PANDUIT™

infrastructure for a connected world

Web Console

User Manual

Release 7.1
Issue 1

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Web Console Overview

The SynapSense® Data Center Optimization Platform provides the ability to monitor, dynamically adjust, and fine-tune the data center thermal environment, based on real-time information and analytics. Whether the data centers are in the same building or spread across the globe, the result is an increase in data center cooling efficiency, as well as the added confidence of knowing the precise environmental conditions affecting data center equipment right now.

SynapSense Web Console is the central hub of the platform, where the data coming through the Environment Server from the sensors is displayed and managed. Data center operators have access to information about their data centers that can be filtered and queried to answer specific questions. A multilayered view of the data center floor plan gives users information about each room and site for daily monitoring and long-term planning. The Dashboard view gives quick access to the most important real-time and historical data.

This user manual provides detailed instructions and information about how to use the Web Console to attain your desired goals in energy monitoring and efficiency.

About this Guide

This user guide is intended for customers or partners of SynapSense Corporation, a Panduit company. Both sets of individuals should receive training from a SynapSense Professional Services representative prior to using the SynapSense Data Center Optimization Platform.

Organization

Since most users will have had training prior to using Web Console, this user guide is set up like a handbook. It is a task-based reference, so you can look for what you want to do and easily find the steps to complete the task.

Chapter	Description
Using the Web Console	Covers opening and closing the console, navigation, and the standard behavior of interface elements.
Setting User Preferences	Covers all aspects of setup and administration for Admin users and those with appropriate permissions.
The Web Console Environment	Covers the activities most customers will want to do on a regular basis.
Setting Data Center Properties	Covers activities customers can perform to help maintain optimum conditions in the data center.

Using Web Console

The following sections describe the basic functionality of the Web Console.

Accessing the Web Console

Depending on the selections made during the installation process, the following methods are available for accessing the Web Console application.

- **Start Menu** – The All Programs list on your Start menu includes a SynapSense folder containing all of the SynapSense programs installed, including Web Console. Click **SynapSense Web Console** to open the application.
- **Desktop Shortcut** – Click the SynapSense Web Console shortcut from your desktop.
- **Web Browser** – Launch any of the supported browser applications and go to one of the following URLs:

  http://<server_name>:<port>/synapsoft

  - or -

  http://<server_ip_address>:<port>/synapsoft

The server name, server IP address, and port are available from your system administrator. The default port is 8080.

The login page should display automatically. If only the application splash screen displays, check the pop-up settings for your browser.

Logging In to Web Console

To log into Web Console, enter a valid User Name and Password on the login page.

Logging Out of Web Console

Any user can log out without closing the Web Console application. Click the **Logout** button in the upper-right corner of the application window.

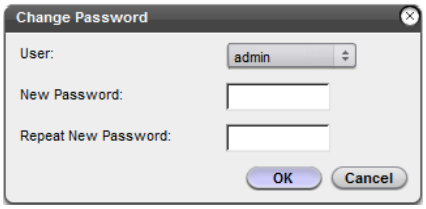
Changing Your Password

All users can modify their own passwords. Administrators, and members of groups with the Create/Edit Users permission, can change the password for other users of the application.

To change your password:

1. On the Profile menu, select **Change Password**.
2. Type and confirm the new password in the New Password and Repeat New Password fields.
3. Click **OK**.

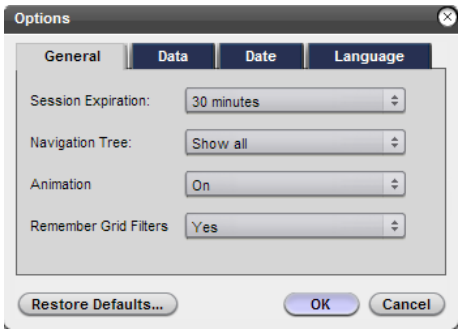
Note: A user with Create/Edit Users permission can change the password for another user of the application by selecting the User Name from the drop-down list in the Change Password dialog.



Credentials for users can be integrated with LDAP authorization processes, authenticated during log-in by the system database, or authorized through a combination of these two approaches. For details, refer to Technical Note TCN-040 on LDAP and Windows AD integration.

Setting User Preferences

The Options dialog contains four tabs: General, Data, Date, and Language. Follow the guidelines below to make your selections. Click **Restore Defaults** to reset everything on all of the tabs to default settings. Click **OK** to save all settings.



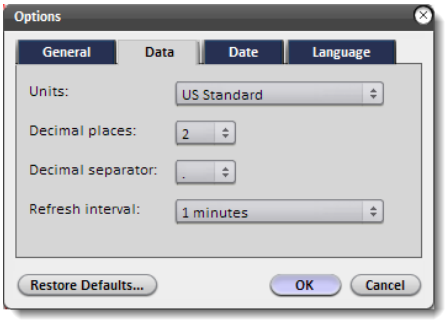
General Tab

The General tab contains settings for session expiration, the navigation tree (Sites List), animation, and grid filters.

Session Expiration	User login sessions expire after a preset period of inactivity. The default is 30 minutes. Users can change this to any value from one to 60 minutes. Select **Never** if you do not want to be logged out automatically.
Navigation Tree	The Sites list provides options for showing all rooms within a data center or hiding the room sub-tree in cases where the data center only has a single room. To hide single rooms, select **Hide Single Rooms**.
Animation	Set whether or not the opening and closing of dialogs and menus have an animated effect. The default is **On**.
Remember Grid Filters	Saves user configured filters for tabular views. The default is **Yes**.

Data Tab

The Data tab provides settings for data/display units throughout the Web Console including units, decimal places, decimal separators, and refresh interval.

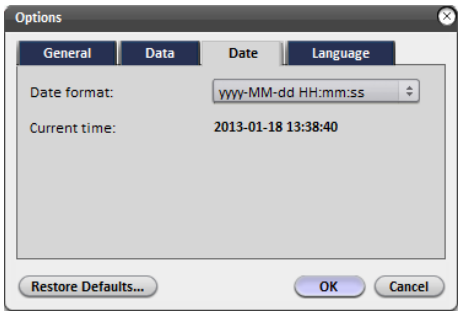


Units	Select the preferred unit of measure to display: **US Standard**

	(Fahrenheit, Inches) or **Standard International** (Centigrade, Pascal).
Decimal Places	Select the number of decimal places (1, 2 or 3) for data values displayed.
Decimal Separator	Select the appropriate decimal separator (period or comma) for data values.
Refresh Interval	Select how often the data refreshes on the screen, from 1 to 60 minutes. The default is one minute. Select **Never** to refresh data only when the screen is refreshed.

Date Tab

The Date tab provides settings for date and time formats displayed throughout the Web Console.

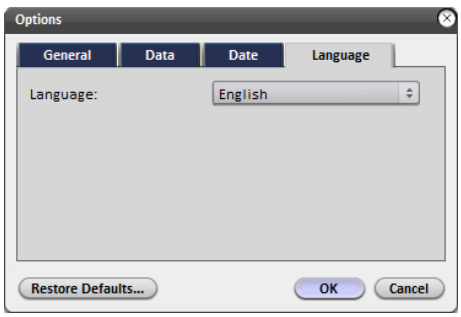


The user can select from the following formats:

MM/dd/yyyy HH:mm:ss	dd.MM.yyyy H:mm:ss
yyyy-MM-dd HH:mm:ss	MM/dd/yyyy AM/PM

Language Tab

Select the language for the display from the drop down list then click **OK** to save the changes.



The Web Console Environment

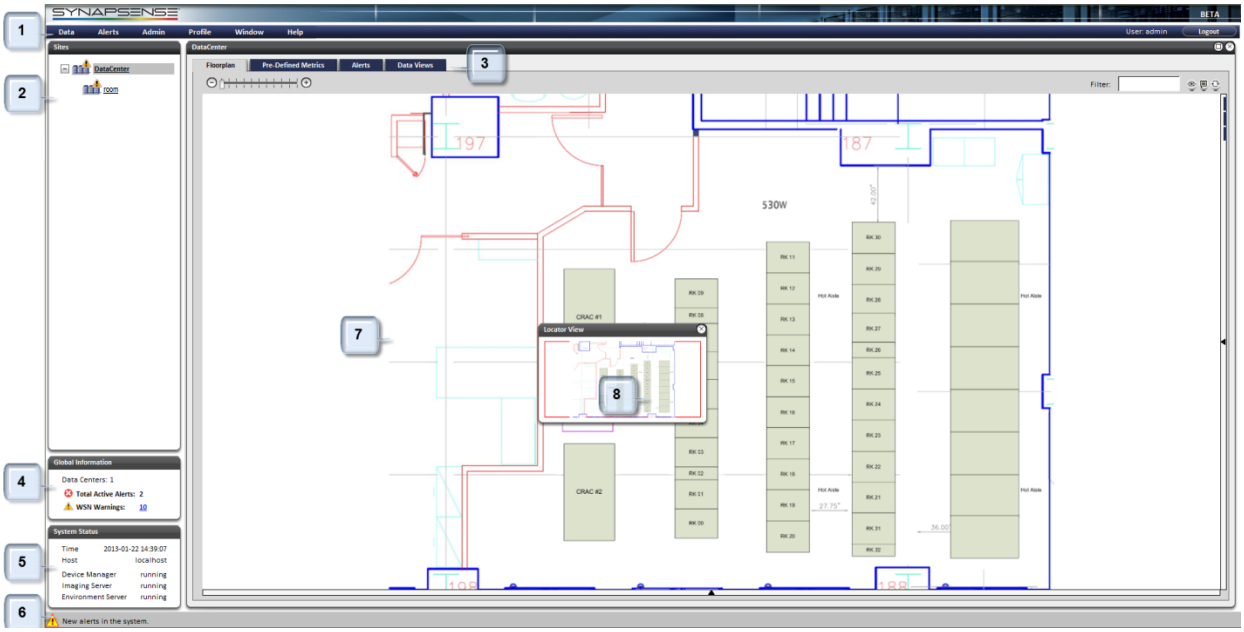
This section describes the layout and basic functions of the main pages in the Web Console. Information about tabs and other features, not described here, is provided in greater depth later in this user guide.

See the following topics:

Main Console View

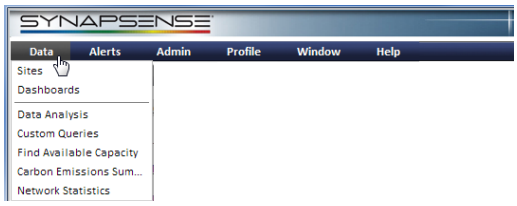
The main window in Web Console is made up of the following elements:

(1) Menu Bar
(2) Sites List
(3) View Tabs
(4) Global Information Box
(5) System Status
(6) Status Bar
(7) Workspace
(8) Locator View



Menu Bar

The Menu Bar contains the titles of menus, which when clicked, expand to display a list of selections. An item with a submenu has an arrow. Items requiring additional information show an ellipsis (…).



Click a selection to execute the function. Click off of the menu to collapse the list. Menus and other components of this software also support keyboard navigation.

Sites List

The Sites list is a panel on the top-left side of the Web Console window. It displays a hierarchical list of data centers and rooms configured in MapSense and imported to Web Console. Click a site on the list to display in the workspace.
Right-click a data center or room icon to open a context menu containing actions and settings related to that site (for example, Data Center Properties and Permissions).
The Web Console remembers the state of the Sites list; at login, the workspace displays the last data center or room selected during the previous session. (See also Dashboard View)

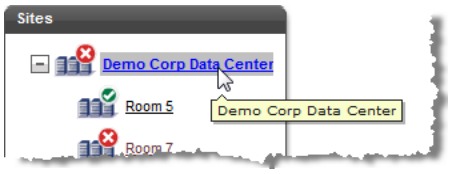
No Alerts or Warnings are present.

There are Active Alerts in at least one room.

Some data was not collected or calculated for two reporting cycles in at least one of the rooms.

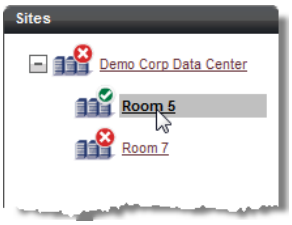
Data Center Level

Click on a Data Center icon or name to display the corresponding floor plan in the workspace.



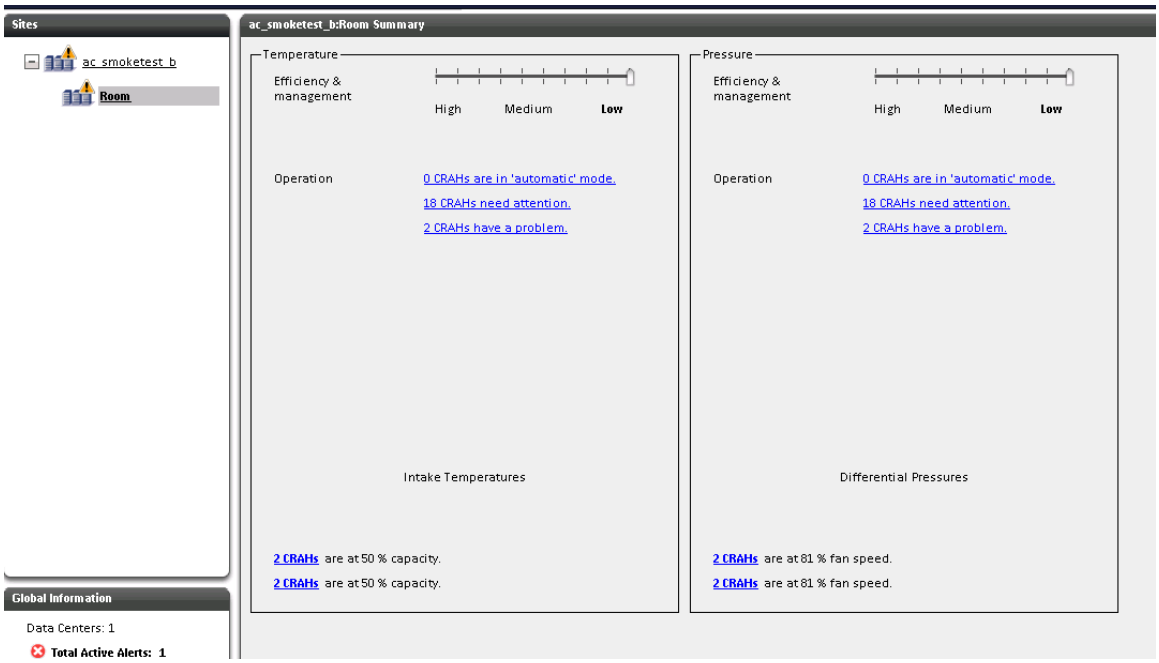
Room Level

Click on a room icon or name to display the corresponding section of the floor plan in the workspace.

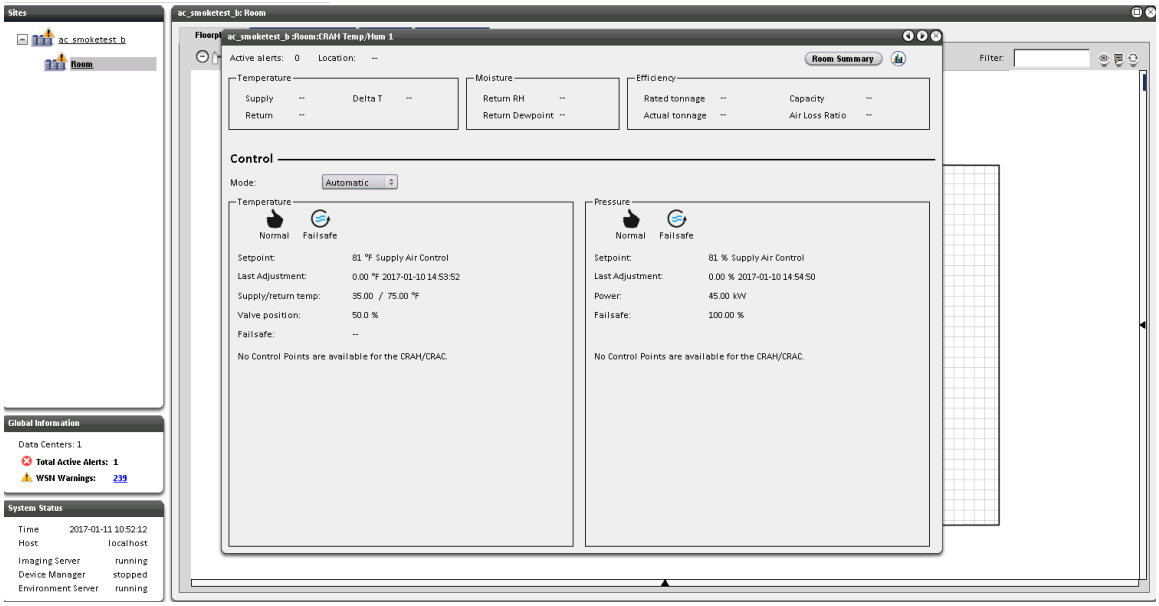


Right-click a room to select from the following options:

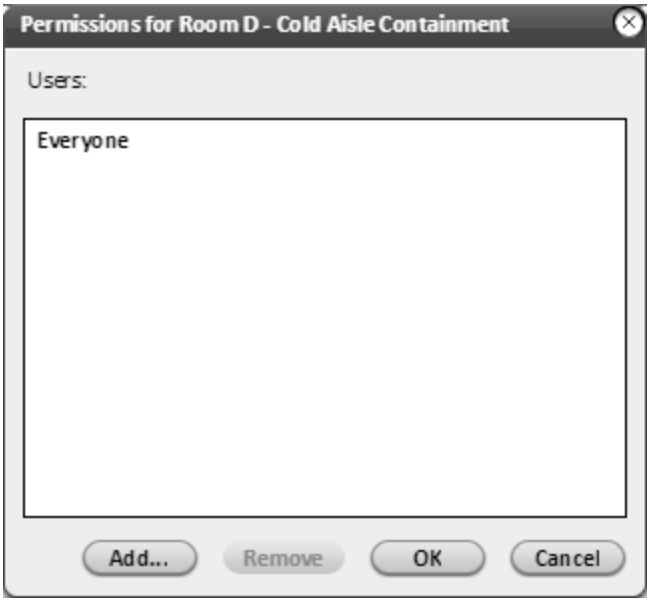
- **Room Configuration**: Opens the Room Configuration page. The Room Configuration page for Raised Floor rooms with a DX Temperature Control Type resembles rooms with a CRAH Control Type, but there is no Pressure component, and the number of CRAC units set to Standby by Active Control is tracked.



- **CRAH Configuration**: Opens the CRAH Configuration page.
- **CRAC Configuration**: Opens the CRAC Configuration page, where the user can manage CRAC control at the CRAC Configuration page. The page for individual CRAC units mostly resembles the CRAH configuration page, but with no Pressure component under the Control header.



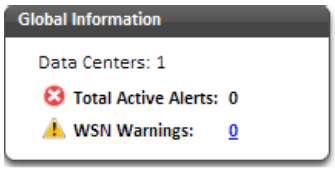
- **Permissions**: Opens the Permissions page, which lists the users who have permissions to view the room data.



- **Settings, Global Settings, Check for Updates**: Opens windows where the user can change Adobe Flash Player settings and check for Flash updates.

Global Information

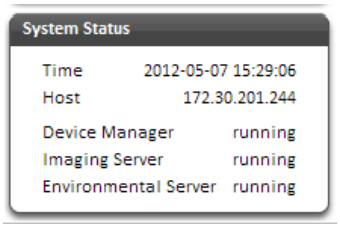
The Global Information box displays the total number of Alerts and Wireless Sensor Network (WSN) Warnings for all of the data centers available in the Sites list.



- **Data Centers** – Displays the total number of data centers.
- **Total Active Alerts** – Displays the combined total of active alerts, including all data centers, rooms, and audit alerts.
- **WSN Warnings** – Displays the combined total of WSN network warnings for all data centers (including rooms). Click the link to view a list of these warnings.

System Status

The System Status box displays status information for the SynapSense data center optimization platform components installed.



- **Time** – Displays the current system time for the computer running the Web Console.
- **Host** – Displays the IP address or hostname of the server running the SynapSense Environment Server, or localhost if the Web Console is running on the same server.
- **Application Status** – Indicates whether or not the listed component is:
  - **running** – working normally and communicating with the auditor service.
  - **stopped** – service is stopped, either manually or due to an error, or if it is not communicating with the auditor service.
  - **unknown** – the auditor service has yet to determine which state the software component is in (this can happen when the auditor service is restarted).
  - **partial** – only one of the two Active Control appliances is working normally and communicating with the auditor service.

Workspace

The Workspace is the area where the tabs (for example, the Floor Plan), and various tables display sensors and other data center assets. It is the main work area of the Web Console.

Status Bar

The Status Bar displays the presence of any new alerts in the system, as well as the status of the latest operation for 30 seconds after completion. Click the icon to view the list of new alerts.

To view a list of all alerts in the system with any status, select **All Alerts** from the **Alerts** menu.

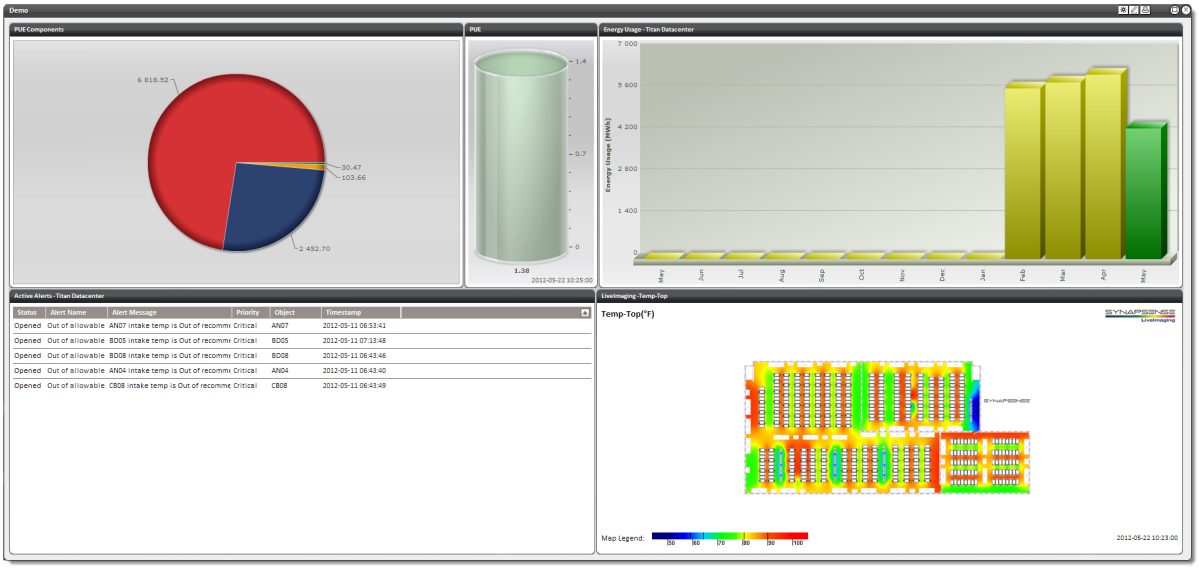
Locator View

Use this window to move (scroll) the zoomed view displayed in the floor plan to any location in the data center.

Click a location on the image in the Locator View to re-center the floor plan image at the click position.

Dashboard View

The Dashboard view enables quick access to the most important real-time and historical data relating to the data center. The ability to view or configure a public or private dashboard is based on user group. Dashboards are available from the Data menu or can be set to display at login instead of the Main Console view.



To open a dashboard, select **Dashboards** from the Data menu. To go back to the Main Console view select **Sites** from the Data menu, or click the X to close the Dashboard view.

To Set a Dashboard as the Default View:

1. Select Dashboards from the Data menu.
2. On the toolbar in the upper right corner of the dashboard window, click the **gear** icon to open the Manage Dashboards dialog.
3. In the Open at login drop down list, select the dashboard to display.
4. Click Apply, then Close.

Note: When selecting Dashboards for the first time, the Add Dashboard dialog displays. See Configuring the Dashboard for more information.

To Print a Dashboard, open the dashboard and click the **Print Dashboard** icon on the toolbar in the upper right corner of the Dashboard window. A standard print dialog displays per your system setup.

Dashboard Carousel View

The Dashboard Carousel provides a way to cycle through a set of dashboards, like a slide-show, changing from one to the other at a selected interval.

A carousel is private to the user, it is not public. The Administrator can manage all of the carousels in the system but individual users cannot view a carousel created by another user.

Icon	Description
	Manage Dashboard Carousels
	Print Dashboard
	Show previous dashboard in sequence
	Show next dashboard in sequence
	Pause carousel sequence
	Resume carousel sequence
	Size window – Min/Max
	Close window

To setup a new dashboard carousel:

1. On the Data menu, select **Dashboard Carousels**.
2. Click **New** in the Dashboard Carousels dialog.

3. Give the new Dashboard Carousel a Name and Description.
4. In the Time Interval field, enter the amount of time that each dashboard should display before changing to the next one. Default is 60 seconds. The allowable range in seconds is 10 to 999999.
5. Click **Next**.
6. The Dashboard Selection dialog displays a list of the dashboards available, based on user permissions. In the left column, highlight the dashboards to display then click the arrow button to move the items to the right column.
7. Set the order in which the dashboards will display by highlighting an item in the list then clicking the up/down arrow buttons to move it.
8. When finished, click **Done**.

To run an existing dashboard carousel, select **Dashboard Carousels** on the Data menu then click the **Run Carousel** icon in the Action column for the carousel you want to display.

To pause or resume a dashboard carousel, Pause/Resume or move through the individual dashboards one-by-one (Next/Previous) using the toolbar buttons in the upper right corner of the Dashboard window.

To edit a dashboard carousel:

1. On the Data menu, select **Dashboard Carousels**.
2. Click the **Edit Carousel** icon in the Action column for the Dashboard Carousel you want to edit.
3. Make any required changes on the Edit Carousel dialog, then click **Next**.
4. Update the Dashboard Selection dialog, as required, then click **Done**.

To delete a dashboard carousel:

1. On the Data menu, select **Dashboard Carousels**.
2. Click the **Delete** icon in the Action column for the Dashboard Carousel you want.
3. Click **OK**.

To change the display interval for a running carousel:

Note: This action affects only the currently running carousel for the duration of current session. The display interval reverts to original settings when the Dashboard Carousel is closed.

1. Right-click anywhere on the dashboard to display the context menu and select **Set Interval**.

2. In the Set Interval dialog, type a Time Interval in seconds. The range is from 10 to 999999.
3. Click **OK**.

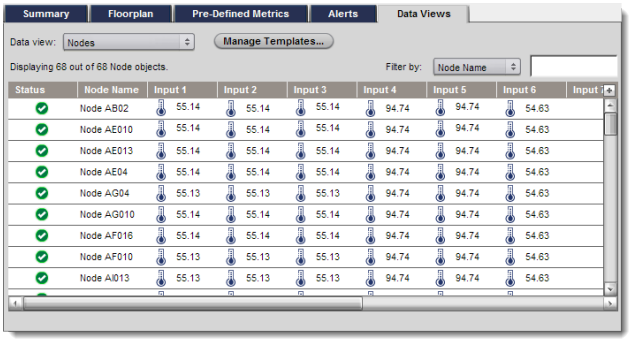
Working with Tables and Charts

This section describes the common features and functionality of charts and tables throughout Web Console. In addition to the pre-configured charts and tables, the Data Analysis feature provides the ability to build an ad hoc query with available data and save it as a Custom Query to run on demand. This section also includes information about printing and exporting data displayed in these tables.

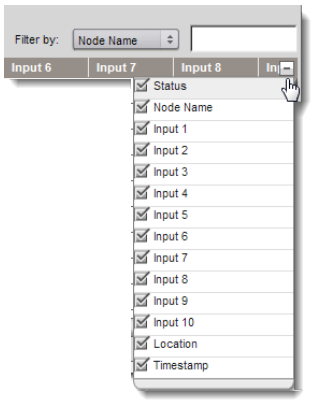
Tables

Tables can be sorted and filtered by columns and various criteria. See Using the Column Filter for more information.
Except where noted, tables behave the same throughout the application:

- Single-click to highlight an item. Highlight multiple items one at a time using Ctrl + Click or highlight a group of items with Shift + Click.
- Double-click to open a details dialog for the item.
- Right-click to open a context menu of options available for the item. When multiple items are selected, the context menu applies to all of the items.



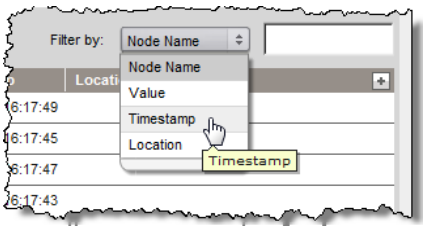
Column Order – The left-to-right order of columns can be changed. Click the column heading and drag it to another column position. To remove a column, see Column Selector below.



Column Selector – Click the "**+**" sign, at the far right of the column header row, to display a list of column names. Deselect a column name to remove it from the table. Check the box to display the column to in the table.

Sort By Column – Click the heading of a column to sort the information in that column, alphabetically or numerically, in ascending or descending order. An up or down arrow appears in the column heading to indicate the sort order. Click the column heading again to reverse the sort order.

Filter By – Select the criteria by which to filter the list from the Filter By drop down list. Type the actual filter value into the field to the right of the drop down list. The list changes to display only those entries matching the filter criteria. Wildcards can be used to widen the search results:
"*" = any number of characters replacement
"?" = any single character replacement



Note: The asterisk "*" wildcard is automatically added to any search substring that does not use a "?" wildcard.

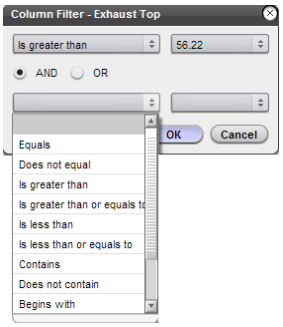
To view additional details, double-click any item on the table to display additional details available for the item. See also Configuring Data Views for more information about available view options.

Using the Column Filter

The Column Filter provides additional operators for even greater flexibility in working with the data.

To configure the column filter:

1. Right-click on a column heading to open the context menu and select **Configure Column Filter**.
2. Select the filter items from the drop down lists or type the criteria.



3. To add another filter criterion, click the **And** or **Or** radio button and repeat Step 2.
4. When finished, click **OK**.

Headings with filters applied display a small filter icon to the right of the name.

To save the column filter:

1. Right-click on any column heading that is using the column filter you want to save.

2. Select **Save Grid Filter** from the context menu.
3. In the Save Grid Filter dialog, give the filter a unique name.
4. Click **OK**.

Charts

Charts provide a graphical view of the historical data on selected properties.

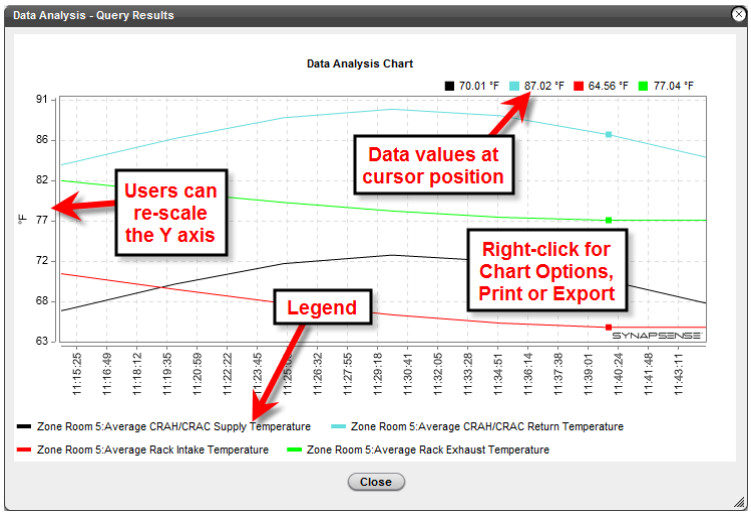
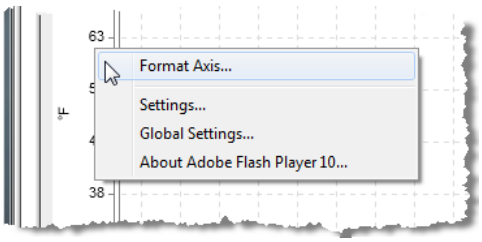
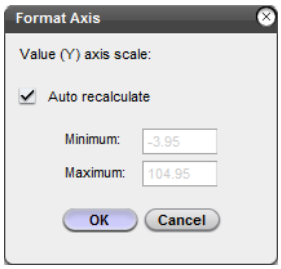


Chart Behavior

Charts include the following features:

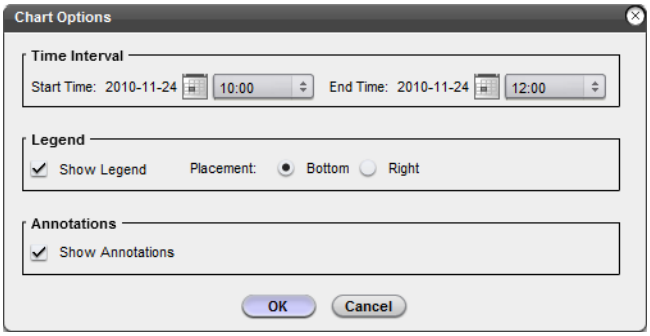
- **Zoom** – Use the mouse wheel to zoom the chart contents in or out. Zoom occurs around the center of the chart display area, not at the current cursor position. To zoom around a different center point, click and drag the chart lines to center as desired for zooming.
- **Drag** – Click and drag the chart to scroll the chart lines left or right. This can be used to center a section of the chart in the middle of the chart for zooming.
- **Data Values Filter**– Show/hide one or more lines on the chart by clicking the square of color representing the data value at the top right of the chart window.
- **Format Axis** – Right-click on the vertical axis of a chart to redefine the upper and lower numbers. The Format Axis dialog displays. Uncheck **Auto recalculate** and enter new minimum and maximum display range values. Click **OK**. The chart displays numbers on its axis between the values entered.





Right-click anywhere in the chart area to open a context menu with additional available functionality.

- **Chart Options** – Select **Chart Options** from the context menu to open the Chart Options dialog. Set Time Interval, Legend show/hide and location, and show/hide annotations.

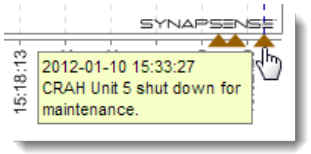


- **Time Interval** – Click the **Calendar** icons to choose the starting and ending times displayed in the chart. Use the drop down lists to choose the month and year. A small "**x**" in the upper-right corner closes the calendar dialog.
- **Legend** – Select the **Show legend** checkbox to show or hide the Legend properties. Use the Placement radio buttons to determine whether the Legend displays below or to the right of the chart.
- **Annotations** – Small brown triangle along the base of charts to mark the presence of time-specific annotations. Hover the mouse cursor over an annotation marker to display a tooltip with the annotation text. Click the triangular marker to keep the tooltip visible even after moving the cursor away from the marker. Click the marker again to close the annotation.

Adding Annotations

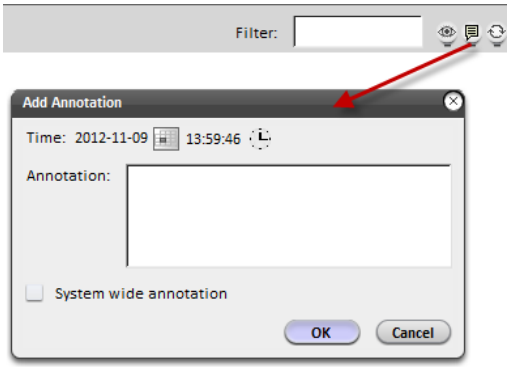
Use Annotations to document data center events and activities that interrupt normal daily events (such as CRAH/CRAC maintenance or a tripped circuit breaker). During a data review, Annotations help explain chart line turns (up or down) that would otherwise be unexpected or appear to indicate an equipment problem.
A small brown triangle along the base of charts indicates the presence of an Annotation. Hover the mouse cursor over an Annotation marker to display the Annotation text.

Click the triangular marker to keep the tooltip visible. If the annotation is longer than the tooltip, a scroll bar displays inside the box to enable reading of the entire message. Click the Annotation marker again to close the tooltip.

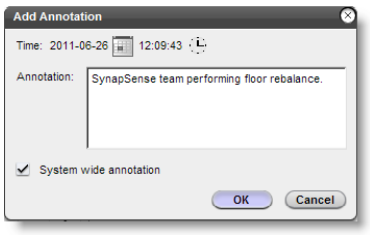


You can create Annotations from several places within the Web Console including:

Create Annotation via Floor Plan Tab – In the upper-right area of the Floor Plan Tab, clicking the note icon opens the Add Annotation dialog.



Create Annotation via System Activity Log – In the System Activity Log, click the **Add Annotation** button (lower-left corner). Type a message into the dialog, then click **OK**.
Create Annotation with Context Menu – Right-click on the floor plan, or on a chart, then select **Add Annotation** from the context menu. Type the message in the dialog, then click **OK**.



Check **System wide annotation** to display the annotation in all data centers.

Data Analysis and Reporting

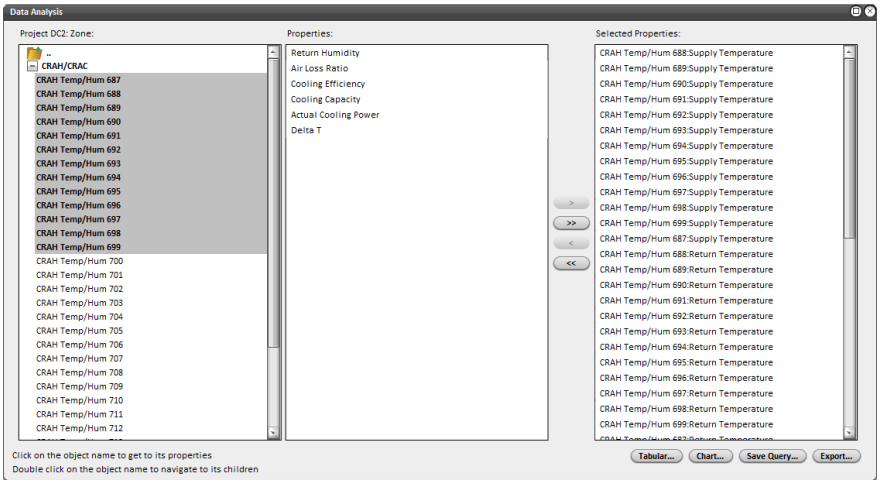
Data Analysis and Custom Queries enable the running and saving of ad hoc queries on the data collected by the SynapSense Data Center Optimization Platform and displayed in Web Console.

Once saved, a Custom Query can be scheduled to run once or on a recurring basis with notification to selected email addresses that the report is ready to view.

See the following topics:

Creating Ad Hoc Tables and Charts

With the Data Analysis function, create ad hoc tables or charts from one or more environmental or power object properties. Save the selections for future use as a Custom Query or export the results to CSV. Access Custom Queries from the Data menu.



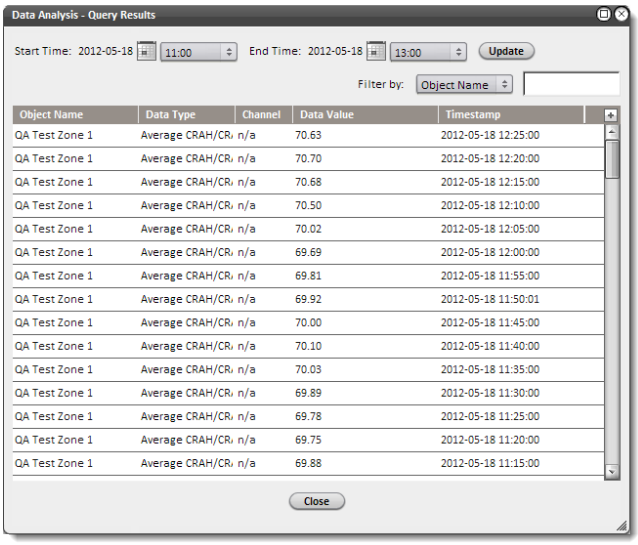
Object Properties are organized by the category or subcategory of data they represent (for example, Group, Panel, PDU, Power Meter, Node, Pressure). Select one or more of the Object Properties, then save the selection set for later (**Save Query…**), create a data table (**Tabular…**) or chart (**Chart…**), or export the data set to CSV (**Export…**).
Note: User access permissions determine the data center and room object properties available in the Data Analysis dialog.

