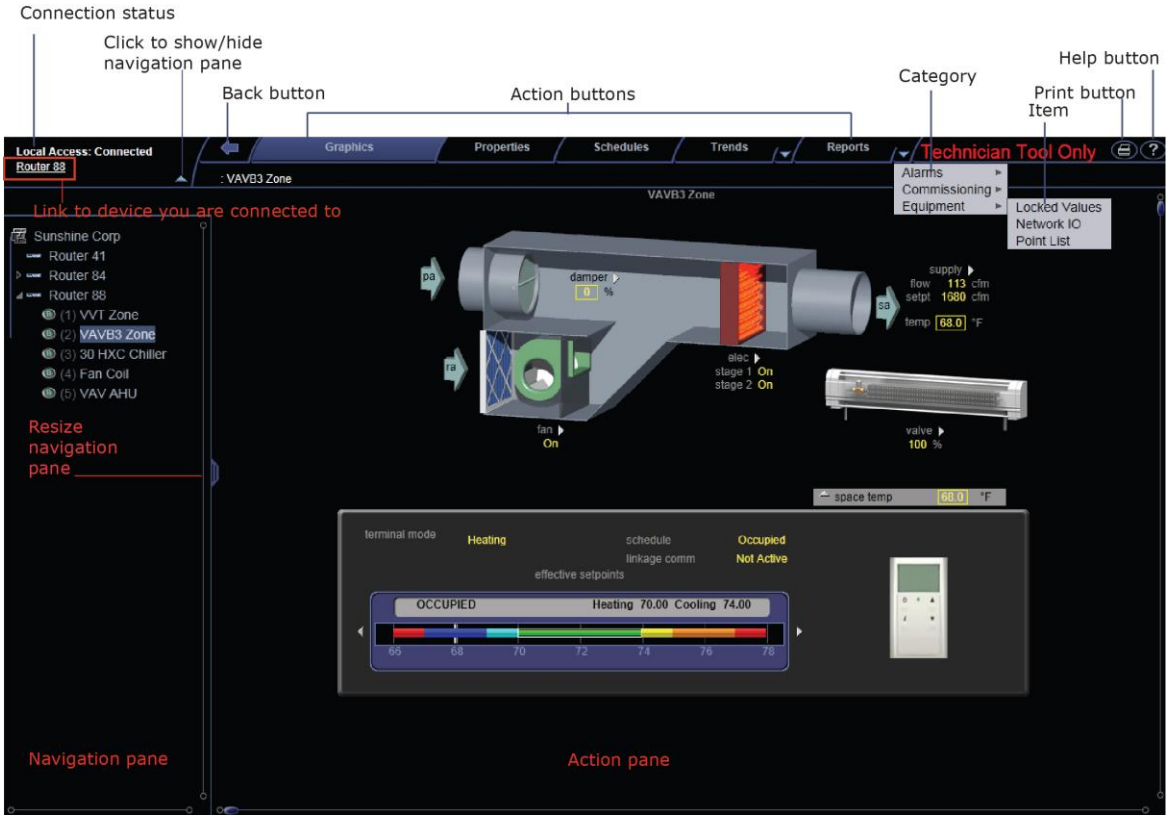
Getting to know the Field Assistant interface



Navigating the system

NOTE Use only the Field Assistant interface to navigate through Field Assistant; do not use the web browser's navigation buttons.

To navigate to an item in the system

1. Select an item on the navigation tree.
2. Use the action buttons and their drop-down menus to navigate to specific types of information about the selected tree item.
3. Use the tabs to filter the information further.

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To navigate using links

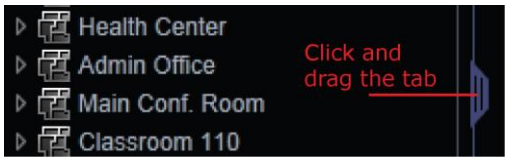
Click links to jump to related pages.

To show, hide, or resize the navigation tree

Click

at the top of the navigation pane to hide or show the navigation tree.

Click and drag the tab on the right side of the tree to adjust its width.



Zooming in and out

- To zoom in and out on the Field Assistant interface:
  - Hold down **Ctrl** and press + or -. Press **Ctrl+0** to return to 100%.
  - Hold down **Ctrl** while rolling your mouse wheel.
  - Use your web browser's zoom functions.
- If a graphic does not fit in the action pane, right-click it and select **Scale to Fit** to make it fit the action pane. Select **Scale to Fit** again to return the graphic to its original size.

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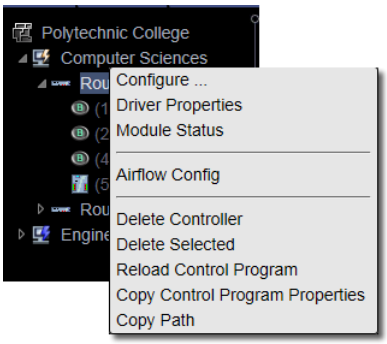
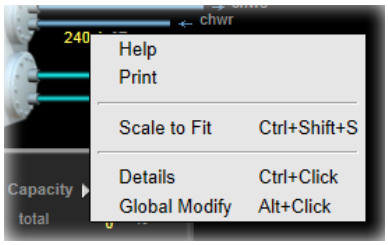
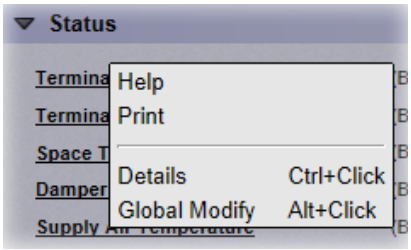
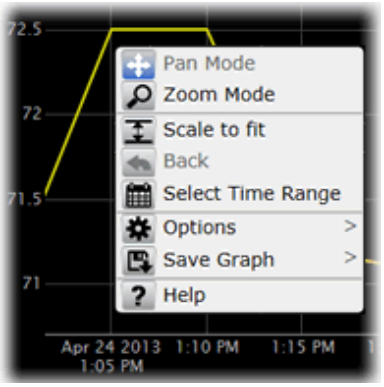
Using right-click menus

You can right-click the following items to select options:

A tree item	The Graphics page
	
A property	**A trend**
	

To print the action pane

Click at the top of the page to print the contents of the action pane. Set the print orientation to **Landscape** in the **Print** dialog box.

TIP To print a Graphics page that exceeds the size of the action pane, right-click the graphic and select **Scale to Fit**.

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Colors and status in the Field Assistant interface

The following colors indicate equipment status throughout Field Assistant interface. These colors are visible on Property pages, Graphics pages and in the setpoint graphs.

Color	Color Name	Status Code	Condition Indicated
	Purple	0 or 15	In a controller—non-operational or no communications In equipment—a hardware or software error
	Charcoal	14	In a controller—a download is required or is already in progress In equipment—a controller has stopped
	Coral	13	Control program error
	Red	2 or 9	Heating or cooling alarm
	Orange	8	Maximum cooling
	Dark blue	3	Maximum heating
	Yellow	7	Moderate cooling
	Light blue	4	Moderate heating
	Grey	1	Unoccupied/inactive
	White	10	Occupied/active
	Light green	6	Free cooling
	Green	5	In a controller—operational or operational read-only In equipment—No heating or cooling

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Setting up and configuring your system

On the **Devices** page > **Manage** tab, you can:

- *Search the network to populate the system with routers and controllers* (page 16)
- *Upload control programs, drivers, graphics, and screen files* (page 20)
- *Perform downloads to individual or multi-selected controllers* (page 30)

Find and upload routers and controllers

1. Select the System in the navigation tree.
2. If connecting over an IP network, on the **Devices** page > **Advanced** tab, set the Field Assistant BACnet/IP network number to match the number of the controller's BACnet/IP network (supplied by your manufacturer or representative).
3. On the **Devices** page > **Manage** tab, click **Find Devices** to discover your routers.
4. Once routers are found, select one router at a time in the left-hand navigation tree and click **Find Devices** again.
5. Once controllers are found, you must upload content to the routers and controllers. Select one or more devices in the list on the **Manage** tab and click **Upload All Content** to upload drivers, graphics, touch files, and control programs to the Field Assistant application. Use **Ctrl+click**, **Shift+click**, or both to select multiple items.

   NOTE If **Show Control Programs** is checked, all control programs are listed. If you have multiple control programs in one controller, you will see every control program in the list. If it is not checked, the list only shows the individual controllers and their model. The same information is uploaded, this option just controls what you see on the **Manage** tab and you can switch back and forth.
6. Click **OK** when you see the message **This will upload all content for the controller. Are you sure you want to do this?**. When complete, a check mark under **Status** indicates a successful upload.

   NOTES

   - If an error message appears, click on the message to view an explanation.
   - If a message appears stating that a file is missing, you must stop and import the source files provided by your manufacturer or representative. See *To import source files* (page 9).
   - Uploading can be time consuming, especially for multiple controllers.
   - The MAC address shows to the left of the controller name in the navigation tree only. Controllers can show multiple equipment listings with the same MAC address, based on control programs created in EquipmentBuilder or Snap.
   - To view the driver names after uploading, select the **Advanced** tab or right-click the controller in the navigation tree and select **Driver Properties** or **Module Status**.
7. Start up, commission, or set parameters as needed.

   NOTE You can make changes to one controller and then copy the changes to other controllers that have the same control program. See *Copying properties from one controller to another* (page 55).

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TIPS

- Click the **i** symbol in the upper left corner to display the status of the latest operation.
- Status messages are color coded as follows:
  - Red - reports an error
  - Blue - requires action
  - Green - indicates an upload or download is in process

Verify network and device settings

CAUTION The Field Assistant application automatically assigns a **BACnet Network IP number** and the **Server Device Id** for the application. Do **not** change these addresses unless absolutely necessary!

NOTE If you have more than 99 routers, you must set your own addresses.

1. Select the System in the navigation tree and go to the **Devices** page > **Advanced** tab to make any necessary changes.
2. Click **Accept**.

Verify and edit the following fields only as necessary.

System level

- **BACnet/IP network —** default is 1600 (The maximum number allowed is 65,534)

  NOTE Typically, you should not need to change this.
- **Server Device Id —** address of the Field Assistant web server (default is 169998)
- **Communications Time-out (in milliseconds) —** increase this value only if downloads to controllers or routers fail with communication time-out errors.
- **Communication Retries** (default is 3)
- **Optimize download for Open PIC controllers —** by default, Full Source files are downloaded to Open PIC controllers because **Optimize download for Open PIC controllers** is unchecked
- **Include graphics in Open programmable controller download —** you can increase download speed by unchecking **Include graphics in Open programmable controller download**. If you are not changing the graphics, you may not want to include them in every download in order to save time.

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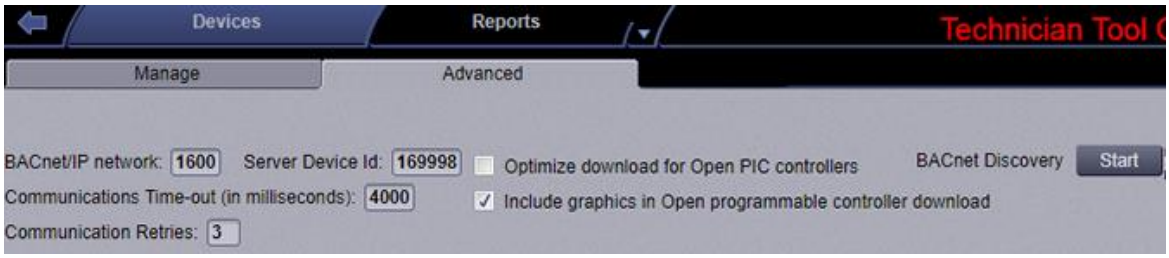
- **BACnet Discovery —** locates all accessible BACnet networks, BACnet devices, and BACnet objects on a BACnet network. Typically used to integrate BACnet third-party devices into the Field Assistant system. See *To discover third-party BACnet networks, devices, and objects* (page 19).



Router level
Select the router in the navigation tree and go to **Devices** > **Advanced** tab.

- **Router to Arcnet network** and **Auto-Assign**
- **Router to MS/TP network** and **Auto-Assign**
- **Device Identifier**

NOTE **Auto-Assign** is disabled when multiple networks are using the same **Port**.

Set up third-party integration

You can integrate third-party devices into a Field Assistant system if the following are true:

- The third-party devices are physically connected on the Field Assistant system's network.
- You have a Carrier® controller that supports third-party integration.
- You have the correct Carrier® driver for the third-party protocol.
- You have enabled a port for a third-party protocol on the Carrier® controller's driver page.

To read from or write to a third-party device, you need the following information from the third-party vendor:

- Protocol
- Third-party device's network address
- Memory location of the object in the device you want to read from or write to

If you are integrating with BACnet devices, you can use the Field Assistant *BACnet Discovery* (page 19) feature to gather this information.

Before you begin a third-party integration, study the Carrier® controller's *Installation and Start-up Guides* and the third-party protocol's *Integration Guide*. Both are available on the Carrier® website.

NOTE The point allowance of the i-Vu® Open Link that provides third-party points applies to only itself. For example, if you download control programs that use 125 third-party Network I/O points, you cannot apply the unused 125 points to a different router.

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To discover third party BACnet networks, devices, and objects

The Field Assistant **BACnet Discovery** feature locates all accessible BACnet networks, BACnet devices, and BACnet objects (including devices in your Field Assistant system) on a BACnet network. The information gathered in this process is typically used to integrate third-party BACnet devices and their BACnet objects into the Field Assistant system.

To use **BACnet Discovery**:

1. Select the **System** in the navigation tree and then the **Devices** page > **Advanced** tab.
2. Click the **BACnet Discovery Start** button to discover BACnet sites for the system. An item called **Discovered Networks** appears in the tree. After all sites are found, close the status dialog box.
3. To discover BACnet networks, select **Discovered Networks**, then click **Go**. A list of all BACnet networks appears in the navigation tree. After all networks are found, close the status dialog box.

   TIP Run a commstat manual command to determine which device routes to each network. The **BACnet Bind Show Network** section of the Commstat window shows the IP address of the router to each network.
4. To discover BACnet devices on a network, select a network in the navigation tree, then click **Go**. After all devices are found, close the status dialog box. Click beside an item to expand the list of devices.
5. To discover BACnet objects on a device, select the device on the navigation tree, then click **Go**. After all objects are found, close the status dialog box. A list of all BACnet objects in this device appears on the navigation tree.

   TIP Make sure you are discovering objects in the correct device. It may take some time to discover objects in devices with more than 100 objects.
6. Optional: Do the following to export the BACnet information so that it can be used in the Snap application:
   a) On the navigation tree, select a discovered network with devices or a single device.
   b) Click **Export**.
   c) Name and save the .discovery file in any folder.

NOTES

- Some third-party BACnet devices may not be discovered because they do not support the BACnet methods required for auto discovery.
- If the discovery process returns ambiguous information, such as multiple points with similar names, contact the third-party manufacturer's representative for clarification.
- Device configuration or network load can prevent the Field Assistant interface from showing all BACnet devices. If you do not see a BACnet device that you expect to see, check the system's BBMD configurations. If the configurations are correct, try the discovery process again.

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Working with equipment in the interface

You can view and adjust equipment operation from the following pages:

Devices pages

Select the system on the navigation tree to view the Devices page, where you can:

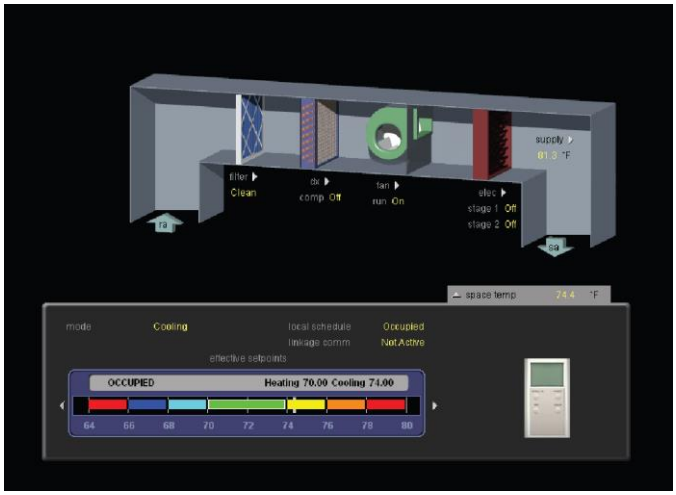
- Upload source files or just parameters
- Download source files, schedules, parameters, or BBMD tables
- Check status and error messages
- View model, IP address, drivers, device ID
- Edit device names

Graphics *pages* (page 51)

You can view and adjust your essential building controls on most Graphics pages.

Graphics show the current status of mechanical equipment and may include an adjustable setpoint control or other editable properties

To upload a graphic from ViewBuilder, double-click the controller in the navigation tree or right-click and select **Configure**.



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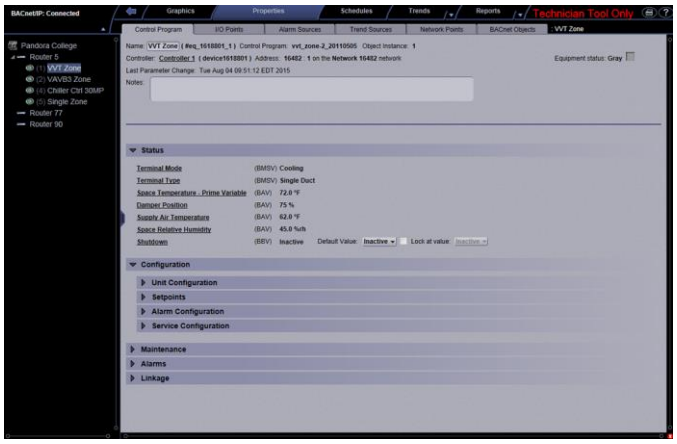
Properties *pages* (page 55)

Each piece of equipment and each microblock has a Properties page. You can view and adjust more equipment properties on a Properties page than on its corresponding Graphics page. Each microblock has a Properties page, or pop-up.



