



Sentry Power Manager

Operations Manual



Instructions

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.



Dangerous Voltage

This symbol is intended to alert the user to the presence of un-insulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



Protective Grounding Terminal

This symbol indicates a terminal that must be connected to earth ground prior to making any other connections to the equipment.

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- direct patient care.

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- the customer assumes all such risks, and
- the liability of Server Technology is adequately protected under the circumstances.

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Notices

301-9999-6 Rev. D (011711)

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Chapter 1: Introduction

Welcome to Server Technology's Sentry Power Manager!

Sentry Power Manager (SPM) is an appliance that provides real-time enterprise power management of Cabinet Distribution Units (CDUs) in one or more remote data center locations.

SPM communicates with discovered CDUs in the network and allows you to monitor and manage remote CDUs in all locations from a single console. The SPM interface gives a top-level view of your data center with drill-down to operational details for each device SPM discovers in the network. You can quickly determine the overall status of your enterprise while managing the operating status of individual devices.

Features of Sentry Power Manager:

- Real-time CDU status and notification of alarms reported dynamically (using SNMP traps), to allow monitoring and immediate outlet control over CDU operating conditions such as power, temperature, and humidity.
- Generation of several high accuracy POPS energy usage reports based on individual outlets, devices, named outlet groups/clusters, and the entire data center.
- Server Technology's "clustering" technology that gathers CDUs across individual IP addresses, multiple CDUs, or the entire data center for power monitoring and calculating data center efficiency.
- Availability of custom trend graphs generated with various operating parameters for temperature, humidity, infeed load, and power.
- A custom view of your data center as a hierarchy of several levels – locations, buildings, floors, rooms, and other specific areas you configure. Background images and device icons let you view equipment conditions graphically by status, load, power, and capacity, and provide drill-down from higher levels to detailed operating parameters.

Technical Support



Experience Server Technology's **FREE SMARTER Technical Support** - [Learn more...](#)

Server Technology understands that there are often questions when installing and/or using a new product. Free Technical Support is provided from 6:00 AM to 7:00 PM, Monday-Friday, Pacific Time.

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Chapter 2: Getting Started

For the administrator: The following list summarizes the step-by-step tasks to help you quickly configure Sentry Power Manager (SPM) to build a graphical data center view, user base, and device connections. The configurations allow connection and communication with your current established network.

NOTE: Before you begin, make sure SNMP is How to.

For detailed information on each step, go to the page number listed to the right:

Connect and Login

Connect and login to Sentry Power Manager 8.

Upon connection to SPM, a web browser is directed to the local IP address of the SPM server. You can then login as the default administrative user with username/password: **admnm/admnm**.

Create a New Administrative Account

Create a new administrative user account 51.

For security it is recommended that you first use the default **admnm** user account to grant access rights to another administrative user account. Use the new administrative account to then change the default **admnm** account username/password. Note that the **admnm** account cannot be deleted or demoted.

Discover Network Devices

Configure supported devices for discovery 43.

Device management starts with adding Cabinet Distribution Units (CDUs) to the SPM network inventory. The Discovery feature adds devices in bulk (IP range) or individually (exact IP) by searching for SNMP-enabled CDUs in the network to communicate with SPM.

Configure Device Settings

Locations: Configure locations 39.

Import, configure, and manage default maps and custom images to be displayed on the Views page as the background for location, cabinet, and device icons.

Cabinets: Configure cabinets 45.

Manage cabinets by adding, editing, and deleting; specify cabinet area (in square ft.) for calculation of power density; associate a cabinet with a location (background) image.

CDUs: Configure CDUs 45.

Configure CDUs by naming the CDU, establishing SNMP Get/Set parameters, providing device capacity, deleting CDUs, and associating a CDU with a cabinet/location.

CDUs: OPTIONAL. Configure Environmental Monitor 46.

If an environmental monitor is connected to a CDU, you can edit the environmental monitor name and sensor name(s) and set the high/low thresholds for temperature and humidity.

CDUs: Configure Enclosures 47.

Edit the names of CDU components: enclosures, infeeds, and outlets; also allows configuration of load threshold (in amperes) and low/high power limits (in watts).

Configure User Groups and Grant Device Permissions

Create user groups 53.

Create a new user group and assign the user group to an access rights level (user type), such as administrative, regular user, view-only, or reboot-only.

Assign user group permissions to networked devices 56.

Grant access rights by individual user groups to networked clusters, locations, cabinets, CDUs, and outlets.

Configure New Users


Create a new user and assign to a user group 51.

Create a new user and password. Then assign the new user to a user group which has permissions granted to select network devices.


Build a Graphical Data Center

Select maps and images for Views page 39.

Select default or custom location images as the graphical background to depict customized levels of your data center.