To perform an ad hoc query:

1. Click **Data**.
2. Select **Data Analysis** from the drop-down menu. The Data Analysis window displays the Data Center locations and the list of Properties.
3. Select the type of object in the left column. The Object Properties for that object type display in the Properties column. Double-click an item to display any child objects.
4. Select one or more Object Properties from the Properties column then click the single right arrow button to add them to the Selected Properties column on the right (or click the double right arrow to add All currently-displayed properties).
5. Repeat Steps 1 and 2 to select Object Properties from other types of objects listed in the left column. Remove some (or all) of the Object Properties with the left arrow buttons.
6. Once objects are in the Selected Properties column, use the up and down arrows that display to the right of the column to adjust the order of the objects in the list.
7. When finished, click **Tabular**, **Chart**, **Save Query** or **Export**.

To create a table:

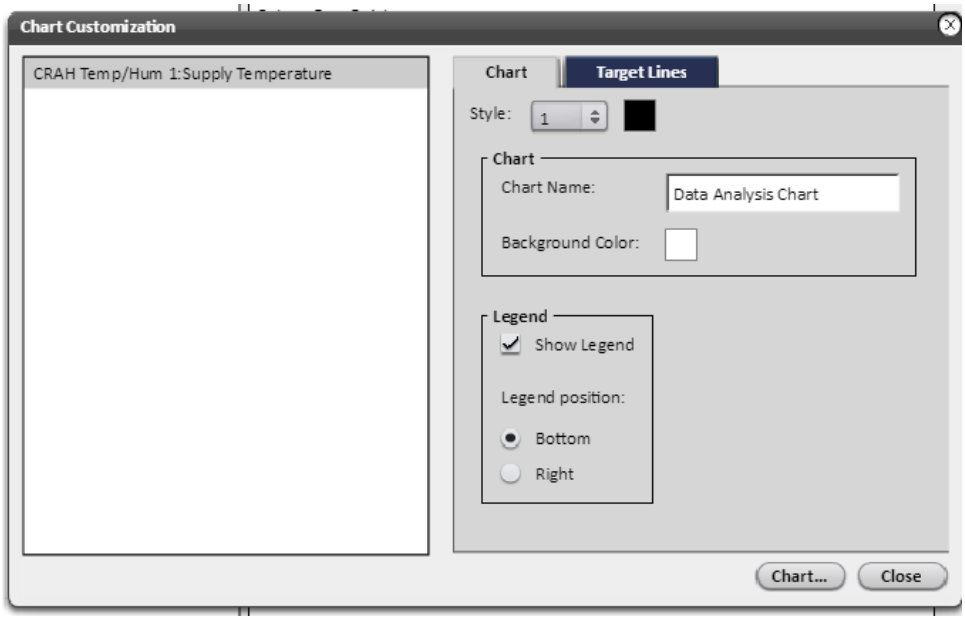
1. Click the **Tabular** button to open a dialog displaying the results in a table format.



2. Adjust the Dates, Start Time, and End Time for the data displayed in the Data Value column. Click the **Update** button for the new time span settings to take effect. The date selection is saved for the session.
3. To Show/Hide columns in the table, select the plus button at the far right of the column heading row. Click to add/remove a column.
4. Right-click anywhere in the table area to open a context menu with Print Table and Export selections. You can print the (filtered) table results or export them to a CSV file. See Print/Export Table Data for more information.

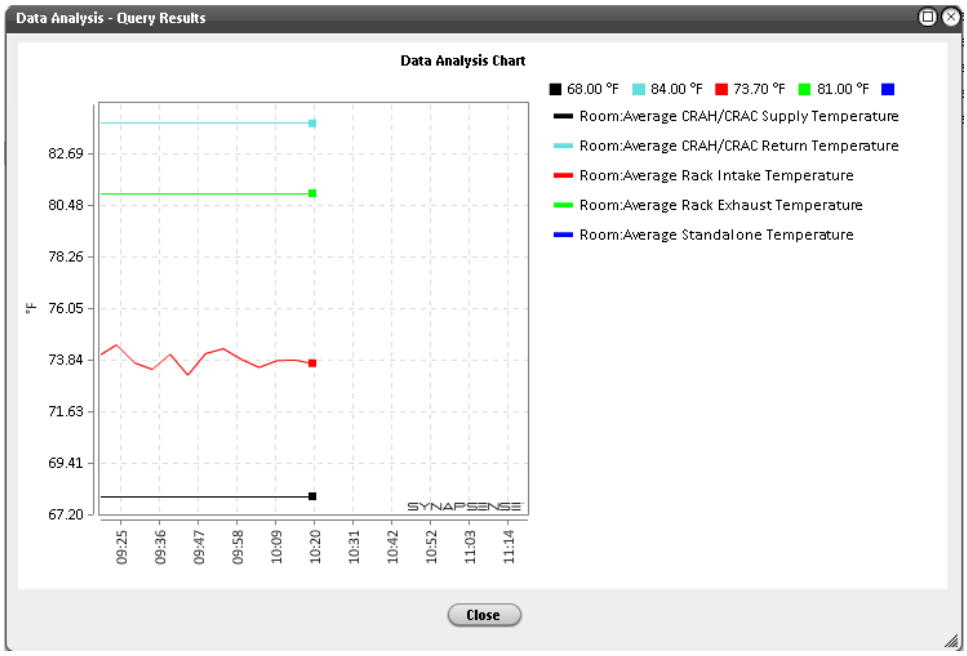
To create a chart:

1. Click the **Chart** button to open the Chart Customization dialog.



- **Style** (line thickness) – Click an Object Property in the list then select a line thickness (weight) for that property from the Style drop-down list. Click the colored square to select a color for the line from the color palette.
- **Chart Name** – Type in a name for the chart.
- **Background Color** – Select a chart background color for all charts produced by clicking the color square and selecting a new color from the Color Selector dialog.
- **Line Color** – Click an Object Property in the list then click the color square to the right of the Style drop-down list and select a line color for that property from the Color Selector dialog.
- **Legend** – Use the **Show Legend** checkbox to show or hide the Legend properties. Select the **Legend Position** radio button to display the legend below or to the right of the chart.

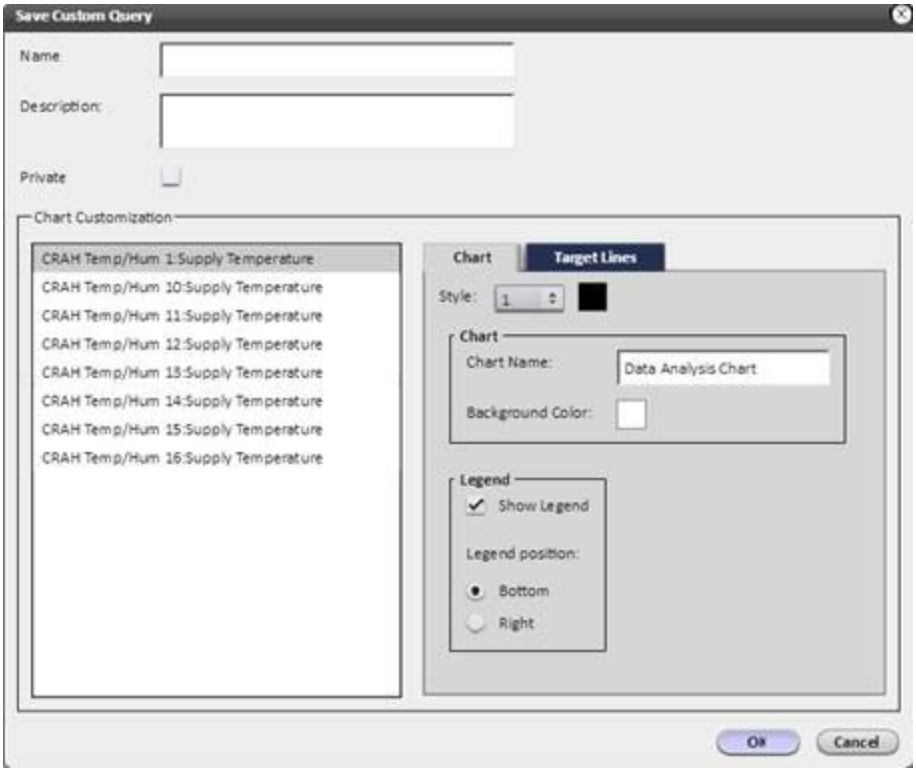
2. Click **Chart** to display the resulting data.



3. When finished, click **Close**.

To save a custom query:

1. Click the **Save Query** button to open the Save Custom Query dialog.



2. Enter the **Name of the Query** (this will appear in a list of saved Custom Queries) and any applicable description. The **Private** check box prevents other users from seeing or accessing the saved query.
3. Click **OK** to save the Custom Query.

Note: To view, run, edit, or delete previously-saved queries, select **Custom Queries** on the **Data** menu to bring up a Custom Query list.

To export the query results:

1. Click the **Export** button to open the Export Query Results dialog.
2. Select Start and End dates and times.
3. Click **OK**.
4. In the View Downloads dialog, **Open** or **Save** the results as .csv file.

Working with Custom Queries

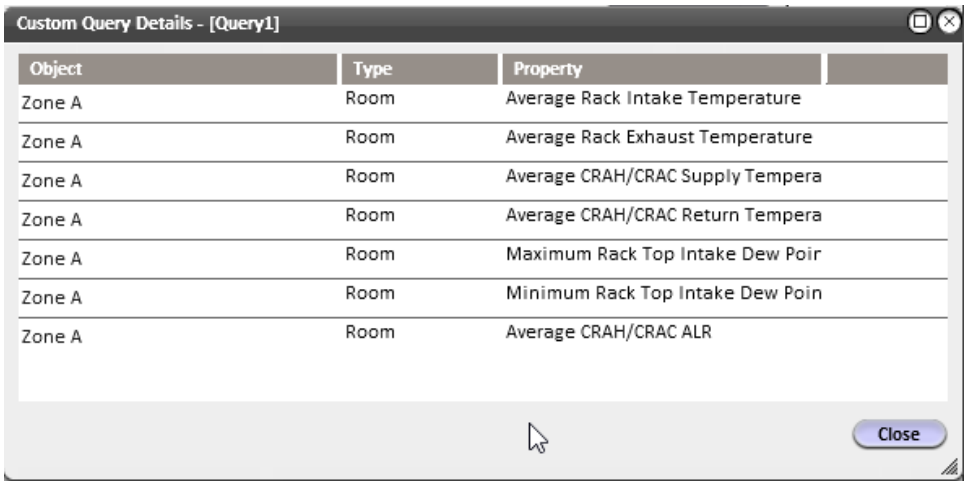
Use Custom Queries to view tabular or charted reports of object properties selected from Data Analysis (for example, various rack temperature properties, power factors, current per phase). Display a list of all existing queries by selecting **Custom Queries** from the **Data** menu.

Icon	Description
	View
	Run
	Edit
	Copy
	Delete
	Schedule Custom Query
	Create New Query

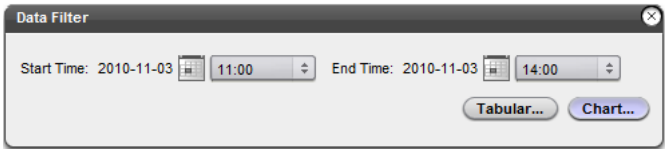
- **Filter By** – The list can be filtered using the Filter By option.

In addition to the Filter By option, the following operations are available for each Custom Query in the list by clicking on the icons to the right of each entry:

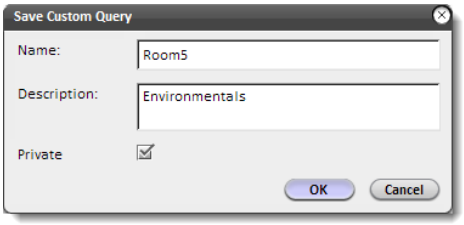
- **View** – Opens the Custom Query Details dialog, a list of the object properties for the selected Custom Query.



- **Run** – Click the Run icon to display the Data Filter dialog. Select the time span for the table or chart then click either the **Tabular** or **Chart** button to execute the selected Custom Query.



- **Edit** – Click the **Edit** icon to open the Edit Custom Query dialog. Add or remove object properties from the current Custom Query, then click the **Save Query** button to overwrite the query with the new selections.
- **Copy** – Click the **Copy** icon to make an identical copy of the query. Using this option saves time when one query is very similar to another.



- **Delete** – Deletes the selected Custom Query (opens a message to confirm the action).
- **New** – The **New** button opens the Data Analysis window. Use to create a table or chart of selected object properties and save the selections as a new Custom Query.

Working with Reports

The SynapSense Reporting feature enables a saved Custom Query to be scheduled to run once or at set intervals. No template is required to schedule Custom Queries.

SynapSense Reports also provides functionality to import a custom report template that can be used for a scheduled report. See About Report Templates for more information.

About Report Templates

Importing a custom report template is an Administrative function. Once a template is imported, it displays on the Report Templates dialog for selection and scheduling by users with permission to use the Reporting features.

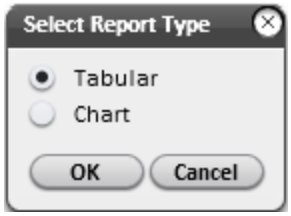
Scheduling Reports

The scheduling reports feature lets you set a time for a report to run. When the report finishes, the system sends an email to let you know the report is ready to view. Scheduled reports are available on the Data menu through the Custom Queries and Reports selections.

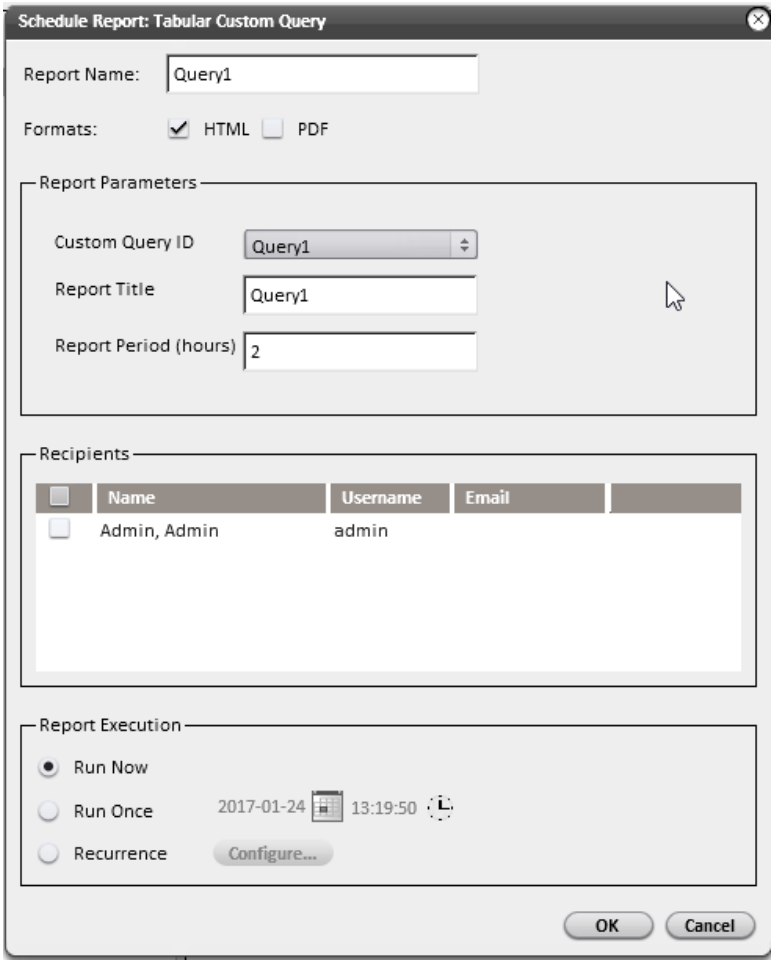
Note: Depending on the query size, report generation can take some time. For larger reports with hundreds or thousands of data points, the time required can amount to hours.

To schedule a custom query to run as a report:

1. From the Custom Query dialog, select the Schedule Query icon. The Select Report Type dialog box displays.



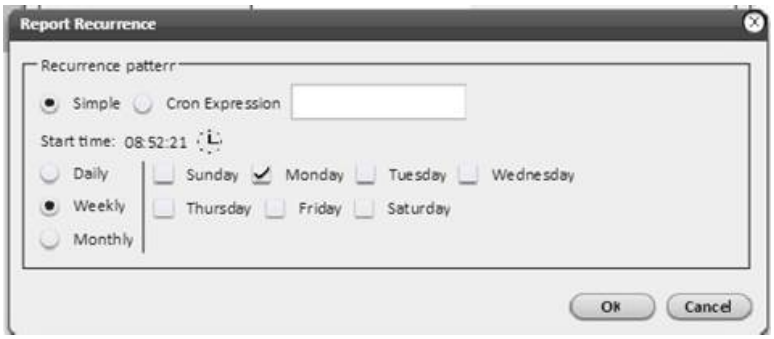
2. Select **Tabular** or **Chart** and click **OK**. The Schedule Report dialog box displays.



3. In the Reports Name field, auto-populates with the name of the report selected. If you want to change it, enter a unique name for the report to be run.
4. Select an output format for the report: HTML or PDF.
5. In the Reports Parameters box the Custom Query ID, Report Title, and the amount of time you want the report to cover auto-populate from the settings for the selected report.
6. In the Recipients box, select the users that should receive email notification that this report has run and is ready to review.
7. In the Report Execution box, click one of the following:

- **Run Once:** Default runs the report Now. If you do not want to run the report immediately, click the calendar and clock widgets to set a specific time and date to run the report only once.
- **Recurrence:** This selection activates the Configure button.

8. Click **Configure.** The Report Recurrence dialog box displays.



9. Make your selections and click Click **OK**.

To schedule a report from an imported template (Admin Only):

1. From the Data menu, select **Report Templates**.
2. The Report Templates dialog displays the available imported reports. Click to highlight the report you want to schedule.
3. Click the **Schedule** button to open the Schedule Reports dialog.
4. Follow **Steps 5 through 7** above to select recipients and schedule the report.
5. Click **OK**.

To view reports:

1. On the Data menu, select **Reports**.
2. On the Reports dialog, highlight the name of the report. Click **Refresh** to update the list.
3. Click **View** to display the report without refreshing the data.
4. Click **OK** to close the dialog.

To edit a report:

1. On the Data menu, select **Report Templates**.
2. Select the template type to display the scheduled reports of that type.
3. Click to highlight the name of the report.
4. Click **Edit** to display the Schedule Reports dialog.
5. Make the changes, then click **OK** to close the dialog.
6. Click **OK** to close the Report Templates dialog.

To delete a scheduled report:

1. On the Data menu, select **Report Templates**.
2. Select the template type to display the scheduled reports of that type.
3. Click to highlight the name of the report.

4. Click **Delete** then click **OK** to confirm the action.
5. Click **OK** to close the Report Templates dialog.

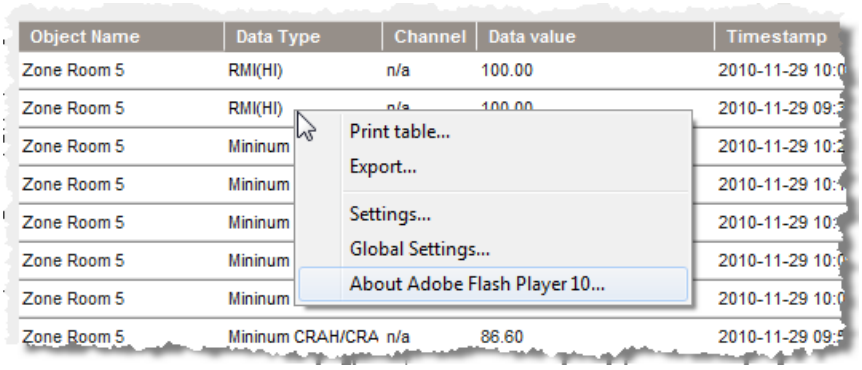
Click **Refresh** to update the list of reports displayed in the Report Templates dialog.

Printing and Exporting

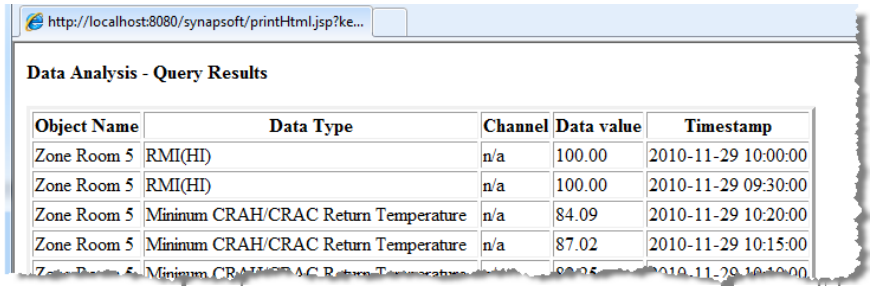
Print the ad hoc queries and scheduled reports or export the data to CSV format for parsing in another tool. These options are available in the context menu in any displayed table or chart.

Print and Export Table Data

Right click anywhere within the data area of a table to open a context menu with Print table and Export choices.



- **Print Table** – Select **Print table…** to display the data in a browser window. The Print dialog for the browser displays to enable printing.



- **Export** – Select **Export** to open a blank browser window, along with a File Download dialog, from which you can view or save the table data in CSV (comma separated value) format.

If the File Download dialog does not display, ensure that the pop-up blocker in the web browser is turned off, or you may need to add the server to the trusted room to allow file downloads. See browser documentation for how to allow pop-ups.

Print/Export Chart Data

When data is displayed in chart form, right-click anywhere on a chart to open a context menu.

- **Print Chart** – Select **Print Chart** to display a Print dialog. This prints just the chart selected when the context menu was opened.
- **Export** – Select **Export** to open a File Download dialog. View or save the chart data in CSV (comma separated value) format.

Managing Users and Groups

The SynapSense Web Console establishes access through user group permission sets. The administrator assigns users to the group that aligns with their access requirements. Select from the three default groups or create a new group from the available access settings for a fully customizable access scheme. Access can be as high level as Read Only or as extensive as full administrative permissions. See "User Group Permissions" on page 44 for the full list of available permissions. Also see Default User Groups and Power User Functions.

To set up user group management:

1. Determine the user access needs.
2. Determine if the default groups provide the access required to meet those needs.
3. If not, create a new user group.
4. Add new or existing users to the appropriate group from the Manage Users dialog.

Default User Groups

Web Console has three default user groups: Standard, Power, and Administrator. Each level has access permissions within Web Console.

Standard User Functions

(Basic permission set) Standard users can view and interact with most Web Console screens, reports, alerts and dialogues, including:

- View and act upon active alerts
- Change password and set user options
- Use Data Analysis to view and save custom queries
- Use Find Available Capacity
- View the Carbon Emissions Summary
- View Network Statistics
- Access User Documentation and About dialogs
- View Data Center Properties
- Create Dashboards and view public dashboards created by other Standard users

Standard users can be blocked from viewing various data center and room entries in the Sites list.

Power User Functions

(Mid-level permission set) Power users have all the basic permissions of Standard users (see bullet points above) plus the ability to:

- Define new alerts
- Enable and disable nodes
- Create Dashboards and view public dashboards created by other Power users

Power users can be blocked from viewing various data center and room entries in the Sites list.

Administrator Functions

(Complete permission set) Administrators have complete access to all available functions within the Web Console (no restrictions). In addition to the access available to Standard and Power users, the Administrator can also:

- Configure the system in MapSense
- Manage Users
- Manage Asset Groups
- Reconcile Server Names
- Access the System Activity Log
- Access System Configuration Report
- Create and export a Modbus Points List
- Create Dashboards and view public or private dashboards created by any user level

Adding a User Group

A user with the default Administrator permissions can create a user group and assign individual users to the new group. Be sure to review the entire list to ensure the new user group provides the access needed by the group members to perform their duties.

To create a user group:

1. Select **Manage User Groups** on the Admin menu.
2. Click **Create Group** in the Manage User Groups dialog.
3. In the Define User Group dialog box, add a **Name** and **Description**.
4. Click the check box for each of the permissions needed by the user group to perform their duties. If you need the user to make changes to an area, be sure to check both the access and the configuration selection.
5. When finished, click **OK**.

Editing a User Group

A user with the default Administrator permissions can make changes to a user group. Be sure to review the entire list to ensure the new user group provides the access needed

by the group members to perform their duties.

To make changes to a user group:

1. On the Admin menu, select **Manage User Groups**.
2. Click the **Edit** icon. In the Edit User Group dialog, make necessary changes to Group Name, Description, or selected permissions.

> **Note**: If you need the user to make changes to an area, be sure to check both the access and the configuration selection.

3. Click **OK**.

Deleting a User Group

A user with the default Administrator permissions can delete a user group.

To delete a user group:

1. On the Admin menu, select **Manage User Groups**.
2. Click the **Delete** icon.

> **Note**: Users must be assigned to a group in order to access this application. Be sure to reassign any users in this group to another group.

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

Cloning a User Group

An Administrator, or a user with permission to create groups, can copy an existing group, give it another name, and add or remove permissions. This enables giving more than one group the same basic set of permissions without having to recreate the same group over again.

To clone a group:

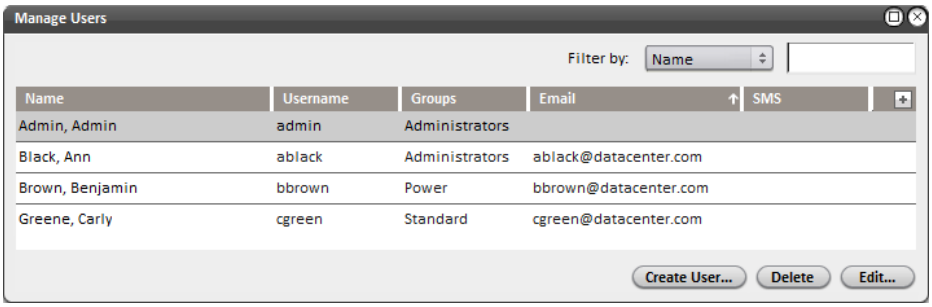
1. On the Admin menu, select **Manage User Groups**.
2. Click the **Clone Group...** icon.
3. Give the new group a name and describe its purpose or differences.

4. Select or deselect the permissions for this user group.
5. Click **OK** to create the new group.

Managing a User Account

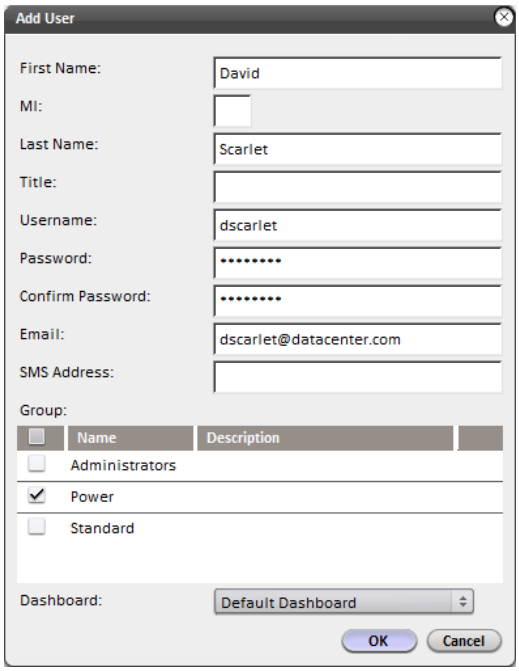
On the Admin menu, select Manage Users to view a list of all users in this instance of Web Console.

Use the Manage Users dialog to create, edit, sort, filter, and delete user accounts.



Adding a User

User accounts allow access to the Web Console application at three default levels, and any additional user group levels established. See Adding a User Group. A user with create user permissions, who is not also an Administrator, can only add a user to groups to which she is also a member.



To add a new user:

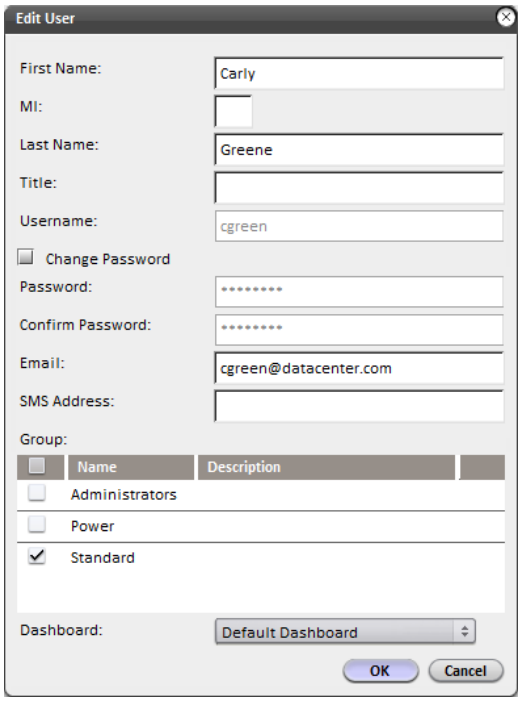
1. On the Admin menu, select **Manage Users**.
2. Enter the information using the guidelines in the field definitions provided here:

- **First Name, MI (middle initial), Last Name, Title** – Biographical information about the user.
- **Username, Password, Confirm Password** – The user name and password this individual uses to access Web Console. The username and password may be any combination of letters and numbers. The password is case sensitive.
- **Email** – The email address on which this user will receive system alerts and notifications.
- **SMS Address** – The SMS (Short Message Service) address at which the user will receive system alerts and notifications. Typically used to send text messages to cell phones. Often, a 10 digit cell number, plus "@", plus the cell carrier web URL (for example, 9165551212@att.net).
- **Group** – A user can be a member of one or more groups. Check the box for the groups that apply.
- **Dashboard** – A list of all public dashboards. Select one from the drop down list if you would like it displayed on login.

3. Click **OK**.

Editing a User Account

On the Manage Users list, double-click on a user name (or highlight the entry then click **Edit**) to open the Edit User dialog. Make changes as required, then click **OK** to save.



Check **Change Password** to enable the Password and Confirm Password fields. Only the Administrator, and those with the Create/Edit Users group permission, can change the password for another user.

Deleting a User Account

On the Manage Users dialog, highlight the account then click **Delete.** Click **OK** to confirm the action.

User Group Permissions

Permission	Description
System Configuration	
Log in to Web Console	Allows access to the Web Console application.
Access Site Permissions	Allows user to view a list of users and groups that have permission to access the data center

Permission	Description
	or room in the Sites list.
Edit Site Permissions	Allows user to edit the list of users and groups that have access to the data center or room in the Sites list.
Access Data Center Properties	Allows user to view the Data Center Properties dialog.
Edit Data Center Properties	Allows user to edit values in the Data Center Properties dialog.
Access Users	Allows user to view a list of users in the system.
Configure Users	Allows user to create, edit, and delete system users.
Access User Groups	Allows user to view a list of user permission groups in the system.
Access Manage Asset Groups	Allows user to view a list of server asset groups in the system.
Configure Asset Groups	Allows user to create, edit, and delete server asset groups.
Access Configuration	Allows user to view current system configuration details.
Edit Configuration Settings	Allows user to edit current system configuration details.
Access Reconcile Asset Names	Allows user to reconcile default server names when rack names are changed.
Access System Activity Log	Allows user to view the System Activity Log.
Print/Export System Activity Log	Allows user to print or export the System Activity Log.
Access System Configuration Report	Allows user to view the System Configuration Report.
Print/Export System Configuration Report	Allows user to print or export the System Configuration Report.
Access Modbus Points List	Allows user to configure the Modbus Points List.
Generate Diagnostic Support Package	Allows user to generate a SynapSense Support Package for use when debugging reported issues.
Export from MapSense	Allows user to export the configuration from MapSense to the Environment Server.

Permission	Description
Report Management	
Access Data Analysis	Allows user to configure queries to analyze system data.
Print/Export Query Results	Allows user to print or export the results of a query.
Print/Export Charts	Allows user to print or export a data chart.
Add Annotations	Allows user to create data center specific annotations.
Add System Annotations	Allows user to create system wide annotations.
Access Custom Queries	Allows user to execute saved custom queries.
Configure own private custom queries	Allows user to create, edit, or delete their own private custom queries.
Configure own public custom queries	Allows user to create, edit, or delete their own public customer queries.
Configure all custom queries	Allows user to create, edit, or delete all custom queries.
Access Find Available Capacity	Allows user to execute a search for available capacity.
Access Carbon Emissions Summary	Allows user to view the Carbon Emissions Summary report.
Edit Carbon Emissions Target Values	Allows user to edit the target values used for the Carbon Emissions Summary Report.
Print Carbon Emissions Summary	Allows user to print the Carbon Emissions Summary report.
Access Network Statistics	Allows user to view the Network Statistics report.
Print/Export Network Statistics	Allows user to print the Network Statistics report.
Schedule Custom Queries	Allows user to schedule any listed custom query.
Manage Report Templates	Allows user to perform all tasks available on the Report Templates dialog including: import, schedule, edit or delete.
View Reports	Enables the View Reports menu option and allows user to view reports that have run.
Delete Reports	Allows user to delete a report from the Reports list.
Alert Management	

Permission	Description
Access Alert Definitions	Allows user to view the current alert definitions.
Configure Alert Definitions	Allows user to create or edit an alert definition.
Enable/Disable Alert Definitions	Allows user to enable or disable an alert definition.
Delete Alert Definitions	Allows user to delete an alert definition.
Access Notification Templates	Allows user to view alert notification templates.
Configure Notification Templates	Allows user to create, edit, or delete an alert notification template.
Access All Alerts	Allows user to view alerts in the system.
Acknowledge and Resolve Alerts	Allows user to acknowledge or resolve alerts.
Dismiss Alerts	Allows user to dismiss alerts without resolution.
Access Delete All Alerts	Allows user to delete all alerts in the system.
Dashboards	
Access Dashboards	Allows user to view configured dashboards.
Configure Own Private Dashboards and Carousels	Allows user to create, edit, or delete their own private dashboards and carousels.
Configure Own Public Dashboards	Allows user to create, edit, or delete dashboards available to other users.
Configure All Dashboards and Carousels	Allows user to create, edit, or delete any dashboard or carousel in the system.
Floor Plan	
Access Floor Plan	Allows user to view the Floor Plan tab.
Access WSN Network Floor Plan	Allows user to view the WSN Network layer of the Floor Plan tab.
Send WSN Command to Nodes	Allows user to send WSN commands to the nodes.
Access Active Control Performance Data	Allows user to view the Active Control layer of the Floor Plan tab when Active Control is installed.
Edit Active Control Operational Parameters	Allows user to configure operational parameters for the control input.
Edit Active Control Target Values	Allows user to edit the target values for the Region of Influence.
Access Environmentals Floor Plan	Allows user to view the Environmental layer of the Floor Plan tab.

Permission	Description
Manage Nodes	Allows user to access the Manage Nodes dialog to manage the vertical placement of ThermaNode EZ components on a rack.
Enable/Disable Objects	Allows user to enable or disable objects on the floor plan and in Data Views.
Access PowerImaging Floor Plan	Allows user to view the Power Imaging layer of the Floor Plan tab.
Edit PowerImaging Parameters	Allows user to edit the power thresholds in Power Imaging.
Enable LiveImaging Layer	Allows user to view the LiveImaging layer of the Floor Plan tab.
Access LiveImaging Advanced	Allows user to view the advanced features of LiveImaging.
Print/Export LiveImaging Images	Allows user to print or export the images created with LiveImaging.
Data Monitoring	
Access PUE Summary	Allows user to view the PUE Summary tab.
Access Pre-defined Metrics	Allows user to view the Pre-defined Metrics tab.
Access Custom Metrics	Allows user to view the Custom Metrics tab.
Access PDU	View Allows user to view the PDU tab.
Access BCMS View	Allows user to view the BCMS tab.
Edit BCMS Circuit Names	Allows user to edit the BCMS circuit names in the BCMS tab.
Access Data Views	Allows user to view defined Data Views.
Configure Own Private Templates	Allows user to create, edit, or delete their own private data view templates.
Configure Own Public Templates	Allows user to create, edit, or delete public data view templates used by other users.
Configure All Templates	Allows user to create, edit, or delete any data view template in the system.
Restore Default Templates	Allows user to restore the default template set for data views.
Print/Export Data Views	Allows user to print or export the data displayed in a data view.

Configuring Data Center Properties

These properties must be set for every data center in the Web Console.

See the following topics:

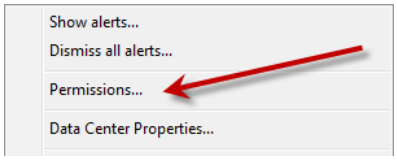
Setting Access Permissions

Giving user and groups access to a specific data center or room is done through the context menu for the Sites list. These access permissions are in addition to Managing Users and Groups settings. Permissions assign permission to configure Data Center Properties, and to access data centers and rooms to groups or individual users.

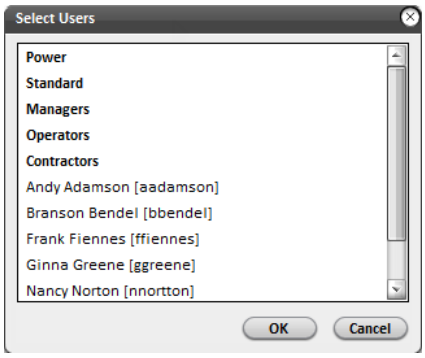
Everyone is the default permission level. No access restrictions apply to any user or group.
To implement a permissions scheme, remove Everyone and add the groups or individual users for the data center and rooms to which they need access. The Administrator will not be able to remove the Everyone permission level without first adding a user or group to access the data center or room.

To grant access to a specific data center or room:

1. On the Sites list, right-click on the data center name or room and select **Permissions** in the context menu.



2. Click **Add** in the Permissions dialog.
3. In the Select Users dialog, highlight the names (individual or group) from the list.

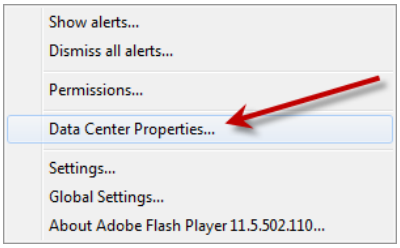


4. Click **OK** to return to the Permissions dialog.
5. Click **OK** in the Permissions dialog to save and exit.

To remove individual permission, highlight the name then click **Remove**. Click **OK** to save and exit.

Setting Data Center Properties

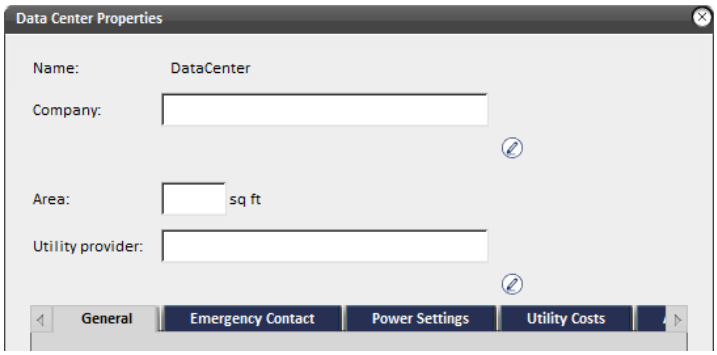
Right-click on a data center name then select **Data Center Properties** in the context menu to open the Data Center Properties dialog.



Use this dialog to enter specific information about the selected Data Center.

Tab Descriptions

- **General** – Information about power usage, capacity, and electrical equipment counts.
- **Emergency Contact** – The name and contact information for the primary emergency contact for the data center.
- **Power Settings –** Settings for historical reference, power factor, de-rate policy, and allowable phase deviation.
- **Utility Costs** – The tiered cost per kWh for electricity supplied to the data center. This information can be used for cost calculations elsewhere in the Web Console for cost burdened PUE calculations the CO_2 Emissions Summary.

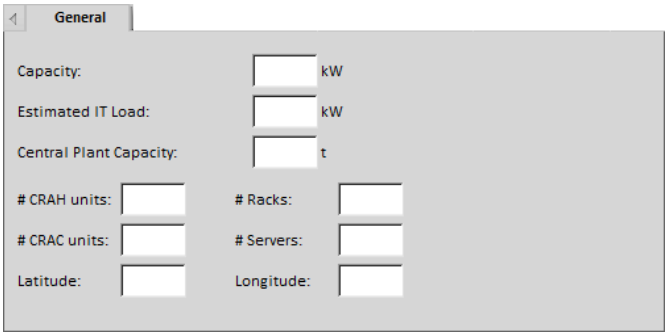


Field Descriptions

- **Name** – The name of the selected data center. This field automatically populates. The name can only be changed in MapSense.
- **Company** – The name of the company that owns the data center. Click the **Edit** icon to the right of the field to enter an address for the data center.
- **Area** – The approximate size of the selected data center. This information is used in Lighting Density calculations.
- **Utility Provider** – The name of the utility company providing electric power to the data center. Click the **Edit** icon to the right of the field to enter an address for the data center.