Logic *pages* (page 61)

Logic pages show the control program for a piece of equipment. Use the sequence of control and yellow status values on the Logic pages for troubleshooting your mechanical equipment.

Properties/Microblock popups

To open a microblock pop-up where you can view and change properties:

- Click a microblock on a Logic page
- Click the bold, underlined microblock name on a Properties page
- Right-click a value and then select **Detail**

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Working with control programs in the Field Assistant interface

The source files given to you by your manufacturer or representative could contain new control programs. You might revise or create a new one in the Snap application.

You can use the Field Assistant interface to:

- **Edit Existing** - Downloads programmable controller files to your computer to edit in Snap or EquipmentBuilder
- **Add New** - Obtains files for the Field Assistant application to add to a controller or to replace an existing control program
- **Delete Unused** - Deletes unused control programs
- **Update** - Changes the control program, view, driver, and screen files to use the current SAL library version. See Update the SAL library for complete instructions.
- **Reload a revised control program** - place the control program in the <system_name>**\programs** folder. On the Field Assistant navigation tree, right-click the equipment, then select **Reload Control Program**. Reloading updates all instances of a control program throughout the system and marks the controller(s) for download. Field Assistant determines the appropriate *download option* (page 30) based on what changed in the control program.

You can use EquipmentBuilder or Snap to create your control programs (.equipment files).

- EquipmentBuilder can also produce a graphic (.view file), screen file, and a sequence of operation, based on the equipment options you select.
- If using Snap, you must create your graphics separately in ViewBuilder. See Snap Help for detailed instructions on creating a custom control program.

After creating your control program, load it into the Field Assistant application and download it into the controller. See *Add or delete a custom control program* (page 23).

NOTE If you change a control program in the Snap application and it does not display correctly in the Field Assistant interface, **Ctrl+right-click** the Field Assistant action pane, and then select **Refresh**.

To edit a control program

You cannot edit a PIC control program in the Snap application.

To obtain the control program to be edited

1. On the Field Assistant navigation tree, double-click the equipment, or right-click and select **Configure**.
2. In the **General** tab, next to the **Control Program** drop-down list, click **Edit File** to download the file.

Edit the control program in the Snap application. See Snap Help for more information.

CAUTION Be sure to save it with a different name.

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To put the edited control program back in your database

1 On the Field Assistant navigation tree, double-click the equipment, or right-click and select **Configure**.

2 Click **Add New Equipment**.

3 If other equipment in the system uses the current control program, select which equipment you want to change:

- Change this control program only
- Change for all control programs of this type on this network only
- Change for all control programs of this type

4 Click **Add New** and browse to select the control program.

5 Click **Continue**.

6 Click **Save**.

To download the edited control program to your controller(s)

Click Download. See *Downloading to controllers* (page 30).

Add or delete a custom control program and graphic

To save time when testing custom control programs, you can use **DEBUG MODE** (page 85) in the Field Assistant interface for one controller at a time.

CAUTION Never leave your Field Assistant system without unchecking DEBUG MODE first and then downloading all content. The source files are not in the controller until you complete both steps.

To add a new control program to a programmable controller

1 Select the router in the navigation tree.

2 Select **Devices** > **Manage** tab.

3 Select the controller in the list on the page.

4 If you are adding a new control program, click the **Add Control Program** button Add Control Program. A dialog window appears.

5 Enter a name for your control program in **Name** and select your controller in the **Controller** drop-down list.

NOTES

- If you already have the maximum number of control programs for a controller, it will not appear in the list.
- Optional: You can change the control program's **Reference Name** if needed.

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6 Do one of the following:

If the control program is...	
In the **Control Program** drop-down list	a. Select the control program. b. If other equipment in the system uses the current control program, select which equipment you want to change: • Change this control program only • Change for all control programs of this type on this network only • Change for all control programs of this type c. Click **Save**.
Not in the **Control Program** drop-down list	a. Click **Add New Equipment**. b. If other equipment in the system uses the current control program, select which equipment you want to change: • Change this control program only • Change for all control programs of this type on this network only • Change for all control programs of this type c. Click **Add New** and browse to select the control program. d. Click **Continue**. e. Click **Save**.

7 To upload a graphic, do one of the following:

If the graphic is...	
In the **Views Available** list	a. Select the graphic, then click **Attach**. b. If the system has other control programs of this type, select which control programs you want to change: • Change for this control program only • Change for all control programs of this type on this network only • Change for all control programs of this type c. Click **Save**.
Not in the **Views Available** list	a. Click **Add New Equipment**. b. If the system has other control programs of this type, select which control programs you want to change: • Change for this control program only • Change for all control programs of this type on this network only • Change for all control programs of this type c. Browse to select the view file. d. Click **Continue**. e. Click **Save**.

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8 Right-click on the programmable controller in the controller list and select **Check Status** from the list. The status of the controller should say **File Mismatch**.

9 In the **Download** drop-down list, select **All Content**, then click the **Download** button. See *Downloading to controllers* (page 30).

NOTE If you need to edit the **Object Instance**, right-click the control program in the navigation tree and then select **Configure**. Click next to the field for additional information.

To delete a single control program in a programmable controller

1 Select the router in the navigation tree.

2 Right-click the the desired controller/control program in the list on the **Devices** page > **Manage** tab and click **Delete Selected** from the list.

3 The message appears **Do you wish to remove a controller and all its descendants?** Click **OK**.

IMPORTANT! The process is not finished until you complete the following steps.

4 Highlight the programmable controller in the controller list again, and select **Check Status**. The status of the controller should say **File Mismatch**.

5 Click **File Mismatch** and click the **Download** button. This deletes the files from the controller.

To delete all control programs in a programmable controller

1 Select the router in the navigation tree.

2 Right-click the desired controller/control program in the list on the **Devices** page > **Manage** tab and select **Delete Programs**. Click **OK** when the following message appears **This will delete all programs in this controller. Are you sure?**

IMPORTANT! The process is not finished until you complete the following steps.

3 Highlight the programmable controller in the controller list again, and select **Check Status**. The status of the controller should say **File Mismatch**.

4 Click **File Mismatch** and click the **Download** button. This deletes the files from the controller.

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Working with drivers in the Field Assistant interface

You can make the following changes to a driver in the Field Assistant interface.

- Change or upgrade a driver for controllers. See topic below.
- Routers only:

  Reload a driver if it becomes corrupt (for example, a driver page is missing). On the Field Assistant navigation tree, right-click the router or driver, then select **Reload Driver**. Reloading updates all instances of the driver throughout the system and marks the router for an All Content download. Changes you made on the driver pages in Field Assistant remain in effect.

After you make these changes, you must download all content to the affected devices. See *Downloading to Controllers* (page 30).

To change or upgrade a driver

1. On the Field Assistant navigation tree, right-click the controller, then select **Driver Properties.**
2. Select **Properties** tab > **Update** tab > **General** tab.
3. Choose a driver in the **Driver** drop-list, then click **Save**. If the driver is not in the drop-list, see the steps below.
   a) Go to the **Add New Driver** tab.
   b) If other controllers in the system use this driver, select which controllers you want to change:
      - This controller only
      - All controllers on this network that use the current driver version
      - All controllers in the system that use the current driver version
   c) Click **Add New** and browse to select a driver. Then click **Continue**.
   d) Click **Save**.
4. *Download All Content* (page 30) to the controller.

NOTES

- In the **Add New Driver** tab, check **Stage driver in controller** to stage the driver to the controller before installing it. Use this option to avoid interrupting controller function when installing the driver.
- In the **Add New Driver** tab, click **Delete Unused** to delete all unused drivers in <system_name>**drivers**.

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Working with screen files in the Field Assistant interface

To use an Equipment or System Touch, or BAC*view*®, to view or edit a controller's property values, you must download a screen file (.touch, .bacview, .S37, or.kpd) to the controller.

To select a different screen file

1. On the Field Assistant navigation tree, double-click the controller, or right-click the controller and select **Configure**.
2. On the **General** tab, locate the **Screen File** drop-down list and do one of the following:

If the screen file is...	
In the **Screen file** drop-down list	a. If other controllers in the system use the current screen file, select which controllers you want to change: ○ This controller only ○ All controllers on this network that use the same screen file ○ All controllers in the system that use same screen file b. Select the file. c. Click **Save**.
Not in the **Screen file** drop-down list	a. Click **Add New Screen File**. b. If other controllers in the system use the current screen file, select which controllers you want to change: ○ This controller only ○ All controllers on this network that use the same screen file ○ All controllers in the system that use same screen file c. Browse to select the screen file. d. Click **Continue**.

3. Optional: To delete unused screen files, go to the **Add New Screen File** tab and click **Delete Unused**. This deletes all unused screen files in <system_name>**views** and <system_name>**programs**.
4. Download all content to the controller. See *Downloading to controllers* (page 30).

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To edit a screen file

You can obtain a screen file from the Field Assistant application, edit it, and then replace it in your Field Assistant application.

To obtain the screen file for editing

1 On the Field Assistant navigation tree, double-click the controller that uses the screen file, or right-click and select **Configure**.

2 In the **General** tab, next to the **Screen File** drop-down list, click **Edit File** to download the file.

To put the edited file back in the Field Assistant system

1 On the Field Assistant navigation tree, double-click the controller that uses the screen file, or right-click and select **Configure**.

2 Click **Add New Screen File**.

3 If other controllers in the system use the current screen file, select which controllers you want to change:

- This controller only
- All controllers on this network that use the same screen file
- All controllers in the system that use same screen file

4 Click **Add New** and browse to select the screen file.

5 Click **Continue**.

BACnet device tools and services

The tools and services described below let you control or troubleshoot BACnet devices. To access the tools and services, click on the BACnet router on the Field Assistant navigation tree, then click **Properties**.

Tool	Description
Module Status	Generates a Modstat report. See *Using a Modstat to troubleshoot your system* (page 87).
Show Bindings	Displays all Device IDs that the BACnet device communicates with and the network address of each device.

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BACnet device services

Although the following BACnet device services can be used for Carrier® controllers, you should not need to use them for this purpose. Their primary target is a third-party device that supports these services.

Service	Description
Time Sync	Sends the site's local time to the BACnet device.
UTC Time Sync	Sends the Coordinated Universal Time (UTC) to the BACnet device. The device must be able to convert the time to its local time zone. **NOTE** Some devices support only one of the above time sync services.
Backup, **Restore**, and **Abort**	Executes a BACnet Backup or BACnet Restore service as defined by the BACnet standards. A message appears when the backup or restore is complete. Click **Abort** to stop a **Backup** or **Restore**. **NOTE** These services are vendor-specific and should be used with caution. A failed restore could make a device inoperable. Before using these on a device running in a live system, test them on the device during installation.
BACnet Password	Applies to **Backup**, **Restore**, **Warmstart**, and **Coldstart**. Enter your BACnet password if required by the BACnet device. This password is typically defined in a third-party tool.
Warmstart or **Coldstart**	Restarts the BACnet device. For a third-party device, see the manufacturer's documentation to determine the difference between these 2 services. For Carrier® controllers, these services are the same. These services will cycle the controller's outputs.
DCC	Use to stop or start the BACnet device's communication. Select one of the following options in the droplist, then click **DCC**. **Enable** — Starts the device's communication. **Disable** — Stops the device's communication for the amount of time that you enter in the **Timeout** field. See **NOTE** below. **Disable Initiation** — Stops the device from initiating communication for the amount of time that you enter in the **Timeout** field. See **NOTE** below. The device will continue to respond to communications from other devices. **NOTE** Type `-1` in the **Timeout** field to disable communication indefinitely. Normal communication will resume only when the device receives an **Enable** command.
Event Info	Displays detailed information about the objects that are currently in alarm.
Event Summary	Displays summary information about the objects that are currently in alarm.

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Downloading to controllers

If you make any of the following changes, you must download the new data from the Field Assistant application to the affected controllers.

In the Field Assistant interface	• Change or reload a control program • Change or reload a driver • Change a schedule • Change a BAC*view*® or touchscreen file

The Field Assistant application automatically marks the affected controllers as requiring a download. You can download these controllers from the the **Devices** (page 31) page or the **Properties** (page 32) page for the controller, the equipment, or a microblock.

When the Field Assistant application marks a controller for download, it determines what information needs to be downloaded based on the type of information that changed. See *Download Options* (page 30).

By default, Full Source files are downloaded to i-Vu® PIC controllers because **Optimize download for Open PIC controllers** is unchecked on the **Devices** > **Advanced** tab (from the System in the navigation tree). Check this option if you do not want Full Source downloaded.

CAUTION If you want this option checked and purposely had it checked in your previous system, it is automatically unchecked after upgrading and you must check it again.

NOTE A property change in the Field Assistant interface is automatically downloaded to the controller.

Download Options

When Field Assistant marks a controller for download, it determines what information needs to be downloaded based on the type of information that changed. Below are the options that can be downloaded.

This option...	Downloads...
All Content	• Control programs • Graphics • Drivers • Screen files • Parameters • Schedules **NOTE** An **All Content** download also: Synchronizes the controller's time to Field Assistant • Overwrites trends in the controller • Restarts the controller
Only Schedules	All schedules that are not set for automatic download

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This option...	Downloads...
Only Parameters	All editable properties
Only BBMDs	BBMD tables (.bdt file) that you have updated but have not yet written to the controller

NOTE An **All Content** download clears trend, history, and alarm data from the affected controllers.

To upload or download parameters only

This option uploads all editable properties from the device, but not the source files. If you edit the properties on a controller that is not physically connected to the computer, you will have to either upload or download parameters when you connect again. Upload to get what is in the controller into Field Assistant or download to send your changes in Field Assistant to the controller.

To download from the Devices page

The System **Devices** page > **Manage** tab shows all of the routers that Field Assistant marked for download.

A router's **Devices** page > **Manage** tab shows any controller or control programs that are under that router that Field Assistant marked for download.

To download:

1. On the navigation tree, select the System or a router.
2. On the **Devices** > **Manage** tab, view the list that Field Assistant marked for download and select them.

   NOTE Use Ctrl+click, Shift+click, or the **Select All** checkbox to select multiple controllers.
3. Click **Download**. A message appears **This will download programs and other content for the entire controller and restart it. Are you sure you want to do this?**
4. Click **OK**.
5. Repeat for each router.

NOTES

- Active uploads and downloads cannot be stopped.
- Icons in the **Status** column indicate the following:

	Active—Field Assistant is uploading to the controller.
	Active—Field Assistant is downloading to the controller.
	Pending—You initiated the download, and the controller is waiting for its turn to download.
	Failed—The download failed. See *If a controller fails to download* (page 32).
	On Hold—Indicates you clicked **Hold** to stop a pending download.

Click in the upper left-hand corner to view a log of download activity in the current session. **Copy to Clipboard** lets you copy the text to paste it into another application.

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To download from a Properties page

If a controller requires a download, a red download message and a **Download** button appear at the top of the **Properties** page for the controller, the equipment, or a microblock. Click the button to start the download.

Downloading from the **Properties** page downloads **All Content** to the controller.

If a controller fails to download

A controller that fails to download appears on the **Devices** page > **Manage** tab with this icon .

1. Review the reason for the failure:
   - Hold your cursor over the failed task to see hover text giving the reason.
   - Click or in the upper left corner of the page to see information on all failed downloads. **Copy to Clipboard** lets you copy the text to paste it into another application.
2. Correct the problem that caused the failure.
3. On the navigation tree, select the System or a router, then click **Devices**.
4. Select the controller that you want to download.

   NOTE You must be connected to the controller to download.

Checking controller status

On the Field Assistant navigation tree, you can select the System to view the following for your routers or select the router to see the the following for controllers, then click **Devices** to:

- *View the status of the devices* (page 33)
- On the **Manage** tab, you can view information such as address and model. On the **Advanced** tab, you can view the driver and device ID.
- *Download or upload to resolve a mismatch* (page 35)

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Status messages

On the **Devices** page > **Manage** tab, the **Status** column shows a description of the current state. Hold your cursor over the **Status** description to see hover text with a more detailed description. If multiple conditions exist, Field Assistant displays the message with the highest priority.

To see the Status messages:

- On the Field Assistant navigation tree, select the System to view the status of routers.
- On the Field Assistant navigation tree, select a router to view the status of its controllers.

The table below shows all possible messages. The message color indicates the following:

Black—In process
Red—An error occurred
Blue—Requires action from the user

Status column message	Hover text message	Notes
Black messages:		
Downloading	The controller is downloading, communications may be disabled	
Uploading	The controller is uploading, communications may be disabled	
Pending	This controller is waiting to be processed.	
Red messages:		
Communications Error	Cannot communicate with this controller.	
Connection Disabled	The connection for this controller has been disabled.	Occurs if someone stopped the connection.
Connection Error	The connection for this controller failed to start.	Occurs if the connection is misconfigured or failed to start.
Controller Disabled	This controller has been disabled.	
Controller offline	The controller is offline.	
Download Failed	(Message depends on the cause of the failure.)	
Download Not Permitted	This controller is not permitted to download.	
Error	An unknown error has occurred.	
Missing Files	Upload failed. Server is missing source files.	
Not Uploadable	This controller is not configured for content upload.	Occurs if you attempt to upload a controller with a pre-4.x driver.

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Status column message	Hover text message	Notes
Out of Service	This controller is out of service.	**Out of Service** is checked on the controller's Properties page.
Unsupported Controller	This controller does not support content upload.	
Upload Not Permitted	This controller is not permitted to upload.	
Blue messages:		
Controller Replaced	This controller has been replaced by another controller of the same type in the field.	
Download All Content	Please download all content to the controller.	
Download Parameters	To download parameters, highlight row and select "Only Parameters" from the Download Action menu and click "Download"	
Download Schedule	To download schedules, highlight row and select "Only Schedules" from the Download Action menu and click "Download".	
Driver Parameter Mismatch	Driver parameter differences detected. Upload parameters from the controller or download parameters to the controller.	
Network Ready to Find Devices	To upload this network, select the router in the tree and click Find Devices button.	
Parameter Mismatch	Control Program parameter differences detected. Upload parameters from the controller or download parameters to the controller.	See *Handling parameter mismatches* (page 35).
Program Mismatch	Content differences detected. Upload all content from the controller or download all content to the controller.	
Unprogrammed Controller	This is a programmable controller. To add control programs, click **Add Control Program**.	
Upload All Content	Please upload all content from the controller.	
General messages:		
✓	This controller is ok.	
Cancelled	The last operation on this controller was cancelled	

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Handling parameter mismatches

A parameter mismatch occurs when a value in a controller does not match the value in the system database. This can be a driver or control program value.