Place a location icon  on a location (background) image 39.

Associate a location icon with a location (background) image and position the icon on the image using the Views page.

Place a cabinet icon  on a location (background) image 42.

Associate a cabinet with a location image and position the icon on the image using the Views page.

Place a CDU icon  on a location (background) image 45.

Associate a CDU with a location image and position the icon on the image using the Views page.

Optional Features

You can configure the following optional features of SPM in any order:

Outlet Groups/Outlet Clusters

Configure outlet groups/outlet clusters 48.

Create outlet groups and/or outlet clusters for remote reboot and power information. Select outlets to associate with the outlet group/cluster.

Light Directory Access Protocol (LDAP)

Configure LDAP parameters 54.

LDAP support with SPM enables authentication with LDAP servers so that user accounts do not need to be added individually to SPM.

Email Notification

Configure email notifications for system activity logs 57.

Send emails to designated users for Discovery, User Login, User Actions, and Alarm Status logs.

Configure Network Settings

Determine network settings 57.

Connect to, and communicate with, your current established network through email, system settings, network settings, and connections for web, telnet, serial, and the SPM database.

Open Database Connectivity (ODBC)

The ODBC is a technology that provides a non-proprietary interface for universal data access. SPM provides one-way external access via ODBC to other systems – data can be retrieved but not updated from an external source. A software key is required for the ODBC feature.

NOTE: To purchase the ODBC option, please contact your Server Technology representative at 1-800-835-1515 (domestic), ++0 (1) 775.284.2000 (international), or sales@servertech.com.

Chapter 3: Using Sentry Power Manager

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System Requirements

For the Web Browser

The web browser requirements for Sentry Power Manager are:

- Internet Explorer 8.0, 7.0, and 6.0 (service pack 1) or Mozilla Firefox 3.5, 3.0, and 2.0.
- Recommended screen resolution: 1440 x 900.
- Minimum screen resolution: 1024 x 768.

Connecting to Sentry Power Manager

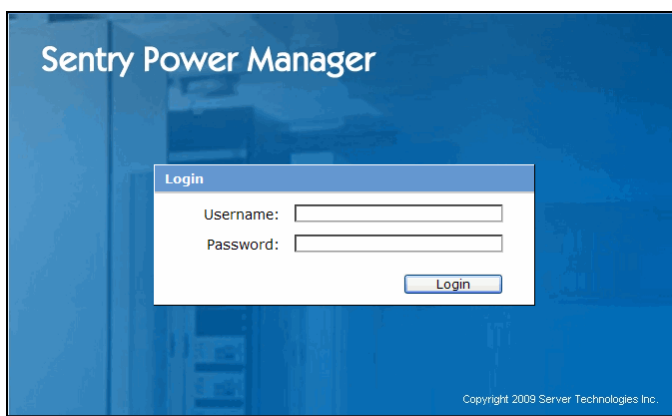
Connecting to SPM requires directing a web browser to the IP address of the Sentry Power Manager server.

Using the Web Connection

Connect to the Sentry Power Manager default IP address at: <http://192.168.1.254>.

SPM Login Page

Connection to SPM displays the following login page:



The username/password for the default administrative account is **admin/admin**.

Working with the Interface

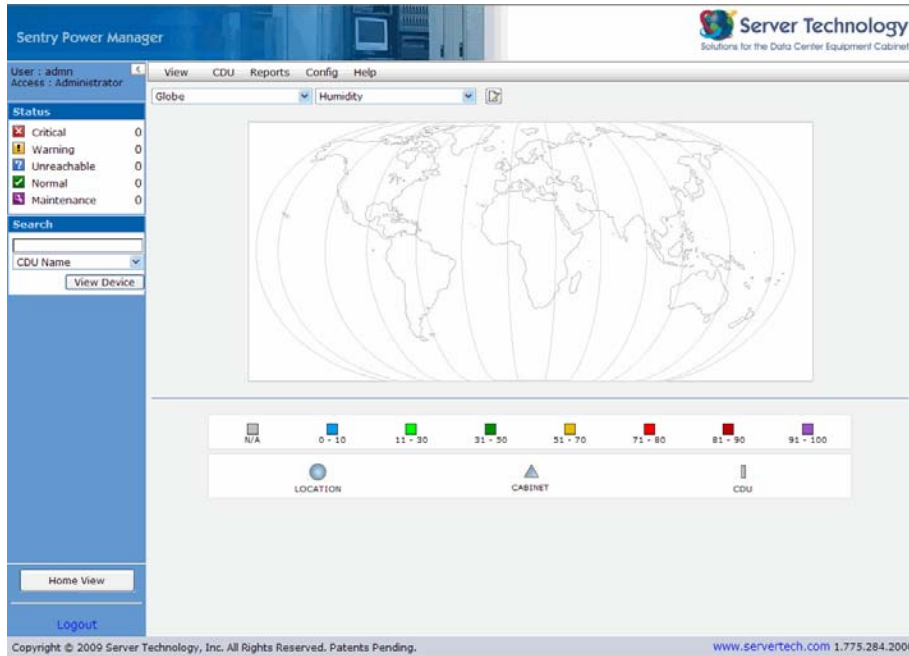
The following sections introduce the pages and features of the Sentry Power Manager (SPM) interface and provide instructions for using enterprise management functions.

