

# WebVision™

## USER GUIDE

### PRODUCT DESCRIPTION

WebVision™ is a web-based building manager that allows contractors and facility managers to view and command HVAC controllers installed at their sites. It communicates over the LonWorks® network to perform building management control of various devices and controllers through a web browser. The WebVision Bundle (**WWS-VL1A1000**) includes the WebVision controller pre-installed with a LON communications card, and power supply.

WebVision is capable of:

- Discovering unitary controllers connected to WebVision
- Configuring controllers using configuration wizards
- Monitoring, raising, and e-mailing alarms on controller points and system events
- Configuring and collecting trends on points
- Driving scheduled occupancy states
- Managing energy through Demand Limit Control (DLC)
- Providing single point of entry into the system to perform all the above mentioned tasks.
- Managing access to information through user privileges
- Providing IT-friendly network interface for easy access and management

WebVision acts as an offline configuration tool that helps the contractor to configure site project that consists of multiple unitary controllers. The contractor can commission all the controllers by connecting through a LAN, WAN, or Dial-up.

WebVision also acts like a network time master to synchronize time and date in devices connected to it with its own time and date or with the Internet time servers. Its Device Discovery feature enables you to discover online devices. You can manage users and control their access to different resources in the system. The System Administrator can configure network settings, site information settings, system and control, network data and time settings, and new module installation.

### Approvals

UL 916, C-UL listed to Canadian Standards Association (CSA) C22.2 No. 205-M1983 "Signal Equipment", CE, FCC part 15 Class A, C-tick (Australia)

### CAUTION

**Make sure that there is not more than one WebVision accessing the same Lon® network simultaneously. If more than one WebVision accesses the same Lon network simultaneously, there may be problems in downloading and uploading parameters.**

NOTE: WebVision is compatible with Microsoft® Internet Explorer® (IE) 6.0 SP2 or higher. Suggested screen resolution is 1280x1024 pixels.

### IMPORTANT

*Make sure that there is only one WebVision accessing the LONWORKS network at a given point in time. If more than one WebVision accesses the same LONWORKS network simultaneously, ensure that its logical address is unique in the network to avoid address conflicts. For a LONWORKS network, logical address refers to Subnet/NodeID.*

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## FEATURES

- Support up to 120 XL10s, XL15Cs, VFDs, and 3rd Party LON devices
  - Perform Auto Discovery and Wizard based configuration of controllers
  - Support Default Alarms on each device
  - Support Default Trends on each device
  - Support default device graphic for each device
- Configure a maximum of 30 users and define their roles in accessing and configuring devices and WebVision
- Configure a maximum of 50 schedules
  - Configure and schedule device occupancy states
  - Assign up to 120 devices per schedule
- Configure a maximum of 100 trends
  - Store up to 1,000 samples per trend
- Configure up to 100 user defined alarms
  - Store and view up to 5,000 alarm records
  - E-mail alarm messages can be sent to a maximum of 50 e-mail addresses
- Configure up to 50 loads for Demand Limit Control
- Configure default and up to 50 user-defined graphics with support to command-able points

WebVision is built on Niagara-AX™ technology and extends the capabilities of WebStat™.

2. Type your WebVision login name in the **User Name** field.
3. Type your **Password**.
4. Click **Login** or press **Enter**. The **Properties** page appears.

### To log off from WebVision:

- Click the **Logout** link located on the right top of your screen to log off from WebVision. You are redirected to the WebVision **Login** page.

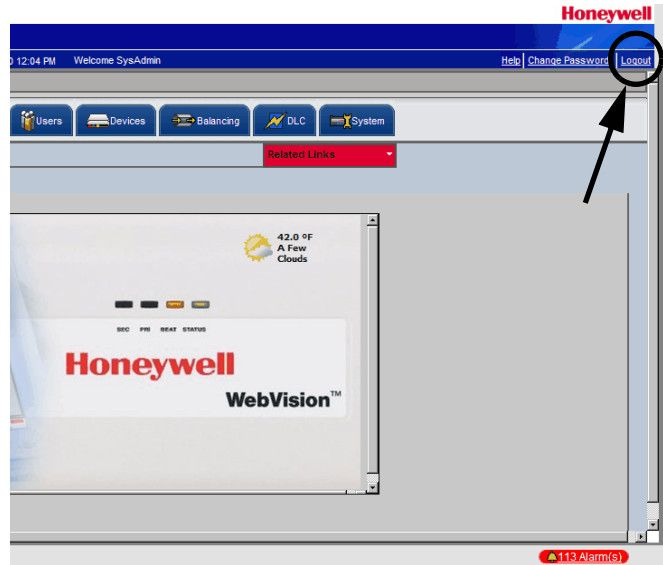


Fig. 2. Logout Link.

## OPERATION AND USE

This section describes how to use the WebVision controller.

### Sign-in

#### To log on to WebVision:

1. Type the WebVision web address (URL) in the Address field of Internet Explorer®. The WebVision **Login** page appears.



Powered by  
**niagara**  
AX  
 WebVision™, Version 01.00.12, Feb 10, 2010  
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Fig. 1. Login page.

### Password Reminder

To be reminded of your UserID or Password, if you have forgotten either of them, perform the following:

1. Type the WebVision web address (URL) in the **Address** field of Internet Explorer. The WebVision **Login** page appears.
2. Click **Forgot UserID or Password?** link on the **Login** page. You are directed to the **Password Reminder** screen.
3. Select your secret question (the one you selected while creating your user account).
4. Enter the answer to the **Password Reminder Question** (you are expected to enter the same answer that you gave while creating your user account).
5. Enter your E-Mail ID (same as in your user account). WebVision looks for account that matches the secret question, the answer to the question, and the e-mail Id. After validating, it sends the user Id/password to that e-mail Id.
6. Click **Submit**.

**Honeywell**

**NOTE:**  
To recover your UserID/Password please follow the steps below. The data you are entering here should be same as what is present in your account. After submitting your data, WebVision will validate it and send your UserID/Password to your configured email account. In case you do not receive email with in one day, you can assume either the information you have entered here is not matching with the information in your account or the emailing service in WebVision is not configured. In that case you should contact your system administrator to reset your password. After submitting this form, you will be redirected to login page again.

Select secret question:

Enter answer to the secret question:

Enter your email address:






**Fig. 3. Password Reminder screen.**

**TIP:** The information you provide is validated against the information present in the WebVision database. If the information is correct, WebVision will send the user ID and password to your E-Mail account.

**TIP:** If you do not remember the password recovery information and the answer provided by you is incorrect, you can request the WebVision Administrator to reset your password. In any other case, please contact the Honeywell Support for assistance.

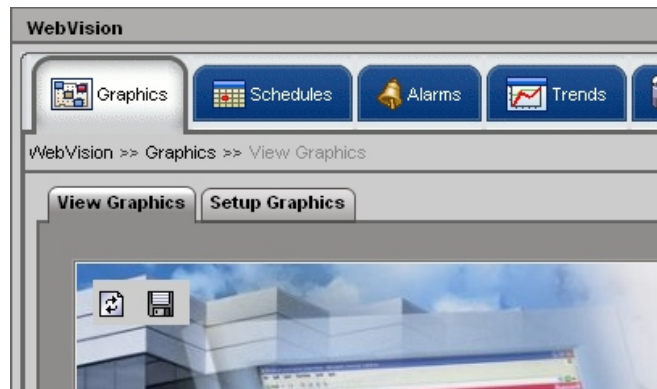
## Working with Tables

Click the column header of a column that you want to sort in ascending/descending order. Columns that you can sort are distinguished by an underlined column header. Tables are, by default, displayed in ascending order. However, for alarms, default display is in the reverse chronological order (the most current alarm is displayed on top).

- Click  to move to the next page.
- Click  to move to the previous page.
- Click  to move to the last page.
- Click  to move to the first page.
- Type the number of rows you want to view on each page in the text box next to .
- Type the page number that you want to navigate to in the Page field. This enables you to quickly move to the page of your interest without having to wade through all intervening pages.

## Graphics

A graphic is a pictorial illustration of a building's layout coupled with the placement of various devices within a building. With the help of a graphic you can view the various devices installed in your building.



**Fig. 4. Graphics Tab.**

There are 3 locations in the WebVision where you can view and setup graphics. These are:

- Network Tree > WebVision Node (Max 1 Graphic)
- Network Tree > Device Node. One graphic for each device. This is the default device graphic. You can add a maximum of three links on the graphic pointing to an external URL or to another graphic.
- Location Tree. You can create user defined location hierarchy (as tree). For each location (tree node), there can be one user defined graphic. You can customize the graphic and set a background image, monitor and command points, add links to external web sites, and add links to a different graphic.

You can insert the following in a graphic:

- Background images
- Points
- Devices
- Text
- External Links
- Links to other graphics

**NOTE:** Apart from the Contractor (who has all the privileges in WebVision) all the users who add/replicate new graphics have access to all the graphics created by them.

### To view a graphic:

1. Click the **Graphics** tab. The **View Graphics** page appears.
2. Select the graphic you want to view from the list. The selected graphic appears.

### To setup a graphic:

1. Click the **Graphics** tab. The **View Graphic** page appears.
2. Click **Setup Graphics**. The **Setup Graphics** page appears.

Use the following options to configure graphics:

**TIP:** Move the pointer over any button. A tool tip appears describing the action performed by the button.

### To insert a background image:

NOTE: The supported background image formats include: jpg, jpeg, and gif.

The size of the image file must not exceed 1MB.

1. Click the **Insert Background Image** button. The **Insert Background Image** dialog box appears.



Fig. 5. Insert Background Image dialog box.

2. Browse and select an image that you want to use as background image.
3. Click **Upload** to insert the image.

NOTE: To abort the action, click **Cancel**.

### To insert a point:

1. Click the **Insert Point** button. The **Insert Point** dialog box appears.



Fig. 6. Insert Point dialog box.

2. Select the Channel, Device, and Point that you want to add to the graphic from the corresponding drop-down lists.
3. Click **OK**. The Point properties are displayed in the background image.

NOTE: To abort the action, click **Cancel**.

### To insert text:

1. Click the **Insert Text** button. A **Text Message** box appears.



Fig. 7. Text Message Box.

2. Type the required text in the **Edit Text** field.
3. Click **Save** to reflect the changes in the image.

NOTE: To abort the action, click **Cancel**.

### To insert an external link:

1. Click the **Insert External Link** button. The **Add Link** dialog box appears.



Fig. 8. Add Link dialog box.

2. Select a link from the Link To drop-down list. You can select from Device Graphics, Locations Graphics, or an External URL.
3. If you select the Device Graphics option, the **Insert Device** dialog box appears. Select a Channel and Device and click **OK**.
4. If you select the Locations Graphics option, the **Add Link** dialog box appears. Check the locations that you want to add as link and click **OK**.
5. If you select the External URL option, the **Insert External Link** dialog box appears. Type the Display name for the url and type the url in the URL field.
6. Click **OK** to view the URL in the image.


NOTE: To abort the action, click **Cancel**.

NOTE: A maximum of fifty links can be inserted in a graphic in WebVision.

**To delete selected objects:**

1. Select the object that you want to delete from the graphic.
2. Click **Delete Selected** objects. The selected object is deleted.

**To copy graphics:**

1. Click the  button. The **Copy Graphics From** dialog box appears.
2. Click **Delete Selected** objects. The selected object is deleted.

**Schedules**

Schedules define the days and times when an occupancy event must occur. Schedules are weekly calendars for occupancy mode changes. Schedules also contain special event information such as holidays or unplanned events.

NOTE: You can have a maximum of 50 schedules in WebVision.

You can create, modify or delete a schedule only if you have these privileges assigned to you.

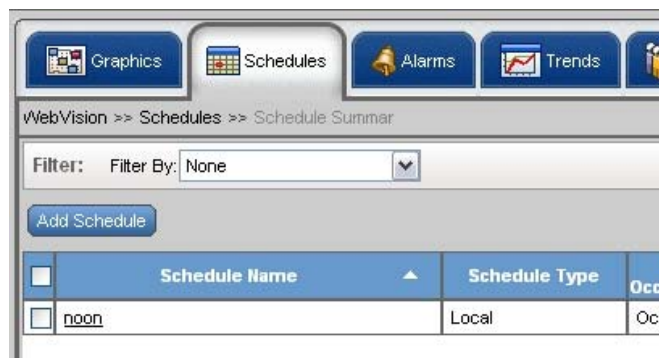
There are three occupancy modes:

- **Occupied** – A period of time when the controlled environment is considered to be occupied. It requires a closer control for comfort, health, and safety.
- **Unoccupied** – A period of time when the controlled environment is considered to be unoccupied. It is used to reduce energy consumption.
- **Standby** – A period during the normal occupied period when the space may not be occupied. It is used for energy saving programs.
- **No Event** – WebVision displays the default state as Occupied when no event is configured.

NOTE: Apart from the Contractor (who has all the privileges in WebVision) all the users who add new schedules have access to all the schedules created by them.

**To view schedules:**

1. Click the **Schedule** tab. A list of schedules appear with the following details in a tabular format:



**Fig. 9. Schedule Tab.**

**TIP:** Use Filters to quickly search the required Schedules.

Use one of the following filter options to search for the required schedule:

- Schedule Name
- Current Occupancy State

**TIP:** To quickly search the schedules, type the first letter of schedule name or occupancy state, (as the case may be) in the **Keyword** text box and type \*. This lists all the names starting with the first letter that you have written in the **Keyword** text box.

- **Schedule Name** – Indicates the name of the schedule.
- **Schedule Type** – Indicates if the schedule is configured in the local system or followed from a remote system.
- **Current Occupancy State** – Indicates the occupancy state as defined by the schedule at the moment.

NOTE: A maximum of 100 devices can be assigned to a schedule.

- **Next Occupancy State** – Indicates the occupancy state for the next defined schedule.
- **Time Remaining (minutes)** – Indicates the time remaining in switching to next occupancy state.
- **Replicate** – Click Replicate to replicate the settings.

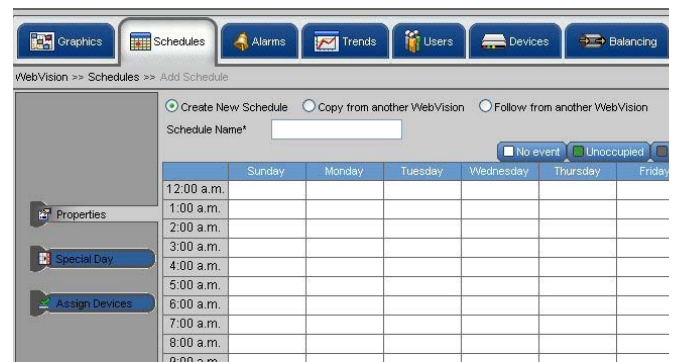
**Add/Edit Schedules**

You can add a maximum of 50 schedules.

NOTE: All fields marked with an asterisk (\*) are mandatory.

**To create a new schedule:**

1. Click the **Schedule** tab. A list of schedules appears.
2. Click **Add Schedule**. The **Properties** page appears.



**Fig. 10. Schedule Properties page.**

3. Select the **Create New Schedule** option.
4. Type a schedule name in the Schedule Name field and provide a description in the Description field.
5. Select the cells by dragging over the cells. Cells can be selected horizontally and vertically. After selecting the cells, click on the schedule occupancy state button to indicate the state on the selected cell.
6. Click **Apply** to apply the schedule.
7. Click **Finish** to save the settings.

NOTE: Click **Edit Time** and type the Start Time and End Time. You can change the start and end time of the selected area.



**To edit a schedule:**

1. Click the **Schedule** tab. A list of schedules appears.
2. Click the schedule that you want to edit by clicking the corresponding link in the Schedule Name column.
3. Follow the steps described in the above sections and make the required changes.

**Assign Devices**

You can select a number of devices and assign them to a current configuring schedule. You can change the settings as and when required.

**To assign devices:**

1. Click the **Schedule** tab. The **Schedule** page appears.
2. Go to **Add Schedule**. The **Add Schedule** page appears.
3. Type a unique name for the schedule.
4. Click **Assign Devices**. The **Assign Devices** page appears.
5. Check the devices from the Device Name list that you want to assign to the current schedule. All the devices that are already assigned to schedules are listed in the Currently Assigned Schedule column. If a device is already assigned to a schedule, WebVision un-assigns the device from the earlier schedule and assigns it to the current schedule.
6. Click **Finish** to save the settings.

NOTE: To abort the action, click **Cancel**.

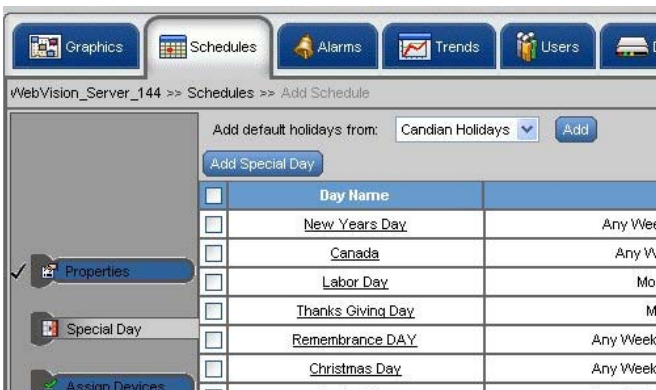
**Define Special Event**

Holiday schedules and schedules for special events differ from the normal days. You can define schedules for special events using WebVision.

NOTE: You can define any number of special events in a schedule.

**To define a schedule for special events:**

1. Click **Special Event** on the **Properties** page. The **Special Event** page appears.

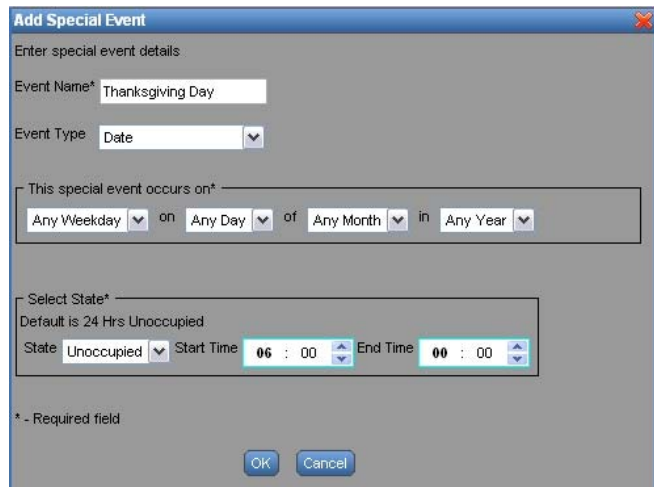


**Fig. 11. Schedule Properties page - Special Event.**

All the special events along with a summary appear in a tabular format.

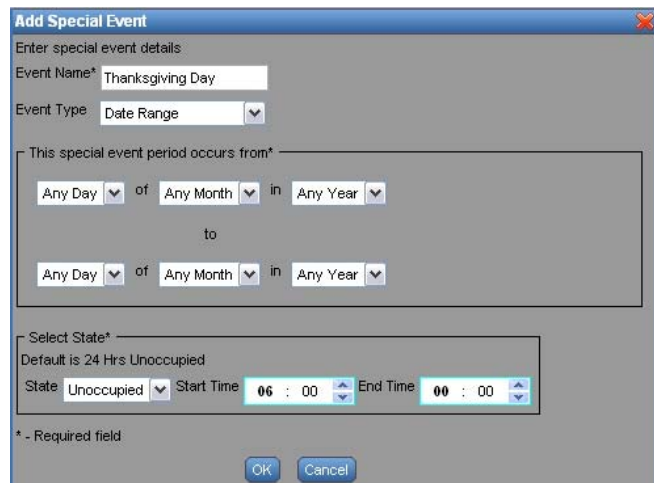
2. Click **Add Special Event**, to add new special events to the list. The **Add Special Event** dialog box appears.
3. Enter/select the following information:
  - **Event Name** – Name of the special event. Example: Thanksgiving Day.
  - **Event Type** – You can define the type of day using the three options given: Date, Date Range, and Week and Day. Depending on the selected criteria, you get the following output:

**Date** – If you select Date, specify the day, date, month, and year.



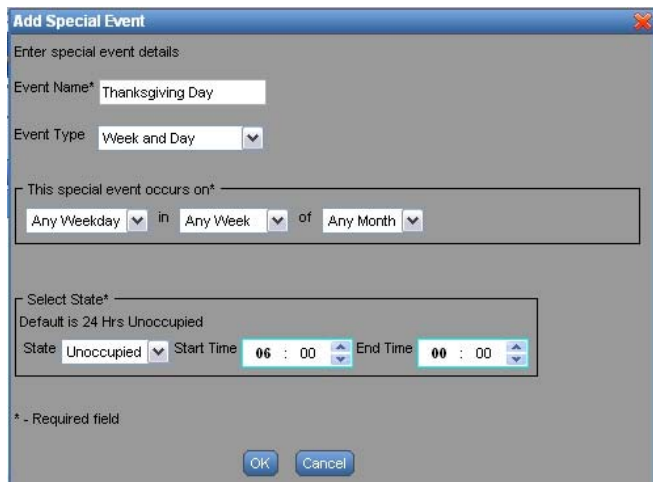
**Fig. 12. Add Special Event dialog box.**

**Date Range** – If you select Date Range, specify the date range, month, and year (Fig. 13).



**Fig. 13. Add Special Event dialog box - Date Range.**

**Week and Day** – If you select Week and Day, specify the month, week, and year (Fig. 14).



**Fig. 14. Add Special Event dialog box - Week and Day.**

4. Enter/select the following information under Select State
  - **State** – Occupied, Unoccupied, and Standby.
  - **Start Time** – The time to start the special event.
  - **End Time** – The time to end the special event.

NOTE: By default the occupancy state is 24 hours Unoccupied.

5. Click **OK** to save the settings.

NOTE: Click **Cancel** to close the window without saving the changes.

### Default holiday list

Table 1 and Table 2 list the default holidays for the US and Canada.

**Table 1. Default US Holidays.**

Name	Day
New Year's Days	January 1st
Martin Luther King Jr. Day	The third Monday in January
Presidents Day	The third Monday in February
Memorial Day	The last Monday in May
Independence Day	July 4th
Labor Day	The first Monday in September
Columbus day	The second Monday in October
Veterans Day	November 11th
Thanksgiving Day	The fourth Thursday in November
Christmas Day	December 25th

**Table 2. Default Canadian Holidays.**

Name	Day
New Year's Days	January 1st
Canada Day	July 1st
Labour Day	The first Monday in September
Thanksgiving Day	The second Monday in October
Remembrance Day	November 11th
Christmas Day	December 25th
Boxing Day	December 26th

### To add the pre-configured holidays:

1. Select the US Calendar or Canadian Holidays using the drop-down list on the **Special Event** page.
2. Click **Add**. The selected (US or Canadian) pre-configured list of holidays is added and is displayed in tabular format.

### IMPORTANT

*Special events are not executed if you commit an error in specifying them. WebVision cannot validate the dates you enter for a special event. No error is shown if you configure wrong dates for special event, provided the dates are in the specified format.*

## Delete Schedules

### To delete a schedule:

1. Click the **Schedule** tab.
2. Select the check box corresponding to the schedule you want to delete from the Schedules Name list.
3. Click **Delete**. A confirmation message appears.
4. Click **OK** to confirm the deletion.

NOTE: Click **Cancel** to cancel deletion.

**TIP:** To delete all schedules at once, check the **All** check box in the header and click **Delete**.

## Replicate Schedule

You can replicate one schedule at a time. A maximum of 10 copies of the selected schedule can be replicated. Click **Replicate** to replicate that schedule.

### To replicate a schedule:

1. Click the **Schedule** tab.
2. Click **Replicate**. The **Replicate Schedule** box is displayed.
3. Enter the number of copies that you want to create.
4. Add a prefix or suffix to the new replicated schedule's name in the **Label** text box.
5. Click **OK** to confirm the replication.

NOTE: Click **Cancel** to cancel replication.

# Alarms

## Viewing alarms

A device configured with alarm settings is set when the value of a point satisfies the alarm condition of that device.

Use the Alarms tab to view and acknowledge alarms that are raised on various devices. You can filter alarms based on occurrence, acknowledgment status, ack time, RTN time, priority, and so on. You can setup alarms, define their limits, and prioritize them. You can also acknowledge alarms and delete acknowledged alarms.

Alarm priorities can be set for each type of alarm condition. The alarm priority can range from 1 to 10 and is used to determine E-Mail alarm message recipients. High priority alarms have a higher reporting priority. For example, system alarms (for example, low battery) are always high priority.

E-Mail alarm messages can be sent to a maximum of 50 E-Mail addresses. Any E-Mail alarm message can be sent to any combination of 50 E-Mail addresses based on the priority assigned.

When you add a device, all the default alarms present in that device are added to WebVision. All the default alarms are enabled.

An alarm is raised when the value of a point on a device on which an alarm condition is configured satisfies the alarm condition. The **View Alarms** page displays a list of alarms raised on devices along with information such as description of the alarm, occurrence time of the alarm, the time when the alarm was acknowledged, return to normal time, the priority of the alarm, and so on.

### To filter and view alarms:

1. Click the **Alarms** tab. The **View Alarms** page appears. The following information appears in a tabular format:

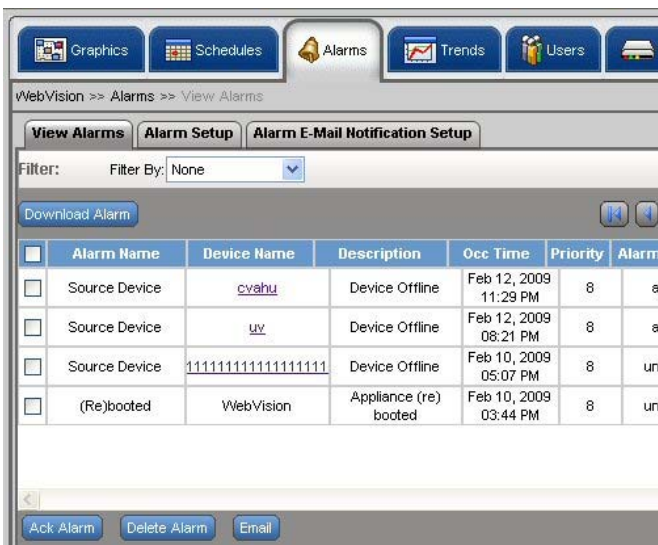


Fig. 15. Alarms Tab.

NOTE: Select the check box in the header row to select all the listed alarms.

- **Alarm Name** – List of all alarm names.
- **Device Name** – Lists all devices on which alarms are set. To view the details of any device, click the respective device.
- **Description** – Indicates the condition that raised the alarm.
- **Occurrence Time** – Indicates the date and time when the alarm was raised.
- **Priority** – Indicates the priority level of an alarm. There are ten priority levels defined in WebVision - 1 through 10. 1 is low and 10 is the highest priority level.
- **Alarm State** – Indicates alarm acknowledgement status.
- **Acknowledged by** – Indicates the user who acknowledged the alarm.
- **Acknowledge Time** – Indicates the date and time when the alarm was acknowledged.
- **Return to Normal Time** – Indicates the date and time when the alarm returned to the normal condition.

TIP: Check the **Enable Auto Refresh** check box to enable the auto refresh feature. The page is refreshed every 30 seconds.

### To acknowledge an alarm:

1. Click the **Alarms** tab. The **View Alarms** page appears.

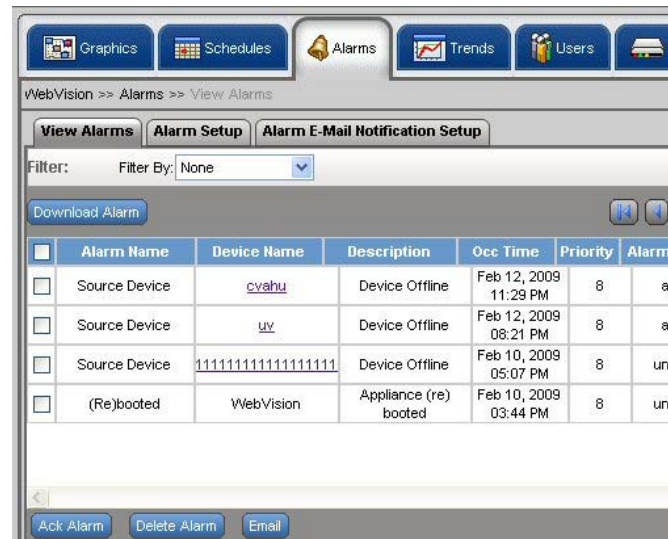


Fig. 16. View Alarms page.

2. Select the check box corresponding to the alarm you want to acknowledge.
3. Click **Ack Alarm**.
4. The alarm is acknowledged. The time and date when the alarm is acknowledged appears in the Ack Time column. The user name is displayed in the Ack By column.

TIP: Select the check box in the header row to select all the alarms for acknowledgment simultaneously.



## Exporting Alarms

You can export alarms on WebVision.

### To export alarms:

1. Click the **Alarms** tab. The **View Alarms** page appears.
2. Click **Export All Alarms** to download all the alarms at once.
3. A .csv file is displayed.
4. Click **Open** to open the file and click **Save** to save the file on your computer.

### To E-Mail alarms:

1. Select the alarms you would want to e-mail by clicking the corresponding check boxes.
2. Click **E-Mail**. An **Enter Email Addresses** box is displayed. Enter a list of e-mail addresses to which the selected alarms must be E-Mailed. The list must be separated by a semicolon (;).
3. Click **Ok**. The selected alarms are E-Mailed to those recipients.

## Alarm Configuration and Use

### To add new alarms:

1. Click the **Alarms** tab. The **View Alarms** page appears.
2. Click the **Alarm Setup** tab on **View Alarms** page. The **Alarm Setup** page appears.

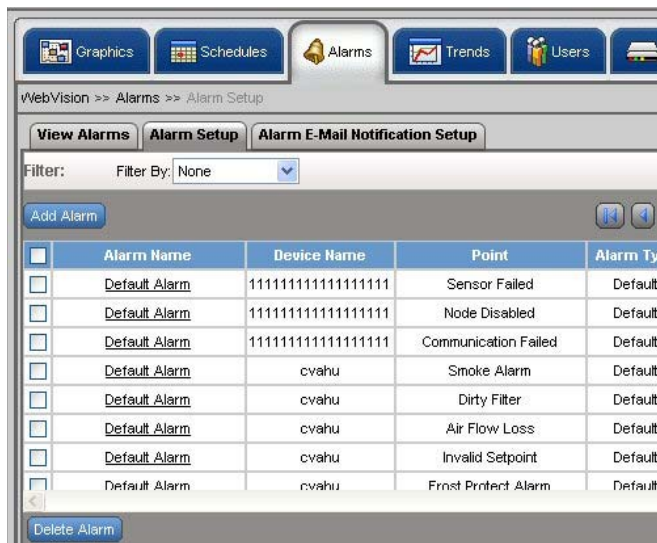


Fig. 17. Alarm Setup page.

3. Click **Add Alarm**. The **Add Alarm** page appears.
4. Enter the Alarm Name and select the desired Points:
  - **Alarm Name** – The name of the alarm.
  - **Select Points:**
    - **Channel** – The selected channel.
    - **Device** – The selected device.
    - **Point** – The selected point.
    - **Select Point** – Click **Select Point**. The **Select Point** dialog box is displayed. Select a Channel, Device, and Point from the corresponding drop

down list. The selected values are reflected in the Alarm Setup screen. Type a Display Name for the point.

**NOTE:** The alarm condition depends on the type of selected point. If it is a numeric point, you must provide Alarm High Limit and Alarm Low Limit. If it is a discrete value (Enumerated or Boolean) point, then select an alarm value in the possible point value list in the combo box.

**Example:** For Occupancy State, you can select alarm value as Unoccupied in which case WebVision raises an alarm whenever the point has Unoccupied as its value.

- **Select Alarm value** – This option is available for enum and boolean values. Select the required alarm value from the drop down list.
- **Limits:**
  - **High Limit** – Select or type the higher limit of a device beyond which an alarm is raised.
  - **Low Limit** – Select or type the lower limit of the device below which an alarm is raised.

**NOTE:** For numeric values, Limits are listed and for enum and boolean values the Select Alarm Value is listed.

- **Description** – Description of the alarm.
  - **Set Priority As** – Indicates the priority of the alarm. Set 1 for low priority and 10 for High priority. It can be Low, Medium, or High. Priority is configured depending on the device's configurations and settings
  - **Enable** – Click Yes to enable the alarm along with its configuration. Checking this option, displays the alarm in the **View Alarms** page. Click No to disable the alarm.
5. Click **Save** to save the settings.

### To edit an alarm configuration:

1. Select an alarm from the alarm's list to edit it. The selected alarm's details appear.
2. Modify the required fields as described in step 4 of "To add new alarms:".
3. Click **Save** to save the settings.

**NOTE:** You can enable or disable an alarm from the Alarm Setup screen. For example, click **Disable** from the table on the **Alarm Setup** page to disable an alarm.

### To delete an alarm:


1. Click the **Alarms** tab. The **View Alarms** page appears.
2. Select the check box corresponding to the alarm you want to delete.
3. Click **Delete Alarm**. A confirmation message appears.
4. Click **OK** to confirm the deletion.

**NOTES:**

1. Click **Cancel** to cancel the deletion.
2. Only Acknowledged Alarms can be deleted.

**TIP:** To delete all alarms at once, select the **Alarm Name** check box and click **Delete Alarm**.

### To replicate an alarm:

1. Click the **Alarms** tab. The **View Alarms** page appears.
2. Click the **Alarm Setup** tab on the **View Alarms** page. The **Alarm Setup** page appears.
3. Click  corresponding to the alarm that you want to replicate. The **Replicate Alarm** dialog box appears.
4. Type the alarm name in the **Alarm Name** text box.
5. Select an alarm and device that you want to replicate from the Replicate Alarm and Device drop-down list.
6. Choose a prefix or suffix to name the replicated copy of the alarm. Select the Prefix with or Suffix with option as required.
7. Type a label name for the alarm in the **Label** text box.
8. Click **Replicate** to confirm the replication.

NOTE: Click **Cancel** to cancel the replication.

### To setup alarm E-Mail notification:

1. Click the **Alarms** tab. The **View Alarms** page appears.
2. Click the **Alarm E-Mail Notification Setup** tab on the **View Alarms** page.

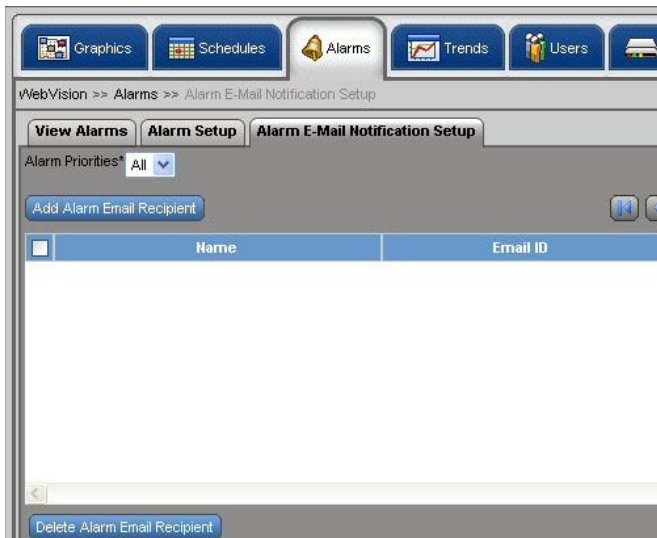


Fig. 18. Alarm E-Mail Notification Setup Tab.

3. The **Alarm E-Mail Notification Setup** page appears with the following information in the tabular format:

**TIP:** Select the check box in the header row to select all the listed alarms e-mail recipients.

- **Name** – Lists names of the users who will receive the alarm E-Mail notification.
- **E-Mail ID** – Lists the E-Mail IDs of the corresponding users.
- **Recipient Type** – Lists the type of user.
- **Associated Alarm Priorities** – Lists the alarm priorities associated to the corresponding user if the user is external. Alarm priorities range from 1 to 10. 1 being the lowest priority level and 10 being the highest priority level. Check Select All to select all the alarm priorities.

### Add, Edit, or Delete Alarm E-Mail Recipient

#### To add an alarm E-Mail recipient's details:

1. Click the **Alarms** tab. The **View Alarms** page appears.
2. Click the **Alarm E-Mail Notification Setup** tab on the **View Alarms** page. The **Alarm E-Mail Notification Setup** page appears.
3. Click **Add Alarm E-Mail Recipient**. The **Add Alarm E-Mail Recipient** page appears.
4. Select the recipient type using the Select Recipient Type drop-down list.
  - For an External recipient, enter:
    - **Recipient Name** – Name of the recipient.
    - **Recipient E-Mail ID** – E-Mail ID of the recipient.
  - For an Internal recipient, enter:
    - **Select User** – Select the type of the user using the drop-down list.
5. Select the alarm priorities that must be informed to the recipient. Check the **Select All** check box to select all the alarm priorities.
6. Click **Save** to add a new recipient.

NOTE: Click **Cancel** to abort the action.

#### To edit an alarm E-Mail recipient's details:

1. Click the **Alarms** tab. The **View Alarms** page appears.
2. Click the alarm name that you want to edit. The **Alarm Setup** page of the selected alarm appears.
3. Edit the fields as explained in step 3 of “To add an alarm E-Mail recipient's details:”.
4. Click **Save** to save the changes.

NOTE: Click **Cancel** to abort the action.

NOTE: The alarm priority information for internal user is available in the user account configuration page.

#### To delete an alarm E-Mail notification recipient:

1. Click the **Alarms** tab. The **View Alarms** page appears.
2. Click **Alarm E-Mail Notification Setup**. The **Alarm E-Mail Notification Setup** page appears.
3. Select a user from the Name list that you want to delete.
4. Click **Delete** to delete the selected recipient.

**TIP:** To delete all recipients at once, check the **All** check box in the header and click **Delete**.

### Trends

Trends depict the values of points over time in a graphical format. Use the **Trends** tab to view trends for the selected points over a period ranging from a day to a year.

You can store a maximum of 1000 samples per trend. By default you can store 500 samples per trend. Once you cross the limit, the oldest sample is overwritten and rolled over based on trend configuration. Five trends can be plotted simultaneously. For example, outside air temperature and space temperature plotted for a period of one month.

A trend point can be a data point from any supported LONWORKS network device. A data point can be used in multiple trend configuration. There are few default sample

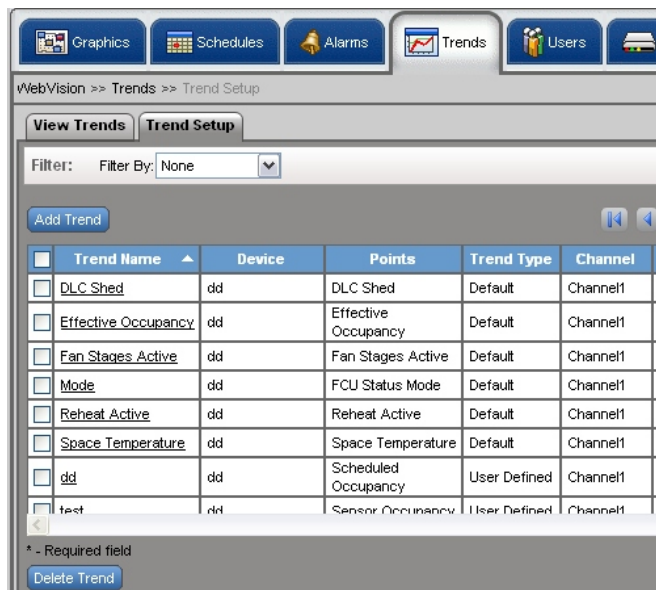
trends stored in WebVision. You cannot delete these sample trends. However, you can create new trends. The trends created by you are called User Defined trends.

When you add a device, all the default trends present in that device are added to WebVision. All the default trends are disabled.

You can create and view a maximum of 100 trends.

### To view trends:

Click the **Trends** tab. The **View Trends** page appears with the following information:



**Fig. 19. Trends page.**

- **Trend Name** – The unique name for the Trend.
- **Device** – Indicates the location on the device.
- **Points** – Indicates the points whose readings are required to generate a trend.
- **Trend Type** – Indicates type of trend. For instance it can be a user defined trend.
- **Channel** – Indicates the channel on which the devices are present.
- **Sampling Interval** – Indicates the time interval between two successive read operations on the point. One hour is the default setting.

The sampling interval time can range from a few minutes to a day. The range covered is:

- 15 seconds
- 30 seconds
- 60 seconds (1 minute)
- 900 seconds (15 minutes)
- 1800 seconds (30 minutes)
- 2700 seconds (45 minutes)
- 3600 seconds (60 minutes)

- **Enable/Disable** – Indicates if a trend is enabled or disabled. Click the Enable or Disable buttons to enable/disable the trend.

**TIP:** Use Filters to quickly search the required trend.

Use one of the following filter options to search for the required trend:

- Channel Name
- Trend Type
- Trend Name
- Device Name
- Point Name
- Point Group

**TIP:** To quickly search the trends, type the first letter of the required filter criteria in the **Keyword** text box and type an asterisk (\*). This lists all the names starting with the first letter that you have written in the **Keyword** text box.

### Plotting trends

NOTES:

1. A security warning message appears when you access the **Trends** page and prompts you to download the applet. Click Yes to continue.
2. A Java plug-in version 1.6 and above must be installed to view the trend chart.

### To plot a trend:

1. Click the **Trends** tab. The **View Trends** page appears.
2. Select a trend from the Configured Trends list to plot.
3. Click **Plot Trend**. The **Plot Trend** dialog box appears.
4. Enter the following parameters:
  - Select **Start Time** – Click to select the start date and enter the start time in hours and minutes.
  - Select **End Time** – Click to select the end date and enter the end time in hours and minutes.

NOTE: Start time must be less than the end time.

5. Click **OK** to view the graphical representation of the trend or click **Cancel** to cancel the trend.

### Viewing plotted trends

The view of the trends plotted have the following information:

- **Plotted Trends** – Lists the name of the trends that are plotted.
- **Start Time** – Select the start time, if required.
- **End Time** – Select the end time, if required.
- **Re-Plot Trends** – After selecting the Start and End time select this option to re-plot the trend with the new time range.
- **Download Trendlog** – Click this button to download trend log in .csv format for the plotted trends.
- **Ok** – Click Ok to go back to the View Trends screen.

## Trend Setup and Use

**TIP:** You can enable or disable trends from the Trends Setup screen.

### To setup a trend:

1. Click the **Trends** tab. The **View Trends** page appears.
2. Click the **Trend Setup** tab. The **Trend Setup** page appears.

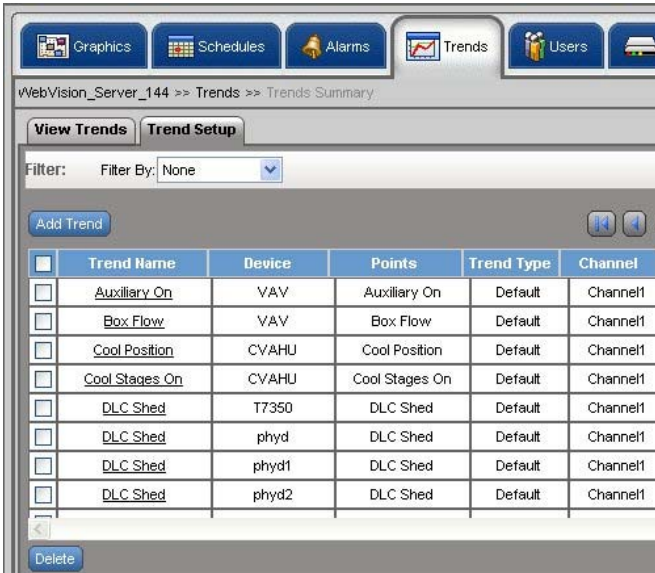


Fig. 20. Trend Setup tab.

### To add a new trend:

1. Click the **Trends** tab. The **View Trends** page appears.
2. Click the **Trend Setup** tab. The **Trend Setup** page appears.
3. Click **Add Trend**. The **Add New Trend** page appears.
4. Enter/select the following details:

**NOTE:** All the fields in this section are mandatory.

- **Trend Name** – The unique name for the trend.
- **Select Point** – Click Select Point. Select a Channel, Device, and Point. The selected values appear in the respective fields.

**NOTE:** Start time must be less than the end time.

- **Start Time** – The start time of the sampling period. Click to select the date, month, and year
- **End Time** – Check Enable End Time to enable the end time field. The end time of the sampling period. Click to select the date, month, and year.
- **Trend Type** – Indicates the type of trend.
  - **Periodic Sampling** – Indicates the time interval between two successive read operations on the point. Select Periodic Sampling option and in the Sampling Interval list, select the desired time interval.

The sampling interval time can range from a few seconds to a few minutes. The range covered is:

- 15 seconds
- 30 seconds
- 60 seconds (1 minute)
- 900 seconds (15 minutes)
- 1800 seconds (30 minutes)
- 2700 seconds (45 minutes)
- 3600 seconds (60 minutes)
- **Change of Value** – Indicates that the next sample is collected when the point value changes. This results in less number of samples getting collected for plotting the same trend as compared to Periodic Sampling. Change Tolerance is required only for numeric points. Select a numeric point from the Select Point option and type a tolerance value after which the data logging begins.
- **Trend Limit** – Roll Over is the default selection. This option trends the point forever.
  - **Roll Over** – Indicates that the readings of sampling are generated continuously. When the sample limit is reached, the oldest sample is replaced with the next sample and trending continues in that fashion.
  - **Stop when full** – Indicates that the trend sampling is stopped after it reaches the set limit.
- **Max number of Samples** – The maximum number of samples. Select the number of samples to be generated from the list.

**NOTE:** WebVision uses the polling mechanism to read point values at regular interval. It may take up to 30 seconds to detect a point value. If the point value changes at a higher frequency than 30 seconds, WebVision may not be able to detect the changes.

5. Click **Save** to save the settings.

**NOTE:** Click **Cancel** to clear the fields.

### To edit trends:

1. Click the **Trends Setup** tab. The **View Trends** page appears.
2. Select a Trend from the Trends list. The details of the selected Trend appear.
3. Modify the required fields as described in step 4 of “To add a new trend.”.
4. Click **Save** to save the settings.

**NOTE:** Click **Cancel** to cancel the settings.

### To delete a trend:

1. Click the **Trends** tab. The **View Trends** page appears.
2. Go to Trends Setup. Select the trend that you want to delete from the Trends listed on the left corner of the screen.
3. Click **Delete**. A confirmation message appears.
4. Click **OK** to confirm the deletion.

**NOTE:** Click **Cancel** to cancel the deletion.

**TIP:** To delete all the trends simultaneously, select the check box in the column header and click **Delete Trend**.



## Users

You can create a maximum of 30 user profiles. You must be familiar with User ID and Password security standards to enforce user compliance when creating a user profile. As WebVision is a secure server, you need to log in with a pre-assigned user ID and password. The user ID and password combination determine your access level, which in turn determine the kind of operator and configuration functions performed.

The Network Administrator must be familiar with user ID and password security standards and enforce user compliance. The WebVision System Administrator can be accessed using these initial default user ID and password: User ID - **SysAdmin** and Password - **!Sys!Admin**.

It is a good practice to add one or more additional users with Administrator access level to ensure top level access to WebVision. Those with higher access levels have the privileges of all the lower levels in addition to the privileges unique to that level. These access levels are managed by the System Administrator. There can be an individual or many System Administrators who are assigned the task of managing individuals at different access levels.

NOTE: For security compliance, it is mandatory to change your password after the initial login process. Once changed, the default password will no longer work. Exercise care to create a new password that meets the security standards and can be easily remembered by the System Administrator.

Use the **Users** tab to add users, assign devices to them and define their privileges based on their roles. There are four types of user roles (see Table 3):

- **Contractor** - Contractor is a user with all the privileges assigned and can perform all tasks. **SysAdmin** is a user account with contractor privileges that cannot be deleted. The privileges cannot be altered. This is to ensure that there is at least one contractor available in the system.
- **Facility Manager** - This role represents a Building Engineer who maintains HVAC equipment and monitors the system with the help of WebVision.
- **Tenant** - The user assigned to this role has limited access to WebVision. The user with the Tenant role has access to only those devices which are assigned to the user.
- **Balancer** - Balancer is a user who performs VAV Balancing Job. The user assigned to this role has access to VAV devices for WebVision.

## Role Matrix

See Table 3.

Table 3. Role Matrix.

Privilege ID	Privileges	Depends On	Contractor	Facility Manager	Tenant
1	<b>Graphics</b>		pa	P	P
2	Change Controller Setpoints (temporary)	4	P	P	P
3	Override Schedule Occupancy	4	P	P	P
4	View Graphics		P	P	P

Table 3. Role Matrix. (Continued)

Privilege ID	Privileges	Depends On	Contractor	Facility Manager	Tenant
<b>Graphics (continued)</b>					
5	Edit Graphics	4	P	X <sup>b</sup>	X
6	Add Graphics	4	P	X	X
7	<b>Schedules</b>		P	P	P
8	View Summary Screen		P	P	P
9	View Schedule Configuration	9	P	P	P
10	Add Schedule Configuration	9	P	X	X
11	Edit Schedule Configuration	10	P	P	P
12	Delete Schedule Configuration	9	P	X	X
13	Assign Devices to Schedule	9,11/12	P	X	X
14	<b>Alarms</b>		P	P	P
15	View Alarms Summary		P	P	P
16	Acknowledge Alarms	16	P	P	X
17	Delete Alarms	16	P	X	X
18	View Alarms Configurations Summary		P	P	X
19	View Alarm Configurations	19	P	P	X
20	Add Alarm Configurations	19	P	X	X
21	Edit Alarm Configurations	20	P	P	X
22	Delete Alarm Configurations	19	P	X	X
23	Download Alarm Records as CSV Files	16	P	P	X
24	Suppress Alarms	19	P	P	X
25	Setup Alarm E-mail Notifications		P	P	X
26	View Priority 1 Alarms	16	C <sup>c</sup>	C	C
27	View Priority 2 Alarms	16	C	C	C
28	View Priority 3 Alarms	16	C	C	C
29	View Priority 4 Alarms	16	C	C	C
30	View Priority 5 Alarms	16	C	C	C
31	View Priority 6 Alarms	16	C	C	C

**Table 3. Role Matrix. (Continued)**

Privilege ID	Privileges	Depends On	Contractor	Facility Manager	Tenant
<b>Alarms (continued)</b>					
32	View Priority 7 Alarms	16	C	C	C
33	View Priority 8 Alarms	16	C	C	C
34	View Priority 9 Alarms	16	C	C	C
35	View Priority 10 Alarms	16	C	C	C
36	<b>Trends</b>		P	P	P
37	View Trend Graph		P	P	P
38	Download Trend Data CSV Files	38	P	P	X
39	View Trend Configurations Summary		P	P	X
40	View Trend Configurations	40	P	P	X
41	Add Trend Configurations	40	P	X	X
42	Edit Trend Configuration	41	P	P	X
43	Delete Trend Configuration	40	P	X	X
44	<b>Users</b>		P	P	
45	View User Summary		P	P	X
46	View User Account Information	46	P	P	X
47	Add New User Accounts	46	P	P	X
48	Edit User Accounts	47	P	P	X
49	Delete User Accounts	46	P	P	X
50	<b>Devices</b>		P	P	
51	View Device Summary	52	P	P	X
52	Discover Devices on the Network	52	P	X	X
53	Add New Device	52	P	X	X
54	Copy an Existing Device	52	P	X	X
55	Download/Upload Device Configuration	52	P	P	X
56	Delete Device	52	P	X	X
57	Invoke Device Configuration Wizard	52	P	P	X
58	Match Device	52	P	X	X
59	Change Setpoints	52	P	P	X

**Table 3. Role Matrix. (Continued)**

Privilege ID	Privileges	Depends On	Contractor	Facility Manager	Tenant
60	<b>System</b>		P	P	
61	General Configuration		P	P	X
62	IP Network Configuration		P	X	X
63	Mail Configuration		P	P	X
64	Change System Date and Time		P	P	X
65	Upgrade Firmware		P	X	X
66	Reboot System		P	P	X
67	Download System Load		P	P	X
68	Download Audit Log		P	P	X
69	Network Navigation		P	C	C
70	Physical Navigation		P	C	C
71	<b>WebSuite Network</b>		P	P	
72	View Appliance Summary		P	P	X
73	Discover Appliances on Network	73	P	X	X
74	Add New Appliance	73	P	X	X
75	Enable Network Firmware at Network Level	73	P	X	X
76	Change Master Ownership	73	P	X	X
77	Change Network User Password	73	P	X	X
78	<b>DLC</b>		P	P	
79	Configure DLC		P	X	X
80	View Load Summary		P	X	X
81	Add Load	81	P	X	X
82	Delete Load	81	P	X	X
83	Edit Load	81	P	X	X
84	Monitor DLC Status		P	P	X

- a The letter P means the role has that privilege.
- b The letter X means the role does not have that privilege.
- c The letter C means that the user can be given that privilege when configuring his/her account.

## View list of Users

The list of users provides information on WebVision users such as their names, roles, and e-mail IDs.

To view the list of users:

1. Click the **Users** tab. The **Users** page appears.

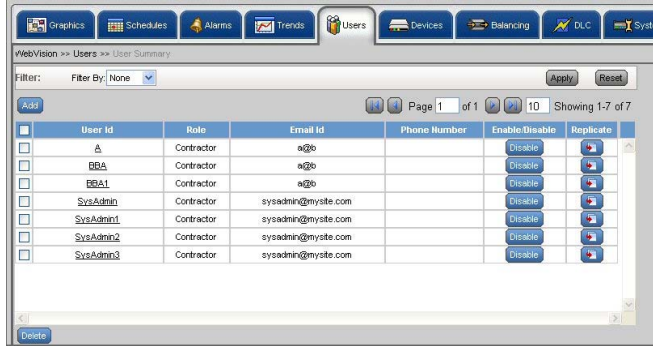


Fig. 21. Users page.

**TIP:** Use Filters to quickly search the required user.

Use one of the following filter options to search for the required user:

- User ID
- Role
- Email ID

**TIP:** To quickly search the users, type the first letter of the required filter criteria in the **Keyword** text box and type an asterisk (\*). This lists all the names starting with the first letter that you have written in the **Keyword** text box.

2. The following information appears in a tabular format:
  - **User Name** – Displays the name of the user name.
  - **Role** – Displays the role assigned to the user.
  - **Email ID** – Displays the user's e-mail ID for communication.
  - **Phone Number** – Displays the user's phone number.
  - **Enable/Disable** – Displays the user's status. Click Enable to enable the user or Disable to disable the user.

**NOTE:** Select the check box in the header row to select all the users listed.

## Add/Edit Users

While adding a user:

- Configure information related to User Name, Password, Contact Information, and User Role Information through the Properties tab.
- Assign Devices to the user being created using the Access on this WebVision tab.
- Add new User only in the WebVision that is configured as Network Server in networked WebVision.

## To add a user:

1. On the **Users** page, click the **Add User** button. The **Properties** page appears.

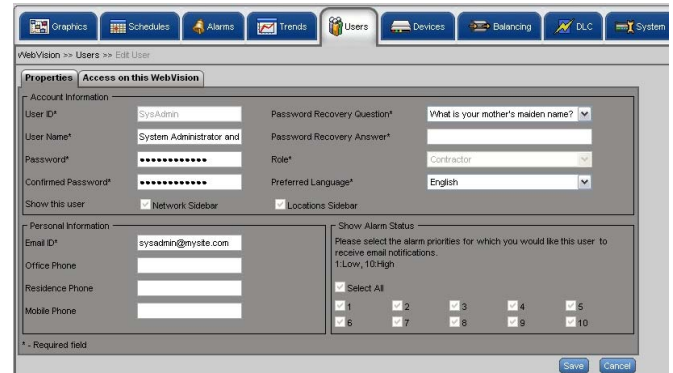


Fig. 22. Add User - Properties page.

2. Enter the account information of the user:
  - **User ID** – The unique user ID. It must have a minimum of 6 characters.

**TIP:** You can use a maximum of 30 characters and a minimum of 6 characters to set your user ID. The permitted characters include a-z, A-Z, \_, 0-9. The following characters are not allowed: !, @, #, \$, %, ^, \*, -, and |.

- **User Name** – The user name.
- **Password** – Type your password.

**TIP:** You can use a maximum of 30 characters and a minimum of 6 characters to set your password. The permitted characters include a-z, A-Z, \_, 0-9. The following characters are not allowed: !, @, #, \$, %, ^, \*, -, and |.

- **Confirm Password** – Retype your password.
- **Password Recovery Question** – Select the Password Reminder Question.
- **Password Recovery Answer** – Type an answer for the above question.
- **Role** – The role or designation of the user. Select the role from the list.
- **Show this user** – The view authorized to the user.
- **Network Sidebar** – The user is authorized to view only the network side bar view.
- **Locations Sidebar** – The user is authorized to view only the locations view.
- **Preferred Language** – The user defined language. Select the language from the list.

3. Enter the Personal Information of the user:
  - **Email ID** – Type the user's e-mail ID.
  - **Office Phone** – The user's office contact number.
  - **Residence Phone** – The user's residence contact number.
  - **Mobile Phone** – The user's mobile contact number.
4. Set the Show Alarm Status. Select the alarm priorities for which you want status update. The numbers are listed from 1 through 10. The user can see only those alarms whose corresponding priority is checked in this step. Check Select All to view all the alarms simultaneously.

- Click the **Access on this WebVision** tab. The **Access on this WebVision** page appears. You can select various options from Device Access, Schedule Access, and Locations View Access. Check Select All to select all the options simultaneously.

Use this option to assign customized access to users.



Fig. 23. Access on this WebVision page.

- Click Save to save the user properties.

**To edit a user:**

Select a user from the User list, and make the required changes as explained in the above section.

**To delete users:**

NOTE: Any user who has user management privileges can add or remove a user.

- On the **Users** page, click the name of the user you want to delete from Users Name column.
- Click **Delete**. A confirmation message appears.
- Click **OK** to confirm the deletion.

**IMPORTANT**

*SysAdmin is a user account with contractor privileges that cannot be deleted. A SysAdmin's privileges cannot be altered. This is to ensure that there is at least one contractor available in the system.*

**To enable/disable a user:**

- Click **Enable** to enable a user.
- Click **Disable** to disable a user.

**Devices**

**Device List**

You can view all the devices present in WebVision. All the information related to name, type, status, and so on is available.