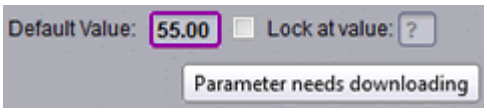
To find mismatches in your system

You can find mismatches in the following places:

- The **Devices** page > **Manage** tab > **Status** column will show **Parameter Mismatch.**
- The **Properties** page for a controller, driver, control program, or point will show one of the following red messages at the top of the page stating:

  Control Program parameter differences detected.
  Driver parameter differences detected.
  Parameter download required.

  The value that has a discrepancy will appear with a purple box around it. Hover your cursor over the field to see:

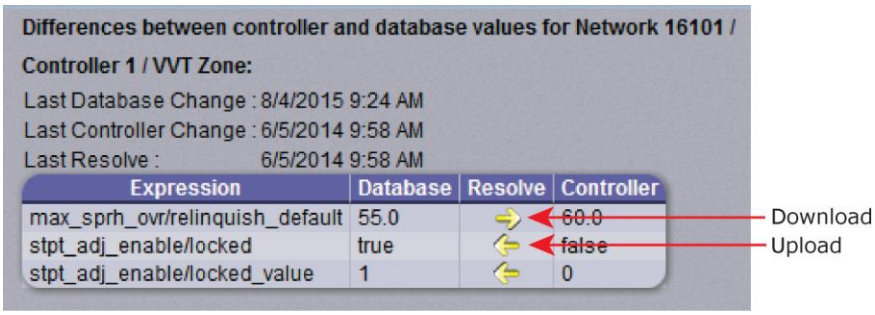


or

To resolve a mismatch

1 Go to one of the following:
   - **Devices** page - Click the **Parameter Mismatch** link
   - **Properties** page that shows one of the red messages above

2 Click one of the following:
   - **Resolve** to let the Field Assistant application download changes made in the Field Assistant interface or upload changes made in the controller. Click the **Details** button to see what the discrepancy is and whether **Resolve** will download or upload parameters. See NOTE below.



   - **Upload** to upload the parameters from the controller to the Field Assistant application
   - **Download** to download the parameters from the Field Assistant application to the controller

NOTE On the **Devices** page with **Show Control Programs** unchecked, if a controller has simultaneous mismatches in the driver and control program, clicking **Details** will show that a control program mismatch exists but it will only show details for the driver mismatch. You must go to the control program in the tree to see details of that mismatch. However, clicking **Resolve** will resolve both mismatches.

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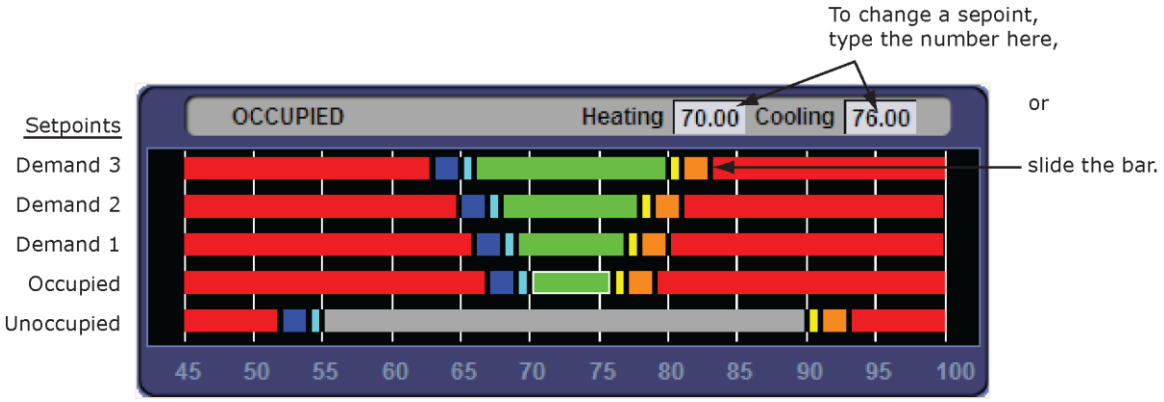
Managing setpoints

The **Setpoint** graphic shown on a standard equipment graphic indicates the base setpoint values (Occupied High/Low, Unoccupied High/Low). The Field Assistant application reads these values back periodically, typically within 10 seconds. The timing can vary based on network traffic, the number of controllers in the database, and several other variables. Setpoints that are changed in the field via another user interface are displayed in the Field Assistant interface as soon as they are detected.

You can, at any time, change the setpoints from Field Assistant graphics by using the slider or by entering numeric values directly. Updated setpoints are transmitted to the controller when you **Accept** the changes. Setpoints can also be changed on the **Properties** page > **Control Program** tab > **Space Temperature and Setpoints**. or **Configuration** > **Setpoints**.

The various color bars indicate adherence to or deviation from the setpoint. You can change the current default settings for setpoint deviation. Select a color band on the setpoint graph to see the current setpoints in the **Heating** and **Cooling** fields. The values in this graphic are Fahrenheit. See setpoint descriptions below.

NOTE This graphic is an example only. Your setpoints may differ.



Color		Condition
	Green	Temperature is within the Occupied Low and High Setpoint
	Gray	Temperature is within the Unoccupied Low and High Setpoint
	Light Blue	Temperature is less than 2°F below the Occupied Low Setpoint
	Dark Blue	Temperature is more than 2°F below the effective Low Setpoint but less than 4°F below the effective Low Setpoint
	Yellow	Temperature is less than 2°F above the effective High Setpoint
	Orange	Temperature is more than 2°F above the effective High Setpoint but less than 4°F above the effective High Setpoint
	Red	Temperature is more than 4°F above or below the effective setpoints

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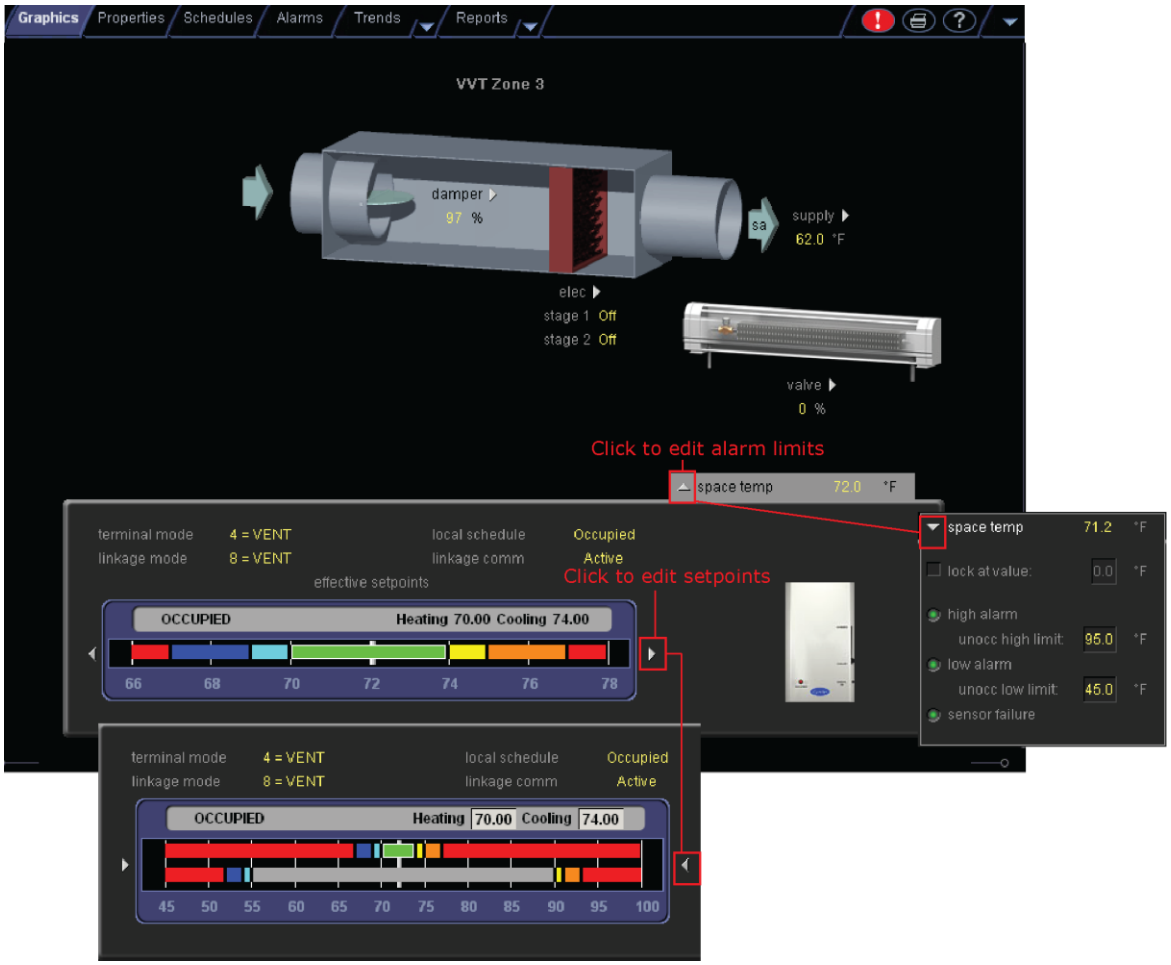

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Adjust setpoints

- **Programmed setpoints** are set and changed by operators.
- **Effective setpoints** reflect the impact of other system conditions on the programmed setpoints, such as setpoint adjustments, and hysteresis. Effective setpoints control the equipment.

To change programmed setpoints:

1. Navigate to a setpoint control in one of the following places:
   - **Properties** page > **Control Program** tab > **Configuration** > **Setpoints**
   - The setpoint microblock pop-up on a **Logic** page
   - A **Graphics** page (Click a setpoint trend graph control to access the editable setpoint bar.)
2. Make changes on a programmed setpoint bar by either:
   - Clicking and dragging the segment or the gap between segments
   - Typing new values in the **Heating** and **Cooling** fields
3. Click **Accept**.

Demand Control

Demand Control is a cost-saving strategy that saves energy while maintaining comfort in the following ways:

- Controlling energy use to avoid peak demand, ratchet, or time of use utility charges
- Maintaining ventilation at relaxed setpoints rather than shutting down equipment (as with load shedding or duty cycling)

Before you can use Demand Control effectively, you must:

- Obtain details regarding past energy usage and peak demand, ratchet, and time of use charges from your energy provider.
- Understand the demand profiles of the zones you are controlling.

Demand Control can be customized at the zone level. For example, you may relax the setpoints in some zones, like break rooms and closets, by a few degrees, but you may not want to relax setpoints in computer rooms at all.

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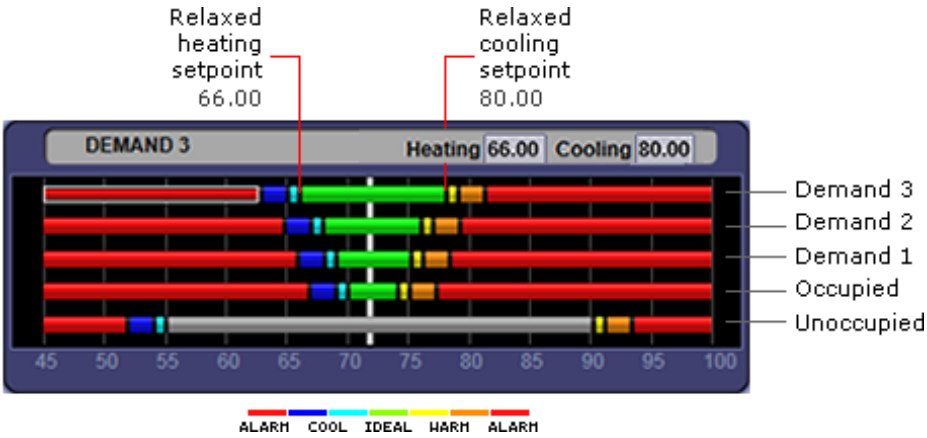


To define Demand Control properties

1 On the navigation tree, select the electric meter.

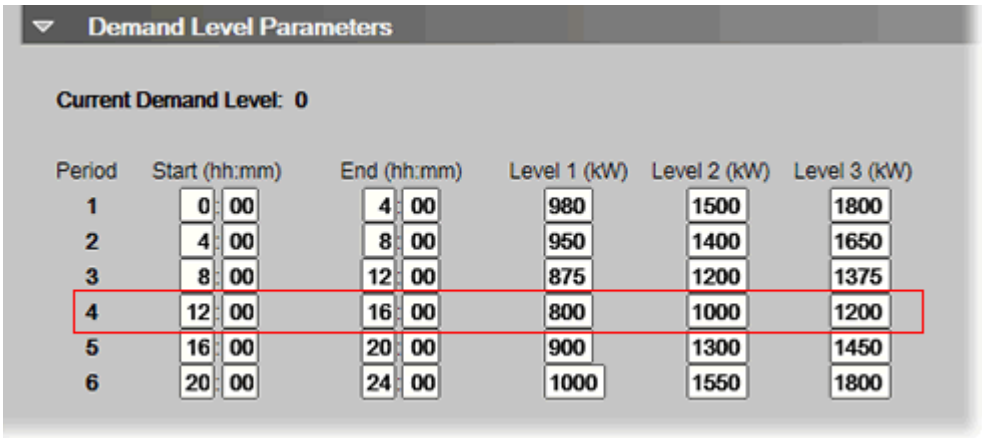
2 Select **Properties** > **Control Program** and expand the **Demand Level Parameters** section.

3 Type the **Start** and **End** time to define the time period that you want demand control to be in effect for this zone.

4 Type kilowatts per hour (kW/hr) in the **Level** columns to define the amount of power that the demand must exceed before the Field Assistant system calls for a higher demand level.

NOTE Levels are defined in the electric meter control program in the Snap application. You can test the Demand Levels by locking the meter to a value.

In the example below, during Period 4, defined as 12:00 (noon) to 16:00 (4:00 p.m.), if the demand exceeds 800 kW/hr, the Field Assistant system uses Demand Level 1 setpoints. If the demand exceeds 1000 kW/hr, the Field Assistant system uses Demand Level 2 level setpoints and so on.



Period	Start (hh:mm)	End (hh:mm)	Level 1 (kW)	Level 2 (kW)	Level 3 (kW)
1	0:00	4:00	980	1500	1800
2	4:00	8:00	950	1400	1650
3	8:00	12:00	875	1200	1375
4	12:00	16:00	800	1000	1200
5	16:00	20:00	900	1300	1450
6	20:00	24:00	1000	1550	1800

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Configuring Optimal Start

Enable and configure Optimal Start on the **Properties** page > **Control Program** tab > **Configuration** > **Setpoints**. Your control program could be configured for **Optimal Start** or for both **Optimal Start** and **Optimal Start Type**.

NOTES

- The **Optimal Start** options depend on the revision date of the control program in your controller.
- Optimal Start is automatically disabled when **Properties** > **Control Program** > **Maintenance** > **Occupancy** > **BAS On/Off** is set to either **Unoccupied** or **Occupied**.

Optimal Start

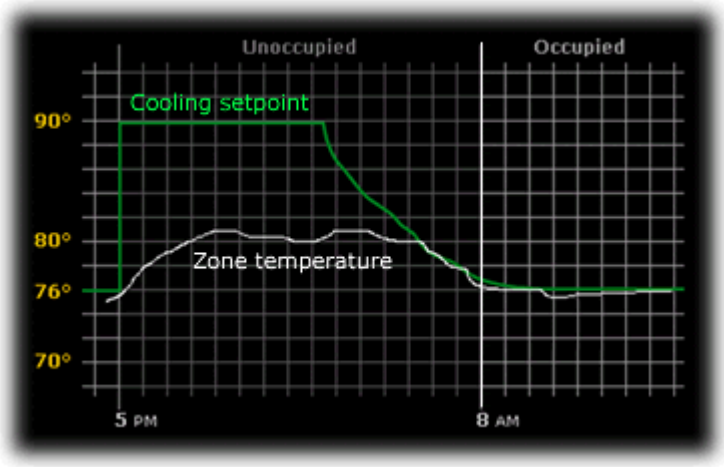
Optimal Start adjusts the effective setpoints to achieve the occupied setpoints by the time scheduled occupancy begins.The Optimal Start recovery period may begin as early as 4 hours prior to occupancy. The algorithm works by moving the unoccupied setpoints toward the occupied setpoints. The rate at which the setpoints move is based on the outside air temperature, design temperatures, and capacities.

The following conditions must be true for optimal start to operate:

- On the **Properties** page > **Control Program** tab > **Configuration** > **Setpoints** > **Optimal Start**, the **Default Value** must be set greater than **0** and less than or equal to **4** (**0.00** disables **Optimal Start**).
- The system is unoccupied

NOTE If the Open controller does not have a valid outside air temperature, then a constant of 65° F is used. This value is not adjustable.

The actual equation that the controller uses to calculate **Optimal Start** is nonlinear. An approximation of the result is shown below.



To change **Optimal Start** settings:

1 In the navigation tree, select the equipment that you want to change.

2 Select **Properties** page > **Control Program** tab > **Configuration** > **Setpoints**.

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Optimal Start Type

If you have **Optimal Start Type**, you must choose from the following:

- **None**
- **Temperature Compensated Optimal Start**
- **Learned Adaptive Optimal Start**

To select the method used to change from unoccupied to occupied setpoints:

1. In the navigation tree, select the equipment that you want to change.
2. Click **Properties** page > **Control Program** tab > **Configuration** > **Setpoints**.
3. Select option from the **Optimal Start Type** drop-down list.
4. See below to make further adjustments.