General

Specify capacity, and electrical equipment counts on the Data Center Properties General tab.

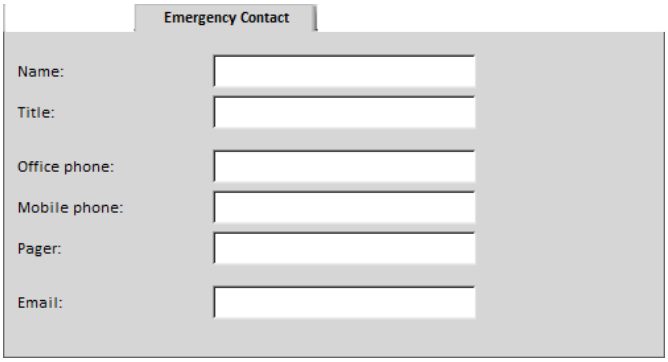


- **Capacity** – (kW) Power provided to the selected data center.
- **Estimated IT load** – (kW) Estimate of the IT load (power consumed to drive servers).
- **Central plant capacity** – Capacity of the central plant used to cool the data center.
- **# CRAH Units** – Total number of CRAHs in the selected data center. May be different from the number of CRAHs instrumented with SynapSense sensors.
- **# CRAC Units** – Total number of CRACs in the selected data center. May be different from the number of CRACs instrumented with SynapSense sensors.

- **# Racks** – Total number of racks in the selected data center. May be different from the number of racks instrumented with SynapSense sensors.
- **# Servers** – Total number of servers in the selected data center. May be different from the number of servers instrumented with SynapSense sensors.
- **Latitude and Longitude** – The latitude and longitude coordinates for the selected data center using values in the appropriate range (-90 to 90 and -180 to 180).

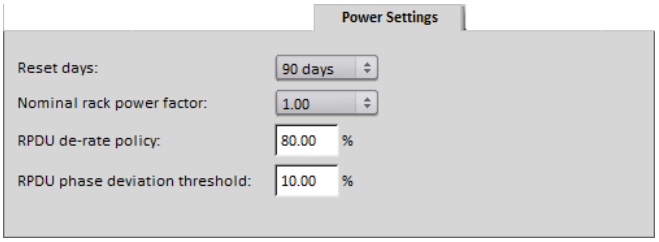
Emergency Contact

Provide information about the primary emergency contact for the data center including name, title, office phone, mobile phone, pager, and email address.



Power Settings

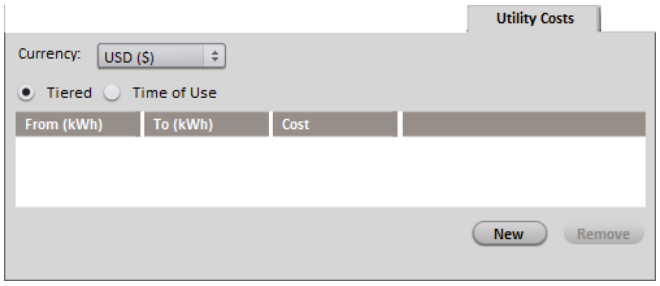
Specify power usage on the Power Settings tab.



- **Reset days** – Number of days before the historical reference time stamp for the power data automatically resets.
- **Nominal rack power factor** – The power factor to use in rack power calculations.
- **RPDU de-rate policy** – The data center policy for de-rating the maximum current threshold for RPDUs.
- **RPDU phase deviation threshold** – The data center policy for maximum allowable deviation between phases within an RPDU before an alert is triggered.

Utility Costs

This information is used in Carbon Emission Summary calculations. Select either tiered cost or time of use per kWh for electricity supplied.

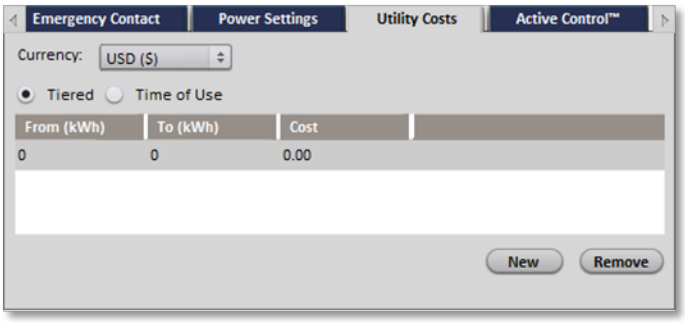


Tiered Method

Utility companies use different methods for charging customers. For those using a tiered costing method follow these steps for completing the Utility Costs tab.

To set the utility cost tiers:

1. From the drop-down list, select the appropriate Currency for calculating utility costs for the data center location.
2. Select the **Tiered** radio button.
3. Click **New** to add a tier. The From values in the list are not editable and automatically set to either zero (0) (first entry) or to match the increment for the To value of the previous entry. Enter the To value as well as the cost for the tier. Repeat this step to add more tiers.



> **Note**: If the user deletes a row, the From value in the next row automatically updates to ensure contiguous cost tiers. For example, if the user deletes the 301-400 cost tier, the 401-500 cost tier automatically updates to 301-500.

4. Click **OK** when finished and confirm the changes in the dialog that displays.
5. Click **Cancel** to exit without saving any changes made since opening the dialog. A dialog will appear to confirm cancelling without saving.

To remove a cost tier:

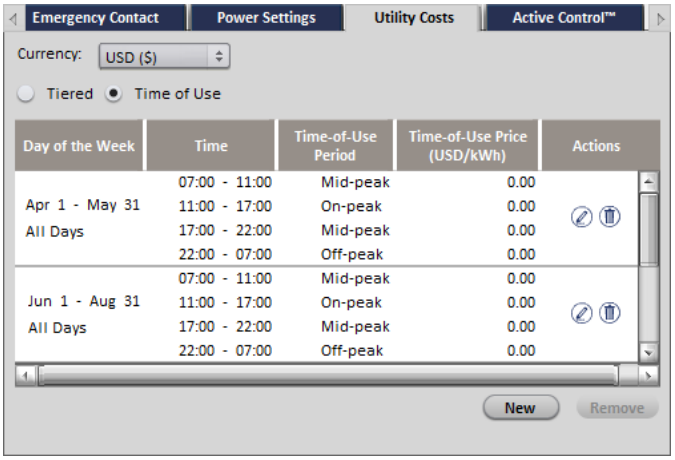
1. Highlight the entry.
2. Click **Remove**.
3. Click **OK** to save the changes.

Utility Cost Time of Use Method

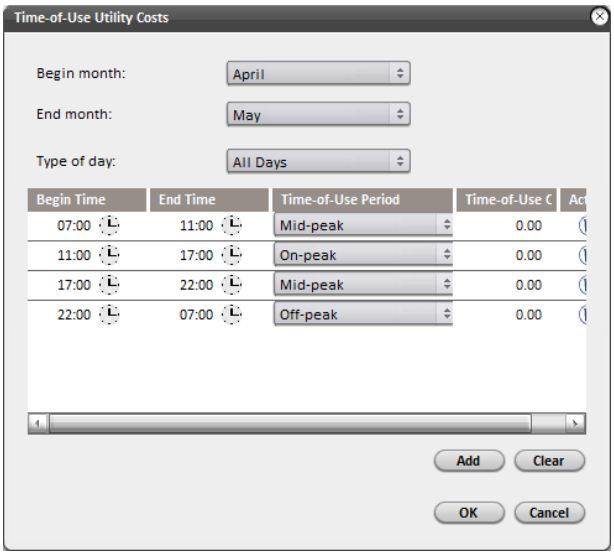
Utility companies use different methods for charging customers. For those using a time of use costing method follow these steps for completing the Utility Costs tab.

To set the time of use:

1. From the drop-down list, select the appropriate Currency for calculating utility costs for the data center location.
2. Select the **Time of Use** radio button.



3. Click **New** to display the Time-of-Use Utility Costs dialog.



4. Use the drop down lists and clock widgets to set the appropriate dates, time, and time of use periods.
5. Click **Add** to enter another time of use period. Repeat until you have all of the times needed. A new line displays after the others. You cannot add a new line between existing lines.
6. Click **OK** to save the entries.

Note: The Clear button deletes all of the entries.

To edit a time of use entry, click the **Edit** icon in the Action column adjacent to the entry you want to change. This opens the Time of Use Utility Costs dialog. Make the necessary changes, then click **OK**.

To delete a time of use entry, select the **Delete** icon in the Action column, then click **OK**.

Configuring the Delivery Mechanism and Defining Alerts

The Alerts menu contains options for defining alerts, configuring notification templates, viewing all alerts, and deleting alerts.
Alerts definition and configuration includes:

- Alert Definition Wizard
- Notification Macros and Templates
- Alert Escalation
- Enhanced Alert Lifecycle
- Support of Primary and Secondary SMTP Server
- Refined Searching and Filtering

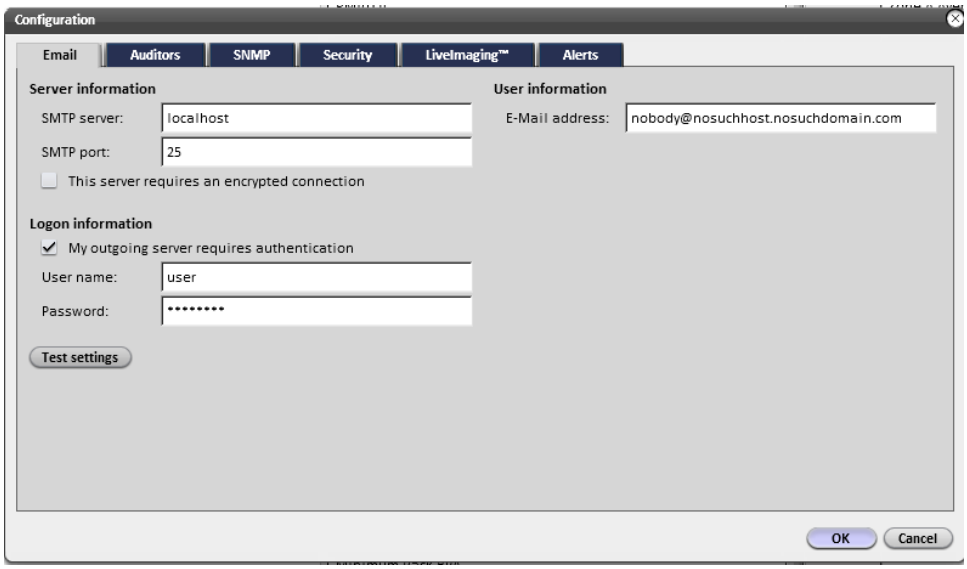
This section describes the steps required to set up the Alerts Delivery Mechanism for one or many distributed data centers. For details about working with alerts, seeWorking with Notification Templates and Defining Alerts.

Configuring the Alerts Delivery Mechanism

Before defining an alert, set the Email, SNMP, and Alerts Processor delivery mechanisms. If the delivery mechanisms are not set, the alert system will not function properly. To display the Configuration dialog, select **Configuration** on the Admin menu.

Configuring Email Delivery

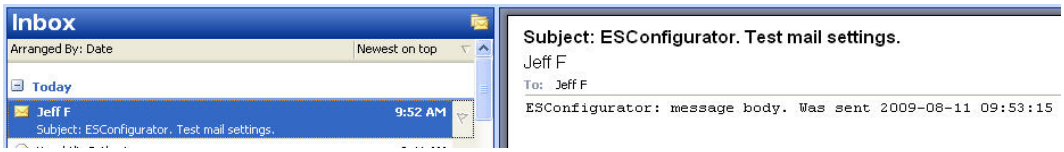
Triggering an Alert involves notifying specific recipients of an alert condition when it arises via email, SMS, or SNMP Trap.



The Email tab in the Configuration dialog defines the connection to the outgoing mail server.

Field Definitions

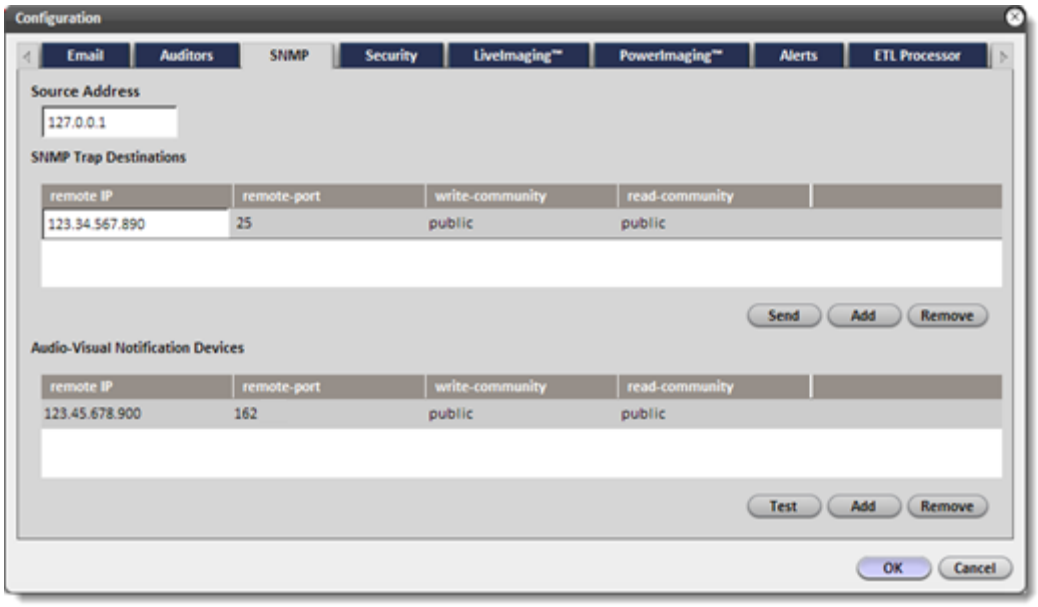
- **Server Information** – The SMTP Server field is for the host name or IP address of the email server. The port for SMTP is typically 25. Check with your company email administrator for the correct port number.
- **User Information** – The User Name field is the name that displays as the sender when the alert email arrives in the Inbox of the recipient. The Email Address field is the address of the account on the email server that sends alert emails. To ensure an appropriate and timely response to alert email, it is recommended that your company create an email account specifically for delivering SynapSense system emails. This prevents alert email from being mistaken for routine email traffic.
- **Logon Information** – If authentication is required check the box and provide the proper username and password.
- **Test Settings** – After configuring the three sections above, click **Test Settings** to send a test email to the email server (see example). Verify that the email was successfully received by the email address configured for receiving Alerts emails.



Configuring SNMP Delivery

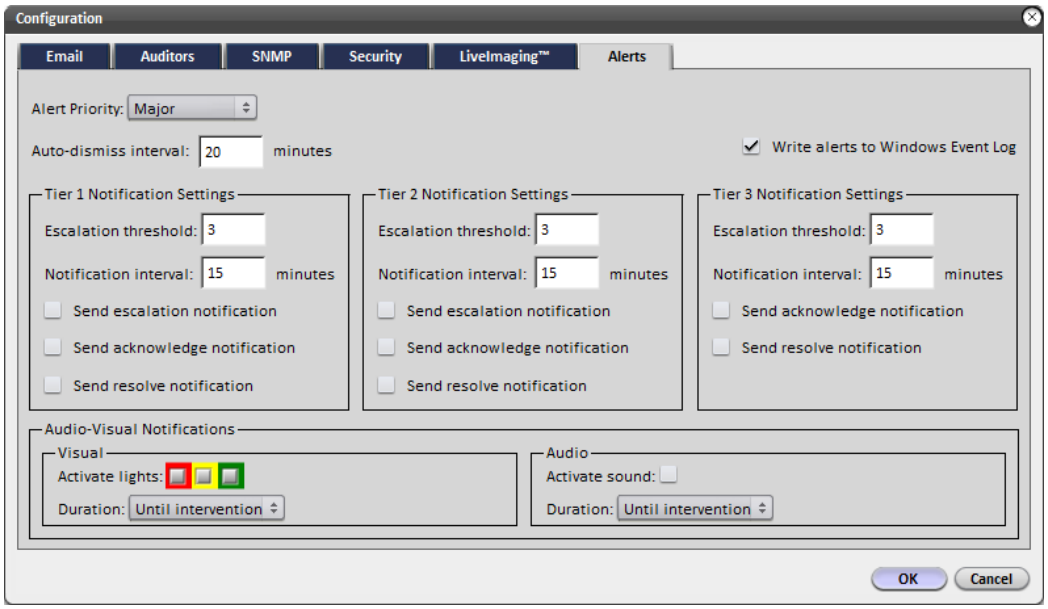
The SynapSense Alert system is capable of sending SNMP-based data to other SNMP enabled systems and devices when an alert is triggered. The dialog below shows the area where destinations are configured. When entering a new SNMP destination, all fields are required.

- **SNMP Trap Destinations** – Click to activate the field, then enter the IP address of the server for the trap destination system. The port number for SNMP Traps is typically 162, but may be different for the facility destination system. Consult destination system documentation for the correct port number at the facility.
- **Audio Visual Notification Devices** – Click to activate the field, then enter the IP address for the device, the port and community strings. The source address must be the IP address of the SynapSense Environment Server. Contact Panduit Technical Support for a list of supported devices and additional information.



Configuring the Alerts Processor

Configure the SynapSense Alert Processor to send additional alert emails and notifications at specific intervals. Set each Alert Priority with a notification level appropriate to its urgency for escalation and audio-visual notification.



To configure the alerts processor, repeat these steps for each priority type (Critical, Major, Minor, and Informational):

1. Select the Alert Priority type from the drop down list.
2. Set the Auto-dismiss Interval for each alert priority. Enter the number of minutes to wait, after the condition that triggered the alert has returned to normal, before the system automatically dismisses the alert.
3. Check the box to **Write Alerts to the Windows Event Log** in addition to other selected delivery options.
4. Set the Escalation threshold. This represents the number of notifications sent before an alert moves to the next tier of escalation. The default value for all three tiers is 3.
5. Set the Notification interval. This is how frequently (in minutes) the system sends notifications.
6. Check preferences at each tier for sending email notification for escalation, acknowledgement, and resolution. Some selections are not available for the Informational alert level.
7. If using the Audio-Visual Notification device, do the following:

   Visual: The audio-visual device has colored lights that illuminate for the alert level. Select one or more of the light color boxes for the alert level. In the Duration drop down list, select the length of time for the lights to remain illuminated (10 to 180 seconds or until intervention).

   Audio: Select the Activate Sound checkbox for a loud, continuous beep to emanate from the device at this alert level. In the Duration drop down list,

select the length of time for the alarm to sound (10 to 180 seconds or until intervention).

8. Click **OK**.

Working with Notification Templates

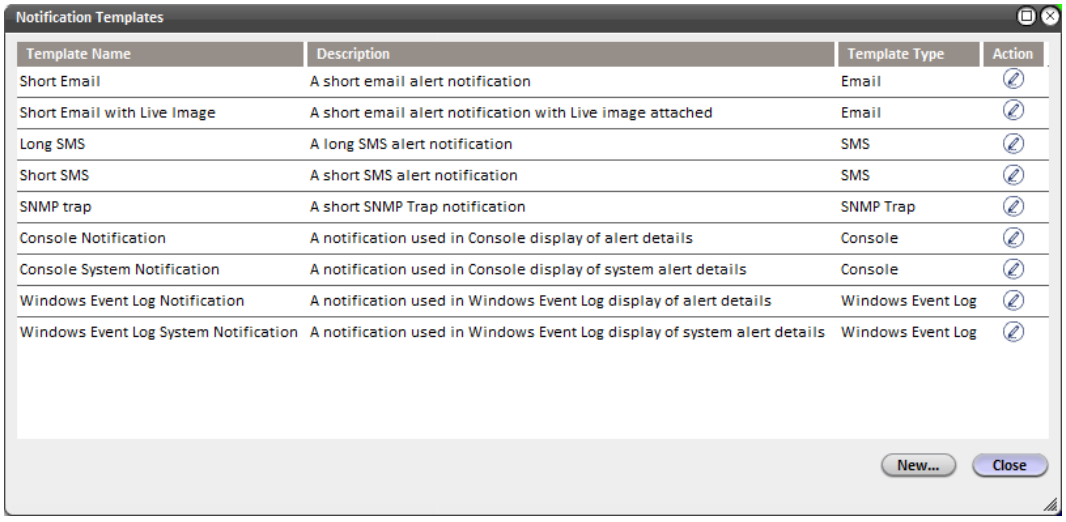
Web Console provides a series of common alert message templates along with a mechanism for creating new customer templates.
The list of default templates displays with an Edit icon. Custom templates display with both an Edit icon and a Delete icon. The list of template names displays in a drop down list on the Notification tab of the Alert Definition.

Note: Default notification templates cannot be deleted.

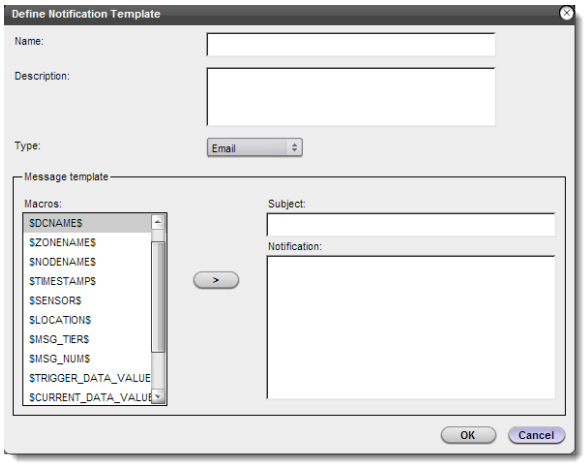
Icon	Description
	Edit
	Delete

To define a new notification template:

1. On the Alerts menu, select **Notification Templates**.
2. On the Notification Templates dialog, click **New**.



3. Use the field names and descriptions below to fill in the dialog.



4. Click **OK**.

Field Descriptions

- **Name** – A unique name that identifies the alert type and its purpose.
- **Description** – Description of the template to display in the Notification Templates window.
- **Type** – Email, SMS, SNMP Trap, Console, or Windows Event Log.
- **Macros** – See the "Available Notification Macros with Descriptions" on the facing page table. This list provides options for formatting the message, such as inserting the alert name and time stamp in the notification so users know which alert was triggered and when.

  While typing the text of the Notification, place a macro at the current cursor position by selecting it from the list then clicking the right arrow button. When the notification is assembled, each macro in the message is replaced by its corresponding node-specific data for the alert.

- **Subject** – The message subject line (or part of the SNMP Trap packet). It may be any combination of letters, numbers, spaces, colons, underscores, tildes, carets, commas and periods (no dashes or asterisks).
- **Notification** – Create the alert message text, inserting macros that represent the data you want to see displayed with the message. When the system assembles the alert message, the actual data replaces the macros.

Note: Be sure not to exceed the message character limit for your carrier. The standard SMS message limit is 160 characters for Latin alphabet and 70 characters for non-Latin. The standard email message length is 2000 characters for any character set.

Available Notification Macros with Descriptions

Macro	Description
$ALERT_ DESCRIPTION$	The description of the alert being triggered
$ALERT_LINK$	The URL to the alert being triggered
$ALERT_NAME$	The name of the alert being triggered
$CURRENT_DATA_ VALUE$	The current value of the parameter that triggered the alert
$DCNAME$	Name of the data center
$LOCATION$	The text from the location field entered for that object in MapSense. This is a free text field, so any information about the sensor or equipment can be entered there. Some Objects do not have a location field (sensors and circuits), so nothing will be displayed if one of those Objects triggers the Alert.
MSG_NUM	The number of messages sent so far. For example, Notification message 3. Note: Only available for notifications delivered via email.
MSG_TIER	The escalation tier at which the alert currently sits. For example, Tier 1, Tier 2, Tier 3 Note: Only available for notifications delivered via email.
$OBJECTNAME$	Name of the object that triggered the alert
$TIMESTAMP$	The date/time that data was collected when the Alert was triggered. This time is not changed when reminder emails are sent
$TRIGGER_DATA_ VALUE$	The data value that triggered the alert
$ROOMNAME$	Name of the room in which the objects that triggered the alert are located
DC_LIVE_IMAGE	Includes the LiveImaging layer of the data center at the time of the alert
$ROOM_LIVE_ IMAGE$	Includes the LiveImaging layer of the room at the time of the alert.

To edit a notification template:

1. On the **Alerts** menu, select **Notification Templates**.
2. Find the notification template you want to edit and select the **Edit** icon. See "Work-

ing with Notification Templates" on page 60 for icon descriptions.
3. Makes changes, as needed, then click **OK**.

To delete a notification template:

1. On the Alerts menu, select **Notification Templates**.
2. Find the notification template you want to delete and select the **Delete** icon. See "Working with Notification Templates" on page 60 for icon descriptions.
3. Click **OK**.

Defining Alerts

Alerts are used by data center operators to identify issues with the equipment in the data center. This functionality allows Administrators, and users with configure alerts definitions permission, to define new alerts set to trigger when selected conditions are met for one or more Object Property. The resulting alerts are then available for viewing on the Alerts tab or by clicking the Alerts icon in the lower left corner of the Web Console window. Emails, SMS, and SNMP Traps can also be generated when alerts are triggered.

To define a new alert:

1. On the Alerts menu, select **Alert Definitions**.
2. On the Alert Definitions dialog, click **Create**.
3. On the New Alert Dialog, use the instructions that follow to complete each tab:

- General
- Recipients
- Alert Conditions
- Notification

4. Click **OK** when finished.

Common Terms Used in Alerts Management

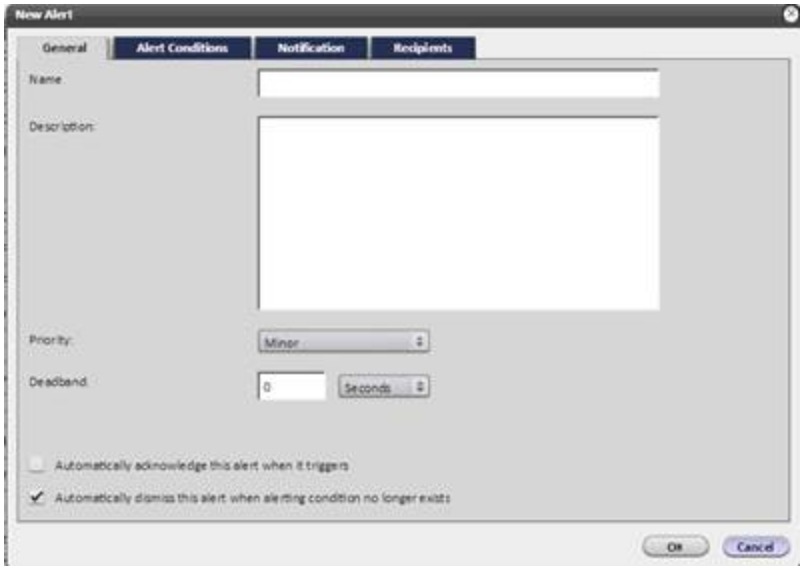
Item	Definition
Alert	The definition of an alert includes an alert message header and alert configuration information (for example, name, description, priority).
Subject	The subject line for any alert notification messages sent as the result of a triggered alert.
Notification Body	The text of the Alert notification message sent as the result of a triggered alert.
Alert Condition	Criteria for a specific object type used to trigger the alert. It

Item	Definition
	can be combined with other conditions using the AND/OR operators.
Alert Object	Objects in the SynapSense system are racks, CRACs, CRAHs, pressure, panels, circuits, meters, nodes, and sensors.
Operator	An operator defines how sensor readings of a particular data type are evaluated against the specified value. Operators used in SynapSense Web Console are (a) equal to (b) greater than (c) greater than or equal to (d) less than (e) less than or equal to, and (f) not equal to.
Threshold value	The threshold value is the reference value used to determine if an alert should be triggered. For example, an alert that evaluates sensor readings to ensure that they are not greater than 55% RH uses a value of 55. Similarly, if the temperature from a sensor should not be less than 60 degrees Fahrenheit, then 60 is the threshold value. Door, equipment status, and liquid detection sensors use a text value instead of a numeric value.
Associated Objects	The specific object or objects in the system to which an alert applies. Multiple objects, such as racks or CRACs, can be selected.
Alert Recipients	Notifications are sent to alert recipients when alerts are triggered. This can be an email address, SMS, or an SNMP trap.
Alert Priority	Alerts can have a priority of critical, major, minor, or informational. This determines how often a notification is sent until the alert is acknowledged. See also Configuring Alerts Delivery Mechanism earlier in this guide for more information about setting notification frequency.
Open Alert	Any active alert that has not been marked as Acknowledged, Dismissed, or Resolved.
Acknowledged	If an alert is triggered, a user can click Acknowledged to indicate it was received.
Dismissed	Makes the Alert Definition inactive in the SynapSense Web Console. Historical information regarding this alert is still available to the application. However, history is removed when alert definitions are deleted.
Resolved	When the cause of an alert is researched and rectified the

Item	Definition
	alert can be marked as Resolved in SynapSense Web Console.

General Tab

On the General tab, name and describe the alert, set its priority and deadband, and select preferences for alert handling. When finished, complete the Recipients tab.

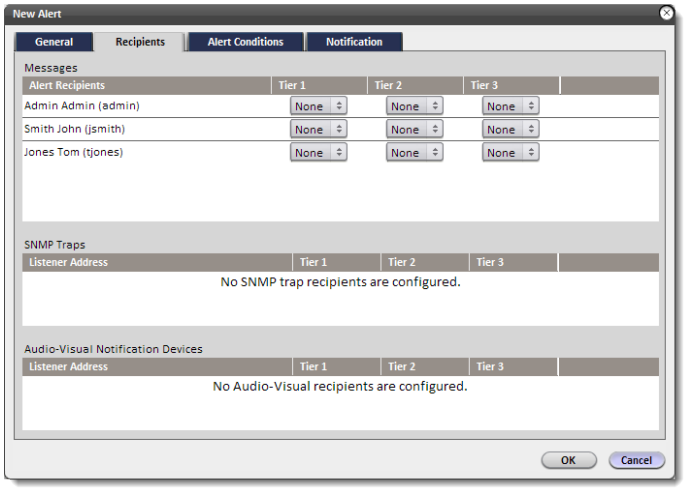


Field Definitions

- **Name** – Appears in the Name column of the Active Alerts and Alert Definitions lists. The name may be any combination of letters, numbers, spaces, underscores, tildes, carets, commas and periods (no dashes or asterisks).
- **Description** – Briefly describe the purpose of the alert. This information appears in the Description column of the Alert Definitions list. Only 50-80 characters display in the Alert Definitions list.
- **Priority** – Sets the priority of the alert to Critical, Major, Minor, or Informational.
- **Deadband** – Sets the amount of time during which continuing alert conditions will not trigger additional alerts. This feature is designed to keep multiple alerts from triggering after an alert is Acknowledged and work is in progress to resolve the issue.
- **Automatic Alert Handling Preferences** – Choose one or both of the checkboxes.
  Automatically acknowledge this alert when it triggers – Once triggered, the system automatically sets the status of the alert to Acknowledged.
  Automatically dismiss this alert when alerting condition no longer exists – If at end of the auto-dismiss period the alert condition no longer exists, the system automatically sets the alert status to Dismissed.

Recipient Tab

When conditions trigger an alert, an email, SMS message, or SNMP Trap notifies the recipients according to the settings on this tab.
The Alert Recipients list contains all users of the system. The columns indicate the escalation tier and the drop down list provides the available message delivery types. Once any recipient sets an alert status to Acknowledged, no further escalation messages will be sent.



Email and SNMP Trap configuration must be performed prior to emails or traps being used. See Configuring the Alerts Delivery Mechanism for information about how to

configure these options. If no recipients are defined for the alert, then the alert will only display in the Web Console or Windows Event Log, if configured.

To select recipients:

1. On the New Alert dialog, click the **Recipients** tab.
2. Locate the user who should receive notification for this alert.
3. Use the drop down lists adjacent to the Alert Recipients to select the notification method for each escalation tier.
4. Repeat Steps 2 and 3 for each Alert Recipient.
5. Click **OK** when finished.

Repeat these steps for each new alert.

To remove a name from a notification:

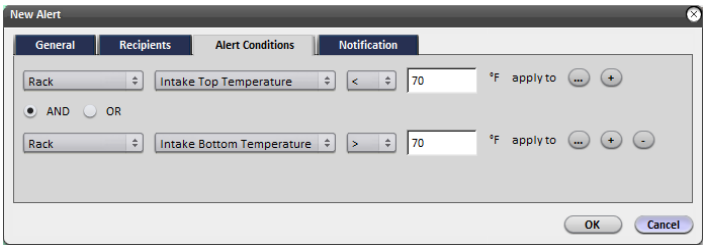
1. Locate the user on the list.
2. Select **None** from the drop down list for each Tier column.
3. Click **OK**.

Alert Conditions Tab

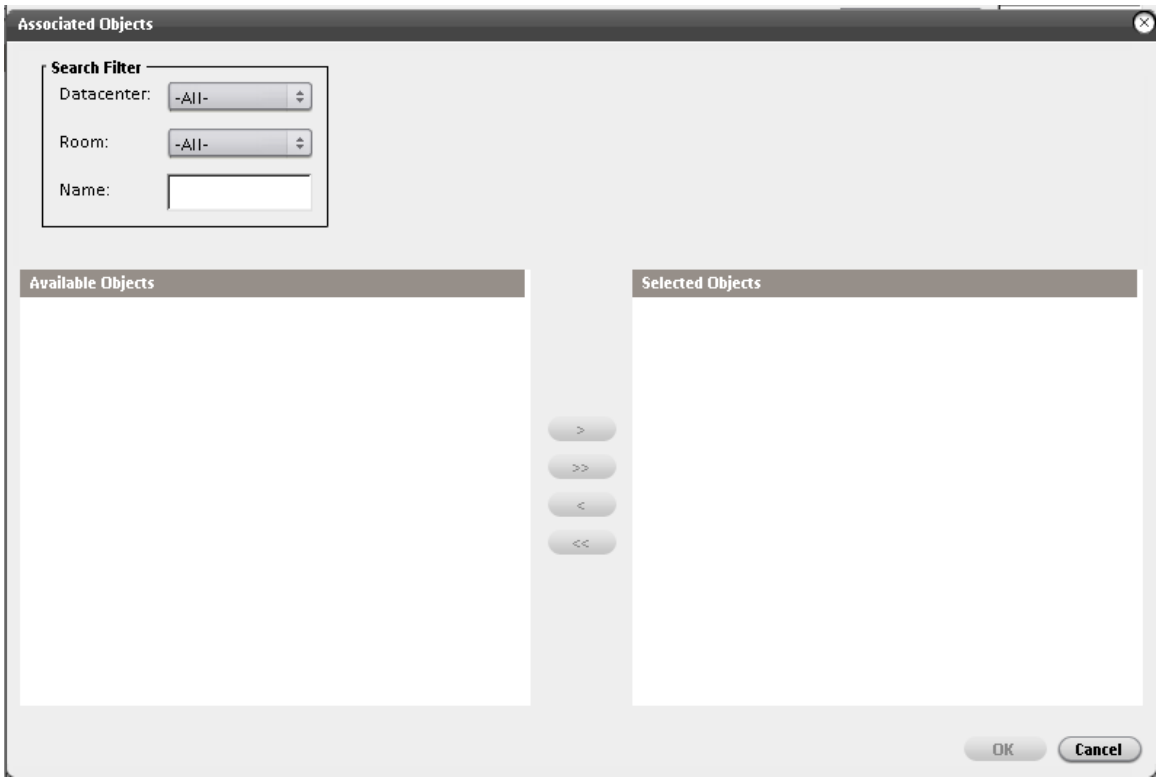
Use the Alert Conditions tab to specify the trigger conditions for the new Alert. Specify up to five conditions, each with its own relationship to the other conditions.

To set alert conditions:

1. From the first drop down list (left), select the Object you want to associate with the alert.



2. From the second drop down list (center), select the Object Properties. This list automatically displays the available properties for the object you selected in Step 1.
3. From the third drop down list (right), select a trigger parameter (for example, <, >, =), and enter a value in the field that displays.
4. Click the ellipsis button (…) at the right of the drop down lists to open the Associated Objects dialog. Use this dialog to select the objects to which you want these conditions applied.



5. In the Associated Objects dialog, do the following to locate objects:

    a. In the Search Filter box, use the drop down list to filter objects by Data Center, Room, or object Name.
    b. The Available Objects list displays the list of objects based on the Search Filters. Select one or more objects in the list then click the arrow buttons to move the items to the Selected Objects list.
    c. To select or deselect multiple objects use Ctrl+Click or Shift+Click, then click the single arrow button.
    d. To select or deselect all of the objects use the double arrow buttons.
    e. You can also double-click to select and move one or more items from one list to the other.
    f. To add more objects from another data center of other locations in the same data center, change the Search Filter selection and repeat a and b of Step 5.
    g. When finished, click **OK** to close the dialog and return to the Alert Conditions tab.

6. To add another set of trigger conditions, do the following:

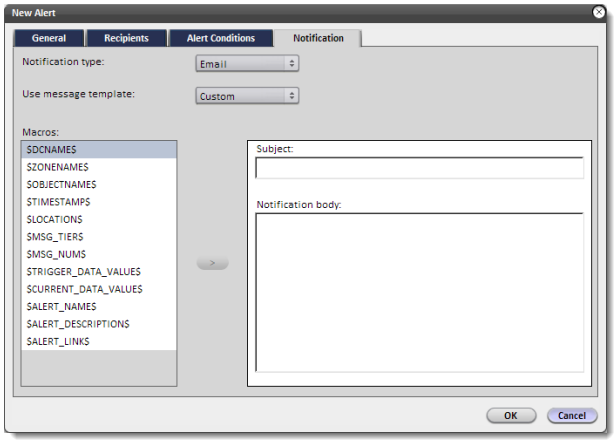
    a. Click the **(+)** button.

b. Select either **And** or **Or** to set the relationship to the other conditions in this list.
c. Repeat Steps 1 to 5 of this procedure.

To delete a set of trigger conditions, click the minus (-) button.

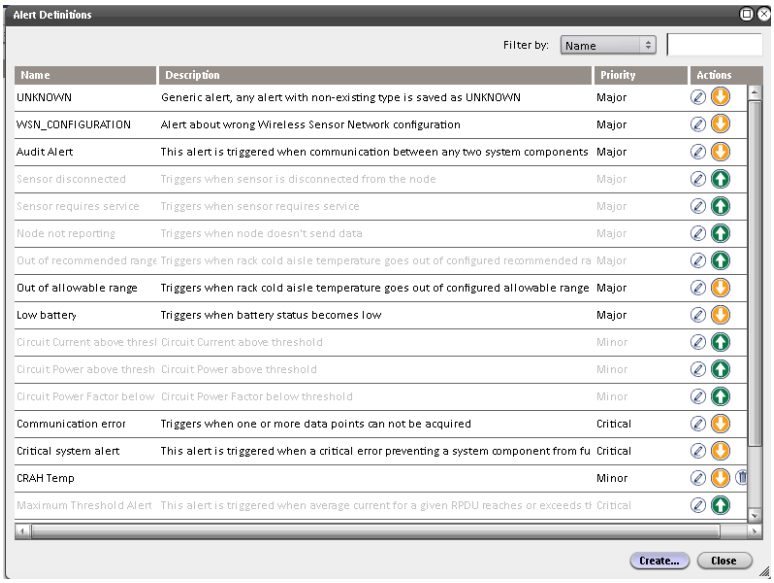
Notification Tab

On the Notification Tab, compose the message body and insert macro strings into the text where specific information should appear, such as the location and node that triggered the alert. When an alert triggers, each macro is replaced by actual data that it represents.
The New Alert dialog is shown below with the list of available macros. See Working with Notification Templates for more information.



Managing Alert Definitions

A list of all defined alerts (both active and deactivated) is available in the Alert Definitions dialog.