Touring the Views Page

Views Menu Option

Option	Description
Views	Provides at-a-glance monitoring of enterprise locations, cabinets, and CDUs using color-coded icons positioned on background (location) images. The Views page displays networked equipment by the vantage points of operating status, load, power, temperature, humidity, or capacity.

The Views page is the graphical overview of your data center that gives point-and-click monitoring of network status and control of discovered devices.



Using Location Images

Maps and other images are the backgrounds on the Views page where you place icons to depict various locations and devices in your data center. Location images represent the customized levels of your data center, such as buildings, floors, and rooms.






The default global map and other default maps are installed with SPM, however, you can import your own graphics files (JPG, PNG, or GIF formats only) to use as custom location images.

NOTE: Administrative user accounts have full access to the View page, including all default and custom location images. However, non-administrative user accounts have limited access to the Views page until granted permissions by the administrator with **Config > Users & Groups > Users** and **Config > Users & Groups > Permissions**.

Acknowledging Alarms and CDU Status

The Status box is the real-time graphical reporting of alarms and status changes occurring in a discovered CDU.

SPM is an SNMP trap destination for the Sentry Switched and Smart CDUs, which allows the units to distribute alarm notifications and status reporting.

Status		
	Critical	1
	Warning	0
	Unreachable	0
	Normal	5
	Maintenance	0

The Status box displays in a fixed size and position in the left pane of the SPM interface. As a CDU communicates its status to SPM, status is reported in one of five categories shown in the Status box. SPM only reports status as received from a discovered CDU. The operating condition of the CDU determines the severity of the status category.

Each status category in the Status box is represented by an icon, the category name, and the total number of CDUs currently reported in the category.

To acknowledge a device reported in the Status box, click the icon for the category. The **CDU > Manage** option opens and displays the operating details of the reported CDU where you can review and manage the current condition of the CDU.

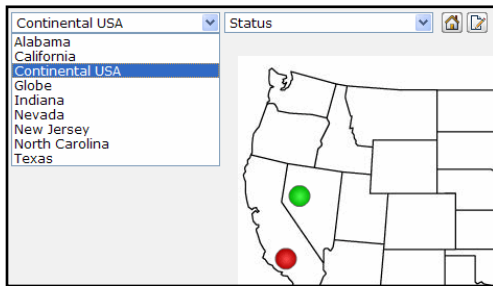
The condition of a CDU is reported in one of five categories:

Status Categories

Status	Description
Critical	CDU has developed a service-affecting condition that requires immediate corrective action.
Warning	Alerts the operator that a CDU is on-battery with a loss of utility power; the outlet may be scheduled to be turned off if not quickly remedied.
Unreachable	SPM cannot communicate with a CDU via the network and the CDU is placed in temporary unreachable status.
Normal	CDU does not show any warning or alarm conditions and is operating normally within thresholds.
Maintenance	CDU remains for the time period specified or until manually removed.

Choosing Location Images for the Data Center

The drop-down list in the upper left of the Views page shows the graphic files installed with SPM (and administrator-enabled), as well as any custom graphic files the administrator added and enabled using **Config > Locations**.



Any graphic files (such as maps or custom images) in the drop-down list are the backgrounds that represent different levels of your data center, such as a building, floor, room, or other specific area.

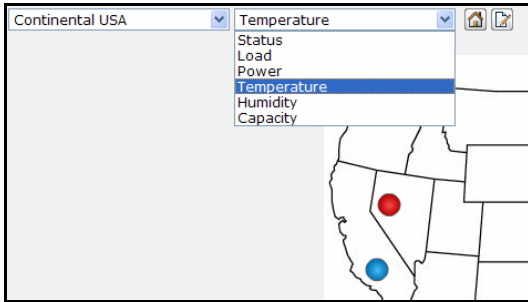
The graphics files display in the drop-down list by the name assigned by the administrator. The file you select from the list provides the working background in the Views page where you place icons representing data center locations, cabinets, and CDUs. Acceptable formats for the graphics files JPG, PNG, and GIF.