None – The unit does not start to control to the occupied setpoints until the unit goes into an occupied mode. Setpoints do not ramp, but change immediately from unoccupied to occupied values. When you select **None**, you must set all Learning Adaptive Optimal Start transition factors, identified by their thermographic color, to 0. These are located directly above the **Effective Set Points** graph.

Temperature Compensated – The unit changes to occupied setpoints at some time prior to the occupied time, not to exceed the hours you set for **Optimal Start**. The start time is determined by the current error between space temperature and the appropriate heating or cooling setpoint. At that time, the setpoints do not ramp, but change immediately from unoccupied to occupied values. When selecting **Temperature Compensated**, you must set all Learning Adaptive Optimal Start transition factors, identified by their thermographic color, to 0. These are located directly above the **Effective Set Points** graph.

When selecting **Temp Compensated**, you can adjust the following:

- **Heat Start K factor (min/deg)** – If **Optimal Start Type** is **Temp Compensated**, this is the time in minutes per degree that the equipment starts before the occupied period when the space temperature is below the occupied heating setpoint (including any setpoint offset).
- **Cool Start K factor (min/deg)** – If **Optimal Start Type** is **Temp Compensated**, this is the time in minutes per degree that the equipment starts before the occupied period when the space temperature is above the occupied cooling setpoint (including any setpoint offset).

  NOTE The default value for the above is 15.00 and the range is 0 to 99.

Learning Adaptive Optimal Start – This function gradually adjusts the unoccupied setpoints over a specified period of time to achieve the occupied setpoint by the time scheduled occupancy begins. This learning adaptive algorithm uses the **learned heating capacity** and **learned cooling capacity** values to calculate the effective setpoints prior to the occupied start time. The algorithm calculates a learned cooling and heating capacity during the previous unoccupied time. Set the **Learning Adaptive Optimal Start** recovery period from 1 to 4 hours in **Optimal Start**. When the **Learning Adaptive Optimal Start** routine runs, adjustments are based on the color that is achieved when occupancy begins. Adjustment amounts are defined in the thermographic color fields located directly above the **Effective Setpoints** graph under **Setpoints**.

EXAMPLE The heating capacity for a zone is 5° per hour (default). When the zone becomes occupied, the zone temperature is 1° below the occupied setpoint, indicating a need for additional heat. Because the zone temperature was low by 1°, the learned heating capacity is decreased by the value entered in the **LtBlue** thermographic color field (0.0600 default). As a result, the learned heating capacity is adjusted to 4.94° for the next optimal start period. Since the algorithm has calculated that the equipment has less capacity to bring the temperature to setpoint within the configured recovery period, the setpoint adjustment begins sooner in the next unoccupied period.

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To change the adjustment values in the **Learning Adaptive Optimal Start** routine:

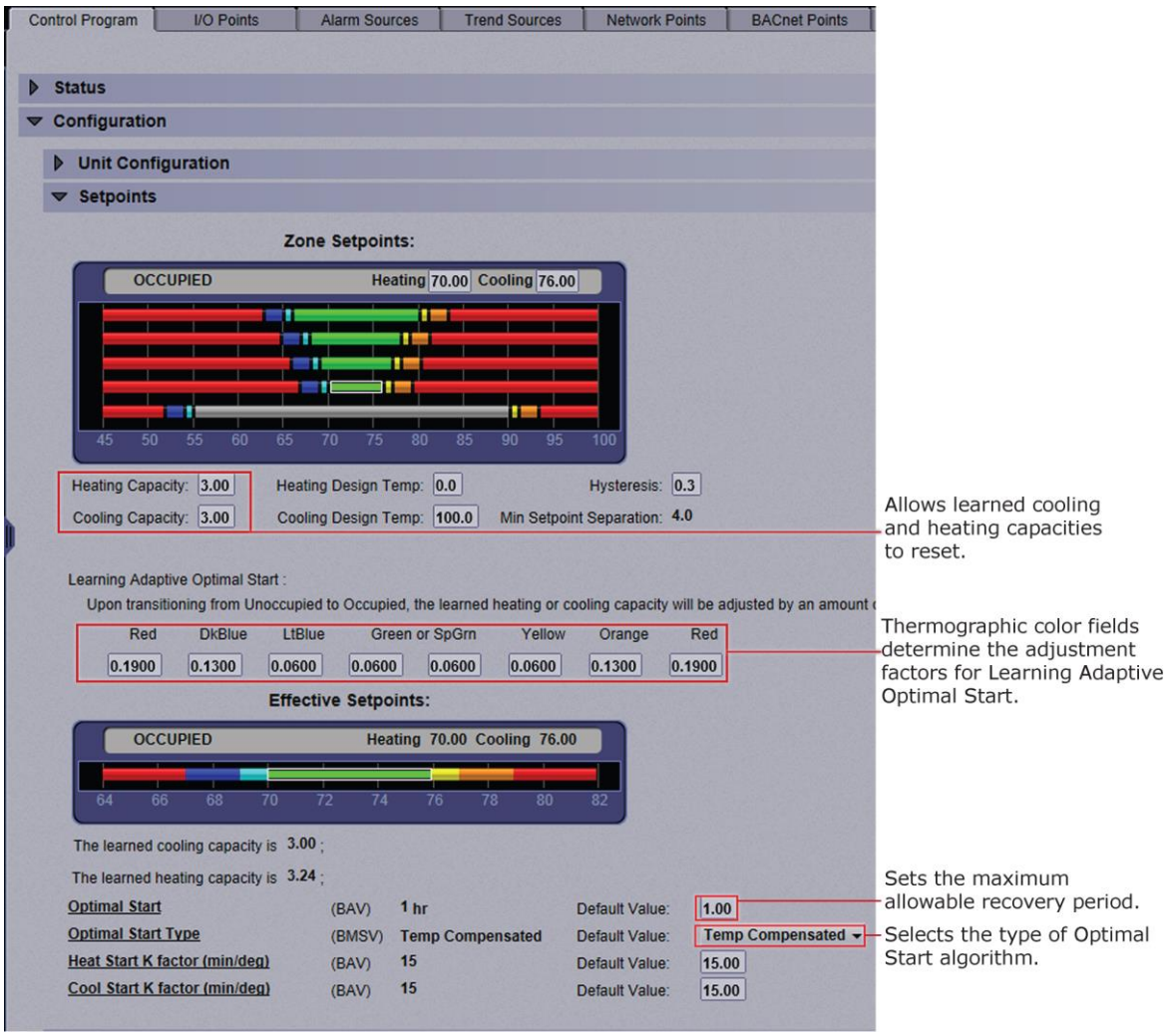
1 In the navigation tree, select the equipment that you want to change.

2 Click **Properties** page > **Control Program** tab > **Configuration** > **Setpoints**.

3 Adjust the color fields between the Zone Setpoints graph and the **Effective Setpoints** graph.

When you determine that no further start time optimization is required, you can disable **Heating** and **Cooling Capacity** adjustments by setting the color field values to 0.0.

You can reset the learned heating and cooling capacities by entering a value into either the **Heating Capacity** or **Cooling Capacity**, located beneath the **Zone Setpoints** graph.



CAUTION When using **Learning Adaptive Optimal Start**, be sure that all equipment is properly maintained so that your system does not “learn” to compensate for dirty filters or loose fan belts.

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Commissioning equipment

Follow the process below to commission system equipment.

Step 1: Check out point setup

1. On the Field Assistant navigation tree, select the piece of equipment you want to check out.
2. Click **Properties**.
3. View and change properties on the **I/O Points, Alarm Sources, Trend Sources, Network Points, BACnet Objects**, and **Rnet Points** tabs. See "Property descriptions" below. Tabs may or may not appear, depending on the control program.
4. Select **Checked Out**. This field is for your reference only.
5. Optional: Type Checkout Notes if desired. Notes remain in this field until an operator deletes them.
6. Optional: Click the **Reports** drop-down arrow, then select and run each of the following reports to verify your work:
   - **Equipment** > **Point List**
   - **Equipment** > **Network IO**
   - **Alarms** > **Alarm Sources**

TIP You can export the calibrated data so that you can import it into another control program. See *Optional: Import/export calibration data* (page 50).

Property descriptions

I/O Points

Name	Click the name to display the microblock pop-up. **NOTE** A red name indicates a fault condition where the point may be misconfigured. **EXAMPLE** No input/output number or a nonexistent input/output number.
Type	Type of Input or Output point. See *Point types* (page 57).
Value	The point's present value.
Offset	Allows for fine calibration of the present value of an analog point.
Polarity	Determines the point's binary normal polarity in the control program. **NOTE** Polarity is not the hardware normally open/normally closed position.
Locked	Select the checkbox to lock the present value at the value you specify.
Exp:Num	Expander numbers and input or output numbers associated with where the physical point wires, such as a sensor wire, are physically connected to a controller.
I/O Type	Selects the bank of physical inputs or outputs on the controller.

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Sensor	Selects how the physical input is mapped to the engineering units. **Min/Max** is used with the sensor type of linear to scale the input to engineering units. **NOTE** This field is ignored for sensor types other than linear. **EXAMPLE: AI** linear sensor type min -10 max 50 when input reads 100% the value is 50 50% 20 0% -10
Actuator	Selects how the present value in engineering units is mapped to the physical output. **Min/Max** is used with the actuator type of linear to scale the output from engineering units. **NOTE** This field is ignored for actuator types other than linear. **EXAMPLE: AO** linear sensor type min -10 max 50 when input reads 50 the output is 100% 20 50% -10 0%
Resolution	Amount by which the present value will change. **EXAMPLE** If a physical input changes by 1, but the resolution is set at 2, then the present value remains the same. If the input changes by 2, the present value will then change by 2.
Checked Out **Checkout Notes**	These fields are for your reference only.

Alarm Sources

Name	Click the name to display the microblock pop-up.
Type	Type of point that is an alarm source. See *Point types* (page 57).
Alarm	Shows **Alarm** in red if a current alarm exists.
Network Visible	Select to allow the microblock to be seen by the Field Assistant application and third-party BACnet controllers on the network.
Potential alarm source	Select to enable the microblock to generate alarms.
Alarm Enabled	**Alarm—**Select to generate an alarm when conditions exceed the limits set in the **Condition** column. **Return—**Select to generate a return-to-normal message when the alarm condition returns to a normal state. **Fault—**Select to have an alarm generated if the alarm source is not configured correctly. For example, a misconfigured channel number produces a no sensor fault.
Requires ack	**Alarm—**Select to require that the alarm be acknowledged. **Return—**Select to require that the return-to-normal message be acknowledged.
Critical	Select if the alarm is critical.

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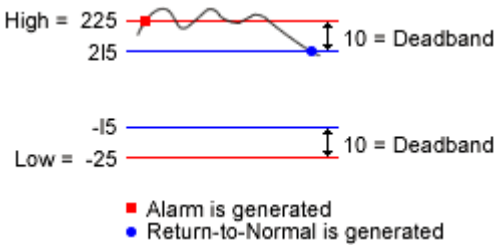
Category	You can change the alarm category assigned to the microblock.
Condition	An alarm will be generated if conditions exceed the low or high limits set. **Deadband**: The amount inside the normal range by which an alarm condition must return before a return-to-normal notification is generated. **EXAMPLE** 
Delay	Delay time in seconds for notification after an alarm is generated.

Trend Sources

Name	Click the name to display the microblock pop-up. **NOTE** A red name indicates a fault condition where the point may be misconfigured. **EXAMPLE** No input/output number or a nonexistent input/output number.
Type	The type of point being trended. See *Point types* (page 57).
Sample Interval	The interval or COV (Change of Value) increment that triggers the trend sample.

Network Points

Name	Click the name to display the microblock pop-up. **NOTE** A red name indicates a condition where the point may be misconfigured.
Type	Type of network point.
Value	The point's present value. **EXAMPLE** For a Maximum point type, Value is the maximum value of all the target BACnet object properties the point is communicating with.
Locked	Select the checkbox to lock the present value at the value you specify.
Default Value	The value that the control program will use as the point's value when communication with the target defined in the **Address** column is lost or communication is disabled.
Com Enabled	Select to enable this point's network communications. Disable this property for troubleshooting. **NOTE** Select **All** in the column header to quickly enable all points in the control program.

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COV Enable	Select to make: • A digital network output point write a value to the target defined in the **Address** column only when the value changes. • An analog network output point write a value only when the value changes by the specified increment.
Refresh Time (mm:ss)	The time interval at which the network point writes or retrieves the value to or from the target. For network output points, this time is used when COV is not enabled or when COV is enabled but fails. **NOTE** If COV fails and the Refresh Time is zero, the value is sent once per second.
Address	The address of the target BACnet object property or third-party value that the point communicates with. **NOTE** Click **Search/Replace** at the top of the **Address** column to have the Field Assistant application replace all instances of specific text in the addresses with different text. This is especially useful when copying a control program to use for multiple third-party devices.
Error	The error code and error if the point cannot communicate with the target.
Present Value	Current value of the target defined in the **Address** column.
Checked Out **Checkout Notes**	These fields are for your reference only. Notes typed in this field appear in the **Equipment Points List Report**.

BACnet Objects

Name	The name used in the Field Assistant interface for this object. Click the name to display the microblock pop-up. **NOTE** A red name indicates a condition where the point may be misconfigured.
Reference name	A unique identifier that allows the point to be referenced for used for graphics, source tree rules, or network links.
Type	The BACnet object type.
Present Value	The object's current value.
Locked	Check to lock the third-party object to a specific value.
Device	A device alias. See "To reuse a control program" in Device Alias in Microblock Reference.
Object Name	An alpha-numeric string that is unique within the third-party device.
Object ID	A combination of the object type and a unique instance number. The object ID must be unique within the device.
Address	The address of the third-party object that the microblock references.
Network Visible	Allows other BACnet equipment to read or change the microblock's present value. Must be enabled for this microblock to generate alarms.

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Rnet Points

This tab shows varying information for the different point types. Below are all possible properties that may appear on this tab and a list of the applicable points. The following list is arranged alphabetically.

Combination Algorithm	(Analog Sensed Values) The method used to combine the ZS sensors' values to determine the microblock's output value.
Default Value	(Analog Parameters, Binary Parameters, Multi-State Parameters) The value the control program uses until a user changes the value in the system interface.
Display Resolution	(Analog Sensed Values, Analog Statuses, Analog Parameters) Defines the resolution of the value to be displayed on the ZS sensor. For example, 1 displays only integers (example: 74) and 0.5 displays values to the nearest 0.5 (example: 74.5).
Edit Increment	(Analog Parameters) The amount that you want each press of the sensor's ▲ or ▼ button to change the microblock's value.
Editable	(Analog Parameters, Binary Parameters) When enabled, the microblock's value is editable on the ZS sensor.
Lock Present Value to	(Binary Parameters) Check to output the locked value from the microblock instead of the microblock's calculated value.
Maximum	(Analog Parameters) The highest amount that this value can be changed to on the ZS sensor or in the Field Assistant interface.
Menu Configuration	(All points) Shows which sensor screens display the value.
Minimum	(Analog Parameters) The lowest amount that this value can be changed to on the ZS sensor or in the Field Assistant interface.
Minimum off time	(Binary Parameters) The minimum period (seconds) that the microblock sends an off signal to the controller, regardless of the input signal to the microblock.
Minimum on time	(Binary Parameters) The minimum period (seconds) that the microblock sends an on signal to the controller, regardless of the input signal to the microblock.
Object Id	(All points) A combination of the object type and a unique instance number.
Object Name	(All points) A unique alphanumeric string that defines the BACnet object. Although the **Object Name** field can be edited, it is not recommended.
Reference name	(All points) A unique identifier that allows the point to be referenced for used for graphics, source tree rules, or network links.

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Rnet Tag	(All points) Defines what type of information this value represents and determines how the sensor will display the value. For example, for the Rnet Tag **Fan Status**, the sensor automatically displays on the Home screen when the microblock is active.
Show on sensors	(Analog Sensed Values) Defines whether the ZS sensors are to display their individual sensed values, or the value determined by the **Combination Algorithm**.
Type	(All points) Type of Input or Output point. See *Point types* (page 57).
Value	(All points) The point's present value.

Protocol Mapping

If a control program was built with Protocol Mapping information in Snap, this tab appears showing third-party protocol configuration information.

Step 2: Check controller to sensor wiring

PREREQUISITE On the Logic page, disable the run condition(s) in the control program to prevent control program execution from affecting output values while you check out the equipment.

Binary inputs (BI)

1. Short the binary inputs wires at the end device, for example, at a pump proof or fan proof.
2. On the **Properties** page **I/O Points** tab, verify the binary input point is closed.
3. Open the binary input at the end device.
4. Verify the binary input point is open on the **Properties** page.
5. Repeat for all binary inputs.

NOTE If the readings on the **Properties** page are reversed from actual conditions, the polarity (normally closed/normally open contact position) is set incorrectly.

Analog inputs (AI)

1. Verify the sensor type and the min/max values are configured correctly.
2. On the **Properties** page **I/O Points** tab, read the analog input value.
3. Short the point. The sensor should go to full range when shorted.
4. Calibrate analog input value by adjusting the calibration offset if needed.

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Binary outputs (BO)

1. If the controller's binary output is wired through an equipment starter, set the starter HOA switch to Automatic.
2. On the controller, set the binary output's HOA switch to On.
3. Verify that the controlled equipment has turned on.
4. On the controller, set the binary output's HOA switch to Automatic.
5. On the **Properties** page **I/O Points** tab, lock the binary output point to On.
6. Verify the device has turned on.
7. Unlock the binary output point.
8. On the controller, set the binary output's HOA switch to Automatic.

NOTE If the locked conditions on the **Properties** page are reversed from actual conditions, the polarity (normally closed/normally open contact position) is set incorrectly.