Activate / Deactivate Alert Definition Icons – The green up arrow is the Activate Alert button. The amber down arrow is the Deactivate Alert button. If an alert is currently deactivated, it will not trigger, even if its trigger conditions are met. This allows users to set aside Alert Definitions for future use without having to create them again each time they are needed to monitor for various data center conditions.

To put an alert definition into service, click the green up arrow (Activate Alert Definition) then click **OK** in the confirmation dialog that displays. The green up arrow becomes an amber down arrow.

To take an alert definition out of service, click the down arrow (Deactivate Alert Definition), then click **OK** in the confirmation dialog that displays. The amber down arrow becomes a green up arrow.

The following table defines the alert definition icons.

Icon	Definition
	Indicates the alert is currently Inactive. Click to activate the alert.
	Indicates the alert is currently Active. Click to deactivate the alert.
	Edit an alert
	Permanently delete the alert. (Only available for user defined alerts.)

A message displays on the status bar of the Web Console window confirming successful deactivation of the alert.

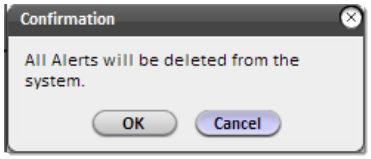
Although the deactivated alert definition is not currently generating alerts it can be made active again. The application remembers the alert definition for the purpose of interpreting and reporting historical data. Therefore, the name of the deactivated alert definition cannot be reused and the Administrator should not create another Alert Definition with the same name.

Click the **Edit** icon next to an Alert Definition to edit its configuration settings. The Edit Alert dialog opens. This dialog operates in a similar manner to the New Alert dialog and tabs. Edit the existing Alert Definition as desired then click the **OK** button.

Only custom alert definitions can be deleted. Administrators can delete any alert definition. Power users can delete custom alert definitions that they created. Custom entries have a delete icon in the Actions column. To delete, highlight the item and click the **Delete** icon.

Deleting Alerts History

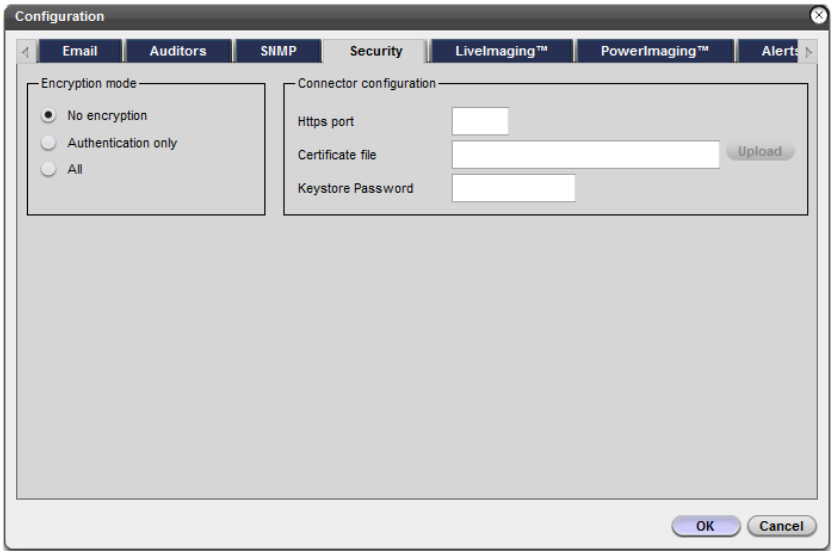
An Administrator can delete the entire alerts history by selecting **Delete All Alerts** from the Alerts menu, then clicking **OK** to remove the entire list of Alerts.



Important! This is an unrecoverable operation!

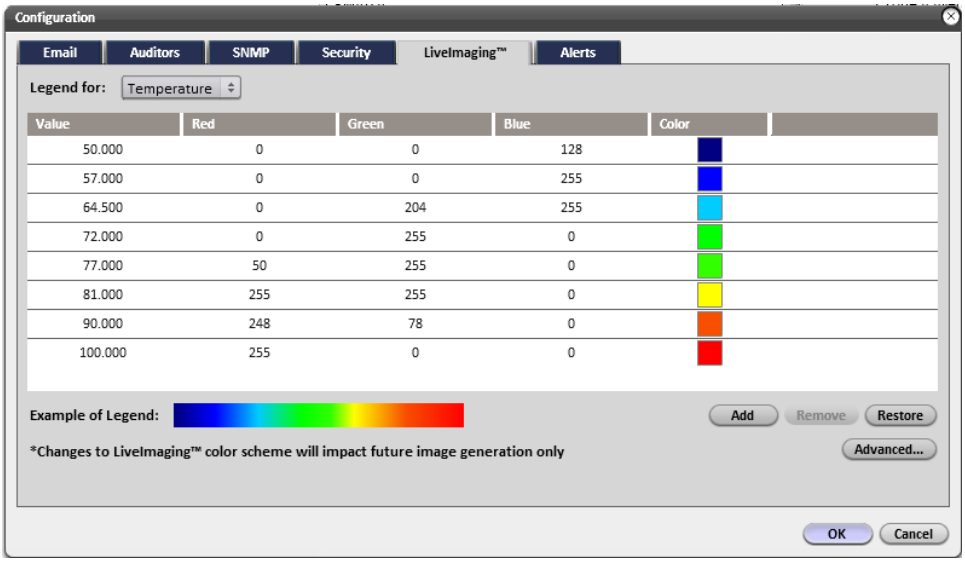
Configuring System Security

The Web Console can be secured using SSL instead of the regular HTTP protocol. Select the Encryption Mode and enter the port number (normally 8443), certificate file, and keystore password. Use either self-certification or third-party certificates.



Configuring LiveImaging

The LiveImaging system can generate a color map to represent values of data for temperature, humidity, dew point, and pressure. The number of divisions, and the color that represents each, can be customized to meet the needs of a specific installation.



Note: Once changes are saved, it is not possible to go back to the default color set without manually resetting each color. Prior to saving a color setting, use Restore to undo the last action.

To configure colors used in LiveImaging:

1. Click on the **Value** or the color box to make changes.
2. Click the color to open the Basic Colors dialog.
3. Make the color selection then click OK.
4. Repeat these steps for each color entry you want to change.

A new Legend generates for all images created from that time forward. Images created prior to the change will use the colors and data divisions defined at the time the image was generated by the system. LiveImaging images are created for each room and data center according to the image retention policy (default is every 5 minutes).

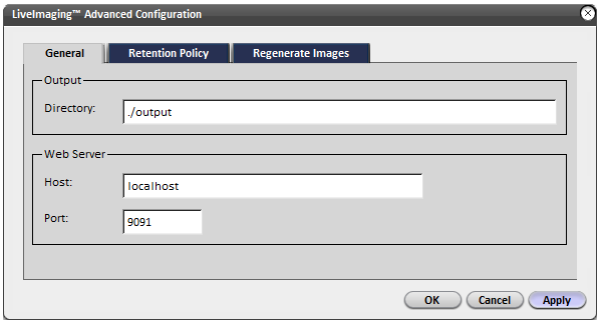
Configuring an Image Retention Policy

Retaining LiveImaging history takes a lot of disk space when capturing images every 5 minutes continuously. The image retention policy provides options for saving these images to a location anywhere on your network and to set the interval for disk cleanup. For example, you may want a full set of images for 7 days but only need a sampling for review after that. Use the retention policy settings to reduce the number of images saved per hour, per day, or as needed.

Because of the amount of disk space required to retain images, a recommended best practice is to retain images for a shorter period and use the Regenerate LiveImaging feature when the need arises to view older images.

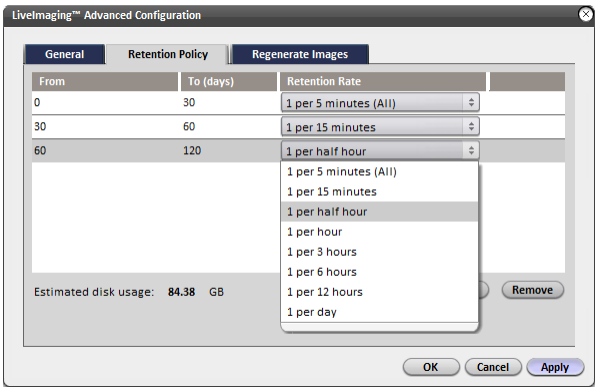
To set the image retention location

1. On the Admin menu, select **Configuration**.
2. On the LiveImaging tab, click **Advanced**.
3. On the General tab of the LiveImaging Advanced Configuration dialog, set the location of the image repository. (Length of path can be up to 255 characters.)
4. Click **Apply**.



To set the image retention policy

1. On the Retention Policy tab, use the drop-down list to set the number of images to save.



2. To change the number of days in the From and To (days) columns, click on the number to activate the field. Then type the number and click off of the field to set the number.
3. To set another retention period (up to 8), click **Add**. After the longest available retention interval is selected, a system message displays to indicate retention rate limit is reached.
4. Click **OK** to save the changes.

Note: A scheduled task runs every hour to archive generated images. The first time this task runs after a retention policy change, it applies the change to all existing images.

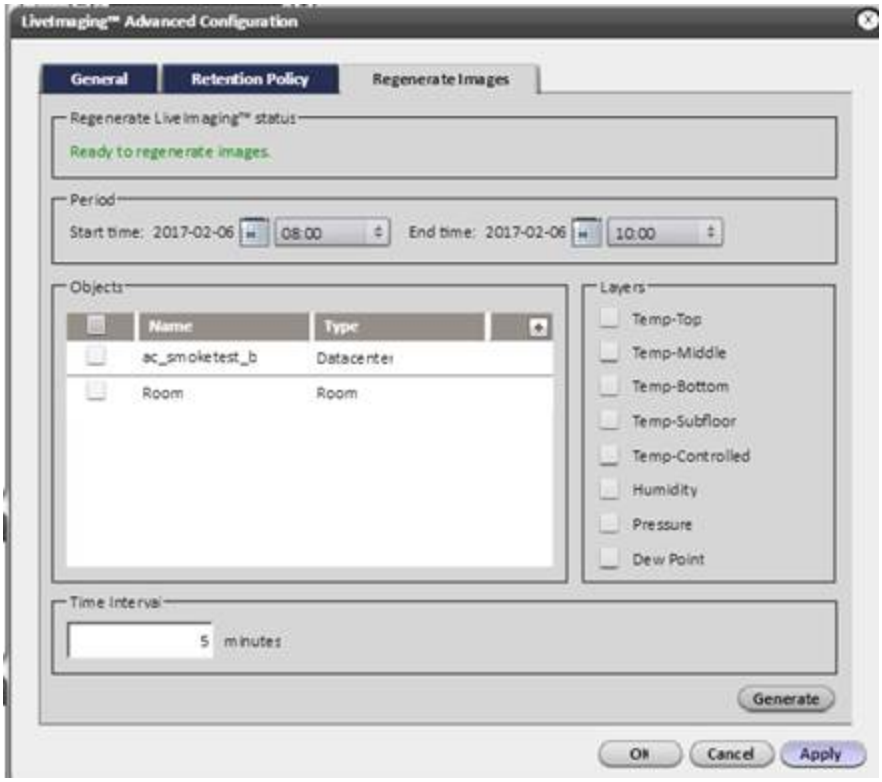
Therefore, choosing a longer time period means images will be removed from the existing archive. For example, increasing the time interval from the default of one image every five minutes (1 per 5) to one image every 15 minutes (1 per 15) would delete 192 images per day from the image archive.

Estimated Disk Usage displays the approximate disk space required to store the images at each selected time interval.

To delete a retention period from the list, click **Remove**.

Re-generating LiveImaging from Historical Data

The LiveImaging Retention Policy sets the interval and time frame for images retained in the image repository. The Regenerate Images feature provides the ability to recreate LiveImaging of a time frame for which the images were removed.



To regenerate images from historical data:

1. On the Admin menu, select **Configuration**.
2. In the Configuration dialog, select the **LiveImaging** tab.
3. On the LiveImaging tab, click **Advanced** in the lower right corner.

4. Select the **Regenerate Images** tab. The **Regenerate LiveImaging status** section indicates whether or not the system is ready to regenerate images.
5. In the Period section, select the Start and End date and time.
6. In the Objects section, select one or more checkbox for the data center or room data to regenerate.
7. In the Layers section, select one or more checkbox for the sensor layer to regenerate.
8. In the Time Interval section, type the frequency of images to regenerate. The default is 5 minutes.
9. Click **Generate**.

To view the regenerated images, go to the LiveImaging Advanced Window via the LiveImaging layer of the Floor Plan tab, and make the appropriate selections for the time and date, to display the regenerated images.

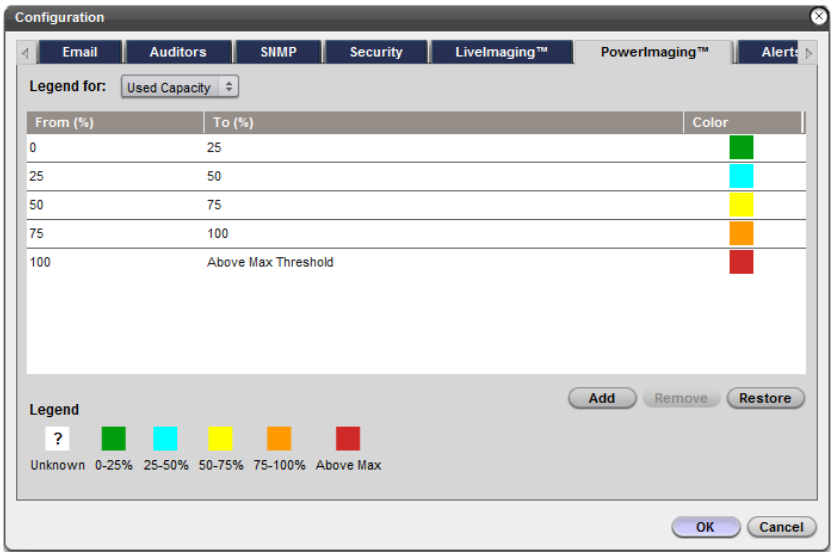
Notes:

Images generated for image data prior to version 6.5 of SynapSense may not accurately reflect the historical sensor position.

The regenerated images are for the floor plan background image in use at the time the data was collected.

Configuring PowerImaging

PowerImaging tooltips appear, when selected, on the Floor Plan tab. Colors represent ranges of displayed capacity data. Default ranges and colors are provided. If a different color palette is preferred, it can be configured in the PowerImaging tab.



To configure colors used in power imaging:

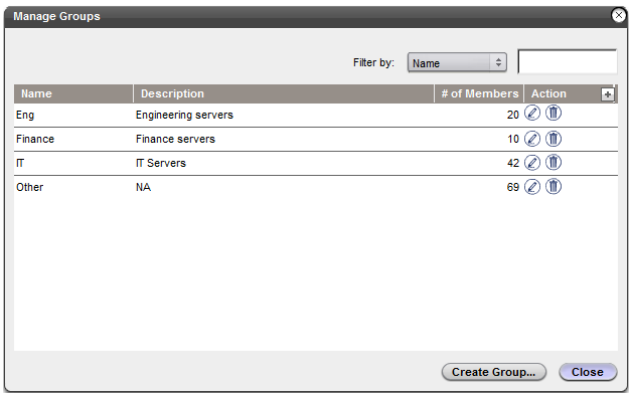
1. Click on an entry in the From or To columns to make changes to a division.
2. Click on the Color column for an entry to display the **Basic Colors** dialog.

3. Make the color selection.
4. Click **OK** to accept any changes to the color for that division.
5. Repeat these steps for each entry.

Note: Once changes are saved, it is not possible to go back to the default color set without manually resetting each color. Prior to saving a color setting, use Restore to undo the last action.

Managing Asset Groups

Data center assets can be placed into groups to allow for calculating total by-group data (for example, aggregating the power usage by the servers used by a specific customer, group, or department). Once the asset group is created, move an object into or out of the group from the Manage Asset Groups dialog.



Note: An Asset Group best practice is to ensure that servers with different RPDU configurations (Wye or Delta) be segregated by configuration. For example, a group with a Wye configuration should not contain any servers connected to Delta RPDUs.

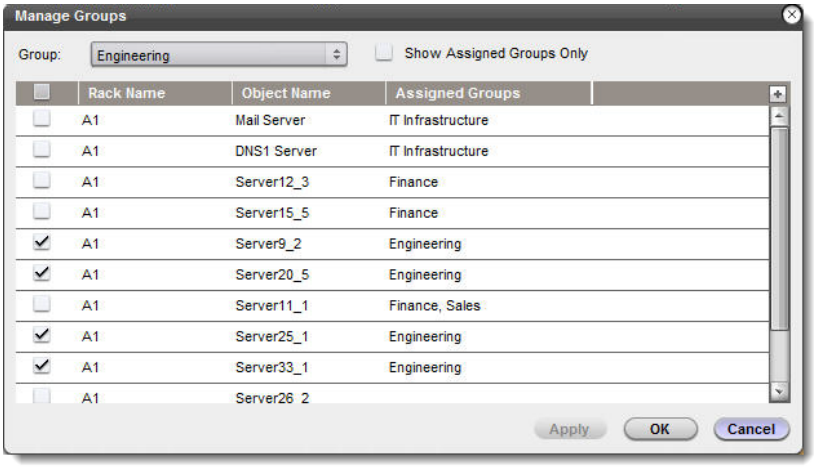
To create a group:

1. Do one of the following:
   - Select **Manage Asset Groups** from the Admin menu.
   - Right-click on an object then select **Manage Groups** on the context menu

2. Click the **Create Group** button.
3. Enter a Name for the new Group.
4. Enter descriptive text to display in the Description column of the Manage Groups dialog.
5. Click **OK** to create the new Group.

To add an object to a managed asset group:

1. Select the object or group of objects to assign to the group. Do this from the Floor Plan or the Data Views tab.
2. Right-click to display the context menu and select **Manage Groups**.
3. In the Managed Groups dialog, select the group to which you want to assign the object from the Group drop down list.
4. Check the box next to the object name to assign it to the group.
5. Click **OK**.



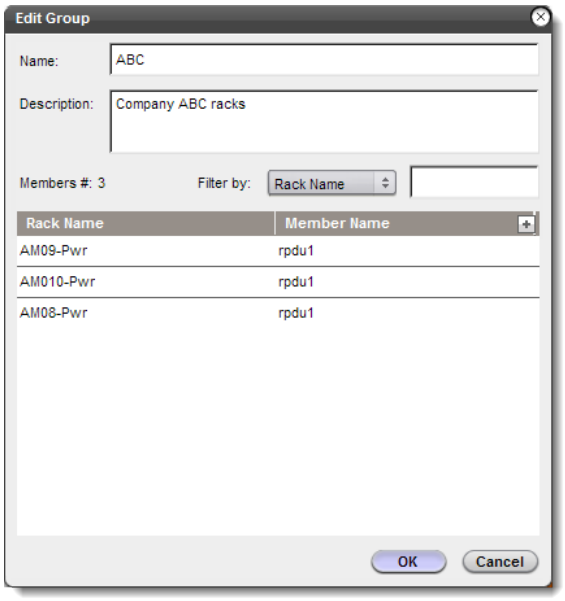
Note: You must create an asset group before assigning an object to that group.

To remove an object from a managed asset group:

1. Right-click on the object you want to remove and select **Managed Group** from the context menu.
2. Remove the checkmark from the box adjacent to the object name.
3. Click **OK**.

To edit an asset group:

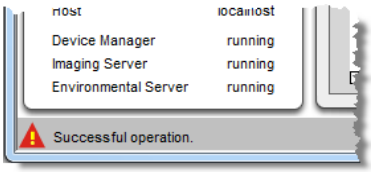
1. From the Admin menu, select **Manage Asset Groups**.

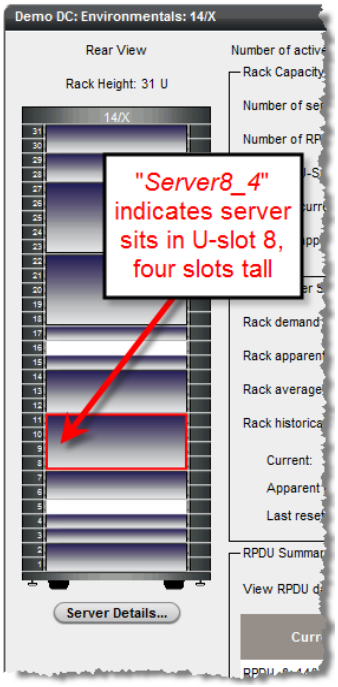


2. Click the **Edit** icon for the asset group that needs updating.
3. In the Edit Group dialog, that displays, make the changes.
4. Click **OK**.

Reconciling Asset Names

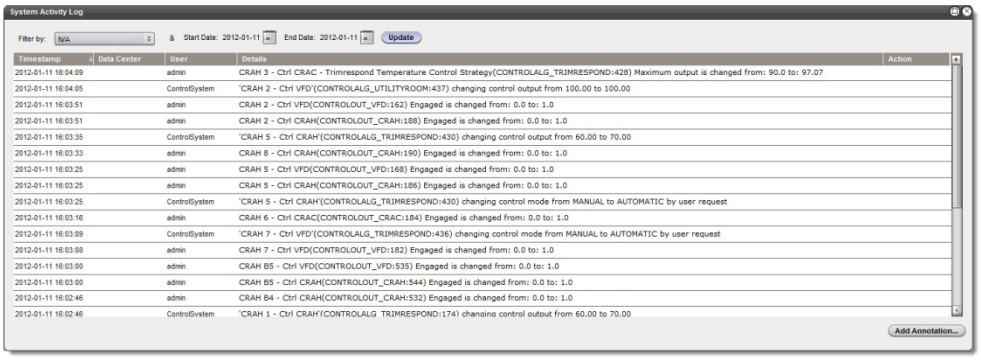
Select Reconcile Asset Names on the Admin menu to automatically rename all of the Servers in a data center with a different naming structure so they match the actual U-slot position in the rack (*<Rack_name>-U<location>). This is useful for automatically matching (reconciling) the names of servers or data center equipment that have been added or moved to a new rack. Only Server names without an asterisk (*) at the beginning will not be renamed.
Once selected and confirmed, the Reconcile Asset Names action displays “Successful operation” in lower-left corner of the Web Console.





Using the System Activity Log

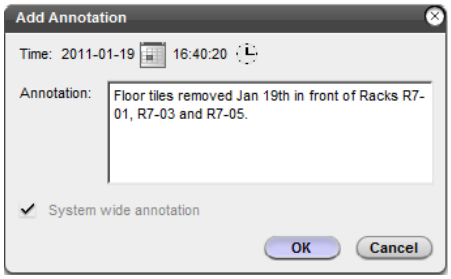
The Web Console System Activity Log records many things including annotations, user log-in and log out, changes to user accounts, system and alert notifications, and project imports. Contact Panduit Technical Support for a complete list of logged items.



- **Filter By** – The list can be filtered using the Filter By option. It can also be filtered by starting and ending calendar dates and times. Select from Action, Module, or Username, then select from the Action list available for that item. The Start and End Dates use the standard calendar widget.

Note: Click **Update** to refresh the results list after making changes to the filter parameters.

- **Add Annotation** – To create a new annotation in the System Activity Log, click **Add Annotation**, fill out the text in the dialog that displays, then click **OK**. System-wide annotations display on all charts.



Optional Component Configuration

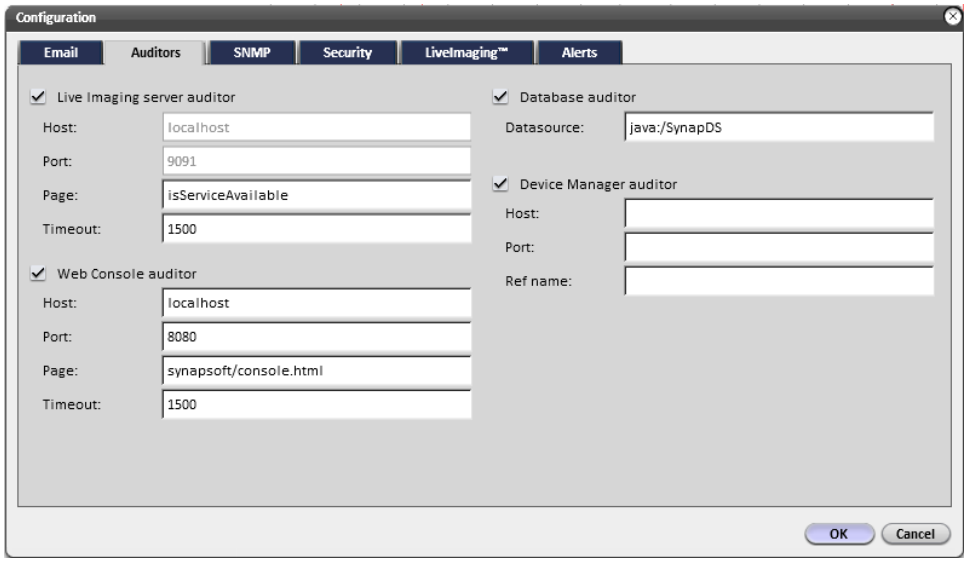
Configure installed optional components using the corresponding tabs in the Configuration dialog.

Configuring the Auditor Service

The Auditor services are internal mechanisms that verify that the database, device manager, LiveImaging and Web Console components of the system are running and accessible to the other portions of the system. If the Auditor component is unable to access a portion of the system, an Alert is generated.

In an installation where all components are on the same server, it is typically not necessary to change any of the configuration settings on this tab.

If SSL (https) is configured or the port is changed from the default 8080 to another port, then the Web Console port must be changed to that new port number. The Database Auditor, Device Manager Auditor and LiveImaging Server Auditor sections should not be changed, except at the recommendation of Panduit Technical Support.



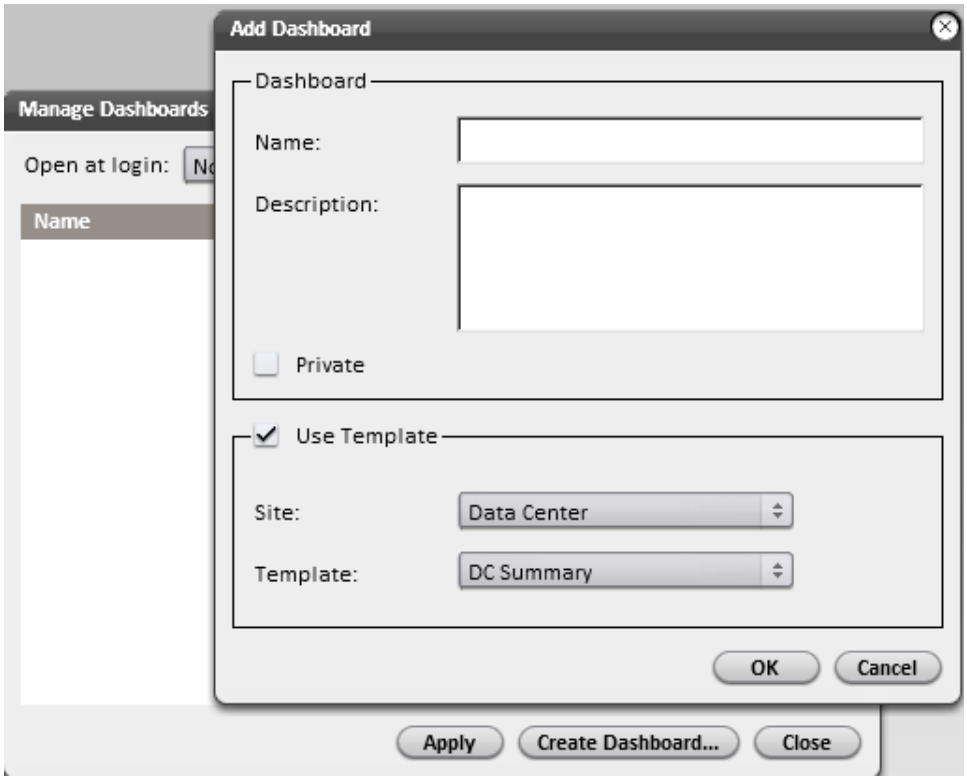
Configuring the Dashboard

The Dashboard displays data from the main Web Console tabs and views in a central location. Use the pre-defined and custom sections of the slide-out menu to add widgets, then drag each widget to position it on the dashboard. Configure multiple dashboards or just one. Create a Dashboard Carousel to display several dashboards in rotation See Dashboard View for information about opening the dashboard and setting it to open at login.

First-Time Access

When no dashboard is present, the Add Dashboards dialog displays with dashboard template options.

1. Click **Data** and select **Dashboards** from the drop-down menu. The Add Dashboard dialog box displays, covering the Manage Dashboards dialog box.

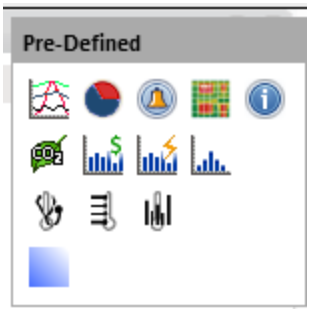


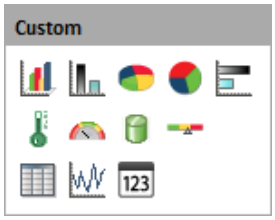
2. In the **Site** drop down list, select the site to which this dashboard will apply.
3. Select a **Template** from the drop-down list.
4. Enter a **Name** and **Description** for the new dashboard.
5. Click **OK**.

To configure a new dashboard:

1. Select the **Manage Dashboards** button on the toolbar to display the Manage Dashboards dialog.

2. Click **Create Dashboard** to display the Add Dashboard dialog.
3. Enter a **Name** and **Description** for the new dashboard.
4. Select the **Private** checkbox if this dashboard is only for your viewing. Leave the checkbox empty to make the dashboard Public and available to all users.
5. Click **OK**.
6. Click and drag widgets from the slide-out menu to a location on the dashboard. The first widget fills the window. Additional widgets split the window into sections. Each dashboard can contain up to 24 widgets.
7. Select the Save icon from the toolbar to save the dashboard and switch to View mode.





To align widgets:

1. Click the **Edit** icon to enter Edit Mode.
2. Use Ctrl + Click to select the widgets you want to align.
3. Right click to display the context menu and select either **Distribute Vertically** or **Distribute Horizontally**.
4. Click **Save**.

Note: Widgets must be side-by-side to use this align feature.

To size widgets:

1. Click the **Edit** icon to enter Edit Mode.

2. Right-click on the header of the widget you want to size and select **Set Widget Size**.
3. On the dialog that displays, enter the dimensions.
4. Click **OK**.
5. Click **Save**.

The following table lists and defines Dashboard Widget icons.

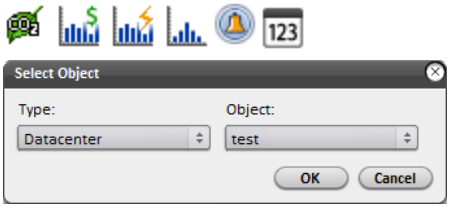
Icon	Pre-defined Widget Description	Icon	Custom Widget Description
	PUE History Chart		3D Column Chart
	PUE Real-time Chart		2D Column Chart
	Active Alerts Grid		3D Pie Chart
	LiveImaging		2D Pie Chart
	Global Information		Bar Chart
	Carbon Emissions Summary		Thermometer
	Energy Cost		Gauge
	Energy Usage		Cylinder
	Temperature Histogram		Horizontal LED
			Data View
			Historical Chart
			Numeric Value

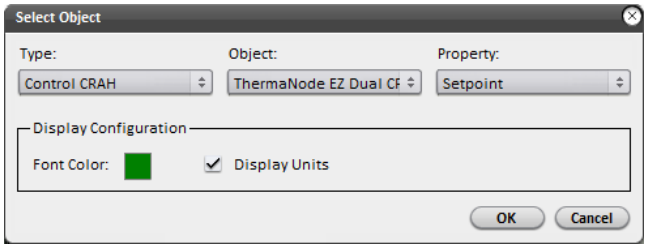
Widget Configuration

After selecting a widget type, the configuration dialog for that type of widget displays. This section gives a high level description of each type of widget configuration dialog.

Select Object

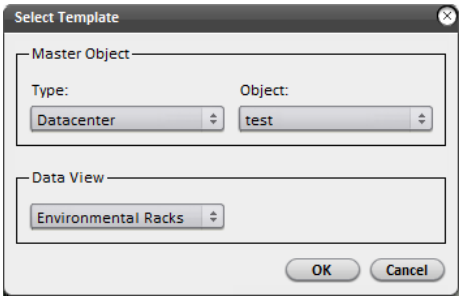
Select the type, object and properties from the drop down lists as presented for the selected widget.





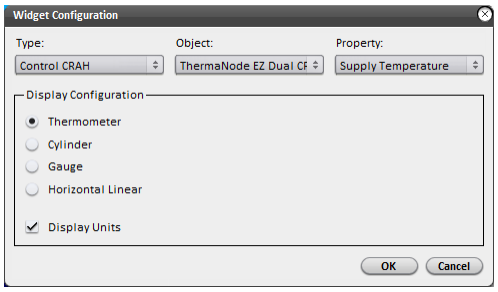
Select Template

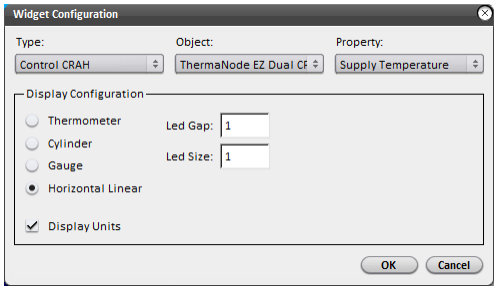
Use the drop-down lists to select the information you want to display.

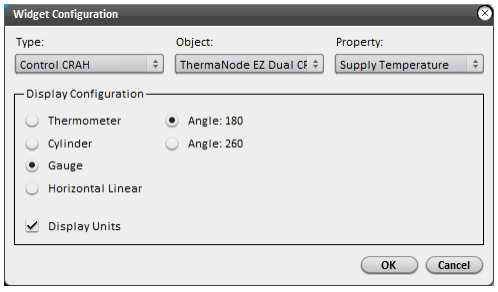


Widget Configuration

Several different widgets use this very similar dialog. Depending on the type of display desired, additional configuration settings may display. For example, the Thermometer and cylinder require the same information whereas the gauge and horizontal linear ask for additional settings.

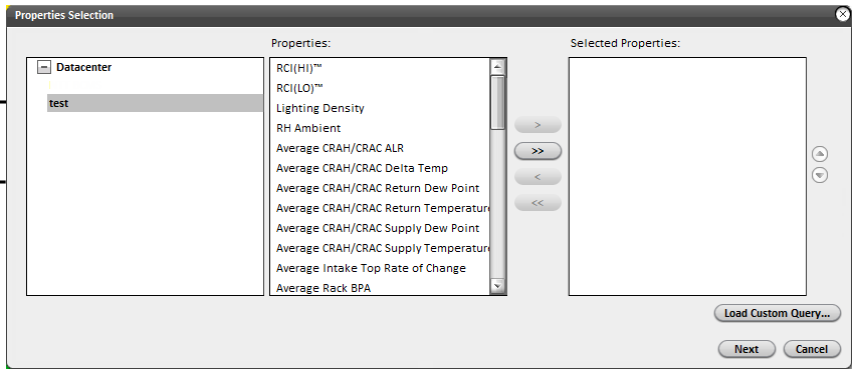






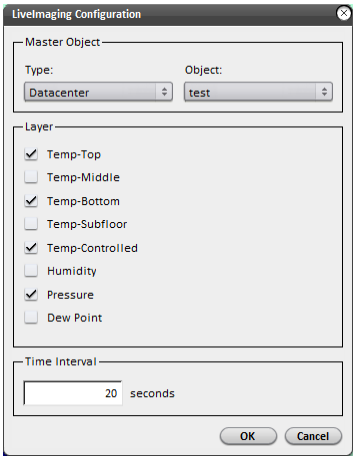
Select Properties

The select properties dialog uses data analysis and custom query information. See Creating Ad Hoc Tables and Charts for more information about using this dialog.



LiveImaging Configuration

Select the temperature sensor layer to display. When selecting more than one layer to display, this dialog provides the settings necessary for a rotating through the set of LiveImaging data and how frequently to change the layers displayed. The default time interval is 20 seconds.



To add another dashboard:

1. On the Data menu, select **Dashboards**.
2. In the upper right corner of the window, click the **Manage Dashboards** icon.
3. In the Manage Dashboards dialog, click **Create Dashboard**.
4. On the Add Dashboard dialog, give the new dashboard a name and description.

5. Select the **Private** checkbox if this dashboard is only for your viewing. Leaving the checkbox empty makes the dashboard available to all users (Public).
6. Click **OK**.
7. Follow the steps above to configure the dashboard.

The following table lists and describes the Dashboard toolbar icons.

Icon	Description
	Manage Dashboards
	View mode
	Edit mode
	Edit Dashboard Settings
	Print Dashboard
	Save
	Select Object
	Size window – Min/Max
	Close

About the Workspace

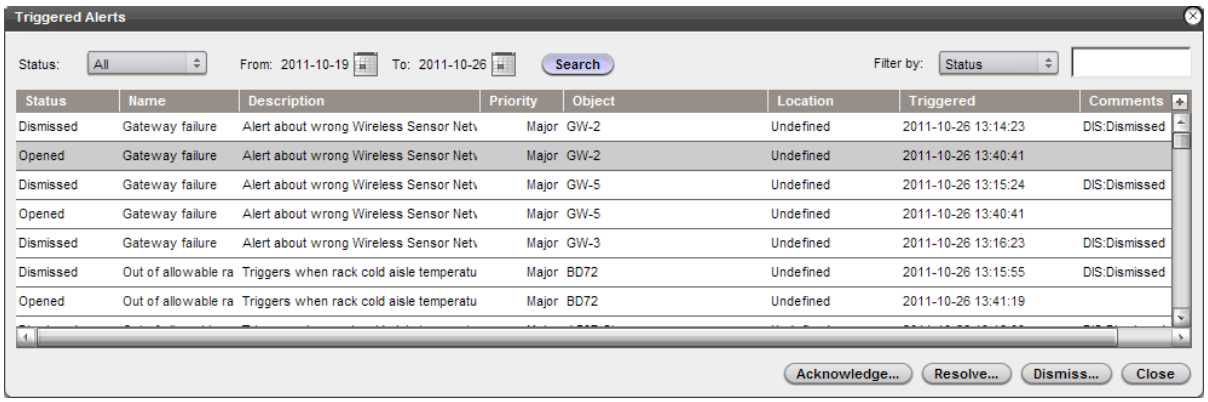
Which tabs display in the Workspace is dependent upon the level selected in the Sites list and user access permissions. See the list of available tabs in the table below. The order of presentation in this section is alphabetical. Click the link to jump directly to the section.

The following table lists the tab order by sites list selection.

Data Center	Room
Floor Plan	Summary
Pre-Defined Metrics	Floor Plan
Alerts	Pre-Defined Metrics
PDUs (when configured)	Alerts
BCMS (when configured)	Data View
Data View	
PUE (when configured)	
Custom Metrics (when configured)	

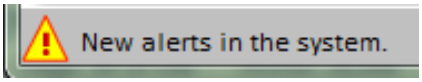
Using the Alerts Tab

The Alerts Tab includes the list of all alerts triggered for the selected data center. Filter alerts by status, search by date, or use the Filter by feature. Use the Alerts tab to manage alerts individually or in groups, change the status, add comments, review and analyze alerts history, and print or export the data to CSV file.

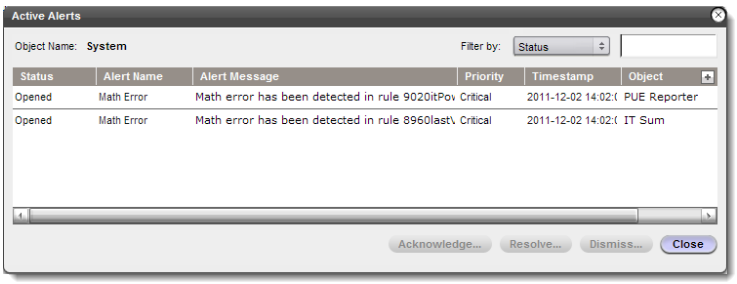


Alerts notify data center operators of important or significant changes. The Web Console includes a mechanism that sends alert messages to designated recipients when sensor readings fall outside specified thresholds. See Defining Alerts for information about creating alerts for a wide range of events and conditions within the data center.