**To view the list of devices:**

- Click the **Devices** tab. The **Device List** page appears. The following information appears in a tabular format:

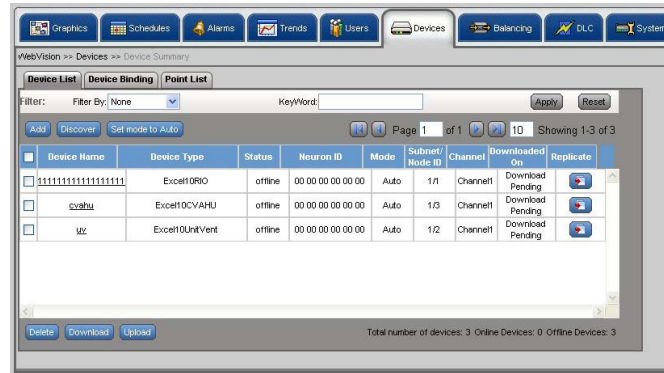


Fig. 24. Devices Tab - Device List page.

TIP: Use Filters to view the required list.

Use one of the following filter options to search for the required device: Channel, Device Name, Device Type, Status, Mode.

- **Device Name** – Name of the device.
- **Device Type** – Type of the device.
- **Status** – Status of the device, it can be online or offline.
- **Neuron ID** – Each LONWORKS Controller node has a 48 bit unique identifier, called the Neuron ID. This is used to address the nodes on the LONWORKS network.
- **Mode** – Mode of the device, it can be auto or manual.
- **Subnet/Node ID** – A mask that is used to determine the subnet of a network. Subnetting enables the network administrator to further divide the host part of the address into two or more subnets.
- **Channel** – The channel on which the device is present.
- **Synced On** – Date and time on which the device is last downloaded or uploaded.
- **Replicate** – Click Replicate to replicate the device settings.

**To add a device:**

- Click the **Devices** tab. The **Device List** page appears.
- Click **Add**. The **Add Device** dialog box appears. Enter the following details:



Fig. 25. Add Device dialog box.



- **Device Name** – Name of the device.
- **Channel** – The channel on which the device is present.
- **Device Type** – Type of the device.
- **Model** – Type the model number of the device.
- **Application Type** – Type of application that is required for the selected device.
- **Application Version** – Type the version of application used.
- **Application File** – Application that must run on the device. Click Browse to upload an application file.
- **Neuron ID** – The 48 bit unique identifier each LONWORKS Controller node has. This is used to address the nodes on a LONWORKS network.
- **Description** – Description of the device.

#### NOTES:

1. All the fields marked with an asterisk (\*) are mandatory. However, it is advised to provide all the information in the fields, so that WebVision can provide more manageable features.
2. The above listed parameters form a comprehensive list. The appearance of these parameters vary depending upon the selected device.
3. Click **Add** to add the device.

NOTE: Click **Cancel** to abort the action.

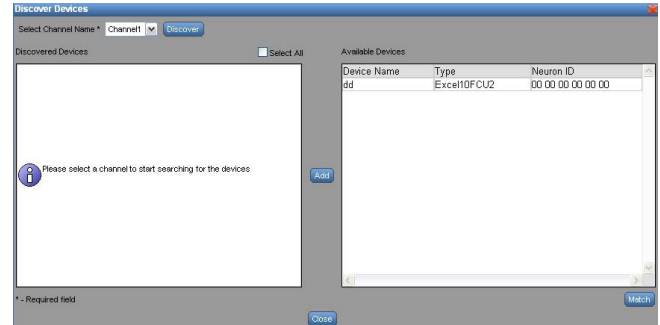
NOTE: To support 3rd party devices other than the controllers listed in the dialog box, you must have a corresponding Niagara LNML file that contains information about the device and its points. This file has to be uploaded while adding a device to WebVision. WebVision allows you to create alarms and trends on the 3rd party devices. WebVision cannot drive the device's scheduled occupancy state, do energy management using DLC, or do VAV balancing for 3rd party devices.

#### To discover devices:

You can discover the devices available on the network and then add them to WebVision.

NOTE: Once a device is selected in the Discovered Device table, only the matching device type in the Available devices table is enabled for selection.

1. Click the **Devices** tab. The **Device List** page appears.
2. Click **Discover**. The Discover Device in the network dialog box appears. The discovered devices are displayed.



**Fig. 26. Devices Tab - Device List - Discover button.**

3. Select a channel on which you want to discover devices.
4. Click **Discover** to start discovery. Once the discovery is completed, WebVision lists the discovered new devices on the left side list.
5. If you want to match a discovered device against an existing device in WebVision, select the discovered device on the left side list and select the existing device on the right side list and click Match.

NOTE: Check the **Select All** check box to select all the devices simultaneously.

6. Click **Add** to add discovered devices as new devices to WebVision. The selected device gets added to the Available Devices list.
7. Click **OK** to save the settings.
8. Click **Log** to view the discovery status.

NOTE: Click **Cancel** to abort the action.

NOTE: After discovering the devices you must upload the device bindings to save the existing bindings onto WebVision. This prevents you from losing the existing binding, while downloading the new binding. To upload, see "To upload device bindings:" on page 19.

#### Deleting Devices

Deleting a device removes it from the device list as well as from all other configurations such as trends, alarms, special displays, DLC and schedules. Any alarms generated before the device was deleted is still displayed on the **Alarms** page.

NOTE: You will not be able to see the deleted device in any of the pages until it is discovered and added using device add or discovery operation.

When you delete a device (that provides current power input), the DLC service is disabled. All the alarms generated by a device are available on the Alarms Summary screen. However, the link present on the device fails, when the device is deleted. Both trend configuration and trend data gets deleted from the database.

#### To delete a device:

1. Click the **Devices** tab. The **Device List** page appears.
2. Select the devices that you want to delete by checking the corresponding check box.
3. Click **Delete** to delete the devices.

4. Click **OK** to confirm the deletion.

**TIP:** To delete all devices at once, check the **All** check box in the header and click **Delete**.

## Set Mode to Auto

Sometimes when debugging a device, you set the mode to manual. The Set Mode to Auto feature is a simple option to set the devices back to auto mode.

### To set the devices to auto mode:

1. Click the **Devices** tab. The **Device List** page appears.
2. Select the devices that you want to set to auto mode.
3. Click **Set Mode to Auto** to set the devices to auto mode. A success message appears indicating that the devices have been set to auto mode.

**NOTE:** Check the **Select All** check box to select all the devices simultaneously.

## Download Device Configuration

Once you have made all of the necessary configuration settings to a device in WebVision, you will need to download the configuration to the device.

### To download a device:

1. Click the **Devices** tab. The **Device List** page appears.
2. Select the devices that you want to download by checking the corresponding check boxes.
3. Click **Download** to download the selected devices. The Downloading Device Information bar indicates the progress of download.
4. Click **Log** to view the download status.

**NOTE:** Click **Cancel** to abort the action.

## Upload Device Configuration

You can upload device configuration from a device on to WebVision.

### To upload configurations from a device:


1. Click the **Devices** tab. The **Device List** page appears.
2. Select the devices whose configurations you want to upload.
3. Click **Upload** to upload the settings.
4. Click **Log** to view the upload status.

**NOTE:** Click **Cancel** to abort the action.

## Replicate Devices

You can replicate existing devices in WebVision.

### To replicate a device:

1. Click the **Devices** tab. The **Device List** page appears.
2. Click  corresponding to the device that you want to replicate. The **Replicate Device** dialog box displays and the selected device displays in the Replicate Device list.
3. Select the number of copies that you want to create using the Number of copies to be created selection field.

4. Choose a prefix or suffix to name the replicated copy of the device. Select the Prefix with or Suffix with option as required.
5. Type a label name for the device in the **Label** text box.
6. Click **OK** to save the settings.

**NOTE:** Click **Cancel** to abort the action.

## Device Binding

Binding refers to a configured association either within a device, or between separate devices on a LONWORKS network.

### To view a list of bound devices:

1. Click **Devices** on the **WebVision** page. The **Device List** page is displayed.
2. Click **Device Binding**. The **Device Binding** page is displayed.

**NOTE:** Select the required channel from the Select Channel drop-down list.

3. The following information displays in tabular format:
  - **Source Device** – Lists the source device involved in the binding.
  - **Source Point** – Lists the network object/point of the source device that is involved in the binding.
  - **Target Device** – Lists the target device involved in the binding.
  - **Target Point** – Lists the network object/point of the target device that is involved in the binding.
  - **Link Status** – Shows the binding status. The status can be bound or unbound.

### To add devices for binding:

1. Click **Devices** on the **WebVision** page. The **Device List** page is displayed.
2. Click **Device Binding**. The **Device Binding** page is displayed.
3. Click **Add**. The **Add Device Binding** box is displayed.
4. Select the following:
  - Channel
  - Source Device
  - Source Point
  - Target Device
  - Target Point
5. Click **OK**. The binding is created in WebVision and has to be downloaded to the controllers.

### To delete bindings:

1. Click **Devices** on the **WebVision** page. The **Device List** page is displayed.
2. Click **Device Binding**. The **Device Binding** page is displayed.
3. Select a pair of bounded devices that you want to delete and click **Delete**. The bindings in WebVision are deleted. You have to invoke download to delete the bindings in the devices.

### To download device bindings:

1. Click **Devices** on the **WebVision** page. The **Device List** page is displayed.
2. Click **Device Binding**. The **Device Binding** page is displayed.

3. Click **Download**. The binding settings are downloaded on the selected channel.

### To upload device bindings:

1. Click **Devices** on the **WebVision** page. The **Device List** page is displayed.
2. Click **Device Binding**. The **Device Binding** page is displayed.
3. Click **Upload**. The binding settings are uploaded on the selected channel.

## Point List

### Point Group

Point groups are used for monitoring and diagnostics of controllers. You can create a maximum of fifty point groups in WebVision and add a maximum of fifty points to each point group.

### To view point groups:

1. Click the **Devices** tab. The **Device List** page appears.
2. Click the **Point List** tab. The **Point List** page appears with points present in the first point group.
3. The list of points is displayed with the following information in tabular format:
  - **Point Name** – Indicates the name of the point.
  - **Device Name** – Indicates the name of the device.
  - **Channel** – Indicates the channel being used.
  - **Value** – Indicates the value of the point. If the point is read only point, it appears as a label. If the point is writable point, it appears in a text box/select box with a Write button against it.
  - **Write** – Click Write to write a point value on a controller.

### To add a point group:

1. Click the **Devices** tab. The **Device List** page appears.
2. Click the **Points** tab. The **Point List** page appears.
3. Click **Add Point Group**. The **Add Point** page is displayed.
4. Type the name of the point group in the Point Group Name field.
5. All the points in that group are listed in a tabular format. Click Add Point to add a point. A point selection dialog comes up. Select a point and click **OK** to add the point to the group.
6. Repeat step 5 to add all the required points to the group.
7. Select the required points that you want to delete from the **Point List** page.
8. Click **Delete Point**. A confirmation message appears.
9. Click **Save** to save settings.

NOTE: Click **Cancel** to abort the action.

**TIP:** You can create a maximum of fifty point groups in WebVision and add a maximum of fifty points to each point group.

### To edit a point group:

1. Select a name of the point group that you want to edit in the Point Groups drop-down list.
2. Click **Edit Point Group**. The selected details of the Point Group are displayed. Follow the procedure as explained in step 4 of “To add a point group:” and make the required changes.

### To delete a point group:

1. Click the **Devices** tab. The **Device List** page appears.
2. Click the **Points** tab. The **Point List** page appears.
3. Click **Add Point Group**. The **Add Point** page is displayed.
4. Select a name of the point group that you want to delete in the Point Groups drop-down list.
5. Click **Delete Point Group**. A confirmation message appears.
6. Click **Yes** to delete the selected points.

NOTE: Click **No** to abort the action.

## Device Configuration

This section describes how to view and setup a device graphic and describes the configuration options.

### To view device graphic:

1. On the left corner of the screen, WebVision is listed. Expand WebVision to view all the devices associated with it.
2. Select a device from the list of devices in WebVision. Click the corresponding link to view the properties of that device.
3. Click the **Graphics** tab. The **View Graphics** page appears.
4. You can view the graphic linked to that device. All other parameters, for example, Air Flow, Setpoint, Space (as configured for the device) also appear on the screen.

### To setup a graphic:

1. Select a device from the list of devices in WebVision. Click the corresponding link to view the properties of that device.
2. Click the **Graphics** tab. The **View Graphics** page appears. Click **Setup Graphic**. The **Setup Graphics** page appears.
3. You can add up to 3 links to the default graphic. The links can point to another graphic or to an external Web Site.

## Configuration

The following options can be used for all the above mentioned devices:

- **Import Application** – Use this option to restore the backed up configuration.
- **Export Application** – Use this option to download configuration settings.
- **Reset** – Use this option to reset the configuration settings to the last saved configuration settings.
- **Back** – Use this option for navigation.
- **Next** – Use this option for navigation.

- **Save** – Any change done in the UI is automatically saved locally in the Web UI. To save the modified configuration in the WebVision click Save. To write the saved data onto device, use the Device Download option.

## Set Points

NOTE: The **Setpoints** tab appears only for the supported devices.

### To set the setpoint for a device:

On the left corner of the screen, WebVision is listed. Expand WebVision to view all the devices associated with it.

1. Select a device from the list of devices in WebVision. Click the corresponding link to view the properties of that device.
2. Click the **SetPoints** tab. The **SetPoints** page appears.
3. Select the following parameters:
  - Permanent Set points:
    - **Occupied**: Specify the Cooling SetPoints and the Heating SetPoints.
    - **Standby**: Specify the Cooling SetPoints and the Heating SetPoints.
    - **Unoccupied**: Specify the Cooling SetPoints and the Heating SetPoints.
    - Select the override duration, if any, using the **Override Duration for Setpoint** and **Occupancy State** drop-down list.
  - Fan and System Switch:
    - **System Switch**: Specify the system switch mode: **Heat**, **Auto**, **Cool**, or **Off**.
    - **Fan Switch**: Specify the fan switch mode: **On** or **Auto**.
4. Click Save to save the settings.

## Sensor Calibration

NOTE: The **Sensor Calibration** tab appears only for the supported devices that have analog inputs.

This is a process of configuring the controller to correct error in the value provided by the sensor.

### To calibrate a sensor:

On the left corner of the screen, WebVision is listed. Expand WebVision to view all the devices associated with it.

1. Select a device from the list of devices in WebVision. Click the corresponding link to view the properties of that device.
2. Click the **Sensor Calibration** tab. The **Sensor Calibration** page appears. All the sensors associated with the selected device are listed in the **Sensor Name** list. The **Actual Reading** column lists the actual value measured by the sensor.
3. Specify the correct value that the controller is supposed to measure in **Calibrated Value** column. The difference between the two values is displayed in **Calibrated offset** column. The controller adds the calibrated offset value to the measured value to correct the error.
4. Click **Save** to save the settings.

## Balancing

This process helps the VAV devices to calibrate their flow sensors for better air flow control.

NOTE: To perform balancing ensure that the VAV device is online.

### To view the Balancing page:

1. Click the **Balancing** tab. The **Balancing** page appears.
2. The following information is displayed in tabular format:
  - **Device Name**: Name of the device
  - **Channel Name**: Name of the channel on which the device exists.
  - **Balanced On**: Balancing status. It can be Balanced or Not Balanced.

NOTE: Use Filters to quickly search the required device.

Use one of the following filter options to search for the required device:

- Device Name
- Device Type
- Is Balanced

NOTE: To quickly search the devices, type the first letter of the required filter criteria in the **Keyword** text box and type an asterisk (\*). This lists all the names starting with the first letter that you have written in the **Keyword** text box.

### To view Balancing details:

1. Click the **Balancing** tab to display the **Balancing** page.
2. Select a device from the list and click **Balance** to display the balancing details of the selected device.
3. View/Edit the following details:
  - **Device Name**: Name of the VAV device which is selected for balancing.
  - **Damper Position**: Displays the position of the damper. This field is non-editable. The damper position varies to attain stable air flow.
  - **Sensed Airflow**: Displays the actual air flow that is measured by a pressure sensor connected to the VAV device. This field is non-editable.
  - **Max Airflow Setpoint**: This allows you to set the maximum airflow setpoint. The field is enabled by default. Enter the maximum airflow setpoint value, use **Change max setpoint** to write the maximum airflow setpoint to the device.
  - **Start Max Balance**: Click on this button to balance the device for the maximum air flow setpoint.
  - **Min Airflow Setpoint**: This allows you to set the minimum air flow setpoint value which must be less than the maximum value. The field is enabled by default. It allows you to set the minimum airflow setpoint value, use **Change min setpoint** to write the minimum airflow setpoint to the device.
  - **Start Min Balance**: Click on this button to balance the device for the minimum air flow setpoint.
  - **Zero Airflow Setpoint**: By default 0 is the setpoint value and you cannot edit this field.
  - **Start Zero Balance**: Click on this button to balance the device for the zero air flow setpoint.
4. Click **Save** to save the settings.



## To perform Min/Max Balancing:

Complete the following procedure to do min/max balancing.

NOTE: To do min/max balancing ensure that the VAV device is online.

1. Damper position and Sensed airflow displays the current damper position and flow sensed by the device.
2. Click the **Start Zero Balance** to attain the zero flow setpoint. Job progress status is shown at the bottom of the page, once the setpoint is attained, confirmation message is displayed.
3. Once the Zero airflow setpoints is attained, flow sensed by the device is displayed. Update the actual flow sensed in the **Measured Airflow** field and click **Apply Measured Flow**.
4. Enter **Max Airflow Setpoint** value and click **Change Max Setpoint** to write the value to the device.
5. Click **Start Max Balance** to attain the maximum airflow setpoint. Job progress status of maximum balancing is shown at the bottom of the page, once the setpoint is attained, confirmation message is displayed.
6. Update the actual flow sensed in the **Measured Airflow** field and click **Apply Measured Flow**.
7. Enter **Min Airflow Setpoint** value and click **Change Min Setpoint** to write the value to the device.
8. Click **Start Min Balance** to attain the minimum airflow setpoint. Job progress status of minimum balancing is shown at the bottom of the page, once the setpoint is attained, confirmation message is displayed.
9. Once the balancing is completed, Click **Done** to set the device back to **Auto** mode and go to the balancing summary screen.

## Demand Limit Control (DLC)

Demand Limit Control (DLC) continuously monitors the building's rate of energy consumption. It automatically sheds or restores loads to prevent the demand (load) from exceeding the maximum allowable level or configured setpoint. It is based on the building's power requirements and operating characteristics. For DLC to have control over energy savings, the configured setpoint must be less than the actual demand allocated by the power generating plant. DLC sheds or adjusts the loads during peak usages only. DLC is driven from the current KW demand, which is an instantaneous value averaged over a period of time (demand averaging window period). It is a good practice to adjust the DLC window close to the utility company's demand window period. This in turn will help WebVision to follow the same criteria as that of the utility company when taking KW demand shed decisions. The energy history log must also match the peak demand recorded by the utility company.

## Load Assignments

Each device is considered to be an external object when assigning it to a load. A load consists of a local configuration that defines the behavior of the load and its association with an object or a set of objects. These objects are discovered Excel 10 or Excel 15C devices, which in turn control the external electrical loads. All the objects associated under one load assignment are shed at once, restored at once and overwritten at once depending on the configuration of the load assignment. Each load assignment is identified by a load assignment number ranging from 1 to 50.

The following are the two types of loads that DLC sheds to maintain demand below the peak setpoint:

## Off Continuous Loads

Off Continuous loads are the first loads that are shed by DLC. Once shed, they are not restored immediately. Loads marked as Off Continuous generally control the loads that are least important to overall operation of the facility. When KW demand exceeds the peak setpoint, Off Continuous loads are shed first starting from the lowest numbered load (1) to the highest (50). These loads are shed until the demand goes below the peak setpoint limit. The first load is shed at staging interval seconds after the KW exceeds the peak setpoint. Additional loads are shed at staging interval, seconds until the KW is less than the peak setpoint. Off Continuous loads, once shed are the last to be restored when demand is less than the normal level (setpoint minus the dead band). Off continuous loads are restored in the order reverse to which they were shed (highest load (50th) is restored first). Any Off Continuous load that is shed remains inactive for at least the configured Minimum Shed Time.

## Rotating Loads

Rotating loads are shed or adjusted after shedding Off Continuous loads, as DLC needs to reduce the demand. Loads marked as Rotating have more important equipment assigned to them than the loads marked as Off Continuous.

Rotating loads are shed or adjusted only after all the Off Continuous loads are shed and if the KW demand still exceeds the peak setpoint. DLC sheds the Rotating loads in sequence starting with the lowest numbered load first. When demand is below the normal level (peak setpoint minus the dead band), the Rotating loads are restored on a priority basis; highest priority is given to the load that has been shed for the longest period. If restoration of a Rotating load causes KW to raise above the peak setpoint, then the next eligible Rotating load (usually the next higher numbered Rotating load) is shed.

NOTE: **Note:** Rotating loads are restored before Off Continuous loads when KW demand is below the normal level (less than the peak setpoint minus the dead band). Rotating loads are not eligible for shed until their Minimum On Time has elapsed after restoration. Once shed, a Rotating load cannot be shed again until all the other eligible Rotating loads are shed. Rotating loads are not restored until their Minimum Shed Time has elapsed. Rotating loads can't be in Shed time not more than the Max Shed time.

## DLC Load Shedding and Restoring Methods

DLC monitors the current KW levels at every staging interval and averages it over a period of time.

- If the current KW demand is above the configured peak setpoint, then DLC sheds loads at defined intervals until the demand drops below the peak setpoint.
- If the KW demand drops below the normal level (peak setpoint minus the dead band), then the previously shed loads are actively restored at every staging interval until the KW demand rises back above the normal level.

## Load Shedding Method

1. The DLC starts shedding by first searching for all the Off Continuous loads that are eligible for shedding.
2. Then, it first sheds the lowest numbered Off Continuous load and waits the staging interval to see if the demand has reduced.
3. If the demand is still above the peak setpoint, then DLC sheds another Off Continuous load. This process continues until the demand is well within the peak setpoint limits.
4. If the demand has still not reduced, then DLC searches for all the Rotated loads.

## Load Restoring Method

- If the demand drops below the normal level, then the loads that are currently shed will be actively restored one at a time, every staging interval, until the demand reaches the normal level. When restoring loads, DLC, on priority, searches and restores:
  - The Rotating loads where the load that has been shed for the longest period is restored first.
  - Then the Off Continuous loads where the load restoration goes from highest load number to the lowest load number.
- Loads are restored every staging interval if the override condition becomes true or the maximum shed time has been met. All loads that satisfy these conditions are restored.

## DLC Status

Demand Limit Control is a function that controls the maximum power demand made on the whole system by shedding some of the load based on priority where total power usage of configured loads exceeds the predefined limit. Shedding requires turning off some digital output, or changing a setpoint to a more economical level.

You can view the DLC service status that includes all load assignment details. DLC status is updated at the rate of the staging interval.

### To view the status of the DLC:

1. Click the **DLC** tab. The **DLC Status** page appears.

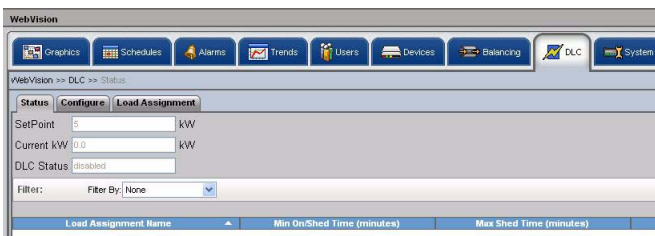


Fig. 27. DLC Status page.

2. The following information is displayed as read only text:
  - **Setpoint:** Displays the setpoint value.
  - **Current KW:** Displays the average power consumption of the total assigned load.
  - **DLC Status:** Displays the current DLC status. Four modes present are: Disable, Deadband, Shed, and Restore.

NOTE: Use Filters to quickly search the required DLC mode.

Use one of the following filter options to search for the required load assignment:

- Load Name Pattern
- Shed Method
- Shed State

NOTE: To quickly search, type the first letter of the required filter criteria in the **Keyword** text box and type an asterisk (\*). This lists all the names starting with the first letter that you have written in the **Keyword** text box.

3. The following information is displayed:
  - **Load Assignment Name**
  - **Min On/Shed Time**
  - **Max Shed Time**
  - **Shed Status**

### To configure the DLC:

1. Click the **DLC** tab. The **DLC Status** page appears.
2. Click the **Configure** tab. The **Configure** page appears.

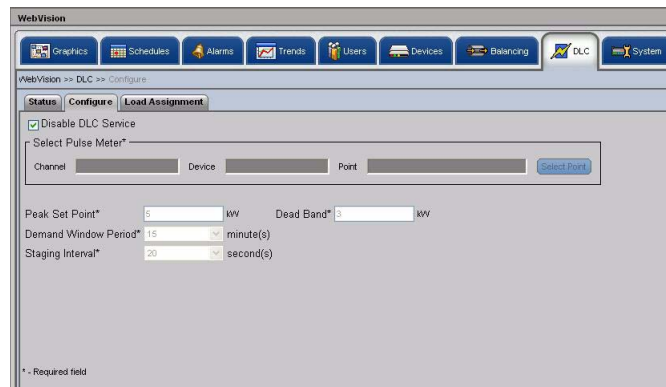


Fig. 28. DLC Configure page.

3. Select the pulse meter options. Click **Select Point**. A **Selected Pulse Meter** pop up appears. Select a **Channel**, **Device**, and **Point** for configuring DLC and click **OK**.

NOTE: Check the **Disable DLC Service** check box to disable the DLC service.

4. Enter/Select the following parameters:
  - **Peak Set Point:** Enter the setpoint to set as the peak limit. The range for peak set point value is 0-6000.
  - **Demand Window Period:** Select the demand window period from the **Demand Window Period** drop-down list. The valid range is in steps of 1 minute to 15 minutes. It is the time interval over which the instantaneous KW demand is averaged to determine the effective KW peak demand value. This value, in turn drives the DLC to shed or restore loads. The demand value is read from the pulse meter for every 15 seconds and the average demand value is calculated accordingly.
  - **Staging Interval:** Select the staging interval from the **Staging Interval** drop-down list. The valid range is in steps of 20 seconds to 120 seconds. WebVision collects the KW samples for every 15

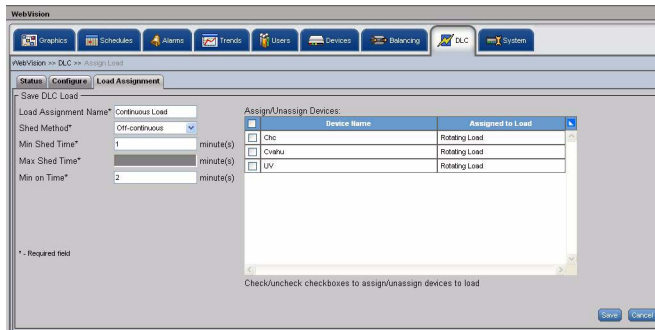
seconds and at the end of a staging interval, compares the power consumption with that of the active demand setpoint and the dead band.

- **Dead Band:** Enter the dead band in the **Dead Band** text box. The dead band peak value is 1000.

5. Click **Save** to save the settings.

**To add a Load:**

1. Click the **DLC** tab. The **DLC Status** page appears.
2. Click the **Load Assignment** tab. The **Load Assignment** page appears.



**Fig. 29. Load Assignment page.**

3. Click **Add Load**. The **Add Load** page appears.
4. Enter/Select the following details:

NOTE: All the fields marked with an asterisk (\*) are mandatory.

- **Load Assignment Name:** Enter a unique name for load assignment.
- **Shed Method:** Select a load shed method from the Load Shed Method drop-down list.

**Table 4. Load Shed Methods.**

If you have selected the Load Shed Method as...	Then...
OFF Continuous Load	In the Minimum Shed Time box, enter the minimum length of time a load must be off after it is shed by the DLC. In the Minimum On Time box, enter the minimum length of time the load must be active before it can be shed or restored by the DLC.  NOTE: The valid range for the minimum shed time and minimum on time is 0 to 99 minutes.

**Table 4. (Continued)Load Shed Methods.**

If you have selected the Load Shed Method as...	Then...
Rotating Load	In the Minimum Shed Time box, enter the minimum length of time a load must be off after it is shed by the DLC. In the Maximum Shed Time box, enter the maximum time a load that is shed by the DLC, must remain off or inactive.  NOTE: The maximum shed time must always be greater than the minimum shed time. A load cannot be in the shed state for more than the configured maximum shed time. It can be restored after the minimum shed time has elapsed (less than the setpoint minus the dead band). In the Minimum On Time box, enter the minimum time that the load must be active ('On').
Last Resort Load	In the Minimum Shed Time box, enter the minimum length of time a load must be off after it is shed by the DLC.  NOTE: The maximum shed time for a Last Resort load is twice its minimum shed time and is displayed as disabled text in the Maximum Shed Time box.

- **Min Shed Time:** Enter a valid value within the specified 0-99 minutes range.
- **Max Shed Time:** Enter a valid value within the specified 0-99 minutes range.
- **Min On Time:** Enter a valid value within the specified 0-99 minutes range.
- **Assign/Unassign Devices:** After configuring a load, you can assign it to an external load object, which in turn controls the electrical loads. All the devices with the **Device Name** and their **Assigned Load** (the name of the load that is assigned to that device) are listed. Check the devices that you want to assign to the current load.

5. Click **Save** to save the settings.

**To edit the Load:**

1. Click the **DLC** tab. The **DLC Status** page appears.
2. Click the **Load Assignment** tab to display the **Load Assignment** page.
3. Select the load to edit from the **Load Assignment Name** list and the selected load's details appear.
4. Modify the required fields as described in step 4 of "To add a Load:" on page 23.
5. Click **Save** to save the settings.

**Assign Load**

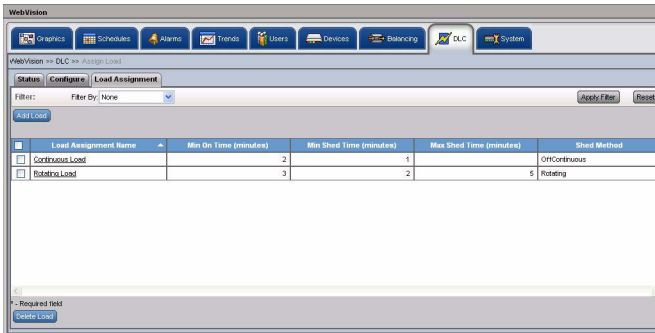
It displays the status of an individual load assignment or all load assignments. If the DLC load configuration is modified, then the load assignment status is displayed as **Normal**. WebVision restores all the load assignments immediately by

issuing a restore command even if the load assignments are in the shed state. After re-loading the configuration, all the Minimum On/Shed timers are also reset.

NOTE: When DLC is in the **Reloading Configuration** mode, only the status of the load assignments is displayed. It implies that the respective load objects are not displayed.

**To view the load assignment details:**

1. Click the **DLC** tab. The **DLC Status** page appears.
2. Click the **Load Assignment** tab. The **Load Assignment** page appears.



**Fig. 30. Load Assignment Details.**

3. The following information appears in a tabular format:
  - **Load Assignment Name:** A unique name for load assignment.
  - **Min On Time:** Displays the minimum period for which the load is active.
  - **Min Shed Time:** Displays the period for which the load is shed.
  - **Max Shed Time:** Displays the maximum period for which the load is shed or made inactive.
  - **Shed Method:** Displays the method used to shed load. For example, it can be Rotating, Off Continuous, and so on.

**Delete Load**

**To delete a load**

1. On the **Load Assignment** page, select the name of the load you want to delete from the **Load Assignment Name** column.
2. Click **Delete**. A confirmation message appears.
3. Click **OK** to confirm the deletion.

**System**

You can use the **System** page only if you have a Contractor's privileges. Use this page to configure general settings of the system that include Time and Date settings, new package installation, SMTP settings, Network settings, and Home Page settings.

Use this **System** page to configure:

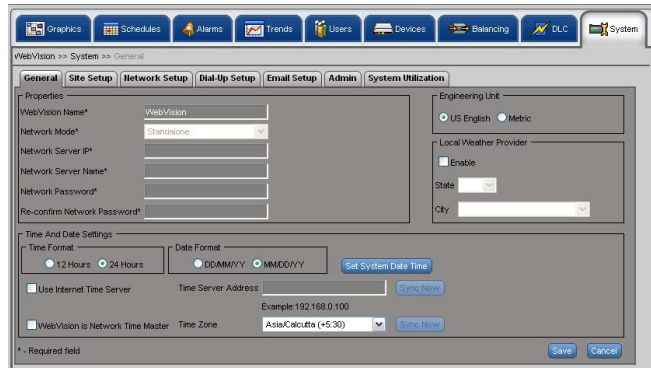
- General Properties
- Site Setup
- Network Setup Details
- Dial In Settings
- E-mail Setup

- Admin
- System Utilization

**To configure the System general properties:**

Use the following procedure to configure the system general properties:

1. Click the **Systems** tab. The **General** tab of the **System** page appears (Fig. 31).



**Fig. 31. System Tab - General Tab.**

2. Enter/Select the following site details:
  - **Properties**
    - **WebVision Name:** The entered WebVision name is displayed.
  - **Time and Date Settings**
    - Select the Time Format and Date Format.
    - Click **Set System Date Time**. The **Set System Date Time** box appears. Set the date and time and click **OK**.
    - Select **Use Internet Time Server** to enable this option. The Time Server Address is enabled. Set the host name of the Internet Time Server. Ensure that the DNS server that WebVision uses (DNS configuration done in Network Server) for hostname to IP resolution must be able to resolve the host name of the Internet. Time Server to IP address. Ensure that WebVision is connected to Internet and is able to access the time server. If you are not sure how to do it, contact your local Network Administrator for help.

NOTE: WebVision automatically synchronizes its time with the internet time servers. Synchronization happens every 24 Hours or when the Sync Now button is pressed.

- **WebVision is Network Time Master:** Select this box to enable periodic time synchronization between WebVision and devices on the network. Time synchronization happens every 24 Hours, when the system clock is changed, DST starts or ends or when the Sync Now button is pressed.
- **Time Zone:** Select the applicable time zone of the WebVision (where the WebVision is installed). Every time the Time Zone is changed, you must reboot WebVision to apply the new time zone. Click Save after selecting the new time zone, WebVision prompts you to reboot the machine. After reboot, set the time and date as explained above.

3. Choose **US English** or **Metric** as the standard for setting the **Engineering Units**. All the point values in the WebVision user interface are shown in the selected unit.
4. For local weather, check the **Enable** check box. Select a **State** and **City** from the corresponding lists.
5. Click **Save** to save the settings.

### To configure Site setup:

Use the following procedure to configure the site setup:

1. Click the **Systems** tab. The **System** page with General Properties appears.
2. Click the **Site Setup** tab. The **Site Setup** page appears.
3. Enter the following site details.

**NOTE:** Note: The supported background image formats include: jpg, jpeg, and gif. The size of the image file must not exceed 1MB.

- Contractor Details:
  - **Company Name**
  - **Contractor Phone**
  - **Contractor Website**
  - **Contractor Email**
  - **Company Logo:** Click the **Browse** button to browse for the site logo. Upload the selected logo.
- Login Screen Image
  - **Image:** Click the **Browse** button to browse for the site image. Upload the selected image.

**NOTE:** Click **Reset Image** to restore the default image.

4. For outside air temperature, click **Select Point** and select **Channel**, **Device**, and **Point** from the corresponding list.

**NOTE:** Click **Clear** to clear the fields.

5. To provide weather conditions from an external link, type the required **URL** and a **Display Name** for the link.
6. Click **Save** to save the settings.

### To configure Network setup:

Use the following procedure to configure the network setup:

1. Click the **Systems** tab. The **System** page with General Properties appears.
2. Click **Network Setup**. The **Network Setup** page appears.
3. Enter/select the following details:
  - **IP Settings:**
    - **Host Name:** Host Name is the name of the WebVision on TCP/IP network. This name is used to find WebVision on the network with the help of the DNS server.
    - **Domain:** Name of the domain in which WebVision exists.
    - **DHCP:** To assign IP addresses dynamically.

**NOTE:** Since the IP address changes frequently, it is not possible to communicate with other WebVision applications on the network.

- **IP Settings:** (continued)
  - **IP Address:** A 32 bit address used to identify WebVision on IP network. This address is typically represented in dotted-decimal notation, with the decimal value of each octet separated by a period, for example, 192.168.0.1.
  - **HTTP Port:** Enter the port number. The default port number is 80. If the port number entered is other than 80 then you must type the application's URL followed by the port number. For example, http://199.63.24.224:81.
  - **Network Mask:** This is used to separate Network Address and Host Address from IP Address in an IP network. For example:  
IP address - 192.168.1.100  
Network Mask - 255.255.255.0  
(IP Address) & (Network Mask) = Network Address = 192.168.1.0  
(IP Address) & (Network Mask)' = Host Address = 0.0.0.100; where "&" is logic and operation and "'" is the logic complement operation.
  - **Gateway IP Address:** IP Address of a host that is used as a gateway by WebVision to communicate with hosts on other networks. Typical scenario is when you connect to WebVision using a host on a different network using a browser.
  - **DNS1 Server Name:** The IP Address of the host on the network that WebVision uses to resolve host name to IP Address or vice-versa. This service is mainly utilized by WebVision for Mail Notification and Internet Time Synchronization.
  - **DNS2 Server Name:** The IP Address of the host on the network that WebVision uses to resolve host name to IP Address or vice-versa. This service is mainly utilized by WebVision for Mail Notification and Internet Time Synchronization.
  - **Mac ID:** The unique hardware identification of a network device.
  - **Map Host Name to IP Address:**
    - Click **Advance Settings**. The Advance Settings window appears.
    - Type the **Host Name**. It is a unique name given to a network equipment. You can change it if required. The host name corresponds to the MAC address.
    - Type the **IP Address**. It is the numerical address used to identify a device on a network.
    - Click **OK**. Each host Name is mapped to the specified IP Address. You can use either to access the device on the network.
  - **Channel Info:**
    - **Channel Name:** LonNetwork name used in the WebVision.
    - **Domain ID:** This is used to name a group of devices connected to a LonNetwork. The Domain ID must contain numbers from zero [0] to nine [9] and must be in pairs. For example, if the length of the Domain ID is configured as 3, then the Domain ID is 12 34 56. There must be a space between each pair.
    - **Subnet/Node ID:** The Subnet represents a LonNetwork and Node ID represents a controller on that network. Here this Subnet/Node ID is used to identify the LonNetwork of the WebVision.



- **Channel Info: (continued)**
    - **Domain Length:** Length of the Domain ID.
4. Click **Save** to save the settings.

**To configure Dial-up settings:**

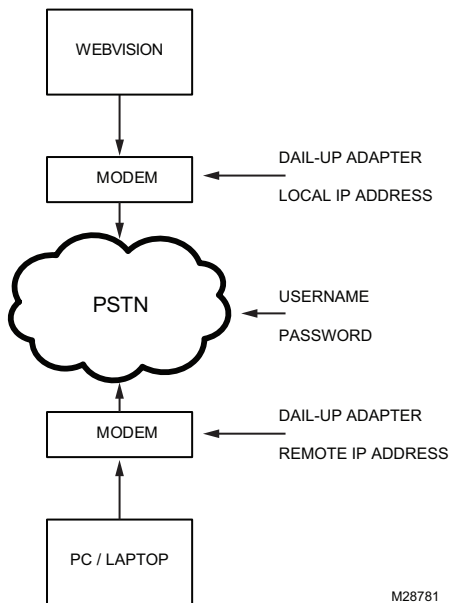
Use the following procedure to configure the dial-up settings:

1. Click the **Systems** tab. The **System** page with General Properties appears.
2. Click the **Dial-Up Setup** tab. The **Dial-Up Setting** page appears.
3. Select required option from the **Dial Up Type** group box. Whenever you are not on network and still want to access WebVision, you can use the Dial-in facility. Using this feature you can access WebVision from anywhere.
4. Enter the following details.
  - **Dial In:**
    - **Local IP Address:** IP address of the local machine from where you want to access the WebVision application.
    - **Remote IP Address:** IP address of remote machine where WebVision application is hosted.
    - **User Name:** Type the user name.
    - **Password:** Type the password.
  - **Modem Setting:**
    - **Initialization String:** As specified in the specification of the modem used.
    - **Baud Rate:** As specified in the specification of the modem used.

NOTE: The default modem settings works for most of the modems. If the modem is not working, then change the configuration.

5. Click **Save** to save the settings.

**Deployment Diagram**

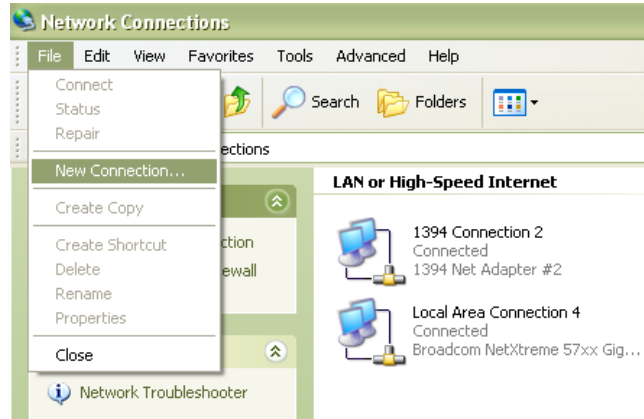


**Fig. 32. Deployment Diagram.**

**To enable Dial In settings:**

Complete the following procedure to enable the dial in settings on your computer/laptop:

1. Go to Start > Settings > Control Panel > Network Connection.
2. Go to **File > New Connection.**



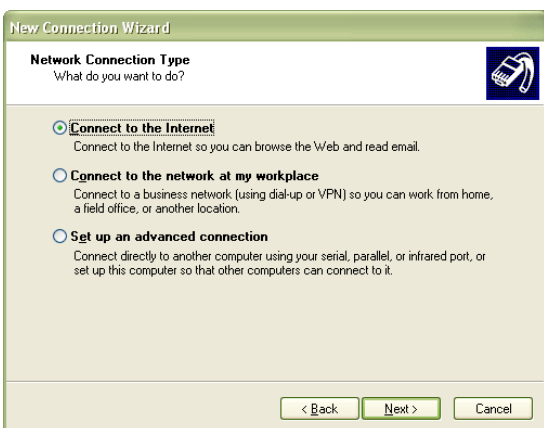
**Fig. 33. File - New Connection menu selection.**

3. The New Wizard screen appears. Click **Next.**



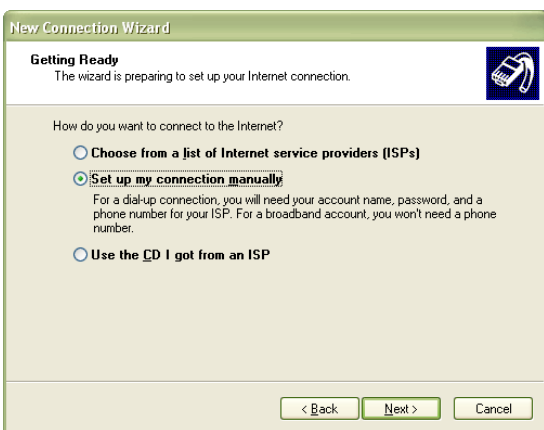
**Fig. 34. New Connection Wizard screen.**

4. Select the **Connect to the Internet** option and click **Next**.



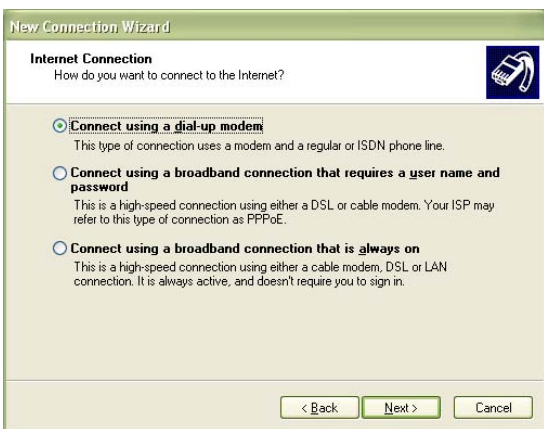
**Fig. 35. Network Connection Type screen.**

5. Select the **Set up my connection manually** option and click **Next**.



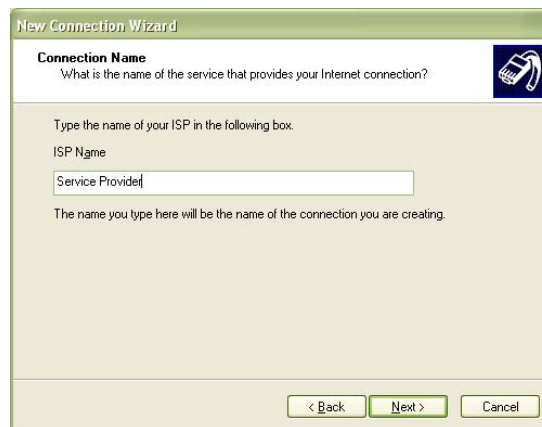
**Fig. 36. Setup my connection manually - button**

6. Select the **Connect using a dial-up modem** option and click **Next**.



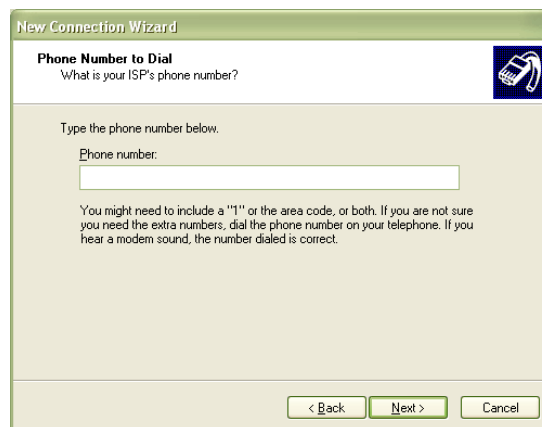
**Fig. 37. Connect using a dial-up modem button.**

7. Type the name of the service provider and click **Next**.



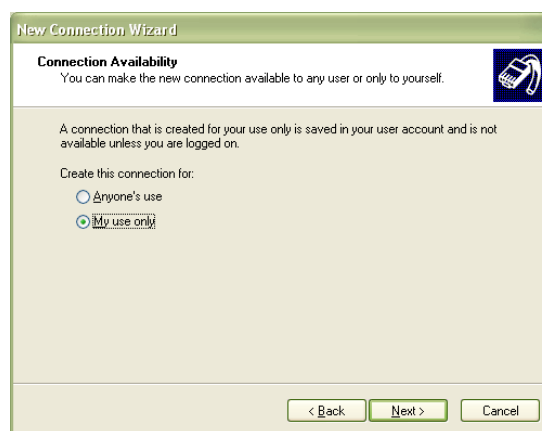
**Fig. 38. Connection Name - Service Provider.**

8. Type your phone number and click **Next**.



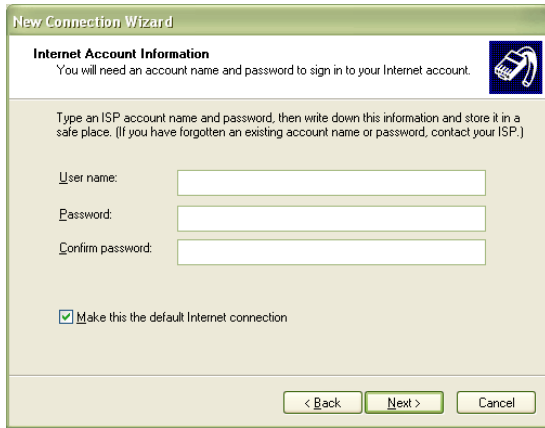
**Fig. 39. Phone Number to Dial screen.**

9. Select the required option for connection availability and click **Next**.



**Fig. 40. Connection Availability screen.**

10. Type the user name and password and click **Next**. The same credentials are used while enabling dial in settings in WebVision.



**Fig. 41. Internet Account Information - User Name and Password.**

11. Click **Finish** to complete the connection.



**Fig. 42. Completing the New Connection Wizard screen.**

**To configure E-mail setup:**

Complete the following procedure to configure the e-mail setup details:

1. Click the **Systems** tab. The **System** page with General Properties appears.
2. Click the **Email Setup** tab. The **Email Setup** page appears.
3. Enter the following details:
  - **SMTP Server**
    - **Enable Email Service:** Check this box to enable the SMTP protocol.
    - **Use Sever WebVision as SMTP gateway:** Check this box to use WebVision server as SMTP gateway.
    - **Email Server:** Enter the SMTP e-mail server to use this service. You must configure SMTP e-mail server to send alarm notifications. The Internet Service Provider (ISP) or Network Administrator has to provide the

server and domain names prior to configuring the SMTP E-mail server option. An example to maintain the format: SMTP.server.com.

- **Email Address:** Enter a valid e-mail address. The account must be present in the SMTP server.
- **User Authentication:** Check this box to provide the user credentials. On selection it enables the following parameters.
  - **User Name:** Type the user name of the SMTP server. Type any name of your choice. For example, webvision1.
  - **Password:** Type the SMTP password.
  - **Confirm Password:** Retype your password.

NOTE: The password field cannot be empty. The maximum number of characters is 50. The characters allowed are: a-z, A-Z, 0-9, \_, !, @, #, \$, %, ^, \*, -, |, SPACE.

4. Click **Save** to save the settings.
5. Click **Send Test Mail**. The **Email Service Status** displays the status. A test message is sent to the e-mail address. A confirmation message appears.
6. If the settings are incorrect then, the **Last Failure Message** field displays the reason for failing in sending the message.

**Configuring Admin**

These files have .dist as the file extension. You can upload files up to 5MB in size.

Complete the following procedure to install a new package:

1. Click **Browse** to upload the **Software Update Package**. This allows you to install software updates, if any, that are published by Honeywell for WebVision.
2. Click **Install**.

**Reboot WebVision**

1. Click the **Reboot** button to reboot WebVision. This logs you out and then initiates reboot.
2. Re-logout after 5 to 10 minutes after the reboot is completed.

**Backup Configuration**

The backup file has .dist as the file extension.

Complete the following procedure to backup the configuration settings:

1. Click **Backup Configuration** to backup the configuration settings.
2. A window appears prompting you to **Save** the backup file.
3. Click **Save** to save the backup file and specify the location for the file.  
or  
Click **Cancel** to close the pop-up.

**Restore Configuration**

You can restore the backed up files using this feature. The backup file has .dist as the file extension.

Complete the following procedure to restore the configuration settings:

1. Click **Restore Configuration** to restore the configuration settings from the backup file. The **Restore Configuration** dialog box appears. Select the backup file that has to be restored.
2. Click **Restore**. WebVision restores the file and automatically logs out before starting to restore. Once restoring is complete, WebVision automatically reboots. This may take about 5 to 10 minutes.
3. Logon to WebVision again, after 5 to 10 minutes.

NOTE: When saving the file, the default **File Type** option is **.dist**.

## Download Audit Log

Complete the following procedure to download the audit log:

1. Click the **Download Audit Log** button.
2. Click **Open** to view the file.  
or  
Click **Save** to save the file at the required location.

The file displays information related to the action performed by all the users.

## Download System Log

Complete the following procedure to download the system log:

1. Click the **Download System Log** button.
2. Click **Open** to view the file.  
or  
Click **Save** to save the file at the required location.

The file displays the logged system level error and trace message.

## System Utilization

Complete the following procedure to view system performance:

1. Click the **Systems** tab. The **System** page with General Properties appears.
2. Click **System Utilization**. The **System Utilization** page appears.
3. You can view the **Resource Utilization** graph details on your screen.

NOTE: This screen helps you to understand the WebVision resources that are being used.

## Migration of LCBS Sites in WebVision

Ensure that the site configuration backup is available in LonSpec.

You should use either LonSpec or WebVision as the primary configuration tool. Having more than one tool would require effort to keep them in sync that is manual and error prone.

At certain sites where XL15B is installed, the most current LonSpec database is present on the XL15B. Such databases must be brought into LonSpec and used for migration.

## Device Configuration Changes

Device configuration covers seven areas:

1. "Decommissioning XL15A"
2. "Decommissioning XL15B" on page 30
3. "Decommissioning T7300" on page 30
4. "T7350 Changes" on page 30
5. "XL15C changes" on page 30
6. "LONSpec Changes" on page 32)
7. "WebVision Configuration Steps" on page 32

## Decommissioning XL15A

Following are the considerations for de-commissioning XL15A (W7760A):

1. **Alarms** – Alarms in XL15A cannot be automatically transferred to WebVision. Looking at the XL15A configuration in LonSpec, manually create corresponding Alarms configuration in WebVision. Follow the steps given in User Guide or Online help to understand how to create Alarms in WebVision.
2. **Trends** – Trends in XL15A cannot be automatically transferred to WebVision. Looking at the XL15A configuration in LonSpec, manually create corresponding Trends configuration in WebVision. Follow the steps given in User Guide or Online help to understand how to create Trends in WebVision. WebVision comes loaded with default trends for each type of supported device in disabled state. If the trend that has to be created is already present and meets the requirement, the user is advised to just enable that trend instead of creating a new one.
3. **Schedules** – Looking at the XL15A configuration in LonSpec, manually create corresponding Schedules configuration in WebVision. Follow the steps given in User Guide or Online help to understand how to create Schedules in WebVision.
4. **Loops** – WebVision does not support inbuilt loops. However, if this feature is critical, the user can replace XL15A with XL15C. Or the user can disconnect XL15A from the Lon Network. If XL15C is used, the same loops can be configured in XL15C using LonSpec and re-commissioned. If the XL15A is disconnected from network, the user should be aware that it may be driving RIOs or may have bindings with other devices to get some sensor information. The device should be reconfigured and re-commissioned using LonSpec to remove such dependencies.
5. **Network Time Master** – If XL15A is acting as Network Time Master, when decommissioned, WebVision can be configured to act as Network Time Master. Refer WebVision's User Guide or Online Help for details.
6. **DLC** – If XL15A is performing Demand Limit Control (DLC). The same can be done in WebVision. However the user should note that WebVision supports only one Setpoint. The configuration has to be done as appropriate. Refer WebVision's User Guide or Online Help for details.
7. **Pulse Meter Input** – If a Energy Pulse Meter is connected to XL15A because it is running DLC or because it is providing that information to a different XL15A, then if replacing XL15A with XL15C will allow the user to configure XL15C to connect Pulse Meter and act as source for KW input for DLC running in WebVision.

8. **Alarm Dial-Out** – This feature is not supported by WebVision or by any alternate mechanisms. Hence this has to be dropped as part of migration process.
9. **Runtime Logs** - This feature is not supported by WebVision or by any alternate mechanisms. Hence this has to be dropped as part of migration process.
10. **Bindings between XL15A and RIOs** – XL15A can be replaced with XL15C to drive the loops configured. If the loops are driving RIOs, the same be achieved using XL15Cs and RIOs. The user should replace XL15A with XL15C, configure the same loops in XL15C, associate RIOs to XL15C in LonSpec and re-commission XL15C and RIOs.

NOTE: The user should remember that replacing a controller would involve rewiring and testing the physical installation. The new XL15C that is replacing existing XL15A has to be purchased separately and will not be provided along with WebVision.

## Decommissioning XL15B

WebVision supports most of the functionality of XL15B. However XL15B configuration has to be manually created in WebVision. Configuration of the following functions should be recreated in WebVision:

1. Alarms
2. Trends
3. **Schedules** – Unlike in XL15B, WebVision does not support year round schedules. WebVision supports weekly schedules that repeat through out the year. Hence the schedules should be modified accordingly
4. **DLC** – Note that WebVision supported only one Setpoint as against three in XL15B. Configuration should be done accordingly
5. **Special Graphics** – Special Graphics in XL15B can be created as Locations and Graphics on Locations in WebVision
6. **Network Time Master** functionality
7. **Internet Time** Synchronization
8. Alarm Emailing
9. User accounts
10. **Home Page** graphics and **Login Page** graphics

## Decommissioning T7300

Following are the considerations for de-commissioning T7300:

1. If the devices on the Lon network are following schedule in T7300, then a similar schedule should be created in WebVision and assign those devices to follow schedule created in WebVision. The schedule configuration can be referred in LonSpec and has to be manually created in WebVision.
2. If T7300 is acting as Network Time Master, the Network Time Master Functionality in WebVision has to be enabled. Once enabled, WebVision will synchronize the clocks on all supported devices with Real-Time Clocks that can be updated over the Lon network

## T7350 Changes

WebVision supports configuration and management of T7350:

1. If a T7350 exists at the site and is driving scheduled occupancy state of other devices, the user should ensure that none of the schedules in WebVision drive

the occupancy state of those controllers that are following T7350. If WebVision has to drive the occupancy state of those controllers, user should first unassign them from T7350 in LonSpec, commission T7350 and the assigned controllers before configuring schedules in WebVision

2. If T7350 is acting as Network Time Master, it has to be disabled from LONSpec and re-commission T7350. The Network Time Master Functionality in WebVision has to be enabled. Once enabled, WebVision will synchronize the clocks on all supported devices with Real-Time Clocks that can be updated over the Lon network

## XL15C changes

XL15C is supported in WebVision. However, there are some differences that should be noted (below):

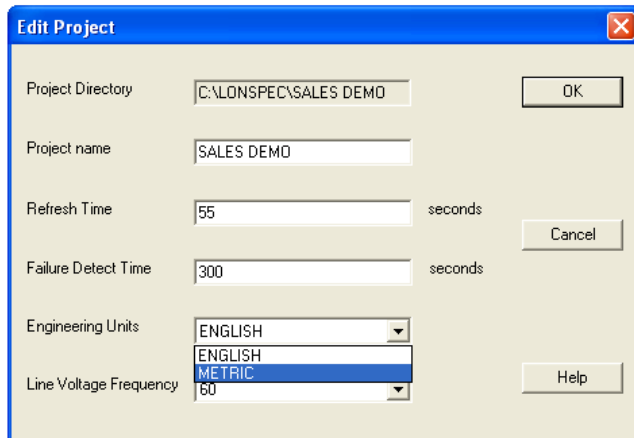
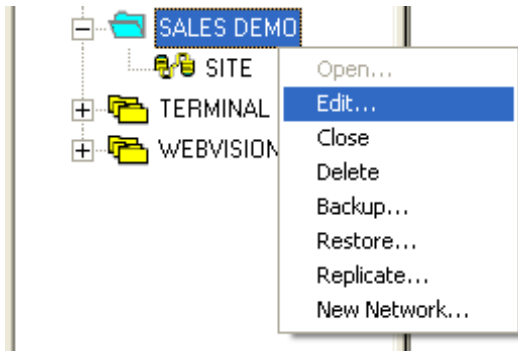
1. LonSpec creates bindings between XL15Cs and assigned RIOs as shown in 'refer points' screen. These bindings are present to read/command all I/Os on RIO even if they are not used. WebVision does not have concept of associating RIOs with XL15Cs. Therefore, following is the behavior during migration:
  - a. When the XL15C bindings are uploaded in WebVision, only used/ configured bindings are actually shown and bindings on un-configured I/Os are ignored
  - b. LonSpec allows naming I/Os of RIO (W7761). These names are stored in associated XL15C's secondary configuration file. As WebVision does not support this file, all the RIO point names will appear with default names in WebVision after migration. User would manually associate them by creating appropriate bindings between XL15Cs and RIOs.
2. If an XL15C controller at the site uses a poll point configured to poll an unsupported LON device, the Device, NV and Field information will not show up in WebVision's XL15C configuration wizard as the device is not present in WebVision's database. As part of decommissioning the unsupported device, the user has to re-commission the XL15C so that information is removed from the configuration
3. The time taken to upload/download XL15C depends on the number of loops configured in that XL15C. If more number of loops is configured, WebVision will take more time to upload/download. XL15C stores each loop configuration in separate sections in its memory. WebVision while uploading reads general device configuration, reads the number of loops, reads I/Os configured and then uploads configuration of each loop and I/O
4. WebVision will upload all the objects that are configured and used in control logic. If there are any Math Functions, Setpoints, Logic Loops, Start Stop Loops that are just given names or engineering units but do not read any input or drive any output, such objects may be ignored. The same reason is applicable while downloading from WebVision. This optimizes the download/upload process and does not impact the XL15C configuration.
5. While uploading bindings, WebVision will not upload bindings in which unconfigured objects like Control Loops, Start Stop Loops, Logic Loops, Analog Inputs are acting as source or target of the bindings.