In the example above, “Continental USA” was selected as the location image, showing two round location icons that were placed by the administrator to represent a data center location in Nevada (containing a device in Normal **green** status) and a location in California (containing a device in Critical **red** status). The images available in the list are determined by the administrator.

The levels of the data center in location images can range from global maps to detailed images, depending on how the administrator decides to represent the data center network. By selecting a location image from the drop-down list and viewing the graphical status of device icons, you can quickly monitor and/or manage the data center devices available to you based on the level of your user permissions.

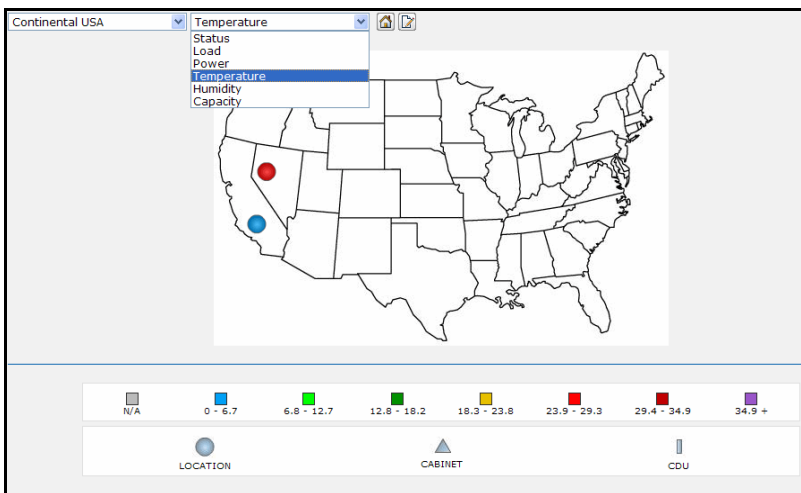
Using Current View to Monitor CDUs

The Current View drop-down list on the Views page provides six different views of a CDU for any location image shown in the list on the left. For example, “Continental USA” is the location image and the current view is “Temperature”:



The six current views are based on data measured and reported by the CDU for current status, load, power, temperature, humidity, and capacity. Although the views are fixed and cannot be configured on the Views page, the views offer a quick way to monitor the operating condition of a CDU.

Each view you select displays its own legend. For example, if you select the “Temperature” view, the temperature value ranges and colors display for each icon on the location image:



Based on the colored location icons and the matching color ranges in the Legend for the Temperature view, you can quickly determine the temperature of a CDU in a specific data center location.

NOTE: Some CDUs do not support all types of data. For example, if temperature data is not available from the CDU to be measured and reported, the icon on the location image will be gray in the legend with the “N/A” label.

The following views provide CDU monitoring:





CDU Current Views

View	Description
Status	Status of the CDU: Critical, Warning, Unreachable, Maintenance, or Normal.
Load	Load of the CDU (in amperes).
Power	Power reporting from the CDU (in watts).
Temperature	Temperature of the CDU (in degrees Celsius).
Humidity	Relative humidity of the CDU (in percentage).
Capacity	Power capacity used by the CDU (in percentage).

Controlling the Page Layout

For the administrator: The following buttons appear in a row at the top of the Views page to control displaying parent location, establishing home location, and moving icons around the location image:

Views Page – Buttons

Button	Description
	Go to the parent of this location. From the displayed location image on the Views page, move up one level in the hierarchy of location images you configured for the data center.
	Edit/move icons. Move location, cabinet, and CDU icons around the displayed location image to position them as desired, and click Save or Cancel .
	Save layout changes. After positioning location, cabinet, and CDU icons on the displayed location image, to save your changes, click Save .
	Cancel layout changes. After positioning location, cabinet, and CDU icons on the displayed location image, to cancel your changes, click Cancel .

Introducing the Legends

A unique legend displays at the bottom of the Views page in response to the current CDU view you selected. Legend colors and ranges are fixed and cannot be configured on the Views page.

As a CDU reports its current operating status or other measurable conditions, the colors of the location, cabinet, and CDU icons change to match the color value ranges in the corresponding legend.

By comparing an icon color to a color range in the legend, you can visually monitor a specific CDU in the data center.

The Legend remains displayed until you select a different option from the Views drop-down list. Legends and color range values for the current CDU view are shown below.