In the lower-left corner of the Web Console window, a flashing yellow triangular icon indicates the presence of new alerts in the system.



Click the triangular icon to open the Active Alerts dialog.



Managing Active Alerts

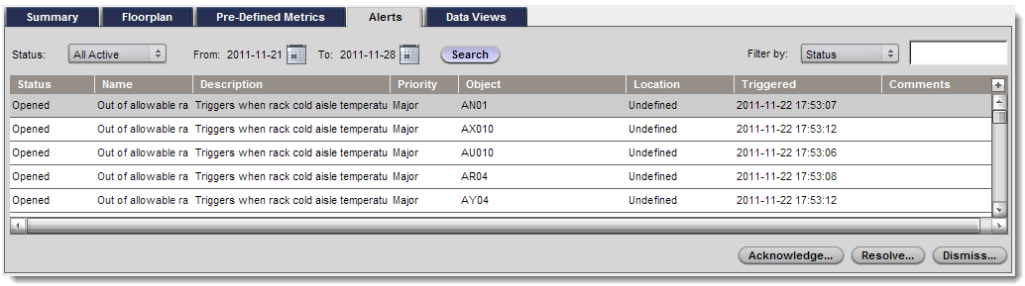
Alerts require acknowledgment or dismissal along with a note to indicate the problem resolution. If the alert is based on a rack, it will change the status of the rack on the floor plan. The ability to acknowledge/ resolve or dismiss an alert is determined by user permission settings.

All alerts, regardless of the object they are based upon, display on the Alerts tab (or Active Alerts dialog) for the room and data center selected in the Sites list. Alerts update at a default interval of one (1) minute.

Manage active alerts from the Sites list view or the Dashboard view. Add an Alerts widget to a Dashboard and use the same tools described here to acknowledge, resolve, or dismiss alerts.

Changing Alert Status

Part of managing an alert is to include a comment about the acknowledgement, resolution, or dismissal of each alert. Alerts can be labeled individually or by group. Use Shift+Click and Ctrl+Click to select more than one alert and apply the new status and comment to all.



To change the status of an active alert:

1. Select one or more alerts.
2. Click the button for the action you want to take. A right-click displays a context menu containing a list of the available actions.

State	Description
Acknowledge	Indicates the operator is aware of the alert and is actively working to address the problem. The alert is considered Active, however, no further notifications are sent.
Resolve	The condition that triggered the alert was resolved and the alert is now Closed.
Dismiss	The alert is a false positive. No true problem exists. The alert is Closed.

3. In the Comment dialog, add a note so that others looking at this alert will know what took place, how the situation was handled, and by whom – or any additional information your organization requires.

Note: The selected action and comment will appear for all of the selected items.

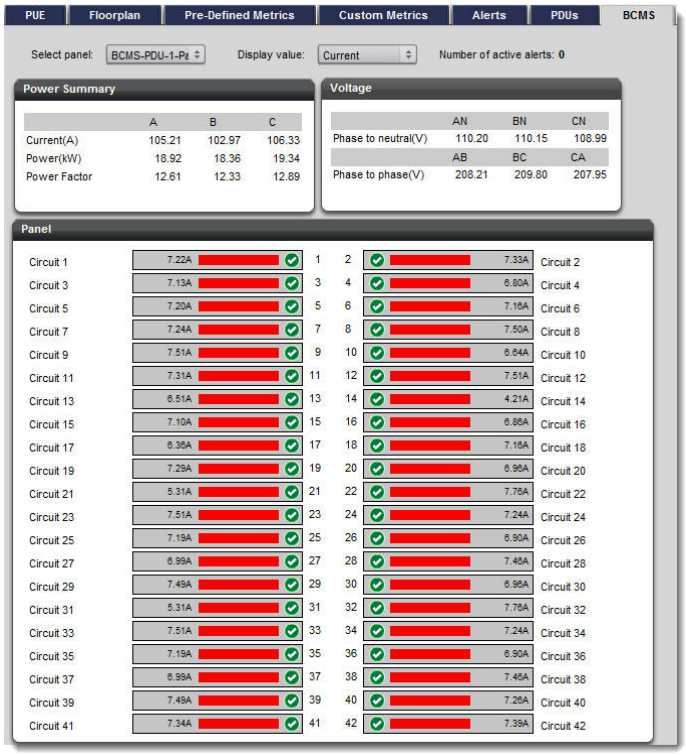
4. Click **OK**.

Alert notifications are only sent when the alert is in an Open status. Notifications cease if the alert status is changed to acknowledged, dismissed or resolved.

All changes to the state of an alert are tracked in the System Activity Log including those made automatically due to the system settings. See Defining Alerts for more information about automatic settings.

Using the BCMS Tab

The BCMS Tab (only available if a BCMS unit is installed in the selected data center) provides a summary of power use for the selected BCMS-equipped power panel, as well as real-time data reflecting the power levels that apply to each individual active circuit.



- **Power Summary and Voltage** – Displays aggregated totals per phase for the entire BCMS panel.
- **Number of Active Alerts** – Total number of alerts currently active for the selected BCMS unit.
- **Select Panel drop-down list** – Use to select which BCMS Panel to display.
- **Display Value drop-down list** – Use to select which power metric (Circuit, Power, Power Factor) to display.

Each circuit in the selected BCMS panel displays with the following data:

- **Value** – Displays the circuit's measured value (e.g., "143.62A") for the metric selected in the Display Value drop down list.
- **Name** – The name of the circuit (e.g., Circuit 1). To rename the circuit, click the name to activate the field, then enter a new alphanumeric value and click outside the field to accept the new value.

- **Value Status Bar** – Displays a color bar indicating the relative magnitude of the circuit value in comparison to all of the other circuits in the BCMS. The bar color indicates:
  - **Blue** = Circuit is using less power than the Minimum Power Normal Operating Threshold (%) value specified for that circuit in MapSense.
  - **Green** = Circuit is using power between the Minimum and Maximum Power Warning Threshold (%) values specified for that circuit in MapSense.
  - **Red** = Circuit is using more power than the Maximum value specified for that circuit in MapSense.
- **Circuit Status** – Displays an icon of the current status of the circuit (e.g., functioning normally or has an Alert indicating a problem exists with the circuit):

 Circuit is Okay

 Circuit has an Alert

Historical Data

Click any of the data values in the BCMS Tab to open the Historical Data chart for that value.
One additional feature on BCMS circuit charts is the Tabular button at the bottom of the open chart, which opens a dialog with a table of the data values and timestamps in the chart. Use the Start Time and End Time calendars to narrow the table results by date and time.

Using the Custom Metrics Tab

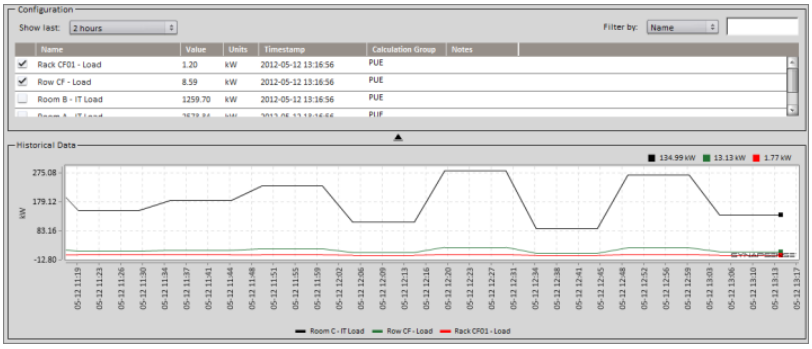
The Custom Metrics tab shows a list of available data inspectors. The tab becomes available at the data center level whenever there is an Inspector object in the imported MapSense project file.

The Custom Metrics tab displays calculations, based on real-time math operations performed on data received from power devices configured in MapSense. Data Inspectors are configured to display these results. See the MapSense User Guide for details.

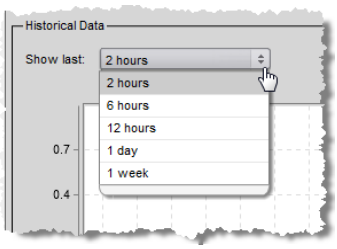
The tab contains a list of configured data inspectors (Configuration) and a Historical Data chart that displays time data for the selected items. All standard chart functionality, except scroll and zoom, is available on the Custom Metrics tab. Click the up/down arrow, above the Historical Data chart section to show/hide the Configuration list.

The timestamp column of data inspector points indicates when the inspector performed its last calculation. The timestamp has no correlation to the arrival of data. Data inspectors perform the calculation based off an interval cycle specified in MapSense, regardless

of whether data is new or old. Panduit recommends using the system's alerting scheme to identify issues related to stale data, failed updates, or communication issues.



Select up to five Inspectors in the list to display in the Historical Data chart. Select time span for Historical Data chart horizontal axis from the Show Last drop down menu (2 hours, 6 hours, 12 hours, 1 day, 1 week). Chart will display the selected time span up to the present.



Using the Data Views Tab

The Data Views tab displays a set of tables in one configurable view. Move, sort, and filter columns, select data by date and time, then double-click an item in the table to view real time sensor data or historical charts. To learn about configuring a data view, see Configuring Data Views. For more information about using tables, see Working with Tables and Charts.

Select the table of information to view from a drop down list that includes:

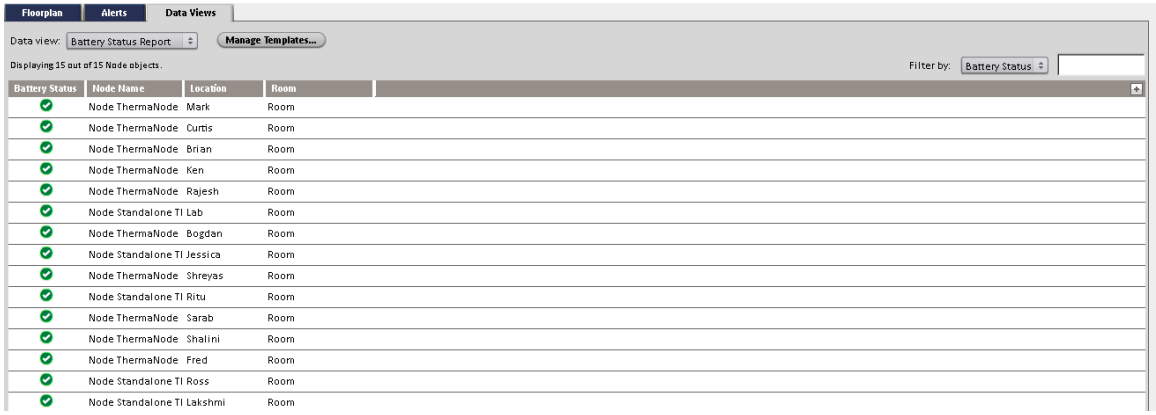
- Battery Status Report
- Control Sensors (Intake/Pressure)
- Environmental Racks
- Node Firmware Report
- Nodes
- Power Meters (Delta and WYE)
- Power Racks

- Pressure
- CRAH/CRAC

Note: Web Console reorders the drop down list based upon your individual usage. The items you use the most display at the top of the list, shaded in blue.

Battery Status Report

The Battery Status Report gives an estimate of remaining battery life for each node in the currently-selected data center or room.



Note: Battery estimates are approximate and based on the assumption that all of the batteries were new and at full capacity when first installed. To add actual values, use the Set Battery Capacity option in the context menu on the floor plan.

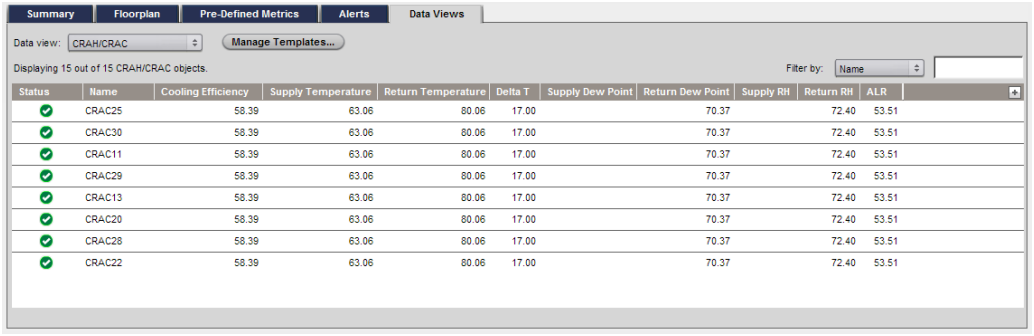
For details about changing batteries, see the SynapSense Cabinet Sensor Hardware Installation Guide, available from Panduit Technical Support or your Panduit representative.

Control Sensor (Intake/Pressure)

When Active Control is installed, two additional data views become available showing information about Control Sensors. See the Active Control User Guide for additional information.

CRAH/CRAC

To view various CRAH/CRAC details for the currently selected room select CRAH/CRAC in the Data View drop down list. A list of all CRAH/CRAC units in the currently selected room displays.

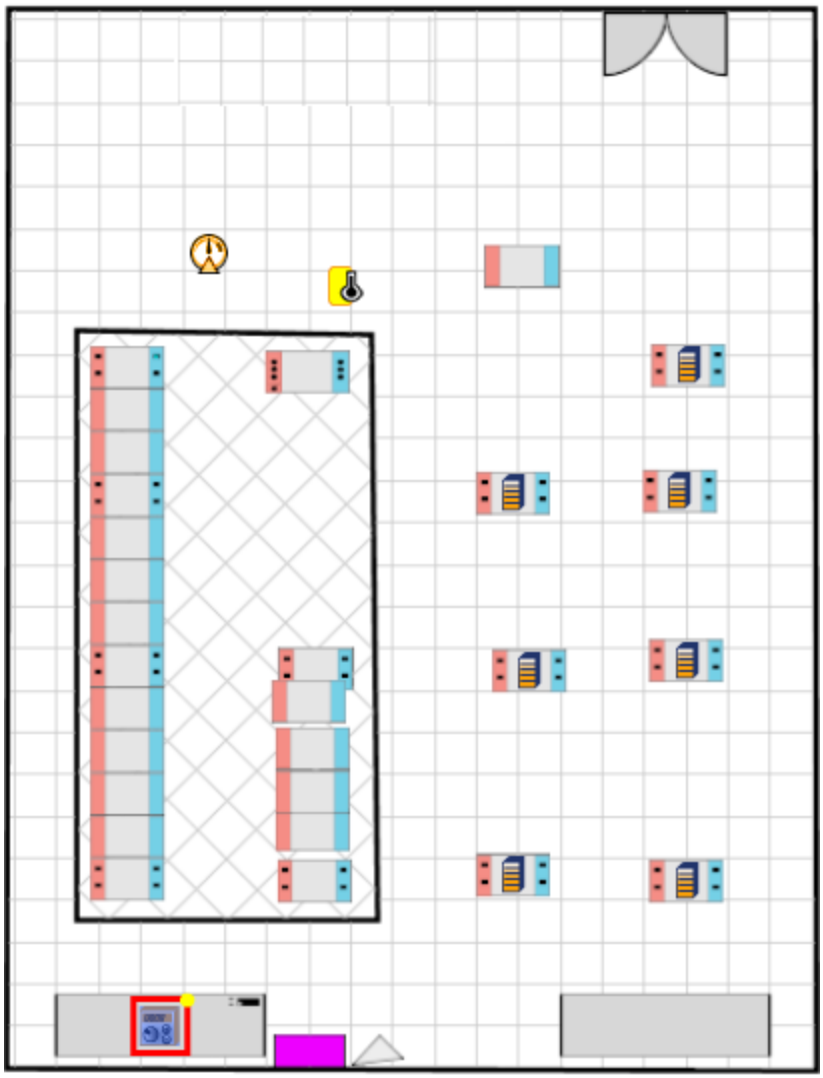


Status	Name	Cooling Efficiency	Supply Temperature	Return Temperature	Delta T	Supply Dew Point	Return Dew Point	Supply RH	Return RH	ALR
	CRAC25	58.39	63.06	80.06	17.00		70.37		72.40	53.51
	CRAC30	58.39	63.06	80.06	17.00		70.37		72.40	53.51
	CRAC11	58.39	63.06	80.06	17.00		70.37		72.40	53.51
	CRAC29	58.39	63.06	80.06	17.00		70.37		72.40	53.51
	CRAC13	58.39	63.06	80.06	17.00		70.37		72.40	53.51
	CRAC20	58.39	63.06	80.06	17.00		70.37		72.40	53.51
	CRAC28	58.39	63.06	80.06	17.00		70.37		72.40	53.51
	CRAC22	58.39	63.06	80.06	17.00		70.37		72.40	53.51

Double-click an entry in the list to open the CRAH summary page with a Historical Graph icon that you can click to view the CRAH's historical data.

Right-click on any CRAH/CRAC unit in the list to display a context menu with the following options:

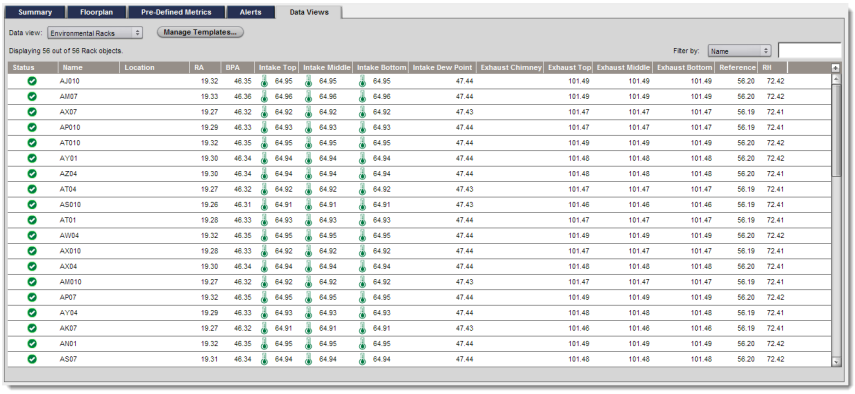
- **Show on Floor Plan** – Opens the Floor Plan tab and frames the object location with an animated red square.



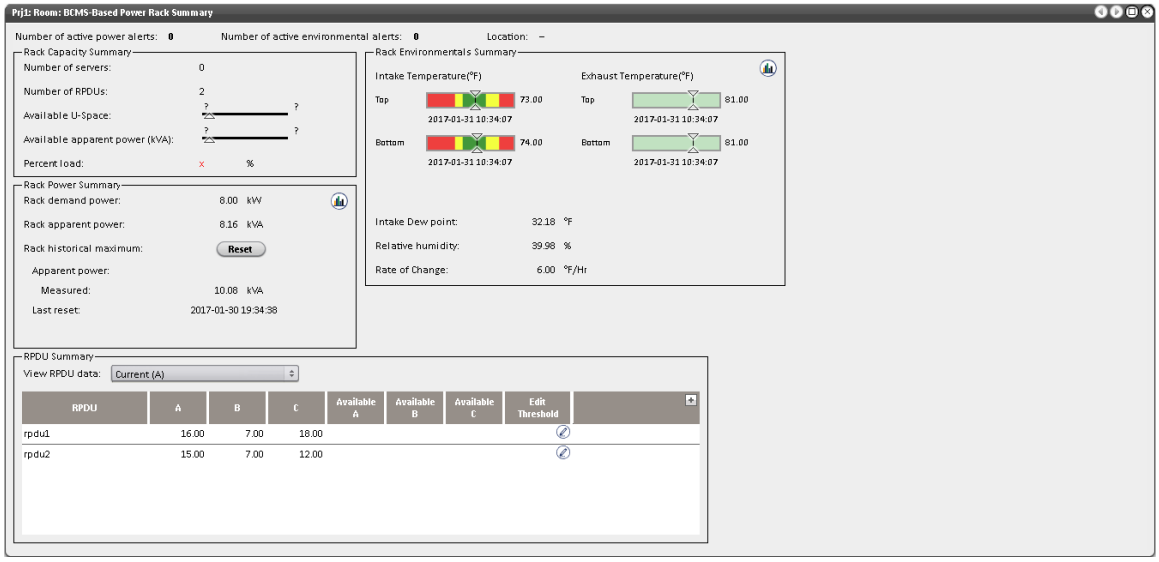
- **Go to Data Analysis** – Opens the Data Analysis dialog with the selected object displaying the available Object Properties. Use these to develop an ad hoc query for display as a chart or table. See Creating Ad Hoc Tables and Charts for details.
- **Define Alert** – Opens the New Alert dialog, allowing the definition of an alert for this device (and other objects selected as additional conditions).
- **Enable / Disable** – (Admin or user with Enable/Disable Objects permission) When disabled, data is not collected for historical charts or metrics calculations. A gap (no data available) occurs in historical charts for any node that is disabled. Select Enable to again include the object data in history charts and metrics calculations.
- **Print Table / Export** – Print or export a table of the data displayed for the selected CRAH/CRAC unit.

Environmental Racks

Select Environmental Racks from the drop down list to view a table of all server cabinets (racks) in the currently-selected data center or room.



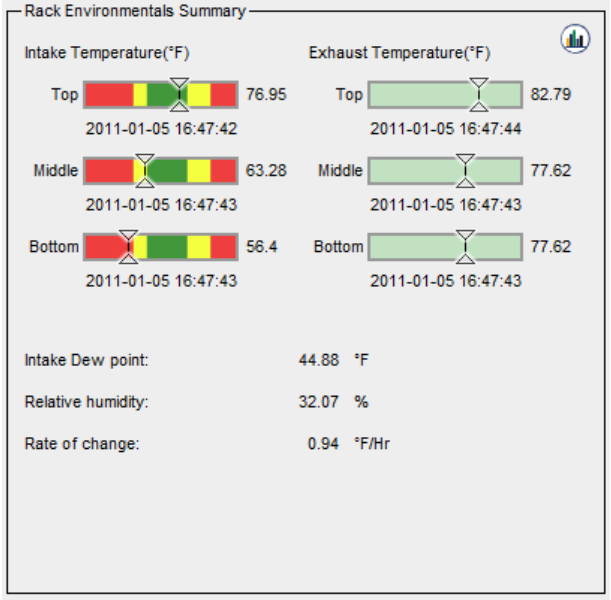
Double-click a rack entry to open the Rack Details window. This includes summaries of environmental data from sensors, as well as rack-level and server-level information collected via the Power Suite devices.



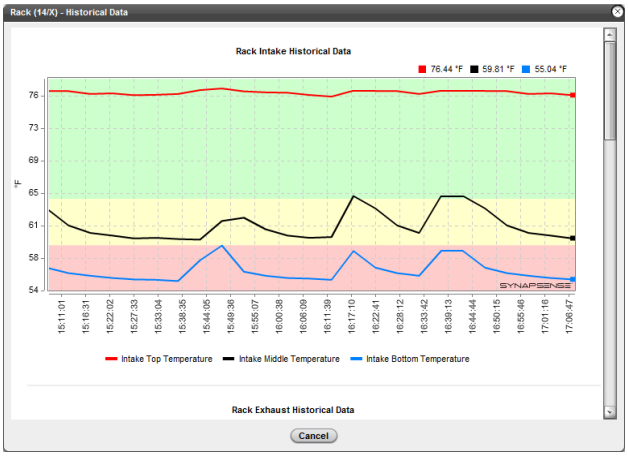
Refer to Rack Details for information on using the Rack Details window.

Rack Environmentals Summary

The Rack Environmental Summary section of the Rack Details window displays various environmental sensor data.



Historical Chart – Displays a series of historical charts for Rack Power and Environmentals data. Scroll down to view all of the charts. Right-click on any of the charts to display a context menu containing various chart options, such as printing and exporting data.

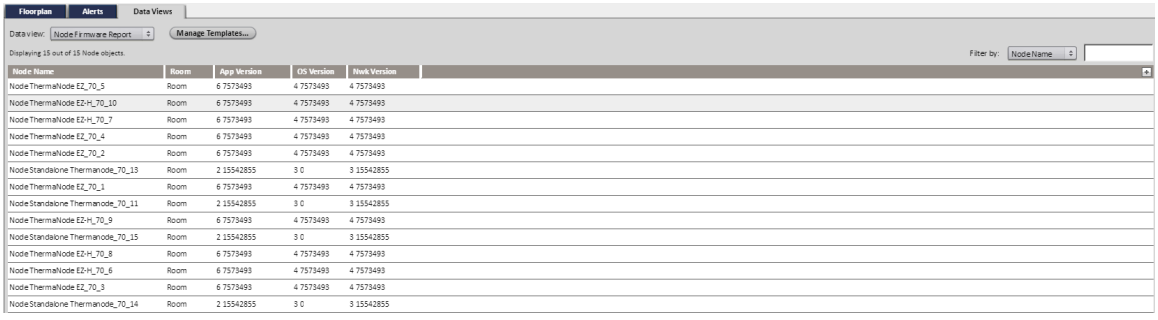


The following table describes the entries for each node in the status columns of the Nodes Data View.

Node Details Entry	Description
	Indicates an “OK” status for the node. There are currently no active alerts triggered at the node.
	Indicates that no data was reported recently for the node. Check further to determine if there is a problem with the node.
	Indicates an “attention required” status for the node. There are currently active alerts triggered at the node.
	Indicates the node is disabled. Data from this node will not display on charts.
Node Name	The name of the node.
Input	The reading for the sensor at the date and time indicated by the timestamp. A red “X” indicates that the sensor is disconnected or yellow “X” indicates the sensor needs maintenance.
Timestamp	The date and time of the latest reading for the sensors.
Location	The location of the node, as entered in MapSense.

Node Firmware Report

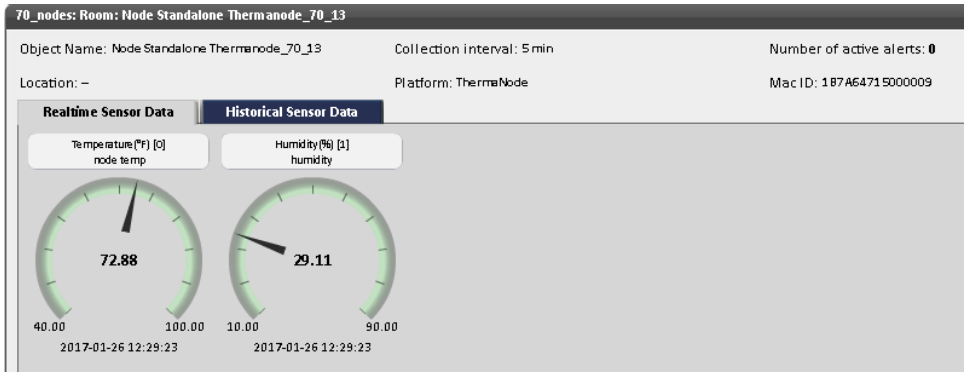
Each wireless node contains onboard firmware that controls all aspects of node functionality. The Node Firmware Report lists which firmware version is currently installed in each node in the currently-selected data center or room. Contact your Panduit representative for information about required updates to the firmware.



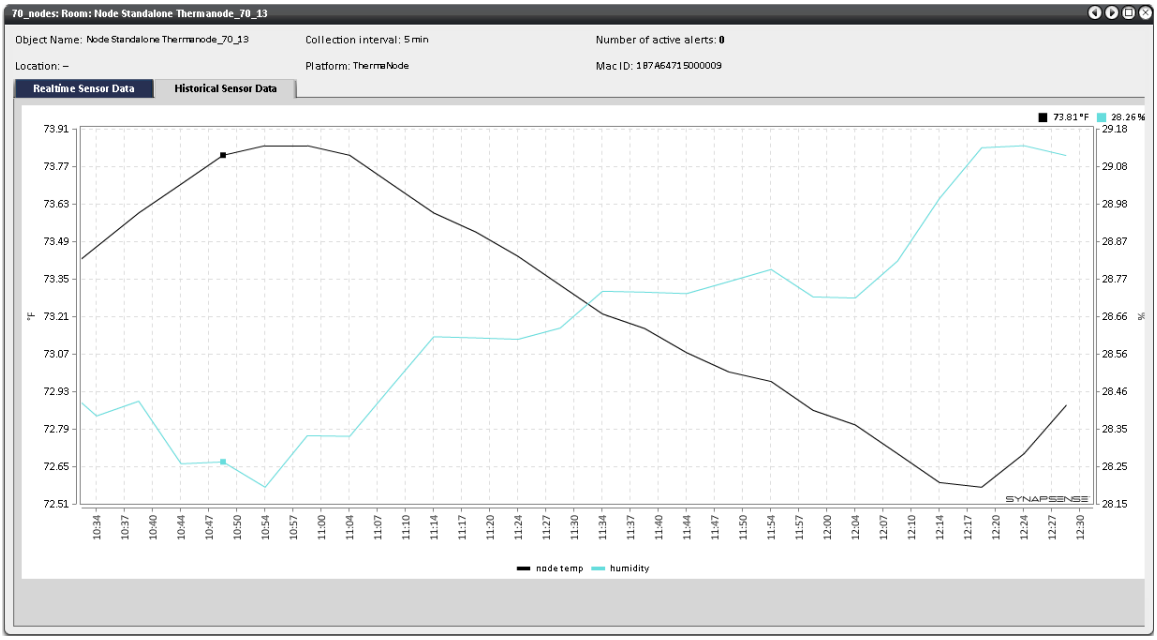
Nodes

The Nodes data view displays a list of all WSN nodes in the selected data center or room. Double-click any entry to open its detailed information in two tabs, Real-time Sensor Data and Historical Sensor Data.

Real-time Sensor Data:

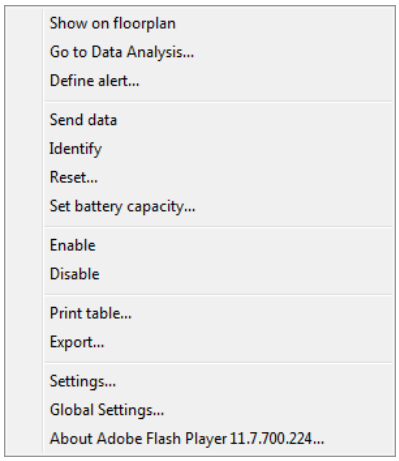


Historical Sensor Data:



The header display area specifies the number of nodes to display.

The main display area shows columns of data for each node, including the alert status, name and location, the type of sensor on each channel, and the most recent node sensor reading, indicated by a time stamp.



Right-click on any row to open a context menu with the following options:

- **Show on Floor Plan** – Jumps to the Floor Plan tab for the associated data center and displays the area where the node is located. The node will be highlighted with a red box (the highlight remains until the view is changed).
- **Go to Data Analysis** – Displays the Data Analysis dialog for the selected node.
- **Define Alert** – Displays the New Alert dialog, which enables the definition of an alert for this object.
- **Send Data** – (Admin or user with Access WSN Network Floor Plan permission) Forces the selected node to immediately take a reading of its sensors and send the updated data to the Environment Server. Table values automatically refresh to reflect the new data.
- **Identify** – (Admin or user with Access WSN Network Floor Plan permission) Causes the currently selected node to flash a blue LED for 30 seconds. This helps to physically locate the device in the data center.
- **Reset** – (Admin or user with Access WSN Network Floor Plan permission) Reboots the currently selected node. The node is forced to rejoin the network and re-establish connection with other nodes before it can resume sending data.

  The delivery of the command is subject to radio interference and may not reach the node. Only functional with nodes that have been part of the network for at least one hour. Nodes in yellow status (not joined to the WSN) will not be reset.

  When a node is reset, the blue and red LED stays on while the green LED flashes. After approximately five (5) seconds, the blue and green LED turn off and the red LED flashes. The flashing red LED is an indication that the node is attempting to synchronize with the Gateway.

- **Set Battery Capacity** – (Admin or user with Access WSN Network Floor Plan permission) Enables the setting of a new value for the selected node after its batteries

are changed.

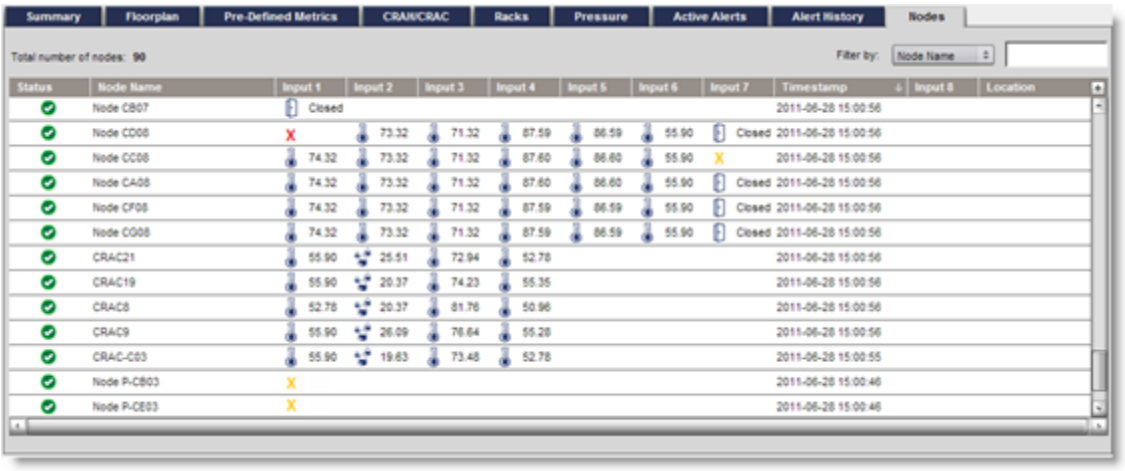
- **Enable / Disable** – An Administrator or user with Enable/Disable Objects permission can Disable a node or an environmental object. When disabled, all of the sensors on a node are marked as disabled. During periodic status checking the environmental object (rack) is marked as disabled if any of the sensors measuring one of its properties are disabled. This automatic status propagation ensures that the system stops calculating metrics since one or more inputs are not valid (disabled).

  When the node is re-enabled, an automatic status propagation re-enables all of the sensors attached to the node and any child objects associated with that node.

- **Print Table** – Print a table with all of the displayed data.
- **Export** – Export a table of the displayed data to a CSV file.

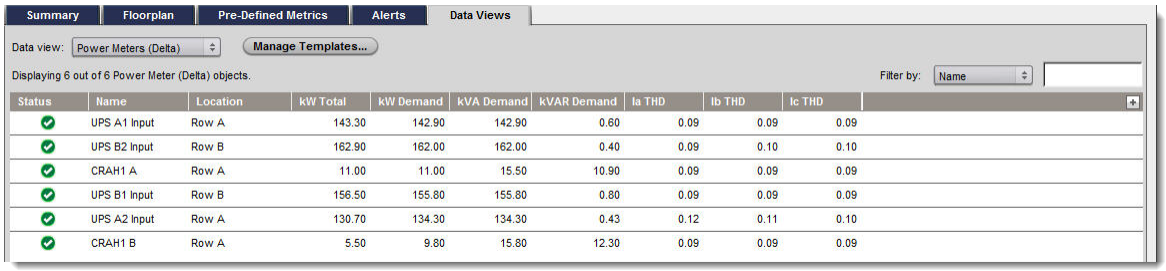
By default, each node sends data every 5 minutes. The application refreshes every 60 seconds. Set the Refresh interval by selecting Options on the Profile menu. The Refresh Interval is a drop down list on the Data tab with options from Never to 60 minutes.

In the event that an external sensor becomes disconnected from the node, a red "**X**" appears in the sensor column for that node instead of a sensor reading. If the sensor needs maintenance, a yellow "**X**" appears in the column.



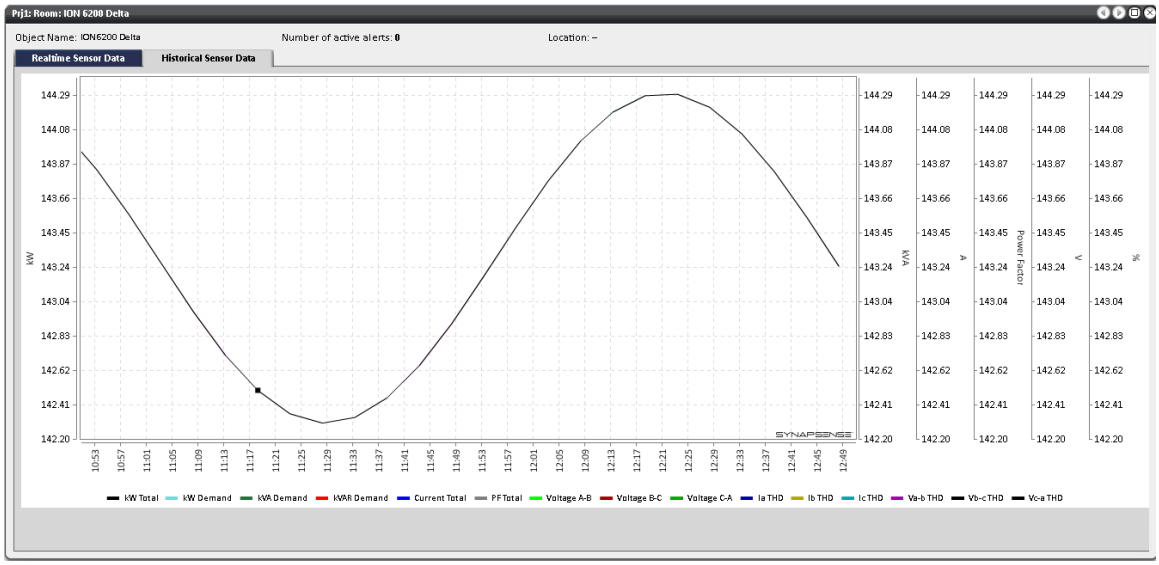
Power Meters (Delta & Wye)

View the power meter details (for example, ION6200) for a selected data center or room by selecting the Power Meters data view from the drop down list. This opens a table of Power Meter data, as shown below.



Status	Name	Location	kW Total	kW Demand	kVA Demand	kVAR Demand	Ia THD	Ib THD	Ic THD
	UPS A1 Input	Row A	143.30	142.90	142.90	0.60	0.09	0.09	0.09
	UPS B2 Input	Row B	162.90	162.00	162.00	0.40	0.09	0.10	0.10
	CRAH1 A	Row A	11.00	11.00	15.50	10.90	0.09	0.09	0.09
	UPS B1 Input	Row B	156.50	155.80	155.80	0.80	0.09	0.09	0.09
	UPS A2 Input	Row A	130.70	134.30	134.30	0.43	0.12	0.11	0.10
	CRAH1 B	Row A	5.50	9.80	15.80	12.30	0.09	0.09	0.09

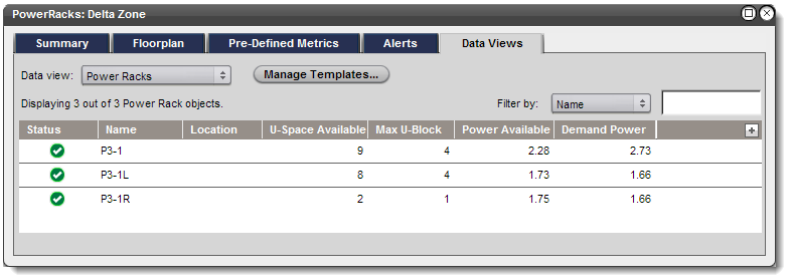
Double-click on any Power Meter entry to display detailed information about that item in two tabs: Real-time Sensor Data and Historical Sensor Data.



Note: Do not mix RPDU configurations. It is recommended that you ensure that servers with different RPDU configurations (Wye or Delta) be segregated by configuration. For example, a group with a Wye configuration should not contain any servers connected to Delta RPDUs. Contact Panduit Customer Support for additional guidance or information.