**LONSPEC METRIC VALUES**

LonSpec downloads metric values to the controller. WebVision does not do any unit conversion of XL15C configuration values when displaying in the user interface. Therefore, what the user gets to see is what is present in the controller. The following step eases the comparison process:

1. Before comparing XL15C configuration with LonSpec, right click on the project and open Edit Project dialog as shown in Fig. 43. Change the Engineering Units to Metrics before proceeding further.



**Fig. 43. Edit project.**

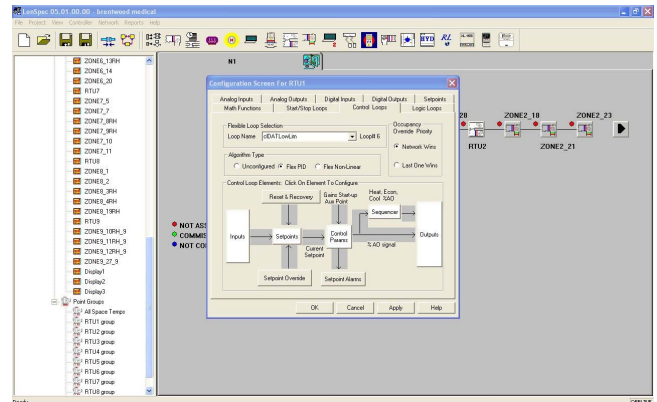
This ensures that you see all the values in LonSpec in the Metric system.

**FIXING RAPIDZONE CONFIGURATION ERRORS IN LONSPEC**

Due to a configuration error in RapidZone, sites built in Rapidzone and migrated to LONSpec may have a configuration error for every XL15C controller (W7760C). As a result, device upload step in WebVision causes problems.

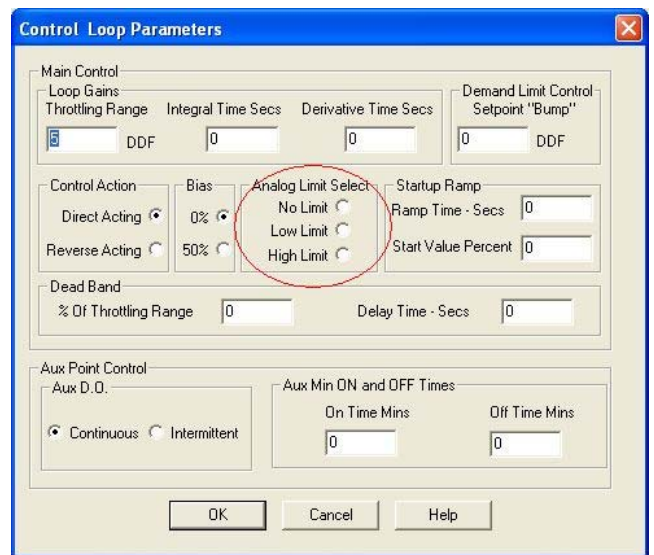
To fix the configuration error, use the following procedure:

1. Open the configuration of each XL15C and go to Control Loops tab.



**Fig. 44. LONSPEC Configuration Screen.**

2. Select Loop 6 (cIDATLowLim) in control loops and click **Control Params**. The **Control Loop Parameters** dialog box appears.



**Fig. 45. Control Loop Parameters dialog box.**

3. Select an appropriate option for **Analog Limit Select** and click **OK**.
4. Repeat the above steps for all the XL15Cs.
5. After changing the **Analog Limit Select**, re-commission all the XL15Cs with LONSpec.

## LonSpec Changes

Complete the following steps for migrating the existing LCBS sites to WebVision:

1. Ensure that LonSpec database which is used to commission the site is ready. Open the LonSpec project. Click **Network > Edit** on the menu bar. The **Edit Network** dialog box appears.

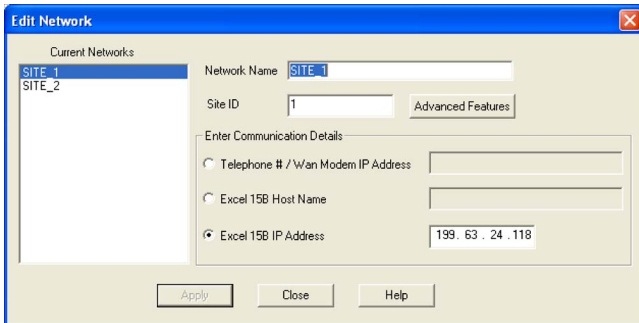


Fig. 46. Edit Network dialog box.

2. Click **Advanced Features**. The **Advanced Features** dialog box appears.

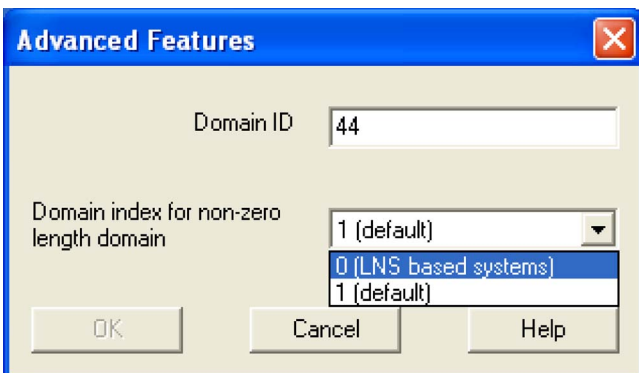


Fig. 47. Advanced Features dialog box.

3. Set the **Domain index for non-zero length domain** to **0 (LNS based systems)**. Click **OK** to save the changes.
4. Modify the original LonSpec project so that it does not contain unsupported devices. The following are frequently used:
  - a. XL15A
  - b. XL15B
  - c. Command Display 1 and 2
  - d. T7300
  - e. RapidLink/SLTA/PCLTA used by LonSpec, LonStation and XL15A.
  - f. RF Gateway
  - g. CX-VFD

It is highly recommended not to have these devices physically connected to the Lon Network as it could result in partial upload of binding information into WebVision, or worse interfere with WebVision functionality.

5. Disconnect WebVision from the network and re-commission all the devices using LonSpec.

NOTE: When re-commissioning, please use full commission command, not quick commission.

6. After re-commissioning, disconnect LonSpec from the network.

## WebVision Configuration Steps

Start the migration process on a fresh WebVision without any existing config file. There should not be any devices present in WebVision

1. Configure WebVision as given in the Quick Start Guide and connect it to Ethernet and LON network.
2. Logon to WebVision through internet browser.
3. Click **System > Network Setup**. In **Channel Info**, set the **Domain ID** to the same domain ID configured in LonSpec typically 2C (44 decimal). The ID must be specified in Hex format. Click **Save** to save the changes.

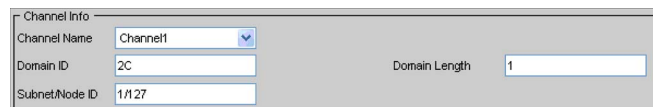


Fig. 48. Channel Info - Domain ID and Domain Length fields.

4. Click the **Devices** tab and go to **Device List** screen.
5. Click **Discover**. A dialog box appears. Select **Channel** as Channel 1 and click **Discover**. A progress bar appears indicating the discovery progress.
6. After the discovery is complete, all the discovered devices are listed on the left side of the table. Review the subnet/node ids of discovered devices to ensure that there are no conflicts. WebVision will detect the clash and on confirmation from the user, it would change the subnet/node id of the device.

NOTE: Changing subnet/node id will break any bindings going in and out of that device. It is suggested that the user find the clash manually and rectify them through LonSpec.

7. Select all the devices by clicking on each device (or click the SelectAll box) and then click **Add** to add them to WebVision database.

NOTE: The user should click on the device to select the device in the discovered list to do further operation on them. Although mouse scrolling across the discovered devices records appear as selection, they are actually not selected

8. Enter a name for each device that should appear in the UI and click **Done** to complete the discovery process.
9. Select all the devices and click **Upload** to upload the device configuration onto WebVision. A progress bar appears indicating the progress of the Upload operation. Once the upload is complete, the **Synced On** option is enabled for each device.
10. Ensure that all the devices are in **Auto** mode in the **Mode** Column. If any device is in Manual or any other mode, select that device and click **Set Mode to Auto**.
11. Click the **Device Bindings** sub-tab next to **Device List** subtab.

12. Click **Upload** to upload the LON binding information onto WebVision. A progress bar appears indicating the progress of the Upload operation.

#### NOTES

1. Ensure all the devices are in Auto mode. If you see any device in Manual or any other mode, select that device and click **Set Mode to Auto** to change the mode.
2. Click **Download** in **Devices > Device List** or **Devices > Device Bindings** to initiate the process of writing configuration data that is present in WebVision to devices. This operation should be performed only if it is absolutely necessary. If there is no requirement to change the configuration in the devices this operation must not be performed.
3. The migration procedure has been tested with LonSpec version 05.01.00.00 and later. It is recommended that users use at least this version for migration.
4. After the auto-resolution of Node ID conflict, if the configuration upload fails (especially for XL15C), user should wait a minute and retry the operation.
5. WebVision does not support access through PPPoE connection. PPPoE is the data link layer protocol used for broadband internet connections. If the user is using PPPoE, the user is advised to purchase a WiFi router or equivalent that supports PPPoE and connect WebVision to the Ethernet side of the router. Follow the User Guide of the router to have the desired setup
6. It is recommended that all the device configurations and bindings are checked field by field to ensure that the migration was successful as expected. If any information is found missing, the user can retry upload operation of configuration/bindings as applicable. If that does

not solve the problem, user should manually fill in the missing information. Any attempts to do download without performing this operation may break the control system in the site.

7. Points can be overridden through any means in WebVision for a period of time. However, if WebVision is powered off during that period and re-started, WebVision will not restore the point i.e. will not cancel the override even if the specified override time has elapsed. In this case, a stale value will be observed in WebVision. To cancel the original override operation, the user should override the point again for a minute and that would restore the default value.
8. If XL15Cs use Math Functions that are type Network Special, the configuration will get uploaded properly into WebVision. However the WebVision interface does not show Math Functions of type Network Special in the user interface.

## WARRANTY AND RETURNS

Refer the user to Honeywell's standard warranty policy in the *Environmental and Combustion Controls Product Catalog* (form 70-6910). This literature is available on [customer.honeywell.com](http://customer.honeywell.com). Try the following link:  
<http://customer.honeywell.com/request.cfm?form=70-6910>

## APPENDIX A – SUPPORTED DEVICES

This appendix provides configuration information for the following controllers and devices:

- W7763C/D/E Chilled Ceiling Controller (CHC) .... page 34
- Constant Volume Air Handling Unit Controller (CVAHU) ..... page 43
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### Configuring Chilled Ceiling Controllers (CHC)

#### Description

The W7763C, D and E Controllers are Chilled Ceiling Controllers in the Excel 10 product line. They cover a wide range of control applications including radiators, induction units, and fan coil units with manual fan switching, chilled ceiling and chilled beam and are suitable for either wall mounting or unit mounting. The controllers can operate as stand-alone units or networked using the standard Echelon® LONWORKS bus. Interfaces are provided for a wide range of actuator types. Heating systems can be water or electric, and cooling systems can be chilled water supply or compressors. Extensive timing and interlock features make the W7763 especially suitable for systems using electric heat and compressors.

#### Navigating to CHC Pages

Go to the **Devices** tab. Expand the list of devices on the left pane (listed under WebVision). Select a device to view its properties.

#### Features

- LonMark® HVAC profile 8020
- Stand-alone operation or on high speed 78 kilobit LON® network.
- Uses Echelon LonTalk protocol.
- Direct connection of thermal actuators.
- Factory-configured default parameters.
- Wide range of supported valves and actuators.
- Available with setpoint knob for wall mounting.
- Built-in LON jack for easy network access.
- LON service pin and LED accessible without disassembly.

The W7763C, D and E are LonMark-compliant Chilled Ceiling Controllers in the Excel 10 family product line. These controllers provide room temperature control using different heating and cooling sequences. The controller is provided with default configuration settings from the factory and is fully operable on installation. Using standard Echelon configuration tools, the controller can be configured with job-specific settings. The TR21 and TR23 wall modules interface with the Chilled Ceiling Controllers and provide the following options: setpoint adjustment, an occupancy bypass button and LED,

and an LON jack. All wall modules include a space temperature sensor, however a remote C7068A return air sensor can also be used.

### Supported Output Types

Table 5 lists the supported output types.

**Table 5. Supported Output Types.**

Output	Options
Heating	Floating, thermal, PWM, on/off, multi-stage electric
Cooling	Floating, thermal, PWM, on/off, multi-stage compressor

### Chilled Ceiling Controller Models

Table 6 lists the Chilled Ceiling Controller models.

**Table 6. Chilled Ceiling Controller Models.**

Model	Inputs	Outputs	Setpoint Knob	Sensor	Bypass
W7763C	3	2	X	X	X
W7763D	4	2	X		
W7763E	4	2			

### Sequences

Heat and cool sequences can be selected to be active or not active, giving a total of four different sequence options:

- Heat only
- Cool only
- Heat/cool changeover
- Heat and cool sequence

The controller automatically disables heat and cool control until the window is closed again. Frost protection remains active.

### Modes of Operation

The controller has the following modes of operation:

**Occupied mode** This is the normal operating condition for a room or zone when it is occupied. The controller can be switched into this mode by a network command, by the room occupancy sensor, or by a bypass button on the wall module.

**Standby mode** The standby mode saves energy by reducing heating or cooling demand during periods where the room is temporarily unoccupied.

**Unoccupied mode** This mode is used for longer unoccupied periods, such as at night or during weekends and holidays.

**Window open** If the controller is configured for window open detection, the controller automatically disables heat and cool control until the window is closed again. Frost protection remains active.

**Frost protection** If the temperature drops below 46 °F (8 °C), the controller enables the heating circuit as frost protection.

**Fan fail** When configured with an air flow detector, the controller protects equipment by disabling the system when the fan fails (for fan coil units with manual fan speed control).

**Changeover** The controller operates two-pipe units configured with a changeover input.

**Dewpoint** When configured with a chilled water temperature sensor, the controller will close the cool valve when the chilled water temperature falls below the dew point. The dew point may be a fixed value or calculated based upon input from a humidity sensor.

**Condensation** When configured with a condensation switch, the controller will close the cool valve when condensation is detected.

**Input/Output**

Table 7 lists the Input/Output (I/O) detail.

**Table 7. Input/Output Detail.**

I/O	Function	PIN Number	Characteristics
<b>INPUTS</b>			
Digital	Window/occupancy/changeover/air flow/condensation	4	Closed ≤ 400 ohm Open ≥ 10K ohm
Digital (See Table 5 on page 34)	Override	7	Closed ≤ 400 ohm Open ≥ 3.3k ohm
Analog	Humidity Sensor	1	0 to 10 Vdc
Analog	Temperature Sensor	3, 9	20K ohm NTC (25 °C)
Analog (Wall Module Connection Only)	Setpoint Adjustment	8	10k Ohm

**Table 7. Input/Output Detail. (Continued)**

I/O	Function	PIN Number	Characteristics
<b>OUTPUTS</b>			
Digital (Wall Module Connection Only)	Override LED	6	0 to 5 Vdc (≤ 10mA)
Triac (2 pairs)	Heat and Cool	14, 15, 17, 18	24 Vac, 250 mA max continuous, 650 mA max surge (≤ 30 sec.)

**CHC Outputs**

**Description**

CHC applications can have a variable number of heating and cooling stages. The number of pipes used on the unit could be two or four. The outputs could be staged, PWM, floating, or Thermal type. In addition the outputs can be of Change over mode.

**Purpose**

Define the operation of the chilled ceiling controller outputs and the type of equipment to be controlled.

**Mode**

Configuration can be performed with the wizard Off-line or On-line.

**Procedure**

1. Click the **Outputs** button on the left pane to open the **Output Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Input Configuration** page.

**CHC Output Fields**

Table 8 describes the field definitions.

**Table 8. CHC Outputs - Field Definitions.**

Name	Definition
Application	
Safety	
Select/disable ceiling protection	
Condensation Protection	
Chilled Ceiling protection option	It enables dew-point calculation and condensation protection. The cold water temperature value must be available (either wired connected or shared via the network). If the humidity value is available (either connected or shared via the network), the controller uses it to calculate the dew-point temperature for the cold water temperature limitation; otherwise it uses a settable dew-point setpoint.



**Table 8. CHC Outputs - Field Definitions. (Continued)**

Name	Definition
Application (continued)	
No Condensation Protection	Disable the dew-point temperature calculation and protection. The cold water temperature and the humidity are not needed by the controller; the chilled ceiling protection can still be performed by the condensation switch.
System	Define the type of equipment that is being controlled in terms of the number of pipes used on the unit.
Two Pipe	A unit that has only two pipes. Selecting this system type limits the controller to control only one valve output and operate in a changeover mode. When operating in the changeover mode, the controller uses only the one valve for controlling both heating and cooling. Use this configuration only when changeover operation is required.
Four Pipe	A unit that has four pipes connected, providing both heating and cooling at the same time. The controller uses one output to control heating only and one output to control cooling only, as configured in the Outputs page.
Control Outputs	
Configures the two control outputs for the different type of actuators and control sequences required for the application.	
Output 1 - Mode	<p>The output triac pair connected to terminals 13/14/15 of the controller.</p> <p>Select the control sequence option to be allocated to Output 1. For four-pipe applications, always allocate this output to the heat option to minimize field wiring errors. For two-pipe applications, the changeover option is the only option.</p>
Heat Mode	The output is modulated open when heat energy is needed in the space.
Cool Mode	The output is modulated open when cool energy is needed in the space; it is also modulated to limit the cold water temperature above dew-point temperature (if enabled).
ChangeOver Mode	The output is modulated open when heat or cool energy is needed in the space. In Cool Mode, the output is modulated to limit the cold water temperature above the dew-point temperature (if enabled).
Not Used	The output is not controlled by the controller and is always off.
Output1 - Type	Select the type of actuator to be connected to the output.
Floating	A three-point actuator that can be commanded open or closed. It is on terminals 14/15 and/or 17/18. The run-times for the actuator are configured in the Outputs page.
Floating	A three point actuator that can be commanded open or closed on terminals 14/15 and/or 17/18. The run-times for the actuator are configured in the Outputs page. The Zero Energy Position (no Heat and no Cool) is the middle Position (50%). The Cool Range is 0 to 50%; the Heat Range, 50 to 100%. The Range can be reversed by selecting the Actuator Direct or Reverse Option. During the Synchronization Process, the fan is turned off.
PWM	A duty-cycled output where the 24VAC output is pulsed on/off in the duty cycle range 0% to 100%. This actuator drives output terminal 14 and/or 17.
One Stage	A single-stage on/off output. It switches terminals 14 and/or 17.
Two Stage	A two-stage output: Terminals 14/17 are switched for stage 1 and terminals 15/18 are switched for stage 2.

**Table 8. CHC Outputs - Field Definitions. (Continued)**

Name	Definition
Control Outputs (continued)	
Three Stage	A three-stage switched output. Terminals 14/17 are switched for stage 1, terminals 15/18 are switched for stage 2. Both terminal 14+15 and/or 17+18 are switched for stage 3.
Thermal	A switched on/off output for switching a 24V thermal actuator on terminal 14/17.
Output 2 - Mode	<p>The output triac pair connected to terminals 16/17/18 of the controller.</p> <p>Select the control sequence option to be allocated to output 2. For four-pipe applications, always allocate this output to the cool option to minimize field wiring errors. For two-pipe applications, only the changeover option is available.</p> <p>The selection options are the same as for Output 1.</p>

## CHC Inputs

### Purpose

To select the wall module parameters and input points to configure a CHC controller.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Inputs** button on the left pane to open the Input **Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Equipment Control Configuration** page or **Back** to display the **Output Configuration** page.

### CHC Input Fields

Table 9 describes the field definitions.

**Table 9. CHC Inputs - Field Definitions.**

Name	Field and Definition
Controller / Wall Module	
	Configures the functionality of the connected wall module. Be careful that the features configured here are the same as the features available on the wall module device to be connected.
	Space Temp Sensor
	Specify whether or not the controller is to be used with a space temperature sensor connected to its input. Normally, a space temperature sensor is used, but in cases where the space temperature is supplied from another device via the network, the local space temperature sensor input is not used.
	Yes
	The local space temperature sensor input is used. Ensure that a space temperature sensor is actually connected otherwise the controller measures incorrect values.
	No
	The local space temperature sensor is not used. This option must be selected when a sensor is not connected.
	LED/LCD Display
	<p>This configuration defines whether a Wall Module with LED or a Wall Module with LCD Display is connected.</p> <p>For the LED, either the Override Status or the Effective Occupancy Status is displayed. The LCD Display show the both - the Effective and the Override Status and an additional Off Condition.</p> <p>The Override Status results from the Scheduler, the Network Override, the Override Button and the Occupancy Sensor. The Off Condition results from the Fan Speed Switch, the Window Contact and the Medium from nviApplicMode.</p>
	LED Override
	The LED shows the Override from the Override Button or from the Network. On indicates Override Bypass, 1 Flash per Second indicates Override Unoccupied, 2 Flashes per Second indicates Override Standby or Occupied. 4 Flashes indicates the Controller answers of the Network Management Command Wink.

**Table 9. CHC Inputs - Field Definitions. (Continued)**

Name	Field and Definition
Controller / Wall Module (continued)	
LED Occupancy	The LED shows the effective Occupancy mode. On indicates effective Occupied or Bypass, 1 Flash per Second indicates effective Standby, Off indicates effective Unoccupied. 4 Flashes indicates the Controller answers of the Network Management Command Wink.
LCD Display	This mode is used only for a Wall Module with LCD Display. The Display has following Symbols to show the Occupancy Modes: Sun indicates effective Occupied or Bypass, Half Sun indicates effective Standby, Moon indicates effective Unoccupied. No Symbol and OFF in 7-Segment indicates the Controller is Off. In the Off mode, a Snow Flag indicates whether Frost Protection is configured. Blinking Symbols are used to show the Override: Blinking Sun indicates Override Occupied or Bypass, blinking Half Sun indicates Override Standby, Blinking Moon indicates override unoccupied. The Controller answers with the Network Management Command Wink with blinking Sun and Moon.
Override Button	Define how the override button on the connected wall module is to be used.
None	The wall module button is not used for bypass function.
ByPass Only	The Bypass button, when pressed, has two different functions depending on the length of time the button is held down: Two seconds puts the controller in Bypass. Five seconds puts the controller in Unoccupied.
Bypass	The Bypass button, when pressed, has the following function: In two seconds the controller is in Bypass mode.
Setpoint Knob	The setpoint knob is available in different types of scale, and with different setpoint meanings, based on the country of usage. The temperature engineering unit used (°C or °F) is the setting made in WebVision when creating the new project. That setting is used for the total project. Note that the setpoint knob only affects the Occupied and Standby Setpoints. The Unoccupied setpoint is not affected by the setpoint knob. Note that Version C and D Chilled Ceiling controllers have an on-board setpoint. They cannot be used with an external TR21 or TR23 setpoint device.  The range of setpoint knob value lies between -9tdf to +9tdf.
No Knob	The setpoint knob is ignored. Note that this must be chosen if there is no setpoint knob connected to the controller. This selection prevents the controller from reacting to incorrect setpoint values.
Relative	The setpoint knob is a relative knob, showing only a setpoint shift as (+) and (-) changes to the configured setpoint.
Absolute Middle	The setpoint knob is an absolute knob, showing the setpoint in absolute degrees. It is used as the space temperature setpoint midway between the heating and cooling zero energy band.
Setpoint Limits	These two fields specify the allowed range of adjustment available from the wall module setpoint knob. This range is used by the building manager for energy management purposes, to balance allowed comfort conditions with energy usage.
(SETPOINT KNOB = RELATIVE)	When the setpoint knob has been chosen as relative, the setpoint limits define the range of adjustment of the setpoint knob from the zero point, in (DDC) for °C installations and (DDF) for °F installations.
(SETPOINT KNOB = ABSOLUTE MIDDLE)	When the setpoint knob has been chosen as absolute, the setpoint limits are limits on the absolute range of the setpoint knob in (Deg.C) for °C installations and (Deg.F) for °F installations.

Table 9. CHC Inputs - Field Definitions. (Continued)

Name	Field and Definition
Input Ports	
	Specifies usage of the controller inputs
	Analog Input 1 and Analog Input 2 <sup>a</sup>
	Window Closed
	Indicates if a window is closed. Close window disables the controller operation. If the contact is closed, the window is closed.
	Window Open
	Indicates if a window is opened. An open window enables the controller operation. If the contact is closed, the window is closed.
	Occupied Sensor
	Indicates if the room is occupied. If the contact is closed, the space is occupied.
	Unoccupied Sensor
	Indicates if the room is unoccupied. If it is unoccupied, the controller switches from the occupied operating setpoints to the standby operating setpoints.
	ChangeOver Cool
	This selection is for local heat/cool changeover operation for two-pipe units using a switch or local thermostat switch. When the contact closes, this input indicates that the system can operate in cooling mode. When the contact opens, this input indicates that the system can operate in heating mode.
	ChangeOver Heat
	This selection is for local heat/cool changeover operation for two-pipe units using a switch or local thermostat switch. When the contact closes, the input indicates that the system can operate in heating mode. When the contact opens, the input indicates that the system can operate in cooling mode.
	Condensation
	Indicates if there is condensation in the ceiling. When condensation is detected, the controller closes the cooling output. The cooling output is controlled again after 5 minutes if condensation is not detected anymore. When the contact closes, there is condensation.
	No Condensation
	Indicates if there is no condensation in the ceiling. As long as there is no condensation, the contact is closed. If the contact opens, the controller closes the cooling output. The cooling output is controlled again after 5 minutes if condensation is no longer detected. When the contact closes, there is no condensation.
	Movement
	This selection is used for movement detector configuration where a closed contact indicates movement. Movement detector is the same as occupancy sensor, but with an additional Hold Time of 15 minutes. This adds a delay to the occupancy signal such that the space is considered occupied until 15 minutes has elapsed since the last movement is detected.
	Cold Water
	The cold water temperature sensor input is used. Ensure that a cold water temperature sensor is actually connected otherwise the controller measures incorrect values.
	Not Used
	The cold water temperature sensor is not used. This option must be selected when a sensor is not connected and is shared via the network.
	Analog Input 3
	Specify whether or not the controller is to be used with a humidity sensor connected to its input. If the controller is configured for ceiling protection, as defined in the Outputs page, the humidity must be either connected or shared via the network.
	Humidity
	The humidity sensor input is used. Ensure that a humidity sensor is actually connected; otherwise, the controller measures incorrect values.
	Not Used
	The humidity sensor input is not used.

<sup>a</sup> You cannot configure the same for Analog Input1 and Analog Input2. For example, you cannot configure Analog Input1 as Window Contact and Analog Input2 as Window Contact. All digital inputs for Input2 are supported since controller version 1.0.4.

# CHC Equipment Control

## Purpose

Define the main control features of controller outputs.

## Mode

Configuration can be performed with the wizard Off-line or On-line.

## Procedure

1. Click the **Equipment Control** button on the left pane to open the **Equipment Control Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Switching Levels Configuration** page or **Back** to display the **Inputs Configuration** page.

## CHC Equipment Control Options

Table 10 describes the configuration options.

**Table 10. CHC Equipment Control - Options.**

Name	Option and Definition
Output Options	Defines the operating characteristics of the two valve actuator outputs.
	Output 1 and Output 2
	Define operation of output 1 and output 2, as configured in the Outputs page. The settings for both Outputs have the same meaning as described in the following text.
	Valve Direction
	Define the operating direction of the valves for actuator types Floating, PWM, and Thermal.
	Direct
	To open, the valve is modulated from 0% to 100%.
	Reverse
	To open, the valve is modulated from 100% to 0%.
	Min Stage Off Time
	Define the minimum off-time for control outputs configured for operation as staged outputs. This setting is particularly useful for heat exchanger operation or compressor units. Each stage of the controlled output stays off for the minimum period of time before the controller turns it on again. The selectable range is 0 to 600 seconds.
	Valve Runtime
	This configuration parameter has three different functions depending on the control output type selected in Control Outputs.
	(CONTROL OUTPUT TYPE = FLOATING)
	The value is the actuator run-time in the range 20 to 600 seconds.
	(CONTROL OUTPUT TYPE = PWM)
	The value is the cycle period of the PWM output in the range 20 to 600 seconds.
	(CONTROL OUTPUT TYPE = ONE, TWO OR THREE STAGE)
	The value is the minimum on-time for each of the stages, for controlling compressor units
PWM Options	
	Configures the full range of the PWM outputs. For many PWM-controlled devices, an output of 0% or 100% is not allowed since a PWM output shows no switching at these percentages. Therefore, most PWM devices have a minimum duty cycle and a maximum duty cycle between which they operate from zero to full scale. The fields here configure the full range settings. You can swap the Zero and Full range values to achieve reverse operation for a PWM output.
	Zero
	PWM % duty cycle for fully closed position.
	Full
	PWM % duty cycle for fully open position.



## CHC Switching Levels

### Purpose

To configure the staged output switching levels.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Switching Levels** button on the left pane to open the **Switching Levels Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Zone Control Configuration** page or **Back** to display the **Equipment Control** page.

### CHC Switching Level fields

All levels can be set in the range 0% to 100%.

## CHC Zone Control

### Purpose

To configure the heating and cooling setpoints for the Occupied, Standby, and Unoccupied operating modes.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Zone Control** button on the left pane to open the **Zone Control Configuration** page.
2. Enter information into available fields.

3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Miscellaneous Configuration** page or **Back** to display the **Switching Levels Configuration** page.

### CHC Zone Control fields

Setpoints can range from 10 to 35 °C (50 to 95 °F).

Also specify dew-point temperature setpoint and a safety band to be used in case the dew point calculation fails or a humidity sensor is not available. These fields are not used when the controller is not configured for ceiling protection.

## CHC Miscellaneous

### Purpose

To configure energy management parameters.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Miscellaneous** button on the left pane to open the **Miscellaneous Parameters Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **PID Configuration** page or **Back** to display the **Zone Control Configuration** page.

### CHC Miscellaneous Options

Table 11 describes the options.

**Table 11. CHC - Miscellaneous Options.**

Name	Option and Definition
Miscellaneous	
	Configures operator bypass and priority options.
	Bypass Time
	Define the period of time (0 to 1080 minutes) in which the controller operates to occupied setpoints after the local user has pressed the override button.
	Override Priority
	Allocate priority between local wall module operations (for example, Bypass) and commands from the building management central. Choices are:
	Last Wins
	Last received input takes precedence. It can be either the Bypass button or the Network signal.
	Network Wins
	The Network signal always takes precedence over the Bypass button

**Table 11. CHC - Miscellaneous Options. (Continued)**

Name	Option and Definition
Energy Management	
DLC SetPoint Bump	For load shedding applications, define the temporary setpoint shift to be added to the setpoint when the controller receives a Load Shedding command. By raising the setpoint during cooling operation, or reducing the setpoint during heating operation, the controller reduces the amount of heat or cool energy dissipated as a contribution to load shed algorithms. The parameter can be set in the range 0 to 10DDC (0 to 18DDF).
Cool. Rec. Ramp, Heat. Rec. Ramp	Define the rate at which the setpoint is reset during changes between occupancy modes to provide a form of optimum start algorithm

## CHC PID

### Purpose

Configure the variables for closed loop control. PID parameters can be set separately for both heating and cooling control.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **PID** button on the left pane to open the **PID Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Wiring Configuration** page or **Back** to display the **Miscellaneous Configuration** page.

### CHC PID settings

Table 12 describes the settings.

**Table 12. CHC - PID Settings.**

Name	Setting and Definition
PID	
Cooling/Heating	Allows the algorithm control parameters to be configured.
Proportional band	This value is the temperature deviation between setpoint and space temperature, which causes the control output to modulate from 0% to 100% of full range. The variable can be set in the range 2 to 100DDC (3.6 to 180DDF), 1.3 to 100DDC (2.3DDF to 180DDF) for Proportional Control only.
Reset Time	This value is the integral reset time in the range 0 to 3200 sec. Setting the Integral constant to zero disables integral operation.
Derivative Time	This value is the derivative constant in the range 0 to 3200 sec. Setting the derivative constant to zero disables derivative operation.
Thermal Switching Band/PID Boost	
Cooling/Heating	
Boost Temp	Allows a boost band to be set for normal PID operation and when using thermal actuators. The variables indicate a setpoint-space temperature deviation outside which the outputs are switched to full operation to act as a boost function when space temperature deviates significantly from the desired setpoint. This band also serves as a threshold for two-point switching of thermal actuators. The threshold can be set in the range 0 to 10DDC (7.2 to 180DDF). If the threshold is set to 0DDC, the boost function is disabled.

## CHC Wiring Diagram

### Purpose

Display the wiring diagram for the controller.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Wiring** button on the left pane to open the **Wiring Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Back** to display the **PID Configuration** page.

### Fields

DI1 Window / Occupancy / Air Flow / Changeover.

**Table 13. CHC - Wiring Diagram.**

Name	Definition
Wall Module	Use these terminals to connect the Wall Module. <ul style="list-style-type: none"> <li>• Override LED</li> <li>• Setpoint</li> <li>• Bypass Button</li> <li>• Room Temp Sensor</li> </ul>

### LON Bus

The terminals in Table 14 are used to connect the LON Bus FTT-10A. The LON terminals are insensitive to polarity.

**Table 14. CHC - LON Bus Terminals.**

Output1 / Output2	Terminal 14/15	Terminal 17/18
Floating	14 On = open valve	17 On = open valve
	15 On = close valve	18 On = close valve
1-stage	14 = On/Off	17 = On/Off
	15 = not used	18 = not used
2-stage	14 On = stage 1	17 On = stage 1
	14 On + 15 On = stage 2	17 On + 18 On = stage 2

**Table 15. XL10 CVAHU Device Properties for each Model.**

Criteria	W7750A	W7750B	W7750C
Digital Outputs	6 (Relay)	8	5
Analog Outputs	0	0	3
Conventional or Heat pump control	yes	yes	yes
Stages of electric or gas fired heating	1-4	1-4	1-4
Stages of Cooling	1-4	1-4	1-4

**Table 14. CHC - LON Bus Terminals. (Continued)**

Output1 / Output2	Terminal 14/15	Terminal 17/18
3-stage	14 On = stage 2	17 On = stage 1
	15 On = stage 2	18 On = stage 2
	14 On + 15 On = stage 3	17 On + 18 On = stage 3
PWM	14 = PWM	17 = PWM
	15 = not used	18 = not used
Thermal	14 = Pulse Modulated	17 = Pulse Modulated
	15 = not used	18 = not used

### Power

24VAC: 50/60 Hz.

## Configuring the Constant Volume Air Handling Unit Controllers (CVAHU)

### Description

The W7750 series is the Constant Volume Air Handling Unit (CVAHU) controller in the Excel 10 family. It is a LonMark compliant device designed to control single zone and heat pump air handlers. The W7750 series can be configured to control a wide variety of possible equipment arrangements.

The various models available for The XL10 CVAHU are:

- W7750A
- W7750B
- W7750C

### Purpose

To configure a CVAHU application.

### Navigating to CVAHU Pages

Go to the **Devices** tab. Expand the list of devices on the left pane (listed under WebVision). Select a device to view its properties.

### CVAHU Device Property Fields

Table 15 lists the CVAHU device properties for each controller model.

Table 15. XL10 CVAHU Device Properties for each Model. (Continued)

Criteria	W7750A	W7750B	W7750C
Heating	N/A	Floating, or Pulse width modulated	Floating, Pulse width modulated, reverse Pulse width modulated, Analog, or reverse Analog
Cooling	N/A	Floating, or Pulse width modulated	Floating, Pulse width modulated, Reverse Pulse width modulated, Analog, or reverse Analog
Mixed Air Damped Output	Floating	Floating or Pulse width modulated	Floating, Pulse width modulated, Reverse Pulse Width modulated, Analog, or reverse Analog
Optional Outputs	AuxEcon, OccStatus, Free1, Free2, Free1PulseOn  or Free1PulseOff	AuxEcon, OccStatus, Free1, Free2, Free1PulseOn  or Free1PulseOff	AuxEcon, OccStatus, Free1 or reverse Free1  Free2 or Reverse Free2  Free1PulseOn or Free1PulseOff  Free1AO or Free1AORev Free2AO or Free2AORev
Override	Occupancy sensor override and window open override	Occupancy sensor override and window open override	Occupancy sensor override and window open override
Analog Inputs	3 resistive	4 resistive and 2 voltage	4 resistive and 2 voltage With Outdoor 20KNTC sensor support
Digital Inputs	3 digital inputs	5 digital inputs	5 digital inputs with Coil Freeze Status support
LED digital output	Yes	Yes	Yes
Power Supply	N/A	22 Vdc power supply	22 Vdc power supply

NOTE: One digital input is reserved for the Wall Module Bypass. One analog input reserved for Wall Module Sensor and one analog input reserved for Wall Module Setpoint. Consult the System Engineering Guide before configuring the CVAHU. Also, refer to *Excel 10 W7750A,B, C Constant Volume AHU Controller Specification Data* (form 74-2956); or *Excel 10 W7750A, B, C Constant Volume AHU Controller Installation Instructions* (form 95-7521) for more information.  
This literature is available on [customer.honeywell.com](http://customer.honeywell.com). Try the following link for any document:  
<http://customer.honeywell.com/request.cfm?form=xx-xxxx>

NOTE: Packaged Economizer is selected by using **EconNonePackaged** and selecting the **AuxEcon** optional Output. This output will enable the economizer when the CVAHU is in the Occupied mode.

### Purpose

Enter all outputs, including optional outputs, to be controlled by the CVAHU Controller.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Outputs** button on the left pane to open the **Output Configuration** page.
2. Enter information into available fields.
3. Select the appropriate controller type from the Controller Type list.
4. Select the power frequency from the Power Frequency list.
5. Select the appropriate equipment type from the Equipment Type list.
6. Choose the number of heating stages (1-4) or the type (PWM or Floating) from the Heating list.

## CVAHU Outputs

### Description

CVAHU applications can have a variable number of heating and cooling stages. The outputs could be of staged, PWM, floating, or Analog type. In addition there is a Change over relay (Heat Pump Application) and Economizer Output. The Economizer output can be Floating, PWM, Analog, or Packaged Economizer 1. Optional points can also be selected from this selection.

7. Choose the number of cooling stages (1-4) or the type (PWM or Floating) from the Cooling list.
8. Select the type of economizer from the Economizer list.
  - a. If the heating, cooling, or economizer is configured as PWM, the Period, Zero Scale, and Full Scale settings must be configured.
  - b. If the heating, the cooling, or the economizer is configured as Floating, the Motor speed settings must be configured.
9. Configure the Optional points. Refer to Table 16 on page 45 for possible values.
10. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
11. Click **Next** to display the **Input Configuration** page.

### CVAHU Controller Outputs

Table 16 lists the CVAHU Outputs for each controller model.

**Table 16. CVAHU Outputs for each Model.**

Output	W7750A	W7750B	W7750C
Heating	1 to 4 stages	1 to 4 stages, HeatPWM or HeatingFloating	1 to 4 stages, HeatPWM, HeatPWMRev, HeatAO, HeatAORev, or HeatingFloating.
Cooling	1 to 4 stages	1 to 4 stages, CoolPWM or CoolingFloating	1 to 4 stages, CoolPWM, CoolPWMRev, CoolAO, CoolAORev, or CoolingFloating.
Economizer	EconNone or EconFloating	EconNone, EconPWM, or EconFloating	EconNone, EconPWM, EconPWMRev, EconAO, EconAORev or EconFloating.
Optional Points	OccStatus, AuxEcon, Free1, Free2, Free1PulseOn, Free1PulseOff.  Maximum of one optional point.	OccStatus, AuxEcon, Free1, Free2, Free1PulseOn, Free1PulseOff.  Maximum of three optional points.	OccStatus, AuxEcon, Free1, Free1Rev, Free2, Free2Rev, Free1PulseOn, Free1PulseOff, Free1AO, Free1AORev, Free2AO, Free2AORev.  No optional points available.

NOTE: The optional points Free1AO, Free2AO, Free1AORev, Free2AORev are available in the W7750C Model of CVAHU only. These enumerations must be selected to use terminals 6,7 and 8 of W7750C model. These outputs can be driven by XL15A or XL15C, but since Free1 and Free2 are digital in nature, XL15A and XL15C can only command these points to ON or OFF. Hence, these points can be driven only by digital outputs of XI15A/ XI15C loops.

### CVAHU Outputs fields

Table 17 lists the CVAHU Outputs fields.

**Table 17. CVAHU Outputs Fields.**

Name	Definition
Controller Type	Select one of the following model types: <ul style="list-style-type: none"> <li>• W7750A</li> <li>• W7750B</li> <li>• W7750C</li> </ul> The wizard does not allow commissioning if incorrect Model Type is selected
Power Frequency	Select one of the following options: <ul style="list-style-type: none"> <li>• 50 Hz</li> <li>• 60 Hz</li> </ul>
Equipment Type	Select one of the following options: <ul style="list-style-type: none"> <li>• Conventional</li> <li>• HeatPump</li> </ul>

**Table 17. CVAHU Outputs Fields. (Continued)**

Name	Definition
Heating	Refer to table above for selecting Heating options: <ul style="list-style-type: none"> <li>• If you select Floating, enter the Motor Speed settings.</li> <li>• If you select PWM, enter the PWM settings.</li> </ul>
Cooling	Refer to the table above for selecting Cooling settings: <ul style="list-style-type: none"> <li>• If you select Floating, enter the Motor Speed settings.</li> <li>• If you select PWM, enter the PWM settings.</li> </ul>
Economizer	Refer to the table above for selecting Economizer options: <ul style="list-style-type: none"> <li>• If you select Floating, enter the Motor Speed settings.</li> <li>• If you select PWM, enter the PWM settings.</li> </ul>

**Table 17. CVAHU Outputs Fields. (Continued)**

Name	Definition
Motor Speed	<p>You can configure three Motor Speed settings:</p> <ul style="list-style-type: none"> <li>• Heating</li> <li>• Cooling</li> <li>• Economizer</li> </ul> <p>If you select HeatingFloating for configuring Heating settings, Motor speed for heating is enabled.</p> <p>Similarly, if you select CoolingFloating or Econfloating for cooling and economizer respectively, Motor Speed for Cooling and Economizer is enabled.</p>
PWM Settings	<p>PWM settings are enabled if heating, cooling, or Economizer is configured as PWM.</p> <p>It consists of Zero Scale, Full Scale, and Period values to control PWM output type.</p>

**Optional Points available for the XL10 CVAHU**

NOTE: When selecting one of the following, the wizard assigns a digital output I/O terminal to the function.

**XL10 CVAHU Optional Points fields**

Table 18 lists the Optional Points available for the XL10 CVAHU.

**Table 18. Optional Points for XL10 CVAHU.**

Name	Definition
Occupancy_Status	Energized if the controller is currently in Occupied mode.
Free1	Network controller digital output. Follows the input signal nviFree1. Turns on when nviFree1 is on.
Free2	Network controller digital output. Follows the input signal nviFree2. Turns on when nviFree2 is on
Free1_Pulse_On	Momentary digital output (1 Sec.). Typically used for controlling lighting systems. This output turns the lights on. Uses nviFree1
Free1_Pulse_Off	Momentary digital output (1 Sec.). Typically used for controlling lighting systems. This output turns the lights off. Uses nviFree1.
Unused_Out	No digital output assigned.
Aux_Econ	Tracks occupancy (On for OCC, OFF for UNOCC). Emulates the T7300's internal economizer output signal for controlling external economizer packages.

**CVAHU Inputs**

**Description**

To select the wall module type, voltage and resistive inputs for a CVAHU application.

**Purpose**

Enter all inputs to be wired to the CVAHU.

**Mode**

Configuration can be performed with the wizard Off-line or On-line.

**Procedure**

1. Click the **Inputs** button on the left pane to open the **Input Configuration** page.
2. Enter information into available fields.
3. Select **Space Temp** sensor type.
4. Select the optional Digital and Analog Inputs.
5. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
6. Click **Next** to display the **Equipment Control Configuration** page or **Back** to display the **Output Configuration** page.

**CVAHU Inputs fields**

Table 19 lists the CVAHU Inputs fields.

**Table 19. CVAHU Inputs Fields.**

Name	Definition
Space Temp	<p>Space Temp sensor type. Select one of the following options:</p> <ul style="list-style-type: none"> <li>Wall Module</li> <li>LCD Wall Module (physical sensor)</li> <li>Network Only (network sensor signal)</li> </ul> <p>Note: The LCD wall module is supported by the following versions of CVAHU: CVAHU Model A- v1.02.14 CVAHU Model C – v2.01.103</p>
Wall Module	<p>You cannot modify this option as it is read-only. Wall Module supports the following types:</p> <ul style="list-style-type: none"> <li>• Sensor Only</li> <li>• Sensor Setpoint</li> <li>• Sensor Bypass</li> <li>• Sensor Setpoint Bypass</li> </ul> <p>See the table below for further details.</p>



**Table 19. CVAHU Inputs Fields. (Continued)**

Name	Definition
Optional Digital Inputs	<p>You can configure digital inputs. The W7750A can be configured with a maximum of two digital inputs. The W7750B, W7750B Enhanced, and the W7750C, can be configured with all four digital inputs. CoilfreezeStat is available on W7750C only.</p> <p>Configure one of the following as an optional digital point:</p> <ul style="list-style-type: none"> <li>• OccSensor</li> <li>• OccTimeclock</li> <li>• ProofAirFlow</li> <li>• EconEnable</li> <li>• IaQOverride</li> <li>• SmokeMonitor</li> <li>• DirtyFilter</li> <li>• Shutdown</li> <li>• WindowOpen</li> <li>• MonitorSw</li> <li>• ScheduleMaster</li> <li>• Dehumidify</li> <li>• Unused DI</li> </ul>

**Table 19. CVAHU Inputs Fields. (Continued)**

Name	Definition
Optional Analog Inputs	<p>You can configure both resistive and voltage type analog inputs. The W7750A, has one resistive analog input that can be configured. The W7750B, W7750B Enhanced, and W7750C have two resistive and two voltage inputs that can be configured. The W7750C supports the OutdoorTemp20KNTC sensor type.</p> <p>Configure one of the following as a Resistive optional analog point:</p> <ul style="list-style-type: none"> <li>• DschgTempPT3000</li> <li>• OutdoorTempPT3000</li> <li>• RtnTempPT3000</li> <li>• DschgTemp20KNTC</li> <li>• OutdoorTemp20KNTC</li> <li>• RtnTemp20KNTC</li> <li>• Unused RAI</li> </ul> <p>Configure one of the following as a Voltage/current optional analog point:</p> <ul style="list-style-type: none"> <li>• Rtn HumidityC7600C</li> <li>• RtnEnthalpy</li> <li>• OdHumidityC7600C</li> <li>• OdEnthalpy</li> <li>• FilterPress</li> <li>• SpaceCO2</li> <li>• MonitorSensor</li> <li>• Rtn HumidityH7621</li> <li>• Rtn HumidityC7600B</li> <li>• OdHumidityH7621</li> <li>• OdHumidityC7600B</li> <li>• Unused VAI</li> </ul> <p>The RtnHumidityH7621/31 and OdHumidityH7621/31 humidity sensors for voltage inputs are supported by CVAHUs of model type CVAHU C whose versions are 2.01.103 and above.</p> <p>The other humidity sensor models H7620 and H7630 work fine when CVAHU is configured to use the existing C7600C humidity sensors.</p> <p>The DischTemp20KNTC sensor can be used to report valid temperatures up to 180 °F. This is applicable CVAHU C models whose versions are 2.01.103 and above. This is applicable to CVAHU Model A also whose version is 2.01.13 and above.</p>

The wall module configuration affects the Use Wall Module (under the **Zone Option** page) and Over Ride Priority (under the **Miscellaneous Parameters** page). The possible values of Use Wall Module and Override Priority is given in Table 20:

**Table 20. Use Wall Module vs. Override Priority.**

Sensor	Use Wall Module as Setpoint in Zone Option page	Use Override Priority in Miscellaneous Parameter page	Meaning
Sensor only	No	None	Use Wall Module as Sensor only
Sensor Setpoint	Yes	None	Use Wall module as Sensor as well as get set point.
Sensor Bypass	No	Normal Bypass	Use Wall module as Sensor as well as for bypass.
Sensor Setpoint Bypass	Yes	Normal Bypass	Use the Wall module as the Sensor source for temperature setpoint as well as input to bypass scheduled occupancy state

## CVAHU Equipment Control

### Description

Sensor type, Cascade control options, COR Mode, Fan, and Smoke control options.

### Purpose

Define equipment control settings.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Equipment Control** button on the left pane to open the **Equipment Control Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Economizer Parameters Configuration** page or **Back** to display the **Input Configuration** page.

## CVAHU Equipment Control fields

Table 21 lists the CVAHU Equipment Control fields.

**Table 21. CVAHU Equipment Control Fields.**

Name	Definition
Main Sensor	Set sensor type, if any, to Space Temperature or Return Air Temperature.  Return Air option is available only if a Return Air sensor is configured on the CVAHU Controller Inputs page.

**Table 21. CVAHU Equipment Control Fields. (Continued)**

Name	Definition
Cascade Control	Configure cascade control. Default is No.  Yes is available only if both a Discharge Air Temperature sensor and modulating heating or cooling are configured.
C.O.R. Fail Mode	Changeover Relay (For Heat Pump only) fail mode: Heating or Cooling.  This option determines which mode (Heating or Cooling) is activated on power failure to the C.O.R. This item is available only if HeatPump was selected on the Output page.
Fan Control	You can select one of the following fan control options: <ul style="list-style-type: none"> <li>• Auto - Auto cycles the fan with call for cooling (and heating if Fan Heating is On).</li> <li>• Continuous - Indicates that the fan runs continuously in the Occupied mode, and intermittently (with call for heating/cooling) in the Unoccupied mode.</li> </ul>
Fan-Heating	Select one of the following options: <ul style="list-style-type: none"> <li>• On</li> <li>• Off - Select Off to allow for control circuits where, when in heat mode, the fan is directly controlled by an interlock control circuit (not part of the Excel 10 controller) which brings on the fan once the plenum temperature has risen above its setpoint. This option is typically used in roof top air handlers with gas-fired heating.</li> </ul>
Smoke Control	This value determines what the controller does when a smoke alarm occurs (either from the digital input, or via the LONWORKS network). Select one of the following options: <ul style="list-style-type: none"> <li>• FanOffDmperClose</li> <li>• FanOnDmperOpen</li> <li>• FanOnDmperClosed</li> </ul>
Fan Fail Time	Enabled when Air Flow switch is selected.  This value sets the amount of time that must pass after fan start-up before the Air Flow Switch is checked. This action allows the fan to come up to speed and prevents false air flow failure alarms.
Filter Pressure Stpt	Filter Pressure Setpoint. Enabled if analog Filter Pressure sensor is selected.  If the measured pressure exceeds this setpoint, the Dirty Filter alarm is issued. There is a built-in hysteresis of 25 percent of the Filter Press Stpt value (for the Dirty Filter alarm to return to normal).

## CVAHU Economizer

### Purpose

Define the four settings for using an economizer in a CVAHU application.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Economizer** button on the left pane to open the **Economizer Configuration** page.
2. Enter information into available fields.
3. Select the **Enable Type** for the economizer.
4. Use the Min Position field to select a Minimum Position for the Outdoor damper.
5. Use the IAQ Position field to select a minimum damper position for poor Indoor Air Quality (IAQ) conditions.
6. Use the Use Heat for IAQ field to choose whether or not to use heat during poor Indoor Air Quality conditions.
7. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
8. Click **Next** to display the **Heat-Cool Stages Configuration** page or **Back** to display the **Equipment Control Configuration** page.

### CVAHU Economizer fields

Table 22 lists the CVAHU Economizer fields.

**Table 22. CVAHU Economizer Fields.**

Name	Definition
Enable Type	Source of the economizer enable decision for determining when to use outdoor air for cooling. The list of available selections is: <ul style="list-style-type: none"> <li>• NoLocalEconSensor</li> <li>• OutdoorTemp</li> <li>• DiffTemp</li> <li>• OdEnthTypeA</li> <li>• OdEnthTypeB</li> <li>• OdEnthTypeC</li> <li>• OdEnthTypeD</li> <li>• SingleEnthalpy</li> <li>• DiffEnthalpy</li> <li>• Digital</li> </ul> The W7750A will have the following options only: <ul style="list-style-type: none"> <li>• NoLocalEconSensor</li> <li>• OutdoorTemp</li> <li>• Digital</li> </ul>
Min. Position	Minimum position of the Outdoor Damper (0 to 100 percent). Under normal Occupied-mode operation, the dampers are not closed below this setting.  If Unoccupied, or if a Discharge Low Temperature condition exists, the dampers are closed below this setting.

**Table 22. CVAHU Economizer Fields. (Continued)**

Name	Definition
IAQ Position	Minimum Position of Damper used when poor Indoor Air Quality conditions exist (IAQ sensor > IAQ Setpoint, or if Digital IAQ Switch is on). Select a value from 0 to 100 percent.
Use Heat for IAQ	Enable or disable heat. <ul style="list-style-type: none"> <li>• Yes enables heat when damper is open for IAQ purposes.</li> <li>• No disables heat if controller is in Cool mode.</li> </ul> NOTE: A discharge low temperature condition overrides this setting and closes the dampers to prevent equipment damage due to freezing.
Enable Setpoint	Defines the setpoint value for enabling the economizer.
OA Temp High Limit	Defines the high limit for the outside temperature.

## CVAHU HC Stages

### Description

The minimum on/off times, Cycles/ hour, Minimum and maximum recovery ramps are set for heating and cooling stages of a CVAHU application.

### Purpose

Define heating and cooling (h/c) stage parameters, including minimum on and off times.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **H/C Stages** button on the left pane to open the **Heat-Cool Stages Configuration** page.
2. Select MinHeatOn/Off for Heating and MinCoolOn/Off for Cooling.
3. Enter information into available fields.
4. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
5. Click **Next** to display the **Zone Options Configuration** page or **Back** to display the **Economizer Parameters Configuration** page.

## CVAHU HC Stages fields

Table 23 lists the CVAHU HC Stages fields.

**Table 23. CVAHU HC Stages Fields.**

Name	Definition
Minimum On/Off	MinHeatOn enables minimum on/off time. MinHeatOff replaces set minimum on/off times with a 30-second default.  MinCoolOn enables minimum on/off time. MinCoolOff replaces set minimum on/off times with a 30-second default.
Cycles/Hour	Cycles per hour (cph). Enter a value from 2 through 12. For example, cph for conventional heating stage one is normally 3 cph. Consult your hardware installation guide for recommended values.
OAT Lockout	Outside Air (OA) temperature lockout. OA temperature values below the Cooling lockout setting disables the cooling stages. OA temperature values above the heating lockout setting disable the heating stages.
Min. Recov. Ramp	Minimum recovery ramp (degrees per hour). Enter a value from 2 through 20 for cooling; 3 through 20 for heating. See <i>Excel 10 System Engineering manual</i> , (form 74-2958) at for a discussion of the recovery ramp feature of the CVAHU. <ul style="list-style-type: none"> <li>This literature is available on <a href="http://customer.honeywell.com/request.cfm?form=74-2958">customer.honeywell.com</a>. Try the following link: <a href="http://customer.honeywell.com/request.cfm?form=74-2958">http://customer.honeywell.com/request.cfm?form=74-2958</a></li> </ul>
Min. Recov. Ramp Oa Temp	Minimum recovery Oa (outside air) temperature. Enter value from 0 through 100 for cooling or heating. See <i>Excel 10 System Engineering manual</i> for a discussion of the CVAHUs recovery ramp feature.
Max. Recov. Temp	Maximum recovery ramp (degrees per hour). Enter a value from 6 through 20 for cooling; 8 through 20 for heating. See <i>Excel 10 System Engineering manual</i> for a discussion of the recovery ramp feature of the CVAHU.
Max. Recov. Oa Temp	Maximum recovery Oa (outside air) temperature. Enter value from 0 through 100 for cooling or heating. See <i>Excel 10 System Engineering manual</i> for a discussion of the recovery ramp feature of the CVAHU.
Fan Run On Time	Enter an amount of time (from 0 to 120 seconds) the fan will continue to run after the last stage of heating or cooling has switched off. This value is only applicable during Unoccupied times, and during Occupied times if the Fan Control field is set to AutoFan.

## CVAHU Zone Options

### Purpose

Configure CVAHU Controller zone options such as cooling and heating setpoints (temperature settings).