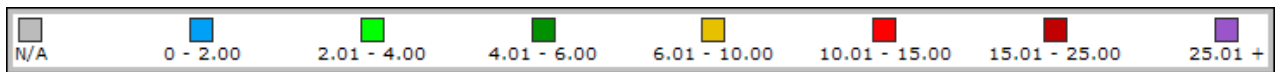
Status

The colors in the Status legend show the current condition (status) of the CDU:



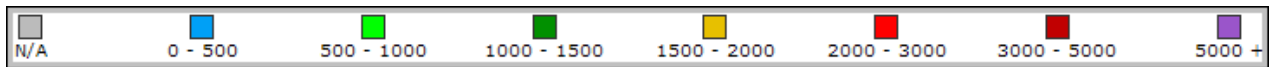
Load

The color range in the Load legend shows the load value used by the CDU (in amperes):



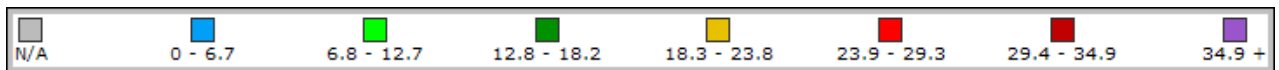
Power

The color range in the Power legend shows the reading of the CDU (in watts):



Temperature

The color range in the Temperature legend shows the temperature of the CDU (in degrees Celsius):



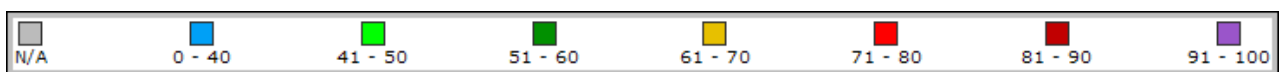
Humidity

The color range in the Humidity legend shows the humidity of the CDU (in percentage):



Capacity

The color range in the Capacity legend shows the power capacity used by the CDU (in percentage):



NOTE: If a current view does not apply to a CDU, for example, humidity, the icon displayed on the Views page will be gray to correspond to the gray "N/A" label on the Humidity legend.

The Icons Legend

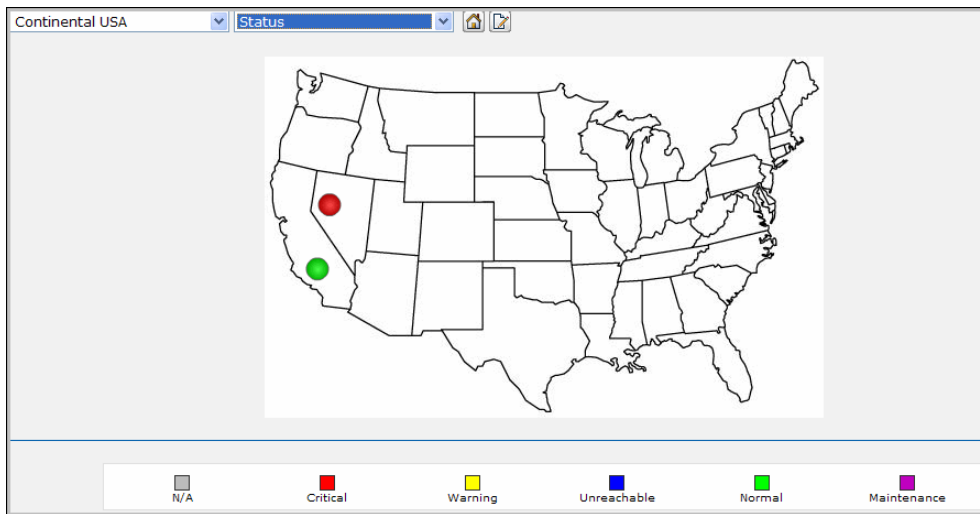
The Icons legend at the bottom of the Views page shows the shapes designated for location, cabinet, and CDU icons.



The icon types are fixed and cannot be configured. To place icons on a location image, use the **Configuration** menu options for Locations, Cabinets, and CDUs.