Analog outputs (AO)

1. Verify the output/actuator type and the min/max values are configured correctly.
2. Lock the analog output point to the device minimum output, such as 2 volts or 0%.
3. Verify movement of the end device to the desired position.
4. Lock the voltage output to the device maximum, such as 10 volts or 100%.
5. Verify movement of the end device to the desired position.
6. Unlock.

Step 3: Check equipment operation

Refer to the sequences of operation in the system specifications to verify that the equipment operates in each operational mode (for example, occupied and unoccupied) as specified.

TIP If needed, you can import calibration data that you exported from another control program. See *Optional: Import/export calibration data* (page 50).

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Optional: Import/export calibration data

You can export I/O point calibration data from a control program and import it into the same control program or another control program with the same I/O point configuration.

To export calibration data

1 On the Field Assistant navigation tree, select the control program whose data you want to export.

2 Scroll to the bottom of the **Properties** page **I/O Points** tab, and then click **Export**. The file **<control program name>_<ref name>.xml** is saved in your browser's **Downloads** folder.

To import calibration data

NOTE We recommend that you export existing data as a backup before you import new data.

1 On the Field Assistant navigation tree, select the control program that you want to import the data into.

2 Scroll to the bottom of the **Properties** page **I/O Points** tab, and then click **Import**.

3 Browse to the file you want to import.

4 Click **Continue**. A side-by-side comparison of existing data and the new import data will appear. Red text indicates one of the following errors:

- Duplicate data—Existing data has duplicate I/O numbers so that import cannot determine its match.
- I/O type mismatch—I/O Type in existing data does not match I/O Type in import data.
- Missing import data—Existing data has a point that import data does not have.
- Missing system data—Import data has a point that existing data does not have.

5 Click **OK** to complete the import. Existing data that does not show an error will be overwritten by the imported data.

Adjust airflow configuration for VAV or VVT controllers

To enter airflow parameters for a VAV Zone, VVT Zone or VVT Bypass controller, right-click on the controller in the navigation tree and select **Airflow Config** in the menu.

For more information, see the following microblock details.

- VAV Zone, VAV Zone II, Zone Ctrl, VAV Zone II Secondary Duct - Airflow Control
- VVT Zone, VVT Zone II - PD Airflow Control
- VVT Bypass, VVT Bypass II - BACnet Bypass Control

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Graphics pages

Field Assistant can upload and display multiple graphics (.views) that were downloaded to a controller. But Field Assistant can download only a single .view to the controller. If you edit one of the .views and download to the controller, you will only download the edited .view. Information for the other .views will be removed from the controller. You can reattach and redownload those .views from your i-Vu® system.

You can view and adjust your system from **Graphics** pages.

Some typical controls that may appear on a graphics page are:

- Button or switch to turn equipment on or off
- Input field to set a property value
- Drop-down list to select a state
- Interactive room sensor to override an unoccupied schedule
- Setpoint graph to adjust setpoints
- Trend graph to view trend information
- Link to jump to another Field Assistant page

NOTES

- Right-click a value, then select **Details** to view and change properties in the microblock pop-up.
- Right-click a value, then select **Global Modify** (page 58) to view and change the property in other control programs.
- A yellow dashed line indicates a value that is forced or locked.

- If a graphic does not fit in the action pane, right-click it and select **Scale to Fit** to make it fit the action pane. Select **Scale to Fit** again to return the graphic to its original size.

To attach a graphic in the Field Assistant interface

1. On the navigation tree, right-click the item that you want to attach a graphic to, then select **Configure**.
2. Equipment graphic only: If the system has other control programs of this type, select which control programs you want to change:
   - Change for this control program only
   - Change for all control programs of this type on this network only
   - Change for all control programs of this type

   NOTES

   - If the control program is in an IP router, the second option will change the graphic for all control programs of this type only on the IP network.
   - If the control program is on the network below an IP router, the second option will not change the graphic for the router's control programs of this type.

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3 Do one of the following:

If the graphic is...	
In the **Views Available** list	a. If the system has other control programs of this type, select which control programs you want to change: • Change for this control program only • Change for all control programs of this type on this network only • Change for all control programs of this type b. Select the graphic, then click **Attach**. c. Click **Save**.
Not in the **Views Available** list	a. Click **Add New Equipment**. b. If the system has other control programs of this type, select which control programs you want to change: • Change for this control program only • Change for all control programs of this type on this network only • Change for all control programs of this type c. Browse to select the view file. d. Click **Continue**. e. Click **Save**.

NOTES

- Select a graphic in the **Attached** list to edit the following information for the graphic:
  - **Display Name**–The name that appears in the **Graphics** button drop-down list
  - **Category**–The name of the category that multiple graphics may be sorted into in the **Graphics** button drop-down list

    NOTE Changes to **Display Name** or **Category** apply only in the Field Assistant interface and are not retained if you export source files.
  - **Reference Name**–The name that is used to create links to the graphic in ViewBuilder
  - **Default View**–Sets the selected graphic as the default view if the tree item has multiple graphics. The default graphic is bolded in the **Attached** list.
    Included in download–Equipment graphics only. Select to have the .view file included in an **All Content** download so that it can be uploaded by Field Assistant. The graphic has beside it in the **Attached** list. Requires 4.x or later drivers.

- You can click **Delete Unused** in the **Views** section to delete all unattached graphic files from your system.

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To edit a graphic from the Field Assistant application in ViewBuilder

1. In the Field Assistant interface, double-click the controller in the navigation tree or right-click and select **Configure**.
2. In the **Views** section, select a file and click **Edit File** to download.
3. Open ViewBuilder.
4. Select **File** > **Open.** Browse to your saved graphic and click to open.
5. Edit and save with a new name. The original system name is locked and cannot be used for an edited graphic.

   NOTE Names are case sensitive and should not have any spaces or special characters.

To control equipment using an interactive zone sensor

An equipment graphic may include an interactive zone sensor that provides you with the following control.

If the sensor is a...	You can...
ZS 	• Click ▲ to raise the setpoint or ▼ to lower the setpoint. • Click ⏻ to override the schedule and put the zone in an occupied state. To cancel an override, continue clicking ⏻ until the display shows 0. • See that the zone is in an occupied state when the green LED is lit.

SPT Standard, Plus, or Pro
 	
	• Click the **WARMER** or **COOLER** button to adjust the setpoint.
	• Click the **MANUAL** button to override the schedule and put the zone in an occupied state.
	• Click the **INFO** button to cycle through the following information:
	  • Outside air temperature, if enabled in the control program
	  • Override time remaining
	  • Heating setpoint
	  • Cooling setpoint
	• See the **Occupied/Unoccupied** state in the display.

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If the sensor is a...	You can...

SPT Pro Plus
 	
	• Click the **WARMER** or **COOLER** button to adjust the setpoint.
	• Click the **MANUAL** button to override the schedule and put the zone in an occupied state.
	• Click the **INFO** button to cycle through information such as:
	  • Outside air temperature
	  • Override time remaining
	  • Heating setpoint
	  • Cooling setpoint
	• Click the **FAN** button to adjust the fan speed.
	• Click the **MODE** button to perform customer-specific functions.
	• See the **Occupied/Unoccupied** state in the display.

To control equipment using an interactive zone control

An equipment graphic may include an Interactive Zone control that provides you with the following control.

To...	Click...
View or change temperature	Click . Use to raise or lower the setpoint. **TIP** Check the **Show Zone Color** option in the control's properties in ViewBuilder to match the color of the control's border with the thermographic color of the zone.

Set timed override	Click . Use to override the schedule and put the zone in an occupied state.
	  ○ **0** — No override is active.
	  ○ **999** — Continuous override is active. The override remains in effect until the schedule transitions to occupied or until you cancel it.
	  ○ Any other number — Number of minutes remaining until the next transition to an unoccupied state.
	To cancel an override and return control to the schedule, continue clicking until the display shows 0.

View or change fan speed	Click . Use to change the fan speed. **NOTE** Check the **Allow Fan Adjustment** option in the control's properties in ViewBuilder to enable fan speed control.

Click **Accept** to confirm changes.

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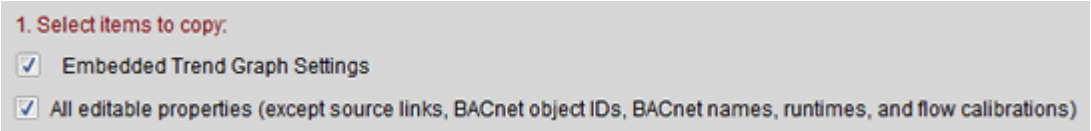
Copying properties from one controller to another

You can copy a control program's properties to other controllers that use the same control program. You do not have to be physically connected to the controller that you are copying **from**. But, to download copied properties **to** a controller, you must be connected to it or to the network that the controller resides on.

1. On the navigation tree, right-click the controller that has the properties you want to copy, then select **Copy Control Program Properties** and click **OK**.
2. In the **Global Copy** dialog box, check **Embedded Trend Graph Settings** and **All editable properties**.



3. Click **Search**.
4. Do one of the following:
   - Check **Skip bad values** to copy all values except a bad value (the hardware differs, a property to be copied is undefined, etc.).
   - Uncheck **Skip bad values** to prevent any values from being copied if a bad value is found.
5. Click **Apply Changes**, then close the dialog box.

NOTE If a message appears **Copy process complete, but some values were not copied**, click **OK**. Field Assistant displays a list of parameters that were not copied.

Properties pages

Properties pages are automatically generated from control programs. **Properties** pages show the status of a piece of equipment and the points/properties currently stored in it. See *Check out point setup* (page 43) for details.

Use **Properties** pages to:

- View the status of a piece of equipment. See *Colors and status in the Field Assistant interface* (page 15).
- View or change the equipment point/properties currently stored in the controller.
- *Commission equipment* (page 43)
- Set up Linkage.

Refer to your individual controller's *Installation and Start-up Guide* for detailed explanations of the points/properties.

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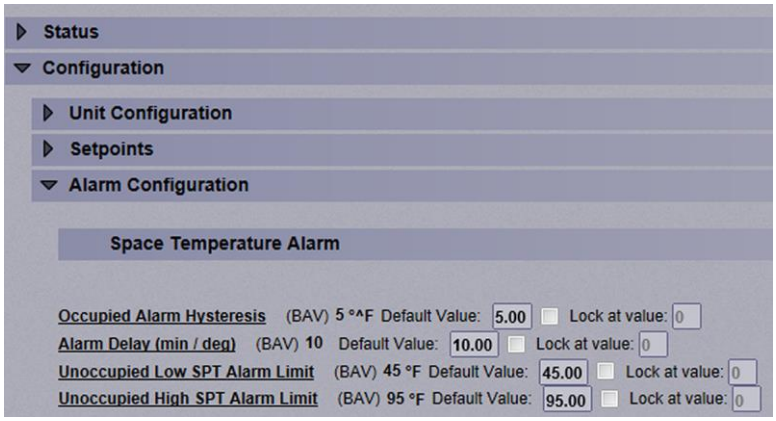
To view or edit properties on a Properties page

1 Select a controller on the navigation tree, click **Properties**, and then select the appropriate tab.

NOTE You must resolve any condition described in red text at the top of the page before a **Properties** page can obtain current information from its controller.

2 Click ▶ to show property details.



3 Do one of the following to change a property:

- Select or clear a checkbox
- Select an item on a drop-down list
- Change text in a text field

4 Click **Accept**.

NOTES

- Click the bold, underlined point name to open the editable microblock pop-up
- Right-click a value, then select **Details** to view and change properties in the microblock pop-up.
- Right-click a value, then select **Global Modify** (page 58) to view and change the property in other control programs.
- Use **Search/Replace** on the **Network Points** tab to replace a term in the point address with another address.
- For the legend of status colors, see *Colors and status in the Field Assistant interface* (page 15).
- A yellow dashed box around a value indicates the value is locked or forced.

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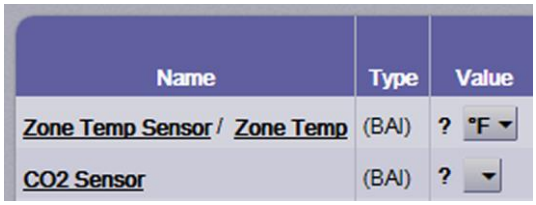
Point types

A point name on the Properties page is followed by a code that tells you the point type. The table below describes each code.



Code	Point type
AI	Analog Input
ANI	Analog Network Input
ANI2	Analog Network Input 2
ANO	Analog Network Output
ANO2	Analog Network Output 2
AO	Analog Output
ASVI	BACnet Analog Sensed Value Input
AV	Analog Value
BAI	BACnet Analog Input
BALM	BACnet Alarm
BAO	BACnet Analog Output
BAV	BACnet Analog Value
BBI	BACnet Binary Input
BBO	BACnet Binary Output
BBV	BACnet Binary Value
BFM	Floating Motor
BI	Binary Input
BMSV	BACnet Multi-State Value
BNI	Binary Network Input
BNI2	Binary Network Input 2
BNO	Binary Network Output
BNO2	Binary Network Output 2
BO	Binary Output
BPTA	Pulse to Analog Input

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Code	Point type
BPWM	Pulse-Width Output
BRS	RS Sensor
BRSF	RS Sensor Fan
BSVI	BACnet Binary Sensed Value Input
BTLO	Timed Local Override
BTRN	Trend Log
BV	Binary Value
DI	Digital Input
DO	Digital Output
EVT	BACnet Alarm
POLLAVG	Average Analog Properties
POLLMAX	Maximum Analog Properties
POLLMIN	Minimum Analog Properties
POLLTOT	Total Analog Properties
PTA	Pulse to Analog Input
TLO	Timed Local Override

Changing properties/points in multiple controllers at the same time

Two Field Assistant features, **Global Modify** and **Global Copy**, allow you to view and change points or properties in multiple controllers at the same time.

TIP Click to copy a reference path to the clipboard that you can use in ViewBuilder.

To use Global Modify

Use the Global Modify feature to:

- View a microblock's full path, control program name.
- View or change a single property in several control programs at one time.
- View errors on Graphics and Properties pages.

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1 Browse to any page that displays the property you want to view or change.

2 Do one of the following to access Global Modify.

- Right-click the property, then select **Global Modify**.
- Alt+click the property.

3 Make changes to the **Control Program** field, if needed.

NOTES

- Use wildcards in the **Control Program** field to broaden the search.
  For example:

  `vav*` matches vav, vav**1**, vav**x**, vav**12345**

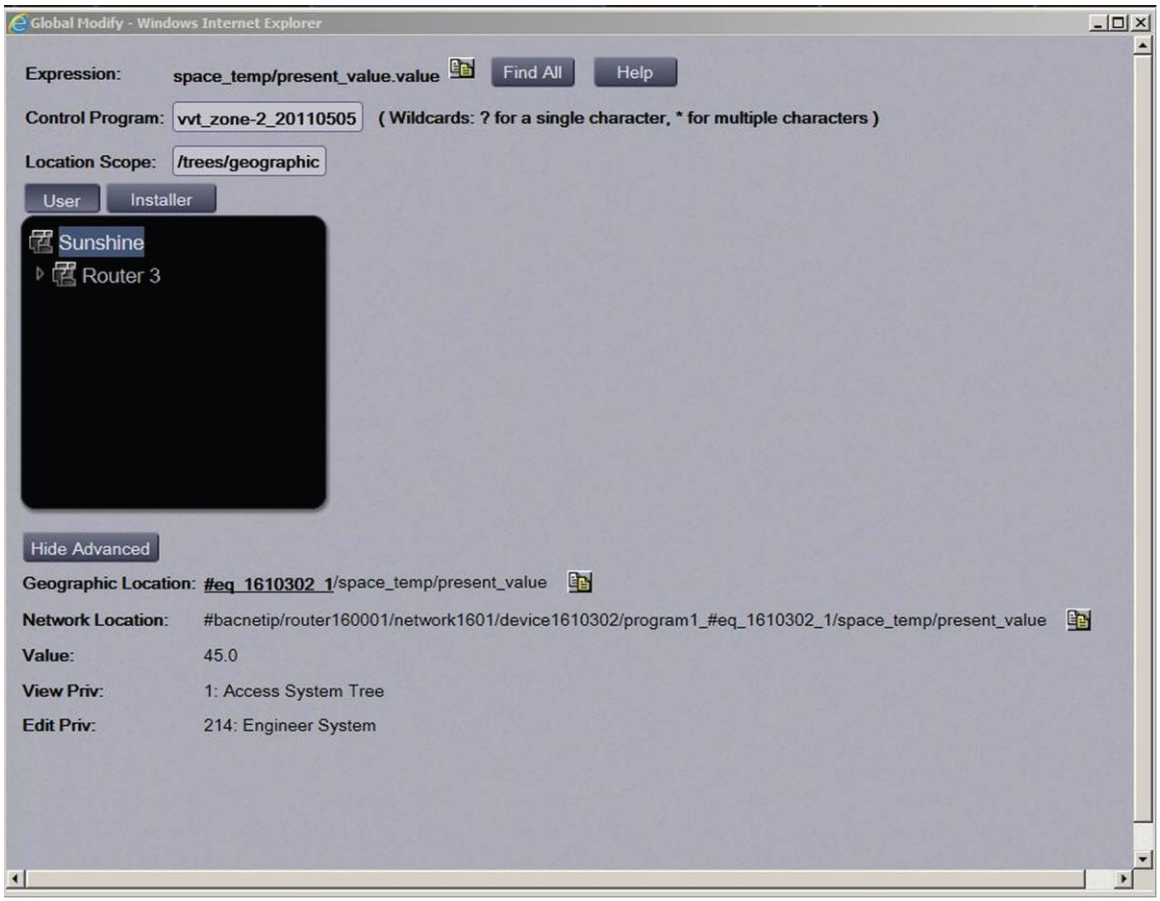
  `vav*z` matches vavz, vav**1**z, vav**x**z, vav**12345**z

  `vav*1*2` matches vav12, vav**abc**1**xyz**2

  `vav??` matches vav**11**, vav**12**, vav**zz**, but does not match vav, vav1, vav123

  `*` matches any control program

- Click **Show Advanced** to view the location and value associated with this property.