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Zone Options** button on the left pane to open the **Zone Options Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Miscellaneous Configuration** page or **Back** to display the **Heat-Cool Stages Configuration** page.

## CVAHU Zone Options fields

Table 24 lists the CVAHU Zone Option fields.

**Table 24. CVAHU Zone Options Fields.**

Name	Definition
Cooling Occupied Setpoint	Temperature range is 50 to 90 °F (10 to 32 °C). Thermostat reaches this temperature during Occupied times while in the cooling mode.
Cooling Standby Setpoint	Temperature range is 50 to 90 °F (10 to 32 °C). Thermostat reaches this temperature during Standby times while in the cooling mode.
Cooling Unoccupied Setpoint	Temperature range is 50 to 90 °F (10 to 32 °C). Thermostat reaches this temperature during Unoccupied times while in the cooling mode.
Heating Occupied Setpoint	Temperature range is 50 to 90 °F (10 to 32 °C). Thermostat reaches this temperature during Occupied times while in the heating mode.
Heating Standby Setpoint	Temperature range is 50 to 90 °F (10 to 32 °C). Thermostat reaches this temperature during Standby times while in the heating mode.
Heating Unoccupied Setpoint	Temperature range is 50 to 90 °F (10 to 32 °C). Thermostat reaches this temperature during Unoccupied times while in the heating mode.
Min. Limit Setpoint	Provides a lower limit on the allowed settings of the setpoint knob of the Wall Module. Enabled if Wall Module Setpoint is configured (Input Configuration page). Values range from -9 to 9, (Setpoint default set to OFFSET) or from 50 to 90 (Setpoint default set to ABSOLUTE_MIDDLE).

Table 24. CVAHU Zone Options Fields. (Continued)

Name	Definition
Max. Limit Setpoint	Provides an upper limit on the allowed settings of the setpoint knob of the Wall Module. Enabled if Wall Module Setpoint is configured (Input tab). Values range from -9 to 9, (Setpoint default set to OFFSET) or from 50 to 90 (Setpoint default set to ABSOLUTE_MIDDLE).

## CVAHU Miscellaneous

### Purpose

Define additional CVAHU Controller parameters, such as DLC setpoint bump.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Miscellaneous** button on the left pane to open the **Miscellaneous Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **PID Configuration** page or **Back** to display the **Zone Options Configuration** page.

### CVAHU Miscellaneous fields

Table 25 lists the CVAHU Miscellaneous fields.

Table 25. CVAHU Miscellaneous Fields.

Name	Definition
IAQ CO2 Setpoint	Setting above which the Indoor Air Quality (IAQ) is deemed to be poor, and the controller enters the IAQ override mode. Values range from 0 to 2000 PPM (Enabled when SpaceCo2 sensor is selected).
DLC Setpoint Bump	Upon receipt of a DLC_Shed signal over the LONWORKS network, the current operating setpoint value is bumped up/down (for cool/heat modes) by this amount. Values range from 0 to 10 DDF (0 to 5.56 DDK).

Table 25. CVAHU Miscellaneous Fields. (Continued)

Name	Definition
Use Wall Module	Select one of the following options: <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul> <p>If set to Yes, the wall module setpoints are used by the controller and those set in the configuration are ignored.</p> <p>If set to No, the setpoint values set in the configuration are used.</p>
Override Type	Specify the type of Bypass override functions that are available from the Wall Module's Override push button. Select one of the following options: <ul style="list-style-type: none"> <li>• None (no Bypass configured for wall module)</li> <li>• Normal</li> <li>• Bypass (no Continuous Unoccupied allowed from the push button)</li> </ul>
Override Priority	Set the priority scheme for the Bypass override function. Options are: <ul style="list-style-type: none"> <li>• LastWins - Last received input takes precedence. It can be either the Bypass button or the Network signal.</li> <li>• NetManOccWins - The Network signal always takes precedence over the Bypass button.</li> </ul> <p>NOTE: This field is available only if Override Type is Normal or Bypass Only.</p>
Bypass Time	Set the time period for a bypass override event. Values range from 0 through 1080 minutes. Enabled if Override Type is Normal or Bypass Only
Max. DaTemp Setpoint	Values range from 65 to 135 °F (18.33 to 57.22 °C). Enabled if a discharge air temperature sensor is selected.
Min. DaTemp Setpoint	Values range from 0 to 60 °F (-17.78 to 15.56 °C). Enabled if a discharge air temperature sensor is selected.
Setpoint Knob Type	Relative - (plus or minus up to 9 DDF (5 DDK) from the current actual setpoint set on the Zone Options tab).

## CVAHU PID

### Purpose

Adjust PID (Proportional Integral Derivative) control parameters for the CVAHU.

### Mode

Configuration can be performed with the wizard Off-line or On-line.



## CAUTION

### Equipment Damage Possible.

Can cause short cycling of compressors or wide swings in space temperature and excessive overdriving of modulating outputs.

If large or frequent change to PID control parameters is made, it is possible to cause equipment problems such as short cycling compressors (if the stage minimum run times were disabled). Other problems that can occur include wide swings in space temperature and excessive overdriving of modulating outputs.

The default values provide proper control for most applications. If the PID parameters require adjustment away from these values, use caution to ensure that equipment problems do not arise. If any change to PID control parameters is made, the adjustments should be gradual. After each change, allow the system to stabilize so the effects are accurately observed. Make further refinements as needed until the system is operating as desired.

If the default values are changed and you want to reset them, add a second CVAHU Controller to the subnet, record then re-enter the default PID values to the first CVAHU.

### Procedure

1. Click the **PID** button on the left pane to open the **PID Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Custom Wiring** page or **Back** to display the **Miscellaneous Parameters Configuration** page.



## CAUTION

### Equipment Damage Possible.

Setting Control Band too low may cause large over or undershooting of setpoint.

The smaller the Control Band, the more responsive the control output. Be careful not to set the Control Band (heating, cooling, or econ) too low. This can happen if the space or

discharge sensors or wiring are in noisy environments and the value reported to the controller is not stable (such that it bounces). The Control Band is used only in modulating control, and has no purpose when staged control is configured.

### CVAHU PID fields

Table 26 lists the CVAHU PID fields.

**Table 26. CVAHU PID Fields.**

Name	Definition
Cooling Proportional Gain	Enter the range in degrees 2 to 30 DDF (1.1 to 16.7 DDK).
Cooling Integral Gain	Enter the range in seconds (0 to 5,000).
Cooling Derivative Time	Enter the range in seconds (0 to 9,000).
Heating Proportional Gain	Enter the range in degrees 2 to 30 DDF (1.1 to 16.7 DDK).
Heating Integral Gain	Enter the range in seconds (0 to 5,000).
Heating Derivative Gain	Enter the range in seconds (0 to 9,000).
DA Heating Control Band	Enter the range in degrees 5 to 30 DDF (2.8 to 16.7 DDK).
DA Cooling Control Band	Enter the range in degrees 5 to 30 DDF (2.8 to 16.7 DDK).
Econ Control Band	Enter the range in degrees 5 to 30 DDF (2.8 to 16.7 DDK).

NOTE: Throttling Range or Proportional Gain determines what impact the error has on the output signal. Decreasing the Throttling Range amplifies the effect on the error, that is, for a given error (the difference between the measured space temperature and the current actual space temperature setpoint), a small Throttling Range causes a higher output signal value.

### Integral Time

Determines what impact the error-over-time has on the output signal. Error-over-time has two components that make up its value: the amount of time the error exists and the size of the error. The higher the integral time, the slower the control response. In other words, a decrease in Integral Time causes a more rapid response in the output signal.

### Derivative Time or Gain

Determines what impact the error rate has on the output signal. The error rate is how fast the error value is changing. It can also be the direction space temperature is going, either towards or away from the setpoint and its speed - quickly or slowly. A decrease in Derivative Time causes a given error rate to have a larger effect on the output signal.



## CVAHU Custom Wiring

### Configuring CVAHU Custom Wiring

Use the CVAHU **Custom Wiring** page to assign configured outputs to physical pins.

### Purpose

View or modify sensor output wiring locations.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

NOTE: To add or delete outputs, refer to “CVAHU Controller Outputs” on page 45.

### Limits

Outputs must be configured using the **Unit Ventilator Controller Outputs** page.

### Procedure

1. Click the **Wiring Assignment** button on the left pane to open the **Wiring Assignment** page.
2. For Custom Assignment, select **Custom** from the Output Assignment field. The Custom Assignment fields become editable.
3. Enter information into available fields.
4. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
5. Click **Next** to display the **Wiring Diagram** page or **Back** to display the **PID Configuration** page.

### CVAHU Custom Wiring fields

Table 27 lists the CVAHU Custom Wiring fields and definitions.

**Table 27. CVAHU Custom Wiring Fields.**

Name	Definition
Default Assignment	This column displays the default assignments as the outputs are configured in the Outputs page.
Custom Assignment	Custom assignment is used to change the assignments.
Existing	If the device is online, this shows the assignments as in the device. Else, it shows from the database.

## CVAHU Wiring Diagram

### Purpose

Display the wiring diagram for the controller.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Wiring Diagram** button on the left pane to open the **Wiring Diagram Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Back** to display the **PID Configuration** page.

### CVAHU Wiring Terminals

Table 28 lists the CVAHU Wiring terminals.

**Table 28. CVAHU Wiring Terminals.**

Terminal	Connected To
1	Earth Ground
2	LED
3	Bypass
4	Sensor
5	AI Ground
6	Set Point
7	AI-1 Ohm
8	AI Ground
9	DI-1
10 and 11	DI Ground
12	DI-2
13	Not used
14 and 15	LONWORKS Bus
16 through 20	Not used
21	Vac Com
22	Vac
23	Rh
24	Rc
25 and 26	Network (DO1) <sup>a</sup>
27	G (DO2)
28	Y2 (DO3)
29	W2 (DO4)
30	W1 (DO5)
31	Not used (DO6)

<sup>a</sup> DO = Digital Output

NOTE: Fields appearing grayed out indicate those fields that change based on the Controller Type selected on the **Outputs Configuration** page.

## Configuring Fan Coil Unit Controllers (FCU)

### Description

The W7752 D, E, F, and G Controllers are communicating mains-powered Fan Coil Unit Controllers in the Excel 10 product line. They cover a wide range of fan coil control applications. The controllers can operate as stand-alone units or networked using the standard Echelon LONWORKS bus. Interfaces are provided for a wide range of actuator types. Heating systems can be water or electric, and cooling systems can be chilled water supply or compressors. Extensive timing and interlock features make the W7752 especially suitable for systems using electric heat and compressors.

### Features

- LonMark HVAC profile 8020.
- Stand-alone operation or on high speed 78 kilobit LON network.
- Uses Echelon LonTalk protocol.
- Direct connection of thermal actuators.
- Direct connection to fan switch.
- Direct connection to electric heat.
- Factory-configured default parameters.
- Wide range of supported valves and actuators.
- Interlocks and time delays to protect equipment.
- Slim design fits into narrow fan coil units.
- Terminations all on one side allow controller to be positioned at back of fan coil unit.
- Power supplied by power mains.

### FCU Controller Models

Table 29 lists the FCU Controller models.

**Table 29. FCU Controller Models.**

OS Number	Power Input	Reheat Delay
W7752D2xxx	230 Vac	YES
W7752E2xxx	230 Vac	NO
W7752F2xxx	115 Vac	YES
W7752G2xxx	115 Vac	NO

The W7752D,E,F and G are LonMark compliant Fan Coil Unit Controllers in the Excel 10 family product line. These controllers provide room temperature control for two and four pipe fan coil units with optional electric heating coils (W7752D,F) and can control single, two or three speed fans. The controller is provided with default configuration settings from the factory and is fully operable on installation. Using standard Echelon configuration tools, the controller can be configured with job-specific settings. A variety of optional wall modules interface with the FCU controllers and provide any or all of the following: setpoint adjustment, fan speed adjustment, and occupancy bypass button. All wall modules include a space temperature sensor, however a remote C7068A return air sensor can also be used.

### Supported Output Types

Table 30 lists the supported output types for the FCU Controller.

**Table 30. FCU Controller Output Types.**

Output	Options
Heating	Floating, thermal, PWM, on/off, multi-stage electric
Cooling	Floating, thermal, PWM, on/off, multi-stage compressor
Fan	On/Off, 2-speed, 3-speed
Electric Reheat	On/Off

### Navigating to FCU Pages

Go to the **Devices** tab. Expand the list of devices on the left pane (listed under WebVision). Select a device to view its properties.

### Sequences

Heat and cool sequences can be selected to be active or not active, giving a total of eight different sequence options (each can be with or without fan control):

- Heat only
- Cool only
- Heat/cool changeover
- Heat and cool sequence
- All the above with electric reheat

### Modes of Operation

The controller has the following modes of operation:

- **Occupied mode**  
This is the normal operating condition for a room or zone when it is occupied. The controller can be switched into this mode by a network command, by the room occupancy sensor, or by a bypass button on the wall module. In the occupied mode the fan is controlled by the setting of the fan speed switch on the wall module or by the control algorithm when the switch is set to **auto**. The fan can be configured to remain on or turn off during the zero energy band.
- **Standby mode**  
The standby mode saves energy by reducing heating or cooling demand during periods where the room is temporarily unoccupied. In this mode the fan is switched off during the zero energy band.
- **Unoccupied mode**  
This mode is used for longer unoccupied periods, such as at night or during weekends and holidays.
- **Window open**  
The controller is configured for window open detection, the controller automatically disables heat and cool control until the window is closed again. Frost protection remains active.
- **Frost protection**  
If the temperature drops below 46 °F (8 °C), the controller enables the heating circuit as frost protection.

- **Fan fail**  
When configured with an air flow detector, the controller protects equipment by disabling the system when the fan fails
- **Changeover**  
The controller operates two-pipe FCUs configured with a changeover input.

## FCU Input/Output Specifications

Table 31 lists the FCU Input/Output specifications.

**Table 31. FCU Input/Output Specifications.**

Input/Output	Function	Characteristic
<b>Inputs</b>		
Digital	Window/ occupancy/ changeover/air flow	Closed $\leq$ 400 ohm, open $\geq$ 10K ohm
Analog/Digital (Wall Module connection only)	Fan speed/ Override	Resistor Network
Analog	Temperature Sensor	20K ohm NTC
Analog (Wall Module connection only)	Setpoint adjustment	10k Ohm
<b>Outputs</b>		
Digital (Wall Module connection only)	Override LED	0/5 Vdc
Triac (2 pairs) (See Table 30 for options)	Heat and cool	24 Vac, 250 mA max. continuous, 650 mA max. surge ( $\leq$ 30 sec)
Relay (3)	Fan Switching	20 to 253 Vac, 3A max.
High Power relay (W7725D, F only)	Electric heat (resistive load)	20 to 300 Vac, 10A max., 6A max.

## FCU Outputs

### Description

FCU applications can have a variable number of heating and cooling stages. The number of pipes used on the unit could be two or four. The outputs could be of staged, PWM, floating, or Thermal type. In addition the outputs can be of Change over mode.

### Purpose

Define the operation of the controller outputs and the type of fan coil unit to be controlled.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Outputs** button on the left pane to open the **Output Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Input Configuration** page.

### FCU Outputs fields

Table 32 on page 56 lists the FCU Outputs fields and definitions.

**Table 32. FCU Outputs - Fields and Definitions.**

Field	Definition							
Types	<b>FCU</b>	Select the hardware version to be used for the controller. The different hardware versions have different combinations of inputs and outputs. See the inset table below. The type of hardware you select affects the choices that appear in the rest of the pages for FCU. Based on your hardware selection, the configuration software ensures that you cannot configure a controller for an application it cannot perform.						
		Selection in Tool	Controller Type	Number of Relays for:		Number of Outputs	Number of Digital Inputs	LON Transceiver
				Fan	Reheat			
		W7752D_F	W7752D	3	1	2	1	FTT-10
			W7752F					
	W7752E_G_J	W7752E	3	0	2	1		
		W7752G						
		W7752J						
	<b>System</b>	Define the type of fan coil unit that is being configured. It describes the number of pipes used on the unit.						
	<b>Two Pipe</b>	A fan coil unit that has only two pipes. This system type limits the controller to control only one valve output and operate in a changeover mode. When operating in the changeover mode, the controller uses only the one valve for controlling both heating and cooling. Use this configuration only when changeover operation is required.						
	<b>Four Pipe</b>	A fan coil unit that has four pipes connected, providing both heating and cooling at the same time. The fan coil controller uses one output to control heating only and one output to control cooling only, as configured in the control outputs (Equipment Control page).						
Relay Outputs	<b>Fan</b>	Select the number of stages required for the fan output.						
	<b>Relay 4</b>	Select the use of the fourth relay for those controller types with four relays. This relay is normally used for electric reheat, but can also be used for switching equipment not directly controlled by the fan coil controller.						
	<b>Reheat</b>	The relay is switched on when the control algorithm demands electrical reheat as defined in the Reheat Options (Equipment Control tab).						
	<b>Free Use</b>	The relay is switched on and off as commanded from the network. It is not controlled by the internal fan coil controller temperature control algorithm.						
	<b>Rel Not Used</b>	The Relay is not switched by the fan coil controller and cannot be commanded via the network.						

**Table 32. FCU Outputs - Fields and Definitions. (Continued)**

<b>Field</b>	<b>Definition</b>
Control Outputs	Configures the two control outputs for the different type of actuators and control sequences required for the application.
<b>Output 1 - Mode</b>	The output triac pair connected to terminals 13, 14, and 15 of the controller. Select the control sequence option for Output 1. For four-pipe applications, the heating option is recommended to minimize field wiring errors. For two-pipe applications, the changeover option is the only selection.
<b>Heat Mode</b>	The output is modulated open when heat energy is needed in the space.
<b>Cool Mode</b>	The output is modulated open when cool energy is needed in the space
<b>ChangeOver Mode</b>	The output is modulated open when heat or cool energy is needed in the space.
<b>Not Used</b>	The output is not controlled by the controller and always remains off.
<b>Output 1 - Type</b>	Select the type of actuator to be connected to the output.
<b>Floating</b>	A three-point actuator that can be commanded open or closed. This type is on Terminals 14/15 and/or 17/18. The run times for the actuator are configured in the Equipment Control tab.
<b>Floating Mid</b>	A three point actuator that can be commanded open or closed on terminals 14/15 and/or 17/18. The run-times for the actuator are configured in the Outputs tab. The Zero Energy Position (no Heat and no Cool) is the middle Position (50%). The Cool Range is 0 to 50%; the Heat Range, 50 to 100%. The Range can be reversed by selecting the Actuator Direct or Reverse Option. During the Synchronization Process, the fan is turned off.
<b>PWM</b>	Duty-cycled output where the 24VAC output is pulsed on/off in the duty cycle range: 0 percent to 100 percent. This type drives output Terminal 14 and/or 17.
<b>One Stage</b>	Single-stage on/off output. This type switches Terminals 14 and/or 17.
<b>Two Stage</b>	Two-stage on/off output. This type switches Terminal 14/17 for stage 1 and Terminal 15/18 for stage 2.
<b>Three Stage</b>	Three-stage switched output. The output switches Terminal 14/17 for stage 1 and Terminal 15/18 for stage 2. It switches both Terminals 14/15 and/or 17/18 for stage 3.
<b>Thermal</b>	Switched on/off output. This type switches a 24V thermal actuator on Terminal 14/17.
<b>Output 2 - Mode</b>	The output triac pair connected to terminals 16, 17, and 18 of the controller. Select the control sequence option for Output 2. For four-pipe applications, the Cool Mode option is recommended to minimize field wiring errors. For two-pipe applications, the ChangeOver Mode option is the only selection.
<b>Output 2 - Type</b>	The selection options are the same as for Output 1.

## FCU Inputs

### Purpose

To configure the wall module parameters and input points for a FCU controller.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

## Procedure

1. Click the **Inputs** button on the left pane to open the **Input Configuration** page.
2. Enter information into available fields (see Table 33 on page 58).
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Equipment Control Configuration** page or **Back** to display the **Output Configuration** page.

## FCU Inputs fields

Table 33 lists the FCU Inputs fields and definitions.

**Table 33. FCU Inputs Fields.**

Name	Definition										
Wall Module	Configures the functionality of the connected wall module. Always ensure that the features configured here are the same as the features available on the wall module device to be connected.										
Space Temp Sensor	<p>Specify whether or not the controller is to be used with a space temperature sensor connected to its input. A space temperature sensor is typically used, but in cases where the space temperature is supplied from another device via the network, the local space temperature sensor input is not used.</p> <p><b>YES</b> The local space temperature sensor input is used. Ensure that a space temperature sensor is actually connected otherwise the controller measures incorrect values.</p> <p><b>NO</b> The local space temperature sensor is not used. This option must be selected when a sensor is not connected.</p>										
LED/LCD Display	<p>This configuration defines whether a Wall Module with LED or a Wall Module with LCD Display is connected. For the LED there is shown either the Override Status or the Effective Occupancy Status. The LCD Display show both the Effective and the Override Status, and an additional Off Condition. The Override Status results from the Scheduler, the Network Override, the Override Button and the Occupancy Sensor. The Off Condition results from the Fanspeed Switch, the Window Contact and the Medium from nviApplicMode.</p> <p><b>LED Override</b> The LED shows the Override from the Override Button or from the Network. On indicates Override Bypass, 1 Flash per Second indicates Override Unoccupied, 2 Flashes per Second indicates Override Standby or Occupied. 4 Flashes indicates the Controller answers of the Network Management Command Wink.</p> <p><b>LED Occupancy</b> The LED shows the effective Occupancy Mode. On indicates effective Occupied or Bypass, 1 Flash per Second indicates effective Standby, Off indicates effective Unoccupied. 4 Flashes indicates the Controller answers of the Network Management Command Wink.</p> <p><b>LCD Display</b> This mode is used only for a Wall Module with LCD Display. The Display has following Symbols to show the Occupancy Modes: Sun indicates effective Occupied or Bypass, Half Sun indicates effective Standby, Moon indicates effective Unoccupied. No Symbol and OFF in 7-Segment indicates the Controller is Off. In the Off Mode, a Snow Flag indicates whether Frost Protection is configured. Blinking Symbols are used to show the Override: Blinking Sun indicates Override Occupied or Bypass, blinking Half Sun indicates Override Standby, Blinking Moon indicates override unoccupied. The Controller answers with the Network Management Command Wink with blinking Sun and Moon.</p>										
Override Button	<p>Define how the override button on the connected wall module is to be used.</p> <p><b>None</b> The wall module button is not used for bypass function.</p> <p><b>BYPASS UNOCCUPIED</b> The Bypass button, when pressed, has two different functions depending on the length of time the button is held down:</p> <ul style="list-style-type: none"> <li>• Two seconds puts the controller in Bypass.</li> <li>• Five seconds puts the controller in Unoccupied.</li> </ul> <p><b>Bypass Only</b> The Bypass button, when pressed, has the following function: Two seconds puts the controller in Bypass.</p> <p><b>Fan Speed Switch</b> Define the type of switch used on the Wall module. <b>Note</b> that this setting also controls the maximum speed setting of the fan. For example, if a three-speed fan is used, but the fan speed switch is set to two-speed, the fan only operates with two speeds.</p> <p><b>Normal</b> Settings based Switch Function</p> <table border="0"> <thead> <tr> <th>Setting</th> <th>Fan speed switch function</th> </tr> </thead> <tbody> <tr> <td>No Fan Switch</td> <td>The fan speed switch is ignored</td> </tr> <tr> <td>Three Position</td> <td>Off/Auto/On</td> </tr> <tr> <td>Four Position</td> <td>Off/Auto/Low/High</td> </tr> <tr> <td>Five Position</td> <td>Off/Auto/Low/Medium/High</td> </tr> </tbody> </table>	Setting	Fan speed switch function	No Fan Switch	The fan speed switch is ignored	Three Position	Off/Auto/On	Four Position	Off/Auto/Low/High	Five Position	Off/Auto/Low/Medium/High
Setting	Fan speed switch function										
No Fan Switch	The fan speed switch is ignored										
Three Position	Off/Auto/On										
Four Position	Off/Auto/Low/High										
Five Position	Off/Auto/Low/Medium/High										



Table 33. FCU Inputs Fields. (Continued)

Name	Definition	
Wall Module Knob (cont.)	Setpoint Knob	<p>The setpoint knob is available in different types of scales, and with different setpoint meanings, based on the country of usage. The temperature engineering unit used (°C or °F) is the setting made in WebVision when creating the new project. This setting is used for the total project.</p> <p>NOTE: The setpoint knob only affects the Occupied and Standby Setpoints. The Unoccupied setpoint is not affected by the setpoint knob.</p> <p><b>No Knob</b> The setpoint knob is ignored. <b>Note</b> that this must be chosen if there is no setpoint knob connected to the controller. Selecting “NO” prevents the controller from reacting to incorrect setpoint values.</p> <p><b>Relative</b> The setpoint knob is a relative knob, showing only a setpoint shift as (+) and (-) changes to the configured setpoint.</p> <p><b>Absolute Middle</b> The setpoint knob is an absolute knob, showing the setpoint in absolute degrees. It is used as the space temperature setpoint midway between the heating and cooling zero energy band.</p>
	Setpoint Limits	<p>These two fields specify the allowed range of adjustment available from the wall module setpoint knob. It is used by the building manager for energy management purposes to balance allowed comfort conditions with energy usage.</p> <p><b>(SETPOINT KNOB = RELATIVE)</b> When the setpoint knob has been chosen as relative, the setpoint limits define the range of adjustment of the setpoint knob from the zero point, in (DDC) for °C installations and (DDF) for °F installations.</p> <p><b>(SETPOINT KNOB = ABSOLUTE MIDDLE)</b> When the setpoint knob has been chosen as absolute, the setpoint limits are limits on the absolute range of the setpoint knob in (Deg.C) for °C installations and (Deg.F) for °F installations.</p>
Digital Input Points	<p>Specifies usage of the digital input of the controller.</p> <p><b>Digital Input 1</b> Window Closed Indicates if a window is opened. An open window disables the controller operation. If the contact is closed, the window is closed.</p> <p><b>Window Open</b> Indicates if a window is opened. An open window disables the controller operation. If the contact is closed, the window is open.</p> <p><b>Occupied Sensor</b> Indicates if the room is occupied. While unoccupied, the controller switches from the occupied operating setpoints to the standby operating setpoints. If the contact is closed, the space is occupied.</p> <p><b>Unoccupied Sensor</b> Indicates if the room is unoccupied. While unoccupied, the controller switches from the occupied operating setpoints to the standby operating setpoints. If the contact is closed, the space is unoccupied.</p> <p><b>Air Flow</b> For monitoring correct fan operation using an air flow switch. When the fan is commanded on, the controller monitors this input for the fan run-up time. If the fan does not run within 30 seconds, the input indicates that the fan has failed. Similarly, the input indicates if the fan fails during normal operation. If the contact is closed, the fan runs.</p> <p><b>No Air Flow</b> For monitoring correct fan operation using an air flow switch. When the fan is commanded on, the controller monitors this input for the fan run-up time. If the fan does not run within 30 seconds, the input indicates that the fan has failed. Similarly, the input indicates if the fan fails during normal operation. If the contact is closed, the fan is not running.</p> <p><b>ChangeOver Cool</b> This selection is for local heat/cool changeover operation for two-pipe units using a switch or local thermostat switch. When the contact closes, this input indicates that the system can operate in cooling mode. When the contact opens, this input indicates that the system can operate in heating mode.</p> <p><b>Changeover Heat</b> This selection is for local heat/cool changeover operation for two-pipe units using a switch or local thermostat switch. When the contact closes, the input indicates that the system can operate in heating mode. When the contact opens, the input indicates that the system can operate in cooling mode.</p>	

**Table 33. FCU Inputs Fields. (Continued)**

Name	Definition
Digital Input Points (continued)	<p><b>Movement</b> This selection is used for movement detector configuration where a closed contact indicates movement. Movement detector is the same as occupancy sensor, but with an additional Hold Time of 15 minutes. This adds a delay to the occupancy signal such that the space is considered occupied until 15 minutes has elapsed since the last movement is detected.</p> <p><b>No Movement</b> This selection is used for movement detector configuration where a closed contact indicates no movement. Movement detector is the same as occupancy sensor, but with an additional Hold Time of 15 minutes. This adds a delay to the occupancy signal such that the space is considered occupied until 15 minutes has elapsed since the last movement is detected.</p> <p><b>Not Used</b> This setting indicates that the digital input is not used. Use this setting if nothing is connected to the controller to ensure that spurious signals do not cause the controller to operate incorrectly. The status of this digital input is reported to the network for use as a free digital input if required. It has no effect on the control algorithm.</p>

## FCU Equipment Control

### Purpose

Define the main control features of controller outputs.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Equipment Control** button on the left pane to open the **Equipment Control Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Fan Configuration** page or **Back** to display the **Inputs Configuration** page.

### FCU Equipment Control fields

Table 34 lists the FCU Equipment Control fields and definitions.

**Table 34. FCU Equipment Control Options.**

Name	Definitions
Output Options	Defines the operating characteristics of the two valve actuator outputs.
	<p><b>Output 1 / Output 2</b> Define operation of output 1 and output 2 as configured in the Outputs page. The fields have the same meanings for both outputs.</p>
	<p><b>Fan Interlock</b> Normally used to protect electric heating coils controlled by Output 1 or Output 2. Without this protection, heating coils can overheat. This option can also prevent ice-up or condensation build-up on cooling or compressor coils.</p>
	<p><b>Yes</b> The fan always turns on for the run-up time before turning on the control output, to ensure air is flowing over the electric heating coil before turning on the electric coil. The fan continues to run after the electric coil is turned off, for the post-run time, to ensure the electric coil is cooled down before the fan turns off. Similarly, for cooling coil condensation protection, the fan re-run and post-run times are observed. Additionally, if the digital input is configured for fan fail detection, and the fan does not operate within the defined run-up time, then the control output is not turned on. This action also occurs if the fan fails during normal operation.</p>
	<p><b>No</b> There is no interlock between fan operation and the control outputs.</p>
	<p><b>Valve Direction</b> Define the operating direction of the valves for actuator types Floating, PWM, and Thermal.</p>
	<p><b>Direct</b> To open, the valve is modulated from 0% to 100%.</p>
	<p><b>Reverse</b> To open, the valve is modulated from 100% to 0%.</p>

Table 34. FCU Equipment Control Options. (Continued)

Name	Definitions
Output Options (continued)	
	<p><b>Min Stage Off Time</b> Define the minimum off-time for control outputs configured for operation as staged outputs. This setting is particularly useful for heat exchanger operation or compressor units. Each stage of the controlled output stays off for the minimum period of time before the controller turns it on again. The selectable range is 0 to 600 seconds.</p>
	<p><b>Valve Runtime</b> This configuration parameter has three different functions depending on the control output type selected in Control Outputs: (CONTROL OUTPUT TYPE = FLOATING) The value is the actuator run-time in the range 20 to 600 seconds. (CONTROL OUTPUT TYPE = PWM) The value is the cycle period of the PWM output in the range 20 to 600 seconds. (CONTROL OUTPUT TYPE = ONE, TWO OR THREE STAGE) The value is the minimum on-time for each of the stages, for controlling compressor units.</p>
Reheat Options	<p>Defines the control output level at which the electric reheat relay (relay 4) switches.</p>
	<p><b>Switch Level</b> Define the control output level at which the electric reheat output switches on. Range 0% to 100%. Use a setting of 5% where electric heating has priority over a water heating valve, for example, as the first heating sequence. Or use for electric heating control only. Use higher settings, for example, 90%, where water heating has priority over electric heating. Or when electric heating is required during summer/winter changeover periods.</p>
	<p><b>Hysteresis</b> Define the control output level (Switch level - Hysteresis) at which the Reheat control output switches off.</p>
PWM Options	<p>Allows the full range of the PWM outputs to be configured. Many PWM-controlled devices cannot provide an output of 0% or 100% because a PWM output shows no switching at these percentages. Therefore, most PWM devices have a minimum duty cycle and a maximum duty cycle between which they operate from zero to full scale. The fields here allow you to configure the full range of settings. It is possible to swap the Zero and Full range values to achieve reverse operation for a PWM output.</p>
	<p><b>Zero</b> PWM % duty cycle for fully closed position.</p>
	<p><b>Full</b> PWM % duty cycle for fully open position</p>

## FCU Fan

### Purpose

Define fan operation.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Fan** button on the left pane to open the **Fan Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Switching Levels Configuration** page or **Back** to display the **Equipment Control Configuration** page.

## FCU Fan fields

Table 35. FCU Fan Field Options.

Name	Definitions
Fan General	<p><b>Fan Occupancy</b> Configure the operation of the fan during occupied periods.</p>
	<p><b>Auto Mode</b> The fan is automatically turned on and off according to heat or cool demand.</p>
	<p><b>Continuous Mode</b> During the occupied period, the fan continuously operates at least at the minimum speed. If heat or cool demand requires a higher speed, the fan automatically operates to the required speed. This setting does not affect automatic fan operation during standby and unoccupied periods.</p>
	<p><b>Min On Time</b></p>
	<p><b>Min Off Time</b></p>
Fan Interlock	<p>Define the pre-run (Fan Run-up Time) and post-run (Fan Overrun Time) times for the fan, when fan interlock has been selected (Equipment Control page).</p>

## FCU Switching Levels

### Purpose

To configure fan switching level and staged output switching levels.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Switching Levels** button on the left pane to open the **Switching Levels Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Zone Control Configuration** page or **Back** to display the **Fan Configuration** page.

### FCU Switching Levels fields

Acceptable range for all levels is 0% to 100%. A setting of 0% means the fan is OFF for this and the following stages.

## FCU Zone Control

### Purpose

Configure the heating and cooling setpoints for the Occupied, Standby and Unoccupied operating modes.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Zone Control** button on the left pane to open the **Zone Control Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Miscellaneous Configuration** page or **Back** to display the **Switching Levels Configuration** page.

### FCU Zone Control fields

Setpoints can range from 10 to 35 °C (50 to 95 °F).

Table 36. FCU Zone Control Options.

Name	Definitions
Temperature Setpoints	Cooling/Heating
	<b>Occupied</b> Setpoints during Occupied mode. Setpoints can range from 10 to 35 °C (50 to 95 °F).
	<b>Standby</b> Setpoints during Standby mode. Setpoints can range from 10 to 35 °C (50 to 95 °F).

Table 36. FCU Zone Control Options. (Continued)

Name	Definitions
	<b>Unoccupied</b> Setpoints during Unoccupied mode. Setpoints can range from 10 to 35 °C (50 to 95 °F).

## FCU Miscellaneous

### Purpose

To configure energy management parameters.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Miscellaneous** button on the left pane to open the **Miscellaneous Parameters Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **PID Configuration** page or **Back** to display the **Zone Control Configuration** page.

### FCU Miscellaneous fields

Table 37. FCU Miscellaneous Field Options.

Name	Definitions
Miscellaneous	Configures operator bypass and priority options.
	<b>Bypass Time</b> Define the period of time (0 to 1080 minutes) in which the controller operates to occupied setpoints after the local user has pressed the override button.
	<b>Override Priority</b> Allocate priority between local wall module operations (for example, Bypass) and commands from the building management central. Choices are: <b>Last Wins</b> - Last received input takes precedence. It can be either the Bypass button or the Network signal. <b>Network Wins</b> - The Network signal always takes precedence over the Bypass button.
Energy Management	<b>DLC SetPoint Bump</b> For load shedding applications. Define the temporary setpoint shift to be added to the setpoint when the controller receives a Load Shedding command. By raising the setpoint during cooling operation, or reducing the setpoint during heating operation, the controller reduces the amount of heat or cool energy dissipated as a contribution to load shed algorithms. <ul style="list-style-type: none"> <li>The parameter can be set in the range 0 to 10 DDC (0 to 18 DDF).</li> </ul>

**Table 37. FCU Miscellaneous Field Options. (Continued)**

Name	Definitions
Energy Management (continued)	<b>Cool.Rec.Ramp, Heat.Rec.Ramp</b> Define the rate at which the setpoint is reset during changes between occupancy modes to provide a form of optimum start algorithm.

## FCU PID

### Purpose

Configure the variables for closed loop control. PID parameters can be set separately for both heating and cooling control.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **PID** button on the left pane to open the **PID Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Wiring Diagram Configuration** page or **Back** to display the **Miscellaneous Configuration** page.

### FCU PID fields

**Table 38. FCU PID Options.**

Name	Definitions
PID	Cooling/Heating
	<b>Proportional band</b> This value is the temperature deviation between setpoint and space temperature, which causes the control output to modulate from 0% to 100% of full range. <ul style="list-style-type: none"> <li>• Range 2 DDC to 100 DDC (3.6 to 180 DDF) for PID control, respectively; 1.3 to 100 DDC (2.3 to 180 DDF) for P Control only.</li> </ul>
	<b>Reset Time</b> This value is the integral reset time in the range 0 to 3200 sec. Setting the Integral constant to zero disables integral operation.
	<b>Derivative Time</b> This value is the derivative constant in the range 0 to 3200 sec. Setting the derivative constant to zero disables derivative operation.

**Table 38. FCU PID Options. (Continued)**

Name	Definitions
Thermal Switching Band/PID Boost	Cooling /Heating
	<b>Boost Temp</b> Sets a boost band for normal PID operation and when using thermal actuators. The variables indicate a setpoint-space temperature deviation outside, which switches the outputs to full operation This option acts as a boost function when space temperature deviates significantly from the desired setpoint. This option also serves as a threshold for two-point switching of thermal actuators. <ul style="list-style-type: none"> <li>• The threshold can be set in the range 0 to 10 DDC (7.2 to 180 DDF).</li> <li>• If the threshold is set to 0 DDC, the boost function is disabled.</li> </ul>

## FCU Wiring Diagram

### Purpose

Display the wiring diagram for the controller.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Wiring** button on the left pane to open the **Wiring Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Back** to display the **PID Configuration** page.

### FCU Wiring Terminals

D11 Window / Occupancy / Air Flow / Changeover.

**Table 39. FCU Wiring Diagram.**

Name	Definitions
Wall Module	Use these terminals to connect the Wall Module: <ul style="list-style-type: none"> <li>• Override LED</li> <li>• Setpoint</li> <li>• Bypass Button</li> <li>• Room Temp Sensor</li> </ul>

## LON Bus

The terminals in Table 40 are used to connect the LON Bus FTT-10A. The LON terminals are insensitive to polarity, eliminating wiring errors during installation. Recommended wire size is level IV 22 AWG nonshielded, twisted pair, solid conductor wired.

**Table 40. LON Bus Terminal Connections.**

Output 1 / Output 2	Terminal 14/15	Terminal 17/18
Floating	14 on = open valve	17 on = open valve
	15 on = close valve	18 on = close valve
1-stage	14 = on/off	17 = on/off
	15 = not used	18 = not used
2-stage	14 on = stage 1	17 on = stage 1
	14 on + 15 on = stage 2	17 on + 18 on = stage 2
3-stage	14 on = stage 1	17 on = stage 1
	15 on = stage 2	18 on = stage 2
	14 on + 15 on = stage 3	17 on + 18 on = stage 3
PWM	14 = PWM	17 = PWM
	15 = not used	18 = not used
Thermal	14 = Pulse modulated	17 = Pulse modulated
	15 = not used	18 = not used

Output Characteristics: 24 Vac, 250 mA max continuous, 650 mA max surge.

## Fan Relays

These terminals are used to connect a Fan. Characteristics: 20 to 253 Vac, 3 A max.

## Power Mains In

### POWER SUPPLY

W7752D and W7752E: 230 Vac + 10%, -15%; 50/60Hz  
 W7752F and W7752G: 115 Vac + 10%, -15%; 50/60 Hz

### POWER CONSUMPTION

W7752D and W7752E: 30 VA max  
 W7752F and W7752G: 30 VA max

## Operational temperature

32 to 122 °F (0 to 50 °C)

## Reheat Relay

These terminals connect an Electric Reheat.

Characteristics: 20 to 200 Vac, 10 A max.

# Configuring Hydronic Controllers (HYD)

## Description

The W7762A and B Controllers are Hydronic Controllers in the Excel 10 product line. They cover a wide range of control applications including radiators, induction units, and fan coil units with manual fan switching, and are suitable for either wall mounting or unit mounting. The controllers can operate as stand-alone units or networked using the standard Echelon LONWORKS bus. Interfaces are provided for a wide range of actuator types. Heating systems can be water or electric and cooling systems can be chilled water supply or compressors. Extensive timing and interlock features make the W7762 especially suitable for systems using electric heat and compressors.

## Features

- **LonMark HVAC profile 8020**
- **Stand-alone operation or on high speed 78 kilobit LON network.**
- **Uses Echelon LonTalk protocol.**
- **Direct connection of thermal actuators.**
- **Direct connection to fan switch.**
- **Direct connection to electric heat.**
- **Factory-configured default parameters.**
- **Wide range of supported valves and actuators.**
- **Interlocks and time delays to protect equipment.**
- **Slim design fits into narrow fan coil units.**
- **Terminations all on one side allow controller to be positioned at back of fan coil unit.**
- **Power supplied by power mains.**

## Description

The W7762A and B are LonMark compliant Hydronic Controllers in the Excel 10 family product line. These controllers provide room temperature control using different heating and cooling sequences. The controller is provided with default configuration settings from the factory and is fully operable on installation. Using standard Echelon configuration tools, the controller can be configured with job specific settings. TR21 and TR23 wall modules interface with the Hydronic Controllers and provide the following options: setpoint adjustment, an occupancy bypass button and LED, and a LON network access jack. All wall include a space temperature sensor, however a remote C7068A return air sensor can also be used.

**Table 41. Hydronic Heating and Cooling Options.**

Output	Options
Heating	Floating, thermal, PWM, on/off, multi-stage electric
Cooling	Floating, thermal, PWM, on/off, multi-stage compressor



Heat and cool sequences can be selected to be active or not active, giving a total of four different sequence options:

- Heat only
- Cool only
- Heat/cool changeover
- Heat and cool sequence

## Modes Of Operation

The controller has the following modes of operation.

### Occupied mode

This is the normal operating condition for a room or zone when it is occupied. The controller can be switched into this mode by a network command, by the room occupancy sensor, or by a bypass button on the wall module.

### Standby mode

The standby mode saves energy by reducing heating or cooling demand during periods where the room is temporarily unoccupied.

### Unoccupied mode

This mode is used for longer unoccupied periods, such as at night or during weekends and holidays.

### Window open

If the controller is configured for window open detection, the controller automatically disables heat and cool control until the window is closed again. Frost protection remains active.

### Frost protection

If the temperature drops below 46 °F (8 °C), the controller enables the heating circuit as frost protection.

### Fan fail

When configured with an air flow detector, the controller protects equipment by disabling the system when the fan fails (for fan coil units with manual fan speed control).

### Changeover

The controller operates two-pipe units configured with a changeover input.

## HYD Inputs/Outputs

Table 42. Hydronic Controller Input and Output Information.

Inputs Outputs	Description	Function	PIN Number	Characteristics
Inputs	Digital	Window/occupancy/ changeover/ air flow/condensation	4	Closed<=400 ohm; open>=10K ohm
		Override	7	Closed<=400 ohm; open>=3.3k ohm
	Analog	Temperature Sensor	9	20K ohm NTC (25 °C)
		Setpoint Adjustment	8	10k Ohm
Outputs	Digital	Override LED	6	ON: 5 Vdc, 10 mA. OFF: 0 Vdc, <1 mA
	Triac (2pais)	Heat and Cool	14, 15, 17, 18	24 Vac; 250 mA max continuous; 650 mA max surge (<=30 sec)

## HYD Outputs

### Description

HYD applications can have a variable number of heating and cooling stages. The number of pipes used on the unit could be two or four. The outputs could be of staged, PWM, floating, or Thermal type. In addition the outputs can be of Change over mode.

### Purpose

Define the operation of the hydronic controller outputs and the type of equipment to be controlled.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Outputs** button on the left pane to open the **Output Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Input Configuration** page.

HYD Outputs fields

Table 43. Hydronic Controller Types and Outputs.

Name	Definition																		
Types	<p><b>HYD</b> Select the hardware version to be used for the controller. Each hardware version has different combinations of inputs and outputs. The software checks Type against the controller's selected application so that you cannot configure a controller for an application that it cannot perform.</p> <table border="1"> <thead> <tr> <th>Selection in Tool</th> <th>Controller Type</th> <th>Onboard Setpoint</th> <th>Number of Outputs</th> <th>Number of Digital In</th> <th>Transceiver</th> </tr> </thead> <tbody> <tr> <td>W7762A</td> <td>W7762A</td> <td>No</td> <td>2</td> <td>1</td> <td>FTT-10</td> </tr> <tr> <td>W7762B</td> <td>W7762B</td> <td>Yes</td> <td>2</td> <td>1</td> <td>FTT-10</td> </tr> </tbody> </table> <p><b>System</b> Define the type of equipment (number of pipes) being controlled.</p> <p><b>TWO_PIPE</b> Unit has only two pipes. Selecting this system type limits the controller to control only one valve output and operate in a changeover mode. When operating in changeover mode, the controller uses only the one valve for controlling both heating and cooling. Use this configuration only when changeover operation is required.</p> <p><b>FOUR_PIPE</b> Unit has four pipes connected, providing both heating and cooling at the same time. The controller uses one output to control heating only and one output to control cooling only (as specified in Control Outputs).</p>	Selection in Tool	Controller Type	Onboard Setpoint	Number of Outputs	Number of Digital In	Transceiver	W7762A	W7762A	No	2	1	FTT-10	W7762B	W7762B	Yes	2	1	FTT-10
Selection in Tool	Controller Type	Onboard Setpoint	Number of Outputs	Number of Digital In	Transceiver														
W7762A	W7762A	No	2	1	FTT-10														
W7762B	W7762B	Yes	2	1	FTT-10														
Control Outputs	<p>Configures the two control outputs for the different type of actuators and control sequences required for the application.</p> <p><b>Output 1- Mode</b> Output triac pair connected to terminals 13/14/15 of the controller. Select the control sequence option for output 1. For four-pipe applications, always allocate this output to the heat option to minimize field wiring errors. For two-pipe applications, you can select only the changeover option.</p> <p><b>HEATING</b> The output is modulated open when heat energy is needed in the space.</p> <p><b>COOLING</b> The output is modulated open when cool energy is needed in the space.</p> <p><b>CHANGEOVER</b> The output is modulated open when heat or cool energy is needed in the space.</p> <p><b>OUTP_NOT_USED</b> The output is not controlled by the controller and is always off.</p> <p><b>Output 1- Type</b> Select the type of actuator to be connected to the output.</p> <p><b>FLOATING</b> Three-point actuator that can be commanded open or closed (terminals 14/15 and/or 17/18). The run-times for the actuator are configured on the Equipment Control tab (Output Options).</p> <p><b>FLOATING_MID</b> A three point actuator that can be commanded open or closed on terminals 14/15 and/or 17/18. The run-times for the actuator are configured in the Outputs tab. The Zero Energy Position (no Heat and no Cool) is the middle Position (50%). The Cool Range is 0 to 50%; the Heat Range, 50 to 100%. The Range can be reversed by selecting the Actuator Direct or Reverse Option. During the Synchronization Process, the fan is turned off.</p> <p><b>PWM</b> Duty-cycled output where the 24VAC output is pulsed on/off in the duty cycle range 0% to 100%. This type drives output terminal 14 and/or 17.</p> <p><b>ONE_STAGE</b> Single-stage on/off output that switches terminal 14 and/or 17.</p> <p><b>TWO_STAGE</b> Two-stage output: Terminal 14/17 is switched for stage 1 and terminal 15/18 is switched for stage 2.</p> <p><b>THREE_STAGE</b> Three-stage switched output. Terminal 14/17 is switched for stage 1, terminal 15/18 is switched for stage 2. Both terminals 14+15 and/or 17+18 are switched for stage 3.</p> <p><b>THERMAL</b> Switched on/off output for switching a 24V thermal actuator on terminal 14/17.</p>																		

**Table 43. Hydronic Controller Types and Outputs. (Continued)**

Name	Definition
Control Outputs (cont.)	<p><b>Output 2- Mode</b> Output triac pair connected to terminals 16/17/18 of the controller. Select the control sequence option to be allocated to output 2. For four-pipe applications, always allocate this output to the cool option to minimize field wiring errors. For two-pipe applications, you can select only the changeover option.</p>
	<p><b>Output 2- Type</b> Selection options are the same as for Output 1.</p>

## HYD Inputs

### Purpose

To configure the wall module parameters and input points for a HYD controller.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Inputs** button on the left pane to open the **Input Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Equipment Control Configuration** page or **Back** to display the **Output Configuration** page.

### HYD Inputs fields

**Table 44. Wall Module and Hydronic Controller Inputs.**

Name	Definition
Wall Module	Configures the functionality of the connected wall module. Be careful that the features configured here are the same as the features available on the wall module device to be connected.
	<p><b>Space Temp Sensor</b> Define whether or not the controller is to be used with a space temperature sensor connected to its input. Typically, a space temperature sensor is used, but in cases where the space temperature is supplied from another device via the network, the local space temperature sensor input is not used.</p> <p><b>YES</b> The local space temperature sensor input is used. Ensure that a space temperature sensor is actually connected, otherwise the controller measures incorrect values.</p> <p><b>NO</b> The local space temperature sensor is not used. This option must be selected when a sensor is not connected.</p>
	<p><b>LED/LCD Display</b> This configuration defines whether a Wall Module with LED or a Wall Module with LCD Display is connected. For the LED there is shown either the Override Status or the Effective Occupancy Status. The LCD Display shows the both – the Effective and the Override Status and an additional Off Condition. The Override Status results from the Scheduler, the Network Override, the Override Button and the Occupancy Sensor. The Off Condition results from the Fanspeed Switch, the Window Contact and the Medium from nviApplicMode.</p> <p><b>LED_OVERRIDE</b> The LED shows the Override from the Override Button or from the Network. On means Override Bypass, 1 Flash per Second means Override Unoccupied, 2 Flashes per Second means Override Standby or Occupied. 4 Flashes means the Controller answers of the Network Management Command Wink.</p> <p><b>LED_OCCUPANCY</b> The LED shows the effective Occupancy Mode. On means effective Occupied or Bypass, 1 Flash per Second means effective Standby, Off means effective Unoccupied. 4 Flashes means the Controller answers of the Network Management Command Wink.</p> <p><b>LCD_DISPLAY</b> This Mode is used only for a Wall Module with LCD Display. The Display has following Symbols to show the Occupancy Modes: Sun means effective Occupied or Bypass, Half Sun means effective Standby, Moon means effective Unoccupied. No Symbol and OFF in 7-Segment means the Controller is Off. In the Off Mode, a Snow Flag indicates whether Frost Protection is configured. Blinking Symbols are used to show the Override: Blinking Sun means Override Occupied or Bypass, blinking Half Sun means Override Standby, Blinking Moon means override unoccupied. The Controller answers with of the Network Management Command Wink with blinking Sun and Moon.</p>

Table 44. Wall Module and Hydronic Controller Inputs. (Continued)

Name	Definition
Wall Module (cont.)	<p><b>Override Button</b> Define how the override button on the connected wall module is to be used.</p> <p><b>NO_BUTTON</b> The wall module button is not used for the bypass function.</p> <p><b>BYPASS_UNOCCUPIED</b> The Bypass button, when pressed, has two different functions depending on the length of time the button is held down: Two seconds puts the controller in Bypass. Five seconds puts the controller in Unoccupied.</p> <p><b>BYPASS</b> The Bypass button, when pressed, has the following function: Two seconds puts the controller in Bypass.</p>
	<p><b>Setpoint Knob</b> The setpoint knob is available in different types of scale, and with different setpoint meanings, based on the country of usage. The temperature engineering unit used (°C or °F) is the setting made in WebVision when creating the new project. This setting is used for the total project. <b>Note</b> that the setpoint knob only affects the Occupied and Standby Setpoints. The Unoccupied setpoint is not affected by the setpoint knob.</p> <p>NOTE: Hydronic controller Version B has an on-board setpoint. It cannot be used with an external TR21 or TR23 setpoint device.</p> <p><b>NO_KNOB</b> The setpoint knob is ignored. <b>Note</b>, that this must be chosen, if there is no setpoint knob connected to the controller, to prevent the controller from reacting to incorrect setpoint values.</p> <p><b>RELATIVE</b> The setpoint knob is a relative knob, showing only a setpoint shift as (+) and (-) changes to the configured setpoint.</p> <p><b>ABSOLUTE_MIDDLE</b> The setpoint knob is an absolute knob, showing the setpoint in absolute degrees. It is used as the space temperature setpoint midway between the heating and cooling zero energy band.</p> <p><b>Setpoint Limits</b> These two fields specify the allowed range of adjustment available from the wall module setpoint knob. It is used by the building manager for energy management purposes, to balance allowed comfort conditions with energy usage.</p> <p><b>(SETPOINT KNOB = RELATIVE)</b> The setpoint limits define the range of adjustment of the setpoint knob from the zero point, in (DDC) for °C installations and (DDF) for °F installations.</p> <p><b>(SETPOINT KNOB = ABSOLUTE MIDDLE)</b> The setpoint limits are limits on the absolute range of the setpoint knob in (Deg.C) for °C installations and (Deg.F) for °F installations.</p>

Table 44. Wall Module and Hydronic Controller Inputs. (Continued)

Name	Definition
Digital Input Points	<p>Specifies usage of the controller's digital input. Digital Input 1.</p> <p><b>DI_WINDOW_CLOSED</b> Indicates if a window is opened. An open window disables the controller operation. If the contact is closed, the window is closed.</p> <p><b>DI_WINDOW_OPEN</b> Indicates if a window is opened. An open window disables the controller operation. If the contact is closed, the window is open.</p> <p><b>DI_OCCUPIED_SENSOR</b> Indicates if the room is occupied. While unoccupied, the controller switches from the occupied operating setpoints to the standby operating setpoints. If the contact is closed, the space is occupied.</p> <p><b>DI_UNOCCUPIED_SENSOR</b> Indicates if the room is occupied. While unoccupied, the controller switches from the occupied operating setpoints to the standby operating setpoints. If the contact is closed, the space is unoccupied.</p> <p><b>DI_CHANGEOVER_COOL</b> This selection is for local heat/cool changeover operation for two-pipe units using a switch or local thermostat switch. When the contact closes, this input indicates that the system can operate in cooling mode. When the contact opens, this input indicates that the system can operate in heating mode.</p> <p><b>DI_CHANGEOVER_HEAT</b> This selection is for local heat/cool changeover operation for two-pipe units using a switch or local thermostat switch. When the contact closes, the input indicates that the system can operate in heating mode. When the contact opens, the input indicates that the system can operate in cooling mode.</p> <p><b>DI_MOVEMENT</b> This selection is used for movement detector configuration where a closed contact indicates movement. Movement detector is the same as occupancy sensor, but with an additional Hold Time of 15 minutes. This adds a delay to the occupancy signal such that the space is considered occupied until 15 minutes has elapsed since the last movement is detected.</p> <p><b>DI_NO_MOVEMENT</b> This selection is used for movement detector configuration where a closed contact indicates no movement. Movement detector is the same as occupancy sensor, but with an additional Hold Time of 15 minutes. This adds a delay to the occupancy signal such that the space is considered occupied until 15 minutes has elapsed since the last movement is detected.</p> <p><b>DI_NOT_USED</b> This setting indicates that the digital input is not used. Use this setting if nothing is connected to the controller to ensure that spurious signals do not cause the controller to operate incorrectly. The status of this digital input is reported to the network for use as a free digital input if required. It has no effect on the control algorithm.</p>

## HYD Equipment Control Outputs

### Purpose

Define the main control features of controller outputs.

### Mode

Configuration can be performed with LonSpec Off-line or On-line.

### Procedure

1. Click the **Equipment Control** button on the left pane to open the **Equipment Control Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Switching Levels Configuration** page or **Back** to display the **Input Configuration** page.

## HYD Outputs fields

**Table 45. Hydronic Controller Outputs Fields.**

Name	Definition
Output Options	<p>Defines the operating characteristics of the two valve actuator outputs, Output 1 and Output 2 as configured in the Outputs tab. The settings for both Outputs have the same meaning as described in the following text.</p> <p><b>Valve Direction</b> Define the operating direction of the valves for actuator types Floating, PWM, and Thermal.</p> <p><b>DIRECT</b> To open, the valve is modulated from 0% to 100%.</p> <p><b>REVERSE</b> To open, the valve is modulated from 100% to 0%.</p> <p><b>Min Stage Off Time</b> Define the minimum off-time for control outputs configured for operation as staged outputs. This setting is particularly useful for heat exchanger operation or compressor units. Each stage of the controlled output stays off for the minimum period of time before the controller turns it on again. The selectable range is 0 to 600 seconds. Min St On or PWM Per or Valve Runtime This configuration parameter has three different functions depending on the control output type selected in Control Outputs:</p> <p><b>(CONTROL OUTPUT TYPE = FLOATING)</b> The value is the actuator run-time in the range 20 to 600 seconds.</p> <p><b>(CONTROL OUTPUT TYPE = PWM)</b> The value is the cycle period of the PWM output in the range 20 to 600 seconds.</p> <p><b>(CONTROL OUTPUT TYPE = ONE, TWO OR THREE STAGE)</b> The value is the minimum on-time for each of the stages, for controlling compressor units.</p>
PWM Options	<p>Configures the full range of the PWM outputs. For many PWM-controlled devices, an output of 0% or 100% is not allowed since a PWM output shows no switching at these percentages. Therefore, most PWM devices have a minimum duty cycle and a maximum duty cycle between which they operate from zero to full scale. The fields here configure the full range settings. You can swap the Zero and Full range values to achieve reverse operation for a PWM output.</p> <p><b>ZERO</b> PWM % duty cycle for fully closed position.</p> <p><b>FULL</b> PWM % duty cycle for fully open position.</p>

## HYD Switching Levels

### Purpose

To configure the Hydronic controller staged output switching levels.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Switching Levels** button on the left pane to open the **Switching Levels Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Zone Control Configuration** page or **Back** to display the **Equipment Control Configuration** page.

### HYD Switching Levels fields

All levels can be set in the range 0% to 100%.

## HYD Zone Control

### Purpose

To configure the heating and cooling setpoints for the Occupied, Standby, and Unoccupied operating modes.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Zone Control** button on the left pane to open the **Zone Control Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Miscellaneous Configuration** page or **Back** to display the **Switching Levels Configuration** page.

### HYD Zone Control fields

Setpoints can range from 10 to 35 °C (50 to 95 °F).