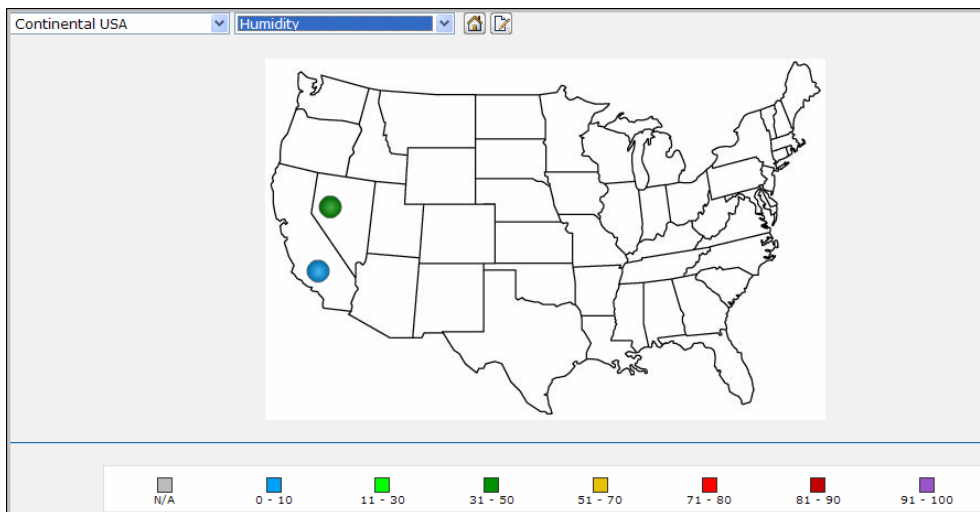
Example of Current Views and Legends

The following example shows the Status view selected from the drop-down menu and the coordinating Status legend displayed at the bottom of the page. The two icons indicate one location in Critical status (**red**) and the other location in Normal status (**green**).



The following example shows the Humidity view selected from the drop-down menu and the coordinating Humidity legend displayed at the bottom of the page.

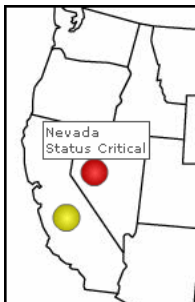
The two icons changed color to represent their humidity condition, reflected in the value ranges in the Legend. One icon is within 31-50 % (**green**) and the other icon is within 0-10 % (**blue**).



The Legend remains displayed until you select a different CDU view from the drop-down list.

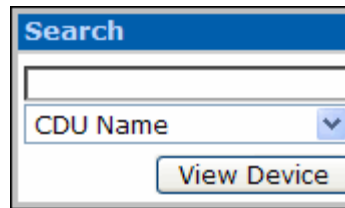
To identify an icon

To quickly view the name and status of an icon, hover the mouse pointer over the icon.



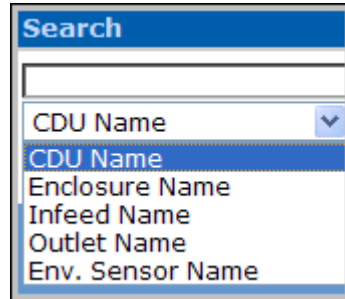
Searching for a CDU

The Search box is available in the left pane to search for a discovered device in the SPM network.

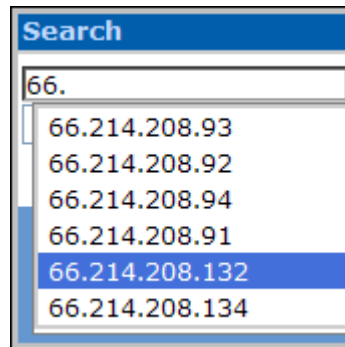


Search is available by IP address, the CDU name (if different than IP address), enclosure, infeed, outlet, or environmental sensor.

To start the search, click the down arrow and select the type of name from the drop-down list, such as CDU Name was selected in this example:



As you start typing the name, a list of matches displays.



Select a name in the list and click **View Device**. The detailed search results are displayed on a device details page. For example, for the CDU 66.214.208.132, you would see:


CDU							
CDU Name:	66.214.208.132	sysLocation:	ts_test				
IP Address:	66.214.208.132	sysContact:	No Contact				
Watts/Unit Area:	0 W/m ²	sysDescription:	Sentry3_511c14				
Total Power:	0 W	Serial Number:	8107188				
Status:	Critical	Version:	Sentry Switched CDU Version 6.0g (090420)				
Max Infeed Load:	0.00 A	Max Infeed Power:	0 W				
Max Temperature:	25.6 C	Max Humidity:	40 %				
Capacity Used:	0.00 %						
Outlets							
Tower	Infeed	Outlet Name	Status	Load	Power	Control State	Control Action
TowerA	TowerA_InfeedA	TowerA_Outlet1	On	N/A	N/A	On	None
TowerA	TowerA_InfeedA	TowerA_Outlet2	On	N/A	N/A	On	None
TowerA	TowerA_InfeedA	TowerA_Outlet3	On	N/A	N/A	On	None
TowerA	TowerA_InfeedA	TowerA_Outlet4	On	N/A	N/A	On	None
TowerA	TowerA_InfeedA	TowerA_Outlet5	On	N/A	N/A	On	None
TowerA	TowerA_InfeedA	TowerA_Outlet6	On	N/A	N/A	On	None
TowerA	TowerA_InfeedA	TowerA_Outlet7	On	N/A	N/A	On	None

NOTE: The default CDU name is IP address. The administrator can change the CDU name by using **Config > CDUs > Configure CDUs**.

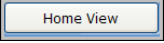
Setting the Home Location

On the Views page, do the following:

1. To set a location image on the Views page as your home location, select the desired location from the Locations drop-down list on the Views page.


2. Click the “Set this location as the home location” button on the Views page .


The displayed image will remain as your home location, even after logging off.