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4 Select the tree item that you want to search under for every occurrence of that microblock in other control programs.

5 Click **Find All**.

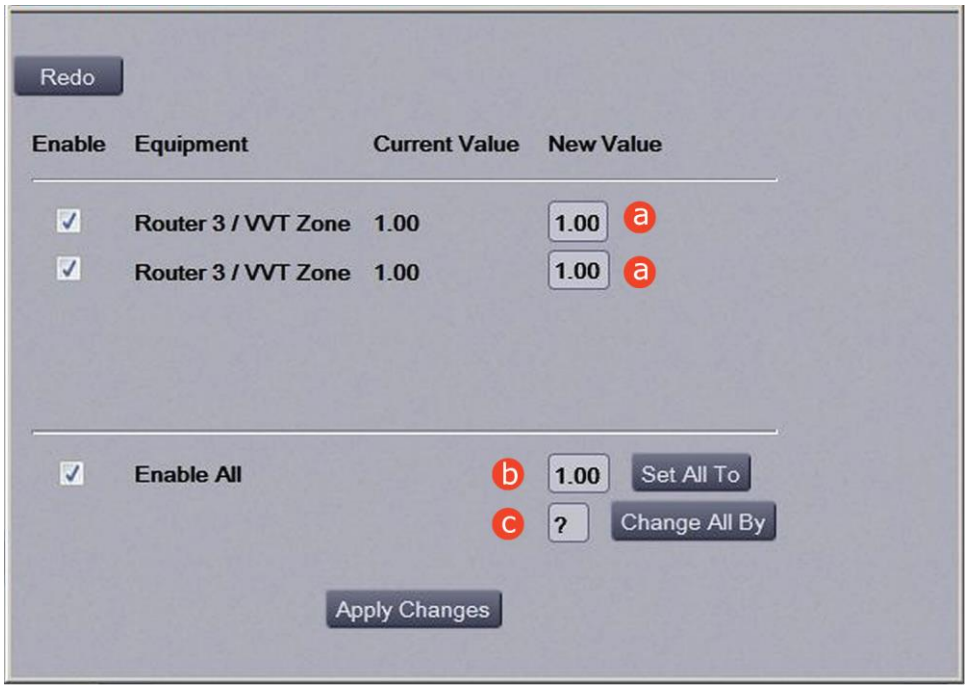
6 Select the properties in the list that you want to change.

7 Do one of the following:

a) Type a **New Value** a to the right of each selected item.

b) Select **Enable All**, type a new value in b, then click **Set All To**.

c) Select **Enable All**, type a new value in c, then click **Change All By**.



8 Click **Apply Changes**.

NOTE To modify several properties in multiple control programs at the same time, use **Global Copy**.

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To use Global Copy

Use **Global Copy** to copy any or all of the following from one control program to other equipment using the same control program:

- Embedded trend graph settings
- Custom trend graphs
- Custom reports
- Other editable properties to other pieces of equipment using the same control program.

1. On the navigation tree, right-click the piece of equipment that has the properties you want to copy, then select **Copy Control Program Properties**.
2. Click **OK** when you see **This will copy this control programs properties to other control programs of the same type. Continue?**. This opens the next screen and does not lock in any changes.
3. In the **Global Copy** dialog box, select the items that you want to copy.
4. Select the area on the tree containing similar control programs that you may want to copy these properties to, then click **Search**.

   All instances at that level and below are listed in the expanded lower window.
5. Check or uncheck items as needed.
6. Do one of the following:
   - Check **Skip bad values** to copy all values except a bad value (it cannot be copied because you do not have the necessary privilege, the property to be copied is undefined, etc.).
   - Uncheck this field to prevent any values from being copied if a bad value is found.
7. Click **Apply Changes**, then close the **Global Copy** dialog box.

Logic pages

The **Logic** page shows a custom control program for a programmable controller. The live data (yellow text) is updated every few seconds and when you click the **Logic** button. The control program uses exact property values for its calculations, but values are rounded to 2 decimal places when displayed on the **Logic** page.

TIP Click anywhere on the **Logic** page, then use your keyboard's Page Up, Page Down, and arrow keys to scroll through the page.

NOTE If you find an unexpected value on a **Properties** page or a **Logic** page, you can use the **Logic** page to troubleshoot.

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To view a Logic page

1. Select a custom control program on the navigation tree.
2. Click **Logic**.
3. Click a microblock to view its details.

To locate a microblock, section, or label

1. Right-click the Logic page, then select **Jump To**.
2. Do one of the following:
   - On the **Microblock** or **Section** tab, select an item to have it located and highlighted.
   - On the **Label** tab, select a label to display a reduced logic page outlined in yellow that shows all instances of the label. A red box indicates an output label; a yellow box indicates an input label. Click a red or yellow box to jump to that label in the full-size logic page.

     NOTE You can also click a label on the full-size Logic page to display the reduced Logic page.

To change properties, alarms, or trends

1. Click a microblock on the equipment's **Logic** page.
2. In the microblock pop-up, click the **Properties**, **Alarms**, or **Trends** button.
3. Change properties, alarms, or trends for that microblock in the same way that you would make changes on a regular *Properties* (page 55), *Alarms* (page 72), or *Trends* (page 68) page.
4. Click **Accept**.

NOTE Right-click a value, then select **Global Modify** (page 58) to view and change the property in other control programs.

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Using a Logic page to troubleshoot

The Field Assistant application monitors your system and provides feedback. If you get unexpected feedback, you can use a Logic page as a troubleshooting tool. On the Logic page, work your way backward (right to left) through the sequence in the control program to discover what caused the problem. See Microblock Reference to understand what each microblock in the sequence is doing.

Unexpected feedback	Possible cause
Space temperature reads excessively high or low	• The sensor has a short (or open) circuit. Verify wires are properly connected at the sensor and controller. • A sensor is missing or configured incorrectly. Open the sensor or input microblock from the Logic page to verify its configuration.
Equipment displays an unexpected color - effective setpoints are different than the programmed setpoints	**NOTE** Equipment operates using effective setpoints. Open the Setpoint microblock from the Logic page and check the following: • Hysteresis • Demand Level • Optimal Start • Timed Local Override (TLO) • Setpoint Adjust
Gaps in trend data on trend graph	Usually gaps result if network communication was disrupted or a point was temporarily disabled. If the gap is not the result of interrupted communication, send reports more frequently. From the Logic page, open the trend microblock that displayed the gap in data, then decrease the notification threshold so that it is approximately 40% of the buffer size (allocated memory size) for that microblock.
The Field Assistant application is not receiving alarms from a BACnet alarm microblock	Locate the microblock on the Logic page. If the color square on the microblock is black, the alarm is disabled. To enable it: 1 Click the microblock. 2 In the microblock pop-up, click the **Alarms** button. 3 On the **Enable/Disable** tab, select **Potential alarm source**.
The equipment is on when I expect it to be off, or off when I expect it to be on	Use the Logic page to determine whether the program is sending an unexpected signal and why, or if the problem is with the physical equipment. For example, the On-Off-Auto (OOA) switch on the controller for that equipment may be locked in the On (Hand) position.
Sensor value on the Properties page does not match the reading from handheld sensor	Calibrate the sensor. On the Logic page, check to see if the output point is locked on.

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To lock a BACnet point of value

You can lock certain editable parameters to a specified setting from the **Properties** page or microblock popup.

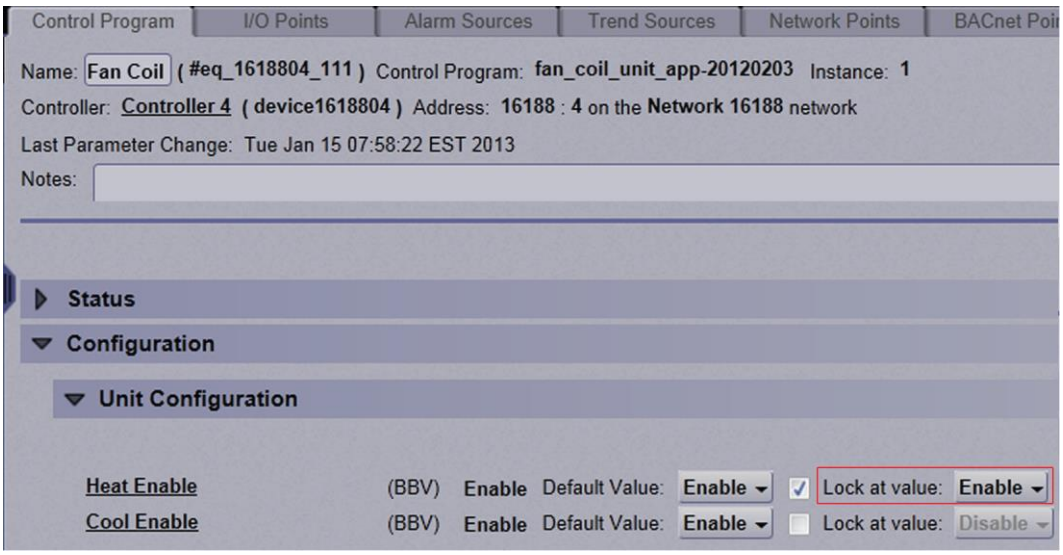
1 Select the **Lock** checkbox.

2 Type the value you want to send to the controller.

3 Click **Accept**.

NOTE Locked values are indicated by a dashed yellow line on graphics.

On **Properties** page > **Control Program** tab, click ▶ to locate the point you wish to lock.



On the microblock popup:

1. Click on the underlined **Name** or **Reference Name** of the point on any of the **Properties** tabs to open the point/properties details popup.
2. Click **Properties** page > **Details** tab to lock a value.

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Using schedules, trends, and reports

Creating and modifying a Field Assistant schedule

Using schedules, your equipment can maintain one set of setpoints during occupied periods to provide comfort, and it can maintain a different set of setpoints during unoccupied periods to reduce energy consumption. Schedules are the most effective cost-saving strategy.

NOTE Do not include preheating or precooling time in your schedules. *Optimal Start* (page 40), another cost-saving strategy, automatically calculates and controls precise preheating and precooling routines.

CAUTION Schedules are managed in the i-Vu® application and will override any that you set in Field Assistant. You must use the i-Vu® application to set up Holiday schedules. You can use Field Assistant to set up temporary schedules.

To view schedules

1. Select a controller on the navigation tree.
2. Click **Schedules** page > **View** tab.
3. Optional: Click an **Effective** bar to view all the schedules that contribute to the resulting schedule.

   NOTE When multiple schedules affect a controller, Field Assistant sorts the schedules by priority—the higher the priority, the closer the schedule is to the **Effective** bar. You set a schedule's priority when you add a schedule.

To apply a schedule to a controller

Schedules in Field Assistant are typically based on zone occupancy.

1. On the navigation tree, select the controller you want to schedule.
2. Click the **Schedules** page > **Configure** tab.
3. Click **Add**.
4. Select a **Priority**. A schedule's priority determines whether affected zones will use occupied or unoccupied setpoints.

Select...	For...
Weekly	A typical occupied period
Exception	An unoccupied period that overrides a Weekly schedule **NOTE** This functions the same as a Holiday schedule.

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5 Select a **Type**. See table below.

6 Enter desired values in the fields below **Description** (50 characters maximum).

7 On the graph, change a time segment's **Start** and **End** times by doing one of the following:

- Click the segment, then type the times in the **Start** and **End** fields.
- Click and drag either end of the segment or the entire segment.

8 Optional: Click **Add Time Period** to add one or more segments to the schedule. Or, select a segment and click **Delete Time Period** to delete that segment.

9 Click **Accept**.

Type	Schedule runs
Weekly	Every week on the specified days
Date	On a single, specified date
Date Range	Between two specified dates
Date List	On multiple, specified dates
Wildcard	According to a repeating pattern (For example, the second Tuesday of every month)
Continuous	Continuously between specified times on two separate dates
Dated Weekly	Weekly between a start date and an end date (For example, the summer break in the school year)

To edit or delete a schedule

1 Select the controller whose schedule was defined.

2 Click **Schedules** page > **Configure** tab.

3 Select the schedule you want to edit or delete.

4 Edit the fields you want to change or click **Delete**.

5 Click **Accept**.

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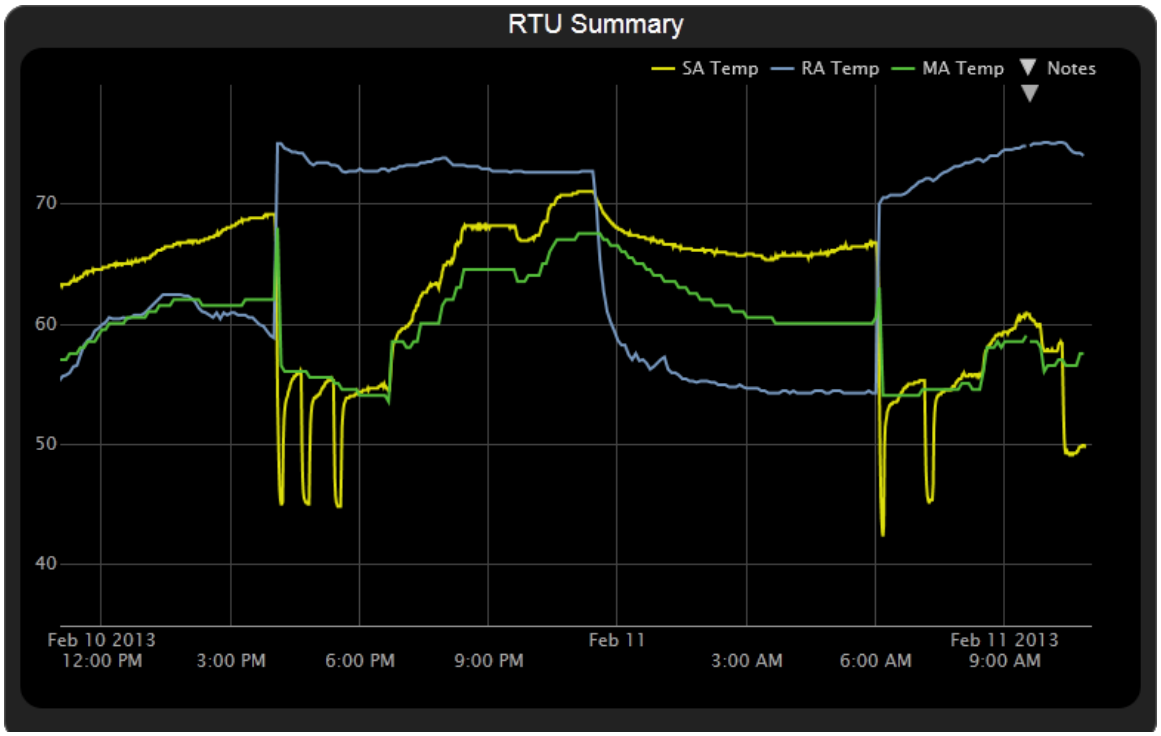
Trends

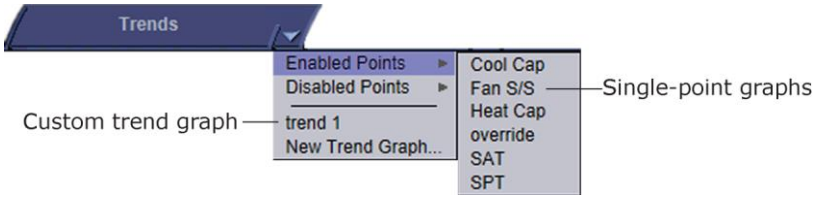
Field Assistant can read and store equipment status values over a limited time and then displays this information in a trend graph to help you monitor the equipment's operation.



You can collect trend data for any point value in the Field Assistant system. The controller reads point values at intervals that you define and then stores that data in the controller. A controller has limited memory for storing trend data.

After you *set up the desired points for trend data collection* (page 68), you can:

- *View built-in trend graphs that show a single point* (page 68)
- *Create custom trend graphs with multiple points* (page 69)



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To collect trend data for a point

Before you can look at a trend graph for a point, you must enable trending for that point and then tell Field Assistant how you want the equipment to collect the point's data.

1 On the navigation tree, select the controller that has the point you want to trend.

2 Click the **Trends** button drop-down arrow, select **Disabled Points**, then select the point.

3 Click the **Enable/Disable** tab, then check **Enable Trend Log**.

4 Enter information in the appropriate fields. See table below.

5 Click **OK**.

TIP You can set up all trends for a piece of equipment at once on the **Trend Sources** tab of the equipment's **Properties** page.

Field	Notes
Sample every _:_:_ (hh:mm)	This method records (samples) the point's value at the time interval you define in this field. **NOTE** Be sure to set trend intervals to one minute or greater.
Sample on COV (change of value)	This method records the point's value only when the value changes by at least the amount you enter in the **COV Increment** field. **NOTE** Use this method for a binary point or for an analog point that has infrequent changes in value.
BACnet Configuration	The **Object Name** is a unique alphanumeric string that defines the BACnet object. Although the **Object Name** field can be edited, it is not recommended. The **Notification Class** is set to 1 to receive alarms generated by Carrier® controllers.

Viewing a built-in, single-point trend graph

1 On the navigation tree, select the equipment whose trend you want to view.

2 Click the **Trends** button drop-down arrow, select **Enabled Points**, and then select the graph you want to view.

3 Select the **View** tab. See *Using trend graphs* (page 71).

NOTE On the **Configure** tab, you can:

- Enable/disable the grid.
- Set the time range for the X axis. For example, enter 7 days to see the data for the last week.
- Turn off autoscaling so that you can define a range for the Y-axis
- Type a Y-axis label that will appear on the right side of the graph.