## HYD Miscellaneous Parameters

### Purpose

To configure miscellaneous and energy management parameters.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Miscellaneous** button on the left pane to open the **Miscellaneous Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **PID Configuration** page or **Back** to display the **Zone Control Configuration** page.

### HYD Miscellaneous Parameter fields

**Table 46. Hydronic Miscellaneous and Energy Management Parameters.**

Name	Definition
Miscellaneous	<p>Configures operator bypass and priority options.</p> <p><b>Bypass Time</b> Define the period of time (0 to 1080 minutes) in which the controller operates to occupied setpoints after the local user has pressed the override button.</p> <p><b>Override Priority</b> Allocate priority between local wall module operations (for example, Bypass) and commands from the building management central. Choices are:  <b>LAST WINS</b> – Last received input takes precedence. It can be either the Bypass button or the Network signal.  <b>NETWORK WINS</b> – The Network signal always takes precedence over the Bypass button.</p>
Energy Management	<p><b>DLC Stpt Bump</b> For load shedding applications, define the temporary setpoint shift to be added to the setpoint when the controller receives a Load Shedding command. By raising the setpoint during cooling operation, or reducing the setpoint during heating operation, the controller reduces the amount of heat or cool energy dissipated as a contribution to load shed algorithms. The parameter can be set in the range 0 to 10DDC (0 to 18DDF).</p> <p><b>Cool Rec Ramp, Heat Rec Ramp</b> Define the rate at which the setpoint is reset during changes between occupancy modes to provide a form of optimum start algorithm.</p>

## HYD PID

### Purpose

To configure the variables for closed loop control. PID parameters can be set separately for both heating and cooling control.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **PID** button on the left pane to open the **PID Configuration** page.
2. Enter information into available fields (see Table 47 on page 71).
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Wiring Configuration** page or **Back** to display the **Miscellaneous Configuration** page.

### HYD PID fields

**Table 47. Hydronic PID Parameters.**

Name	Definition
PID	<p>Cooling/Heating</p> <p><b>Proportional band</b> This value is the temperature deviation between setpoint and space temperature, which causes the control output to modulate from 0 to 100% of full range. The variable can be set in the range 2 to 100 DDC (3.6 DDF to 180 DDF), respectively; 1.3 to 100 DDC (2.3 DDF to 180 DDF) for P Control only.</p> <p><b>Reset Time</b> This value is the integral reset time in the range 0 to 3200 sec. Setting the Integral constant to zero disables integral operation.</p> <p><b>Derivative Time</b> This value is the derivative constant in the range 0 to 3200 sec. Setting the derivative constant to zero disables derivative operation.</p>



**Table 47. Hydronic PID Parameters. (Continued)**

Name	Definition
Thermal Switching Band/PID Boost	Cooling/Heating <b>Boost Temp</b> Sets a boost band for normal PID operation and when using thermal actuators. The variables indicate a setpoint-space temperature deviation outside which the outputs are switched to full operation to act as a boost function when space temperature deviates significantly from the desired setpoint. These values also serve as a threshold for two-point switching of thermal actuators. <ul style="list-style-type: none"> <li>• The threshold can be set in the range 0 to 10 DDC (7.2 to 180 DDF).</li> <li>• If the threshold is set to 0 DDC, the boost function is disabled.</li> </ul>

## HYD Wiring

### Purpose

To display the wiring diagram for the Hydronic controller.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Wiring** button on the left pane to open the **Wiring Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Back** to display the **PID Configuration** page.

### HYD Wiring fields

D11 Window / Occupancy / Air Flow / Changeover

**Table 48. HYD Wiring Diagram.**

Name	Definition
Wall Module	Override LED Setpoint Bypass Button Room Temp Sensor

## LON Bus

The terminals in Table 49 are used to connect the LON Bus FTT-10A. The LON terminals are insensitive to polarity.

**Table 49. LON Bus FTT-10A Terminal Connections.**

Output 1 / Output 2	Terminal 14/15	Terminal 17/18
Floating	14 on = open valve	17 on = open valve
	15 on = close valve	18 on = close valve
1-stage	14 = on/off	17 = on/off
	15 = not used	18 = not used
2-stage	14 on = stage 1	17 on = stage 1
	14 on + 15 on = stage 2	17 on + 18 on = stage 2
3-stage	14 on = stage 1	17 on = stage 1
	15 on = stage 2	18 on = stage 2
	14 on + 15 on = stage 3	17 on + 18 on = stage 3
PWM	14 = PWM	17 = PWM
	15 = not used	18 = not used
Thermal	14 = Pulse modulated	17 = Pulse modulated
	15 = not used	18 = not used

## Power

**Power Supply** 24 Vac; 50/60 Hz

## Configuring the Excel 10 Remote Input/Output Device (RIO)

### Description

The W7761A Excel 10 Remote Input/Output Device (RIO) is a LonMark compliant device designed to monitor and control HVAC equipment, lighting, and other miscellaneous loads in a distributed network.

### Usage

In this version of the wizard, only the Excel 15 W7760A Building Manager uses the RIO.

### Application

The RIO communicates with other controller nodes, monitoring devices, and engineering tools using the LonWorks Bus. RIOs provide inputs (analog and digital) and outputs (digital) to any node on the LonWorks Bus.

Refer to *Excel 10 W7761A Remote Input/Output Device Specification Data*, form 74-2698; *Excel 10 W7761A Remote Input/Output Device Installation Instructions*, form 95-7539; or *Excel 10 W7761A Remote Input/Output Device System Engineering*, form 74-2699 for more information. This literature is available on customer.honeywell.com. Try the following link:  
<http://customer.honeywell.com/request.cfm?form=xx-xxxx>

### Purpose

To configure RIO inputs and outputs.

### Configuration Parameters

- Six analog inputs – four are resistive type and two are current or voltage
  - All resistive inputs are temperature inputs
  - Current or voltage can be humidity, airflow, or pressure sensors
- Four digital inputs
- Eight digital outputs, which can be discrete, modulating, or floating

RIO devices do not have equipment control or zone option parameters, only hardware points. The next two sections describe the options for configuring the RIO:

## RIO Inputs

Use Table 50 to configure the RIO inputs.

### Purpose

Configuration of six Analog Inputs and four Digital Inputs of RIO. Specify up to six analog inputs (four resistive and two voltage) and four digital inputs.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

## Procedure

1. Click the **Input\_pane** button on the left pane to open the **Input Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Output Configuration** page.

## RIO Inputs fields

Table 50. RIO Analog and Digital Inputs.

Name	Definition
Analog Inputs 1 through 6	Specify up to six analog inputs (four resistive, two voltage).
Resistive	UNUSED DISCHARGE_TEMP_PT3000 OUTDOOR_TEMP_PT3000 RETURN_TEMP_PT3000 DISCHARGE_TEMP_20KNTC RETURN_TEMP_20KNTC SPACE_TEMP_T7700
AI1-4 Name	After configuring a resistive analog input, enter a descriptive name (up to 18 characters).
Voltage	UNUSED FIL_ST_PRESS_DIFF_AI MONITOR_SENSOR1_AI OD_HUM_C7600B_AI OD_HUM_C7600C_AI OUTDOOR_ENTHALPY_AI RETURN_ENTHALPY_AI RTN_HUM_C7600B_AI RTN_HUM_C7600C_AI SPACE_CO2_AI
AI5-6 Name	After configuring a voltage analog input, enter a descriptive name (up to 18 characters).
Digital Inputs 1 through 4	Select ACTIVE_SHORT or ACTIVE_OPEN. For each Digital Input configured, specify MAINTAINED or MOMENTARY. <ul style="list-style-type: none"> <li>• Maintained contact closure A maintained contact closure is where the monitored contact input changes condition and remains.</li> <li>• Momentary contact closure A momentary contact closure is where the monitored contact input only needs to stay in one condition for 1 second minimum.</li> </ul>
DI1-4 Name	After configuring a digital input, enter a descriptive name (up to 18 characters).

## RIO Outputs

Use Table 51 to configure the RIO outputs.

### Purpose

Control points through the RIO using the outputs. Configure up to eight outputs.

## Mode

Configuration can be performed with the wizard Off-line or On-line.

## Procedure

1. Click the **Output\_pane** button on the left pane to open the **Output Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Delta Configuration** page or **Back** to display the **Input Configuration** page.

## RIO Outputs fields

Table 51. RIO Digital Outputs.

Name	Definition
Point Type	<p>Select up to eight digital outputs, DO1 to DO8, from the following types:</p> <ul style="list-style-type: none"> <li>• DISCRETE1 through DISCRETE8</li> <li>• FLOAT1_OPEN through FLOAT8_OPEN</li> <li>• FLOAT1_CLOSE through FLOAT8_CLOSE</li> <li>• MODULATE1 through MODULATE8</li> </ul> <p>The following additional parameters are also available for configuration:</p> <ul style="list-style-type: none"> <li>• Speed for Floating DOs</li> <li>• PWM settings for Modulated DOs</li> </ul> <p>For floating outputs, a corresponding float close should be available for a float open and vice versa. If not, the wizard gives an error message while you try to save the configuration.</p>

## RIO Deltas

Use Table 52 to configure the RIO Deltas.

### Purpose

Delta is an adjustable threshold that allows the user to determine, on a per-sensor basis, what change in value is required before the sensor is updated. All Excel 10 controllers have a guaranteed periodic update time of 55 seconds, which requires that all sensors report any change every update period. The delta for each sensor is used to reduce LonWorks Bus traffic by reducing the amount of updates on a sensor that are constantly or quickly changing. View or modify Deltas (change thresholds) for sensors.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Deltas\_pane** button on the left pane to open the RIO's **Delta Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.

4. If sensors are being used for display only, then they can have a larger value for the delta and rely on the guaranteed periodic update to update the sensor every 55 seconds regardless on the amount of change.
5. If the sensor is bound to another Excel 10 controller, configure a smaller delta so that the control algorithm does not see large changes in value.
6. The default value of 0 sends an update every 2 seconds.
7. Click Back to display the RIO's **Input Configuration** page.

## RIO Deltas fields

Table 52. RIO Deltas.

Name	Definition
Delta T1	Degrees Farheitheit (°F)
Delta T2	Degrees Farheitheit (°F)
Delta T3	Degrees Farheitheit (°F)
Delta T4	Degrees Farheitheit (°F)
Delta H	Percentage
Delta P	Inches H <sub>2</sub> O
Delta V	Volts
Delta C	Milliamperes
Delta CO <sub>2</sub>	CO <sub>2</sub> level

## Configuring the Unit Ventilator (UV)

The W7753A is the Unit Ventilator Controller in the Excel 10 product line family. The Unit Ventilator is a LonMark compliant device to monitor/control HVAC equipment, lighting, and other miscellaneous loads in a distributed network.

Refer to *Excel 10 W7753A Unit Ventilator Controller Specification Data* (form 74-2962) or *Excel 10 W7753A Unit Ventilator Controller Installation Instructions* (form 95-7520) for more information. This literature is available on customer.honeywell.com. Try the following link: <http://customer.honeywell.com/request.cfm?form=xx-xxxx>

### Navigating to Unit Ventilator Pages

Go to the **Devices** tab. Expand the list of devices on the left pane (listed under WebVision). Select a device to view its properties.

### Configuring a Unit Ventilator Controller

The options for configuring a Unit Ventilator Controller are as follows:

- Outputs
- Inputs
- Equipment Control
- Economizer
- H/C Stages
- Zone Options
- Miscellaneous
- PID
- Wiring Assignment
- Wiring Diagram

## UV Outputs

Use Table 53 to configure the Unit Ventilator Outputs for heating and cooling stages. The outputs could be of stages, PWM, or floating types. In addition, the number of fan speeds and Economizer types must be set. You can also select optional points.

### Purpose

Select all outputs, including optional outputs, to be controlled by the Unit Ventilator Controller.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **UVOutputPane** button on the left pane to open the **Output Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to open the **Input Configuration** page.

## UV Outputs fields

**Table 53. Unit Ventilator Outputs.**

Name	Definition
Fan Speeds	Select one of the following fan speeds: <ul style="list-style-type: none"> <li>• No_Fan</li> <li>• One_Speed</li> <li>• Two_Speed</li> <li>• Three_Speed</li> </ul>
Heating	Select one of the following Heating types: <ul style="list-style-type: none"> <li>• Heating_Stage_1</li> <li>• Heating_Stage_2</li> <li>• Heating_PWM</li> <li>• Heating_Floating</li> <li>• No_Heating</li> </ul> <p>If you select Floating, the Motor Speed field displays actuator speed in seconds. If you select PWM, the PWM Settings become editable.</p>
Cooling	Select one of the following Cooling types: <ul style="list-style-type: none"> <li>• Cooling_Stage_1</li> <li>• Cooling_Stage_2</li> <li>• Cooling_PWM</li> <li>• Cooling_Floating</li> <li>• No_Cooling</li> </ul> <p>If you select Floating, the Motor Speed field displays actuator speed in seconds. If you select PWM, the PWM Settings fields become editable.</p>

**Table 53. Unit Ventilator Outputs. (Continued)**

Name	Definition
Economizer	Selection of Economizer mixed air damper actuator type: None (or packaged external economizer), PWM, or Floating. <ul style="list-style-type: none"> <li>• Econo_None_Pkgd</li> <li>• Econo_PWM</li> <li>• Econo_Floating</li> </ul> <p>NOTE: If you configure a floating or PWM economizer, you MUST select a Discharge Air sensor (see Unit Ventilator Inputs) to enable automatic damper control.</p>
Motor Speed	Actuator motor speeds (in seconds). Enabled with a selection of floating heating, floating cooling or floating economizer.
Optional Points	The first optional point is enabled if there is sufficient room on the controller. After you select the first point, the second one is enabled if there is sufficient space, and so on. The following options are available: <ul style="list-style-type: none"> <li>• Status_Occupied - (output energized when controller is in Occupied mode) AND/OR</li> <li>• Aux_Econ1 - (Emulates a T7300 – for controlling an external economizer) AND/OR</li> <li>• Free1 - (Network-controlled output) AND/OR</li> <li>• Unused - (Point is unused)</li> </ul>
Controller Type	The Model type.
Power Frequency	This field defines the line voltage that Excel 10 Controllers use and also tells LonSpec the calculation required for noise immunity. The calculation differs for 50 and 60 Hz applications
PWM Settings	PWM Period time (in seconds). <ul style="list-style-type: none"> <li>• Zero Pulse time for a 0 percent output signal (in seconds).</li> <li>• Full Pulse time for a 100percent output signal (in seconds). This value must be less than or equal to the PWM Period.</li> </ul>

## UV Inputs

Use Table 54 to configure the Unit Ventilator Inputs for the space temperature sensor type, wall module type, and the voltage and digital inputs for a Unit Ventilator application.

### Purpose

To select all sensors to be wired to the Unit Ventilator Controller.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

**Procedure**

1. Click the **Input** button on the left pane to open the **Input Configuration** page.
2. Enter information into available fields (see Table 54 on page 76).
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Equipment Control Configuration** page or **Back** to display the **Output Configuration** page.

**UV Inputs fields**

**Table 54. Unit Ventilator Inputs.**

Name	Definition
Space Temp	<p>Select one of the following Space Temp sensor type options:</p> <ul style="list-style-type: none"> <li>• Unused</li> <li>• TR21 or TR23 (wall module)</li> <li>• UseReturn Temp</li> <li>• UseDischarge Temp</li> </ul> <p>Select Physical Sensor (Wall Module or LCD Wall Module) or Network Sensor Signal.</p> <p>NOTE: The LCD Wall Module is supported by the devices whose version is v1.00.10 or above.</p>
Optional Digital Points	<p>User address(es) for four optional digital input points.</p> <ul style="list-style-type: none"> <li>• DI1</li> <li>• DI2</li> <li>• DI3</li> <li>• DI4</li> </ul> <p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>• UnUnsedDi</li> <li>• OccSensor - (usually a motion detector)</li> <li>• IaQOverrideIn</li> <li>• SmokeMonitor</li> <li>• DirtyFilterIn</li> <li>• ShutDown - (shuts down, and disables automatic temperature control)</li> <li>• WindowOpen</li> <li>• Monitor - (generic switch input to be sent out over the LonWorks Bus network)</li> <li>• CoilFreezeStat</li> <li>• AqstatMakeTmpRise - (make on Temperature Rise)</li> <li>• AqstatBreakTmpRise - (break on Temperature Rise)</li> <li>• TimeClock</li> <li>• DripPanFull - (locks out cooling when contacts are made)</li> <li>• EconEnable - (Economizer enabled when contacts are made)</li> </ul>

**Table 54. Unit Ventilator Inputs. (Continued)**

Name	Definition
Optional Analog Points	<p>User address(es) for analog points. Two resistive and two voltage sensors are available.</p> <p>Select one of the following resistive options:</p> <ul style="list-style-type: none"> <li>• UnUsedRai</li> <li>• OutDoorTempPt3000</li> <li>• DischargeTempPt3000</li> <li>• ReturnTempPt3000</li> <li>• MixedAirTempPt3000</li> <li>• FanSwitch</li> <li>• DischargeTemp20kntc</li> <li>• ReturnTemp20kntc</li> <li>• MixedAirTemp20kntc</li> </ul> <p>Select one of the following voltage options:</p> <ul style="list-style-type: none"> <li>• UnusedVai</li> <li>• RtnHumidityC7600C</li> <li>• ReturnEnthalpy</li> <li>• OdHumC7600C</li> <li>• OutdoorEnthalpy</li> <li>• OutdoorCO</li> <li>• FilterStaticPressDiff</li> <li>• SpaceCO2</li> <li>• OutdoorCO2</li> <li>• MonitorSensor1</li> <li>• RtnHumC7600B</li> <li>• OdHumC7600B</li> <li>• RtnHumidityH76721/31</li> <li>• OdHumidityH76721/31</li> </ul> <p>NOTES:</p> <ol style="list-style-type: none"> <li>1. If you configured a floating or PWM economizer (see “UV Outputs” on page 75), you <b>MUST</b> select a Discharge Air sensor to enable automatic damper control.</li> <li>2. The RtnHumidityH7621/31 and OdHumidityH7621/31 humidity sensors for voltage inputs are supported by UVs whose versions are 1.01.10 and above.</li> <li>3. The DischTemp20KNTC sensor can be used to report valid temperatures up to 180 °F. This is applicable for UVs whose versions are 1.01.10 and above.</li> </ol>

**UV Equipment Control Options**

Use Table 55 to configure the Unit Ventilator Equipment Control cascade, fan, and smoke control options.

**Purpose**

Define Equipment Control parameters that the Excel 10 Controller uses to control the unitary equipment.

**Mode**

Configuration can be performed with the wizard Off-line or On-line.

**Procedure**

1. Click the **Equipment Control** button on the left pane to open the **Equipment Control Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Economizer Configuration** page or **Back** to display the **Input Configuration** page.

**UV Equipment Control fields**

**Table 55. .Unit Ventilator Control Options.**

Name	Definition
Cascade Control	Cascade control modulates/stages heating/cooling to control discharge air temperature, and uses space temperature to reset the discharge air temperature set point. Select one of the following cascade control options: Yes - Select Yes only if 1both a Discharge Air Temperature sensor and modulating heating or cooling are configured. No - Select No if the heating/cooling equipment are controlled strictly from space temperature, and discharge temperature is not used.
Fan Control	Select one of the following fan control options: Auto - Auto cycles the fan with call for cooling (and heating if you set Fan - Heating to On [next parameter]). Continuous - Continuous means the fan runs continuously in the Occupied mode, and intermittently (with call for heating/cooling) in the Unoccupied mode
Fan Run on Heat	Select one of the following fan control options: On Off - Select Off to allow for control circuits where, when in heat mode, the fan is directly controlled by an interlock control circuit (not part of the Excel 10 controller) which brings on the fan once the plenum temperature has risen above its thermostatic set point.
Smoke Control	This value determines what the controller does when a smoke alarm occurs (either from the digital input, or via the LonWorks Bus network). Select one of the following smoke control options: Fan Off Damper Closed Fan On Damper Open Fan On Damper Closed
Fan Fail Time	This option is enabled if an Air Flow switch was selected. This value sets the amount of time that must pass after closed contacts on the Air Flow switch are detected before the controller shuts down and attempts a restart. If three fan start attempts fail to prove air flow, the controller is disabled and locked out until reset. This action allows the fan to come up to speed on start up, and prevents false air flow failure alarms.

**Table 55. .Unit Ventilator Control Options. (Continued)**

Name	Definition
Filter Setpoint	This option is enabled if an analog Filter Pressure sensor was selected. If the measured pressure exceeds this setpoint, the Dirty Filter alarm is issued. There is a built-in hysteresis of 25 percent of the Filter Press Stpt value (for the Dirty Filter alarm to return to normal).

**UV Economizer Settings**

**Purpose**

This section defines the Economizer functions. Use Table 56 to configure the Unit Ventilator Economizer settings.

**Mode**

Configuration can be performed with the wizard Off-line or On-line.

**Procedure**

1. Click the **Economizer** button on the left pane to open the **Economizer Configuration Page**.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **H/C Stage Parameters Configuration** page or **Back** to display the **Equipment Control Configuration** page.

**UV Economizer fields**

**Table 56. Unit Ventilator Economizer Settings.**

Name	Definition
IAQ Sensor Setpoint	This is the Indoor Air Quality setpoint. This setting, in ppm, is compared to the current actual indoor CO <sub>2</sub> sensor reading to determine the indoor air quality.
OAQ Sensor Setpoint	This is the Outdoor Air Quality setpoint. This setting, in ppm, is compared to the current actual outdoor CO or CO <sub>2</sub> sensor reading to determine the outdoor air quality. If OAQ is poor, the economizer damper is closed to 0%.
Enable Type	Source for economizer enable decisions. Choose one of the following methods to determine when to use outdoor air for cooling: <ul style="list-style-type: none"> <li>• Digital</li> <li>• OutDoorTemp</li> <li>• OdEnth Type A</li> <li>• OdEnth Type B</li> <li>• OdEnth Type C</li> <li>• OdEnth Type D</li> <li>• DiffTemp</li> <li>• SingleEnth</li> <li>• DiffEnth</li> <li>• EconNul</li> </ul>

**Table 56. Unit Ventilator Economizer Settings. (Continued)**

Name	Definition
OA Damper Min Pos	Minimum position of the Outdoor Damper (0 to 100%). Under normal Occupied-mode operation, the dampers are not closed below this setting. If Unoccupied, or if a Discharge Low Temperature condition exists, the dampers are closed below this setting.
IAQ Position	Minimum Position of Damper used when poor Indoor Air Quality conditions exist (IAQ sensor > IAQ Setpoint, or if Digital IAQ Switch is on). Value range from 0 to 100%.  NOTE: A discharge low temperature condition overrides this setting and closes the dampers to prevent equipment damage due to freezing.
Use Heat for IAQ	Select one of the following options: <ul style="list-style-type: none"> <li>• Yes - Enables heat to be used when the damper is opened for IAQ purposes.</li> <li>• No - Keeps heat disabled if controller is in Cool mode.</li> </ul>
Oa Temp High Limit	This field is enabled only when Enable Type is set to Single Enth(alty). It provides an outdoor air temperature high limit setting, above which, the economizer is disabled, regardless of the current enthalpy value.
Mixed Temp Setpoint (ASHRAE Cycle 3 only)	This field is enabled only when ASHRAE Cycle III is selected in the Equipment Control Tab.
Ashrae Cycle	When a unit ventilator is in the occupied mode it typically follows one of three operating cycles defined by the American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc. (ASHRAE): <ul style="list-style-type: none"> <li>• Cycle I: Fixed 100% Outdoor Air</li> <li>• Cycle II: Variable Percentage of Outdoor Air with Minimum Position setting</li> <li>• Cycle III: Variable Outdoor Air Maintaining Constant Mixed Air Temperature</li> </ul>
Enable Setpoint	This setpoint is enabled if Enable Type is Outside Air Temp, Diff. Temp, or Single Enth
OaEconEnTemp	For OdTemp, this field sets the threshold. The economizer is disabled when OdTemp exceeds this value.
DiffEconEnTemp	For Diff Temp, this field sets the difference between the Outdoor and Return air temperatures, above which, the economizer is disabled.
OaEnthEn	For Single Enth, this field sets the enthalpy value, above which, the economizer is disabled.

## UV Heating/Cooling (H/C) Stages

Use Table 57 to configure the Unit Ventilator H/C Stages to set the minimum on/off times, Cycles/ hour, recovery ramps of a Unit Vent application for heating and cooling stages.

### Purpose

Define heating and cooling (h/c) stage parameters, including minimum on and off times.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **HcStageParameter** button on the left pane to open the **H/C Stage Parameters Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Zone Operations Configuration** page or **Back** to display the **Economizer Configuration** page.

## UV Heating/Cooling (H/C) Stages parameters

**Table 57. Unit Ventilator Heating and Cooling Stage Parameters.**

Name	Definition
Min On/Off	<ul style="list-style-type: none"> <li>• Min_heat_on enables minimum on/off times.</li> <li>• Min_heat_off replaces set minimum on/off times with a 30 second default.</li> <li>• Min_cool_on enables minimum on/off times.</li> <li>• Min_cool_off replaces set minimum on/off times with a 30 second default.</li> </ul>
Cycles/Hour	Cycles per hour (cph). Enter value from 2 through 12. For example, cph for conventional heating stage one is normally 3 cph. Consult your hardware installation guide for recommended values.
Oa Temp Lock Out	OA temperature lockout. OA temperature values below the cooling lockout setting disables the cooling stages. OA temperature values above the heating lockout setting disable the heating stages.
Ramp	Recovery ramp (degrees per hour). Enter value from 2 through 20 for cooling or 3 through 20 for heating
Fan Run-On Time	Enter amount of time (from 0 to 120 seconds) the fan will continue to run after the last stage of heating or cooling has switched off.  This value is only applicable during unoccupied times, and during occupied times if the Fan Control field is set to Auto_Fan.

## UV Zone Options

Use Table 58 to configure the Unit Ventilator Zone Options to set the heating and cooling setpoints.

### Purpose

Enter all outputs, including optional outputs, to be controlled by the Unit Ventilator Controller.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Zone Options** button on the left pane to open the **Zone Options Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Miscellaneous Parameters Configuration** page or **Back** to display the **H/C Stage Parameters Configuration** page.

### UV Zone Options fields

Table 58. Unit Ventilator Zone Options.

Name	Definition
Cooling Occupied Setpoint	Enter Occupied cooling setpoint; range: 50 to 95 °F (10 to 35 °C).
Cooling Standby Setpoint	Enter Standby cooling setpoint; range: 50 to 90 °F (10 to 32 °C).
Cooling Unoccupied Setpoint	Enter Unoccupied cooling setpoint; range: 50 to 90 °F (10 to 32 °C).
Heating Occupied Setpoint	Enter Occupied heating setpoint; range: 50 to 90 °F (10 to 32 °C).
Heating Standby Setpoint	Enter Standby heating setpoint; range: 50 to 90 °F (10 to 32 °C).
Heating Unoccupied Setpoint	Enter Unoccupied heating setpoint; range: 50 to 90 °F (10 to 32 °C).
Use Wall Module Setpoint	Select usage of setpoint adjustment potentiometer on a connected Wall Module. This field is active if you selected a Sensor_Setpoint type in the Wall Module field on the Input tab.
Min. Limit Setpoint	Provides a lower limit on the allowed settings of the Wall Module's setpoint knob. Enabled if Use Wall Module Setpoint is Yes. Values range from 55 to 85 °F when the setpoint knob type is absolute and range for relative setpoint knob type is -9 to 9 DDf.

Table 58. Unit Ventilator Zone Options. (Continued)

Name	Definition
Max. Limit Setpoint	Provides an upper limit on the allowed settings of the Wall Module's setpoint knob. Enabled if Use Wall Module Setpoint is Yes. Values range from 55 to 85 °F when the setpoint knob type is absolute and range for relative setpoint knob type is -9 to 9 DDf.

## UV Miscellaneous Settings

Use Table 59 to configure the miscellaneous Unit Ventilator application settings.

### Purpose

Enter all outputs, including optional outputs, to be controlled by the Unit Ventilator Controller.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Miscellaneous** button on the left pane to open the **Miscellaneous Parameters Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **PID Configuration** page or **Back** to display the **Zone Options Configuration** page.

### UV Miscellaneous settings

Table 59. Unit Ventilator Miscellaneous Settings.

Name	Definition
DLC Setpoint Bump	Upon receipt of a DLC_Shed signal over the LonWorks-Bus network, the current operating setpoint value is bumped up/down (for cool/heat modes) by this amount. Select a value from 0 through 10.
Override Type	Specify the type of Bypass override functions that are available from the Wall Module's Override button. You can select one of the following options: <ul style="list-style-type: none"> <li>• None</li> <li>• Normal</li> <li>• ByPassOnly</li> </ul> <p>NOTE: No Continuous Unoccupied allowed from the Wall Module's Override button.</p>



**Table 59. Unit Ventilator Miscellaneous Settings.**

Name	Definition
Override Priority	<p>Set the priority scheme for the Bypass override function. You can select one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>Last</b> - Whichever was last to occur; either the button was pushed or the network signal arrived.</li> <li>• <b>Net</b> - The network signal always takes precedence over the push button.</li> </ul> <p>This field is enabled if Override Type is Normal or Bypass Only.</p>
Bypass Time	<p>Set the time period for a bypass override event. Value ranges from 0 through 1080 minutes. Enabled if Override Type is Normal or Bypass Only.</p>
Max Da Temp Setpoint	<p>Value ranges from 65 to 135 °F (18 to 57 °C). Enabled if you selected a discharge air temperature sensor. This setting is only used if Cascade Control is enabled.</p>
Min. Da Temp	<p>Value ranges from 0 to 60 °F (-18 to 16 °C). Enabled if you selected a discharge air temperature sensor. This setting is used in Cascade Control, and as the Low Limit alarm threshold for discharge temp.</p>
Setpoint Knob Type	<p>Select Relative (plus or minus up to 10 degrees from the current actual setpoint set on the Zone Options page), or Absolute_Middle (the Wall Module's knob sets the midpoint between the heat and cool current actual setpoints). You can select one of the following options:</p> <ul style="list-style-type: none"> <li>• Unused</li> <li>• Offset</li> <li>• Absolute</li> </ul>

## UV PID settings

Use Table 60 to configure the Unit Ventilator PID settings.

### Purpose

Adjust PID (Proportional Integral Derivative) control parameters for the Unit Ventilator Controller.

### Mode

Configuration can be performed with the wizard Off-line or On-line.



## CAUTION

### Equipment Damage Possible

Can cause short cycling of compressors or wide swings in space temperature and excessive overdriving of modulating outputs.

If a large or frequent change to the PID control parameters is made, it is possible to cause equipment problems such as short cycling compressors (if the stage minimum run times were disabled). Other problems that can occur include wide swings in space temperature and excessive overdriving of modulating outputs.

The default values provide proper control for most applications. If the PID parameters require adjustment away from these values, use caution to ensure that equipment problems do not arise. If any change to the PID control parameters is made, the adjustments should be gradual. After each change, allow the system to stabilize so the effects are accurately observed. Make further refinements as needed until the system is operating as desired.

If the default values are changed and you want to reset them, add a second Unit Ventilator Controller to the subnet, record then re-enter the default PID values to the first Unit Ventilator.

### Procedure

1. Click the **PID** button on the left pane to open the **PID Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Wiring Assignment** page or **Back** to display the **Miscellaneous Parameters Configuration** page.



## CAUTION

### Equipment Damage Possible

Adjustments may cause large over or undershooting of setpoint. The default values provide proper control for most systems.

## UV PID Settings fields

**Table 60. Unit Ventilator PID Settings.**

Name	Definition
Cooling Throttling Range	<p>Throttling Range or Proportional Gain</p> <p>Determines what impact the error has on the output signal. Decreasing the Throttling Range amplifies the effect on the error, that is, for a given error (the difference between the measured space temperature and the current actual space temperature setpoint), a small Throttling Range causes a higher output signal value.</p> <p>Enter the range in degrees: 2 to 30 °F (-17 to -1 °C).</p>

**Table 60. Unit Ventilator PID Settings. (Continued)**

Name	Definition
Cooling Integral Time	<p>Integral Time</p> <p>Determines what impact the error-over-time has on the output signal. Error-over-time has two components that make up its value: the amount of time the error exists and the size of the error.</p> <p>The higher the integral time, the slower the control response. In other words, a decrease in Integral Time causes a more rapid response in the output signal.</p> <p>Enter the range in seconds: 0 to 5000.</p>
Cooling Derivative Time	<p>Derivative Time or Gain</p> <p>Determines what impact the error rate has on the output signal. The error rate is how fast the error value is changing. It can also be the direction space temperature is going, either towards or away from the setpoint and its speed - quickly or slowly.</p> <p>A decrease in Derivative Time causes a given error rate to have a larger effect on the output signal.</p> <p>Enter the range in seconds (0 – 9,000).</p>
Heating Throttling Range	<p>Throttling Range or Proportional Gain</p> <p>Determines what impact the error has on the output signal.</p> <p>Decreasing the Throttling Range amplifies the effect on the error, that is, for a given error (the difference between the measured space temperature and the current actual space temperature setpoint), a small Throttling Range causes a higher output signal value.</p> <p>Enter the range in degrees: 2 to 30 °F (-17 to -1 °C)</p>
Heating Integral Time	<p>Integral Time</p> <p>Determines what impact the error-over-time has on the output signal. Error-over-time has two components that make up its value: the amount of time the error exists and the size of the error.</p> <p>The higher the integral time, the slower the control response. In other words, a decrease in Integral Time causes a more rapid response in the output signal.</p> <p>Enter the range in seconds: 0 to 5000.</p>

**Table 60. Unit Ventilator PID Settings. (Continued)**

Name	Definition
Heating Derivative Time	<p>Derivative Time or Gain</p> <p>Determines what impact the error rate has on the output signal. The error rate is how fast the error value is changing. It can also be the direction space temperature is going, either towards or away from the setpoint and its speed - quickly or slowly.</p> <p>A decrease in Derivative Time causes a given error rate to have a larger effect on the output signal.</p> <p>Enter the range in seconds: 0 –to 9000.</p>

## UV Outputs Wiring Assignment

Use Table 61 to configure the outputs of a Unit Ventilator to actual physical outputs on a unit ventilator controller.

### Purpose

Modify terminal assignments for configured outputs.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Limits

Outputs must be configured using the **Unit Ventilator Controller Outputs** page.

### Procedure

1. Click the **Wiring Assignment** button on the left pane to open the **Wiring Assignment** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Wiring Diagram** page or **Back** to display the **PID Configuration** page.

## UV Outputs fields

**Table 61. Unit Ventilator Outputs - Terminal Assignments.**

Name	Definition
Default Assignment	This column displays the default assignments as the outputs are configured in the Outputs page
Custom Assignment	Custom assignment – to change the assignments
Existing	If the device is online, this shows the assignments as in the device. Else, it shows from the database

## UV Controller Wiring Diagram

### Purpose

Display the wiring diagram for the UV controller.

### Mode

Configuration can be performed with the device Off-line or On-line.

### Procedure

1. Click the **Wiring Diagram** button on the left pane to open the **Wiring Diagram Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Back** to display the **Custom Wiring** page.

NOTE: Fields appearing grayed out indicate those fields that change based on the Controller Type selected on the **Outputs** page.

## Configuring the Excel 10 VAV II Controller

The W7751B, W7751HSmart, W7751F, W7751D Standard are the different model types of the VAV controller belonging to the Excel10 family. It is a LonMark compliant device designed to control volume and pressure of air. VAV II controllers include integrated Flow sensor on an expanded I/O platform.

The expanded hardware platform allows you to configure the controller with additional Analog and Digital inputs sensors:

- Analog Sensors types: T7750 integrated setpoint pot or 20 k NTC resistive sensors.
- Digital inputs: SPST type dry contact type devices.

- Also Digital Outputs: 8 configurable digital Triac outputs. (24 Vac & 500 mA).

### Navigating to Excel 10 VAV II pages

Go to the Devices tab. Expand the list of devices on the left pane (listed under WebVision). Select a device to view its properties.

- Configuration
- Inputs
- Control Parameters
- PID
- Flow Pickup
- Miscellaneous
- Custom Wiring
- Wiring Diagram

### Purpose

Define VAV configuration attributes for the Excel 10 VAV II controller.

### Mode

Configuration can be performed with the device On-line or Off-line.

### Procedure

Use Table 62 to configure the Excel 10 VAV II.

1. Click the **Configuration** button on the left pane to open the **Outputs Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Inputs Configuration** page.

## Excel 10 VAV II Configuration Parameters

**Table 62. Excel 10 VAV II - Configuration Parameters.**

Name	Definition
Model Type	Defines the XL10 Controller Hardware that will be used for this application. The controller type selection is validated during the download process to prevent a mismatch of hardware configuration. Valid selections for this field are: <ul style="list-style-type: none"> <li>• W7751B</li> <li>• W7751HSmart</li> <li>• W7751F</li> <li>• W7751DStandard</li> </ul> NOTE: W7751HSmart supports 4 output pins while all other models support 8 output pins.
Pressure Type	Defines the VAV Terminal Unit pressure control operation for this Application. This selection defines how the controller will operate the VAV Terminal Unit's damper.  Valid Selections for this field are: Pressure Dependent - The controller uses space temperature as the primary means of controlling the VAV Terminal.  Pressure Independent - The controller uses airflow as the primary means of controlling the VAV Terminal Damper.

Table 62. Excel 10 VAV II - Configuration Parameters. (Continued)

Name	Definition
Box Type	<p>Defines the physical type of VAV Terminal the controller is connected to. This select determines what control options are available for the VAV Terminal.</p> <p>Valid selections for this field are:</p> <ul style="list-style-type: none"> <li>• <b>Single Duct</b> – This VAV Terminal type consist of a single primary air supply inlet connection with or without a primary flow sensor. This box type is primarily used for cooling only applications, cooling with local reheat or dual temperature (central heating/cooling) systems.</li> <li>• <b>Dual Duct</b> – This VAV Terminal type consist of separate primary air supply inlets for cooling and heating. Typically, the box can be configured with a single flow sensor located on the discharge side of the terminal or in one of the two primary air inlets, a flow sensor in each of the primary air inlets, or no flow sensors.</li> <li>• <b>Flow Tracking</b> – This VAV Terminal type consist of a single inlet air connection receiving it's primary source from the condition space. The outlet of the terminal is connected to a return air (or exhaust air) system.</li> </ul>
Wall Module Type	<p>Defines the type of wall module to be used for this application. This selection determines the type of control and options that are available from the wall module.</p> <p>Valid selections for this field are:</p> <ul style="list-style-type: none"> <li>• <b>No Sensor</b> – There is no physical wall module connections to this controller.</li> <li>• <b>Sensor</b> – The physical wall module connected to this controller contains a sensor only.</li> <li>• <b>Sensor Override</b> – The physical wall module connected to this controller contains a sensor and push button override with LED indication.</li> <li>• <b>Sensor Setpoint</b> – The physical wall module connected to this controller contains a sensor and remote setpoint pot</li> <li>• <b>Sensor Setpoint Override</b> – The physical wall module connected to this controller contains a sensor, remote setpoint pot, push button override and LED indication.</li> <li>• <b>LCD Wall Module</b> – The physical wall module connected to this controller contains a sensor, remote setpoint pot., push button override and a LCD display.</li> </ul> <p>NOTE: The LCD Wall Module is supported by VAV devices of type Smart Actuator only whose version is v1.02.14 and above.</p>
Morning Warmup Type	<p>Defines the control method the controller uses when the controller status is set to morning warm-up.</p> <p>Valid selections for this field are:</p> <ul style="list-style-type: none"> <li>• <b>Fixed Flow</b> – The controller maintains a fixed air flow setpoint or damper position during the warm-up period.</li> <li>• <b>Modulating Flow with Reheat</b> – The air flow setpoint is reset by the local space temperature during the warm-up period. If controller is at maximum flow and additional warm-up is required local reheat is used.</li> <li>• <b>Modulating Flow without Reheat</b> – The air flow setpoint is reset by local space temperature during the warm-up period. No local reheat is used during the warm-up period.</li> <li>• <b>CZS Terminal Load</b></li> </ul>
Module Reheat Flow	<p>The check box enables Proportional reheat flow.</p> <p>When checked, the temperature control loop modulates the damper (pressure-dependent mode) or reset air flow setpoint (pressure-independent mode) when the controller is in the reheat mode from Minimum Flow Setpoint to the Reheat Flow Setpoint.</p> <p>If the check box is not checked, then when the controller is in the reheat mode, there is a step change from Minimum Flow Setpoint to the Reheat Flow Setpoint.</p>
Motor Speed Section	
Damper Motor Speed	<p>Defines the time it takes the damper motor actuator to travel from the full close to full open position or visa versa. This time should reflect the damper travel time and not the motor actuator speed. Example, if the actuator motor speed is 90 seconds but the travel time of the damper from full close to full open is 45 seconds then the Dmpr Mtr Spd should be set to 45 seconds.</p>
Reheat Motor Speed	<p>Defines the time it takes the reheat actuator to travel from the full close to the full open position or visa versa. This time should reflect the reheat valve travel time and not the motor actuator speed. Example, if the reheat actuator motor speed is 125 seconds but the travel time of the valve from full close to full open is 90 seconds then the Reheat Mtr Spd should be set to 90 seconds.</p>

Table 62. Excel 10 VAV II - Configuration Parameters. (Continued)

Name	Definition
Output Settings Section	
Flow Type	<p>Defines the control flow algorithm used by the controller. The selection available depends on the Pressure Type and Box Type selected.</p> <p>Valid selections for this field are:</p> <ul style="list-style-type: none"> <li>• <b>Flow Normal</b> – This flow type is selectable when the Pressure Type is set to pressure independent and the Box Type is set to Single Duct or Dual Duct.</li> <li>• <b>Shared Wall Module</b> – This flow type is selectable when the Pressure Type is set to pressure independent or pressure dependent and the Box Type is set to Single Duct.</li> <li>• <b>DD Satel No Flow Mix</b> – This flow type is selectable when the Pressure Type is set to Pressure Independent and the Box Type is set to Dual Duct.</li> <li>• <b>DD Satel Flow Mix</b> – This flow type is selectable when the Pressure Type is set to Pressure Independent and the Box Type is set to Dual Duct.</li> <li>• <b>DD Satel Constant Volume</b> – This flow type is selectable when the Pressure Type is set to Pressure Independent and the Box Type is set to Dual Duct.</li> <li>• <b>DD Master No Flow Mix</b> – This flow type is selectable when the Pressure Type is set to Pressure Independent and the Box Type is set to Dual Duct.</li> <li>• <b>DD Master Flow Mix</b> – This flow type is selectable when the Pressure Type is set to Pressure Independent and the Box Type is set to Dual Duct.</li> <li>• <b>DD Master Constant Volume</b> – This flow type is selectable when the Pressure Type is set to Pressure Independent and the Box Type is set to Dual Duct.</li> <li>• <b>Dual Duct Discharge Sensor</b> – This flow type is selectable when the Pressure Type is set to Pressure Independent and the Box Type is set to Dual Duct.</li> <li>• <b>Dual Duct Discharge Sensor Constant Volume</b> – This flow type is selectable when the Pressure Type is set to Pressure Independent and the Box Type is set to Dual Duct.</li> <li>• <b>Flow Tracking</b> – This flow type is automatically selected when the Pressure Type is set to Pressure Independent and the Box Type is set to Flow Tracking</li> </ul>
Reheat Type	<p>Defines the type of reheat used by the controller. There are two basic types of reheat available for the VAV Terminal, VAV Terminal Reheat and Peripheral Reheat.</p> <p>Valid selections for this field are:</p> <ul style="list-style-type: none"> <li>• <b>No Reheat</b> – There is no local reheat associated with the VAV Terminal.</li> <li>• <b>One Stage Reheat</b> – There is one stage of electric reheat associated with the VAV Terminal. One triac output is required for this option.</li> <li>• <b>Two Stage Reheat</b> – There are two stage of electric reheat associated with the VAV Terminal. Two triac outputs are required for this option.</li> <li>• <b>Three Stage Reheat</b> – There are three stages of electric reheat associated with the VAV Terminal. Three triac outputs are required for this option</li> <li>• <b>Three Stage Bin Reheat</b> – There are three stages of electric reheat associated with the VAV Terminal. The three stages are obtained by first turning on the first electric reheat for stage one, shutting down the first stage and starting the second stage and finally turning both stages of electric reheat on for the third stage. Two triac outputs are required for this option.</li> <li>• <b>One Stage Periph</b> – There is one stage of electric peripheral reheat associated with the VAV Terminal. One triac output is required for this option.</li> <li>• <b>Float Reheat</b> – There is a modulating valve for the VAV Terminal reheat. This output uses the series 60 type floating control. Two triac outputs are required for this option.</li> <li>• <b>Float Periph Reheat</b> – There is a modulating valve for the space peripheral reheat. This option uses the series 60 type floating control for the output to the valve. Two triac outputs are required for this option.</li> <li>• <b>Float Reheat Then Periph</b> – There is a modulating valve for the VAV Terminal reheat and a modulating valve for the space peripheral reheat. This option uses the series 60 type floating control for both valve outputs. The VAV Terminal reheat valve is modulated as the first stage of reheat and the peripheral reheat valve is modulated open as the second stage. Four triac outputs are required for this option.</li> </ul>

Table 62. Excel 10 VAV II - Configuration Parameters. (Continued)

Name	Definition
Output Settings Section (continued)	
Reheat Type (continued)	<ul style="list-style-type: none"> <li>• <b>Float Periph Then Reheat</b> – There is a modulating valve for the VAV Terminal reheat and a modulating valve for the space peripheral reheat. This option uses the series 60 type floating control for both valve outputs. The peripheral valve is modulated as the first stage of reheat and the VAV Terminal reheat valve is modulated open as the second stage. Four triac outputs are required for this option.</li> <li>• <b>PWM Reheat</b> – There is a modulating valve for the VAV Terminal reheat. This option uses Pulse Width Modulation control for the output to the valve. One triac output is required for this option.</li> <li>• <b>PWM Periph</b> – There is a modulating valve for the space peripheral reheat. This option uses Pulse Width Modulation control for the output to the valve. One triac output is required for this option.</li> <li>• <b>PWM Reheat Then Periph</b> – There is a modulating valve for the VAV Terminal reheat and a modulating valve for the space peripheral reheat. This option uses Pulse Width Modulation control for both valve outputs. The VAV Terminal reheat valve is modulated as the first stage of reheat and the peripheral reheat valve is modulated open as the second stage. Two triac outputs are required for this option.</li> <li>• <b>PWM Periph Then Reheat</b> – There is a modulating valve for the VAV Terminal reheat and a modulating valve for the space peripheral reheat. This option uses Pulse Width Modulation control for both valve outputs. The peripheral valve is modulated as the first stage of reheat and the VAV Terminal reheat valve is modulated open as the second stage. Two triac outputs are required for this option.</li> <li>• <b>Three Stage Reheat</b> – There are three stages of electric reheat associated with the VAV Terminal. Three triac outputs are required for this option.</li> </ul>
Fan Type	<p>Defines the type of fan associated with the VAV Terminal. The selection of the fan type defines the control algorithm that the controller will apply to the VAV Terminal.</p> <p>Valid selections for this field are:</p> <ul style="list-style-type: none"> <li>• <b>No Fan</b> – There is no fan associated with this VAV Terminal.</li> <li>• <b>Series Fan</b> – The fan supplied with this VAV Terminal is a series style configuration.</li> <li>• <b>Parallel Fan Temp</b> – The fan supplied with this VAV Terminal is a parallel style configuration that will use temperature control for the fan operation.</li> <li>• <b>VavParallelFlowControl</b> – The fan supplied with this VAV Terminal is a parallel style configuration that will use flow control for the fan operation.</li> <li>• <b>PWM Fan</b> – The fan supplied with this VAV Terminal is a parallel style configuration that will use temperature control for the fan operation with a PWM signal to operate the fan.</li> </ul>
Optional Outputs	<p>Defines the type and operation of outputs that are not directly associated with the control algorithms in the VAV2 controller.</p> <p>There are two basic types of outputs that can be defined and only one instance of each type is allowed.</p> <p><b>Aux Option</b> - This defines an output type that is energized whenever the controller is in the occupied mode and is de-energized for all other modes.</p> <p>Valid selections for this field are:</p> <ul style="list-style-type: none"> <li>• <b>Unassigned</b> – This option output is not assigned to the controller.</li> <li>• <b>Auxiliary_Maintain</b> – This selection assigns one triac output for the auxiliary point.</li> <li>• <b>Auxiliary_Pulse</b> – This selection assigns two triac outputs for the auxiliary point. The controller momentarily pulses one output for the on command and the second output for the off command.</li> </ul> <p><b>Free Option</b> - This defines an output type that is energized through the network variable DestFree. With this assignment an output point within the VAV controller can be commanded from another LON device.</p> <p>Valid selections for this field are:</p> <ul style="list-style-type: none"> <li>• <b>Unassigned</b> – This option output is not assigned to the controller.</li> <li>• <b>Free_Net_Maintain</b> – This selection assigns one triac output for the Free point.</li> <li>• <b>Free_Net_Pulse</b> – This selection assigns two triac outputs for the Free point. The controller momentarily pulses one output for the on command and the second output for the off command.</li> </ul>

**Table 62. Excel 10 VAV II - Configuration Parameters. (Continued)**

Name	Definition
PWM Settings Section	
PWM Period	Defines the time period of the PWM signal. This is usually the sum of the Zero time value and the Full Time value.  The minimum resolution of the time value is 0.1 seconds.
PWM Zero	Defines the time period for the Zero position pulse. When the on time of the PWM period is at this value the PWM device will position itself to the zero position.
PWM Full	Defines the time period for the Full position pulse. When the on time of the PWM period is at this value the PWM device will position itself to the full position.  The minimum resolution of the time value is 0.1 seconds

## Excel 10 VAV II – Inputs

Use Table 63 to configure the Excel 10 VAV II inputs.

### Purpose

Specify all sensors to be wired to a controller. Define Inputs attributes for the VAV II controller.

### Mode

Configuration can be performed with the device On-line or Off-line.

### Procedure

1. Click the **Inputs** button on the left pane to open the **Inputs Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Control Parameters Configuration** page or **Back** to display the **Configuration** page.

## VAV II Inputs fields

**Table 63. Excel 10 VAV II - Analog and Digital Inputs.**

Name	Definition
Analog Input Configuration	
Analog 1	NOTE: If the wall module type is selected without the sensor option in the General page, this field appears as Analog1. Otherwise, it appears as Remote Setpt.  Select type: <ul style="list-style-type: none"> <li>• Absolute</li> <li>• Relative</li> </ul> If the wall module is configured for a sensor selection, the options available are Absolute or Relative. Otherwise, the options are: <ul style="list-style-type: none"> <li>• Discharge Temp NTC</li> <li>• Supply Temp NTC</li> <li>• Unused AI</li> </ul>

**Table 63. Excel 10 VAV II - Analog and Digital Inputs.**

Name	Definition
Analog Input Configuration (continued)	
Analog 2	If there is a second analog input, select type: <ul style="list-style-type: none"> <li>• Discharge Temp NTC</li> <li>• Supply Temp NTC</li> <li>• Unused AI</li> </ul>
Digital Input Configuration	
Digital 1 through Digital 3	You can configure up to three optional digital points. <ul style="list-style-type: none"> <li>• <b>UnusedDI</b> - Select if the point is unused.</li> <li>• <b>Window Open</b> – When open, disables the temperature control and moves damper to a fixed position.</li> <li>• <b>HeatCool ChangeOver</b> – Can manually control operation mode for hot air or cold air supplied from an AHU.</li> <li>• <b>Occ Sensor</b> – Allows an occupancy sensor to change the effective occupancy between standby and occupied mode.</li> </ul> <p><b>Monitor Switch</b> – a simple switch acting like a digital input. Switch Closed means On/True and Switch Open means Off/False.</p>

NOTE: No two inputs can be configured as duplicate. In case the user selects a duplicate input, the wizard displays a warning and reverts back to the previous selection.

## Excel 10 VAV II – Control Parameters

Use Table 64 to configure the Excel 10 VAV II Control Parameters.

### Purpose

Define Equipment Control parameters that the Excel 10 VAV II controller uses to control the unitary equipment. Define VAV II controller parameters.

### Mode

Configuration can be performed with device On-line or Off-line.

### Procedure

1. Click the **Control Parameters** button on the left pane to open the **Control Parameters** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **PID Parameters** page or **Back** to display the **Inputs** page.

## Excel 10 VAV II Control Parameters fields

Table 64. VAV II Control Parameters.

Name	Definition
Cooling Setpoints	Values for the occupied, standby, and unoccupied settings for the cooling setpoints.
Heating Setpoints	Values for the occupied, standby, and unoccupied settings for the heating setpoints.
Limits	Values for the high and low limit settings for the remote setpoint.
Flow Setpoints	Values for the Maximum, Minimum, Max Reheat, and Standby settings for the flow setpoints.
Duct Settings	
Area	Area of the Duct. The user can choose a CustomArea option for the Diameter and enter a value for the area. The valid range allowed is 0 to 4 ft <sup>2</sup> or 0 to 0.372 m <sup>2</sup> .
Diameter	This list shows a predefined set of duct diameters. The user can choose a diameter option and the area will be automatically calculated. Or, the user can choose a "Custom Area" option and manually enter the Area value.
Wall Module Setpoint Limits	Values of the High Limit and Low Limit setpoints on the wall module.

## Excel 10 VAV II – PID Settings

Use Table 65 to configure the Excel 10 VAV II PID values.

### Purpose

Proportional-Integral-Derivative (PID) values regulate an analog output based on two analog values (one is a controlled variable; the other, a reference variable) and operating

parameters. The controlled variable is the variable that should be held constant, for example, a room temperature. The reference variable is the prescribed changeable value of the controlled variable, for example, room temperature setpoint. Define PID (Proportional Integral Derivative) parameters for a VAV II Controller.

### Mode

Configuration can be performed with the device On-line or Off-line.

### Procedure

1. Click the **PID** button on the left pane to open the **PID Parameters** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Flow Pickup** page or **Back** to display the **Control Parameters** page.

## Excel 10 VAV II PID Settings fields

Table 65. VAV II PID Settings.

Name	Definition
Cooling	
Throttling Range	Value ranges from 2 to 30 °F (-17 to -1 °C). The Proportional gain value is equivalent to the throttling range.
Integral Action	Value ranges from 0 through 5,000 sec.
Derivative Action	Value ranges from 0-255 sec.
Heating	
Throttling Range	Value ranges from 2 to 30 °F (-17 to -1 °C).
Integral Action	Value ranges from 0 through 5,000 sec.
Derivative Action	Value ranges from 0-255 sec.

## Excel 10 VAV II – Flow Pickup

Use Table 66 to configure the Excel 10 VAV II flow pickup settings.

### Purpose

Specify differential pressure and velocity for flow sensors. Define the differential pressures and velocities for the flow sensors. These values would be used to calculate the flow linearization values during the download sequence.

### Mode

Configuration can be performed with the device On-line or Off-line.

### Procedure

1. Click the **Flow Pickup** button on the left pane to open the **Flow Pickup Table** page.
2. Enter information into available fields (see Table 66 on page 88).
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Miscellaneous** page or **Back** to display the **PID Parameters** page.



## Excel 10 VAV II Flow Pickup fields

Table 66. VAV II Flow Pickup Fields.

Name	Definition
Pt 1 through Pt 10	Ten pairs of airflow values (Inw [Differential pressure] and FPM [velocity])
Flow Sensor Type	List of tables that contains manufacturers' specifications for airflow units. Each table has 10 pairs of airflow values versus feet per minute or feet per second. When a sensor is selected from the table, the airflow values are set to the default specific to the chosen sensor.
Edit Column	This list has Velocity and Volume options. You can select Velocity, change the velocity value and select Yes in Update Alternate Column to update the volume values. Alternatively, you can modify the volume values and update the velocity.
Update Alternate Column	You can choose: Yes - If the other column needs to be modified No - If the other column does not need to be modified

## Excel 10 VAV II – Miscellaneous Settings

Use Table 67 to configure the Excel 10 VAV II miscellaneous settings.

### Purpose

Define miscellaneous parameters for a VAV II Controller.

### Mode

Configuration can be performed with the device On-line or Off-line.

### Procedure

1. Click the **Miscellaneous** button on the left pane to open the **Miscellaneous Parameters** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Custom Wiring** page or **Back** to display the **Flow Pickup Table** page.

## Excel 10 VAV II Miscellaneous Settings fields

Table 67. VAV II Miscellaneous Settings.

Name	Definition
Percent Max Flow	Percentages of maximum flow for the following categories: Window Reheat Minimum Maximum Standby Press Depress Purge Warmup
Bypass Settings	
Time	Bypass Time (in minutes, default is 180) is the time between the pressing of the override button at the wall module and the return to the original occupancy state. When the Bypass state is activated, the bypass timer is set to the Bypass time.
Type	Select either Normal or Bypass
Priority	Select either Last or Net.
Periph Min Pos	Percentage for peripheral valve minimum position.
Demand Limit Offset	Degrees of offset for demand limit. Activated when DestDlcShed is True or active.
Temp Ramp Rate	Ramp time for temperature.
Fan Flow Setpoint	Setpoint in cfm for fan flow.
Fresh Air Required	Amount of fresh air required in cfm. FreshAirRatio is equal to FreshAirReq divided by SrcBoxFlow. When FreshAirRatio is large (greater than 100 percent), there is insufficient fresh air being supplied to the zone even if the supply air is 100 percent fresh air. When FreshAirRatio is small, there is sufficient fresh air being supplied to the zone. FreshAirRatio is used for coordination within the HVAC subsystem and energy management decisions by the supply equipment.

## Excel 10 VAV II – Custom Wiring Settings

Use Table 68 to configure the Excel 10 VAV II miscellaneous settings.

### Purpose

To enable you to change the output pin configuration.

### Mode

Configuration can be performed with the device On-line or Off-line.

## Procedure

1. Click the **Custom Wiring** button on the left pane to open the **Custom Wiring** page.
2. You can choose to change the default assignment. Select Custom option in the **Assignment Type** list.
3. Select **Default** to revert back to the default assignment.
4. The number of outputs available for changing the configuration depends on the model type. For a W7751B Smart, only 4 output pins would be enabled.
5. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
6. Click **Next** to display the **Wiring Diagram** page or **Back** to display the **Miscellaneous Parameters** page.

## Excel 10 VAV II Custom Wiring Settings fields

Table 68. VAV II Custom Wiring Settings.