Power Racks

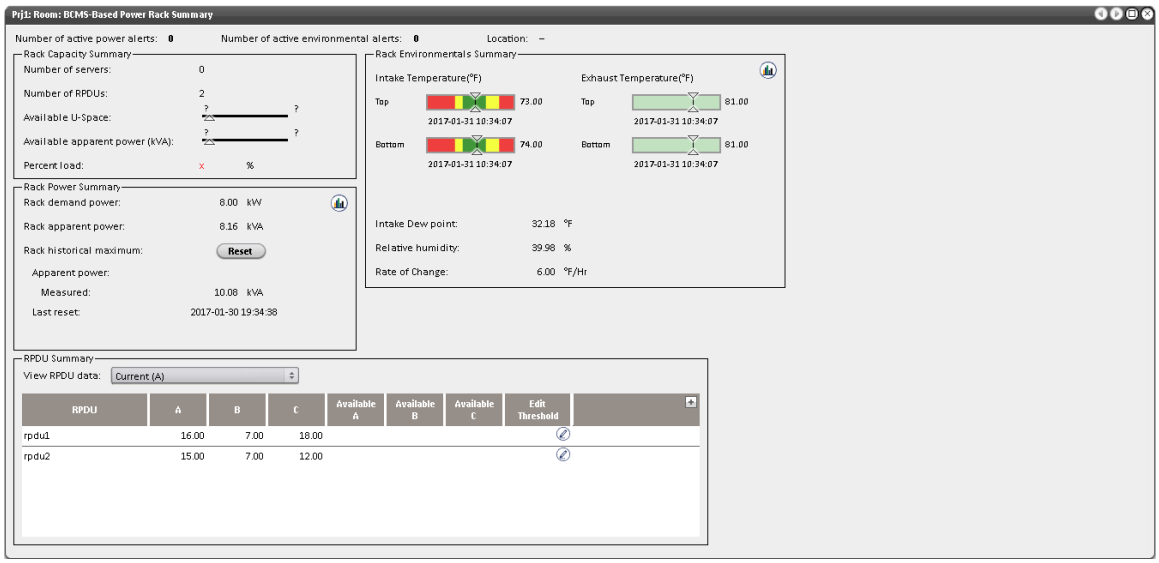
The Power Racks (Delta and Wye) data views provide a list of all server cabinets (racks) instrumented with SynapSense Power Suite products.



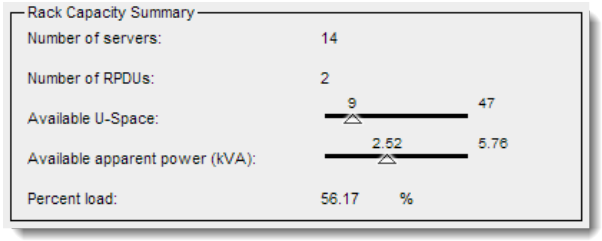
Note: It is recommended that you ensure that servers with different RPDU configurations (Wye or Delta) be segregated by configuration. For example, a group with a Wye configuration should not contain any servers connected to Delta RPDUs. Contact Panduit Customer Support for additional guidance or information.

Rack Details

Double-click on a rack entry in a table, or a rack object on the floor plan, to open Rack Details. This includes summaries of environmental data from sensors, as well as rack-level and server-level information collected via the Power Suite devices and the Power Suite Configuration Utility.

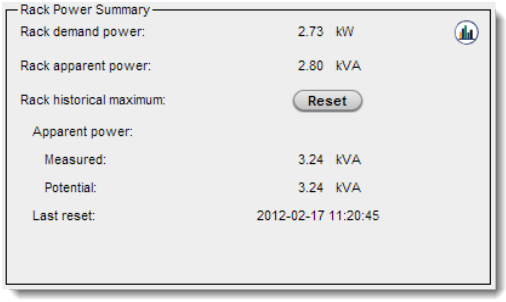


Rack Capacity Summary



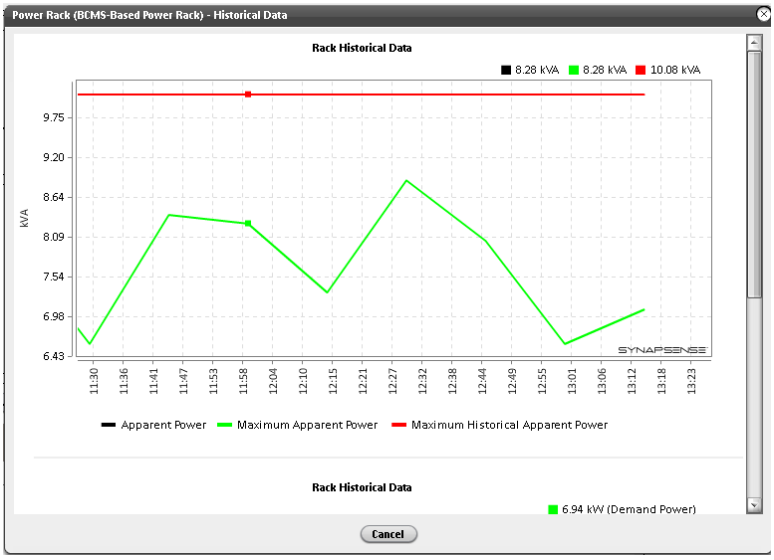
- **Number of Servers** – The number of configured servers.
- **Number of RPDUs** – The number of configured RPDUs (rack power strips) in the rack.
- **Available U-space** – The number of remaining open U-slots in the rack. The value displays graphically as a horizontal meter showing the value for the remaining slots.
- **Available Apparent Power (kVA)** – The amount of apparent power still available for use by any future servers or data center equipment installed. This is calculated as the specified maximum rack power threshold minus maximum historical measured apparent power captured by the system since it was last reset.
- **Percent Load** – The percentage of apparent power in use. This is calculated as the rack demand power (kW) divided by the maximum rack power threshold.

Rack Power Summary



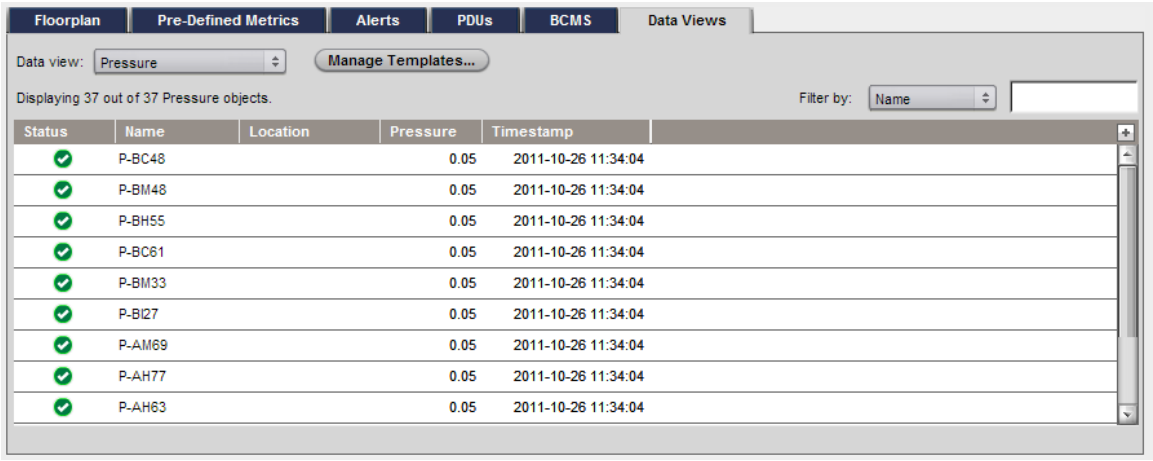
- **Rack Demand Power (kW)** – The average power usage for the rack over the most-recent 15-minute data collection interval.
- **Rack Apparent Power (kVA)** – The product of voltage and current for the rack over the most-recent data collection interval.
- **Reset Button** – Resets the two Rack Historical Maximum values, as well as historical maximums on all child objects including RPDUs, Phases, and Servers.

- Two values display under Apparent Power:
  - **Measured** is the maximum measured peak since the last reset time.
  - **Potential** is the calculated peak based on the maximum value for each phase since the last reset time.
- **Last Reset** – The date and time when the value was last reset (manual or automatic system reset).
- **Historical Chart** – Click the icon in the upper right corner of the window to display a series of historical charts of the Rack Power Summary data. Right-click on the chart to display a context menu with various chart options, such as printing and exporting data.



Pressure

Users can view a list of all Pressure Nodes in the selected room. Double-click an entry to view its real-time data. Click on the Historical Graph icon to view historical data.

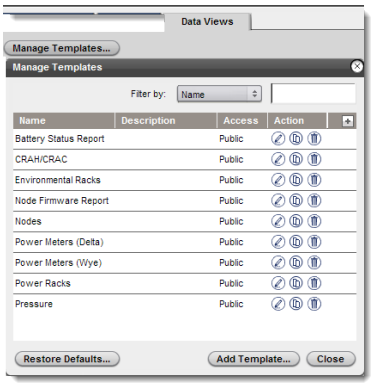


Configuring Data Views

For each page of data, it is possible to create a template to display data in a variety of configurations.

Managing Data View Templates

Default templates define the display for all of the data views. An Administrator or user with configure permissions can copy one of the default templates, make changes and save it with a different name, or create a new template.



The action icons available for this dialog are shown in "Configuring Data Views" above.

Icon	Description
	Edit
	Copy
	Delete

To copy an existing data view template:

1. Click the **Manage Templates** button on the Data Views tab.
2. Select the **Copy** icon for the item you want to change.
3. Make the desired changes in the Edit Data View Template wizard. Steps are the same as those described under Adding a New Data View Template.
4. Click **Done**.

To edit an existing data view template:

1. Click the **Manage Templates** button on the Data Views tab.

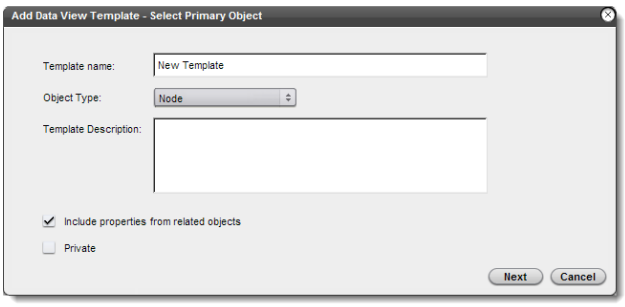
2. Select the **Edit** icon for the item you want to change.
3. Make the desired changes in the Edit Data View Template wizard. Steps are the same as those described under Adding a New Data View Template.
4. Click **Done**.

Adding a New Data View Template

Follow these steps to create a new view of the data.

Step 1 – Select Primary Object

1. Use these descriptions to complete the fields:



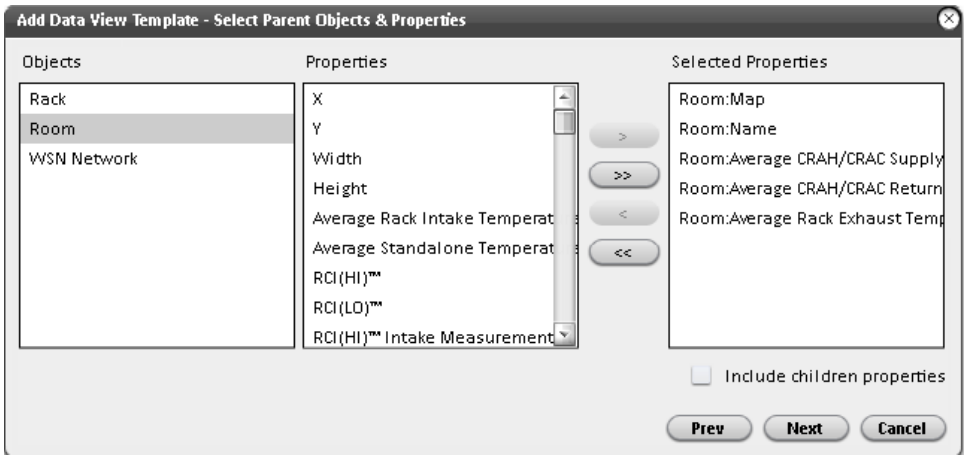
- **Template Name** – Unique name for this template.
- **Object Type** – Drop down list of available objects.
- **Template Description** – Brief description. This displays on the Manage Templates list.
- **Include properties from related objects** – To select properties from parent or child objects, check this box.
- **Private** – This template will only display for your use. No check in this box indicates the template will be available to all users (Public).

2. Click **Next**.

Step 2 – Select Parent Objects and Properties

Selecting the **Include properties for related objects** checkbox in Step 1 displays this step. If you did not select this checkbox, skip to Step 4.

1. Select the items in the Object list to display its Properties.
2. Highlight the properties you want added to the view, then click the right arrow to move the items to the Selected Properties list.

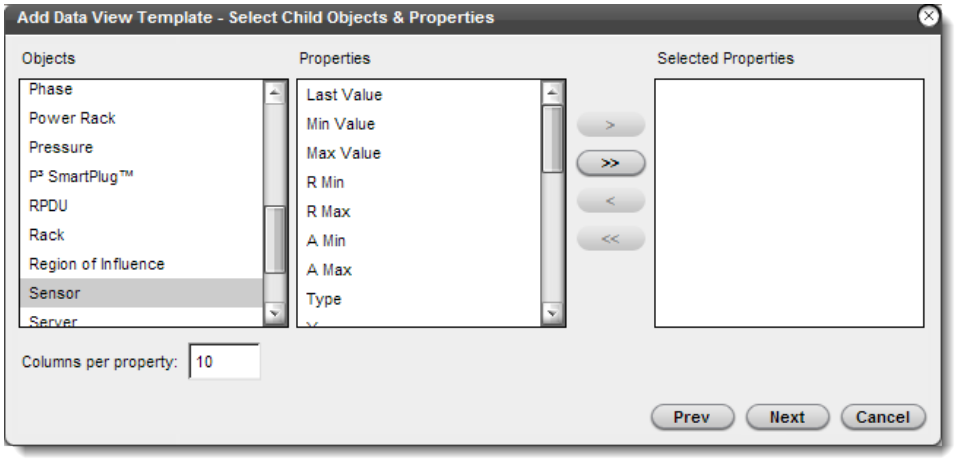


3. (Optional) Select the “Include children properties” option.
4. Click **Next**.

Step 3 – Select Child Objects and Properties

Selecting the Include Child Properties check box in Step 2 displays this step.

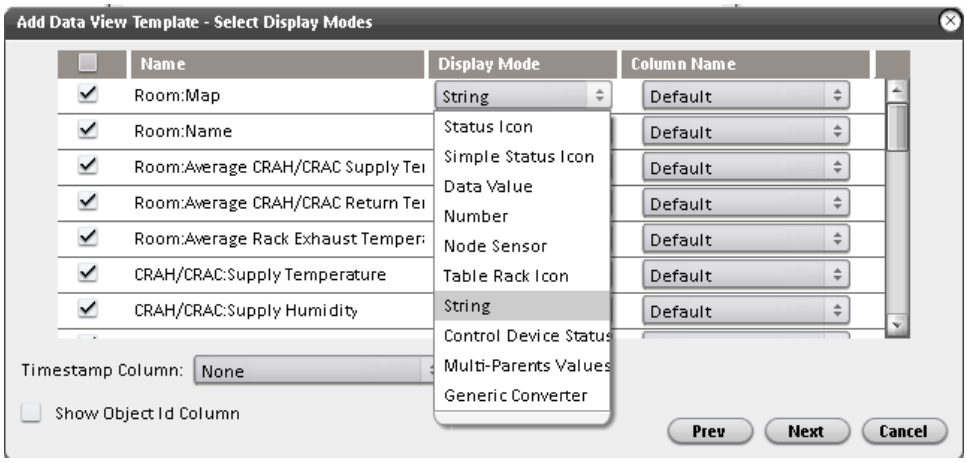
1. Select the items in the Object list to display its Properties.
2. Highlight the properties to add then click the right arrow to move the items to the Selected Properties list.
3. Click **Next**.



Step 4 – Select Display Modes

1. Select or deselect the object property to appear in the view.
2. Select one of the following from the drop down list:

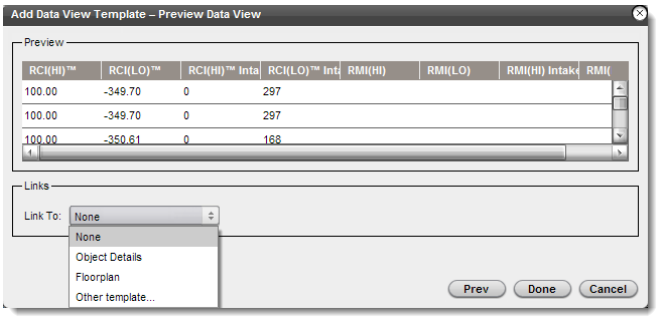
- **Status Icon** – Displays the status of the object.
- **String** – The property value without additional processing or mapping. These values are left aligned.
- **Data Value** – The property value displayed as numeric data.
- **Number** – The property value. Column sorting is based on numeric value. These values are right aligned.
- **Node Sensor** – Displays the value with the icon. For example, temperature or humidity.
- **Table Rack Icon** – Displays with a colored icon.
- **Days** – Remaining days in day, month, years, as appropriate.



- **Timestamp Column** – Select the property for which you want the time stamp to display.

3. Click **Next**.

Step 5 – Preview Data View



1. The Preview grid contains columns for selected properties. Resize and reorder columns, as needed.

2. The Link To section contains a list of actions. In the Data View, when a row is double clicked, the system will take the action selected here. For example, selecting Floor Plan will display and highlight the item on the floor plan.

- **None** – Nothing will happen.
- **Object Details** – The object details for the selected item will display.
- **Floor Plan** – System will take you to the selected object on the floor plan tab.
- **Other template** – Displays another drop down from which you can select another template to open. The new data view will be filtered on the selected object.

3. Click **Done**.

Using the Floor Plan Tab

The Floor Plan tab is available at both the data center and room levels. It provides users with a layout drawing of some or all of the data center, overlaid with sensor and status information. See General Floorplan Tab Characteristics.

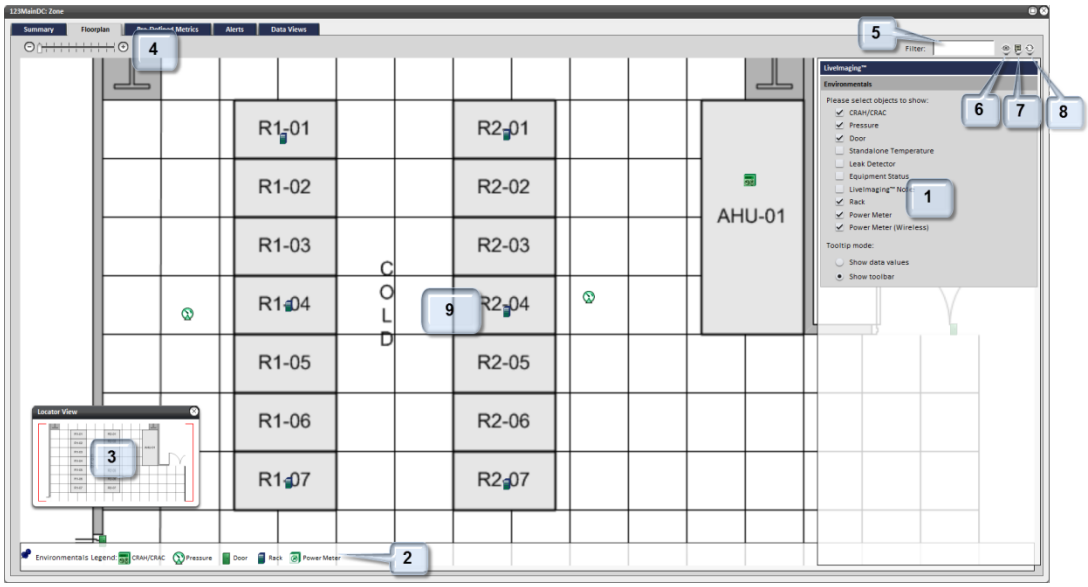
Each floor plan view preserves, to scale, the distance between objects in each room, and in the rooms within each data center. It uses customer-specific underlying images of the data center, rendered to scale, with simple geometric shapes representing various data center equipment.

Transparency around the server cabinets within the floor area of the image allows the LiveImaging maps to show through (see Using LiveImaging for details). The image is installed as the background image in MapSense, where it is populated with icons representing SynapSense hardware installed in the data center. See the MapSense User Guide for details.

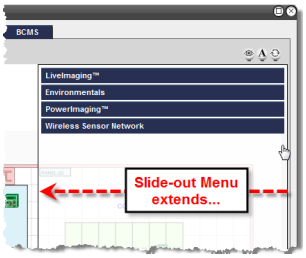
General Floor Plan Tab Characteristics

All layers of the Floor Plan tab have the characteristics described here. Some layers have additional features (for example, the Optimization Filter), that only display on that layer or when a particular combination is active. Follow the links below to view details for those layers. Depending on the configuration of your system, the following layers may be available.

- LiveImaging
- Environmentals
- Power Imaging
- Wireless Sensor Network

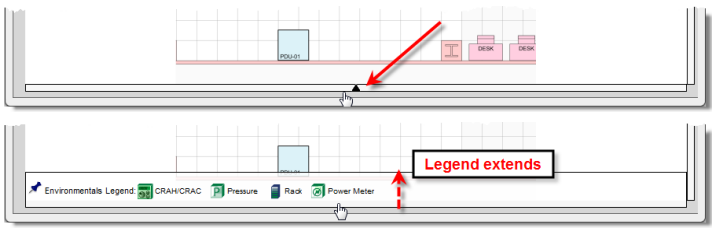


- **Slide-out Menu (1)** – The slide-out menu functions like a drawer. Hover the mouse cursor over the thin vertical box on the right side of the Workspace window to open the slide-out menu. Move the cursor off of the slide-out menu to close it.



Note: The Slide-out Menu cannot be pinned in the open position.

- **Legend (2)** – Hover the mouse cursor over the thin horizontal box along the bottom of the Workspace window to cause the Legend box to extend upwards into view. The Legend contains icons for components currently displayed on the floor plan.



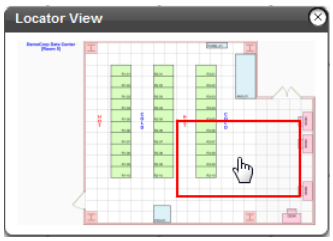
To keep the **Legend** open click the **Pin** icon. Click the **Pin** icon

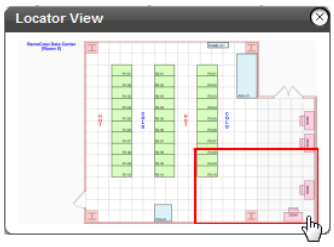
again to close the Legend.

- **Locator View (3)** – Use this window to move (scroll) the zoomed view displayed in the floor plan to any location in the data center.

  Click a location on the image in the Locator View to re-center the floor plan image at the click position.

Note: The red view area box does not click and drag. Nor will it position itself outside the boundary of the floor plan image.





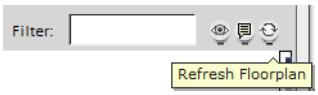
Drag the Locator View anywhere within the Workspace area. The system will remember its location the next time the floor plan is selected.

Note: The Locator View cannot be resized.

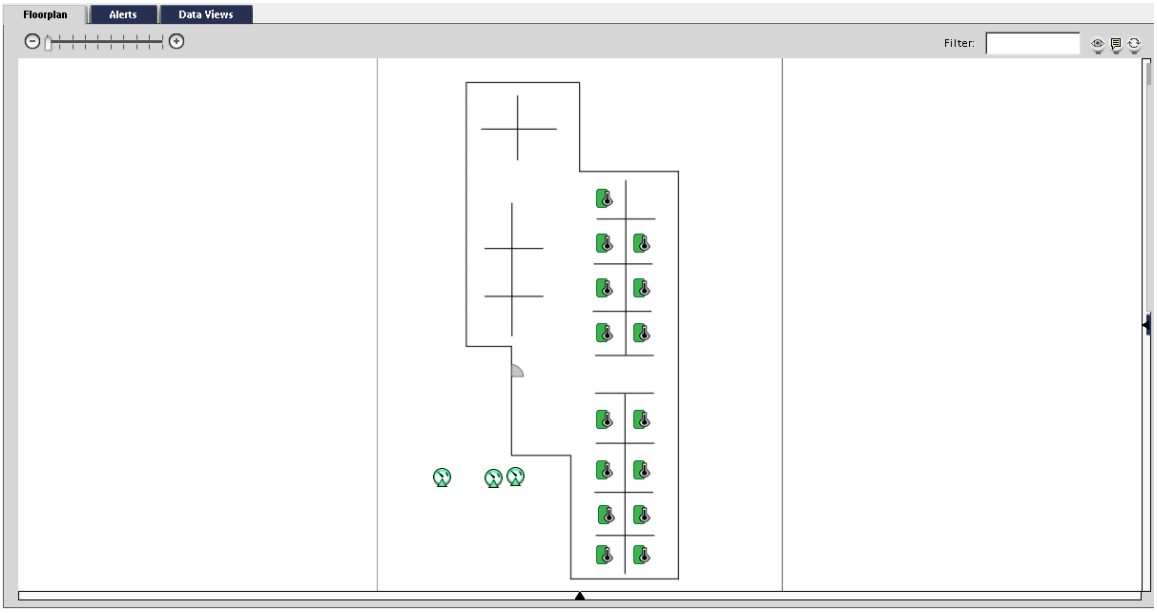
Click the **X** (close) on the Locator View window to hide it.

- **Filter (5) –** Enter all or a portion of an object name to display that object or group of objects on the floor plan. This works at both the data center and room level.

- **Show/Hide Locator View (6)** – Click the 'eye' icon (upper right of tab) to show or hide the Locator View. To hide the Locator View, either click the eye icon again, or click the "X" in the upper right corner.
- **Add Annotation (7)** – To open the Add Annotation dialog, click the note icon, or right-click anywhere within the Workspace window and select **Add Annotation** from the context menu. For more information about annotations, see Adding Annotations.
- **Refresh Floor Plan (8)** – Click the circular arrows icon to refresh the floor plan image with the most current sensor data.



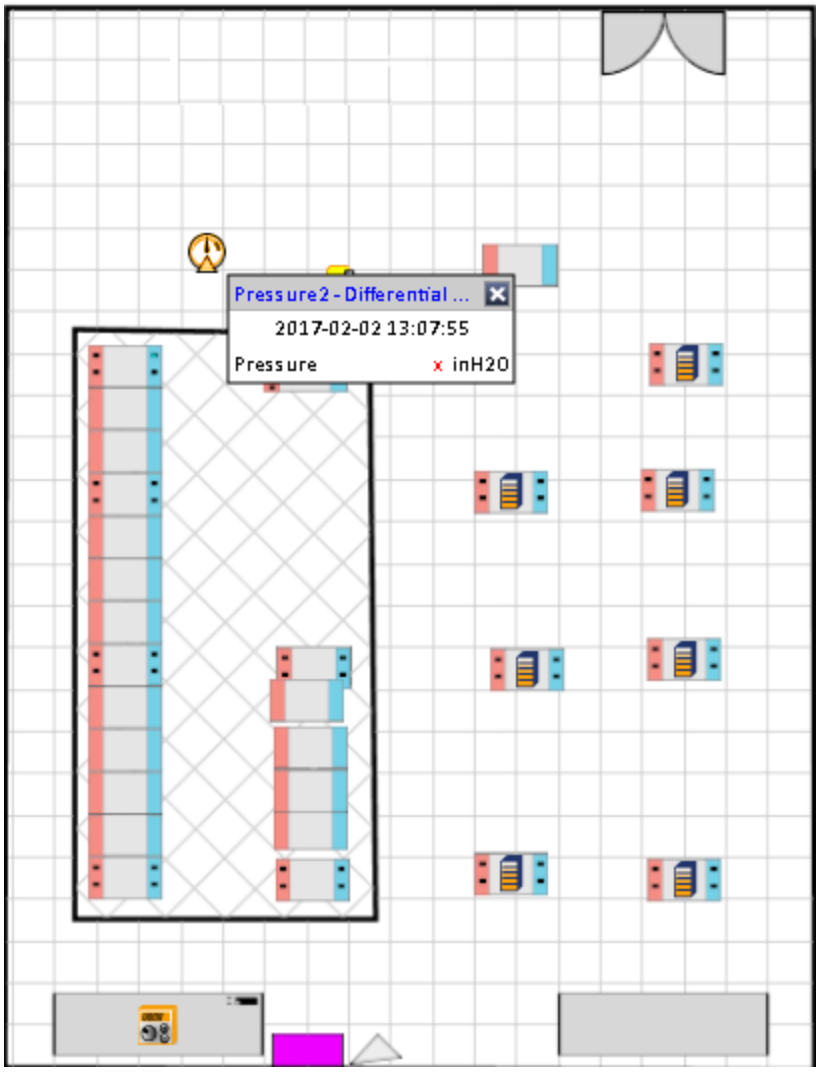
- **Workspace(9)** – The main viewing area for all Workspace layers.



Data Center View

While viewing a data center on the Floor Plan tab, hover over a Room Icon (a group of three server cabinet icons,) to highlight the geographical area of the room with a semi-transparent red, yellow, or green rectangle that covers every node associated with that room.

Note: The room icon is only visible when no other objects are selected on the Slide-out Menu.



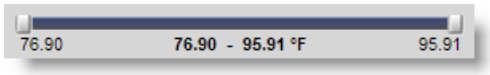
The color of the Room icon and the room boundary rectangle indicates the room status. Click the Room icon to change the floor plan view to the associated room view.

Room Highlight Color	Description
Red	Room has one or more triggered alert(s)
Yellow	At least one object in the Room has not reported new sensor readings or calculated metrics as scheduled
Green	Room has no active alerts. Status is “Good”

- **Zoom Slider (4)** – Click and drag the slider handle to zoom the floor plan image in or out (around the center point of the Workspace). Once zoomed in or out click the floor plan and drag the mouse to move a part of the image into view.

Note: The zoom factor is captured as a user preference and will return a user to the same location and zoom factor when they last logged off of Web Console.

- **Optimization Filter** – Visible when viewing the Environmentals and PowerImaging layers of the floor plan and only one parameter is selected on the Slide-out Menu (for example, Rack Top Intake Temperature). Shows the minimum and maximum values for that parameter. Works on both sensor and calculated values. Click and drag the handles on either end to filter the objects displayed on the floor plan. This filter is not visible when there are fewer than two unique values for a selected property.



Viewing Data Values

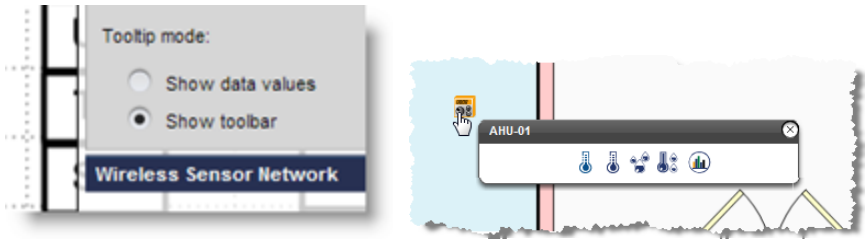
The Web Console displays real-time data values for all CRAH/CRAC, Rack, Power Meter, Pressure, Door Sensor, and Generic Device objects on the floor plan.
A date and time stamp displays on all gauges, tables, and charts in the local time room set in the browser.
On the Environmentals section in the Slide-out Menu, select one of the two data displays:

- **Toolbar** contains icons for various data values and display methods (appears by clicking on an object). Click the icon to display more detail.
- **Data Values Tooltip** displays a table of available data.

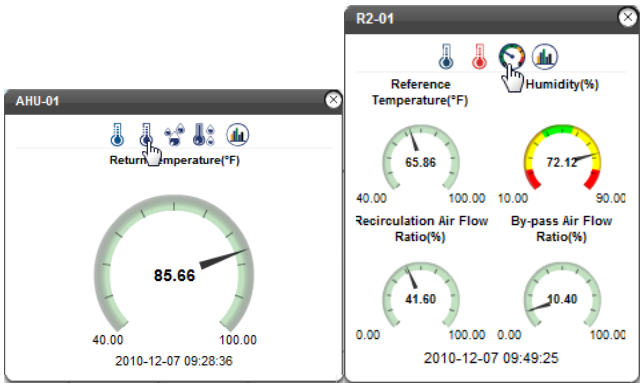
Each method for displaying data values is described below:

Show Toolbar

If set to Show Toolbar (see Environmentals Menu), then clicking on an object in the floor plan (for example, Rack Sensor, Pressure Node, CRAH/CRAC Sensor) opens a popup toolbar containing icons that represent various real-time sensor data. (For example, Supply Temperature, Return Dew Point).

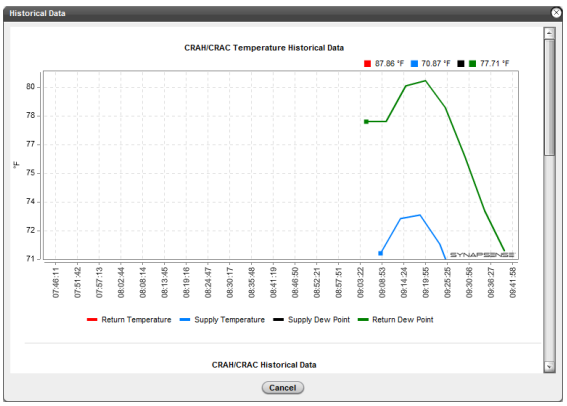


Click an icon to display the gauges associated with that type of object. The data refreshes automatically as new data becomes available.



The chart icon on the far right of the toolbar opens a chart showing the historical data for the selected object.

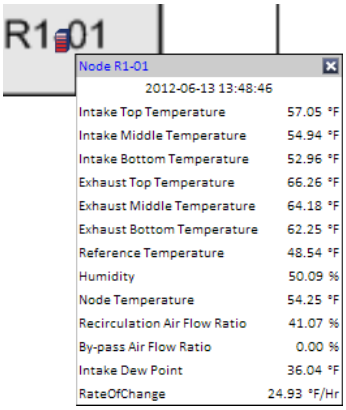
Note: This chart does not refresh automatically. To refresh with current data, close the chart dialog and click the chart icon again.



Show Data Values

To see a table of the available data for the selected object as a tooltip, select Show Data Values on the Environmentals section of the Slide-out Menu on the Floor Plan tab. To

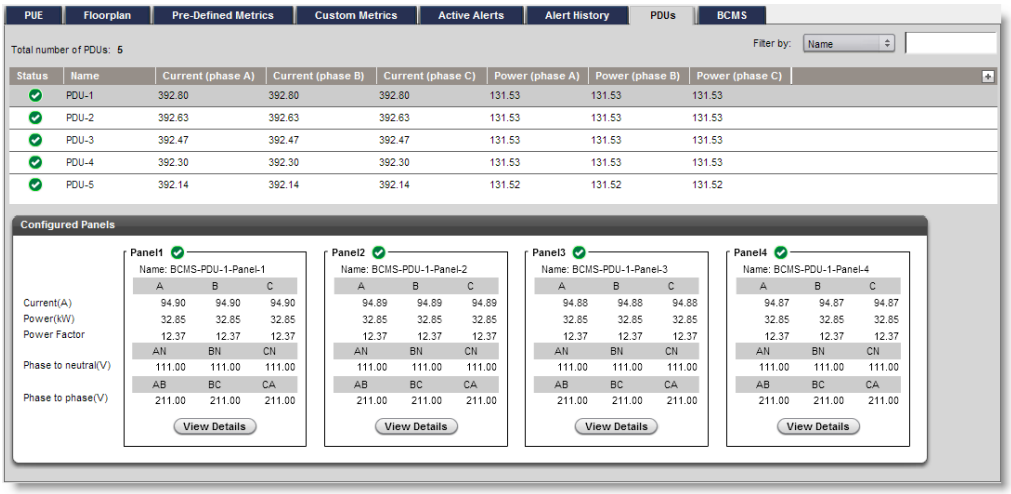
view, click on the object on the floor plan. To close the tooltip, click the X in the upper right corner.



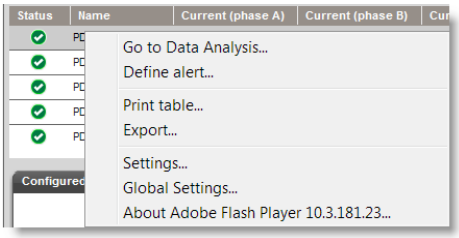
To view the details window for an object, double-click the object to view the details window for any object on the floor plan.

Using the PDUs Tab

A variety of real-time metrics can be measured and calculated for Power Distribution Units (PDUs) equipped with BCMS hardware from SquareD, PDI, and Cyberex. The PDU tab displays data from each 'PDU Rollup' in the currently-selected data center. A PDU Rollup is an object placed in MapSense to aggregate electrical data from each BCMS (Branch Circuit Monitoring System) Panel connected to a PDU.



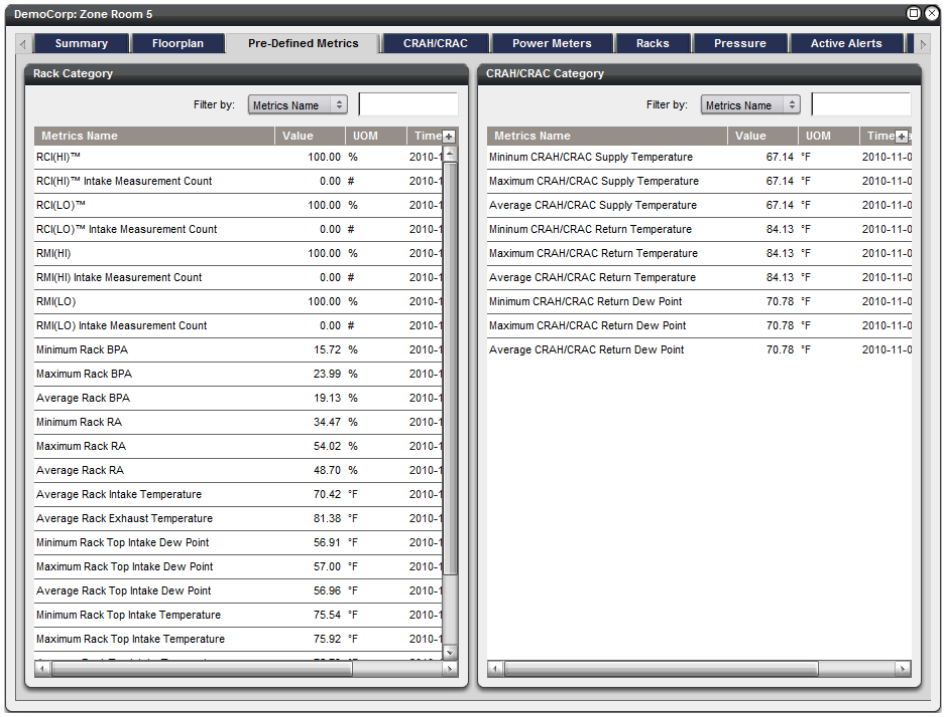
The total number of PDUs in the selected data center is displayed in the top-left corner of the PDU tab.



Right-click a PDU entry in the list to open a context menu with Print and Export options.

Using the Predefined Metrics Tab

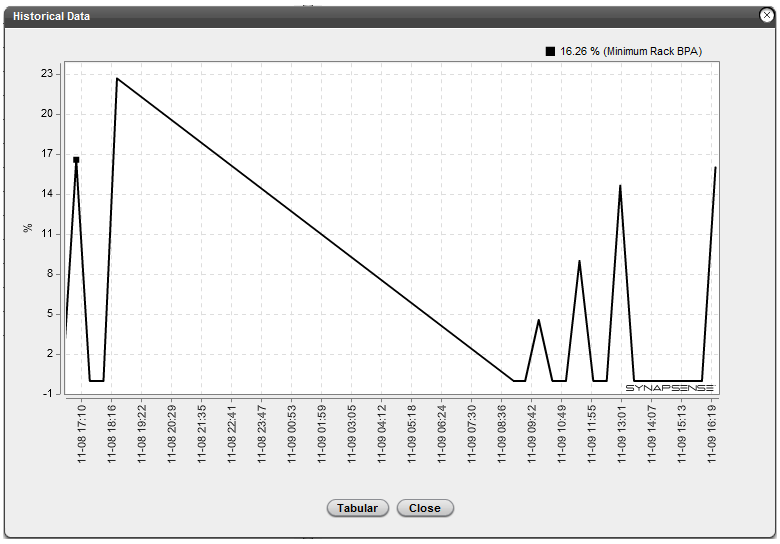
The Predefined Metrics tab consists of one or more metrics list that can be filtered by Value, Unit of Measure or Timestamp. At both the data center and room levels, the Rack Category and CRAH/CRAC Category metrics lists display side-by-side.



Print and export charts or tables of various data center metrics pre-defined by SynapSense.

Rack Cooling Index (RCI™), is a trademark of ANCIS Incorporated (www.ancis.us). These metrics reflect the important aspects of a data center and allow decision making based on how efficiently systems in the data center are operating.
A snapshot of this data can be used as a baseline to compare the effects of changes made to the data center to improve efficiency. A full explanation of each metric is available in Data Center Metrics.

Double-click to display a chart of any room-level metric in the list.
Note: Metrics with a # in the UOM column cannot be charted because they are singular values, such as a rack count.