3. To return to the Views page showing the image you set as you home location, click the **Home View** button in the left pane .

Displaying the Left Pane

On the Views page, do one of the following:

To collapse and hide the left pane of the SPM interface, click .

To expand and display the left pane, click .

Building a Network Location


For the administrator: SPM offers location, cabinet, and CDU icons to represent the levels of your data center. You can place icons for each level on location (background) images on the Views page. The way you customize these levels determines the hierarchy of your data center displayed on the Views page.

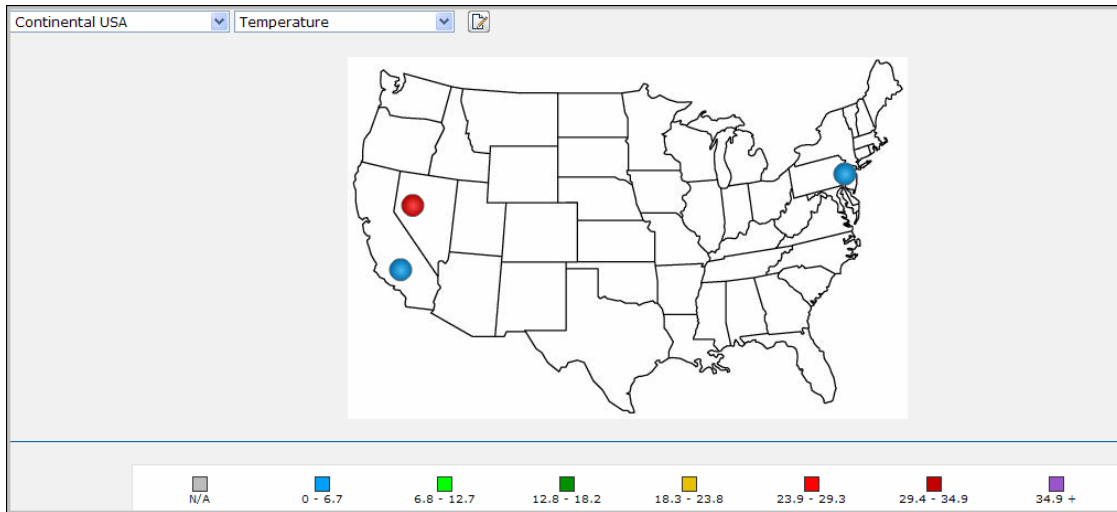
NOTE: The administrator login has full access to all background images and icons that display on the Views page. The administrator must grant each user (or user group) access to individual location, cabinet, and CDU icons using **Config > Users & Groups > Permissions**.

Working with Data Center Levels: Location, Cabinet, CDU

Clicking an icon drills down to a lower data center level to show device operating details.

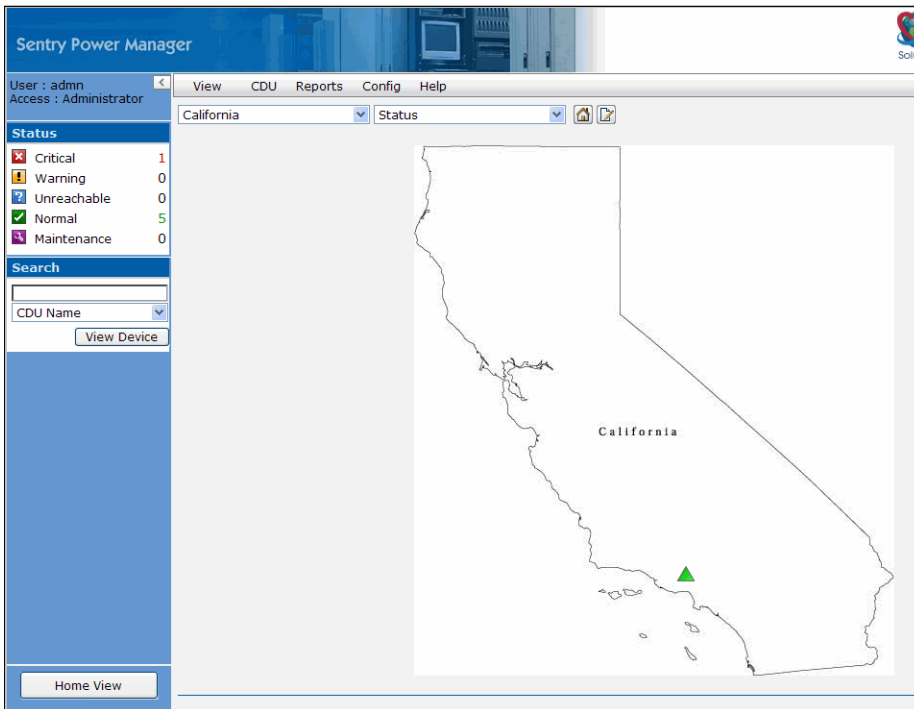
The Location Level

The location icon  on a background image represents a data center location, such as a city, state, place, building, floor, room, or other area specific to your site. The following example shows three location icons placed by the administrator on the image named Continental USA.