Name	Definition
Selected Outputs	All configured outputs
Configured Outputs	Terminal positions available for the Selected Outputs.
Default Assignments	This list is filled with the default assignment as the user configures the outputs in the General page.
New Assignments	This list is by default filled with the same options as Default Assignment. But, the user has an option to change the outputs.
Existing Assignments	This list is filled with the outputs assignment in the controller. This list would show the actual assignment in the device if the device is online. If not, it would just show the values from the database.
Output Assignment	Choose one of the following options: Default Custom - Choose this option if you want to over ride default assignments. This enables the New Assignment column. The number of output pins enabled depends on the Model Type selected.

## Excel 10 VAV II – Wiring Diagram

### Purpose

Display the wiring diagram for the controller.

### Mode

Configuration can be performed with the device Off-line or On-line.

### Procedure

1. Click the **Wiring Diagram** button on the left pane to open the **Wiring Diagram Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Back** to display the **Custom Wiring** page.

NOTE: Fields appearing grayed out indicate those fields that change based on the Model Type selected on the **Configuration** page.

## Configuring the Vacon NX Frequency Converter (NXVFD)

VACON NX frequency converter (NXVFD) is an electronic device for control of speed and torque of three-phase alternating current (AC) motors. NXVFD converts the fixed frequency and voltage of the main supply (mains) to a variable frequency and voltage, which can then be regulated to provide flexible motor operation and reduce energy consumption. VACON NX frequency converters can be connected to the LonWorks network using a field bus board.

The VACON NXOPTC4 option board is equipped with an FTT-10A transceiver supporting the Free Topology transformer coupled network, which allows the network wire to be connected as bus, star, loop or combination of these. The converter can then be controlled, monitored and programmed from the Host system. The LonWorks board shall be installed in slot E on the control board of the frequency converter. The converter can then be controlled, monitored and programmed from the LONWORKS network.

### Configuring NXVFD settings

#### IMPORTANT NOTE:

*After the option card is installed, it is mandatory to make the following settings for Control Place and Frequency Reference:*

1. Selection of Control Place – The NXVFD device can be controlled from three different places. They are (default control place is Key Pad [panel]):
  - I/O terminal
  - Key Pad (panel)
  - Fieldbus

The Key Pad control of NXVFD device is used for parameter setting, reading status data and giving control commands.

The NXVFD has to be configured to select field bus as control place before starting any of the operations through the wizard. This configuration can be performed using the Key Pad control provided along with device as follows:

- In the keypad, from the main menu, select the menu called Keypad Control.
- Select the submenu Control Place and set it to **FieldBus**.

NOTE: None of the values sent (through fieldbus), by the wizard will be considered until and unless the device is configured with field bus as control place.

2. Selection of Frequency Reference – The NXVFD can be configured to select the frequency reference from following different sources:
  - AI1
  - AI2
  - Keypad
  - Fieldbus
  - Configuring VFD NX Drive parameters

It is mandatory to set the option to **Fieldbus** for NXVFD to consider the frequency setpoint from the wizard.

This configuration can be performed using the Key Pad control provided along with device as follows:

- In the keypad, from the main menu, select the menu called Parameters.
- Select the submenu I/O Reference and set it to **FieldBus**.

NXVFD device supports the following types of applications:

- Basic Application
- Standard Application
- Local/Remote Control Application
- PID Control Application
- Multi-Step Speed Control Application
- Multi-Purpose Control Application
- Pump And Fan control Application

The basic control interface and the parameters are easy to use. If a more versatile interface or parameters are required, a more suitable application can be selected from above application package.

Control I/O boards, which are either isolated (NXOPTA8) or not isolated ((NXOPTA1) from the ground are available.

The used I/O can also be extended by the LONWORKS option board:

- Eight digital inputs (standard signals)
- Eight digital outputs (standard signals)

### Configuring NXVFD Drive Parameters

Use the NXVFD configuration screen to configure the motor parameters, transmission controller parameters, and EEPROM saving option parameters.

Use Table 69 to configure the NXVFD Drive Parameters.

### Mode

These parameters can be configured in both Off-line and On-line modes from the wizard.

### Procedure

1. Click on the **Configuration** tab of NXVFD to open the **VFD Configuration** screen.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.

## NXVFD Drive Parameters fields

Table 69. NXVFD Drive Parameters.

Point Name	Min. Value	Max. Value	Typical Value	Description
Maximum Speed	-163.84	163.83	100.0%	Maximum motor speed:  The value of the maximum speed must be validated against the value of the minimum speed as follows:  -163.84 <= minimum speed <= maximum speed <= 163.83
Minimum Speed	-163.84	163.83	0.0%	Minimum motor speed:  The value of the minimum speed must be validated against the value of the maximum speed as follows:  -163.84 <= minimum speed <= maximum speed <= 163.83
Nominal Speed	300	20000	1725 RPM 3450 RPM 1140 RPM	Nominal motor speed in RPM:  Find this value on the rating plate of the motor. This configuration property is used to provide the nominal speed of the motor in RPM. This value is necessary to determine the minimum and maximum speed for the motor, based on the configuration properties nciMinSpeed, nciMaxSpeed (entered as percent of nominal speed).
Nominal Frequency	30	320	60 Hz 50 Hz	Nominal motor frequency:  This configuration property is used to provide the nominal frequency for the motor.
Acceleration Time	0.1	3000.0	30 sec.	Minimum ramp up time:  Defines the acceleration time for Vacon NX.
Deceleration Time	0.1	3000.0	30 sec.	Minimum ramp down time:  Defines the deceleration time for Vacon NX

**Table 69. NXVFD Drive Parameters. (Continued)**

Point Name	Min. Value	Max. Value	Typical Value	Description
Default Drive Speed Scale	-163.84	163.83	0%	<p>Default value for nviDrvSpeedScale:</p> <p>It provides scaling for nviDrvSpeedStpt.</p> <p>Negative values of nviDrvSpeedScale indicate reverse (anti clockwise) direction of motor rotation.</p> <p>This value will be adopted at power-up and in case of not receiving any input variable within the specified Receive Heartbeat time.</p>

## Configuring the XL15C Plant Controller (XL15C)

The XL15C plant controller is designed to control HVAC equipment and other miscellaneous loads in a distributed control network. You can configure plant controller functions such as start/stop loops, control loops, user-defined setpoint values, math, and logic functions.

### Control Functions

- 10 Control Loops
- 8 Start/Stop Loops
- 32 Logic Loops
- 32 Math Functions
- 6 Special Network Functions

### Navigating to XL15C Pages

To navigate to XL15C pages:

1. On the left pane click the required device name. The **Device Configuration** page appears.
2. Click the **Configuration** tab. The **Configuration** page appears.

### Configuring the XL15C Controller

The options for configuring the XL15C Controller are as follows:

- Local Inputs
- SetPoints (Loop Logic)
- Math Functions
- Control Loops
- Logic Loops
- Start Stop Loops
- Outputs

### Configuring XL15C Local Inputs

The XL15C controller has 8 Analog Inputs and 8 Digital Inputs.

#### ANALOG INPUTS

Analog Inputs are used to monitor external conditions, such as temperature, humidity or pressure. These inputs are commonly used for monitoring and as inputs to Control Loops, Start /Stop Loops, Math Functions & Logic Loops.

Each Analog Input may be configured as Analog or Digital.

Analog Inputs configured as Analog can receive Input from various types of sensors. Analog Inputs configured as Digital can only receive digital signals as inputs

#### DIGITAL INPUTS

Digital Inputs are used to monitor external events, such as contact closures (10 mA, 5Vdc). The contact closures initiate alarms, monitor equipment status, and read pulse meters. These inputs are commonly used as inputs to Control Loops, Start /Stop Loops, Math Functions & Logic Loops.

Each Digital Input can be configured as Maintained, Momentary, Counter Slow, Counter Fast, Pulse Meter.

An external digital input source is connected to the digital input.

#### Poll Points

The XL15C controller utilizes poll points as a means to retrieve data from other network devices. Data retrieved by a poll point is available for linking to XL15C objects such as math functions, control loops, logic loops, and start/stop loops.

The XL15C polls each point every two seconds. If the response is not received within ten seconds the poll is changed to once every 30 seconds. When the response is received the poll rate returns to once every 2 seconds.

The XL15C controller supports a maximum of 20 poll points.

#### Purpose

Specify the attributes for up to eight analog inputs and the sensor types and attributes for up to eight digital inputs.

#### Mode

Configuration can be performed with the wizard Off-line or On-line.

#### Limits

**Analog Input:** One XL15C Plant controller supports up to eight analog inputs (AI1 through AI8) as follows: 0 to 8,000 ohms (+-10 ohms), 0 to 10V dc, 4 to 20 mA, using an external 500 ohm resistor with a 2-10V dc input, digital sensing (contact closure).

**Digital Input:** Two of the four digital inputs can be configured as counters. A counter counts the number of active inputs within the range of 1 through 65,535. Pulse No. 65,536 automatically resets the counter to 0.

#### Procedure

1. On the **Configuration** page click the **Local Inputs** tab. The **Local Inputs** page appears on the right pane.
2. To configure the **Analog Inputs**.
  - a. Select the input channel from **Select Input**.
  - b. Type a name in **Input Name**.
  - c. Select required input from **Input Kind**. The input kind must be one of the following types for an analog input:
    - Unconfigured (default)
    - Resistive
    - Voltage

- 20KNTC
- Digital Active Short
- Digital Active Open

NOTE: The Analog Inputs may be configured as analog or digital.

- Select an **Engineering Units**. This list is enabled when the Analog Input is configured as Resistive or Voltage. The measurement types are listed here. When you select an Engineering Units option, the corresponding Engineering unit appear in the Sensor fields.
- Type the **Input Low, Input High, Output Low and Output High**. The following fields are available:
  - Input Low
  - Input High
  - Output Low
  - Output High

NOTE: For standard sensors like PT\_3000, 20\_KNTC and so on the values are filled in automatically.

- Select the **Input Type** if the input is to be shared across the network. The following Input Types are available:
  - Other
  - OutdoorAirTemp
  - OutdoorAirHumidity
  - DischargeAirTemp

The type selection can be made based on the selected sensor. For example, if the selected sensor is PT\_3000, the type cannot be OutdoorAirHumidity.

An Input type assigned to one Analog Input cannot be used again for another Analog Input. For example, if you select OutdoorAirTemp for Analog Input\_1 it cannot be a selection of any other Analog Input. To select OutdoorAirTemp (for say Analog\_Input\_2), the selection for Analog\_Input\_1 needs to be changed to **Other**.

- To configure the **Digital Inputs**.
  - Click the **Digital Inputs** tab.
  - Select the digital channel from **Select Input**.
  - Type a name in **Input Name**.
  - Select required input from **Input Kind**. The input kind can be one of the following types:
    - Unconfigured
    - DigitalMaintained
    - DigitalMomentary
    - Counter Slow – They are capable of counting the number of transitions on the digital input within the range of 1 through 65,535. The 65,535th pulse will automatically reset the counter back to 0. At the most two digital inputs can be configured as Counters (both counter slow/fast put together). The pulse must last for at least 1.25 seconds frequency must not be greater than 0.4 Hz.
    - Counter Fast - They are capable of counting the number of transitions on the digital input within the range of 1 through 65,535. The 65,535th pulse will automatically reset the counter back to zero (0). At the most two digital inputs can be configured as Counters (both counter slow/fast

put together). The pulse must last for at least 20 milliseconds frequency must not be greater than 15 Hz.

- Pulsemeter - At the most two digital inputs can be configured as Pulsemeters. If 2 DIS are configured as Pulsemeter, power from both will be summed.
- Select an **Engineering Unit**. The Engineering Unit list contains all the engineering units you can assign to a digital input. Engineering Unit is enabled only for Input Kind of Maintained and Momentary and disabled for all others.
  - Select a **State**. The state option has 2 choices: Normally Open and Normally Closed. By default, normally open is selected. Normally open = Off when the input contact is open and On when closed. Normally closed = Off when the input contact is closed and On when open.
  - Select a **Type**. The type option has 2 choices: Unconfigured and Sensor occupancy. The type option is enabled only for Input Kind of Maintained and Momentary and disabled for all others.
  - If the **Input Kind** selected is **Pulsemeter** then **Scale Factor** field is enabled. Type the scaling factor. The scale factor is enabled only when the Input Kind selected is Pulsemeter. The scale factor has a range of 0 – 1000 KWHR/pulse.
- To configure the **Poll Points**
    - Select the required poll point from **Select Poll Point**.
    - Type a **Poll Point Name**.
    - Select a controller from **Source Device**. This selects a controller which provides the input to the XL15C's algorithm.
    - Select the network variable from **Source NV**.
    - Select the field from **Source NV Field**. This selects the field from which the data is accessed.
    - Create a link between the poll point object and the internal object. The appropriate link option displays the slots available on the source and destination object. For example, Click **Control Loops** and select appropriate **Link Type** and **Link Name**.
    - Select an appropriate source slot/link (for example, Analog link) on the poll point and select an appropriate destination slot/link (for example, Sensor Link) on the destination object.

NOTE: Since these points are polled by the XL15C controller, it is not required to perform a bind operation.

## Configuring XL15C Setpoints

The XL15C controller has 40 setpoints. These are points internal to the XL15C controller for which a value and engineering unit may be set. They may be used as predefined Analog Inputs to SS loop, Control loop, Logic loop and math functions.

Setpoints may be used to provide analog inputs to Start/Stop Loops, Control Loops, Logic Loops and Math Functions. Setpoint values are constants that may be changed from an operator interface.

## Purpose

To configure setpoint values for the XL15C.

## Mode

Configuration can be performed with the wizard Off-line or On-line.

## Procedure

1. On the **Configuration** page click **SetPoints [Loop Logic]**. The **Set Point** page appears on the right pane.
2. Type a **Float Value**. There are 40 setpoints. Enter the value of the setpoint in this field. The setpoint has a default value of 0 by default. The valid ranges for a setpoint are -99999 to +99999 with 5 digits maximum and a resolution of 0.0001.
3. Select **Engineering Units**. This list contains engineering units that may be assigned to the setpoint. Select the desired engineering unit from the list.

## Configuring XL15C Math Functions

You can configure a maximum of 30 math functions. Math functions are of two types: General Purpose and Network Special. The General Purpose math function operates on a maximum of six floating point analog inputs. These Inputs can be a physical or remote point value, set point, output of a flex, logic loop, or a math function. You can in turn specify the math functions output to be used by any flexible, logic loop, or a math function.

A minimum of two analog inputs need to be selected if you are configuring a Network Special math function.

## Purpose

General Purpose Math functions are used to perform operations like minimum, average, square root etc. on up to 6 floating point analog values available within the controller.

## Mode

Configuration can be performed with the wizard Off-line or On-line.

## Procedure

1. On the **Configuration** page click **Math Functions**. The **Math Function** page appears on the right pane.
2. Select a required math function from **Select Function**.
3. Type a **Function Name**.
4. Select an operator from **Select Operator**.

## Configuring XL15C Control Loops

The XL15C controller may be configured for up to 10 Control Loops.

In the simplest form, a Control Loop reads a sensor (i.e. the control sensor) and calculates an output to maintain the sensed value at a user defined set-point. There are many variations of this. For inputs, the user can configure control, reset, recovery, occupancy, enable/disable, and TOD bypass sensors. For outputs, the users may configure up to 4 modulating analog outputs, up to 4 stages for each analog output and an auxiliary digital output for controlling a fan or pump.

The control portion of the loop is an Enhanced PID (EPID) algorithm. The user configures control algorithm type (PID or Non-linear), bias (position of set point within the proportional band (i.e. 0% or 50%), direct/reverse acting output, which sensor and outputs to use, throttling range, integral time, derivative time, start up ramp time, recovery, reset and sequencer parameters, set points, minimum on, off and bypass times, DLC shed bump and lead/lag.

## Purpose

Define up to ten control loops that create outputs based on algorithms.

## Mode

Configuration can be performed with the wizard Off-line or On-line.

## Procedure

1. On the **Configuration** page click **Control Loop**. The **Control Loop** page appears on the right pane.
2. Select a control loop from **Select Loop**.
3. Type a **Loop Name**.
4. Select **Algorithm Type**. This field defines the algorithm type for the control loop. The default type is "Unconfigured". The user can select the type to be "Flex PID" or "Flex Non-Linear". Only if the algorithm type is "Flex PID" or "Flex Non-Linear" will the other controls in the **Control Loop** page get enabled. Select the corresponding radio button to select an algorithm type.
5. Select a priority from **Occupancy Override Priority**. The two options for occupancy override priority are:
  - With **Network wins** (the default), nviManOcc has priority. If nviManOcc is some other value than OC\_NUL, then the result is the value on nviManOcc. When nviManOcc is OC\_NUL, then nviBypass has priority. If nviBypass is SW\_OFF/SW\_NUL then the wall module override is evaluated. Both nviManOcc and the wall module override use the internal bypass timers. nviBypass depends upon the other node's timer to control the duration of the bypass. The Excel 15C keeps the loop bypass\_timer running while nviBypass is SW\_ON. If nviBypass goes away before the timer expires, then the loop remains in bypass for the balance of the timer.
  - With **Last in Wins**, the last bypass source is used to determine the state. If multiple sources change the state in the same second, they are evaluated in order: nviManOcc, nviBypass, wall module override. Each second the algorithm looks for an update to either nviManOcc, a change of state to nviBypass, or the wall module override being pushed. If any of these occur, then appropriate action is taken. Else, the bypass timer is checked for expiration and the current state returned.
6. Select/Type information for the following.
  - a. **Input & Setpoints**
    - **Inputs:** Used to configure the inputs required for the Control Loop.
    - **Setpoints:** Control Loop can host separate setpoints apart from main 40 setpoints. These are used to drive the occupancy state of the control loop.

- **Setpoint Override:** A configured setpoint overrides the existing setpoint if the corresponding Digital Input is TRUE. The Digital Input1 maps to Setpoint1, Digital Input2 maps to Setpoint2, vice versa.
- b. **Loop Configuration**
- **Reset:** Control loops allow the setpoint (only in occupied mode) to reset either in the direction of increased energy savings or in the direction of the increased comfort. The reset of a control loop is dependent on the analog reset sensor input. The **Zero Reset Sensor Value** is the minimum value above which the reset action occurs. The engineering unit is the reset sensor engineering unit. The **Max Reset Sensor Value** is the maximum value below which the reset action occurs. The **Max Reset Amount** is the value subtracted from the setpoint when the setpoint is reset as per the reset sensor input.
  - **Recovery:** This is used to calculate the ramp rate at which it must reach the setpoint.
  - **Control Params:** This is used to configure the EPID loop.
  - **Auxiliary:** The Aux D.O. is always intermittent for unoccupied mode. The options available are Continuous and Intermittent. The On Time is the minimum ON time for the auxiliary digital output. It ranges from 0 to 254 minutes with a resolution of 1 minute. The Off Time is the minimum OFF time for the auxiliary digital output. It ranges from 0 to 254 minutes with a resolution of 1 minute.
  - **SetPoint Alarms:**

The Alarm Pre Delay represents the time required for the main sensor input value to be beyond the range set by the Alarm Delta Above setpoint or Alarm Delta Below setpoint (before the SET\_POINT\_LOOP\_ALARM is set). The range is 0 to 65460 seconds with a resolution of 1 second

The Alarm Post Delay represents the time required for the main sensor input value to be within the range set by the Alarm Delta Above setpoint or Alarm Delta Below setpoint (before the SET\_POINT\_LOOP\_ALARM return to Normal is set). The range is 0 to 65460 seconds with a resolution of 1 second.

The Alarm Delta Above Setpoint value establishes the Alarm high limit for the main sensor input. If the main sensor input value increases above the effective setpoint value plus the Alarm Delta Above Setpoint Value and remains above for Alarm pre-delay time period then a SET\_POINT\_LOOP\_ALARM is set.

The Alarm Delta Below Setpoint value establishes the Alarm low limit for the main sensor analog input. If the main sensor input value decreases below the effective setpoint value minus the Alarm Delta Below Setpoint value and remains below for Alarm pre-delay time period then a SET\_POINT\_LOOP\_ALARM is set.
- c. **Sequencer & Stager**
- **Sequencer:** The sequencer configuration values x1, x2, y1, and y2 determine the conversion from the primary control loop (EPID) to the three sequencer analog outputs. The sequencer takes the primary (EPID) analog output value and splits

it to three separate analog outputs. Each of the sequenced analog outputs ranges from 0 to 100%. The uses are controlling heating, economizer and cooling, or converting the primary EPID analog output into more stages. The **Sequencer 1 (Heat) Start** field represents start (x) percent of Sequencer. The **Sequencer1 (Heat) End** field represents end (y) percent of Sequencer 1. The **Sequencer2 (Econ) Start** field represents start (x) percent of Sequencer 2. The **Sequencer2 (Econ) End** field represents end (y) percent of Sequencer 2. The **Sequencer3 (Cool) Start** field represents start (x) percent of Sequencer 3. The **Sequencer3 (Cool) End** field represents end (y) percent of Sequencer 3.

For example,

Sequencer 1 (Heat) Start: x = 0% y = 100%.  
 Sequencer 1 (Heat) End: x = 33% y = 0%.  
 Sequencer 2 (Econ) Start: x = 33% y = 0%.  
 Sequencer 2 (Econ) End: x = 66% y = 100%.  
 Sequencer 3(Cool) Start: x = 66% y = 0%.  
 Sequencer 3 (Cool) End: x = 100% y = 100%.

- **Staging**

The Stage1-4 are used to control equipment with ON and OFF states. Up to 4 digital outputs can be assigned to each of the 4 analog outputs (16 total). Typically, the user would either assign 4 digital outputs to the primary analog output or up to 12 digital outputs to the three sequenced analog outputs. It can be configured as local or remote digital outputs. The pseudo point can also be selected.

The Lead Lag selection is used to equally share the run time of the equipment among the stages. The XL15C keeps track of run time by counting the ON time every minute.

The Minimum On Time is the minimum time for each staged digital output to be ON at a resolution of 1 minute. It ranges from 0 to 254 minutes.

The Minimum Off Time is the minimum time for each staged digital output to be OFF at a resolution of 1 minute. It ranges from 0 to 254 minutes.

The Integral stage On Time is the interstage ON time for the staged digital outputs at a resolution of 1 minute. It is the time a lower numbered stage must be ON before the next stage can turn ON. It ranges from 0 to 254 minutes.

The Integral stage Off Time is the interstage OFF time for the staged digital outputs at a resolution of 1 minute. It is the time when a higher numbered stage must be OFF before the next stage can turn ON. It ranges from 0 to 254 minutes.

## Configuring XL15C Logic Loops

The XL15C controller has 32 Logic Loops. Each configured Logic Loop generates outputs by applying logic functions on different analog and digital inputs selected. These logic loop outputs are commonly used as inputs to control loops, start/stop loops, and math functions.

## Purpose

To configure logic loops.

## Procedure

1. On the **Configuration** page click the **Logic Loops** tab. The **Logic Loops** page appears on the right pane.
2. Select a logic loop from **Select Loop**.
3. Type a **Loop Name**. There are 32 Logic Loops. Default name for the Logic Loops are Logc\_Loop\_1, Logc\_Loop\_2, etc. The Logic Loop names can be changed to make each Loop easier to identify. Select the name to be changed in the Logic Loop name combo and type the new name. A Logic Loop name can have a maximum of 18 characters.
4. Select/Type the following options.
  - **ACDO**: Analog Compare Digital Output - Compares (<, >, or =) the values of 2 analog inputs and sets the output to true or false. 3 ACDO buttons (ACDO1, ACDO2, and ACDO3) are available in each Logic Loop. Click an **ACDO** button to open the **ACDO Configuration** dialog box.
  - **Analog Input 1 and 2**: Select a Link Type and Link Name for analog inputs.
  - **Analog Compare**: This is used to compare the two configured inputs. The logic usually is greater than, less than, or equal to.
  - **Engineering Units**: The measurement types are listed here. When you select an Engineering Units option, the corresponding Engineering unit appear in the Sensor fields.
  - **Compare Deadband**: The amount of difference between the input values where the output state does not switch.
    - Output = ON when the condition is true (when the condition between Input 1 and Input 2 is true)
    - Output = OFF when the input 1 compared to input 2 minus the deadband is false.
  - **On Delay Time**: The delay in time for switching from one state to another before the output value switches to ON.
  - **Off Delay Time**: The delay in time for switching from one state to another before the output value switches to OFF.
  - **AND**: Logical AND function - If and only if all configured digital input conditions (3 maximum) are true, the output will be on. Three **AND** buttons (AND1, AND2, and AND3) are available in each Logic Loop. Click an **AND** button to open the **And Configuration** dialog box.
    - **Digital Input 1, 2, and 3**: Select a Link Type and Link Name for digital inputs.
    - **On Delay Time**: The delay in time for switching from one state to another before the output value switches to ON.
    - **Off Delay Time**: The delay in time for switching from one state to another before the output value switches to OFF.
  - **OR**: Logical OR function - If any one of the configured digital input conditions (6 maximum) are true, the output will be ON. OR must be configured if the Logic Loop digital output is to be used. Click the **OR** button to open the **OR Configuration** dialog box.
    - **Digital Input (1 through 6)**: Select a Link Type and Link Name for digital inputs.

- **On Delay Time**: The delay in time for switching from one state to another before the output value switches to ON.
- **Off Delay Time**: The delay in time for switching from one state to another before the output value switches to OFF.
- **DCAO**: Digital Compare Analog Output - Sets the output value to equal analog input\_1 if digital input is true and analog input\_2 if the digital input is false. DCAO must be configured if the Logic Loop analog output is to be used. Click the **DCAO** button to open the **DCAO Configuration** dialog box.
  - **Digital Input**: Select a Link Type and Link Name for digital inputs.
  - **Analog Input 1 and 2**: Select a Link Type and Link Name for analog inputs.
  - **On Delay Time**: The delay in time for switching from one state to another before the output value switches to ON.
  - **Off Delay Time**: The delay in time for switching from one state to another before the output value switches to OFF.

## Configuring XL15C Start Stop Loops

There are eight start/stop loops The start/stop control loops direct control of loads based on time-of-day schedules. The most common applications for start/stop control loops include exhaust fans, pumps, lighting, or any other loads requiring time-of-day control.

## Purpose

To specify up to eight start/stop loops.

## Mode

Configuration can be performed with the wizard Off-line or On-line.

## Procedure

1. On the **Configuration** page click **Start Stop Loops**. The **Start Stop Loop** page appears on the right pane.
2. Select the required loop from **Select Loop**. There are eight start/stop loops available. Select one to begin configuring (SS\_LOOP\_1 through SS\_LOOP\_8).
3. Type the **Loop Name**. Loops are named SS\_LOOP\_1, SS\_LOOP\_2, and so on. To change the name, type over it and then click Change Name. Name the start/stop loop according to the device being controlled. The name can have a maximum of 18 characters.
4. Select the **Link Type** and **Link Name** for **Bypass**. The bypass sensor (TOD) allows the user to place the Start/Stop loop into occupied mode for a timed duration, which depends on the Bypass Time value. The bypass input changes the state to occupied. The bypass input must remain true for the loop to remain in the bypass state for the timed duration.
5. Select the **Link Type** and **Link Name** for **Disable Loop**. This input is to control the Start/Stop loop. The disable input disables the start/stop loop if the DI assigned to it is ON and enables the loop if this DI assigned to it is OFF. The Output is OFF when the loop is disabled.
6. Select the required **Occupancy Override Period**.
  - **Network\_Wins**: Equipment on/off times will follow network schedule.
  - **Last\_One\_Wins** follows the last override request.



7. Select the following time options:
  - **Min On Time:** Default minimum on time for equipment is 5 minutes. Enter new value, if necessary, according to manufacturer's recommendations. Specified range is 0 to 254 minutes.
  - **Min Off Time:** Default minimum off time for equipment is 5 minutes. Enter new value, if necessary, according to manufacturer's recommendations. Specified range is 0 to 254 minutes.
  - **Bypass time:** Default bypass time is 180 minutes. Enter number of minutes the equipment will be in occupancy mode when a bypass is triggered. Specified range is 0 to 1080 minutes.

- a. Choose the output to be defined. There are two possible analog outputs. Click the down arrow to view the list of outputs. Select each one, one at a time, and specify its attributes.
- b. Select the analog output from **Select Output**.
- c. Type a **Output Name**.
- d. Select the required output from the **Output Kind** field. The Output Kind must be one of the following types for analog output:
  - Unconfigured
  - Analog
  - Digital
- e. Select the **Engineering Units**.
- f. Select the **Link Type** and **Link Name**.
- g. Type the output values for 0% & 100% output from the control loop.

## Configuring XL15C Analog and Digital Outputs

### Analog Outputs

The XL15C controller has 6 Analog Outputs.

Analog Outputs are used to control variably driven controller devices, such as damper actuators, valve actuators, variable speed fans, step controllers and other transducers. The analog outputs are 4-20 mA current outputs (max. load 600 ohms) with a 7+ bit resolution.

Each Analog output may be configured as Analog or Digital. Analog outputs configured as Analog can drive an analog load and one configured as Digital can drive a digital load.

### Digital Outputs

The XL15C has 8 Digital Outputs.

Digital Outputs are often used to control lighting, fans, and HVAC equipment.

Each Digital output may be configured as Digital, PWM or Float. Digital outputs configured as Digital can drive a digital load and one configured as PWM or Float can drive an analog load.

### Purpose

Configure an analog and digital output to match the output device and the control algorithm.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Limits

The analog outputs can be configured as digital outputs, however, the digital load must not exceed the 500 ohm maximum.

### Procedure

1. On the **Configuration** page click the **Outputs** tab. The **Outputs** page appears.
2. To configure **Analog Outputs**:

#### 3. To configure **Digital Outputs**:

- a. Select the digital output from **Select Output**. There are eight Digital Outputs in XL15A. Default digital output names are DIGITAL\_OUTPUT 1, DIGITAL\_OUTPUT2, and so on. The name can be changed to make each output easier to identify. A digital output name can have a maximum of 18 characters. No duplicate digital output names are allowed within the page and across pages.
- b. Type an **Output Name**.
- c. Select the required output from the **Output Kind** field. State of digital output. The output state could be one of the following types for a digital output:
  - Unconfigured
  - Digital
  - PWM
  - Float\_Close1
  - Float\_Close2
  - Float\_Open1
  - Float\_Open2

**NOTE:** At the most four digital outputs can be configured as two float pairs. If a digital output is configured as Float\_Open then another digital output must be configured as Float\_Close.

- d. Select the **Engineering Units**.
  - e. Select the **Link Type** and **Link Name**.
  - f. Select the **Output State**.  
The Output State option has two choices: Energized On and Energized Off. Default selection is Energized On. Point type is enabled when output kind is Digital.
  - g. Type the **Motor Speed**.
  - h. Select the **Position Start-Up Synchronization**.
  - i. Type the output values for 0% & 100% output from the control loop.
4. To configure **Remote AO**, select the **Link Type** and **Link Name** for the remote analog output.
  5. To configure **Remote DO**, select the **Link Type** and **Link Name** for the remote digital output.
  6. To configure **Network Outputs**, select **Link Type** and **Link Name** for various Nvo modes. These include NvoAppMode, NvoOccupancy, NvoEconEnale, NvoCoolUTML, and NvoHeatUtml.

## Configuring the T7350 Thermostat Controller (T7350)

The T7350 is a full-featured Commercial programmable thermostat. The primary opportunity for a Commercial thermostat is in buildings with less than 55,000 square feet. These buildings include restaurants, shopping malls, office buildings and banks. Commercial thermostats are used on single zone rooftop units, split systems, heat pumps or hot/ chilled systems.

The electronic thermostat consists of two pieces, the cover assembly and a subbase. The subbase(s) include the equipment control connections. The subbase is mounted on the wall and the thermostat cover assembly is mounted on the sub base. Different subbases will be used for different applications including; up to Three Heat/Three Cool or Two Heat/Four Cool, modulating outputs, and dehumidification high limit control. Each subbase is compatible with the common cover assembly.

### Navigating to T7350 pages

Go to the **Devices** tab. Expand the list of devices on the left pane (listed under WebVision). Select a device to view its properties.

### T7350 Configuration Options

The options for configuring a T7350 Controller are as follows:

- General

- KeyPad/Display
- Setpoints
- Equipment Control

### Configuring the General Page

Use Table 70 and the **General** page to configure the thermostat model, equipment type, outputs, inputs, day light savings details.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **General** button on the left pane to open the **General Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Keypad/Display Configuration** page.

### T7350 General Configuration fields

See Table 70.

**Table 70. T7350 General Configuration Fields**

Name	Definition
Thermostat Model	<p>The T7350 Communicating Subbase(T7350CS) comes in two models, T7350H1009 and T7350H1017.</p> <p><b>T7350H1009:</b> This subbase is the Three Heat/Three Cool model. It allows for conventional or heat pump operation. A total of 8 relays are available with the thermostat cover assembly and subbase. The auxiliary relay may be configured for an economizer, TOD, or dehumidification. The subbase may be configured for 3 Heat/ 3 Cool or 2 Heat/ 4 Cool by using the third stage of heat for an additional stage of cooling.</p> <p><b>T7350H1017:</b> This subbase is the modulating subbase. A total of 4 relays are available with the thermostat cover assembly and subbase. The auxiliary relay may be configured for an economizer, TOD, dehumidification or an additional stage of heating and cooling.</p> <p>See the Outputs section of this table on page 99 for description on these relays.</p>
Equipment Type	<p>This field specifies the operation in which this subbase is used. When the thermostat model is selected as T7350H1009, the equipment type can be selected as Standard or Heat Pump. The T7350H1009 subbase allows for conventional or heat pump operation.</p> <p>When the model is selected as T7350H1017, the equipment type is changed to Standard and this option is disabled for selection. When the T7350H1017 model type is selected, the Heat Action and Cool Action options under Outputs are enabled for selection. The modulating subbase does not allow for heat pumps.</p>
Inputs	This section allows you to configure the inputs to the thermostat.

Table 70. T7350 General Configuration Fields (Continued)

Name	Definition
Room Temp	<p>This option allows the user to configure the source of room temperature input to the thermostat. The T7350 thermostat is equipped with its own internal room temperature sensor. The sensor operating range is 30 to 110 °F.</p> <p>The T7350 thermostat is compatible with the following Honeywell Wall Modules:  T7770A1006  T7770B1046  T7770C1044  T7770D1000  T7771</p> <p>Options available are  <b>Local:</b> Configure as local if the internal temperature sensor on the thermostat is to be used to sense the room temperature.  <b>T7770A/D:</b> The models T7770A1006 and T7770D1000 have only temperature sensors, and have no setpoint knob. Select this option when one of these family of wall modules are connected.  <b>T7770B/C:</b> The wall modules T7770B1046 and T7770D1000 have temperature sensors with setpoint knobs, override button and a LED.  <b>T7771:</b> The T7771 wall module will have a temperature sensor, override button but instead of a setpoint knob, it will have an up/down buttons and 7 LEDs to indicate (-3 to +3 °F) the user has selected.  <b>Network:</b> Select this option if the space temperature is obtained over the network from other controllers. You have to create appropriate bindings for the input.</p> <p>NOTE: Open, short or out-of-range on the internal or remote room temperature sensor input (s) to the thermostat will cause the outputs to be turned off. The fault detection is done only on the sensor being used. That is, if the internal (local) sensor is being used, faults on the remote sensor are ignored.</p>
Room Humidity	<p>Use this option to configure the source of room humidity input to the thermostat. Options available are:  <b>None:</b> Select this option when dehumidification is not required. When this option is selected, if the Aux DO output is configured as Simple Dehumid or Dehumid Hotgas BP, it is defaulted to Time Of Day option and the Simple Dehumid, Dehumid Hotgas BP options are not available for selection. The Dehumidification High Limit and Dehumidification Options in the Setpoints page are disabled.  <b>Local:</b> The thermostat has an internal room relative humidity sensor, which has the range of 5% to 105%RH. For humidity less than 5% and above 105%, the sensor will show invalid and there will be a sensor fail alarm.  <b>Remote:</b> A remote humidity sensor can be hard-wired to the thermostat. Select this option when the humidity input is required from a remote sensor. The thermostat is compatible to H7631A1000 (0 to 10V) or equivalent sensors.  <b>Network:</b> Select this option when the humidity input is required over the network from other controllers. You have to create appropriate bindings for the input.</p>
Discharge Air Temp	<p>Use this field to configure the source for discharge air temperature input. The following options are available:  <b>None:</b> Select this if discharge temperature sensor is not connected. When this option is selected, the Enable Heating DAT HiLimit and Enable Cooling DAT Low Limit in Equip Control page are disabled.  <b>Remote:</b> Select this option if a discharge air temperature sensor is hard-wired to the thermostat. The thermostat is compatible with the C7770A1006, C7031B1033, C7031C1031, and C7031J1050 (averaging) 20K NTC temperature sensor elements (20 K ohms at 77 °F).</p>
Outdoor Air Temp	<p>Use this field to configure the source for outdoor air temperature input. The following options are available:  <b>None:</b> Select this if outdoor air temperature sensor is not connected. When this option is selected, the Enable Heating OAT Lockout and Enable Cooling OAT Lockout options in the Equip Control page, cool and heat OAT at Min Ramp and OAT at Max Ramp fields in Setpoints page are disabled.  <b>Remote:</b> Select this option if an outdoor air temperature sensor is hard-wired to the thermostat. The thermostat is compatible with the following Honeywell outdoor air sensors: C7170A1002 and C7089A1002 PT3000 PTC temperature sensor element (3484 ohms at 77 °F)  <b>Network:</b> Select this option when the outdoor air temperature input is required over the network from other controllers. You have to create appropriate bindings for the input.</p>
Occupancy Sensor	<p>Use this field to configure the source for occupancy input. The following options are available:  <b>None:</b> Select this if occupancy sensor is not connected.  <b>Remote:</b> Select this option if an occupancy sensor is hard-wired to the thermostat.  <b>Network:</b> Select this option when the occupancy input is required over the network from other controllers. You have to create appropriate bindings for the input.</p>

Table 70. T7350 General Configuration Fields (Continued)

Name	Definition																																	
Daylight Savings	<p>Use this option to configure the settings for daylight savings. The following describes each field:</p> <p><b>Enable Daylight Savings:</b> This option is enabled by default. Disable this option if the daylight savings feature is not required to be followed by the thermostat. Deselecting this option will disable the Start Month, Stop Month, Start Day and Stop Day fields.</p> <p><b>Start Month:</b> This field is available for configuration only if the Enable Daylight Savings option field is selected. Its default value is April. Change this option according to the daylight savings settings in the country where the thermostat is installed.</p> <p><b>Start Day:</b> This field is available for configuration only if the Enable Daylight Savings option field is selected. Its default value is First Sunday. Change this option according to the daylight savings settings in the country where the thermostat is installed.</p> <p><b>End Month:</b> This field is available for configuration only if the Enable Daylight Savings option is selected. Its default value is October. Change this option according to the daylight savings settings in the country where the thermostat is installed.</p> <p><b>Start Day:</b> This field is available for configuration only if the Enable Daylight Savings option is selected. Its default value is Last Sunday. Change this option according to the daylight savings settings in the country where the thermostat is installed.</p>																																	
Configuration ID	<p>When you click this button, the button label is replaced by a 16 character alphanumeric number/code with every 2 digits separated by a period. This code represents the configuration information that define the equipment that is connected to the thermostat. This code can be entered through the thermostat keypad using the installer configuration:</p> <p>Press the <b>Run</b> and <b>Copy</b> buttons simultaneously and navigate to the code. You are presented with a number identified by C1. Enter the first 2 digits of the configuration ID that the wizard has generated. Continue entering 2 digits each for C2 through C8. Save this code using the <b>Run</b> button.</p> <p>The configuration in the thermostat is changed to that in the wizard. The thermostat installer set up allows the user to enter the configuration through the keypad. When the <b>Configuration ID</b> button is pressed the wizard derives the configuration string that user can enter into the thermostat through keypad. This way, the configuration in thermostat is same as it is the wizard with respect to inputs, outputs, setpoints, loop tuning parameters, energy management parameters, bypass time.</p>																																	
Outputs	Use this section to configure outputs.																																	
Heat/Cool Stages	Use these fields to configure the number of heat stages and cool stages for the application that the subbase is being used for.																																	
	<table border="1"> <thead> <tr> <th>Outputs</th> <th>Model</th> <th>Equipment Type</th> <th>Default Value</th> <th>Number of Stages Available for Configuration</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Heat Stages</td> <td>T7350H1009</td> <td>Standard</td> <td>Three Stage</td> <td> <ul style="list-style-type: none"> <li>• None</li> <li>• One Stage</li> <li>• Two Stage</li> <li>• Three Stage (Not available if configured for 4 stages of cooling)</li> </ul> </td> </tr> <tr> <td>T7350H1017</td> <td>Standard</td> <td>Heat Enable</td> <td> <ul style="list-style-type: none"> <li>• Heat Enable</li> <li>• One Stage</li> <li>• Two Stage (Used as auxiliary relay or second stage of heat or cool relay. Not available if used as second stage of cooling)</li> </ul> </td> </tr> <tr> <td>Aux Heat Stages</td> <td>T7350H1009</td> <td>Heat Pump</td> <td>One Stage</td> <td> <ul style="list-style-type: none"> <li>• None (No auxiliary heating)</li> <li>• One Stage (of auxiliary heat)</li> <li>• Two Stage (of auxiliary heat)</li> </ul> </td> </tr> <tr> <td rowspan="2">Cool Stages</td> <td>T7350H1009</td> <td>Standard</td> <td>Three Stage</td> <td> <ul style="list-style-type: none"> <li>• None</li> <li>• One Stage</li> <li>• Two Stage</li> <li>• Three Stage</li> </ul> </td> </tr> <tr> <td>T7350H1017</td> <td>Standard</td> <td>Cool Enable</td> <td> <ul style="list-style-type: none"> <li>• Heat Enable</li> <li>• One Stage</li> <li>• Two Stage (Used as auxiliary relay or second stage of heat or cool relay. Not available if used as second stage of heating)</li> </ul> </td> </tr> <tr> <td>Compressor Stages</td> <td>T7350H1009</td> <td>Heat Pump</td> <td>Two Stage</td> <td> <ul style="list-style-type: none"> <li>• None</li> <li>• One Stage</li> <li>• Two Stage</li> </ul> </td> </tr> </tbody> </table>	Outputs	Model	Equipment Type	Default Value	Number of Stages Available for Configuration	Heat Stages	T7350H1009	Standard	Three Stage	<ul style="list-style-type: none"> <li>• None</li> <li>• One Stage</li> <li>• Two Stage</li> <li>• Three Stage (Not available if configured for 4 stages of cooling)</li> </ul>	T7350H1017	Standard	Heat Enable	<ul style="list-style-type: none"> <li>• Heat Enable</li> <li>• One Stage</li> <li>• Two Stage (Used as auxiliary relay or second stage of heat or cool relay. Not available if used as second stage of cooling)</li> </ul>	Aux Heat Stages	T7350H1009	Heat Pump	One Stage	<ul style="list-style-type: none"> <li>• None (No auxiliary heating)</li> <li>• One Stage (of auxiliary heat)</li> <li>• Two Stage (of auxiliary heat)</li> </ul>	Cool Stages	T7350H1009	Standard	Three Stage	<ul style="list-style-type: none"> <li>• None</li> <li>• One Stage</li> <li>• Two Stage</li> <li>• Three Stage</li> </ul>	T7350H1017	Standard	Cool Enable	<ul style="list-style-type: none"> <li>• Heat Enable</li> <li>• One Stage</li> <li>• Two Stage (Used as auxiliary relay or second stage of heat or cool relay. Not available if used as second stage of heating)</li> </ul>	Compressor Stages	T7350H1009	Heat Pump	Two Stage	<ul style="list-style-type: none"> <li>• None</li> <li>• One Stage</li> <li>• Two Stage</li> </ul>
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**Table 70. T7350 General Configuration Fields (Continued)**

Name	Definition
Heat/Cool Stages (continued)	<p>When the model is selected as T7350H1009 and the equipment type as Standard, the tool allows to configure for up to three stages of heating and three stages of cooling. The fourth stage of cooling is available for selection as long as the 0/1/2 heat stages are selected. When the fourth stage of cooling is selected, the third stage of heating is no longer available.</p> <p>When the model is selected as T7350H1009 and the equipment type is selected as Heat Pump, you will have option to configure for 0/1/2 auxiliary heating stages and 0/1/2 compressor stages. One relay is used for heat pump reversing valve.</p> <p>When the model is selected as T7350H1017, you can configure for 0/1/2 heat or cool stages. The modulating outputs are always active. They are always being driven 0-100%. When the number of stages is 0, the relay outputs are used to enable the heating or cooling outputs. Staged action may be used in addition to the modulating outputs. The number of stages is set to 1 or 2. It is not possible to have both 2 stages of heating and cooling.</p> <p>Examples:</p> <ol style="list-style-type: none"> <li>1. Selecting heating stages and cooling stages as 1 configures for modulating heat and modulating cool action.</li> <li>2. To have Mod heat, heating pump enable relay and 1 stage of heating, configure Heat Stages as Heat Enable, Heat Action (depends on the actuator connected) and connect the relay W1 such that it turns the heating pump ON or OFF.</li> </ol>
Aux DO	<p>Use this option to configure the auxiliary outputs. The auxiliary DO can be configured for economizer, Time Of Day or for dehumidification. The dehumidification options available are Simple dehumid or Dehumid Hotgas BP.</p> <p>In the case of T7350H1017 model type, the auxiliary DO can be configured for second stage of heating or cooling. In that case, it cannot be configured for the above mentioned purposes and hence the option is disabled in the screen.</p> <p>NOTE: The dehumid options (Simple dehumid or Dehumid Hotgas BP) are available for configuration only if a humidity sensor is configured.</p>
Heat Pump Rev Value	<p>This option is available for T7350H1009 model when the Equipment Type is selected as Heat Pump.</p> <p>The options available are: Active Cooling Active Heating</p> <p>Select Active Cooling when the O/B valve is energized on cooling or Active Heating if the O/B valve is energized on heating. If the standard application is configured, this option is not available.</p>
Heat Action	<p>This option is available for model is configured as T7350H1017 only. This is disabled when the model is selected as T7350H1009. This is applicable for modulating heat output, that is when the Heat Stages option is configured as Heat Enable. Select Direct 4-20mA if the actuator connected for heating action is driven from 0-100% and Reverse 20-4mA if is driven from 100-0%.</p>
Cool Action	<p>This option is available for model is configured as T7350H1017 only. This is disabled when the model is selected as T7350H1009. This is applicable for modulating cool output, that is, when the Cool Stages option is configured as Cool Enable. Select Direct 4-20mA if the actuator connected for cooling action is driven from 0-100% and Reverse 20-4mA if is driven from 100-0%</p>

### Configuring the Keypad/Display page

Use the **Keypad/Display Configuration** page to configure the keypad lockout level, display temperature unit in the thermostat, time display format, system switch configuration and fan switch configuration.

### Mode

Configuration can be performed with the wizard Off-line or On-line.

### Procedure

1. Click the **Keypad** button on the left pane to open the **Keypad/Display Configuration** page.
2. Enter information into available fields (see Table 71 on page 101).
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Setpoints Configuration** page or **Back** to display the **General Configuration** page.

## Keypad/Display Configuration fields

**Table 71. Keypad/Display Configuration Fields.**

Name	Definition
Keypad Lockout	Use this option to configure the keypad lockout enable/disable through special keypad sequence on the thermostat. Enable All: Selecting this option will allow the user to access any keys on the thermostat. No lockout will be imposed. Enable Setpoints & Override: This option will lockout all keys except Temporary Occupied, Temporary Not Occupied, increase and decrease and information key. Info Key Only: This option will lockout all keys information key
Display Units	Use this option to configure the display units in the thermostat for temperature fields. Degrees F: Select this option to set the display unit for temperature fields as degrees Fahrenheit. Degrees C: Select this option to set the display unit for temperature fields as degrees Centigrade.
Clock Display	Use this to configure the display mode of time in the thermostat. 12 Hour (AM/PM): Selecting this option will display the thermostat time in 12 hour format. 24 Hour: Selecting this option will display the thermostat time in 24 hour format
System Switch	Use this option to configure the system operation of the thermostat. OFF: When this option is selected, heat and cool states are disabled. AUTO: The thermostat is configured for Automatic Changeover. When this option is selected, heating and cooling stages are enabled to maintain heating and cooling setpoints. Cool: When this option is selected, cooling stage operates on call for cooling. Heating stages are disabled. Heat: When this option is selected, heating stage operates on call for heating. Cooling stages are disabled. Emergency Heat: This option is available only when the equipment type is selected as Heat Pump. Auxiliary heat serves as stage one. Compressor stages are locked off.

### Configuring the Setpoints page

Use the **Setpoints Configuration** page to configure the heating and cooling setpoints, energy management features, dehumidification features, recovery setpoints and bypass timer.

## Mode

Configuration can be performed with the wizard Off-line or On-line.

## Procedure

1. Click the **Setpoints** button on the left pane to open the **Setpoints Configuration** page.
2. Enter information into available fields.
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Equipment Control Configuration** page or **Back** to display the **Keypad/Display Configuration** page.

## T7350 Heating and Cooling Setpoints

Use Table 72 to specify the heating and cooling setpoints. Table 72 also provides the default value and valid range for each setpoint.

**Table 72. Heating and Cooling Setpoints.**

Setpoint	Default Value	Min. and Max. Ranges	Description
Cool Unoccupied Spt	85 °F (29 °C)	45-99 °F (7-37 °C)	Unoccupied cooling setpoint <ul style="list-style-type: none"> <li>• Display resolution: 1 °F/°C.</li> <li>• Unoccupied Cool &gt;= Occupied Cool &gt;= Occupied Heat +2 °F (1 °C)</li> <li>• Unoccupied Cool &gt;= Standby Cool &gt;= Standby Heat +2 °F (1 °C)</li> </ul>
Cool Standby Spt	78 °F (26 °C)	45-99 °F (7-37 °C)	Standby cooling setpoint <ul style="list-style-type: none"> <li>• Display resolution: 1 °F/°C.</li> <li>• Unoccupied Cool &gt;= Standby Cool &gt;= Standby Heat +2 °F (1 °C)</li> </ul>
Cool Occupied Spt	75 °F (24 °C)	45-99 °F (7-37 °C)	Occupied cooling setpoint <ul style="list-style-type: none"> <li>• Display resolution: 1 °F/°C.</li> <li>• Unoccupied Cool &gt;= Occupied Cool &gt;= Occupied Heat +2 °F (1 °C)</li> <li>• Max Occupied Cool &gt;= Occupied Cool &gt;= Occupied Heat +2 °F (1 °C)</li> </ul>
Heat Occupied Spt	70 °F (21 °C)	40-90 °F (4-32 °C)	Occupied heating setpoint <ul style="list-style-type: none"> <li>• Display resolution: 1 °F/°C.</li> <li>• Unoccupied Heat &lt;= Occupied Heat &lt;= Occupied Cool -2 °F (1 °C)</li> <li>• Min Occupied Heat &lt;= Occupied Heat &lt;= Occupied Cool -2 °F (1 °C)</li> </ul>

**Table 72. Heating and Cooling Setpoints. (Continued)**

Setpoint	Default Value	Min. and Max. Ranges	Description
Heat Standby Stp	67 °F (19 °C)	40-90 °F (4-32 °C)	Standby heating setpoint <ul style="list-style-type: none"> <li>• Display resolution: 1 °F/°C.</li> <li>• Unoccupied Heat &lt;= Standby Heat &lt;= Standby Cool -2 °F (1 °C)</li> </ul>
Heat Unoccupied Stp	55 °F (13 °C)	40-90 °F (4-32 °C)	Unoccupied heating setpoint <ul style="list-style-type: none"> <li>• Display resolution: 1 °F/°C.</li> <li>• Unoccupied Heat &lt;= Occupied Heat &lt;= Occupied Cool -2 °F (1 °C)</li> <li>• Unoccupied Heat &lt;= Standby Heat &lt;= Standby Cool -2 °F (1 °C)</li> </ul>
Min Heat Occupied Stp	55 °F (13 °C)	40-90 °F (4-32 °C)	Lowest the programmed occupied heating setpoint can be allowed. <ul style="list-style-type: none"> <li>• Display resolution: 1 °F/°C.</li> <li>• Min Occupied Heat &lt;= Occupied Heat &lt;= Occupied Cool -2 °F (1 °C)</li> </ul>
Max Cool Occupied Stp	85 °F (29 °C)	45-99 °F (7-37 °C)	Highest the programmed occupied cooling setpoint can be allowed. <ul style="list-style-type: none"> <li>• Max Occupied Cool &gt;= Occupied Cool &gt;= Occupied Heat +2 °F (1 °C)</li> </ul>

## T7350 Energy Management

### DEMAND LIMIT CONTROL BUMP

Configure the DLC bump according to the heating and cooling requirement of the building from one of the options given below. When a shed request is received, the thermostat bumps the control set point up for cooling and down for heating by the amount this field is configured in a thermostat. The shed state remains until a DLC restore command is received or network communication is lost. When the unit transitions from shed to restore, the set point is ramped back to the original set point over a period of 60 minutes. The control only sheds when the thermostat is in the occupied mode.

### POWER FAILURE SEQUENTIAL START

Configure the value for power sequential start by choosing one of the options 0 to 150 seconds. This allows the thermostat to delay start of the fan heating and cooling stages after power is restored to thermostat. After a power outage, it is desirable to start multiple units sequentially instead of all at once to avoid peak in power consumption.

### DEHUMIDIFICATION

Use this field to configure a dehumidification strategy. If the system is in heat mode, dehumidification is not allowed.

### HIGH LIMIT

Use this to specify the high limit for the dehumidification to start.

Any combination of the following 3 strategies is allowed:

- **Dehumidification using Minimum On Time**  
This option is available to configure only when the humidity input is configured on the **General** page. This is the minimum time the auxiliary relay configured for dehumidification is ON. When this option is selected, user will be provided with an option to configure the minimum on time ranging from 5 to 15 minutes.
- **Dehumidification using Reheat. (not supported on subbase 4)**  
This option is available to configure only when the humidity input is configured on the **General** page. When this is selected, the thermostat switches on the first heating stage when the dehumidification is required. This option is available for only T7350H1009 model type.
- **Dehumidification using Reset Temp Setpt**  
This option is available to configure only when the humidity input is configured on the **General** page. When this is selected, user is allowed to specify a temperature value. When this option is selected, the thermostat reduces the effective cooling temperature setpoint by the amount specified by the user.

The dehumidify setpoint must be smaller than the difference between the cooling and heating occupied setpoints and the difference between the cooling and the heating standby setpoints. When one of these setpoints change, the wizard automatically adjusts the dehumid reset setpoint such that the above condition is satisfied.

When Reset Temp Setpt and Reheat option are selected, the wizard displays a warning message, but proceeds with this configuration.

### RECOVERY

The thermostat allows the adaptive intelligent recovery ramp to the next setpoint during schedule mode changes.

Use the **Setpoints** screen to configure the recovery parameters. Set point recovery will apply to set point changes associated with the following schedule mode changes:

- Unoccupied to Standby
- Unoccupied to Occupied

Setpoint changes from occupied mode or standby mode to unoccupied mode, occupied mode to standby mode and standby to occupied will use a step change in setpoint. The heating or cooling recovery ramp will begin before the next mode transition time. During the recovery ramps, the heating and cooling set points will be ramped from the existing mode setpoint to the next mode setpoint.

There are two standard options available for choosing the heating and cooling ramp rates: Single Recovery and Variable Recovery Ramp Rate.

For heating or cooling recovery, minimum and maximum recovery ramp rates are provided. Making both of these the same is called Single Recovery. Making these rates different is called Variable Recovery.

**MINIMUM RAMP RATE**

Minimum Cool and heat recovery ramp rates are selectable from 0 to 20 DDF/hr. (0 to 11 DDC/hr.). A ramp rate of 0 means no recovery ramp (the setpoint steps from one setpoint to the other).

The recovery ramp rate will vary as a function of outdoor temperature.

**MAX RAMP RATE**

Maximum Cool and heat recovery ramp rates are selectable from 0 to 20 DDF/hr. (0 to 11 DDC/hr.). A ramp rate of 0 means no recovery ramp (the setpoint steps from one setpoint to the other). This field is enabled only if the outdoor air temperature input is configured on the **General** Page.

**OAT MIN RAMP**

The minimum and maximum outdoor corresponds to the minimum and maximum recovery rate. Configure the Outdoor air temperature setpoint for cool and heat recovery at which the minimum rate is equal to the value specified in the cool and heat 'Min Ramp Rate' fields. The value is configurable from -20 to 100 °F (-29 to 38 °C). This option is available to configure only if the outdoor air temperature input on the **General** page is configured.

**OAT MAX RAMP**

The minimum and maximum outdoor corresponds to the minimum and maximum recovery rate. Configure the Outdoor air temperature setpoint for cool and heat recovery at which the maximum rate is equal to the value specified in the cool and heat 'Max Ramp Rate' fields. The value is configurable from -20 to 100 °F (-29 to 38 °C). This option is available to configure only if the outdoor air temperature input on the **General** page is configured.

**RECOVERY LEAD TIME INFORMATION**

The setpoint ramp will be at the target setpoint 10 minutes prior to the occupied/standby event time. This allows the HVAC equipment an extra 10 minutes to get the space temperature to the target setpoint during recovery. (The T7300 series 1000 did a similar method). Based on the heat and cool setpoints configured and the minimum and maximum ramp rates configured, the wizard automatically calculates the lead time information for both cool and heat recovery ramps and displays it in this section.

NOTE: This data is applicable when the unoccupied setpoints change to occupied or standby modes.

When the setpoint changes from occupied or standby mode to unoccupied mode or when the minimum or maximum ramp rates are 0, there will be step change in the setpoint.

**BYPASS**

The temporary override time is the maximum time the controller stays in the occupied mode, when its unoccupied mode was overridden and put in bypass mode. This value is selectable from 1 to 8 hours.

When no outdoor air temperature sensor is available, the minimum recovery ramp rate is used. The recovery ramps have the following configuration parameters:

- Minimum heating recovery ramp rate.
- Maximum heating recovery ramp rate.
- Minimum heating outdoor air temperature.
- Maximum heating outdoor air temperature.
- Minimum cooling recovery ramp rate.
- Maximum cooling recovery ramp rate.
- Minimum cooling outdoor air temperature.
- Maximum cooling outdoor air temperature.

**T7350 Equipment Control****Configuring Equipment Control Page**

Use the **Equip Control Configuration** page to configure the heating and cooling selections and loop tuning parameters.