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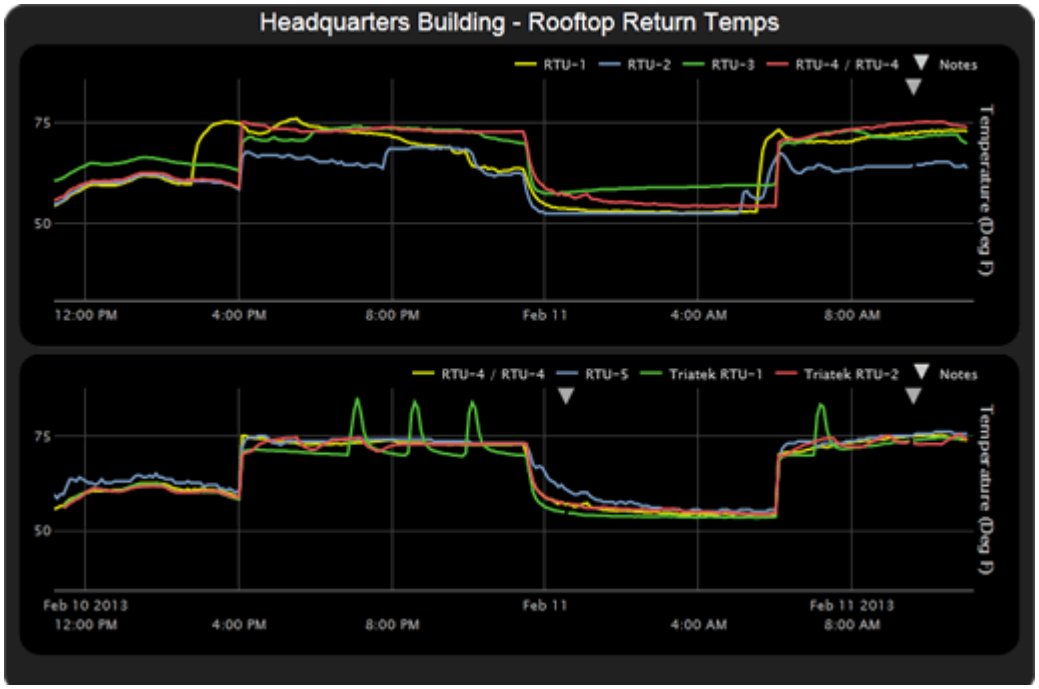
Creating a custom trend graph

When creating a custom trend graph, you can select up to 16 points. If you select more than 4 points or points with different units, the Field Assistant application splits the data into subgraphs. Each subgraph can show a maximum of 4 points with similar units.



NOTE You must enable trending for points that you want to include in the custom trend graph. See *To collect trend data for a point* (page 68).

To create a custom trend graph

1. On the navigation tree, select the area or equipment where you want to see the graph.
2. Click the **Trends** button drop-down arrow, then select **New Trend Graph**.

   NOTE If the **Trends** button does not have a drop-down arrow, the **New Trend Graph** page is already displayed.
3. In the tree on the **New Trend Graph** page, use **Ctrl**+**click** or **Shift**+**click** to select the points (16 maximum) that you want to see on a graph.

   NOTE The tree shows only points that have trending enabled. See *To collect trend data for a point* (page 68).
4. Click **Save**.
5. Type a **Name** for the graph that will appear at the top of the graph and in the **Trends** button drop-down list.
6. Click **OK**.
7. Select:
   - The **View** tab to see the custom trend graph. See *Using trend graphs* (page 71).
   - The **Configure** tab to edit the trend graph. See *To edit a custom trend graph* (page 70).

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To edit a custom trend graph

1 On the navigation tree, select the area or equipment where you created the graph.

2 Select the **Trends** > **Configure** tab. On this page, you can:

- Change the name of the custom trend graph
- Enable/disable the grid
- Set the time range for the X axis
- Edit a subgraph's Y-axis label that will appear on the right side of the graph
- Turn off autoscaling so that you can define a range for the Y-axis
- Add/delete subgraphs (see instructions below)
- Add/delete points (see instructions below)
- Change a point's name on the graph
- Change a binary point's active/inactive text on the graph
- Click **Delete Trend Graph** to delete the entire custom trend graph

To add a subgraph to a custom trend graph

1 Click **Add** below the **Subgraphs** list.

2 Type a Y-axis label.

3 Click **Add** below the **Points** list.

4 Select a point in the **Data source** tree.

NOTE The tree shows only points that have trending enabled. See *To collect trend data for a point* (page 68).

5 Repeat steps 3 and 4 to add up to 4 points to the subgraph.

6 Click **Accept**.

NOTE To delete a subgraph, select it in the **Subgraphs** list, click **Delete** below the list, and then click **Accept**.

To add a point to a subgraph

1 Select the subgraph in the **Subgraphs** list.

2 Click **Add** below the **Points** list.

3 Select a point from the **Data source** tree.

NOTE The tree shows only points that have trending enabled. See *To collect trend data for a point* (page 68).

4 Click **Accept**.

NOTE To delete a point, select the appropriate subgraph, select the point, click **Delete** below the **Points** list, and then click **Accept**.

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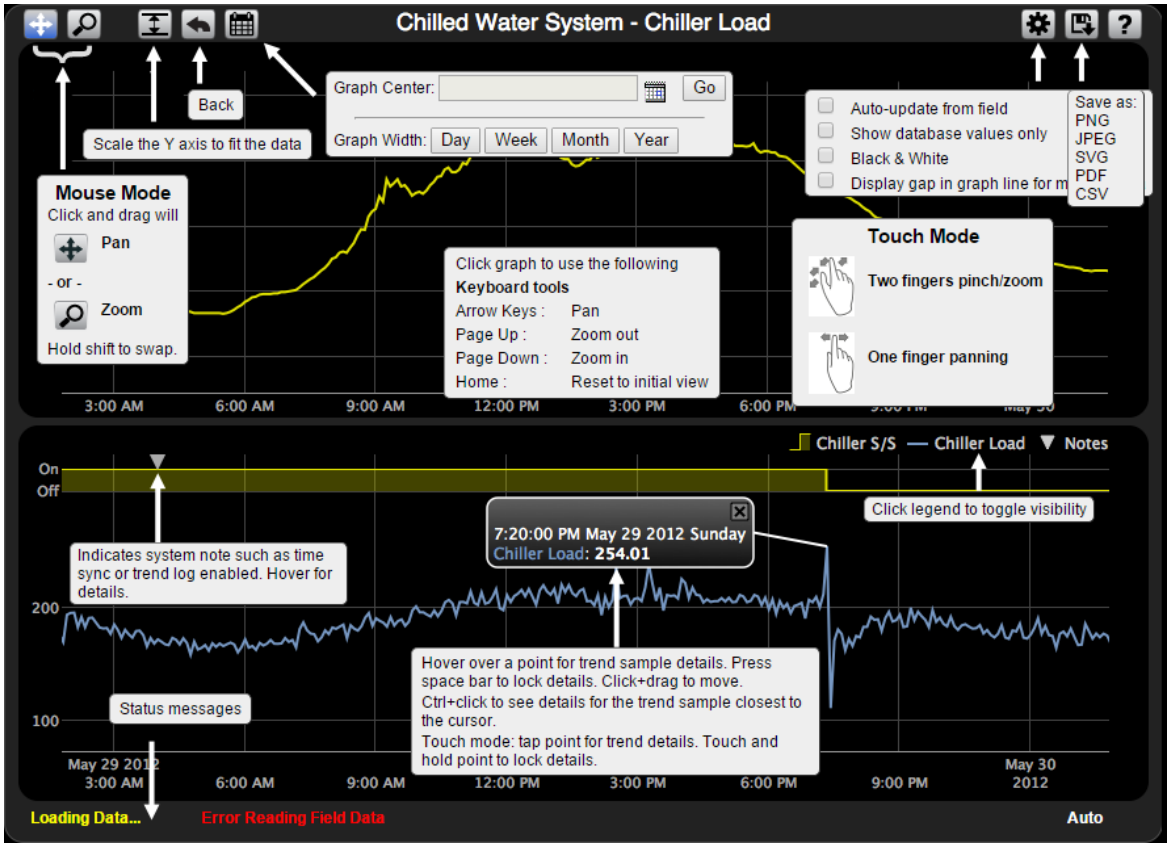
Using trend graphs



NOTES

- A gray triangle at the top of a graph indicates a note from the system. Hover your cursor on the triangle to see which of the following occurred:
  - Equipment received a time synchronization from its network router or from the Field Assistant application.
  - Trend Historian has been enabled or disabled.
  - Trend Log has been enabled or disabled.
  - The trend object ID of a third-party trend source has been changed. For information only, you do not need to do anything.
- Click at the top of the Field Assistant page to print the graph. You may need to set your printer's orientation to Landscape.
- Toolbar options are also accessible by right-clicking a trend graph.
- You can check **Display gap in graph line for missing data** on an individual trend graph page.

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To view trend data in a spreadsheet program

You can save trend data as csv data that you can open in a spreadsheet program such as Microsoft® Excel®.

1 On the **Trends** > **View** tab, select > **Save as CSV data**.

2 Save the data (.zip file) wherever you want. The .zip file contains the following:
   - A .csv file for each trend source (point). The filenames match the point names.
   - A **Combined** folder containing a file with the combined data for all of the graph's trend sources.

3 Open the .csv file in a spreadsheet program.

NOTES

- You will need to convert the data in the spreadsheet's **Time** column to a readable date/time format.
- If you use Microsoft® Excel® on a Mac and the converted date shows the wrong year, do the following:
  1. In Excel, go to **File** > **Options** > **Advanced**.
  2. Scroll down to the section **When calculating this workbook**, and then uncheck **Use 1904 date system**.

To set up, edit, or disable a single alarm source

1 On the navigation tree, select the alarm source.

2 Select the **Properties** page and click on the specific point to open the point/properties details popup.

3 Click the **Alarms** tab in the popup.

4 Make changes to the fields as needed. See table below. The fields can vary for different types of alarm sources.

5 Click **Accept** or **Apply**.

TIP To set up all the alarms for a piece of equipment at once, click **Properties**, then select **Alarm Sources**.

Field	Notes
Potential alarm source	Select the checkbox to enable the alarm source to generate alarms. Clear the checkbox to disable the alarm source.
Alarm	Select to have the alarm source generate an alarm when the specified conditions occur. • For a binary input, enter the conditions for generating an alarm. • For an analog input, type the low and high limits that, when exceeded, will generate an alarm. **Deadband** The amount inside the normal range by which an alarm condition must return before a return-to-normal notification is generated. **NOTE** If the **Status** checkbox is selected, the alarm condition currently exists.

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Field	Notes
Return to Normal	Select to have the alarm source generate a return-to-normal when the alarm condition returns to a normal state.
Fault	Select to have an alarm generated if the alarm source is not configured correctly. **NOTE** If the **Status** checkbox is selected, the alarm source is currently misconfigured.
Alarm requires acknowledgement	Select to have Field Assistant require that an operator acknowledge the alarm.
Return requires acknowledgement	Select to have Field Assistant require that an operator acknowledge the return-to-normal.
Classified as Critical	This property determines the color of the system-wide alarm button when the alarm comes in. = Critical = Non-critical
Event State	The current state of the alarm source can be: • Normal—value is normal • Off normal—the value is not normal (binary only) • Fault—the alarm source microblock may be misconfigured • High Limit—the value exceeds the normal range (analog only) • Low Limit—the value is below the normal range (analog only)
BACnet Configuration: **Dial on alarm**	N/A
Notification Class	Do not change this field.

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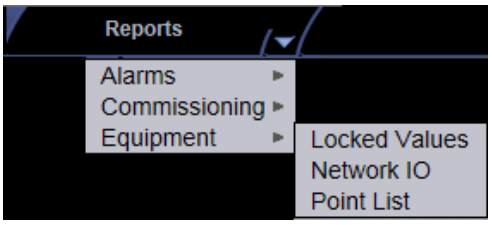
Reports

Use Field Assistant reports to monitor and troubleshoot your system. See the table below for a list of all reports.



The **Reports** button drop-list varies depending on your navigation tree location and your connection.

This pre-configured report...	allows you to...
Alarms	
Alarm Sources	Create a summary of *potential alarm sources* (page 72).
Commissioning	
Test & Balance	View the damper calibration parameters.
Equipment	
Locked Values	Find all locked points and locked values.
Network IO	Verify the programming and status of all network points—especially useful for commissioning controllers used for third-party integration.
Point List	View the details of all points. Verify that all points have been checked out during commissioning. Also, create custom lists for other contractors. For example, create a list of BACnet IDs or Web services links.
Network	
Controller Status	Discover network communication problems (shown as purple squares on the report) that need troubleshooting. The report also shows boot and driver version, download information, and if controller has 4.x or later driver, the report shows the serial number and Local Access port status.
Equipment Status	Display the thermographic color, status, and prime variable of each control program.

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To run a report

1. Select an item on the navigation tree.

   NOTE A report shows data for the selected tree item and all its children.

2. Click the **Reports** button drop-down arrow, then select a report.
3. On the **Options** tab, define the layout and content of the report.

   NOTES

   - Changing the size and orientation of the printed page also changes the report layout on the **View** tab.
   - To create a CSV (Comma Separated Values) file after you run the report, select **Support CSV text format**. See *To create a PDF, Excel spreadsheet, or CSV file* (page 75).
   - The current operator's report options are saved so that when that operator logs in again, the same options are used.

4. Click **Run**.
5. Click **PDF** if you want to print the report.

To create a PDF, XLS, or CSV file

PREREQUISITE FOR CSV You must enable **Support CSV text format** on the **Reports** > **Options** tab before you run the report.

1. Run a report.
2. Click **PDF**, **XLS**, or **CSV**.
3. For XLS or CSV, click **Open** to view the file or **Save** to save it.

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System Management

Although the Field Assistant application is a reliable front-end, you must perform periodic backups of the Field Assistant database to ensure a quick recovery in case of failure. To make sure that your controllers have the latest version of software, you must install periodic library upgrades. The sections below describe how to backup and restore the Field Assistant database and how to install the library updates.

To update Field Assistant

1. Go to the **Field Assistant Launcher** screen.
2. Click **Help** and select **Update.**
3. Browse to the .update file.
4. Check under **Notes:** for any pertinent information regarding the patch.
5. Click **Apply and Restart Now**, if necessary.

To update the SAL library

The Field Assistant application is equipped with a complete library. There are occasionally library (.sal file) updates, which contain the following files:

- graphic (.view)
- control program (.equipment)
- driver (.driver)
- screen (.touch or .bacview)

NOTES

- Get the latest updates from your Carrier representative.
- The library update only changes default graphics. If you have edited your graphic in ViewBuilder, it is not updated.
- Keep copies of the latest libraries in a safe place. In the event of a system restore, any updated .sal files must be reapplied.
- The last digits in the sal library name are the release date of the library.

Step 1: Upload new library to Field Assistant

1. Obtain the updated library (.sal file) from Carrier Control Systems Support.
2. Save the file to your computer in the **IVu_Tools_x.x** > **sals** folder.
3. Start your system in Field Assistant.

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Follow these steps to implement the new equipment library:

Step 2: Update the files for the routers and controllers

1. On the Field Assistant navigation tree, right-click the router or controller to update and select **Driver Properties**.
2. Select **Properties** tab > **Update** tab > **Add New Driver** tab.
3. If the database contains two or more controllers, select which routers to change:
   - This controller only
   - All controllers on this network that use the current driver version
   - All controllers in the system that use the current driver version
4. Click **Update**.
5. Click **Save**.

NOTES

- Check **Stage driver in controller** to stage the driver to the controller before installing it. Use this option to avoid interrupting controller function when installing the driver.
- Click **Delete Unused** to delete all unused drivers in <system_name>**drivers**.

Step 3: Apply the update to the control programs

1. Select the router in the navigation tree and then select the **Devices** > **Manage** tab.
2. Select control programs in the list on the page that are marked for download.

   NOTE Use **Ctrl+click**, **Shift+click**, or the **Select All** checkbox to select multiple control programs.
3. Select **All Content** and click **Download**.

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Advanced topics

Troubleshooting and communications

Troubleshooting a Local Access connection

Inability to communicate over a Local Access connection may cause the following symptoms:

- Question marks on Field Assistant Properties pages and Graphics pages
- Cannot obtain a Modstat from the connected controller
- Controller Status report displays purple for a connected BACnet/IP controller
- Cannot download to connected controller
- A message says Local Access is disabled or unable to connect
- No controllers found in Field Assistant

Possible cause	Solution
BACnet/IP network number in Field Assistant does not match the number found in the controller	Change the Field Assistant BACnet/IP network number to match the controller's IP network number. 1 Select the System or router on the navigation tree and go to the **Devices** page > **Advanced** tab. 2 Type new network number in **BACnet/IP network**. 3 Click **Accept**.
Selected COM port is in use	Shut down other applications such as PuTTY that may be running and holding the port open.
Local Access is disabled	Your manufacturer or representative must enable Local Access in the i-Vu® interface.

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Troubleshooting BACnet bindings

Every controller has a Device Binding Table that contains all Device IDs that the controller communicates with and the network address of each device. This typically includes the Device ID of the BACnet Alarm Recipient.

If the Field Assistant application is not receiving alarms/trends or if a point's value is incorrect, you can view this table to see where the controller is looking for its data.

1 On the Field Assistant navigation tree, select the router that has incorrect or missing data.

2 On the **Properties** page,click the **Show Bindings** button.

To change controller time settings using Field Assistant

To assign a controller as the Time Broadcaster

On a small, stand-alone network of controllers, the time in the controllers is synchronized with the controller that you select as the Time Broadcaster.

1 On the navigation tree, select the System .

2 On the **Devices** page > **Manage** tab, click the **Time Settings** link.

3 Select the router or controller from the **Time Broadcaster** drop-down list.

4 A message appears for you to adjust the time intervals between broadcasts.

5 Click **Accept**.

To adjust the Daylight Saving Time schedule

1 On the navigation tree, select the System .

2 On the **Devices** page > **Manage** tab, click the **Daylight Saving** link.

3 On the **Daylight Saving** tab, make changes as needed.
NOTE Click **Update** to automatically set the table's **Begin** and **End** dates for the next 10 years based on the system's timezone. This marks all controllers for a Parameters download.