The Tabular button opens a dialog with a table of the data values and timestamps shown in the chart, including Start Time and End Time calendars to filter the table results by date and time.

Data Center Metrics

This table lists the data center metrics used within Web Console, the affected area, and the description.

Metric	Description
Rack Cooling Index (RCI)™ Hi	Measure of the absence of over-temperatures; 100% means that no over-temperatures exist. The lower the percentage (it may go negative), the greater the probability that equipment experiences temperatures above the max allowable temperature. Max allowable temperature is determined by ASHRAE. See Note 1 below.
Rack Cooling Index (RCI)™ Lo	RCILO is the complement to RCIHI to draw attention to the supply air when it is below the minimum recommended temperature, according to ASHRAE standards. See Note 1 below.
RCI™ Hi/Lo Intake Measurement Count	Number of temperature sensors that have RCI Hi or Lo measurements above or below the required ASHRAE temperature ranges for Rack inlets. See Note 1 below.
Rack Moisture Index Hi	Amount of sensors above the ASHRAE recommended levels for dew point. RMI Hi = $[1-\sum^{n} (Mx-Mmax\text{-}rec)/(Mmax\text{-}all-Mmax\text{-}rec)^{n}]*100\%$ (for Mx>Mmax-rec)

Metric	Description
Rack Moisture Index Lo	Amount of sensors below the ASHRAE recommended levels for dew point. RMI Lo = [1-$\sum^{n}$ (Mx-Mmin-rec)/(Mmin-rec-Mmin-all)^{n}]*100% (for Mx>Mmin-rec)
RMI Hi/Lo Intake Measurement Count	Number of racks that have RMI Hi or Low measurements above or below the ASHRAE required dew point levels.
Air Loss Ratio	Measure of the CRAC air loss due to air mixing from by-pass & recirculation air flow. Optimally, this should be 0%. A percentage higher than 0 indicates overcooling. (Temperature rise across racks – Temperature rise across CRAC) / (temperature rise across racks)
By-pass Air Flow Ratio	The amount of cold air that is by-passing the rack inlets and going back into the CRAC return air without cooling a rack of equipment. (Average rack discharge air temp (top, middle and bottom) – CRAC return air temp)/(Average rack discharge air temp (top, middle and bottom)) – Reference Temperature

Supply Dew Point	Dew point temperature is calculated using temperature and humidity at the top inlet of each rack or CRAC sensor.
	beta = 17.62;
	lambda = 243.12;
	h = Log(relative humidity/100) + beta*temperature/(lambda+temperature);
	Dew Point = lambda*h/(beta-h)

Return Dew Point	
Recirculation Air Flow Ratio	How much of the exhaust air from the racks is mixing with the cold air before it goes into the rack inlet. ((Average rack inlet air temperature- top, middle & bottom) - (Reference temperature))/(Average rack discharge air temperature- top, middle & bottom)-(Reference temperature)
Min, Max, Average CRAC supply temperature	CRAC supply temperatures calculated per room.
Min, Max, Average CRAC return temperature	CRAC return temperatures calculated per room.
Min, Max, Average CRAC supply dew point temperature	Dew point temperatures for CRAC supply air per room.
Min, Max, Average	Dew point temperatures for CRAC return air per room.

Metric	Description
CRAC return dew point temperature	
Min, Max, Average CRAC delta temperature	The difference between the supply and return temperatures for CRACs per room. Optimally, this should be 28 degrees F.
Min, Max, Average Rack BPA	By-pass air flow is the amount of cold air that is not cooling the IT equipment and is going directly back into the CRAC return. This results in lower delta-T across the CRACs because of a lower return temperature. By-pass air flow rations per rack and room.
Min, Max, Average Rack RA	Recirculation air flow is the amount of hot air from the exhaust side of the racks that is mixing with the air cooling the server intakes, resulting in hotter intake air and causing the operators to lower the CRAC temperatures. Recirculation air flow ratios per rack and room.
Average Rack Intake Temperature	The average of all rack inlet temperature sensors on each rack per room.
Average Rack Discharge Temperature	The average of all rack discharge temperature sensors on each rack per room.
Min, Max, Average Rack Top Intake Dew Point	Dew point calculated at the top inlet on each rack per room.
Min, Max, Average Rack Cold Top Intake Air Temp Rate of Change per Hour	Rack top inlet temperature degrees change per hour per room. On the summary screen this is calculated every 30 minutes based on the past 60 minutes of data.
RhAmbient	Average humidity for the data center
Lighting Density	Ratio of data center lighting power consumption to data center area.

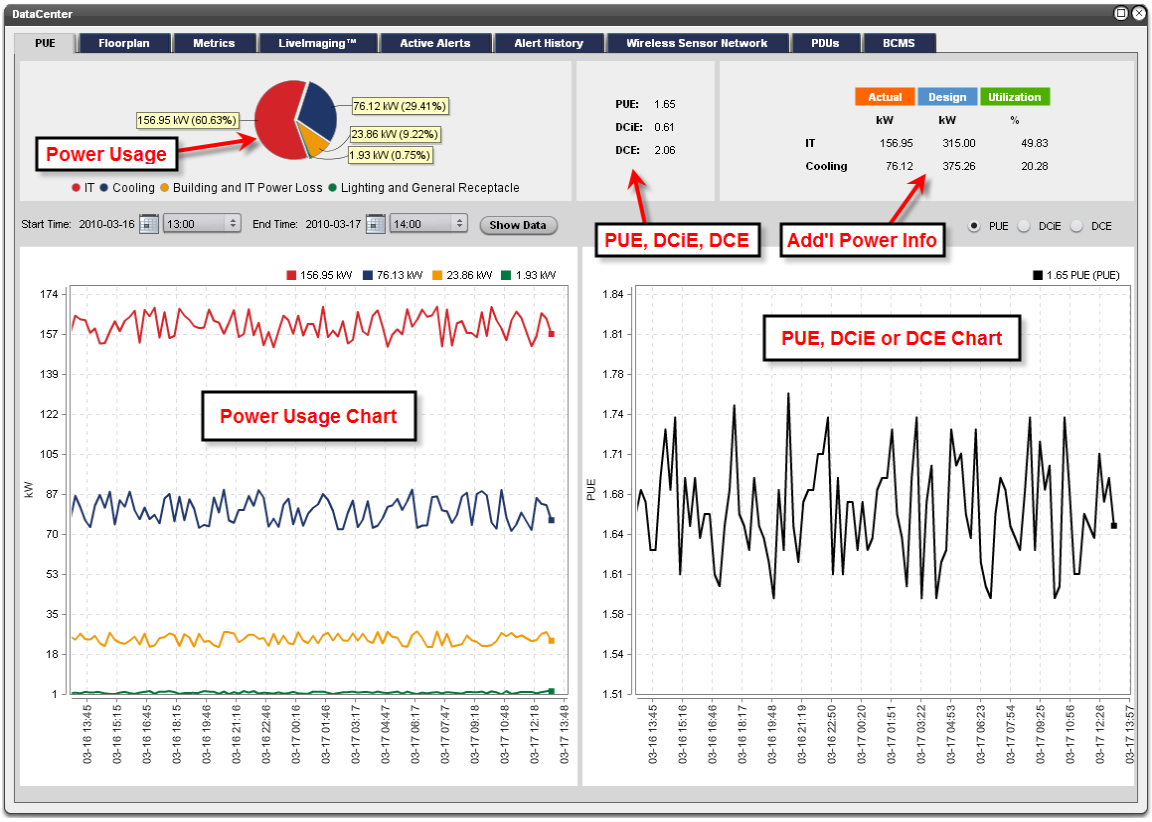
Note 1: Rack Cooling Index (RCI) is a Registered Trademark of ANCIS Incorporated (www.ancis.us). All rights reserved. Used under authorization.

Using the PUE Tab

Broadly adopted throughout the industry as a gauge for estimating the overall energy efficiency within the data center, Power Usage Effectiveness (PUE) represents the ratio of the total data center power to the IT equipment power, expressed as:

PUE = Total Data Center Power / IT Equipment Power

The PUE tab displays energy usage data in five sections. This section describes its features and functionality.

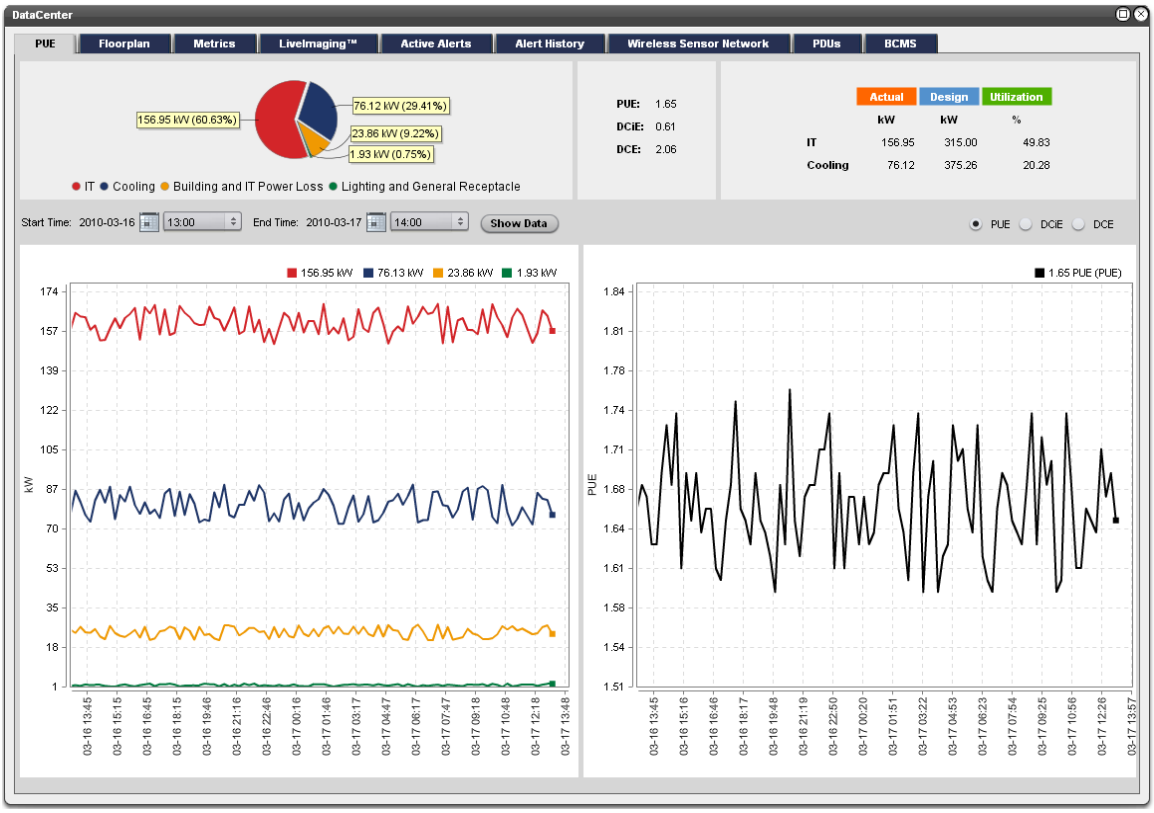


- **Show Data Button** – Applies the Start Time and End Time period and redraws the historical charts with the data for this period.
- **PUE / DCiE / DCE Radio Buttons** – Selects the type of data displayed in the chart on the right.
- Right-click on a chart window to open a context menu with a number of interactive features that can be used to customize the data display and navigate through the chart data.

Note: If the PUE Lite component was used to setup the PUE for this project, fewer properties were used during setup and therefore fewer items display on the PUE tab. Contact Panduit Technical Support if you have questions.

Monitoring and Calculating Energy Use

The PUE tab provides a graphical view of the overall power usage within the data center and dynamically calculates and displays PUE, DCiE, and DCE values.



Definitions for the key values displayed in this window are:

- **Power Usage Effectiveness (PUE)** — Broadly adopted throughout the industry as a gauge for estimating the overall energy efficiency within the data center, the PUE value represents the ratio of the total data center power to the IT equipment power, expressed as:

  PUE = Total Data Center Power / IT Equipment Power

Lower PUE values indicate IT equipment is using a higher percentage of total power usage—a measure of improved efficiency. Total Data Center Power is defined as the sum total of IT power, total cooling power, data center and IT power loss, and data center lighting and miscellaneous loads power use.

- **Data Center Infrastructure Efficiency (DCiE)** — DCiE is the reciprocal of PUE:

  DCiE = IT Equipment Power / Total Data Center Power.

  The DCiE value indicates the ratio of the power consumed within the data center that is being used by the IT equipment. Ratios closer to one (1.00) correspond with better efficiency.

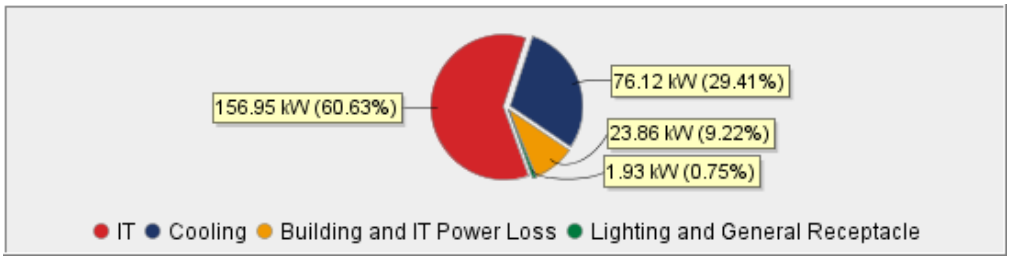
- **Data Center Efficiency (DCE)** — The DCE value corresponds with the ratio of IT power to cooling power consumed. Higher values indicate greater efficiency.

Many factors and considerations come into play that affect the calculations of these three metrics, but they do serve as a reliable means for both gauging the percentage of overall energy use consumed by the IT equipment in the data center and comparing one individual data center with another. Typical data center PUE values range from 1.6 to 3.0.

A PUE value of 1.0 would be the optimal value (where all of the data center power is consumed by the IT equipment), but in practical applications most companies try to bring their PUE as far below 2.0 as possible.

Power Usage and Metrics

The Power window presents the aggregate totals of kilowatts consumed by the monitored categories of equipment, including IT, cooling, building and IT power loss, and lighting and miscellaneous load. The pie chart in the upper-left area of the window (see below) provides a snapshot of the current energy use within the data center.



Additional power data appears in the upper right portion of the screen (see below). The maximum design values of the IT and cooling equipment are displayed in comparison

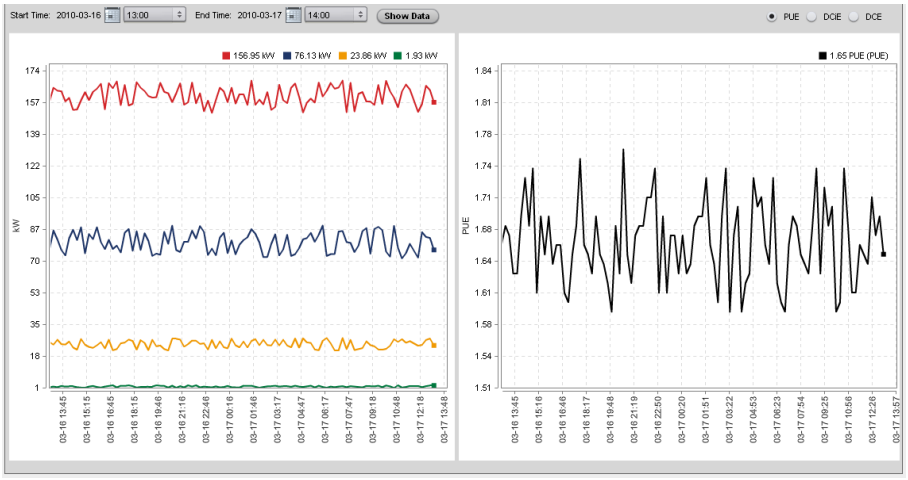
with the real-time measured values of power consumption. The Utilization column provides a percentage value that indicates how close actual usage is to the maximum design cap. If the design value is set to 0 (zero), then Utilization % will be undefined.

	Actual	Design	Utilization
	kW	kW	%
IT	156.95	315.00	49.83
Cooling	76.12	375.26	20.28

The PUE, DCiE, and DCE values are continuously displayed at the top of the window in the center. Move the mouse cursor over each individual term for a tool-tip description of how that metric value was derived.

Viewing Historical Power Charts

The Historical Power Charts (see below) provide a side-by-side comparison of the kilo-watts used by the equipment categories monitored and the relative efficiency data, which can be displayed as a PUE, DCiE, or DCE value.



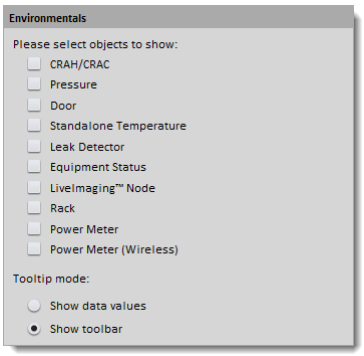
- **Show Data Button** – Applies the Start Time and End Time period and redraws the historical charts with the data for this period.
- **PUE / DCiE / DCE radio Buttons** – Selects the type of data displayed in the chart on the right.
- Right-clicking on a chart window opens a context menu with a number of inter-active features that can be used to customize the data display and navigate through the chart data.

Using the Environmentals Layer

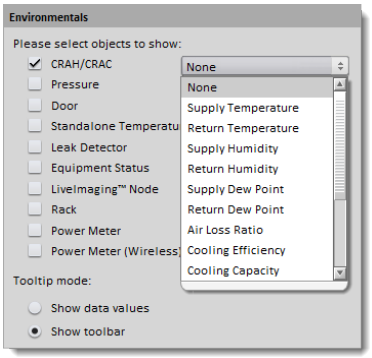
The Environmentals layer of the Floor Plan tab shows sensors on the objects measuring temperature, pressure, humidity, and dew point. Other sensors (for example, standalone, outdoor, and LiveImaging sensors) do not show on this layer.

Environmentals Menu

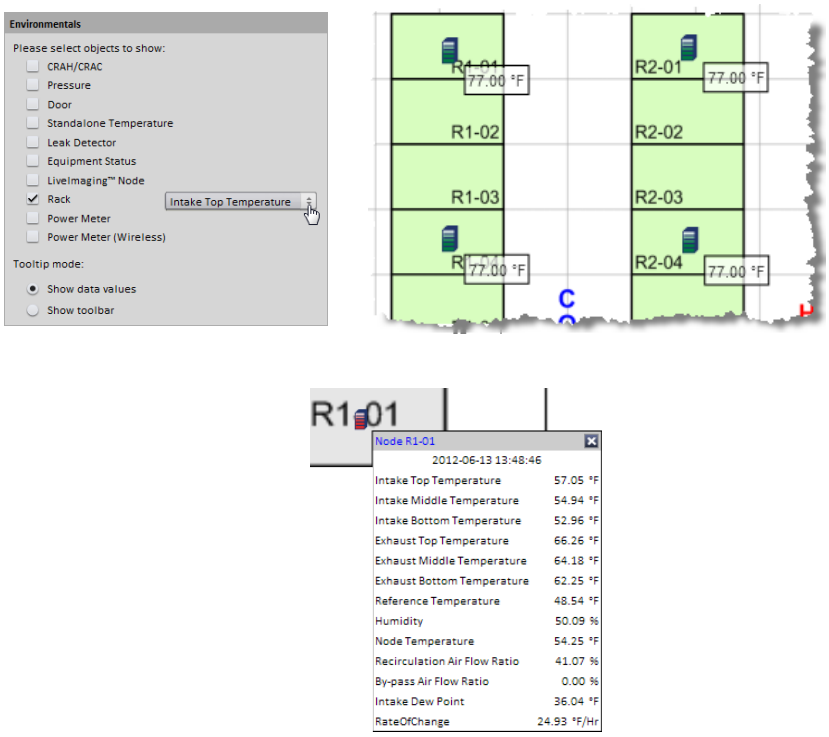
The Environmental menu selects which object (for example, CRAHs, Racks, Pressure Nodes, Power Meters) display on the floor plan of the selected data center or room.



When only one object type is checked, an associated drop down list of its properties displays.



Select a property (for example, Intake Top Temperature) from the drop down list to display its real-time value in a box next to each object.



- **Tooltip Mode** – An individual object can display in one of two modes:
- **Show Data Values** – Click on the object to display a table of properties (for example, Return Temperature, Air Loss Ratio). To close the table, click the X in the upper right or click the object again.

- **Show Toolbar** – Hover the mouse over the object to display the object name. Click on the object to display a toolbar. Click an icon on the toolbar to display properties and associated data in chart and tabular formats.

Environmentals Layer Icons

Each CRAC, Rack, Power Meter and Pressure object is represented by an icon, as shown below in "Using the Environmentals Layer" on the previous page. Right-click on a single object to show the context menu. Use Ctrl + click and drag to highlight a group of objects, then right-click to show the context menu and apply the action to all of the selected objects.

Icon	Description
	CRAC/CRAH
	Door sensor – open and closed
	Equipment Status
	Leak Detector
	LiveImaging Node
	Power Meter
	Pressure sensor
	Server rack or cabinet
	Server rack with door sensor
	Standalone Temperature
The color of the icon (red, yellow, green, or gray) indicates the current status: Green indicates that status is good. Red indicates one or more active alerts. Yellow indicates data was not received from at least one sensor. Gray indicates this object is disabled.	

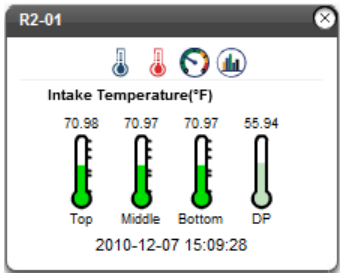
Rack Toolbar

The Rack toolbar, provides a real-time and historical view of data from sensors on the selected rack object.

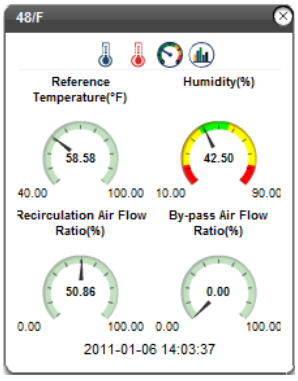
The following table describes what the icons on the Rack toolbar represent.

Group Name	Icon	Description
Pending Alert		Displays a list of active alerts for this object.
Intake Sensor Values		The temperatures and dew point recorded by the sensors positioned in the intake side of this rack object.
Exhaust Sensor Values		The temperature recorded by the sensors positioned in the exhaust side of this rack object.
Calculated Values		The humidity, RA, BPA and reference temperature of this rack object.
Historical Chart		A chart showing historical data for this rack object.

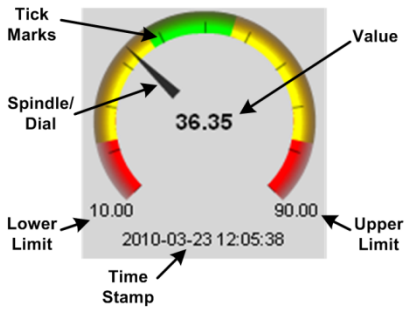
Click the **Intake Sensor Values** icon to display a thermometer-style gauge.



Click the **Calculated Values** icon to display a different set of gauges dependent upon which floor plan is active in the workspace.

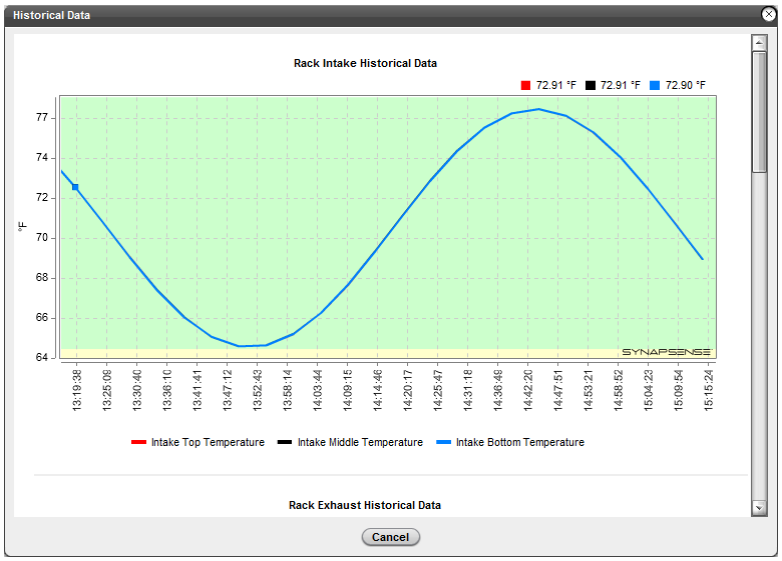


Each gauge displays the object property name (or group name) and the unit of measure. The center of the gauge displays the current reading for the date and time indicated in the time stamp at the bottom of the dialog.



ASHRAE provides recommended ranges for rack intake temperatures and the color bands correspond to these recommendations.

Click the **Historical Chart** icon to display a chart showing the last two (2) hours of readings for each sensor associated with the selected rack object.



Use the scroll bar to view all of the charts including:

- Rack intake historical data
- Rack exhaust historical data
- Rack historical data
- Rack dew point historical data

The color bars in the background represent the ranges configured for the sensor, and correspond to the colors on the radial scale of gauges. If there are no color bars, then there are no associated ASHRAE-recommended values for the properties.

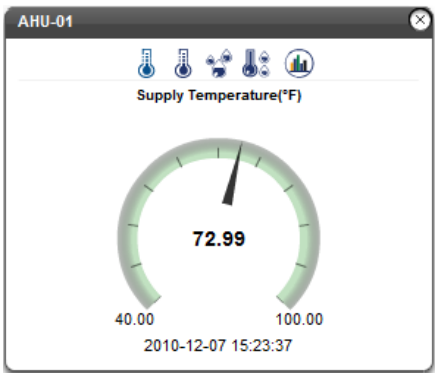
CRAH/CRAC Toolbar

The CRAC toolbar, provides a real-time and historical view of data from sensors on the selected CRAH/CRAC object.

The following table describes what the icons on the CRAH/CRAC toolbar represent.

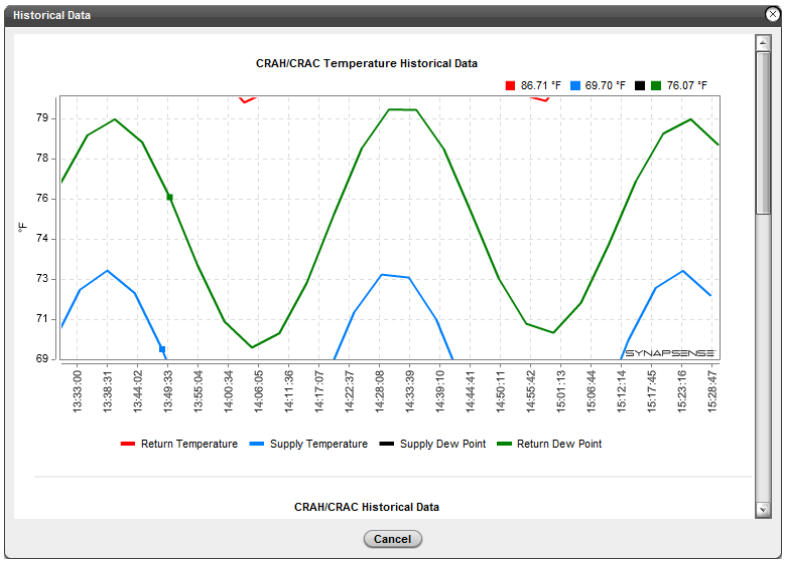
Group Name	Icon	Description
Temperature		The temperature, recorded by the sensors monitoring the supply and return air supply for the CRAH/CRAC.
Humidity		The relative humidity, recorded by the sensors monitoring the supply and return air supply for the CRAH/CRAC.
Dew Point		The dew point, calculated by the sensor monitoring supply and return air supply for the CRAH/CRAC unit.
Metrics		The calculated cold air loss ratio and cooling efficiency.
Power		The cooling capacity and actual cooling power.
Historical Chart		A chart showing historical data for the CRAH/CRAC.

Click the temperature or humidity icons to display a real-time gauge with real-time sensor readings.



Note: Gauges for CRAH/CRACs do not have color range bands because there are no ASHRAE recommended property ranges.

Click the **Historical Chart** icon (on the far right) to display a chart showing the last two (2) hours of data captured for each sensor associated with the selected CRAH/CRAC object.



Use the scroll bar to view all of the charts, including:

- CRAH/CRAC temperature, dew point historical data
- CRAH/CRAC air loss ratio, cooling efficiency, humidity historical data
- CRAH/CRAC cooling power historical data

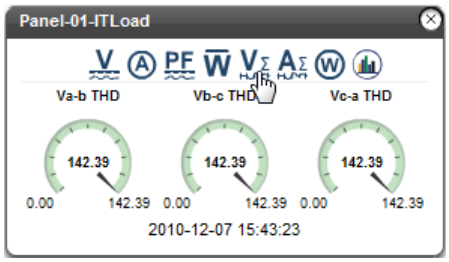
A Legend provides a color-coded key to the displayed sensor readings.

Note: Gauges for CRAH/CRACs do not have color range bands because there are no ASHRAE recommended ranges for these properties.

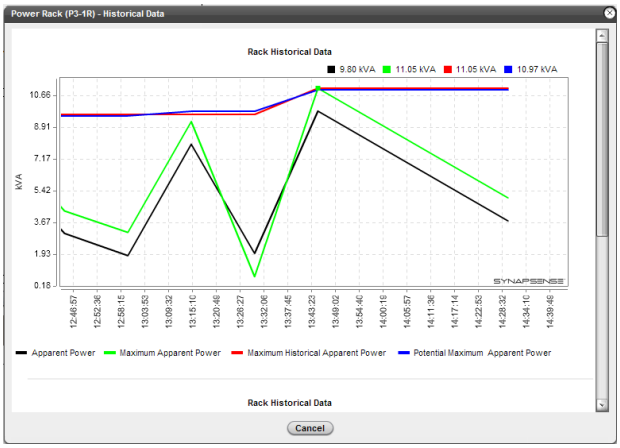
Power Meter Toolbar

The Power Meter Toolbar, provides a real-time and historical view of the power-related data from the selected Power Meter object.

Both Delta and Wye Power Meters display real-time gauges for all of the data collected. Click on any gauge icon to show multiple gauges for the data in each category.



Click the **Historical Chart** icon (on the far right) to display a chart showing the last two (2) hours of data for each sensor associated with the selected Power Meter object.



Use the scroll bar to view all of the charts, including:

- Power Meter phase-to-phase voltage historical data
- Power Meter current (amps) historical data
- Power Meter power factor historical data
- Power Meter kW demand, kVA historical data

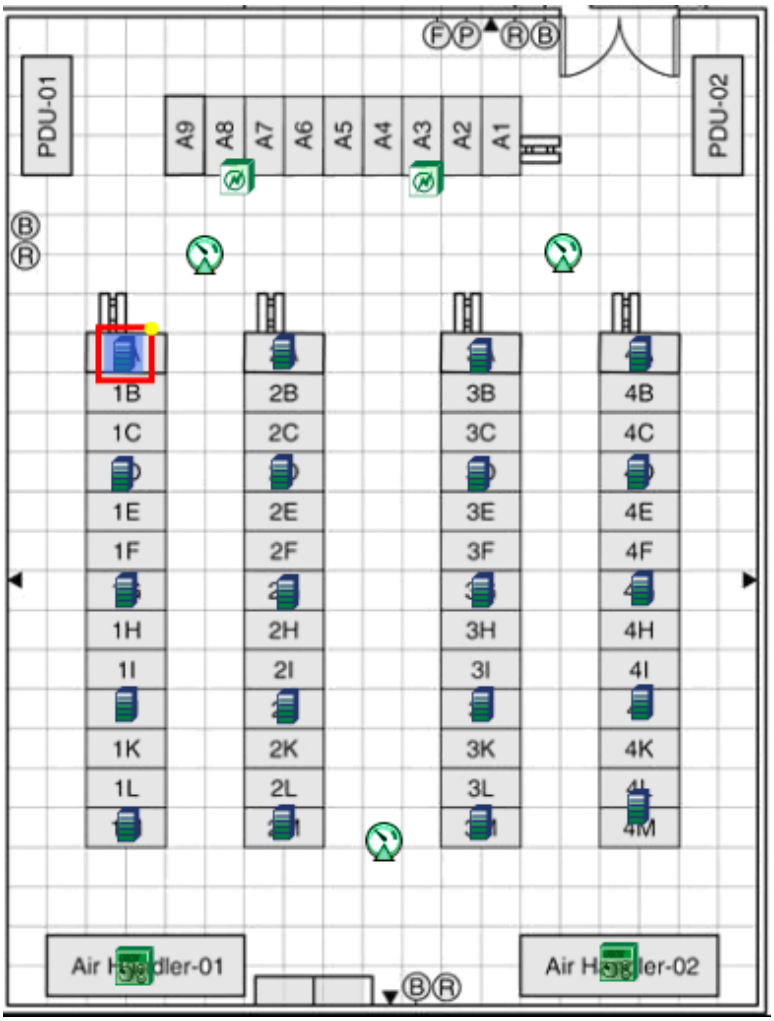
A Legend provides a color-coded key to the sensor readings displayed on the chart. Right-click the squares of color in the upper right to show/hide a line on the graph.

Additional Features

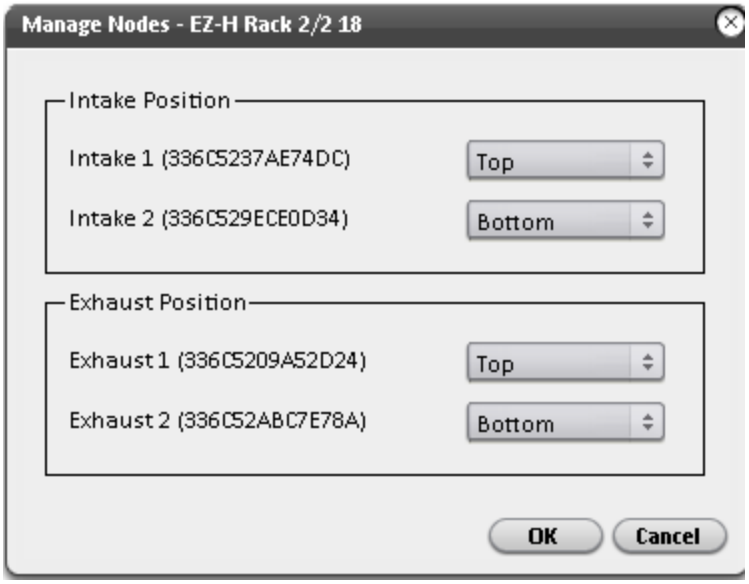
Changing a node position for the ThermaNode EZ can be accomplished in Web Console without going into MapSense and re-exporting the floor plan. Once saved, LiveImaging will also reflect the position change.

To change EZ node position from the floor plan:

1. From the **Data Views** tab, select **Control Sensors (Intake/Pressure)**.
2. Double-click the EZ node to open the floor plan. The rack in which the EZ node resides is highlighted in red.



3. Right-click to display the context menu and select **Manage Rack Nodes**.
4. On the Manage Nodes dialog, the MAC ID for the device displays in parenthesis, next to the current position. Select the new location on the drop down adjacent to the device.



5. Click **OK**.

Note: Changes take effect immediately. Be sure that the physical nodes are moved to the new position prior to changing the Web Console setting. Errors or incorrect data could result.

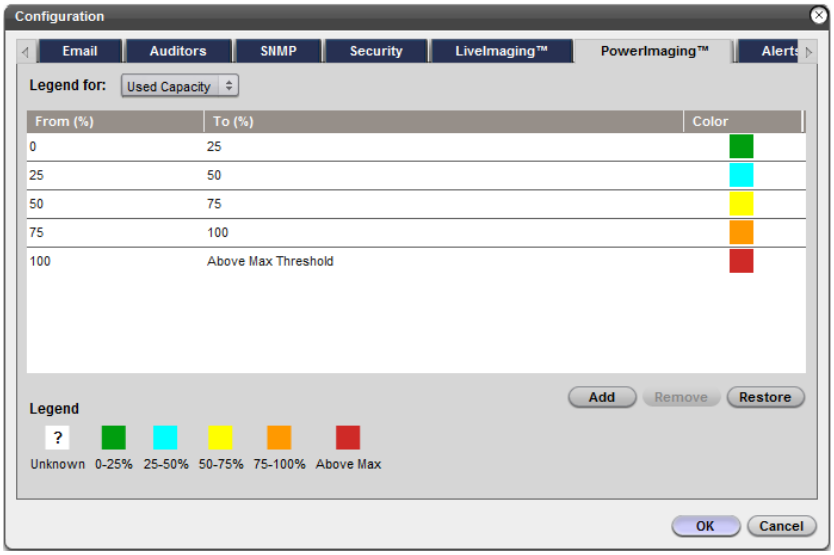
Using the PowerImaging Layer

PowerImaging displays the readings that the Power Suite devices capture from the racks, as well as data about the populated servers from the Power Suite Configuration Utility. This feature shows all the relevant power and capacity data across the selected room or data center in an easily understood array of tooltips placed on the floor plan image. Use the information to assess data center operational condition and expansion capacity.

See Configuring Power Imaging for information about setting the color scheme. Also see PowerImaging on the Floorplan

Configuring PowerImaging

PowerImaging tooltips appear, when selected, on the Floor Plan tab. Colors represent ranges of displayed capacity data. Default ranges and colors are provided. If a different color palette is preferred, it can be configured in the PowerImaging tab.



To configure colors used in power imaging:

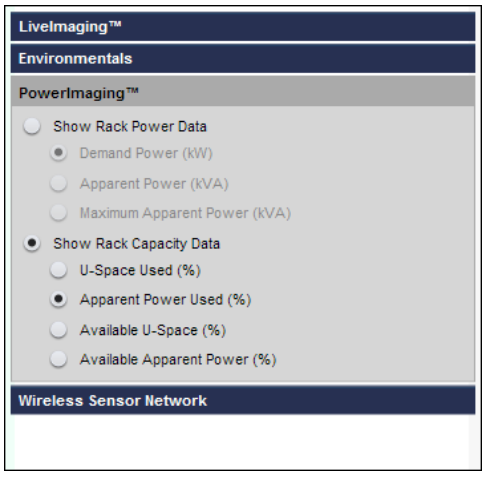
1. Click on an entry in the From or To columns to make changes to a division.
2. Click on the Color column for an entry to display the **Basic Colors** dialog.

3. Make the color selection.
4. Click **OK** to accept any changes to the color for that division.
5. Repeat these steps for each entry.

Note: Once changes are saved, it is not possible to go back to the default color set without manually resetting each color. Prior to saving a color setting, use Restore to undo the last action.

PowerImaging on the Floor Plan Tab

Open the Slide-out Menu to select the radio buttons for which data types to display.



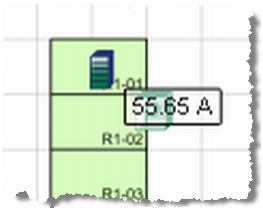
The PowerImaging menu contains two data types; only one power data type can be selected at a time.

Show Rack Power Data

Power-related data values display. Only one choice can be selected for display at a time.

- **Demand Power (kW)** – The average power usage for the rack over the most-recent 15-minute data collection interval.
- **Apparent Power (kVA)** – The product of voltage and current over the most-recent data collection interval.
- **Maximum Apparent Power (kVA)** – The maximum rated rack power.

The selected value displays as a tooltip next to the rack icon.

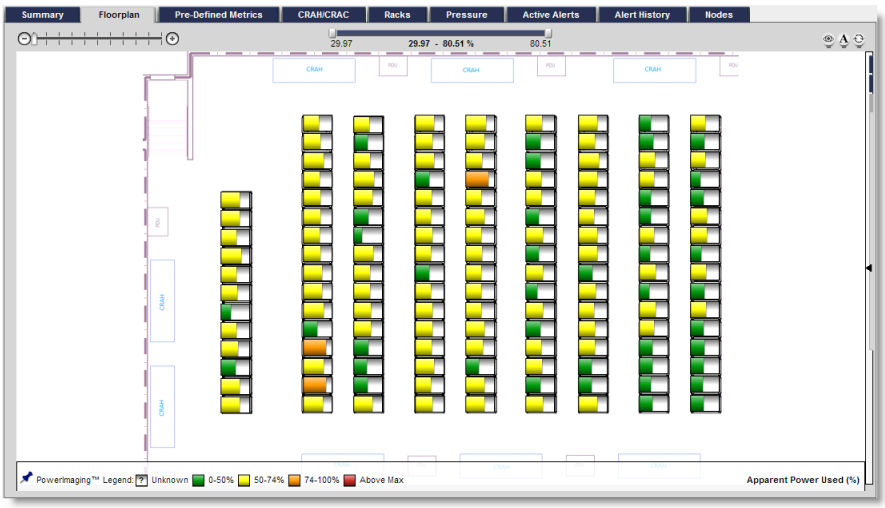


Show Rack Capacity Data

U-slot space or power capacity-related data values display. Only one choice can be selected for display at a time.