**Mode**

Configuration can be performed with the wizard Off-line or On-line.

**Procedure**

1. Click the **Equip Control** button on the left pane to open the **Equip Control Configuration** page.
2. Enter information into available fields (see Table 73 on page 104).
3. Click **Commit** to save the settings or **Reset** to revert to the last saved settings.
4. Click **Next** to display the **Scheduling** page or **Back** to display the **Setpoints** page.



## T7350 Equipment Control fields

Table 73. T7350 Equipment Control Fields.

Name	Definition
Heating Selections	<p><b>Fan On with Heat</b> This field specifies the selection of fan operation</p> <p><b>OFF with Heat</b> The equipment (i.e. plenum switch) controls the fan operation in heat mode. The thermostat controls the fan operation in cool mode.</p> <p><b>ON with Heat</b> The thermostat controls the fan operation in both heat and cool modes.</p> <p><b>Extended Fan Operation</b> Use this option to configure the time for extended fan operation after heating turns off. The choices are No Extend Op (0) or Extend 90 sec (90 sec.).</p> <p><b>Heating Cycling Rate</b> Use this option to configure the heating cycling option for standard or fast response systems. Available choices are: Slow 3 cph (standard response), Med 6 cph (medium), Fast 9 cph (fast), and Fast!! 20 cph (super fast).</p> <p><b>Enable Heating OAT Lockout</b> This option is enabled only if the outdoor air temperature input is configured in the General page. This enables the heating lockout based on the outdoor air temperature.</p> <p><b>Heating OAT Lockout</b> This option is available only if the outdoor air temperature input is configured in the General page and Enable Heating OAT Lockout is selected. If outdoor air temperature is greater than Heat Lockout Setpoint then the heating is locked out.</p> <p><b>Enable Heating DAT Hi Limit</b> This option is enabled only if the discharge air temperature input is configured in the General page. This will enable the usage of the discharge air high limit.</p> <p><b>Heating DAT Hi Limit</b> This option is available only if the discharge air temperature input is configured in the General page and Enable Heating DAT Hi Limit is selected.</p>
Cooling Selections	<p><b>Extended Fan Operation</b> Use this option to configure the time for extended fan operation after cooling turns off. The choices are No Extend Op (0) or Extend 40 sec (40 sec.).</p> <p><b>Cooling Cycling Rate</b> This option allows the user to configure the cooling cycling option for standard or fast response systems. Available choices are: Std 3 cph (standard response), Fast 4 cph (fast).</p> <p><b>Enable Cooling OAT Lockout</b> This option is enabled only if the outdoor air temperature input is configured in the General page. This will enable the cooling lockout based on the outdoor air temperature.</p> <p><b>Cooling OAT Lockout</b> This option is available only if the outdoor air temperature input is configured in the General page and Enable Cooling OAT Lockout is selected. If outdoor air temperature is less than the Cooling OAT Lockout setpoint then cooling is locked out.</p> <p><b>Enable Cooling DAT Low Limit</b> This option is enabled only if the discharge air temperature input is configured in the General page. This enables the usage of discharge air low limit.</p> <p><b>Cooling DAT Low Limit</b> This option is available only if the discharge air temperature input is configured in the General page and Enable Cooling DAT Low Limit is selected.</p>

Table 73. T7350 Equipment Control Fields. (Continued)

Name	Definition																				
Loop Tuning	<p>This section allows the user to configure the loop tuning parameters.</p> <p><b>Throttling Range</b> Use this screen to configure the heat and cool throttling ranges. The wizard automatically modifies the heat and cool throttling ranges when the number of stages configured is changed.</p> <p>For a conventional RTU:</p> <ul style="list-style-type: none"> <li>• Cool Stages = configured cool stages</li> <li>• Heat Stages = configured heat stages</li> </ul> <p>For a heat pump RTU:</p> <ul style="list-style-type: none"> <li>• Cool Stages = configured compressor stages (cool stages)</li> <li>• Heat Stages = configured compressor stages (cool stages) + Configured Aux heat stages</li> </ul> <p>If you change the number of stages to zero, the throttling range remains unchanged. The heat and cool throttling range values are selectable from 1 to 30 °F (1 to 17 °C). If you enter an invalid value, the wizard automatically modifies it to nearest valid value.</p> <p>NOTE: Throttling range remains always at 5 for T7350H1017.</p> <p>See below for throttling default values for the number of stages:</p> <table border="1"> <tr> <td>Heat/Cool Stages</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>Default Throttling Range (degrees)</td> <td>3</td> <td>4</td> <td>7</td> <td>8</td> </tr> </table> <p><b>Integral Time</b> Use this to configure the heat and cool integral time values. The wizard automatically modifies the heat and cool throttling ranges when the number of stages configured is changed. Refer the following table for the default values of integral time values for different stages.</p> <p>If you change the number of stages to zero, the integral time remains unchanged. A value of 0 means that the integral time is disabled. Valid range is 100 to 5000 seconds. 0 also is a valid value. Values from 1 to 99 are invalid values. If you enter an invalid value, the wizard automatically modifies it to nearest valid value.</p> <p>NOTE: Integral time remains always at 1250 for T7350H1017.</p> <p>See below for integral time default values for the number of stages:</p> <table border="1"> <tr> <td>Heat/Cool Stages</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>Default Integral Time (seconds)</td> <td>3100</td> <td>2500</td> <td>1650</td> <td>1250</td> </tr> </table> <p><b>Derivative Time</b> Use this to configure the heat and cool derivative time for PID loop tuning. The value is selectable from 10 to 3000 seconds. 0 also is a valid value. A value of 0 means derivative time is disabled. If you enter an invalid value, the wizard automatically modifies it to nearest valid value.</p> <p><b>Anticipator Authority</b> Configure the anticipator authority value. You can enter a value between 2 and 15. The default value is 4. Select the Apply to Heat only field if it is to be applied for heating only.</p>	Heat/Cool Stages	1	2	3	4	Default Throttling Range (degrees)	3	4	7	8	Heat/Cool Stages	1	2	3	4	Default Integral Time (seconds)	3100	2500	1650	1250
Heat/Cool Stages	1	2	3	4																	
Default Throttling Range (degrees)	3	4	7	8																	
Heat/Cool Stages	1	2	3	4																	
Default Integral Time (seconds)	3100	2500	1650	1250																	

## APPENDIX B – DEVICE POINT TABLES

This appendix provides a table for the points detail and a table for the application of points of the following controllers and devices:

- W7763C/D/E Chilled Ceiling Controller (CHC) .. page 106
- Constant Volume Air Handling Unit Controller (CVAHU) .....page 114
- Fan Coil Unit Controller (FCU) ..... page 122
- Hydronic Controller (HYD) ..... page 129
- Excel 10 Remote Input/Output Device (RIO) ..... page 136
- Vacon NX Frequency Converter (NXVFD) ..... page 138
- T7350 Thermostat (T7350) ..... page 138
- Unit Ventilator (UV) ..... page 138
- Excel 10 VAV II Controller (VAV II) ..... page 145
- XL15C Plant Controller (XL15C) ..... page 155

### W7763C/D/E Chilled Ceiling Controller (CHC)

Table 74 provides the CHC points detail and Table 75 on page 107 provides the CHC application of points.

**Table 74. CHC Point Details.**

Point Name	Network Variable	Field Name	Point Type
Occupied Cool	nciSetPnts	occupiedCool	NumericWritable
Standby Cool	nciSetPnts	standbyCool	NumericWritable
Unoccupied Cool	nciSetPnts	unoccupiedCool	NumericWritable
Occupied Heat	nciSetPnts	occupiedHeat	NumericWritable
Standby Heat	nciSetPnts	standbyHeat	NumericWritable
Unoccupied Heat	nciSetPnts	unoccupiedHeat	NumericWritable
Current State	nviTodEvent	currentState	EnumWritable
Next State	nviTodEvent	nextState	EnumWritable
Time To Next State	nviTodEvent	timeToNextState	NumericWritable
DLC Shed	nviDlcShed	DlcShed	EnumWritable
Out Of Limits	nvoStatus	outOfLimits	BooleanPoint
Open Circuit	nvoStatus	openCircuit	BooleanPoint
Out Of Service	nvoStatus	outOfService	BooleanPoint
Mechanical Fault	nvoStatus	mechanicalFault	BooleanPoint
Feedback Failure	nvoStatus	feedbackFailure	BooleanPoint
Over Range	nvoStatus	overRange	BooleanPoint
Under Range	nvoStatus	underRange	BooleanPoint
Electrical Fault	nvoStatus	electricalFault	BooleanPoint
Unable To Measure	nvoStatus	unableToMeasure	BooleanPoint
Command Failure	nvoStatus	commFailure	BooleanPoint
Self Test Failed	nvoStatus	failSelfTest	BooleanPoint
Application Mode	nviApplicMode	hvacMode	EnumWritable
Fan Speed	nviFanSpeedCmd		SNVTSwitch
Manual Mode	nviRequest	objectRequest	EnumWritable
Manual Occupancy	nviManOccCmd	occupancy	EnumWritable
Temporary Setpoint	nviSetPoint	tempP	NumericWritable
Effective Setpoint	nvoChcStatus	activeSetPt	NumericPoint
Alarm Type	nvoChcStatus	alarmType	EnumPoint

Table 74. CHC Point Details. (Continued)

Point Name	Network Variable	Field Name	Point Type
Condensation State	nvoChcStatus	condensationState	EnumPoint
Cool Output	nvoUnitStatus	coolOutput	NumericPoint
Cool Temperature	nvoChcStatus	coolTemp	NumericPoint
DLC Shed	nvoChcStatus	dlcShed	EnumPoint
Economizer Output	nvoUnitStatus	econOutput	NumericPoint
Effective Occupancy	nvoChcStatus	effectOcc	EnumPoint
Effective Sensor Occupancy	nvoChcStatus	effSenOcc	EnumPoint
Effective Window Open	nvoChcStatus	effWindowOpen	EnumPoint
External Active	nvoChcStatus	externalActive	EnumPoint
Fan Feedback	nvoChcStatus	fanFeedback	EnumPoint
Fan Output	nvoUnitStatus	fanOutput	NumericPoint
Fan Stages Active	nvoChcStatus	fanStagesActive	EnumPoint
HW Override	nvoChcStatus	hwOverride	EnumPoint
HW Window Open	nvoChcStatus	hwWindowOpen	EnumPoint
Humidity	nvoChcStatus	humidity	NumericPoint
Manual Occupancy	nvoChcStatus	netManOcc	EnumPoint
Unit Status Mode	nvoUnitStatus	mode	EnumPoint
CHC Status Mode	nvoChcStatus	mode	EnumPoint
Output Position 1	nvoChcStatus	outputPosition1	NumericPoint
Output Position 2	nvoChcStatus	outputPosition0	NumericPoint
Primary Heat Output	nvoUnitStatus	heatOutputPrimary	NumericPoint
RO LED	nvoChcStatus	rOLed	EnumPoint
Reheat Active	nvoChcStatus	reheatActive	EnumPoint
Reset Bypass Time	nvoChcStatus	restBypassTime	NumericPoint
Scheduled Occupancy	nvoChcStatus	schedOcc	EnumPoint
Secondary Heat Output	nvoUnitStatus	heatOutputSecondary	NumericPoint
Sensor Occupancy	nvoChcStatus	hwSenOcc	EnumPoint
Space Temperature	nvoChcStatus	spaceTemp	NumericPoint
Terminal Load	nvoTerminalLoad	levPercent	NumericPoint

Table 75. CHC Application of Points.

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Occupied Cool (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Standby Cool (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Unoccupied Cool (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Occupied Heat (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0

Table 75. CHC Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Standby Heat (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Unoccupied Heat (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Current State					X	Default Occupied Unoccupied Bypass Standby
Next State					X	Default Occupied Unoccupied Bypass Standby
Time To Next State					X	Units=min Precision=0 Min=0.0 Max=65535.0
DLC Shed					X	dlcShedDisable dlcShedEnable
Out Of Limits					X	False or True
Open Circuit					X	False or True
Out Of Service					X	False or True
Mechanical Fault					X	False or True
Feedback Failure					X	False or True
Over Range					X	False or True
Under Range					X	False or True
Electrical Fault					X	False or True
Unable To Measure					X	False or True
Command Failure					X	False or True
Self Test Failed					X	False or True
Application Mode	X	X	X	X		Default Auto Heat Morning Warmup Cool Night Purge Pre-cool Off Test Emergency Heat Fan Only Free Cool Ice Maximum Heat Economy Dehumidify Calibrate Emergency Cool Emergency Steam Max Cool HVAC Load No Load

Table 75. CHC Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Fan Speed	X	X	X	X		Off Zero Low Medium High Auto
Manual Mode	X	X	X	X		Default Normal Disabled Update Status Self Test Update Alarm Report Mask Override Enable Remove Override Clear Status Clear Alarm Alarm Notify Enabled Alarm Notify Disabled Manual Control Remote Control Program Clear Reset Reset
Manual Occupancy	X	X	X	X		Default Occupied Unoccupied Bypass Standby
Temporary Setpoint	X	X	X	X		Units=°C Precision=1 Min=10.0 Max=35.0
Effective Setpoint	X	X	X			Units=°C Precision=1 Min=-273.2 Max=327.7

Table 75. CHC Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Alarm Type	X	X	X			Node Off Frost Invalid Setpoint Temperature Sensor Restored Setpoint Knob Restored Fan Speed Switch Restored Fan Normal SpaceTemp Com Restored HVAC Mode Com Restored Setpoint Offset Com Restored Sched Occ Com Restored DLC Communication Restored Relative Humidity Com Restored Outdoor Temp Com Restored Occ Sensor Com Restored Window Com Restored Manual Heat Com Restored Manual Cool Com Restored Cool Temp Com Restored Water Too Cold Condensation Normal rtnReserve022 rtnReserve023 rtnReserve024 Alarm Notify Disabled No Alarm Node Off Frost Invalid Setpoint Temperature Sensor
Alarm Type (continued)	X	X	X			Failed Setpoint Knob Failed Fan Speed Switch Failed Fan Failure SpaceTemp Com Failed HVAC Mode Com Failed Setpoint Offset Com Failed Sched Occ Com Failed DLC Communication Failed Relative Humidity Com Failed Outdoor Temp Com Failed Occ Sensor Com Failed Window Com Failed Manual Heat Com Failed Manual Cool Com Failed Cool Temp Com Failed Water Too Cold Condensation Alarm almReserve022 almReserve023 almReserve024
Condensation State	X	X	X			No Condensation Condensation
Cool Output	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Cool Temperature	X	X	X			Units=°C Precision=1 Min=-273.2 Max=327.7

Table 75. CHC Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
DLC Shed	X	X	X			Restored or Shed
Economizer Output	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Effective Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Effective Sensor Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Effective Window Open	X	X	X			Closed or Open
External Active	X	X	X			Inactive or Active
Fan Feedback	X	X	X			Failure or Running
Fan Output	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Fan Stages Active	X	X	X			Fan Off Fan Speed 1 Fan Speed 2 Fan Speed 3 Fan Auto Fan Default
HW Override	X	X	X			Default Occupied Unoccupied Bypass Standby
HW Window Open	X	X	X			Closed or Open
Humidity	X	X	X			Units=%RH Precision=1 Min=-163.8 Max=163.8
Manual Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby



Table 75. CHC Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Unit Status Mode	X	X	X			Default Auto Heat Morning Warmup Cool Night Purge Pre-cool Off Test Emergency Heat Fan Only Free Cool Ice Maximum Heat Economy Dehumidify Calibrate Emergency Cool Emergency Steam Max Cool HVAC Load No Load
CHC Status Mode	X	X	X			Disabled Cool Heat Pressurize Depressurize Manual Mode Factory Test Mode Floating Out of Sync Fan Switch Off Startup Wait
Output Position 1	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Output Position 2	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Primary Heat Output	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
RO LED	X	X	X			Default Occupied Unoccupied Bypass Standby
Reheat Active	X	X	X			Default Off Low Medium High On
Reset Bypass Time	X	X	X			Units=min Precision=0 Min=0.0 Max=65535.0

Table 75. CHC Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Scheduled Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Secondary Heat Output	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Sensor Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Space Temperature	X	X	X			Units=°C Precision=1 Min=-273.2 Max=327.7
Terminal Load	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8

## Constant Volume Air Handling Unit Controller (CVAHU)

Table 76 provides the CVAHU points detail and Table 77 on page 115 provides the CVAHU application of points.

**Table 76. CVAHU Point Details**

Display Name	Network Variable	Field Name	Point Type
Occupied Cool	nciTempSetPts	occupiedCool	NumericWritable
Standby Cool	nciTempSetPts	standbyCool	NumericWritable
Unoccupied Cool	nciTempSetPts	unoccupiedCool	NumericWritable
Occupied Heat	nciTempSetPts	occupiedHeat	NumericWritable
Standby Heat	nciTempSetPts	standbyHeat	NumericWritable
Unoccupied Heat	nciTempSetPts	unoccupiedHeat	NumericWritable
Current State	nviTodEvent	currentState	EnumWritable
Next State	nviTodEvent	nextState	EnumWritable
Time To Next State	nviTodEvent	timeToNextState	NumericWritable
DLC Shed	nviDlcShed	dlcShed	EnumWritable
Air Flow Loss	nvoAlarmStatus	LossAirFlow	EnumPoint
Coil Freeze State	nvoAlarmStatus	FreezeStat	EnumPoint
Dirty Filter	nvoAlarmStatus	DirtyFilter	EnumPoint
Frost Protect Alarm	nvoAlarmStatus	FrostProtectAlarm	EnumPoint
Indoor Air Quality Override	nvoAlarmStatus	IAQOverride	EnumPoint
Input Nv Fail	nvoAlarmStatus	InputNvFail	EnumPoint
Invalid Setpoint	nvoAlarmStatus	InvalidSetPoint	EnumPoint
Low Limit Economizer Close	nvoAlarmStatus	LowLimEconClose	EnumPoint
Node Disabled	nvoAlarmStatus	NodeDisabled	EnumPoint
Sensor Failure	nvoAlarmStatus	SensorFailure	EnumPoint
Application Mode	nviApplMode	hvacMode	EnumWritable
Manual Mode	nviManualMode	manMode	EnumWritable
Manual Occupancy State	nviManOcc	occupancy	EnumWritable
Temporary Setpoint	nviSetPoint	tempP	NumericWritable
Fan Mode	nciConfig	FanMode	EnumWritable
Auxiliary Economizer Out	nvoData1	AuxEconOut	EnumPoint
Bypass Timer	nvoData2	BypassTimer	NumericPoint
Calculated Outdoor Air Enthalpy	nvoData1	CalcODEnthalpy	NumericPoint
Calculated Return Air Enthalpy	nvoData1	CalcRAEnthalpy	NumericPoint
Coil Freeze State	nvoData1	CoilFreezeStat	EnumPoint
Cool Percent	nvoUnitStatus	coolOutput	NumericPoint
Cool Position	nvoData2	CoolPos	NumericPoint
Cool Stages On	nvoData1	CoolStagesOn	NumericPoint
DLC Shed	nvoData1	DlcShed	EnumPoint
Data1 Field No	nvoData1	FieldNo	EnumPoint
Data2 Field No	nvoData2	FieldNo	EnumPoint
Dirty Filter	nvoData1	DirtyFilter	EnumPoint
Discharge Air Temperature	nvoData2	DischargeTemp	NumericPoint
Discharge Setpoint	nvoData2	DischargeSetPt	NumericPoint
Economizer Enable	nvoData1	EconEnable	EnumPoint
Economizer Float Synch	nvoData1	EconFloatSynch	EnumPoint

Table 76. CVAHU Point Details (Continued)

Display Name	Network Variable	Field Name	Point Type
Economizer Position	nvoData2	EconPos	NumericPoint
Effective Occupancy	nvoData1	EffectOcc	EnumPoint
Effective Setpoint	nvoEffectSetPt	tempP	NumericPoint
Fan Status	nvoData1	FanOn	EnumPoint
Filter Air Pressure	nvoData2	FilterPressure	NumericPoint
Free1 Out	nvoData1	Free1Out	EnumPoint
Free2 Out	nvoData1	Free2Out	EnumPoint
Heat Percent	nvoUnitStatus	heatOutputPrimary	NumericPoint
Heat Position	nvoData2	HeatPos	NumericPoint
Heat Stages On	nvoData1	HeatStagesOn	NumericPoint
Indoor Air Quality Override	nvoData1	laqOverRide	EnumPoint
Manual Override	nvoData1	OverRide	EnumPoint
Mode	nvoData1	mode	EnumPoint
Monitor Switch	nvoData1	MonSwitch	EnumPoint
Monitor1	nvoData2	Monitor1	NumericPoint
Network Manual Occupancy	nvoData1	NetManOcc	EnumPoint
Occupancy Sensor	nvoData1	SenOcc	EnumPoint
Occupancy Status Out	nvoData1	OccStatusOut	EnumPoint
Occupancy Time Clock	nvoData1	OccTimeClock	EnumPoint
Outdoor Enthalpy	nvoData2	OutdoorEnthalpy	NumericPoint
Outdoor Humidity	nvoData2	OutdoorHumidity	NumericPoint
Outdoor Temperature	nvoData2	OutdoorTemp	NumericPoint
Proof of Air Flow	nvoData1	ProofAirFlow	EnumPoint
Return Air Enthalpy	nvoData2	ReturnEnthalpy	NumericPoint
Return Air Humidity	nvoData2	ReturnHumidity	NumericPoint
Return Air Temperature	nvoData2	ReturnTemp	NumericPoint
Scheduled Occupancy	nvoData1	SchedOcc	EnumPoint
ShutDown	nvoData1	ShutDown	EnumPoint
Smoke Monitor	nvoData1	SmokeMonitor	EnumPoint
Space Co2	nvoData2	SpaceCo2	NumericPoint
Space Temperature	nvoData2	SpaceTemp	NumericPoint
Temperature Control Point	nvoData2	TempControlPt	NumericPoint
Water Source Heat Pump Enable	nvoData1	WSHPEnable	EnumPoint
Window Open	nvoData1	WindowOpen	EnumPoint

Table 77. CVAHU Application of Points.

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Occupied Cool (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Standby Cool (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0

Table 77. CVAHU Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Unoccupied Cool (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Occupied Heat (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Standby Heat (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Unoccupied Heat (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Current State					X	Default Occupied Unoccupied Bypass Standby
Next State					X	Default Occupied Unoccupied Bypass Standby
Time To Next State					X	Units=min Precision=0 Min=0.0 Max=65535.0
DLC Shed					X	dINoDlcShed dIMinDlcShed
Air Flow Loss					X	False True
Coil Freeze State					X	False or True
Dirty Filter					X	False or True
Frost Protect Alarm					X	False or True
Indoor Air Quality Override					X	False or True
Input Nv Fail					X	False or True
Invalid Setpoint					X	False or True
Low Limit Economizer Close					X	False or True
Node Disabled					X	False or True
Sensor Failure					X	False or True

Table 77. CVAHU Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Application Mode	X	X	X	X		Default Auto Heat Morning Warmup Cool Night Purge Pre-cool Off Test Emergency Heat Fan Only Free Cool Ice Maximum Heat Economy Dehumidify Calibrate Emergency Cool Emergency Steam Max Cool HVAC Load No Load
Manual Mode	X	X	X	X		Enable Disable Manual Suppress Alarms Unsuppress Alarms Set Discharge Air Config. Clear Discharge Air Config.
Manual Occupancy State	X	X	X	X		Default Occupied Unoccupied Bypass Standby
Temporary Setpoint	X	X	X	X		Units=°C Precision=1 Min=10.0 Max=35.0
Fan Mode	X	X	X	X		Fan Auto Fan Continuous
Auxiliary Economizer Out	X	X	X			Off or On
Bypass Timer	X	X	X			Units=min Precision=0 Min=0.0 Max=65535.0
Calculated Outdoor Air Enthalpy	X	X	X			Units=BTU/lb Precision=1 Min=-256.0 Max=256.0
Calculated Return Air Enthalpy	X	X	X			Units=BTU/lb Precision=1 Min=-256.0 Max=256.0
Coil Freeze State	X	X	X			False or True
Cool Percent	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8

Table 77. CVAHU Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Cool Position	X	X	X			Units=% Precision=0 Min=-128.0 Max=127.0
Cool Stages On	X	X	X			Units=null Precision=0 Min=0.0 Max=7.0
DLC Shed	X	X	X			Restored or Shed
Data1 Field No	X	X	X			Update All 1 Mode Effective Occupancy Override Scheduled Occupancy Occupancy Time Clock Network Manual Occupancy Sensor Occupancy Economizer Enabled Proof of Air Flow Calculated Outdoor Enthalpy Calculated Return Air Enthalpy Heat Stages On Cool Stages On Free 1 Out Free 2 Out Occupancy Status Out Fan On Auxiliary Economizer Out Economizer Floating Sync DLC Shed IAQ Override Smoke Monitor Window Open Dirty Filter Shutdown Monitor Switch Wshp Enable Coil Freeze State Update No. 1
Data2 Field No	X	X	X			Update All 2 Bypass Timer Temperature Control Point Space Temperature Discharge Air Temperature Discharge Air Setpoint Return Air Temperature Return Air Humidity Return Air Enthalpy Outdoor Air Temp Outdoor Humidity Outdoor Enthalpy Filter Pressure Space Co2 Monitor Volts Cool Position Heat Position Economizer Position Update No. 2
Dirty Filter	X	X	X			False or True

Table 77. CVAHU Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Discharge Air Temperature	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Discharge Setpoint	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Economizer Enable	X	X	X			Default Off Low Medium High On
Economizer Float Synch	X	X	X			Off or On
Economizer Position	X	X	X			Units=% Precision=0 Min=-128.0 Max=127.0
Effective Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Effective Setpoint	X	X	X			Units=°C Precision=1 Min=-273.2 Max=327.7
Fan Status	X	X	X			Off or On
Filter Air Pressure	X	X	X			Units=in/wc Precision=1 Min=-32.0 Max=32.0
Free1 Out	X	X	X			Off or On
Free2 Out	X	X	X			Off or On
Heat Percent	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Heat Position	X	X	X			Units=% Precision=0 Min=-128.0 Max=127.0
Heat Stages On	X	X	X			Units=null Precision=0 Min=0.0 Max=7.0
Indoor Air Quality Override	X	X	X			False True
Manual Override	X	X	X			Default Occupied Unoccupied Bypass Standby



Table 77. CVAHU Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Mode	X	X	X			Startup Wait Heat Cool Off Disabled Emergency Heat Smoke Emergency Freeze Protect Manual Factory Test Fan Only
Monitor Switch	X	X	X			Off or On
Monitor1	X	X	X			Units=V Precision=1 Min=-32.0 Max=32.0
Network Manual Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Occupancy Sensor	X	X	X			Default Occupied Unoccupied Bypass Standby
Occupancy Status Out	X	X	X			Off or On
Occupancy Time Clock	X	X	X			Default Off Low Medium High On
Outdoor Enthalpy	X	X	X			Units=mA Precision=1 Min=-256.0 Max=256.0
Outdoor Humidity	X	X	X			Units=% Precision=1 Min=0.0 Max=127.5
Outdoor Temperature	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Proof of Air Flow	X	X	X			Default Off Low Medium High On
Return Air Enthalpy	X	X	X			Units=mA Precision=1 Min=-256.0 Max=256.0
Return Air Humidity	X	X	X			Units=% Precision=1 Min=0.0 Max=127.5

Table 77. CVAHU Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Return Air Temperature	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Scheduled Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
ShutDown	X	X	X			False or True
Smoke Monitor	X	X	X			False or True
Space Co2	X	X	X			Units=ppm Precision=0 Min=0.0 Max=65535.0
Space Temperature	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Temperature Control Point	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Water Source Heat Pump Enable	X	X	X			False or True
Window Open	X	X	X			Closed or Open

## Fan Coil Unit Controller (FCU)

Table 78 provides the FCU points detail and Table 79 on page 123 provides the FCU application of points.

**Table 78. FCU Points Details**

Point Name	Network Variable	Field	Point Type
Occupied Cool	nciSetPnts	occupiedCool	NumericWritable
Standby Cool	nciSetPnts	standbyCool	NumericWritable
Unoccupied Cool	nciSetPnts	unoccupiedCool	NumericWritable
Occupied Heat	nciSetPnts	occupiedHeat	NumericWritable
Standby Heat	nciSetPnts	standbyHeat	NumericWritable
Unoccupied Heat	nciSetPnts	unoccupiedHeat	NumericWritable
Current State	nviTodEvent	currentState	EnumWritable
Next State	nviTodEvent	nextState	EnumWritable
Time To Next State	nviTodEvent	timeToNextState	NumericWritable
DLC Shed	nviDlcShed	DlcShed	EnumWritable
Out Of Limits	nvoStatus	outOfLimits	BooleanPoint
Open Circuit	nvoStatus	openCircuit	BooleanPoint
Out Of Service	nvoStatus	outOfService	BooleanPoint
Mechanical Fault	nvoStatus	mechanicalFault	BooleanPoint
Feedback Failure	nvoStatus	feedbackFailure	BooleanPoint
Over Range	nvoStatus	overRange	BooleanPoint
Under Range	nvoStatus	underRange	BooleanPoint
Electrical Fault	nvoStatus	electricalFault	BooleanPoint
Unable To Measure	nvoStatus	unableToMeasure	BooleanPoint
Communication Failure	nvoStatus	commFailure	BooleanPoint
Fail Self Test	nvoStatus	failSelfTest	BooleanPoint
Self Test In Progress	nvoStatus	selfTestInProgress	BooleanPoint
Locked Out	nvoStatus	lockedOut	BooleanPoint
Manual Control	nvoStatus	manualControl	BooleanPoint
Programming Failed	nvoStatus	programmingFail	BooleanPoint
Application Mode	nviApplicMode	hvacMode	EnumWritable
Temporary Setpoint	nviSetPoint	tempP	NumericWritable
Fan Speed Value	nviFanSpeedCmd	value	NumericWritable
Fan Speed State	nviFanSpeedCmd	state	EnumWritable
Manual Occupancy	nviManOccCmd	occupancy	EnumWritable
Effective Occupancy	nvoFcuStatus	effectOcc	EnumPoint
HW Override	nvoFcuStatus	hwOverride	EnumPoint
Scheduled Occupancy	nvoFcuStatus	schedOcc	EnumPoint
Effective Sensor Occupancy	nvoFcuStatus	effSenOcc	EnumPoint
Manual Occupancy	nvoFcuStatus	netManOcc	EnumPoint
Sensor Occupancy	nvoFcuStatus	hwSenOcc	EnumPoint
RO LED	nvoFcuStatus	rOLed	EnumPoint
FCU Status Mode	nvoFcuStatus	mode	EnumPoint
Alarm Type	nvoFcuStatus	alarmType	EnumPoint
DLC Shed	nvoFcuStatus	dlcShed	NumericPoint
Effective Window Open	nvoFcuStatus	effWindowOpen	NumericPoint
HW Window Open	nvoFcuStatus	hwWindowOpen	NumericPoint

Table 78. FCU Points Details (Continued)

Point Name	Network Variable	Field	Point Type
Fan Feedback	nvoFcuStatus	fanFeedback	NumericPoint
External Active	nvoFcuStatus	externalActive	NumericPoint
Fan Stages Active	nvoFcuStatus	fanStagesActive	EnumPoint
Output Position 0	nvoFcuStatus	outputPosition0	NumericPoint
Output Position 1	nvoFcuStatus	outputPosition1	NumericPoint
Reheat Active	nvoFcuStatus	reheatActive	EnumPoint
Effective Setpoint	nvoFcuStatus	activeSetPt	NumericPoint
Space Temperature	nvoFcuStatus	spaceTemp	NumericPoint
Reset Bypass Time	nvoFcuStatus	restBypassTime	NumericPoint
Unit Status Mode	nvoUnitStatus	mode	EnumPoint
Primary Heat Output	nvoUnitStatus	heatOutputPrimary	NumericPoint
Secondary Heat Output	nvoUnitStatus	heatOutputSecondary	NumericPoint
Cool Output	nvoUnitStatus	coolOutput	NumericPoint
Economizer Output	nvoUnitStatus	econOutput	NumericPoint
Fan Output	nvoUnitStatus	fanOutput	NumericPoint
In Alarm	nvoUnitStatus	inAlarm	NumericPoint
Terminal Load	nvoTerminalLoad	levPercent	NumericPoint
Manual Mode	nviManualMode	ManualMode	EnumPoint

Table 79. FCU Application of Points

Point name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Occupied Cool (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Standby Cool (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Unoccupied Cool (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Occupied Heat (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Standby Heat (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Unoccupied Heat (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Current State					X	Default Occupied Unoccupied Bypass Standby

Table 79. FCU Application of Points (Continued)

Point name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Next State					X	Default Occupied Unoccupied Bypass Standby
Time To Next State					X	Units=min Precision=0 Min=0.0 Max=65535.0
DLC Shed					X	Shed or Restore
Out Of Limits					X	False or True
Open Circuit					X	False or True
Out Of Service					X	False or True
Mechanical Fault					X	False or True
Feedback Failure					X	False or True
Over Range					X	False or True
Under Range					X	False or True
Electrical Fault					X	False or True
Unable To Measure					X	False or True
Communication Failure					X	False or True
Fail Self Test					X	False or True
Self Test In Progress					X	False or True
Locked Out					X	False or True
Manual Control					X	False or True
Programming Failed					X	False or True
Application Mode	X	X	X	X		Default Auto Heat Morning Warmup Cool Night Purge Pre-cool Off Test Emergency Heat Fan Only Free Cool Ice Maximum Heat Economy Dehumidify Calibrate Emergency Cool Emergency Steam Max Cool HVAC Load No Load
Fan Speed State	X	X	X	X		Off Zero Low Medium High Auto

Table 79. FCU Application of Points (Continued)

Point name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Manual Mode	X	X	X	X		Default Normal Disabled Update Status Self Test Update Alarm Report Mask Override Enable Remove Override Clear Status Clear Alarm Alarm Notify Enabled Alarm Notify Disabled Manual Control Remote Control Program Clear Reset Reset
Manual Occupancy	X	X	X	X		Default Occupied Unoccupied Bypass Standby
Temporary Setpoint	X	X	X	X		Units=°C Precision=1 Min=10.0 Max=35.0
Effective Setpoint	X	X	X			Units=°C Precision=1 Min=-273.2 Max=327.7

Table 79. FCU Application of Points (Continued)

Point name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Alarm Type	X	X	X			Node Off Frost Invalid Setpoint Temperature Sensor Restored Setpoint Knob Restored Fan Speed Switch Restored Fan Normal SpaceTemp Com Restored HVAC Mode Com Restored Setpoint Offset Com Restored Sched Occ Com Restored DLC Communication Restored rtnComfailTempreset Outdoor Temp Com Restored Occ Sensor Com Restored Window Com Restored Manual Heat Com Restored Manual Cool Com Restored rtnHwSwMismatch rtnReserve020 rtnReserve021 rtnReserve022 rtnReserve023 rtnReserve024 Alarm Notify Disabled No Alarm Node Off Frost Invalid Setpoint Temperature Sensor Failed Setpoint Knob Failed Fan Speed Switch Failed Fan Failure SpaceTemp Com Failed HVAC Mode Com Failed Setpoint Offset Com Failed Sched Occ Com Failed DLC Communication Failed almComfailTempreset Outdoor Temp Com Failed Occ Sensor Com Failed Window Com Failed Manual Heat Com Failed Manual Cool Com Failed almHwSwMismatch almReserve020 almReserve021 almReserve022 almReserve023 almReserve024
Cool Output	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
DLC Shed	X	X	X			Restored or Shed
Economizer Output	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8

Table 79. FCU Application of Points (Continued)

Point name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Effective Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Effective Sensor Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Effective Window Open	X	X	X			Closed or Open
External Active	X	X	X			Inactive or Active
Fan Feedback	X	X	X			Failure or Running
Fan Output	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Fan Stages Active	X	X	X			Fan Off Fan Speed 1 Fan Speed 2 Fan Speed 3 Fan Auto Fan Default
HW Override	X	X	X			Default Occupied Unoccupied Bypass Standby
HW Window Open	X	X	X			Closed or Open
In Alarm	X	X	X			False or True
Manual Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Unit Status Mode	X	X	X			Default Auto Heat Morning Warmup Cool Night Purge Pre-cool Off Test Emergency Heat Fan Only Free Cool Ice Maximum Heat Economy Dehumidify Calibrate Emergency Cool Emergency Steam Max Cool HVAC Load No Load



Table 79. FCU Application of Points (Continued)

Point name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
FCU Status Mode	X	X	X			Disabled Cool Heat Pressurize Depressurize Manual Mode Factory Test Mode Floating Out of Sync Fan Switch Off Startup Wait
Output Position 0	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Output Position 1	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Primary Heat Output	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
RO LED	X	X	X			Default Occupied Unoccupied Bypass Standby
Reheat Active	X	X	X			Default Off Low Medium High On
Reset Bypass Time	X	X	X			Units=min Precision=0 Min=0.0 Max=65535.0
Scheduled Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Secondary Heat Output	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Sensor Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Space Temperature	X	X	X			Units=°C Precision=1 Min=-273.2 Max=327.7
Terminal Load	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8

## Hydronic Controller (HYD)

Table 80 provides the HYD points detail and Table 81 on page 130 provides the HYD application of points.

**Table 80. HYD Point Details.**

Point Name	Network Variable	Field Name	Point Type
Occupied Cool	nciSetPnts	occupiedCool	NumericWritable
Standby Cool	nciSetPnts	standbyCool	NumericWritable
Unoccupied Cool	nciSetPnts	unoccupiedCool	NumericWritable
Occupied Heat	nciSetPnts	occupiedHeat	NumericWritable
Standby Heat	nciSetPnts	standbyHeat	NumericWritable
Unoccupied Heat	nciSetPnts	unoccupiedHeat	NumericWritable
Current State	nviTodEvent	currentState	EnumWritable
Next State	nviTodEvent	nextState	EnumWritable
Time To Next State	nviTodEvent	timeToNextState	NumericWritable
DLC Shed	nviDlcShed	DlcShed	EnumWritable
Out Of Limits	nvoStatus	outOfLimits	BooleanPoint
Open Circuit	nvoStatus	openCircuit	BooleanPoint
Out Of Service	nvoStatus	outOfService	BooleanPoint
Mechanical Fault	nvoStatus	mechanicalFault	BooleanPoint
Feedback Failure	nvoStatus	feedbackFailure	BooleanPoint
Over Range	nvoStatus	overRange	BooleanPoint
Under Range	nvoStatus	underRange	BooleanPoint
Electrical Fault	nvoStatus	electricalFault	BooleanPoint
Unable To Measure	nvoStatus	unableToMeasure	BooleanPoint
Communication Failure	nvoStatus	commFailure	BooleanPoint
Fail Self Test	nvoStatus	failSelfTest	BooleanPoint
Self Test In Progress	nvoStatus	selfTestInProgress	BooleanPoint
Locked Out	nvoStatus	lockedOut	BooleanPoint
Manual Control	nvoStatus	manualControl	BooleanPoint
Fan Speed	nviFanSpeedCmd	value	NumericWritable
Fan Speed	nviFanSpeedCmd	state	EnumWritable
Manual Occupancy	nviManOccCmd	occupancy	EnumWritable
Temporary Setpoint	nviSetPoint	tempP	NumericWritable
Application Mode	nviApplicMode	hvacMode	EnumWritable
Unit Status Mode	nvoUnitStatus	mode	EnumPoint
Primary Heat Output	nvoUnitStatus	heatOutputPrimary	NumericPoint
Secondary Heat Output	nvoUnitStatus	heatOutputSecondary	NumericPoint
Cool Output	nvoUnitStatus	coolOutput	NumericPoint
Economizer Output	nvoUnitStatus	econOutput	NumericPoint
Fan Output	nvoUnitStatus	fanOutput	NumericPoint
In Alarm	nvoUnitStatus	inAlarm	NumericPoint
Effective Occupancy	nvoHydStatus	effectOcc	EnumPoint
HW Override	nvoHydStatus	hwOverride	EnumPoint
Scheduled Occupancy	nvoHydStatus	schedOcc	EnumPoint
Effective Sensor Occupancy	nvoHydStatus	effSenOcc	EnumPoint
Manual Occupancy	nvoHydStatus	netManOcc	EnumPoint
Sensor Occupancy	nvoHydStatus	hwSenOcc	EnumPoint

**Table 80. HYD Point Details. (Continued)**

Point Name	Network Variable	Field Name	Point Type
RO LED	nvoHydStatus	rOLed	EnumPoint
HYD Status Mode	nvoHydStatus	mode	EnumPoint
Alarm Type	nvoHydStatus	alarmType	EnumPoint
DLC Shed	nvoHydStatus	dlcShed	NumericPoint
Effective Window Open	nvoHydStatus	effWindowOpen	NumericPoint
HW Window Open	nvoHydStatus	hwWindowOpen	NumericPoint
Fan Feedback	nvoHydStatus	fanFeedback	NumericPoint
External Active	nvoHydStatus	externalActive	NumericPoint
Fan Stages Active	nvoHydStatus	fanStagesActive	EnumPoint
Output Position 0	nvoHydStatus	outputPosition0	NumericPoint
Output Position 1	nvoHydStatus	outputPosition1	NumericPoint
Reheat Active	nvoHydStatus	reheatActive	EnumPoint
Effective Setpoint	nvoHydStatus	activeSetPt	NumericPoint
Space Temperature	nvoHydStatus	spaceTemp	NumericPoint
Reset Bypass Time	nvoHydStatus	restBypassTime	NumericPoint
Terminal Load	nvoTerminalLoad	levPercent	NumericPoint
Manual Mode	nviManualMode	ManualMode	EnumPoint

**Table 81. HYD Application of Points.**

Point name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Occupied Cool (SetPoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Standby Cool (SetPoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Unoccupied Cool (SetPoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Occupied Heat (SetPoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Standby Heat (SetPoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Unoccupied Heat (SetPoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Current State					X	Default Occupied Unoccupied Bypass Standby

Table 81. HYD Application of Points. (Continued)

Point name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Next State					X	Default Occupied Unoccupied Bypass Standby
Time To Next State					X	Units=min Precision=0 Min=0.0 Max=65535.0
DLC Shed					X	Shed or Restore
Out Of Limits					X	True or False
Open Circuit					X	True or False
Out Of Service					X	True or False
Mechanical Fault					X	True or False
Feedback Failure					X	True or False
Over Range					X	True or False
Under Range					X	True or False
Electrical Fault					X	True or False
Unable To Measure					X	True or False
Communication Failure					X	True or False
Fail Self Test					X	True or False
Self Test In Progress					X	True or False
Locked Out					X	True or False
Manual Control					X	True or False
Application Mode	X	X	X	X		Default Auto Heat Morning Warmup Cool Night Purge Pre-cool Off Test Emergency Heat Fan Only Free Cool Ice Maximum Heat Economy Dehumidify Calibrate Emergency Cool Emergency Steam Max Cool HVAC Load No Load
Fan Speed	X	X	X	X		Off Zero Low Medium High Auto

**Table 81. HYD Application of Points. (Continued)**

<b>Point name</b>	<b>Graphics</b>	<b>Alarms</b>	<b>Trends</b>	<b>Commandable</b>	<b>Internal Use</b>	<b>Valid Values</b>
Manual Mode	X	X	X	X		Default Normal Disabled Update Status Self Test Update Alarm Report Mask Override Enable Remove Override Clear Status Clear Alarm Alarm Notify Enabled Alarm Notify Disabled Manual Control Remote Control Program Clear Reset Reset
Manual Occupancy	X	X	X	X		Default Occupied Unoccupied Bypass Standby
Temporary Setpoint	X	X	X	X		Units=°C Precision=1 Min=10.0 Max=35.0
Effective Setpoint	X	X	X			Units=°C Precision=1 Min=-273.2 Max=327.7

Table 81. HYD Application of Points. (Continued)

Point name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Alarm Type	X	X	X			Node Off Frost Invalid Setpoint Temperature Sensor Restored Setpoint Knob Restored Fan Speed Switch Restored Fan Normal SpaceTemp Com Restored HVAC Mode Com Restored Setpoint Offset Com Restored Sched Occ Com Restored DLC Communication Restored rtnComfailTempreset Outdoor Temp Com Restored Occ Sensor Com Restored Window Com Restored Manual Heat Com Restored Manual Cool Com Restored rtnHwSwMismatch rtnReserve020 rtnReserve021 rtnReserve022 rtnReserve023 rtnReserve024 Alarm Notify Disabled No Alarm Node Off Frost Invalid Setpoint Temperature Sensor Failed Setpoint Knob Failed Fan Speed Switch Failed Fan Failure SpaceTemp Com Failed HVAC Mode Com Failed Setpoint Offset Com
Alarm Type (continued)	X	X	X			Failed Sched Occ Com Failed DLC Communication Failed almComfailTempreset Outdoor Temp Com Failed Occ Sensor Com Failed Window Com Failed Manual Heat Com Failed Manual Cool Com Failed almHwSwMismatch almReserve020 almReserve021 almReserve022 almReserve023 almReserve024
Cool Output	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
DLC Shed	X	X	X			Restored or Shed
Economizer Output	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8

Table 81. HYD Application of Points. (Continued)

Point name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Effective Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Effective Sensor Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Effective Window Open	X	X	X			Closed or Open
External Active	X	X	X			True or False
Fan Feedback	X	X	X			Failure or Running
Fan Output	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Fan Stages Active	X	X	X			Fan Off Fan Speed 1 Fan Speed 2 Fan Speed 3 Fan Auto Fan Default
HW Override	X	X	X			Default Occupied Unoccupied Bypass Standby
HW Window Open	X	X	X			Closed or Open
In Alarm	X	X	X			False or True
Manual Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Unit Status Mode	X	X	X			Default Auto Heat Morning Warmup Cool Night Purge Pre-cool Off Test Emergency Heat Fan Only Free Cool Ice Maximum Heat Economy Dehumidify Calibrate Emergency Cool Emergency Steam Max Cool HVAC Load No Load

Table 81. HYD Application of Points. (Continued)

Point name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
HYD Status Mode	X	X	X			Disabled Cool Heat Pressurize Depressurize Manual Mode Factory Test Mode Floating Out of Sync Fan Switch Off Startup Wait
Output Position 0	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Output Position 1	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Primary Heat Output	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
RO LED	X	X	X			Default Occupied Unoccupied Bypass Standby
Reheat Active	X	X	X			Default Off Low Medium High On
Reset Bypass Time	X	X	X			Units=min Precision=0 Min=0.0 Max=65535.0
Scheduled Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Secondary Heat Output	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Sensor Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Space Temperature	X	X	X			Units=°C Precision=1 Min=-273.2 Max=327.7
Terminal Load	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8



## Excel 10 Remote Input/Output Device (RIO)

Table 82 provides the RIO points detail and Table 83 on page 136 provides the RIO application of points.

**Table 82. RIO Point Details.**

Point name	Network Variable	Field	Point Type
Communication Failed	nvoAlarmStatus	CommFail	EnumPoint
Node Disabled	nvoAlarmStatus	NodeDisable	EnumPoint
Sensor Failed	nvoAlarmStatus	SensorFail	EnumPoint
Manual Mode	nviManualMode	manMode	EnumWritable
Analog In 1	nvorioIO	ai1	NumericPoint
Analog In 2	nvorioIO	ai2	NumericPoint
Analog In 3	nvorioIO	ai3	NumericPoint
Analog In 4	nvorioIO	ai4	NumericPoint
Analog In 5	nvorioIO	ai5	NumericPoint
Analog In 6	nvorioIO	ai6	NumericPoint
Digital In 1	nvorioIO	di1	EnumPoint
Digital In 2	nvorioIO	di2	EnumPoint
Digital In 3	nvorioIO	di3	EnumPoint
Digital In 4	nvorioIO	di4	EnumPoint
Digital Out 1	nvorioIO	d01	EnumPoint
Digital Out 2	nvorioIO	d02	EnumPoint
Digital Out 3	nvorioIO	d03	EnumPoint
Digital Out 4	nvorioIO	d04	EnumPoint
Digital Out 5	nvorioIO	d05	EnumPoint
Digital Out 6	nvorioIO	d06	EnumPoint
Digital Out 7	nvorioIO	d07	EnumPoint
Digital Out 8	nvorioIO	d08	EnumPoint
Mode	nvorioIO	mode	EnumPoint

**Table 83. RIO Application of Points.**

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Communication Failed					X	False or True
Node Disabled					X	False or True
Sensor Failed					X	False or True
Manual Mode	X	X	X	X		Enable Disable Manual Suppress Alarms Unsuppress Alarms
Analog In 1	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Analog In 2	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0

Table 83. RIO Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Analog In 3	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Analog In 4	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Analog In 5	X	X	X			Units=null Precision=0 Min=-32768.0 Max=32767.0
Analog In 6	X	X	X			Units=null Precision=0 Min=-32768.0 Max=32767.0
Digital In 1	X	X	X			False or True
Digital In 2	X	X	X			False or True
Digital In 3	X	X	X			False or True
Digital In 4	X	X	X			False or True
Digital Out 1	X	X	X			Off or On
Digital Out 2	X	X	X			Off or On
Digital Out 3	X	X	X			Off or On
Digital Out 4	X	X	X			Off or On
Digital Out 5	X	X	X			Off or On
Digital Out 6	X	X	X			Off or On
Digital Out 7	X	X	X			Off or On
Digital Out 8	X	X	X			Off or On
Mode	X	X	X			Startup Wait Heat Cool Off Disabled Emergency Heat Smoke Emergency Freeze Protect Manual Factory Test Fan Only

## Unit Ventilator (UV)

Table 84 provides the UV points detail and Table 85 on page 139 provides the UV application of points.

**Table 84. UV Point Details.**

Point Name	Network Variable	Field Name	Point Type
Occupied Cool	nciSetpoints	occupiedCool	NumericWritable
Standby Cool	nciSetpoints	standbyCool	NumericWritable
Unoccupied Cool	nciSetpoints	unoccupiedCool	NumericWritable
Occupied Heat	nciSetpoints	occupiedHeat	NumericWritable
Standby Heat	nciSetpoints	standbyHeat	NumericWritable
Unoccupied Heat	nciSetpoints	unoccupiedHeat	NumericWritable
Current State	nviOccSchedule	currentState	EnumWritable
Next State	nviOccSchedule	nextState	EnumWritable
Time To Next State	nviOccSchedule	timeToNextState	NumericWritable
DLC Shed	nviDlcShed	dlcShed	EnumWritable
Air Flow Loss	nvoAlarmStatus	LossAirFlow	EnumPoint
Communication Failed	nvoAlarmStatus	CommFail	EnumPoint
Dirty Filter	nvoAlarmStatus	DirtyFilter	EnumPoint
Drip Pan Full	nvoAlarmStatus	DripPanFull	EnumPoint
Freeze State	nvoAlarmStatus	FreezeStat	EnumPoint
Frost Protect	nvoAlarmStatus	FrostProtect	EnumPoint
Indoor Air Quality Override	nvoAlarmStatus	laqOverRide	EnumPoint
Invalid Setpoint	nvoAlarmStatus	InvalidSetPt	EnumPoint
Low Limit Economizer Close	nvoAlarmStatus	LowLimEconClose	EnumPoint
Node Disabled	nvoAlarmStatus	NodeDisable	EnumPoint
Outside Air Quality	nvoAlarmStatus	OAQuality	EnumPoint
Sensor Failed	nvoAlarmStatus	SensorFail	EnumPoint
Application Mode	nviApplicMode	hvacMode	EnumWritable
Manual Mode	nviManualMode	manMode	EnumWritable
Manual Occupancy	nviOccManCmd	occupancy	EnumWritable
Temporary Setpoint	nviSetpoint	tempP	NumericWritable
Auxiliary Economizer Out	nvoData1	AuxEconOut	EnumPoint
Bypass Timer	nvoData1	BypassTimer	NumericPoint
Calculated Outdoor Enthalpy	nvoData1	CalcODEnthalpyS7	NumericPoint
Calculated Return Air Enthalpy	nvoData1	CalcRAEnthalpyS7	NumericPoint
Coil Freeze State	nvoData1	CoilFreezeStat	EnumPoint
Cool Stages On	nvoData1	CoolStagesOn	NumericPoint
Cooling Percentage	nvoData1	CoolPos	NumericPoint
DLC Shed	nvoData1	DlcShed	EnumPoint
Dirty Filter	nvoData1	DirtyFilter	EnumPoint
Discharge Air Setpoint	nvoData2	DischargeSetPt	NumericPoint
Discharge Air Temperature	nvoData2	DischargeTemp	NumericPoint
Drip Pan Full	nvoData1	DripPanFull	EnumPoint
Economizer Enabled	nvoData1	EconEnable	EnumPoint
Economizer Float Synch	nvoData1	EconFloatSynch	EnumPoint
Economizer Position	nvoData1	EconPos	NumericPoint
Effective Occupancy	nvoData1	EffectOcc	EnumPoint

Table 84. UV Point Details. (Continued)

Point Name	Network Variable	Field Name	Point Type
Fan Speed	nvoData1	FanSpeed	NumericPoint
Fan Switch	nvoData1	FanSwitch	EnumPoint
Filter Pressure	nvoData2	FilterPressure	NumericPoint
Free State 1	nvoData1	Free1Stat	EnumPoint
Heat Source	nvoData1	HeatSource	EnumPoint
Heat Stages On	nvoData1	HeatStagesOn	NumericPoint
Heating Percentage	nvoData1	HeatPos	NumericPoint
Indoor Air Quality Override	nvoData1	IaqOverRide	EnumPoint
Manual Occupancy	nvoData1	NetManOcc	EnumPoint
Mixed Air Temperature	nvoData2	MixedTemp	NumericPoint
Mode	nvoData1	mode	EnumPoint
Monitor 1	nvoData2	Monitor1	NumericPoint
Monitor Switch	nvoData1	MonSwitch	EnumPoint
Occupancy Statue Out	nvoData1	OccStatusOut	EnumPoint
Occupancy Time Clock	nvoData1	OccTimeClock	EnumPoint
Outdoor Air Enthalpy	nvoData2	OutdoorEnthalpy	NumericPoint
Outdoor Humidity	nvoData2	OutdoorHumidity	NumericPoint
Outdoor Temperature	nvoData2	OutdoorTemp	NumericPoint
Outside Air Quality	nvoData2	OutsideQuality	NumericPoint
Override	nvoData1	OverRide	EnumPoint
Proof Of Air Flow	nvoData1	ProofAirFlow	EnumPoint
Return Air Enthalpy	nvoData2	ReturnEnthalpy	NumericPoint
Return Air Humidity	nvoData2	ReturnHumidity	NumericPoint
Return Air Temperature	nvoData2	ReturnTemp	NumericPoint
Scheduled Occupancy	nvoData1	SchedOcc	EnumPoint
Sensor Occupancy	nvoData1	SenOcc	EnumPoint
Shutdown	nvoData1	ShutDown	EnumPoint
Smoke Monitor	nvoData1	SmokeMonitor	EnumPoint
Space CO2	nvoData2	SpaceCo2	NumericPoint
Space Temperature	nvoData2	SpaceTemp	NumericPoint
Temperature Setpoint	nvoData2	TempControlPt	NumericPoint
Window Open	nvoData1	WindowOpen	EnumPoint

Table 85. UV Application of Points.

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Occupied Cool (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Standby Cool (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Unoccupied Cool (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0

Table 85. UV Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Occupied Heat (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Standby Heat (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Unoccupied Heat (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Current State					X	ocOccupied ocUnoccupied ocBypass ocStandby ocNul
Next State					X	ocOccupied ocUnoccupied ocBypass ocStandby ocNul
Time To Next State					X	Units=min Precision=0 Min=0.0 Max=65535.0
DLC Shed					X	dIcNoDlcShed dIcMinDlcShed
Air Flow Loss					X	false or true
Communication Failed					X	false or true
Dirty Filter					X	false or true
Drip Pan Full					X	false or true
Freeze State					X	false or true
Frost Protect					X	false or true
Indoor Air Quality Override					X	false or true
Invalid Setpoint					X	false or true
Low Limit Economizer Close					X	false or true
Node Disabled					X	false or true
Outside Air Quality					X	false or true
Sensor Failed					X	false or true

Table 85. UV Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Application Mode	X	X	X	X		Default Auto Heat Morning Warmup Cool Night Purge Pre-cool Off Test Emergency Heat Fan Only Free Cool Ice Maximum Heat Economy Dehumidify Calibrate Emergency Cool Emergency Steam Max Cool HVAC Load No Load
Fan Speed Command	X	X	X	X		Off Zero Low Medium High Auto
Manual Mode	X	X	X	X		Enable Disable Manual Suppress Alarms Unsuppress Alarms
Manual Occupancy	X	X	X	X		Default Occupied Unoccupied Bypass Standby
Temporary Setpoint	X	X	X	X		Units=°C Precision=1 Min=10.0 Max=35.0
Auxiliary Economizer Out	X	X	X			Off or On
Bypass Timer	X	X	X			Units=min Precision=0 Min=0.0 Max=65535.0
Calculated Outdoor Enthalpy	X	X	X			Units=BTU/lb Precision=1 Min=-256.0 Max=256.0
Calculated Return Air Enthalpy	X	X	X			Units=BTU/lb Precision=1 Min=-256.0 Max=256.0
Coil Freeze State	X	X	X			False or True
Cool Percent	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8

Table 85. UV Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Cool Position	X	X	X			Units=% Precision=0 Min=-128.0 Max=127.0
Cool Stages On	X	X	X			Units=null Precision=0 Min=0.0 Max=3.0
DLC Shed	X	X	X			Restored or Shed
Dirty Filter	X	X	X			False or True
Discharge Air Setpoint	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Discharge Air Temperature	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Drip Pan Full	X	X	X			False or True
Economizer Enabled	X	X	X			Default Off Low Medium High On
Economizer Float Synch	X	X	X			Off or On
Economizer Position	X	X	X			Units=% Precision=0 Min=-128.0 Max=127.0
Effective Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Fan Speed	X	X	X			Units=null Precision=0 Min=0.0 Max=7.0
Fan Switch	X	X	X			Default Off Low Medium High On
Filter Pressure	X	X	X			Units=in/wc Precision=1 Min=-32.0 Max=32.0
Free State 1	X	X	X			Off or On
Heat Percent	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8

Table 85. UV Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Heat Position	X	X	X			Units=% Precision=0 Min=-128.0 Max=127.0
Heat Source	X	X	X			Default Off Low Medium High On
Heat Stages On	X	X	X			Units=null Precision=0 Min=0.0 Max=3.0
Indoor Air Quality Override	X	X	X			False or True
Manual Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Mixed Air Temperature	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Mode	X	X	X			Startup Wait Heat Cool Off Disabled Smoke Emergency Freeze Protect Manual Factory Test Fan Only
Monitor 1	X	X	X			Units=V Precision=1 Min=-32.0 Max=32.0
Monitor Switch	X	X	X			Off or On
Occupancy Statue Out	X	X	X			Off or On
Occupancy Time Clock	X	X	X			Default Off Low Medium High On
Outdoor Air Enthalpy	X	X	X			Units=mA Precision=1 Min=-256.0 Max=256.0
Outdoor Humidity	X	X	X			Units=% Precision=1 Min=0.0 Max=127.5
Outdoor Temperature	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0



Table 85. UV Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Outside Air Quality	X	X	X			Units=ppm Precision=0 Min=0.0 Max=65535.0
Override	X	X	X			Default Occupied Unoccupied Bypass Standby
Proof Of Air Flow	X	X	X			Default Off Low Medium High On
Return Air Enthalpy	X	X	X			Units=mA Precision=1 Min=-256.0 Max=256.0
Return Air Humidity	X	X	X			Units=% Precision=1 Min=0.0 Max=127.5
Return Air Temperature	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Scheduled Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Sensor Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Shutdown	X	X	X			False or True
Smoke Monitor	X	X	X			False or True
Space CO2	X	X	X			Units=ppm Precision=0 Min=0.0 Max=65535.0
Space Temperature	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Effective Setpoint	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Window Open	X	X	X			Closed or Open

## Excel 10 VAV II Controller (VAV II)

Table 86 provides the VAV II points detail and Table 87 on page 146 provides the VAV II application of points.