4 Click **Accept**.

5 Click **OK**.

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If the updated dates are incorrect

If you clicked **Update** but the dates are incorrect, your system's Java timezone data may be out-of-date. Do the following:

1. Go to the *Oracle Java SE Download site* (*http://java.sun.com/javase/downloads*).
2. Download the **JDK DST Timezone Update Tool** (**tzupdater-v9.0.zip**).
3. In Field Assistant, go to the **Devices** page > **Manage** tab, click the **Time Settings** link.
4. On the **Daylight Saving** tab, click **Import**.
5. Browse to the **tzupdater.zip** file, select it, then click **Open**.
6. Click **Continue**.
7. Restart your system from the Field Assistant Launcher.
8. On the **Daylight Saving** tab, click **Update**.

Manual commands

To run a manual command in Field Assistant:

1. Press **Ctrl**+**M** to open the dialog box.
2. Type the manual command in the dialog box, then click **OK**.

Command	Description
addon	Opens a dialog box where you can upload, start, stop, or remove an add-on program.
bacnet bind show	Shows the selected device's current BACnet bindings.
bacnet bind clear	Clears the selected device's BACnet bindings so that they can be rediscovered.
bacnet showindex	Displays all files (file name, size, date) downloaded to the selected controller.
bbmd commands:	
bbmd read <IP address>	Reads the BBMD table of the controller at the given IP address. For example, to display the BBMD table in the BACnet device router at IP address 154.16.12.101, type: `bbmd read 154.16.12.101`
bbmd update <network number>	Selects BBMDs on the specified network and marks them for download. If no network is entered at the end of the command, all networks in the system are scanned. For example, if the network number is 888, type: `bbmd update 888`

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Command	Description
bbmd view <network number>	Views the list of BBMDs that have been selected for the network number at the end of the command. Assumes the update has been run. For example: `bbmd view 888`
bbmd write <table file> <IP address>	Writes the BBMD table into the controller at the given IPV4 address. For example, to write the BBMD table in dallasbbmd.bdt into the BACnet device router at IP address 154.16.12.101, type: `bbmd write dallasbbmd.bdt 154.16.12.101`
bbmd writeaddresses <addresses> <destination address>	Writes the BBMD table with the included IP addresses, "<addr1;addr2;addr3>", into the BACnet device at the given IPV4 address, [<destaddress>]. For example, to write the BBMD table with 3 IP addresses into the BACnet device with IP address 192.168.10.25, type: bbmd writeaddresses “192.168.20.1;192.168.30.25;10.10.2.36” 192.168.10.25
bbmd clear <IP address>	Clears the BBMD for the specified controller. For example: `bbmd clear 154.16.12.101`
bbmd dump <network> <file>	Writes to a file the BBMD from the specified controller. For example: `bbmd dump 888 dallasbbmd.bdt`
checkurls	**1** Finds all network point exp: expressions for the selected item on the navigation tree. **2** Converts the exp: expressions to bacnet:// equivalent expressions that the controllers use. **3** Compares the equivalent bacnet:// expressions to the bacnet:// expressions currently downloaded in the controllers. **4** Displays any mismatches.
checkurls -p	Does the same as checkurls, then adds any mismatches to the download queue as parameter downloads.
checkurls -v	Does the same as checkurls, but displays the exp: and bacnet:// expressions for all network points that were checked.
commstat	Gives a complete set of diagnostic information for all defined connections as well as information regarding all modems in the system.
copy	Displays a global copy utility that allows you to selectively copy trend graphs, custom reports and all editable properties from the selected equipment to other equipment in the system with the same control program. See *To use Global Copy* (page 61).
download commands:	Each of these commands performs an immediate download to a controller for the selected control program, device, or driver.
download m	Downloads all content, including parameters, schedules, and BBMDs (if applicable).

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Command	Description
download p	Downloads parameters only.
download s	Downloads schedules only.
go commands:	

go <refname or path>	Goes to the point in the system that is referenced.
	For example:
	`go #oa_conditions`
	or
	`go vav_1/m28`

go ~network	Takes you to the network the selected object's controller is associated to.
go -logicpopup <refname>	Goes to the microblock pop-up for the microblock that is referenced. You must run this command from the microblock's equipment on the navigation tree. For example: `go -logicpopup rs`
go <device ID>/<object ID>	Goes to a device and object on the navigation tree. For example: `go 300550/AI:3`
go <object ID>	Goes to an object for the current device on the navigation tree. For example, if a module alarm reports a control program Locked I/O Alarm and references an error in program 11, click the link to go to the device, then go to the object by typing: `go PRG:11`
localhost	Shows the IP address of the Field Assistant web server
markdownload commands:	These commands place the controller for the selected tree item on the list to download at a later time.
markdownload	Marks for an All Content download, that includes parameters, schedules, and BBMDs (if applicable).
markdownload p	Marks for a Parameters download.
markdownload s	Marks for a Schedules download.
memory	Shows the amount of server memory allocated for the Field Assistant application and the amount being used.
memory -free	Releases unused server memory, then shows the Field Assistant memory usage before and after the release.
modstat commands:	These commands display a *Modstat* (page 87) report. **NOTE** It is not necessary to download a controller before running a Modstat on it. Binding takes place when you run the modstat.

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Command	Description
modstat	Displays status of the controller at the current location, including: • Hardware components of the device • Software components of the device • Error conditions that may exist in the device • Date and time the device is using
modstat 8:<device instance number>	Displays status for a specific controller in the IP network using the controller's ID. Your location in the system does not have to be the controller you are querying. For example: `modstat 8:489202`

modstat mac:<network number>,<media type>: <mac address>	Displays a Modstat for a specific controller in the system using the controller's MAC address. Network number is the number of the network this controller is on; media type is the type of network the controller is on; MAC address can be either the controller address or the IP address and depends on the controller's media type.
	Media types allowed are:
	• bacnet/ip or b
	• ms/tp or m
	• ethernet or e
	For example:
	`modstat mac:48161,arcnet:2`
	or
	`modstat mac:888,bacnet/ip: 172.16.101.119`

paramupload	Uploads parameters (editable properties) to the Field Assistant application from the equipment or driver at the current location and below. If you want to upload editable properties for all equipment under a particular router, navigate to the router or the network on the navigation tree.
ping	Ping to verify communication between IP devices. You cannot ping devices on non-IP networks. To run this command type: `ping <hostname>` where <hostname> is the IP address or device name. For example: `ping 192.168.168.1` (will ping the IP address 4 times)
rebuild	Rebuilds a Properties page. Use if you make changes to control program property text in the Snap application.
reload	Reloads a control program. Use if you make changes to control program in the Snap application. Reloading updates all instances of the control program throughout the system and marks the controller(s) for download. The Field Assistant application determines the type of download based on what changed in the control program.
restartmodule	Restarts the current controller.
revert	Resets the selected driver or control program to its default values.

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Command	Description
setdefault	Sets the current page as the default view for the selected action button and the selected tree location.
shutdown	Shuts down the Field Assistant Server application. This stops communication between the server and the client, but does not close any open Field Assistant pages.
storetrends	Uploads trend data from the controller(s) to the database for all equipment at and below the selected item on the navigation tree. This command stores trend data for points that have Trend Historian enabled.
timesync	Synchronizes the time on all controllers at the current location and below to the time on the server. Run this command only from a location on the navigation tree. **NOTE** For CCN networks, executing a timesync on a controller sends the timesync to its Gateway, and all the controllers under that Gateway.
updatedriver commands:	
updatedriver	Updates the selected controller to the latest version of its driver.
whereami	Displays the full path for the current location and gives the display and reference names of the action button, category, instance and tab. If the selected tree location differs from the location shown in the action pane (for example, a point trend page), whereami returns information on both locations. Use this command when you create links in ViewBuilder.
zap	Restarts the current controller.

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Using DEBUG MODE

DEBUG MODE saves considerable time when troubleshooting custom control programs for programmable controllers. Typical operating mode in the Field Assistant application always downloads full source, which is time-consuming. While operating in DEBUG MODE, full source is kept in the database and is not downloaded to the controller.

CAUTION Never leave your Field Assistant system without unchecking DEBUG MODE first and then downloading all content. The source files are not in the controller until you complete both steps.

To use DEBUG MODE

1. Select the custom control program in the navigation tree and either double-click it or right-click and select **Configure**.
2. Check **DEBUG MODE**.
3. Download the new or edited control program. See *Working with control programs* (page 22).
4. Before logging out or switching to a different controller, select the control program in the navigation tree and either double-click it or right-click and select **Configure**.
5. Uncheck **DEBUG MODE**.
6. Download All Content from the **Devices** page > **Manage** tab or any page that has a **Download** button.

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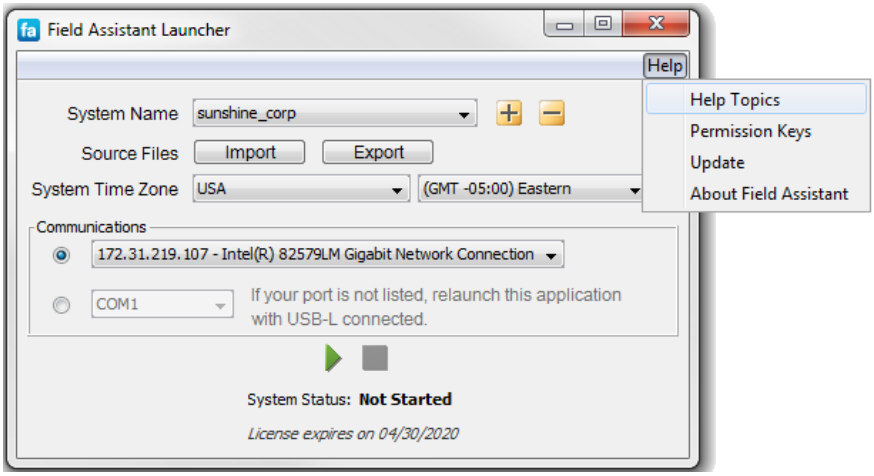
Permissions Keys

When control programs, views, touchscreen, and BACview® files are created by an original equipment manufacturer (OEM), they cannot be used in a Field Assistant system without the creator's permission. However, the creator can produce a key for a system with a different license that will grant permission to the key's recipient.

If you receive a key, put it in a convenient location on your computer. You may want to keep it in the **I-Vu_Tools_x.x** > **resources** > **keys folder**.

1 In the **Field Assistant Launcher**, click **Help** and select **Permission Keys** from the drop-down list.



2 To activate a key, click **Add**, browse to your key file and click **Open**.

3 To delete a key from your system, select the key in the table, then click **Delete**.

NOTE Red text in the table indicates the key has a problem such as it does not apply or has expired. See the **Notes** column for an explanation.

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Using a Modstat to troubleshoot your system

A Modstat (Module Status) provides information about a controller and verifies proper network communication with the controller.

To obtain a Modstat

You can get a controller's ModStat in the following places:

- Open device—In the Field Assistant application
- i-Vu® XT or TruVu™ device—In the Field Assistant application or the controller's setup pages

In the Field Assistant application

Use one of the following methods:

- Right-click a router or control program in the navigation tree, then select **Module Status**.
- Select a router on the navigation tree. On the **Properties** page, click **Module Status**.

In the controller's setup pages (i-Vu® XT or TruVu™ device only)

The **Service Port** on i-Vu® XT or TruVu™ controllers could be either an Ethernet or USB port. Also, the information shown on the controller setup pages is specific to the controller. See the controller's *Technical Instructions* for details on connecting the controller's Service Port to a laptop and on using the controller setup pages.

1. Connect the controller's Service Port to your laptop as specified in the *Technical Instructions.*
2. Turn off the computer's Wi-Fi if it is on.
3. If your computer uses a static IP address, use the following settings:
   - Address: 169.254.1.x, where x is 2 to 7
   - Subnet Mask: 255.255.255.248
   - Default Gateway: 169.254.1.1
4. If it uses a DHCP address, leave the address as it is.
5. Open a web browser on the computer.
6. Navigate to http://local.access or http://169.254.1.1 to see the Service Port controller setup pages.

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Modstat field descriptions

NOTE Modstats vary for different types of controllers. The list below describes all information that could appear on any Modstat. If a description differs between different generations of controllers, the generation is noted.

Field	Description
Date/Time	Date and time the Modstat was run
CM	The controller's rotary switch address (MAC address)
Model Name	Identifies the Product Type
Device Instance	A unique ID assigned to the controller
Driver built	When the driver was built
Downloaded by	When and where the last download was performed
Application Software Version	The name of the first control program that is downloaded
Flash Archive Status	Shows the validity, date, and time of the most recent archive of parameters and status to the controller's permanent flash memory. The archive takes place once a day.
# PRGs initialized # PRGs running	If applicable, the number of control programs that were downloaded vs. the number that are running. If these numbers are not the same, the controller has a problem such as lack of memory.
Firmware sections in flash memory	The name, version, and date of the driver
Reset Counters:	Open device: The number of times each of the following events have occurred since the last time the controller was formatted. i-Vu® XT or TruVu™ device: The number of times each of the following events have occurred since the last time the controller was commanded to clear the reset counters. See **NOTE** below this table.
Power failures	Interruption of incoming power
Brownouts	Low-level incoming power
Commanded boots	Includes commands issued from the Field Assistant interface such as the zap manual command, plus commands issued during a memory download.
System errors	Error in the controller's firmware or hardware
Watchdog timeouts	Watchdog is firmware that monitors the firmware for normal operation. If watchdog detects a problem, it restarts the firmware.
S/W Watchdog timeouts	Watchdog is firmware that monitors the application firmware for normal operation. If the watchdog firmware detects a problem, it restarts the application firmware.
H/W Watchdog timeouts	H/W Watchdog will restart the controller if it detects a severe problem with the controller's operating system
System status	Gives the current status of the controller's operation.
Network status	Gives the current status of the controller's networks.

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Field	Description
System error message history	Open device: High-severity errors since the last memory download or format. Shows the first 5 and last 5 messages. i-Vu® XT or TruVu™ device: High-severity errors since the last memory download. Shows the most recent 10 messages. See **NOTE** below this table.
Warning message history	Open device: Low-severity errors and warning messages since the last memory download or format. Shows the first 5 and last 5 messages. i-Vu® XT or TruVu™ device: Low-severity errors and warning messages since the last memory download. Shows the most recent 10 messages. See **NOTE** below this table.
Information message history	Open device: Information-only messages since the last memory download or format. Shows the first 5 and last 5 messages. i-Vu® XT or TruVu™ device: Information-only messages since the last memory download. Shows the most recent 10 messages. See **NOTE** below this table.
Manifest revision	Firmware revision
Installed bundles	Components of the firmware
ARC156 reconfigurations during the last hour	An ARCNET network normally reconfigures itself when a controller is added to or taken off the network. The **Total** field indicates the number of reconfigurations in the last hour. **Initiated by this node** indicates the number of reconfigurations initiated by this controller. Typical sources of the problem could be this controller, the controller with the next lower rotary switch address, any controller located on the network between these two controllers, or the wiring between these controllers. An excessive number in these fields indicates a problem with the network.
BACnet comm errors in the last 7 days	BACnet communication errors usually indicating dropped packets caused by high traffic on network.
Core (or Main) and Base board hardware	Gives the following information about the controller's boards: • Type and board numbers that are used internally by Carrier®. • The manufacture date and serial number. • Open device only: The core board's RAM and Flash memory. RAM is used for driver and control program executables. Flash memory is used for firmware and file storage. See **Flash storage size** below.
Number of BACnet objects	The number of BACnet objects that were created in the device and the number of those objects that are network visible.
Largest free heap space	Size of the largest piece of unused dynamic memory
Database size	Open device: Size of the controller's memory designated for running programs. Database memory is used for control program parameters, status and history; trends, schedules, and alarms; and driver parameters, status and history. i-Vu® XT or TruVu™ device: Size of the controller's memory.
Flash storage size	The size of the flash memory that is not used by the firmware. This memory is used for file storage and archiving.

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Field	Description
Archive storage size	The amount of flash memory remaining for archival after files are downloaded.
File storage size	The size of all files (control programs, graphics, driver, etc.) downloaded to the controller. How much information is in these files depends on whether the controller's **Download All Content** option is selected in Field Assistant.
Raw physical switches	The readings used to test the DIP or rotary switches
Network Information	Open device: The various network addresses for a controller installed on an Ethernet. The **Current** and **Assigned** addresses will be the same unless: • The Assigned addresses were changed in PuTTY. • The controller's **DHCP/Assigned** DIP switch was moved to the **DHCP** position after the Assigned addresses were defined. • The **Enable IP configuration changeover** on the **BACnet Router Properties** page is being implemented. i-Vu® XT or TruVu™ device: The various network addresses for the controller. The **Current** and **Assigned** addresses will be the same unless the **Enable IP configuration changeover** on the **BACnet Router Properties** page is being implemented.
Route Information	BACnet networks that a router is currently routing traffic to. The list changes as BACnet routers are added or removed from the system.
Ethernet statistics	Diagnostic counters directly related to the ethernet communications hardware.

NOTE i-Vu® XT or TruVu™ device only—If you want to clear the Reset counters and the three message history fields, click the **Clear Counts/Logs** button on the controller's **Properties** page in the Field Assistant application or in the i-Vu® XT or TruVu™ device's setup pages that you access through the Service Port.

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Document revision history

Important changes to this document are listed below. Minor changes such as typographical or formatting errors are not listed.

Date	Topic	Change description	Code*
4/8/25	To edit a screen file	Updated procedure for new interface	X-PM-RD-J-RD
	To select a different screen file		
	To change or upgrade a driver		
	Add or delete a custom control program and graphic		
	To update the SAL library		
	To edit a graphic from the Field Assistant application in ViewBuilder		
	To attach a graphic in the Field Assistant interface		
	To edit a control program		

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