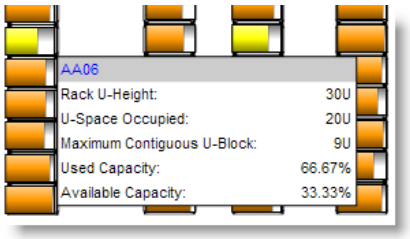
- **U-space Used (%)** – The percentage of total U-slots in the rack occupied by configured data center equipment.
- **Apparent Power Used (%)** – The percentage of the apparent power for the rack divided by the maximum rated rack power.
- **Available U-space (%)** – The percentage of U-slots still available for adding new servers or other data center equipment compared to the total number of U-slots in the rack, calculated as 100% minus the percentage of U-slots used.
- **Available Apparent Power (%)** – The remaining (available) percentage of the maximum rated rack power not currently being used by the data center equipment installed in the rack, calculated as 100% minus the percentage of apparent power used.

  The selected percentage value displays as a rectangle filled to the proportional percentage value with a color defined in the Legend at the bottom of the Floor Plan tab.

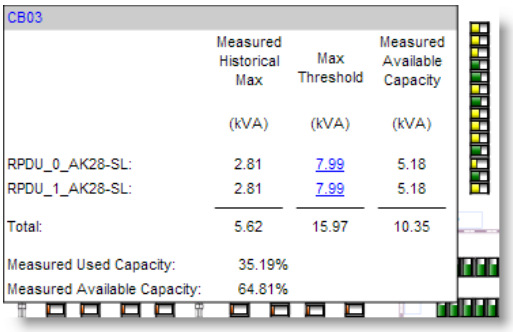


When the **Show Rack Capacity Data** radio button is selected, a tooltip displays whenever the cursor hovers over a rack icon, showing various rack space or power information. Which type of tooltip displays depends on the radio button selected in the Show Rack Capacity Data list.

For **U-Space Used (%)** and **Available U-Space (%)**, the following tooltip displays:



For **Apparent Power Used (%)**, and **Available Apparent Power (%)**, the following data box displays:



Using the LiveImaging Layer

The LiveImaging™ layer is a patented view of the data center available only from SynapSense. It provides several methods for viewing environmental data in the selected data center or room including maps of temperature, pressure, dew point, or humidity. This allows data center operators to quickly assess data center operational conditions and efficiency.

LiveImaging displays the sensor data from a series of horizontal layers that correspond to height-levels in the data center, from the subfloor up to the top rows inside cabinets. A single screen is similar to a thermal-type map, showing all the sensor readings in locations throughout a single layer of the data center. This feature enables quick assessment of all the relevant temperature, humidity, dew point, and pressure readings in an easily understood graphical display.

In LiveImaging, the color maps are overlaid on the floor plan image, so it is clear exactly where in the data center there is need for adjustment. Use the animation option to play back the images in sequence for a specific time period, similar to time-lapse photography.

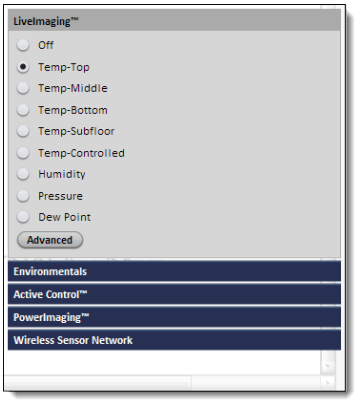
See Configuring LiveImaging for information about setting the color scheme, and setting up the image retention policy.

LiveImaging in the Floor Plan Tab

A static, color LiveImaging array of real-time environmental sensor readings is overlaid on the floor plan image. The Slide-out Menu contains radio buttons to control which layer displays.

LiveImaging Menu

1. On the Floor Plan tab, open the Slide-out Menu and click **LiveImaging**.
2. Select which temperature, pressure, humidity, or dew point sensor data to display.
3. Move the cursor off of the Slide-out Menu to refresh the display with the new selection.



LiveImaging menu selections include:

- **Off** – No LiveImaging data is overlaid onto the floor plan image.
- **Temp-Top** – Top-level temperature sensors.
- **Temp-Middle** – Mid-level temperature sensors.
- **Temp-Bottom** – Bottom-level temperature sensors.
- **Temp-Subfloor** – Temperature sensors placed under the data center subfloor.
- **Humidity** – Humidity sensors (built into the ThermaNode module itself).
- **Pressure** – Pressure Nodes placed strategically around the data center.
- **Dew Point** – Dew point temperature is calculated using temperature and humidity at the top inlet of each Rack or CRAC sensor.
- **Temp-Controlled** – Control input temperature sensors. (Available when Active Control is installed.)
- **Advanced Button** – Opens a separate window that displays static or animated images (no object icons display).

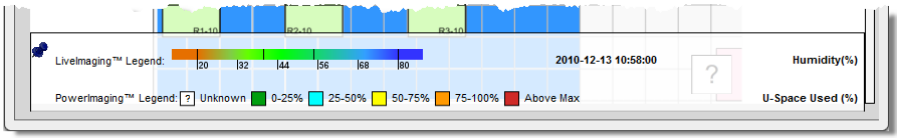
To refresh the displayed image, do one of the following:

- Right-click on the LiveImaging view of the floor plan and select **Refresh LiveImaging** from the context menu that displays.
- Click the **Refresh** icon in the upper right corner of the Floor Plan tab.

Note: This action refreshes the image with the most recently reported information. This image is not saved to the disk. Images continue to be updated according to the scheduled refresh cycle following the refresh request.

Legend

A Legend defining the metrics currently displayed is available as a Slide-out menu at the bottom of the Floor Plan tab.



The Legends apply to the different views shown.

Temperature:

Humidity:

Air Pressure:

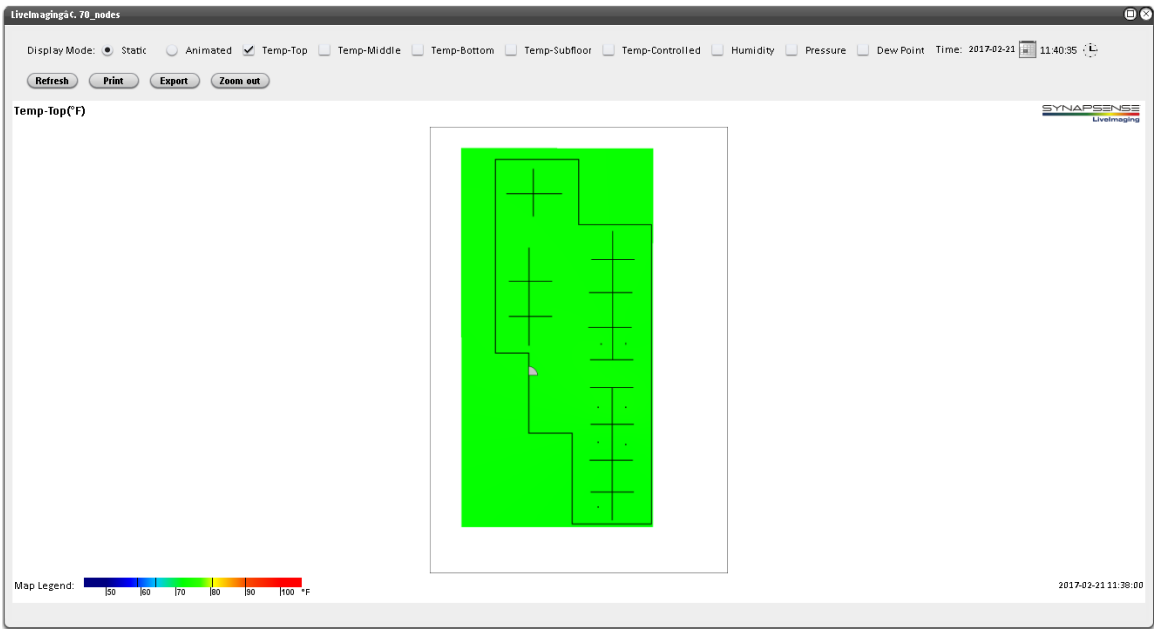
Dew Point

The numbered tick marks along the bottom indicate degrees for temperature and dew point (Fahrenheit or Celsius), humidity (percentage), and air pressure (inches of H_2O or Pascals) readings. The colors provide a corresponding visual key.

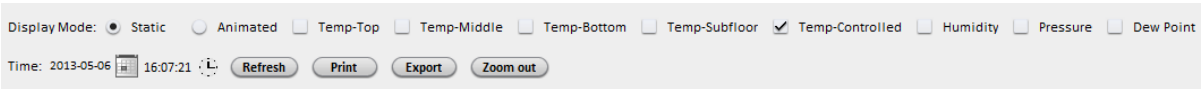
Note: The colors and temperature gradations are set by the Administrator or a user with Edit Configuration Settings permissions. The default color scheme is shown.

LiveImaging Advanced Window

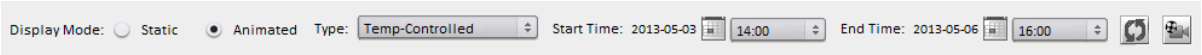
From the Floor Plan tab, click the **Advanced** button from the Slide-out Menu. This opens a dedicated LiveImaging window, showing Static or Animated LiveImaging.



- **Static Mode** – Click the Static radio button to view static LiveImaging for a specific point in time.



- **Animation Mode** – Click the Animated radio button (or if an Alert is 'animated' via its right-click context menu), to view the changes on a single layer for a selected period of time.



To use static display mode:

1. Click the **Static** radio button.
2. Click the check box for the sensor layer to display.
3. Use the Time Selector to indicate the date and time to display.
4. Click **Refresh**.

To use animation mode:

1. Click the Animated radio button.
2. Select the layer to display from the drop down list.
3. Use the Time Selector to indicate the time and date to display.
4. Click **Refresh**.

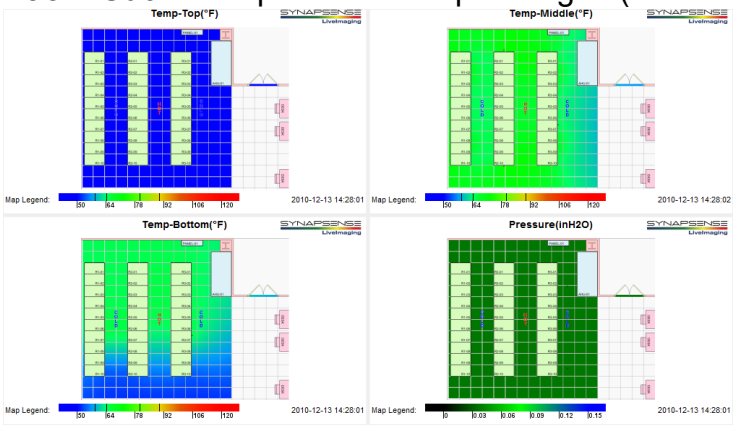
Descriptions of Selection Bar Items

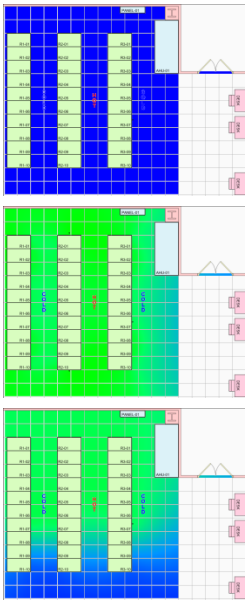
This section contains descriptions about or how to use the items in the Selection Bar for each of the modes.

- **Time Selector** – The time span for animation can be selected via the **Calendar** and **Time Picker**. Click the icon to open the widget. Click the **X** in the corner of the widget to close.

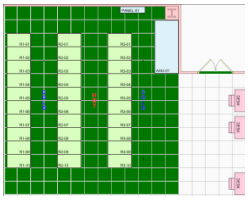
- **Print / Export Buttons** – Both of these buttons open a new browser window displaying one or more LiveImaging maps of the selected layers. The **Print** button opens the Print dialog, so you can print the maps. The **Export** button opens the Save As function, so you can save the maps as JPEG file (.jpg) or PNG (.png) file formats.

Zoom Out button places the maps in a grid (see below):

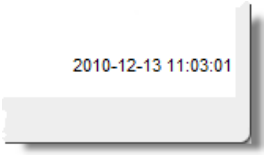




The **Zoom In** button replaces the **Zoom Out** button when maps are in a grid layout and arranges the maps vertically again (see right):



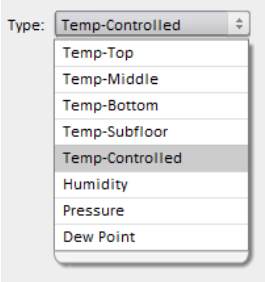
In the lower-right corner of each LiveImage, the date and time of the image displays.



Whether in a grid (zoomed out) or in a vertical column (zoomed in), each LiveImage can be individually zoomed using the scroll feature on a mouse. Horizontal and vertical scroll bars appear inside each individual image when required. While zoomed in, each map can be scrolled by clicking and dragging it in any direction.

In Animation Mode, the entire room is displayed (there is no zoom or scroll functionality in the animated window).

- **Type drop down list** – Select the layer of data to display in sequence.



- **Animation Control Bar** – The animation plays at the rate of one frame per second, and lasts for a maximum of two minutes. The application calculates the number of frames to display in that amount of time based on the start and end dates the user specified.

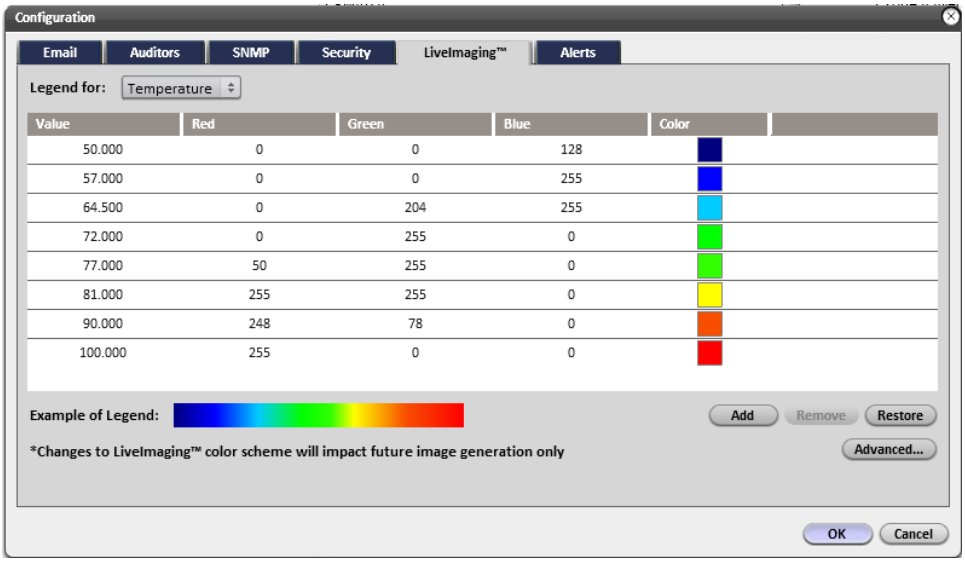
  A counter to the right of the **Animation Control Bar** (for example, “21/24”) shows the number of the currently displayed image and the total number of images selected for the animation period.

Each image is shown for 1 second. The maximum number of images shown for any time period is 120. The maximum time period that will show all images is 10 hours. After that the system begins to skip frames to keep the total animation time to two (2) minutes.

- **Refresh** – Button in the upper-right corner of the window for Animated and the lower row of Selection Bar for Static, forces any newly-entered Start Time and End Time values to take effect. If no time frame is selected, the default time span is from two hours in the past to the present time.
- **Export to Video** – Button in Animation Mode that enables the series of images shown in the animation to be exported to video format and viewed outside of Web Console.  Click the **Export to Video** button. In the View Downloads dialog, save the file to the desired location.

Configuring LiveImaging

The LiveImaging system can generate a color map to represent values of data for temperature, humidity, dew point, and pressure. The number of divisions, and the color that represents each, can be customized to meet the needs of a specific installation.



Note: Once changes are saved, it is not possible to go back to the default color set without manually resetting each color. Prior to saving a color setting, use Restore to undo the last action.

To configure colors used in LiveImaging:

1. Click on the **Value** or the color box to make changes.
2. Click the color to open the Basic Colors dialog.
3. Make the color selection then click OK.
4. Repeat these steps for each color entry you want to change.

A new Legend generates for all images created from that time forward. Images created prior to the change will use the colors and data divisions defined at the time the image was generated by the system. LiveImaging images are created for each room and data center according to the image retention policy (default is every 5 minutes).

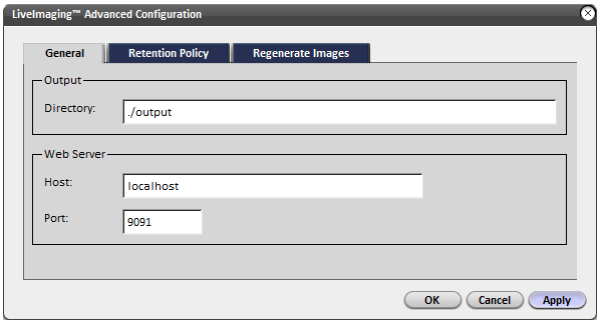
Configuring an Image Retention Policy

Retaining LiveImaging history takes a lot of disk space when capturing images every 5 minutes continuously. The image retention policy provides options for saving these images to a location anywhere on your network and to set the interval for disk cleanup. For example, you may want a full set of images for 7 days but only need a sampling for review after that. Use the retention policy settings to reduce the number of images saved per hour, per day, or as needed.

Because of the amount of disk space required to retain images, a recommended best practice is to retain images for a shorter period and use the Regenerate LiveImaging feature when the need arises to view older images.

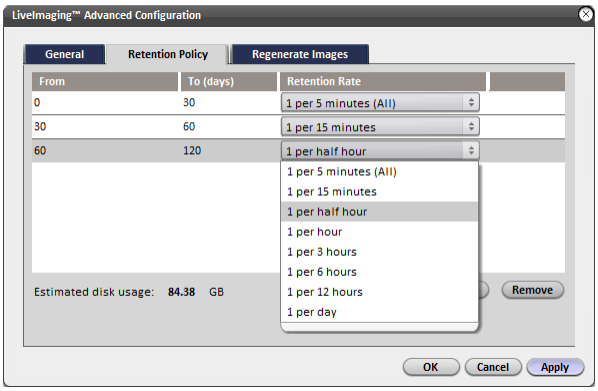
To set the image retention location

1. On the Admin menu, select **Configuration**.
2. On the LiveImaging tab, click **Advanced**.
3. On the General tab of the LiveImaging Advanced Configuration dialog, set the location of the image repository. (Length of path can be up to 255 characters.)
4. Click **Apply**.



To set the image retention policy

1. On the Retention Policy tab, use the drop-down list to set the number of images to save.



2. To change the number of days in the From and To (days) columns, click on the number to activate the field. Then type the number and click off of the field to set the number.
3. To set another retention period (up to 8), click **Add**. After the longest available retention interval is selected, a system message displays to indicate retention rate limit is reached.
4. Click **OK** to save the changes.

Note: A scheduled task runs every hour to archive generated images. The first time this task runs after a retention policy change, it applies the change to all existing images.

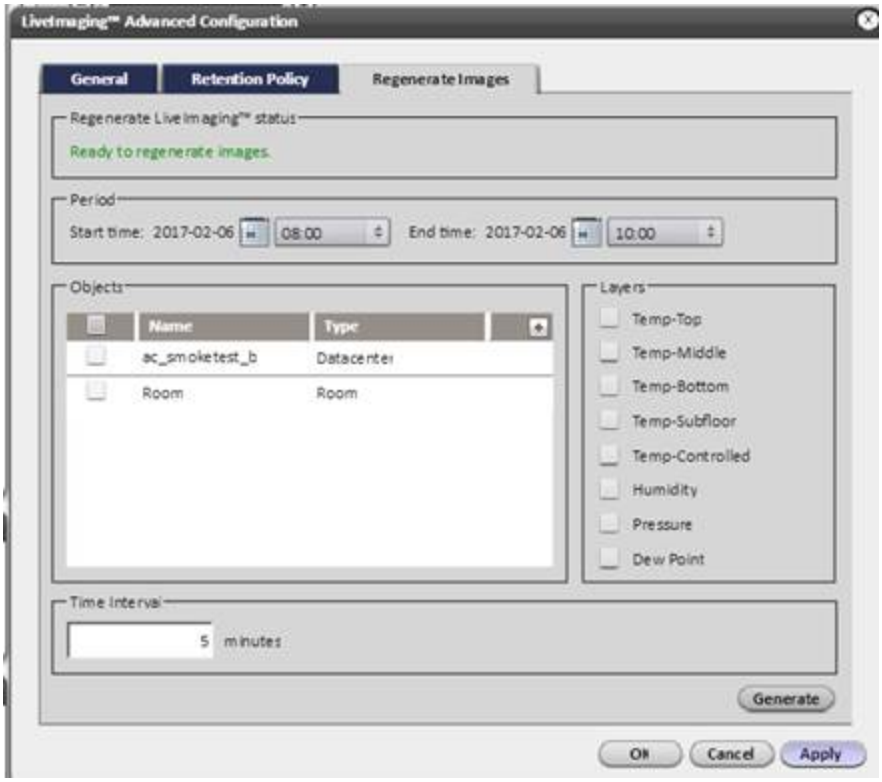
Therefore, choosing a longer time period means images will be removed from the existing archive. For example, increasing the time interval from the default of one image every five minutes (1 per 5) to one image every 15 minutes (1 per 15) would delete 192 images per day from the image archive.

Estimated Disk Usage displays the approximate disk space required to store the images at each selected time interval.

To delete a retention period from the list, click **Remove**.

Re-generating LiveImaging from Historical Data

The LiveImaging Retention Policy sets the interval and time frame for images retained in the image repository. The Regenerate Images feature provides the ability to recreate LiveImaging of a time frame for which the images were removed.



To regenerate images from historical data:

1. On the Admin menu, select **Configuration**.
2. In the Configuration dialog, select the **LiveImaging** tab.
3. On the LiveImaging tab, click **Advanced** in the lower right corner.

4. Select the **Regenerate Images** tab. The **Regenerate LiveImaging status** section indicates whether or not the system is ready to regenerate images.
5. In the Period section, select the Start and End date and time.
6. In the Objects section, select one or more checkbox for the data center or room data to regenerate.
7. In the Layers section, select one or more checkbox for the sensor layer to regenerate.
8. In the Time Interval section, type the frequency of images to regenerate. The default is 5 minutes.
9. Click **Generate**.

To view the regenerated images, go to the LiveImaging Advanced Window via the LiveImaging layer of the Floor Plan tab, and make the appropriate selections for the time and date, to display the regenerated images.

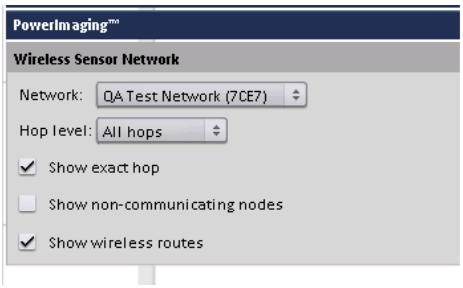
Notes:

Images generated for image data prior to version 6.5 of SynapSense may not accurately reflect the historical sensor position.

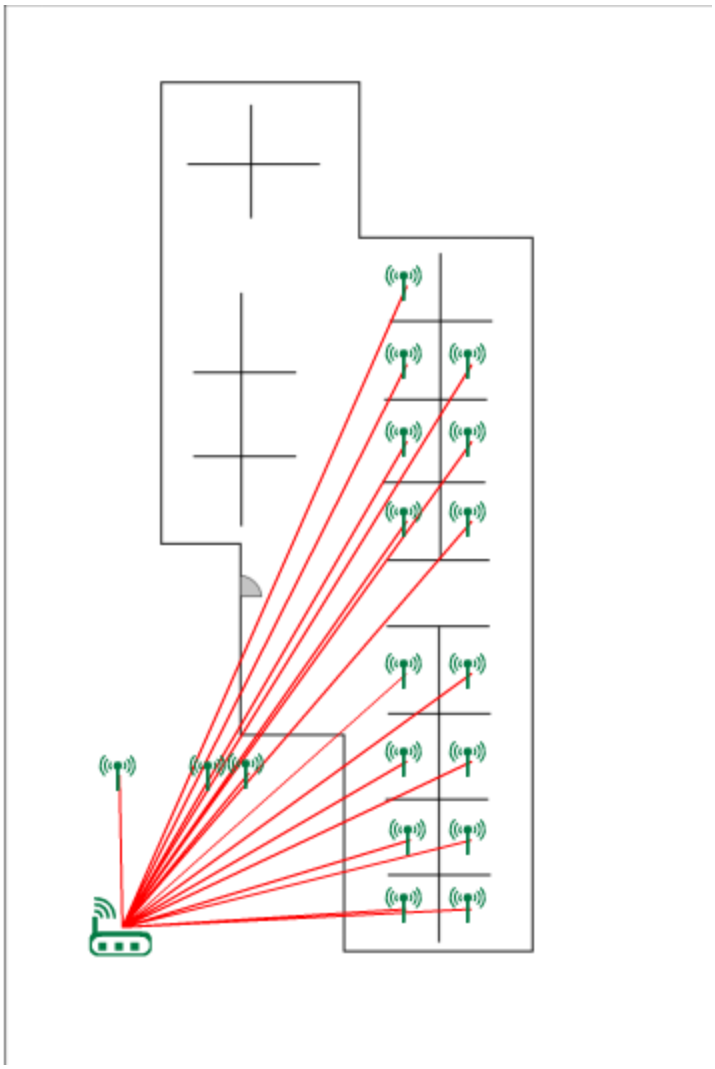
The regenerated images are for the floor plan background image in use at the time the data was collected.

Using the WSN Layer

The Wireless Sensor Network (WSN) layer is only available on the Slide-out Menu when at the Data Center level on the Sites list. This layer displays the status of the Wireless Sensor Networks that are reporting data to the system in the selected network.

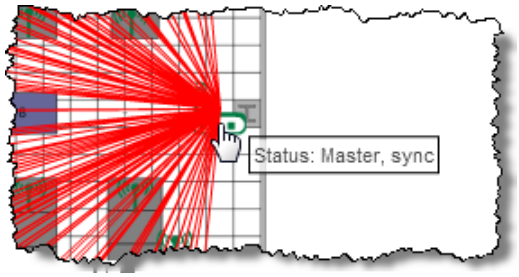


Antenna icons display on the Floor Plan image with lines representing the radio node wireless connections to associated WSN Gateways. It includes all of the radio nodes and the gateways for the selected network.



Each red line indicates the most recent communication path taken by the Node to the Gateway. This is not necessarily the route that the next data packet will take.

Hover the mouse over one of the nodes to display the status of that node, (see right). Gateways also show a tooltip status of Master/slave and whether the Gateway is synchronized to the network.



The Wireless Sensor Network menu, displays the following options:

- **Network** – Selects the network to display. Networks of WSN Gateway devices and the various nodes that communicate with it are configured in MapSense. Only

Nodes (node antenna icons) and Gateways (gateway icons) associated with the selected network will display.

- **Hop Level** – Selects the display of wireless route segments (Level 1 is the first hop from a node to another node or gateway. Level 2 is any subsequent hop from the peer node to another node or gateway. Level 3 is any third hop required to reach another node or gateway. All will display all hops, regardless of level.
- **Show Exact Hop** – Displays the actual route data packets have taken, through peer nodes, as required to reach their associated gateway.
- **Show Non-Communicating Nodes** – Displays any node that is not communicating successfully with a gateway.
- **Show Wireless Routes** – Displays red lines representing each wireless data hop taking place in the selected network.

Carbon Emissions Summary

The Carbon Emissions Summary provides a snapshot of the carbon footprint for the selected data center. To use these tools, a user with Edit Carbon Emissions Summary permissions, must do the following:

1. Configure PUE (see MapSense User Guide)
2. Complete the Utilities tab of the Data Center Properties dialog of Web Console (see Utility Costs)
3. Set PUE object properties in MapSense (see the MapSense User Guide for more detail)

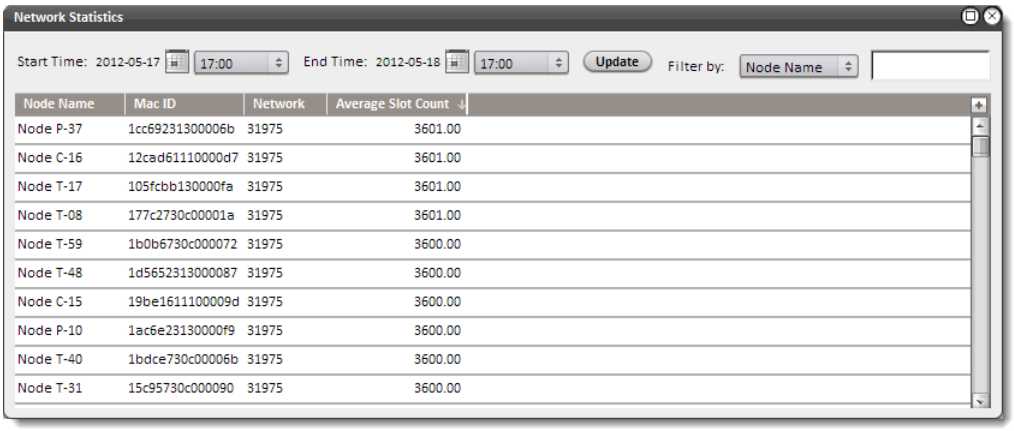
The CO_2 Emissions Summary window contains six sections providing a multi-faceted view of data center energy usage and emissions. Each section is described below.

- **Power Usage Effectiveness (PUE)** – The PUE section of the Emissions Summary illustrates the current and target PUE. The Current PUE slider represents the most recent PUE calculation. The Target PUE can be set to the desired level. A target between 1 and 2 is optimal.
- **Facility Properties** – Displays the facilities properties that are influential in the carbon emissions calculations.

- **Location** is populated with the facility name and address configured in the Data Center Properties dialog.
- **Energy Pricing Method** is drawn from the Utility Costs tab of the Data Center Properties dialog.
- **Facility Capacity** is the maximum power capacity for the facility entered in the Data Center Properties dialog.
- **Current IT Load** is derived from the IT Load for PUE calculation.
- **Target IT Load** is set by the user.
- **CO_2 Emissions Factors** – Displays the emissions footprint and avoided carbon emissions factors derived from the facility location based upon Department of Energy reporting. This item is configured in MapSense for the PUE reporter.
- **Estimated 12 month Energy Usage Summary** – Displays a bar chart illustrating the estimated monthly usage for a 12 month period.
- **Estimated Energy Usage** graph calculates daily energy usage then aggregates these values by month.
- **Estimated Energy Costs** graph applies the cost structure applied on the Utility Costs tab of the Data Center Properties dialog. Energy costs are calculated daily then aggregated for the month values. This enables partial monthly calculations.
- **Estimated CO2 Emissions Summary** – Displays a bar chart illustrating the estimated carbon footprint for the data center for the past 12 months. This is a rolling chart so you always have a picture of a full 12 month period.
- **Estimated Impact to Energy Usage at Target** – These totals are estimates only and may not reflect the actual energy consumed and emissions produced by your data center.

Print these charts or save the data to a CSV file. Right-click to display the context menu and select **Print Chart…** or **Export…**.

Network Statistics



Node Name	Mac ID	Network	Average Slot Count
Node P-37	1cc69231300006b	31975	3601.00
Node C-16	12cad61110000d7	31975	3601.00
Node T-17	105fcbb130000fa	31975	3601.00
Node T-08	177c2730c00001a	31975	3601.00
Node T-59	1b0b6730c000072	31975	3600.00
Node T-48	1d5652313000087	31975	3600.00
Node C-15	19be1611100009d	31975	3600.00
Node P-10	1ac6e23130000f9	31975	3600.00
Node T-40	1bdce730c00006b	31975	3600.00
Node T-31	15c95730c000090	31975	3600.00

Network Statistics is a selection on the Data menu that is used by SynapSense Technical Support for troubleshooting Wireless Sensor Networks. Your SynapSense representative will direct you to this option if it is necessary. Please contact SynapSense Technical Support if you have questions.

Device Maintenance

SynapSense devices are designed to require very little or no maintenance, however, at times, sensors need maintenance, batteries need replacing, or firmware needs updating. This section describes the ways the SynapSense products provide status information.

Detecting Sensors that Need Maintenance

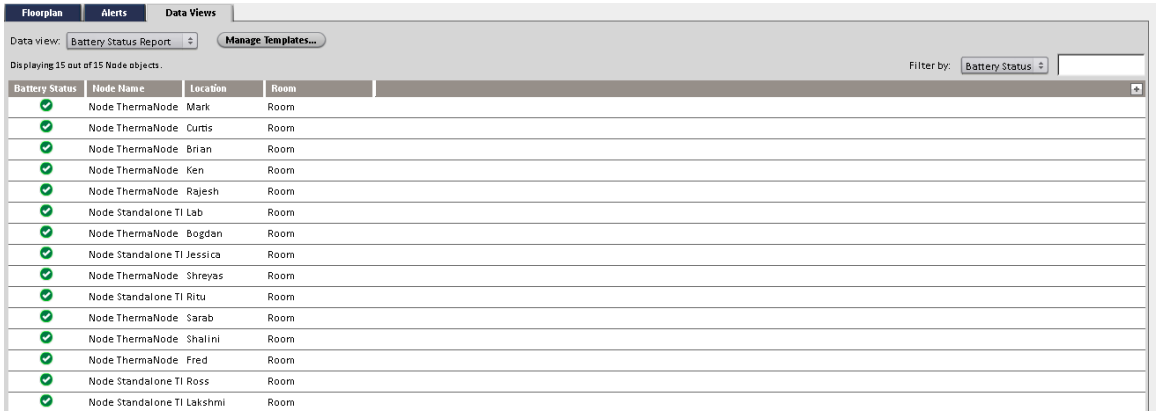
Some external sensors require periodic maintenance in accordance with manufacturer guidelines. This happens very infrequently, however, if this should occur, the application displays a yellow "**X**" in the listing for that sensor. A yellow "**X**" will also display in the center of the real-time gauge for the corresponding sensor.

Notify a Panduit Administrator immediately when a sensor requires maintenance indicated in either location. You can also enable the Sensor Requires Service alert to send notification.

Checking Battery Status

The Battery Status Report lists the battery status for each node in the selected data center or room. The Battery Status field indicates whether batteries need to be changed:

- = OK - The batteries will last for another 1-6 years under normal conditions.
- = Low - The batteries have less than 3 months remaining under normal conditions. Batteries should be changed as soon as possible. Network firmware upgrades, which cause a large drain on the batteries, cannot be started in the "Low" condition.
- = Critical - The batteries may only have a few days of life left. They should be changed immediately.
- = Unknown - The node is disabled or not reporting data.



Note: Battery Status values are approximate and based on the assumption that all of the batteries were new and at full capacity when first installed. To add actual values, use the Set Battery Capacity option in the context menu on the floor plan.

For details about changing batteries, see the SynapSense Cabinet Sensor Hardware Installation Guide.

Firmware Updates

When a firmware update is required for your equipment, Panduit Technical Support will contact you to arrange for the update.

Technical Support

For all technical support issues, contact:

Panduit Technical Support

Severity 1 & 2 Issues:

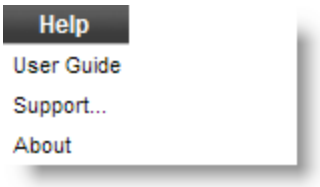
Americas: 1-866-721-5302 x86810 during normal Central Standard Time business hours

EMEA: 44-1291-674-661 x22761 during normal U.K. business hours
APAC: 65-8200-3931 or 65-8200-3932 between 8 a.m. and 5 p.m. local time

Severity 3 & 4 Issues, Email - normal business hours:

systemsupport@panduit.com

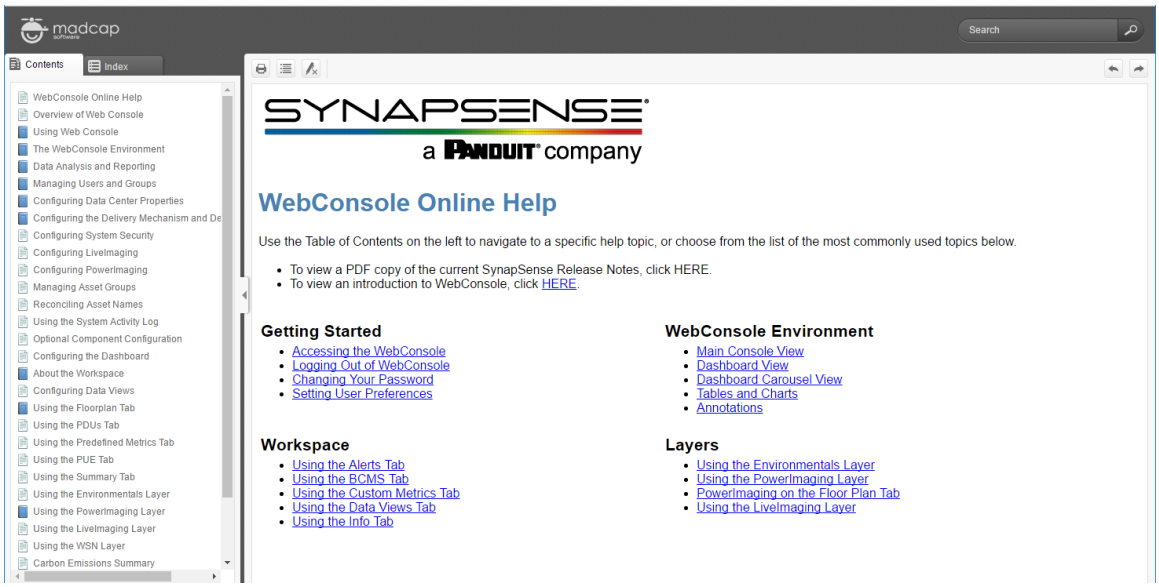
Using the Help Menu



The Web Console Help menu includes links to the user guide, technical support links, and details about the software release installed.

User Guide

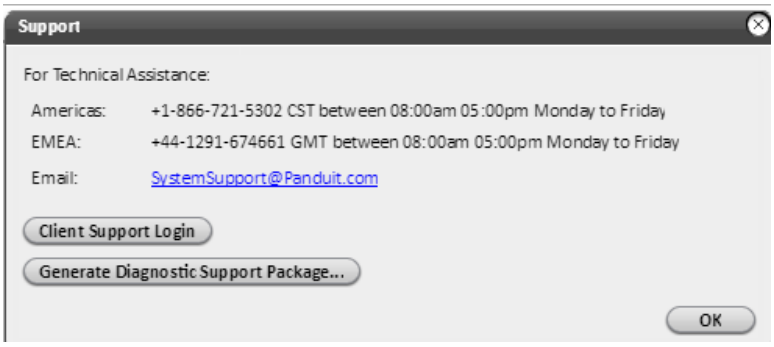
Opens the Web Console Online Help system in a new tab.



Support

The Support dialog provides the following:

1. Contact information for directing questions to the Panduit Technical Support Team.
2. A link to the SynapSense website to consult the Knowledge Base or submit a Help Request.
3. A button that generates a diagnostic support package for use by Panduit Technical Support to help troubleshoot problems. Contact Technical Support for assistance with this step.



About

The About dialog displays the version of the Web Console (and other components, if installed). Clicking **Credits…** displays the Third-Party License Citations file, a list of third-party software used within or for development of the SynapSense solution.


About
SYNAPSENSE
Application Version: 7.0.0.B22-44-g5ac5ff5
Copyright© 2016 SynapSense™ Corporation.
All Rights Reserved.
OK
Credits...