**Table 86. VAV II Point Details.**

Point Name	Network Variable	Field	Point Type
Occupied Cool	nciSetPts	occupiedCool	NumericWritable
Standby Cool	nciSetPts	standbyCool	NumericWritable
Unoccupied Cool	nciSetPts	unoccupiedCool	NumericWritable
Occupied Heat	nciSetPts	occupiedHeat	NumericWritable
Standby Heat	nciSetPts	standbyHeat	NumericWritable
Unoccupied Heat	nciSetPts	unoccupiedHeat	NumericWritable
Current State	nviTodEvent	currentState	EnumWritable
Next State	nviTodEvent	nextState	EnumWritable
Time To Next State	nviTodEvent	timeToNextState	NumericWritable
DLC Shed	nviDlcShed	dlcShed	EnumWritable
Communication Failed	nvoAlarmStatus	CommFail	EnumPoint
Frost Protect	nvoAlarmStatus	FrostProtect	EnumPoint
Invalid Config	nvoAlarmStatus	InvalidConfig	EnumPoint
Invalid Setpoint	nvoAlarmStatus	InvalidSetpoint	EnumPoint
Node Disabled	nvoAlarmStatus	NodeDisabled	EnumPoint
Sensor Failed	nvoAlarmStatus	SensorFail	EnumPoint
Smoke Emergency	nvoAlarmStatus	SmokeEmergency	EnumPoint
Application Mode	nviApplicMode	hvacMode	EnumWritable
Manual Mode	nviManualMode	manMode	EnumWritable
Manual Occupancy	nviManOcc	occupancy	EnumWritable
Temporary Setpoint	nviSetPoint	tempP	NumericWritable
Auxiliary On	nvoData	AuxOn	EnumPoint
Box Flow	nvoData	uiBoxFlowS0	NumericPoint
Box Flow Control Setpoint	nvoData	uiBoxFlowControlPtS0	NumericPoint
Box Heat Flow	nvoData	uiBoxHeatFlowS0	NumericPoint
Bypass Timer	nvoData	BypassTimer	NumericPoint
DLC Shed	nvoData	DlcShed	EnumPoint
Damper Position	nvoData	ubDamperPosS1	NumericPoint
Digital In 1	nvoIO	DigitalIn1	EnumPoint
Digital In 2	nvoIO	DigitalIn2	EnumPoint
Digital In 3	nvoIO	DigitalIn3	EnumPoint
Digital Out 1	nvoIO	DigitalOut1	EnumPoint
Digital Out 2	nvoIO	DigitalOut2	EnumPoint
Digital Out 3	nvoIO	DigitalOut3	EnumPoint
Digital Out 4	nvoIO	DigitalOut4	EnumPoint
Digital Out 5	nvoIO	DigitalOut5	EnumPoint
Digital Out 6	nvoIO	DigitalOut6	EnumPoint
Digital Out 7	nvoIO	DigitalOut7	EnumPoint
Digital Out 8	nvoIO	DigitalOut8	EnumPoint
Discharge Temperature	nvoData	siDischargeTempS7	NumericPoint
Effective Occupancy	nvoData	EffectOcc	EnumPoint
Fan Speed	nvoData	ubFanSpdS1	NumericPoint

Table 86. VAV II Point Details. (Continued)

Point Name	Network Variable	Field	Point Type
Fan Status	nvoData	FanOn	EnumPoint
Field No	nvoData	FieldNo	EnumPoint
Flow Sensor	nvoIO	siFlowSensorS3	NumericPoint
Flow Uncorrected	nvoIO	siFlowUncorrectedS3	NumericPoint
Flow Volts	nvoIO	siFlowVoltsS12	NumericPoint
Free 1 On	nvoData	Free1On	EnumPoint
Fresh Air Ratio	nvoData	siFreshAirRatio	NumericPoint
Heat Cool Switch	nvoData	HeatCoolSwitch	EnumPoint
Heat Cool Switch	nvoIO	HeatCoolSwitch	EnumPoint
Heat Stages	nvoData	HeatStages	NumericPoint
IO Test In	nvoIO	IOTestIn	EnumPoint
IO Test Switch	nvoIO	IOTestSwitch	EnumPoint
Low Flow Alarm	nvoData	LowFlowAlarm	EnumPoint
Manual Occupancy	nvoData	NetManOcc	EnumPoint
Mode	nvoData	Mode	EnumPoint
Model	nvoIO	Model	NumericPoint
Monitor Switch	nvoData	MonSwitch	EnumPoint
Monitor Switch	nvoIO	MonSwitch	EnumPoint
Occupancy Sensor	nvoIO	OccupancySensor	EnumPoint
Override	nvoData	OverRide	EnumPoint
Override IO	nvoIO	OverRide	EnumPoint
Peripheral Heat On	nvoData	PeriphHeatOn	EnumPoint
Peripheral Heat Position	nvoData	ubPeriphHeatPosS1	NumericPoint
Reheat Percentage	nvoData	ubReheatPosS1	NumericPoint
Scheduled Occupancy	nvoData	SchedOcc	EnumPoint
Sensor Occupancy	nvoData	SenOcc	EnumPoint
Space Temperature	nvoData	siSpaceTempS7	NumericPoint
Space Temperature IO	nvoIO	siSpaceTempS7	NumericPoint
Supply Temperature	nvoData	siSupplyTempS7	NumericPoint
Temperature Sensor 0	nvoIO	siTempSensorS7N0	NumericPoint
Temperature Sensor 1	nvoIO	siTempSensorS7N1	NumericPoint
Temperature Setpoint	nvoData	siTempControlPtS7	NumericPoint
Window Open	nvoData	WindowOpen	EnumPoint
Window Open IO	nvoIO	WindowOpen	EnumPoint

Table 87. VAV II Application of Points

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Occupied Cool (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Standby Cool (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0

Table 87. VAV II Application of Points (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Unoccupied Cool (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Occupied Heat (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Standby Heat (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Unoccupied Heat (Setpoint)					X	Units=°C Precision=2 Min=10.0 Max=35.0
Current State					X	Default Occupied Unoccupied Bypass Standby
Next State					X	Default Occupied Unoccupied Bypass Standby
Time To Next State					X	Units=min Precision=0 Min=0.0 Max=65535.0
DLC Shed					X	dINoDlcShed dIMinDlcShed
Communication Failed					X	False or True
Frost Protect					X	False or True
Invalid Config					X	False or True
Invalid Setpoint					X	False or True
Node Disabled					X	False or True
Sensor Failed					X	False or True
Smoke Emergency					X	False or True

Table 87. VAV II Application of Points (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Application Mode	X	X	X	X		Default Auto Heat Morning Warmup Cool Night Purge Pre-cool Off Test Emergency Heat Fan Only Free Cool Ice Maximum Heat Economy Dehumidify Calibrate Emergency Cool Emergency Steam Max Cool HVAC Load No Load
Manual Mode	X	X	X	X		Enable Disable Manual Suppress Alarms Unsuppress Alarms
Manual Occupancy	X	X	X	X		Default Occupied Unoccupied Bypass Standby
Temporary Setpoint	X	X	X	X		Units=°C Precision=1 Min=10.0 Max=35.0
Auxiliary On	X	X	X			Off or On
Box Flow	X	X	X			Units=L/s Precision=0 Min=0.0 Max=65535.0
Box Flow Control Setpoint	X	X	X			Units=L/s Precision=0 Min=0.0 Max=65535.0
Box Heat Flow	X	X	X			Units=L/s Precision=0 Min=0.0 Max=65535.0
Bypass Timer	X	X	X			Units=min Precision=0 Min=0.0 Max=65535.0
DLC Shed	X	X	X			Restored or Shed
Damper Position	X	X	X			Units=% Precision=1 Min=0.0 Max=100.0
Digital In 1	X	X	X			False or True

Table 87. VAV II Application of Points (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Digital In 2	X	X	X			False or True
Digital In 3	X	X	X			False or True
Digital Out 1	X	X	X			Off or On
Digital Out 2	X	X	X			Off or On
Digital Out 3	X	X	X			Off or On
Digital Out 4	X	X	X			Off or On
Digital Out 5	X	X	X			Off or On
Digital Out 6	X	X	X			Off or On
Digital Out 7	X	X	X			Off or On
Digital Out 8	X	X	X			Off or On
Discharge Temperature	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Effective Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Fan Speed	X	X	X			Units=% Precision=1 Min=0.0 Max=100.0
Fan Status	X	X	X			Off or On
Field No	X	X	X			Update All Fields Mode Effective Occupancy Override Scheduled Occupancy Network Manual Occupancy Sensor Occupancy Bypass Timer Temperature Control Point Space Temperature Discharge Temperature Supply Temperature Fresh Air Ratio Box Flow Cont
Flow Sensor	X	X	X			Units=ft/min Precision=1 Min=-4096.0 Max=4095.9
Flow Uncorrected	X	X	X			Units=ft/min Precision=1 Min=-4096.0 Max=4095.9
Flow Volts	X	X	X			Units=V Precision=1 Min=-8.0 Max=8.0
Free 1 On	X	X	X			Off or On
Fresh Air Ratio	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Heat Cool Switch	X	X	X			Off or On

Table 87. VAV II Application of Points (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Heat Cool Switch	X	X	X			Off or On
Heat Stages	X	X	X			Units=null Precision=0 Min=0.0 Max=3.0
IO Test In	X	X	X			False or True
IO Test Switch	X	X	X			Off or On
Low Flow Alarm	X	X	X			False or True
Manual Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Mode	X	X	X			Startup Wait Heat Cool Reheat Morning Warm-up Night Purge Pressurize Depressurize Track Flow Manual Position Manual Flow Freeze Protect Factory Test IO Test Floating Out of Sync Disabled Manual
Model	X	X	X			Units=null Precision=0 Min=0.0 Max=3.0
Monitor Switch	X	X	X			Off or On
Monitor Switch	X	X	X			Off or On
Occupancy Sensor	X	X	X			Unoccupied Occupied
Override	X	X	X			Default Occupied Unoccupied Bypass Standby
Override IO	X	X	X			False or True
Peripheral Heat On	X	X	X			Off or On
Peripheral Heat Position	X	X	X			Units=% Precision=1 Min=0.0 Max=100.0
Reheat Position	X	X	X			Units=% Precision=1 Min=0.0 Max=100.0

Table 87. VAV II Application of Points (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Scheduled Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Sensor Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Space Temperature	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Space Temperature IO	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Supply Temperature	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Temperature Sensor 0	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Temperature Sensor 1	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Effective Setpoint	X	X	X			Units=°F Precision=1 Min=-256.0 Max=256.0
Window Open	X	X	X			Closed or Open
Window Open IO	X	X	X			Closed or Open



## Vacon NX Frequency Converter (NXVFD)

Table 88 provides the NXVFD points detail and Table 89 on page 153 provides the NXVFD application of points.

**Table 88. NXVFD Point Details.**

Point Name	Network Variable	Field Name	Point Type
Application Type	nciApplVer	applicationType	NumericWritable
Application Version	nciApplVer	versionNo	NumericWritable
Application Ver Time	nciApplVer	time	NumericWritable
Device Name	nciDeviceName	DeviceName	String Writable
Adjust Input	nviProcessIn3	levPercent	NumericWritable
Free Analog Input	nviProcessIn2	levPercent	NumericWritable
Torque Reference	nviProcessIn1	levPercent	NumericWritable
Adjust Input / Actual Value 2	nviProcessIn3	levPercent	NumericWritable
Clear Counter	nviClrCntr	value	NumericWritable
Drive Speed Setpoint	nviDrvSpeedStpt	value	NumericWritable
Free Analog / Input Actual Value 1	nviProcessIn2	levPercent	NumericWritable
Reset Fault	nviRstFault	value	NumericWritable
Torque Reference / Reference for PID	nviProcessIn1	levPercent	NumericWritable
AC Fault Code	nvoProcessOut8	levPercent	NumericPoint
Fault Active	nvoDrvStatus	bit3	BooleanPoint
DC Link Voltage	nvoProcessOut7	levPercent	NumericPoint
Drive Current	nvoDrvCurnt	amp	NumericPoint
Drive Energy	nvoDrvEnrgy	elecKwh	NumericPoint
Drive Power	nvoDrvPwr	powerKilo	NumericPoint
Ready	nvoDrvStatus	bit0	BooleanPoint
Running	nvoDrvStatus	bit1	BooleanPoint
Drive Speed	nvoDrvSpeed	levPercent	NumericPoint
Active Fault Code	nvoActFault	count	NumericPoint
Motor Current	nvoProcessOut3	levPercent	NumericPoint
Motor Power	nvoProcessOut5	levPercent	NumericPoint
Motor Speed	nvoProcessOut2	levPercent	NumericPoint
Motor Torque	nvoProcessOut4	levPercent	NumericPoint
Motor Voltage	nvoProcessOut6	levPercent	NumericPoint
Output Frequency	nvoProcessOut1	levPercent	NumericPoint
Reference Eq Actual	nvoDrvStatus	bit5	BooleanPoint
Drive Run Hours	nvoDrvRunHours	timeHour	NumericPoint
Counter Clockwise	nvoDrvStatus	bit2	BooleanPoint
Warning Active	nvoDrvStatus	bit4	BooleanPoint

Table 89. NXVFD Application of Points.

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Adjust Input / Actual Value 2	X	X	X	X		Units=% Precision=1 Min=-163.8 Max=163.8
Clear Counter	X	X	X	X		Units=% Precision=1 Min=0.0 Max=100.0
Drive Speed Setpoint	X	X	X	X		Units=% Precision=1 Min=0.0 Max=100.0
Free Analog / Input Actual Value 1	X	X	X	X		Units=% Precision=1 Min=-163.8 Max=163.8
Reset Fault	X	X	X	X		Units=% Precision=1 Min=0.0 Max=100.0
Torque Reference / Reference for PID	X	X	X	X		Units=% Precision=1 Min=-163.8 Max=163.8
AC Fault Code	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Fault Active	X	X	X			True or False
DC Link Voltage	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Drive Current	X	X	X			Units=A Precision=1 Min=-3276.8 Max=3276.7
Drive Energy	X	X	X			Units=kW/hr Precision=0 Min=0.0 Max=65535.0
Drive Power	X	X	X			Units=kW Precision=1 Min=0.0 Max=6553.5
Ready	X	X	X			True or False
Running	X	X	X			True or False
Drive Speed	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Active Fault Code	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0

Table 89. NXVFD Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Motor Current	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Motor Power	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Motor Speed	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Motor Torque	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Motor Voltage	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Output Frequency	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Reference Eq Actual	X	X	X			True or False
Drive Run Hours	X	X	X			Units=hr Precision=0 Min=0.0 Max=65535.0
Counter Clockwise	X	X	X			True or False
Warning Active	X	X	X			True or False

## XL15C Plant Controller (XL15C)

Table 90 provides the XL15C points detail and Table 91 on page 158 provides the XL15C application of points.

**Table 90. XL15C Point Details.**

Point Name	Network Variable	Field	Point Type
Nvo Alarm Status _ St Pt Lp8 Alm	nvoAlarmStatus/data	StPtLp8Alm	BooleanPoint
Nvo Alarm Status _ St Pt Lp7 Alm	nvoAlarmStatus/data	StPtLp7Alm	BooleanPoint
Nvo Alarm Status _ St Pt Lp6 Alm	nvoAlarmStatus/data	StPtLp6Alm	BooleanPoint
Nvo Alarm Status _ St Pt Lp5 Alm	nvoAlarmStatus/data	StPtLp5Alm	BooleanPoint
Nvo Alarm Status _ St Pt Lp4 Alm	nvoAlarmStatus/data	StPtLp4Alm	BooleanPoint
Nvo Alarm Status _ St Pt Lp3 Alm	nvoAlarmStatus/data	StPtLp3Alm	BooleanPoint
Nvo Alarm Status _ St Pt Lp2 Alm	nvoAlarmStatus/data	StPtLp2Alm	BooleanPoint
Nvo Alarm Status _ St Pt Lp1 Alm	nvoAlarmStatus/data	StPtLp1Alm	BooleanPoint
Nvo Alarm Status _ R A M Checksum Alm	nvoAlarmStatus/data	RAMChecksumAlm	BooleanPoint
Nvo Alarm Status _ File Alm	nvoAlarmStatus/data	FileAlm	BooleanPoint
Nvo Alarm Status _ Input Rem Poll Alm	nvoAlarmStatus/data	InputRemPollAlm	BooleanPoint
Nvo Alarm Status _ Flash Chksum Alm	nvoAlarmStatus/data	FlashChksumAlm	BooleanPoint
Nvo Alarm Status _ Sensor Alm	nvoAlarmStatus/data	SensorAlm	BooleanPoint
Nvo Alarm Status _ Input N V Alm	nvoAlarmStatus/data	InputNVAIm	BooleanPoint
Nvo Alarm Status _ St Pt Lp10 Alm	nvoAlarmStatus/data	StPtLp10Alm	BooleanPoint
Nvo Alarm Status _ St Pt Lp9 Alm	nvoAlarmStatus/data	StPtLp9Alm	BooleanPoint
Nvo A I Cnt _ai Chan1 Sensor	nvoAICnt/data	aiChan1Sensor	NumericPoint
Nvo A I Cnt _ai Chan2 Sensor	nvoAICnt/data	aiChan2Sensor	NumericPoint
Nvo A I Cnt _ai Chan3 Sensor	nvoAICnt/data	aiChan3Sensor	NumericPoint
Nvo A I Cnt _ai Chan4 Sensor	nvoAICnt/data	aiChan4Sensor	NumericPoint
Nvo A I Cnt _ai Chan5 Sensor	nvoAICnt/data	aiChan5Sensor	NumericPoint
Nvo A I Cnt _ai Chan6 Sensor	nvoAICnt/data	aiChan6Sensor	NumericPoint
Nvo A I Cnt _ai Chan7 Sensor	nvoAICnt/data	aiChan7Sensor	NumericPoint
Nvo A I Cnt _ai Chan8 Sensor	nvoAICnt/data	aiChan8Sensor	NumericPoint
Nvo A I Cnt _ai Calibration Chan1	nvoAICnt/data	aiCalibrationChan1	NumericPoint
Nvo A I Cnt _ai Calibration Chan2	nvoAICnt/data	aiCalibrationChan2	NumericPoint
Nvo A I Filtered Cnt _ai Chan1 Sensor	nvoAIFilteredCnt/data	aiChan1Sensor	NumericPoint
Nvo A I Filtered Cnt _ai Chan2 Sensor	nvoAIFilteredCnt/data	aiChan2Sensor	NumericPoint
Nvo A I Filtered Cnt _ai Chan3 Sensor	nvoAIFilteredCnt/data	aiChan3Sensor	NumericPoint
Nvo A I Filtered Cnt _ai Chan4 Sensor	nvoAIFilteredCnt/data	aiChan4Sensor	NumericPoint
Nvo A I Filtered Cnt _ai Chan5 Sensor	nvoAIFilteredCnt/data	aiChan5Sensor	NumericPoint
Nvo A I Filtered Cnt _ai Chan6 Sensor	nvoAIFilteredCnt/data	aiChan6Sensor	NumericPoint
Nvo A I Filtered Cnt _ai Chan7 Sensor	nvoAIFilteredCnt/data	aiChan7Sensor	NumericPoint
Nvo A I Filtered Cnt _ai Chan8 Sensor	nvoAIFilteredCnt/data	aiChan8Sensor	NumericPoint
Nvo A I Filtered Cnt _ai Calibration Chan1	nvoAIFilteredCnt/data	aiCalibrationChan1	NumericPoint
Nvo A I Filtered Cnt _ai Calibration Chan2	nvoAIFilteredCnt/data	aiCalibrationChan2	NumericPoint
Nvo D I Sensor _on Off1	nvoDISensor/data	onOff1	EnumPoint
Nvo D I Sensor _on Off2	nvoDISensor/data	onOff2	EnumPoint
Nvo D I Sensor _on Off3	nvoDISensor/data	onOff3	EnumPoint
Nvo D I Sensor _on Off4	nvoDISensor/data	onOff4	EnumPoint
Nvo D I Sensor _on Off5	nvoDISensor/data	onOff5	EnumPoint
Nvo D I Sensor _on Off6	nvoDISensor/data	onOff6	EnumPoint

Table 90. XL15C Point Details. (Continued)

Point Name	Network Variable	Field	Point Type
Nvo D I Sensor _on Off7	nvoDISensor/data	onOff7	EnumPoint
Nvo D I Sensor _on Off8	nvoDISensor/data	onOff8	EnumPoint
Nvo Cal Cnt _ Cal Count0	nvoCalCnt/data	CalCount0	NumericPoint
Nvo Cal Cnt _ Cal Count1	nvoCalCnt/data	CalCount1	NumericPoint
Nvo Cal Cnt _ Cal Count2	nvoCalCnt/data	CalCount2	NumericPoint
Nvo Cal Cnt _ Cal Count3	nvoCalCnt/data	CalCount3	NumericPoint
Nvo Cal Cnt _ Cal Count4	nvoCalCnt/data	CalCount4	NumericPoint
Nvo Cal Cnt _ Cal Count5	nvoCalCnt/data	CalCount5	NumericPoint
Nvo Cal Cnt _ Cal Count6	nvoCalCnt/data	CalCount6	NumericPoint
Nvo Cal Cnt _ Cal Count7	nvoCalCnt/data	CalCount7	NumericPoint
Nvo Cal Cnt _ Cal Count8	nvoCalCnt/data	CalCount8	NumericPoint
Nvo Cal Cnt _ Cal Count9	nvoCalCnt/data	CalCount9	NumericPoint
Nvo Cal Cnt _ Cal Count10	nvoCalCnt/data	CalCount10	NumericPoint
Nvo Cal Cnt _ Cal Count11	nvoCalCnt/data	CalCount11	NumericPoint
Nvo Od Temp _temp P	nvoOdTemp	tempP	NumericPoint
Nvo Od Hum _lev Percent	nvoOdHum	levPercent	NumericPoint
Nvo Counter1 _count	nvoCounter1	count	NumericPoint
Nvo Counter2 _count	nvoCounter2	count	NumericPoint
Nvo Cascade Out _power Kilo	nvoCascadeOut	powerKilo	NumericPoint
Nvo Sensor Occ1 _occupancy	nvoSensorOcc1	occupancy	EnumPoint
Nvo D A Temp _temp P	nvoDATemp	tempP	NumericPoint
applType	nciApplVer/data	applType	Numeric Writable
applVerNumber	nciApplVer/data	applVerNumber	Numeric Writable
applTime1Jan70	nciApplVer/data	applTime1Jan70	Numeric Writable
hwName	nciDeviceName/data	hwName	
Current State	temp/ControlLoop_1/nviTodEventIn	currentState	EnumWritable
Next State	temp/ControlLoop_1/nviTodEventIn	nextState	EnumWritable
Time To Next State	temp/ControlLoop_1/nviTodEventIn	timeToNextState	NumericWritable
Current State	temp/StartStopLoop_1/nviTodEventIn	currentState	EnumWritable
Next State	temp/StartStopLoop_1/nviTodEventIn	nextState	EnumWritable
Time To Next State	temp/StartStopLoop_1/nviTodEventIn	timeToNextState	NumericWritable
D L C Shed	temp/ControlLoop_1/nviDlcShedIn/data	destDlcShed	NumericWritable
D L C Shed	temp/StartStopLoop_1/nviDlcShedIn/data	destDlcShed	NumericWritable
Nci Flex Set Pts _occupied	temp/ControlLoop_1/nciFlexSetPts/data	occupied	NumericWritable
Nci Flex Set Pts _standby	temp/ControlLoop_1/nciFlexSetPts/data	standby	NumericWritable
Nci Flex Set Pts _unoccupied	temp/ControlLoop_1/nciFlexSetPts/data	unoccupied	NumericWritable
Nvi Bypass _value	temp/ControlLoop_1/nviBypass	value	NumericWritable
Nvi Bypass _state	temp/ControlLoop_1/nviBypass	state	EnumWritable
Nvi Man Occ _occupancy	temp/ControlLoop_1/nviManOcc	occupancy	EnumWritable
Nvi Bypass _value	temp/StartStopLoop_1/nviBypass	value	NumericWritable
Nvi Bypass _state	temp/StartStopLoop_1/nviBypass	state	EnumWritable
Nvi Man Occ _occupancy	temp/StartStopLoop_1/nviManOcc	occupancy	EnumWritable
Nvo A I Sensor _ai Val	temp/AnalogInput_1/nvoAISensor/data	aiVal	NumericPoint
Nvo Remote Cmd _lev Percent	temp/Remote_1_AO1/nvoRemoteCmd	levPercent	NumericPoint
Nvo Dig Cmd Free _value	temp/Remote_1_DO1/nvoDigCmdFree	value	NumericPoint
Nvo Dig Cmd Free _state	temp/Remote_1_DO1/nvoDigCmdFree	state	EnumPoint

Table 90. XL15C Point Details. (Continued)

Point Name	Network Variable	Field	Point Type
Nvo Appl Mode _hvac Mode	temp/NetworkOut/nvoApplMode	hvacMode	EnumPoint
Nvo Econ Enable _value	temp/NetworkOut/nvoEconEnable	value	NumericPoint
Nvo Econ Enable _state	temp/NetworkOut/nvoEconEnable	state	EnumPoint
Nvo Occupancy _occupancy	temp/NetworkOut/nvoOccupancy	occupancy	EnumPoint
Nvo Cool U T M L _value	temp/NetworkOut/nvoCoolUTML	value	NumericPoint
Nvo Cool U T M L _state	temp/NetworkOut/nvoCoolUTML	state	EnumPoint
Nvo Heat U T M L _value	temp/NetworkOut/nvoHeatUTML	value	NumericPoint
Nvo Heat U T M L _state	temp/NetworkOut/nvoHeatUTML	state	EnumPoint
Nvo Bypass _value	temp/ControlLoop_1/nvoBypass	value	NumericPoint
Nvo Bypass _state	temp/ControlLoop_1/nvoBypass	state	EnumPoint
Nvo F T Status _effective Set Point	temp/ControlLoop_1/nvoFTStatus/data	effectiveSetPoint	NumericPoint
Nvo F T Status _cntrl Sensor	temp/ControlLoop_1/nvoFTStatus/data	cntrlSensor	NumericPoint
Nvo F T Status _reset Amount	temp/ControlLoop_1/nvoFTStatus/data	resetAmount	NumericPoint
Nvo F T Status _bypass Remaining	temp/ControlLoop_1/nvoFTStatus/data	bypassRemaining	NumericPoint
Nvo F T Status _manual Mode	temp/ControlLoop_1/nvoFTStatus/data/loopState	manualMode	EnumPoint
Nvo F T Status _effect Occupancy	temp/ControlLoop_1/nvoFTStatus/data/loopState	effectOccupancy	EnumPoint
Nvo F T Status _sched Occupancy	temp/ControlLoop_1/nvoFTStatus/data/loopState	schedOccupancy	EnumPoint
Nvo F T Status _sensor Occupancy	temp/ControlLoop_1/nvoFTStatus/data/loopState	sensorOccupancy	EnumPoint
Nvo F T Status _sys Mode	temp/ControlLoop_1/nvoFTStatus/data/loopState	sysMode	EnumPoint
Nvo F T Status _dlc Status	temp/ControlLoop_1/nvoFTStatus/data/loopState	dlcStatus	BooleanPoint
Nvo F T Status _primary Cmd Percent	temp/ControlLoop_1/nvoFTStatus/data	primaryCmdPercent	NumericPoint
Nvo F T Status _seq1 Cmd Percent	temp/ControlLoop_1/nvoFTStatus/data	seq1CmdPercent	NumericPoint
Nvo F T Status _seq2 Cmd Percent	temp/ControlLoop_1/nvoFTStatus/data	seq2CmdPercent	NumericPoint
Nvo F T Status _seq3 Cmd Percent	temp/ControlLoop_1/nvoFTStatus/data	seq3CmdPercent	NumericPoint
Nvo F T Status _prim Activ Stages	temp/ControlLoop_1/nvoFTStatus/data	primActivStages	NumericPoint
Nvo F T Status _seq1 Active Stages	temp/ControlLoop_1/nvoFTStatus/data	seq1ActiveStages	NumericPoint
Nvo F T Status _seq2 Active Stages	temp/ControlLoop_1/nvoFTStatus/data	seq2ActiveStages	NumericPoint
Nvo F T Status _seq3 Active Stages	temp/ControlLoop_1/nvoFTStatus/data	seq3ActiveStages	NumericPoint
Nvo F T Status _prim Stage1 On	temp/ControlLoop_1/nvoFTStatus/data	primStage1On	BooleanPoint
Nvo F T Status _prim Stage2 On	temp/ControlLoop_1/nvoFTStatus/data	primStage2On	BooleanPoint
Nvo F T Status _prim Stage3 On	temp/ControlLoop_1/nvoFTStatus/data	primStage3On	BooleanPoint
Nvo F T Status _prim Stage4 On	temp/ControlLoop_1/nvoFTStatus/data	primStage4On	BooleanPoint
Nvo F T Status _seq1 Stage1 On	temp/ControlLoop_1/nvoFTStatus/data	seq1Stage1On	BooleanPoint
Nvo F T Status _seq1 Stage2 On	temp/ControlLoop_1/nvoFTStatus/data	seq1Stage2On	BooleanPoint
Nvo F T Status _seq1 Stage3 On	temp/ControlLoop_1/nvoFTStatus/data	seq1Stage3On	BooleanPoint
Nvo F T Status _seq1 Stage4 On	temp/ControlLoop_1/nvoFTStatus/data	seq1Stage4On	BooleanPoint
Nvo F T Status _seq2 Stage1 On	temp/ControlLoop_1/nvoFTStatus/data	seq2Stage1On	BooleanPoint
Nvo F T Status _seq2 Stage2 On	temp/ControlLoop_1/nvoFTStatus/data	seq2Stage2On	BooleanPoint
Nvo F T Status _seq2 Stage3 On	temp/ControlLoop_1/nvoFTStatus/data	seq2Stage3On	BooleanPoint
Nvo F T Status _seq2 Stage4 On	temp/ControlLoop_1/nvoFTStatus/data	seq2Stage4On	BooleanPoint
Nvo F T Status _seq3 Stage1 On	temp/ControlLoop_1/nvoFTStatus/data	seq3Stage1On	BooleanPoint
Nvo F T Status _seq3 Stage2 On	temp/ControlLoop_1/nvoFTStatus/data	seq3Stage2On	BooleanPoint
Nvo F T Status _seq3 Stage3 On	temp/ControlLoop_1/nvoFTStatus/data	seq3Stage3On	BooleanPoint
Nvo F T Status _seq3 Stage4 On	temp/ControlLoop_1/nvoFTStatus/data	seq3Stage4On	BooleanPoint
Nvo F T Status _aux Status	temp/ControlLoop_1/nvoFTStatus/data	auxStatus	EnumPoint
Nvo L L Status _man Mode Status	temp/LogicLoop_1/nvoLLStatus/data	manModeStatus	EnumPoint

**Table 90. XL15C Point Details. (Continued)**

Point Name	Network Variable	Field	Point Type
Nvo L L Status _or Gate Status	temp/LogicLoop_1/nvoLLStatus/data	orGateStatus	EnumPoint
Nvo L L Status _dc Ao Status	temp/LogicLoop_1/nvoLLStatus/data	dcAoStatus	NumericPoint
Nvo Bypass _value	temp/StartStopLoop_1/nvoBypass	value	NumericPoint
Nvo Bypass _state	temp/StartStopLoop_1/nvoBypass	state	EnumPoint
Nvo St Stp Status _bypass Remaining	temp/StartStopLoop_1/nvoStStpStatus/data	bypassRemaining	NumericPoint
Nvo St Stp Status _manual Mode	temp/StartStopLoop_1/nvoStStpStatus/data/loopState	manualMode	EnumPoint
Nvo St Stp Status _effect Occupancy	temp/StartStopLoop_1/nvoStStpStatus/data/loopState	effectOccupancy	EnumPoint
Nvo St Stp Status _sched Occupancy	temp/StartStopLoop_1/nvoStStpStatus/data/loopState	schedOccupancy	EnumPoint
Nvo St Stp Status _sensor Occupancy	temp/StartStopLoop_1/nvoStStpStatus/data/loopState	sensorOccupancy	EnumPoint
Nvo St Stp Status _sys Mode	temp/StartStopLoop_1/nvoStStpStatus/data/loopState	sysMode	EnumPoint
Nvo St Stp Status _dlc Status	temp/StartStopLoop_1/nvoStStpStatus/data/loopState	dlcStatus	BooleanPoint
Nvo St Stp Status _out Status	temp/StartStopLoop_1/nvoStStpStatus/data	outStatus	EnumPoint
Nvo Bypass Arb _override Priority	temp/StartStopLoop_1/nvoBypassArb/data	overridePriority	BooleanPoint
Nvo Bypass Arb _wall Mod Override	temp/StartStopLoop_1/nvoBypassArb/data	wallModOverride	EnumPoint
Nvo Bypass Arb _bypass Timer	temp/StartStopLoop_1/nvoBypassArb/data	bypassTimer	NumericPoint
Nvo Bypass Arb _occ Timer	temp/StartStopLoop_1/nvoBypassArb/data	occTimer	NumericPoint
Nvo Bypass Arb _schedule X	temp/StartStopLoop_1/nvoBypassArb/data	scheduleX	EnumPoint
Nvo Bypass Arb _occ Sensor	temp/StartStopLoop_1/nvoBypassArb/data	occSensor	EnumPoint
Nvo Bypass Arb _man Override	temp/StartStopLoop_1/nvoBypassArb/data	manOverride	EnumPoint
Nvo Bypass Arb _eff Occ State	temp/StartStopLoop_1/nvoBypassArb/data	effOccState	EnumPoint
Nvo Bypass Arb _bypass State	temp/StartStopLoop_1/nvoBypassArb/data	bypassState	NumericPoint

**Table 91. XL15C Application of Points.**

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Current State					X	Occupied Unoccupied Bypass Standby Default
Next State					X	Occupied Unoccupied Bypass Standby Default
Time To Next State					X	Units=min Precision=0 Min=0.0 Max=65535.0
Current State					X	Occupied Unoccupied Bypass Standby Default
Next State					X	Occupied Unoccupied Bypass Standby Default

Table 91. XL15C Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Time To Next State					X	Units=min Precision=0 Min=0.0 Max=65535.0
D L C Shed					X	Units=null Precision=0 Min=0.0 Max=255.0
D L C Shed					X	Units=null Precision=0 Min=0.0 Max=255.0
Nvo Alarm Status _ St Pt Lp8 Alm					X	False or True
Nvo Alarm Status _ St Pt Lp7 Alm					X	False or True
Nvo Alarm Status _ St Pt Lp6 Alm					X	False or True
Nvo Alarm Status _ St Pt Lp5 Alm					X	False or True
Nvo Alarm Status _ St Pt Lp4 Alm					X	False or True
Nvo Alarm Status _ St Pt Lp3 Alm					X	False or True
Nvo Alarm Status _ St Pt Lp2 Alm					X	False or True
Nvo Alarm Status _ St Pt Lp1 Alm					X	False or True
Nvo Alarm Status _ R A M Checksum Alm					X	False or True
Nvo Alarm Status _ File Alm					X	False or True
Nvo Alarm Status _ Input Rem Poll Alm					X	False or True
Nvo Alarm Status _ Flash Chksum Alm					X	False or True
Nvo Alarm Status _ Sensor Alm					X	False or True
Nvo Alarm Status _ Input N V Alm					X	False or True
Nvo Alarm Status _ St Pt Lp10 Alm					X	False or True
Nvo Alarm Status _ St Pt Lp9 Alm					X	False or True
Nci Flex Set Pts _occupied	X	X	X	X		Units=null Precision=1 Min=-inf Max=+inf
Nci Flex Set Pts _standby	X	X	X	X		Units=null Precision=1 Min=-inf Max=+inf
Nci Flex Set Pts _unoccupied	X	X	X	X		Units=null Precision=1 Min=-inf Max=+inf
Nvi Bypass _value	X	X	X	X		Units=% Precision=1 Min=0.0 Max=100.0
Nvi Bypass _state	X	X	X	X		Off On Default
Nvi Man Occ _occupancy	X	X	X	X		Occupied Unoccupied Bypass Standby Default



Table 91. XL15C Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Nvi Bypass _value	X	X	X	X		Units=% Precision=1 Min=0.0 Max=100.0
Nvi Bypass _state	X	X	X	X		Off On Default
Nvi Man Occ _occupancy	X	X	X	X		Occupied Unoccupied Bypass Standby Default
Nvo A I Sensor _ai Val	X	X	X			Units=null Precision=1 Min=-inf Max=+inf
Nvo Remote Cmd _lev Percent	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Nvo Dig Cmd Free _value	X	X	X			Units=% Precision=1 Min=0.0 Max=100.0
Nvo Dig Cmd Free _state	X	X	X			Off On Default
Nvo Appl Mode _hvac Mode	X	X	X			Default Auto Heat Morning Warmup Cool Night Purge Pre-cool Off Test Emergency Heat Fan Only Free Cool Ice Maximum Heat Economy Dehumidify Calibrate Emergency Cool Emergency Steam Max Cool HVAC Load No Load
Nvo Econ Enable _value	X	X	X			Units=% Precision=1 Min=0.0 Max=100.0
Nvo Econ Enable _state	X	X	X			Off On Default

Table 91. XL15C Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Nvo Occupancy_occupancy	X	X	X			Occupied Unoccupied Bypass Standby Default
Nvo Cool U T M L _value	X	X	X			Units=% Precision=1 Min=0.0 Max=100.0
Nvo Cool U T M L _state	X	X	X			Off On Default
Nvo Heat U T M L _value	X	X	X			Units=% Precision=1 Min=0.0 Max=100.0
Nvo Heat U T M L _state	X	X	X			Off On Default
Nvo Bypass _value	X	X	X			Units=% Precision=1 Min=0.0 Max=100.0
Nvo Bypass _state	X	X	X			Off On Default
Nvo F T Status _effective Set Point	X	X	X			Units=null Precision=1 Min=-inf Max=+inf
Nvo F T Status _cntrl Sensor	X	X	X			Units=null Precision=1 Min=-inf Max=+inf
Nvo F T Status _reset Amount	X	X	X			Units=null Precision=1 Min=-inf Max=+inf
Nvo F T Status _bypass Remaining	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo F T Status _manual Mode	X	X	X			Enable Disable Manual
Nvo F T Status _effect Occupancy	X	X	X			Occupied Unoccupied Bypass Standby Default
Nvo F T Status _sched Occupancy	X	X	X			Occupied Unoccupied Bypass Standby Default

**Table 91. XL15C Application of Points. (Continued)**

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Nvo F T Status _sensor Occupancy	X	X	X			Occupied Unoccupied Bypass Standby Default
Nvo F T Status _sys Mode	X	X	X			Auto Heat Morning Warmup Cool Night Purge Pre-cool Off Test Emergency Heat Fan Only Free Cool Ice Maximum Heat Economy Dehumidify Calibrate Emergency Cool Emergency Steam Default
Nvo F T Status _dlc Status	X	X	X			TRUE
Nvo F T Status _primary Cmd Percent	X	X	X			Units=% Precision=0 Min=0.0 Max=255.0
Nvo F T Status _seq1 Cmd Percent	X	X	X			Units=% Precision=0 Min=0.0 Max=255.0
Nvo F T Status _seq2 Cmd Percent	X	X	X			Units=% Precision=0 Min=0.0 Max=255.0
Nvo F T Status _seq3 Cmd Percent	X	X	X			Units=% Precision=0 Min=0.0 Max=255.0
Nvo F T Status _prim Activ Stages	X	X	X			Units=null Precision=0 Min=0.0 Max=255.0
Nvo F T Status _seq1 Active Stages	X	X	X			Units=null Precision=0 Min=0.0 Max=255.0
Nvo F T Status _seq2 Active Stages	X	X	X			Units=null Precision=0 Min=0.0 Max=255.0
Nvo F T Status _seq3 Active Stages	X	X	X			Units=null Precision=0 Min=0.0 Max=255.0
Nvo F T Status _prim Stage1 On	X	X	X			False or True
Nvo F T Status _prim Stage2 On	X	X	X			False or True

Table 91. XL15C Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Nvo F T Status _prim Stage3 On	X	X	X			False or True
Nvo F T Status _prim Stage4 On	X	X	X			False or True
Nvo F T Status _seq1 Stage1 On	X	X	X			False or True
Nvo F T Status _seq1 Stage2 On	X	X	X			False or True
Nvo F T Status _seq1 Stage3 On	X	X	X			False or True
Nvo F T Status _seq1 Stage4 On	X	X	X			False or True
Nvo F T Status _seq2 Stage1 On	X	X	X			False or True
Nvo F T Status _seq2 Stage2 On	X	X	X			False or True
Nvo F T Status _seq2 Stage3 On	X	X	X			False or True
Nvo F T Status _seq2 Stage4 On	X	X	X			False or True
Nvo F T Status _seq3 Stage1 On	X	X	X			False or True
Nvo F T Status _seq3 Stage2 On	X	X	X			False or True
Nvo F T Status _seq3 Stage3 On	X	X	X			False or True
Nvo F T Status _seq3 Stage4 On	X	X	X			False or True
Nvo F T Status _aux Status	X	X	X			Off or On
Nvo L L Status _man Mode Status	X	X	X			Enable Disable Manual
Nvo L L Status _or Gate Status	X	X	X			Off or On
Nvo L L Status _dc Ao Status	X	X	X			Units=null Precision=1 Min=-inf Max=+inf
Nvo Bypass _value	X	X	X			Units=% Precision=1 Min=0.0 Max=100.0
Nvo Bypass _state	X	X	X			Off On Default
Nvo St Stp Status _bypass Remaining	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo St Stp Status _manual Mode	X	X	X			Enable Disable Manual
Nvo St Stp Status _effect Occupancy	X	X	X			Occupied Unoccupied Bypass Standby Default
Nvo St Stp Status _sched Occupancy	X	X	X			Occupied Unoccupied Bypass Standby Default
Nvo St Stp Status _sensor Occupancy	X	X	X			Occupied Unoccupied Bypass Standby Default

Table 91. XL15C Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Nvo St Stp Status _sys Mode	X	X	X			Auto Heat Morning Warmup Cool Night Purge Pre-cool Off Test Emergency Heat Fan Only Free Cool Ice Maximum Heat Economy Dehumidify Calibrate Emergency Cool Emergency Steam Default
Nvo St Stp Status _dlc Status	X	X	X			False or True
Nvo St Stp Status _out Status	X	X	X			Off or On
Nvo Bypass Arb _override Priority	X	X	X			False or True
Nvo Bypass Arb _wall Mod Override	X	X	X			Occupied Unoccupied Bypass Standby Default
Nvo Bypass Arb _bypass Timer	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo Bypass Arb _occ Timer	X	X	X			Units=null Precision=0 Min=0.0 Max=255.0
Nvo Bypass Arb _schedule X	X	X	X			Occupied Unoccupied Bypass Standby Default
Nvo Bypass Arb _occ Sensor	X	X	X			Occupied Unoccupied Bypass Standby Default
Nvo Bypass Arb _man Override	X	X	X			Occupied Unoccupied Bypass Standby Default
Nvo Bypass Arb _eff Occ State	X	X	X			Occupied Unoccupied Bypass Standby Default
Nvo Bypass Arb _bypass State	X	X	X			Units=null Precision=0 Min=-128.0 Max=127.0

Table 91. XL15C Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Nvo A   Cnt_ai Chan1 Sensor	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo A   Cnt_ai Chan2 Sensor	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo A   Cnt_ai Chan3 Sensor	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo A   Cnt_ai Chan4 Sensor	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo A   Cnt_ai Chan5 Sensor	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo A   Cnt_ai Chan6 Sensor	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo A   Cnt_ai Chan7 Sensor	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo A   Cnt_ai Chan8 Sensor	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo A   Cnt_ai Calibration Chan1	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo A   Cnt_ai Calibration Chan2	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo A   Filtered Cnt_ai Chan1 Sensor	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo A   Filtered Cnt_ai Chan2 Sensor	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo A   Filtered Cnt_ai Chan3 Sensor	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo A   Filtered Cnt_ai Chan4 Sensor	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0

Table 91. XL15C Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Nvo A I Filtered Cnt _ai Chan5 Sensor	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo A I Filtered Cnt _ai Chan6 Sensor	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo A I Filtered Cnt _ai Chan7 Sensor	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo A I Filtered Cnt _ai Chan8 Sensor	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo A I Filtered Cnt _ai Calibration Chan1	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo A I Filtered Cnt _ai Calibration Chan2	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo D I Sensor _on Off1	X	X	X			Off or On
Nvo D I Sensor _on Off2	X	X	X			Off or On
Nvo D I Sensor _on Off3	X	X	X			Off or On
Nvo D I Sensor _on Off4	X	X	X			Off or On
Nvo D I Sensor _on Off5	X	X	X			Off or On
Nvo D I Sensor _on Off6	X	X	X			Off or On
Nvo D I Sensor _on Off7	X	X	X			Off or On
Nvo D I Sensor _on Off8	X	X	X			Off or On
Nvo Cal Cnt _ Cal Count0	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo Cal Cnt _ Cal Count1	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo Cal Cnt _ Cal Count2	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo Cal Cnt _ Cal Count3	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo Cal Cnt _ Cal Count4	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo Cal Cnt _ Cal Count5	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0

Table 91. XL15C Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Nvo Cal Cnt _ Cal Count6	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo Cal Cnt _ Cal Count7	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo Cal Cnt _ Cal Count8	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo Cal Cnt _ Cal Count9	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo Cal Cnt _ Cal Count10	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo Cal Cnt _ Cal Count11	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo Od Temp _temp P	X	X	X			Units=°C Precision=1 Min=-273.2 Max=327.7
Nvo Od Hum _lev Percent	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Nvo Counter1 _count	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo Counter2 _count	X	X	X			Units=null Precision=0 Min=0.0 Max=65535.0
Nvo Cascade Out _power Kilo	X	X	X			Units=kW Precision=1 Min=0.0 Max=6553.5
Nvo Sensor Occ1 _occupancy	X	X	X			Occupied Unoccupied Bypass Standby Default
Nvo Sensor Occ2 _occupancy	X	X	X			Occupied Unoccupied Bypass Standby Default
Nvo D A Temp _temp P	X	X	X			Units=°C Precision=1 Min=-273.2 Max=327.7



## T7350 Thermostat (T7350)

Table 92 provides the T7350 points detail and Table 93 on page 169 provides the T7350 application of points.

**Table 92. T7350 Point Details.**

Point Name	Network Variable	Field	Point Type
Occupied Cool	nciSetpoints	occupiedCool	NumericWritable
Standby Cool	nciSetpoints	standbyCool	NumericWritable
Unoccupied Cool	nciSetpoints	unoccupiedCool	NumericWritable
Occupied Heat	nciSetpoints	occupiedHeat	NumericWritable
Standby Heat	nciSetpoints	standbyHeat	NumericWritable
Unoccupied Heat	nciSetpoints	unoccupiedHeat	NumericWritable
Current State	nviOccSchedule	currentState	EnumWritable
Next State	nviOccSchedule	nextState	EnumWritable
Time To Next State	nviOccSchedule	timeToNextState	NumericWritable
DLC Shed	nviDlcShed	DlcShed	EnumWritable
Cover Communication Failed	nvoAlarmStatus	coverCommFail	EnumPoint
Invalid IO Configuration	nvoAlarmStatus	invalidIOConfig	EnumPoint
Invalid SubBase Type	nvoAlarmStatus	invalidSubBaseType	EnumPoint
Network Communication Failed	nvoAlarmStatus	networkCommFail	EnumPoint
Sensor Failed	nvoAlarmStatus	sensorFail	EnumPoint
Application Mode	nviApplicMode	hvacMode	EnumWritable
Manual Mode	nviRequest	objectRequest	EnumWritable
Manual Occupancy	nviOccManCmd	occupancy	EnumWritable
Temporary Setpoint	nviSetpoint	tempP	NumericWritable
Auxiliary Heat 1	nvoData2	noAuxHeat1	EnumPoint
Auxiliary Heat 2	nvoData2	noAuxHeat2	EnumPoint
Auxiliary Relay	nvoData2	relayAux	EnumPoint
Auxiliary Relay	nvoData2	auxRelay	EnumPoint
Bypass Time	nvoData1	bypassTime	NumericPoint
Cool Relay 1	nvoData2	relayCool1	EnumPoint
Cool Relay 2	nvoData2	relayCool2	EnumPoint
Cool Relay 3	nvoData2	relayCool3	EnumPoint
Cool Stages On	nvoData1	coolStgsOn	NumericPoint
DLC Shed	nvoData2	dlcShed	EnumPoint
Days Left Keypad Holiday	nvoData1	daysLeftKeypadHoliday	NumericPoint
Dehumidifier Active	nvoData2	dehumidActive	EnumPoint
Discharge Air Limit	nvoData2	DALimit	EnumPoint
Discharge Air Temperature	nvoData1	dischTemp	NumericPoint
Economizer Output	nvoUnitStatus	econOutput	NumericPoint
Effective Mode	nvoData1	effMode	EnumPoint
Effective Occupancy	nvoData1	effOccCurrentState	EnumPoint
Effective Setpoint	nvoData1	effSetPt	NumericPoint
Fan	nvoData1	fan	EnumPoint
Fan Relay	nvoData2	relayFan	EnumPoint
Heat Relay 1	nvoData2	relayHeat1	EnumPoint
Heat Relay 3	nvoData2	relayHeat3	EnumPoint
Heat Stages On	nvoData1	heatStgsOn	NumericPoint

Table 92. T7350 Point Details. (Continued)

Point Name	Network Variable	Field	Point Type
Holiday	nvoData2	holiday	EnumPoint
Next State	nvoData2	schedNextState	EnumPoint
Occupancy Sensor	nvoData2	occSensor	EnumPoint
Outdoor Temperature	nvoData1	oDTemp	NumericPoint
Percent Cool Command	nvoData1	percentCmdCool	NumericPoint
Percent Heat Command	nvoData1	percentCmdHeat	NumericPoint
Relay Heat 2	nvoData2	relayHeat2	EnumPoint
Remote Setpoint Offset	nvoData2	remoteStPtOffset	NumericPoint
Scheduled State	nvoData2	scheduledState	EnumPoint
Space Humidity	nvoData1	spaceHumidity	NumericPoint
Space Temperature	nvoData1	spaceTemp	NumericPoint
Stages Active	nvoData2	stagesActive	NumericPoint
SubBase Type	nvoData1	subBaseType	EnumPoint
System Mode	nvoData1	sysMode	EnumPoint
Temporary Setpoint	nvoData2	temporarySetPt	NumericPoint
Terminal Load	nvoData1	terminalLoad	NumericPoint
Time To Next State	nvoData2	scheduledTuncos	NumericPoint
Total Error	nvoData2	totalError	NumericPoint
	nviTimeSet	year	Numeric Writable
	nviTimeSet	month	Numeric Writable
	nviTimeSet	day	Numeric Writable
	nviTimeSet	hour	Numeric Writable
	nviTimeSet	minute	Numeric Writable
	nviTimeSet	second	Numeric Writable

Table 93. T7350 Application of Points.

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Occupied Cool (Setpoint)					X	Units=°C Precision=2 Min=7.2 Max=37.2
Standby Cool (Setpoint)					X	Units=°C Precision=2 Min=7.2 Max=37.2
Unoccupied Cool (Setpoint)					X	Units=°C Precision=2 Min=7.2 Max=37.2
Occupied Heat (Setpoint)					X	Units=°C Precision=2 Min=4.4 Max=32.2
Standby Heat (Setpoint)					X	Units=°C Precision=2 Min=4.4 Max=32.2

Table 93. T7350 Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Unoccupied Heat (Setpoint)					X	Units=°C Precision=2 Min=4.4 Max=32.2
Current State					X	Occupied Unoccupied Bypass Standby Occ Null
Next State					X	Occupied Unoccupied Bypass Standby Occ Null
Time To Next State					X	Units=min Precision=0 Min=0.0 Max=65535.0
DLC Shed					X	dINul dINoDlcShed dIMinDlcShed
Cover Communication Failed					X	False or True
Invalid IO Configuration					X	False or True
Invalid SubBase Type					X	False or True
Network Communication Failed					X	False or True
Sensor Failed					X	False or True
Application Mode	X	X	X	X		Default Auto Heat Morning Warmup Cool Night Purge Pre-cool Off Test Emergency Heat Fan Only Free Cool Ice Maximum Heat Economy Dehumidify Calibrate Emergency Cool Emergency Steam Max Cool HVAC Load No Load
Fan Mode	X	X	X	X		Auto or Continuous

Table 93. T7350 Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Manual Mode	X	X	X	X		Default Normal Disabled Update Status Self Test Update Alarm Report Mask Override Enable Remove Override Clear Status Clear Alarm Alarm Notify Enabled Alarm Notify Disabled Manual Control Remote Control Program Clear Reset Reset
Manual Occupancy	X	X	X	X		Default Occupied Unoccupied Bypass Standby
Temporary Setpoint	X	X	X	X		Units=°C Precision=1 Min=7.2 Max=37.2
Auxiliary Heat 1	X	X	X			Off or On
Auxiliary Heat 2	X	X	X			Off or On
Auxiliary Relay	X	X	X			Off or On
Auxiliary Relay	X	X	X			Off or On
Bypass Time	X	X	X			Units=min Precision=0 Min=0.0 Max=65535.0
Cool Relay 1	X	X	X			Off or On
Cool Relay 2	X	X	X			Off or On
Cool Relay 3	X	X	X			Off or On
Cool Stages On	X	X	X			Units=null Precision=0 Min=0.0 Max=255.0
DLC Shed	X	X	X			Restored or Shed
Days Left Keypad Holiday	X	X	X			Units=day Precision=0 Min=0.0 Max=255.0
Dehumidifier Active	X	X	X			False or True
Discharge Air Limit	X	X	X			False or True
Discharge Air Temperature	X	X	X			Units=°C Precision=1 Min=-273.2 Max=327.7

Table 93. T7350 Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Economizer Output	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Effective Mode	X	X	X			Default Off Cool Heat Emergency Heat Reheat Manual Factory Test
Effective Occupancy	X	X	X			Default Occupied Unoccupied Bypass Standby
Effective Setpoint	X	X	X			Units=°C Precision=1 Min=-273.2 Max=327.7
Fan	X	X	X			Default False True
Fan Relay	X	X	X			Off or On
Heat Relay 1	X	X	X			Off or On
Heat Relay 3	X	X	X			Off or On
Heat Stages On	X	X	X			Units=null Precision=0 Min=0.0 Max=255.0
Holiday	X	X	X			False or True
Next State	X	X	X			Occupied Unoccupied Bypass Standby Occ Null
Occupancy Sensor	X	X	X			Unoccupied Occupied
Outdoor Temperature	X	X	X			Units=°C Precision=1 Min=-273.2 Max=327.7
Percent Cool Command	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Percent Heat Command	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Relay Heat 2	X	X	X			Off or On
Remote Setpoint Offset	X	X	X			Units=°F Precision=0 Min=-128.0 Max=127.0

Table 93. T7350 Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Scheduled State	X	X	X			Occupied Unoccupied Bypass Standby Occ Null
Space Humidity	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Space Temperature	X	X	X			Units=°C Precision=1 Min=-273.2 Max=327.7
Stages Active	X	X	X			Units=null Precision=0 Min=0.0 Max=7.0
SubBase Type	X	X	X			sbNul sbSubaseneone sbSubbase1 sbSubbase2 sbSubbase3 sbSubbase4 sbSubbase5 sbSubbase6 sbSubbase7 sbSubbase8 sbSubbase9 sbSubbase10 sbSubbase11 sbSubbase12 sbSubbase13 sbSubbase14 sbSubbase15 sbSubbase16
System Mode	X	X	X			Default Auto Heat Morning Warmup Cool Night Purge Pre-cool Off Test Emergency Heat Fan Only Free Cool Ice Maximum Heat Economy Dehumidify Calibrate Emergency Cool Emergency Steam Max Cool HVAC Load No Load
Temporary Setpoint	X	X	X			Units=°F Precision=1 Min=-8.0 Max=7.9

Table 93. T7350 Application of Points. (Continued)

Point Name	Graphics	Alarms	Trends	Commandable	Internal Use	Valid Values
Terminal Load	X	X	X			Units=% Precision=1 Min=-163.8 Max=163.8
Time To Next State	X	X	X			Units=min Precision=0 Min=0.0 Max=65535.0
Total Error	X	X	X			Units=°F Precision=1 Min=-512.0 Max=512.0

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**Automation and Control Solutions**

Honeywell International Inc.  
1985 Douglas Drive North  
Golden Valley, MN 55422

Honeywell Limited-Honeywell Limitée  
35 Dynamic Drive  
Toronto, Ontario M1V 4Z9  
[www.honeywell.com/buildingsolutions](http://www.honeywell.com/buildingsolutions)

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