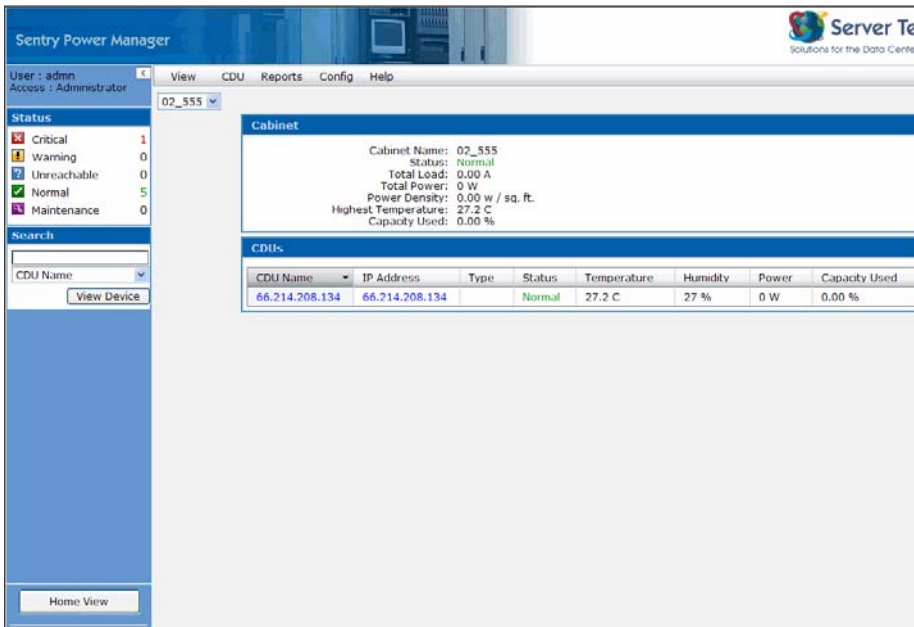
Based on the Temperature view selected and the color ranges in the corresponding Temperature legend, the temperature ranges can be monitored for CDUs in the three locations.

To drill down from the Continental USA background image to the location named “California”, click the California icon to display the California background image:




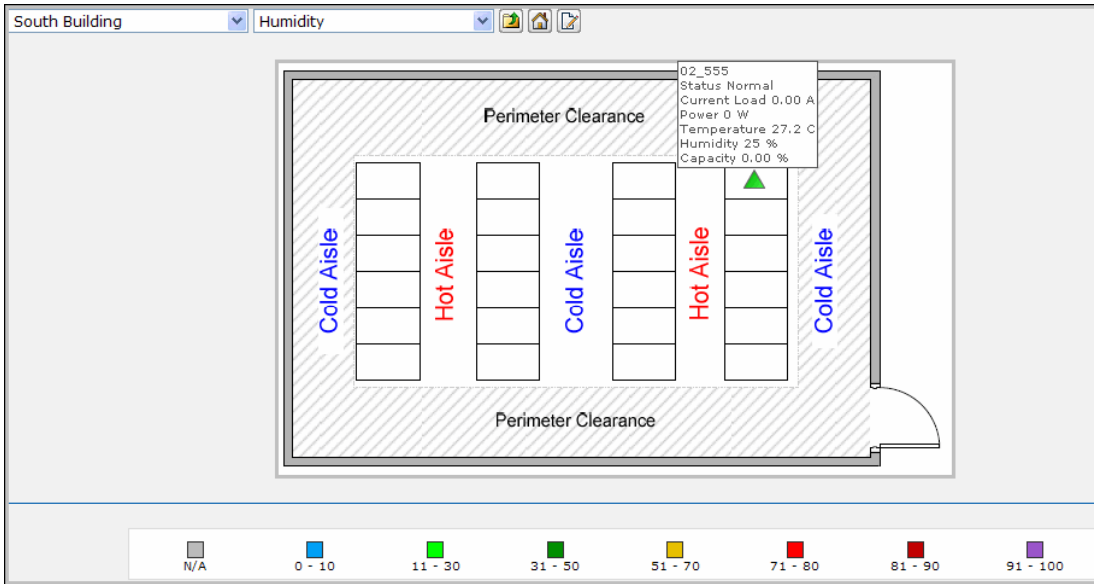
The above example shows the California location has a cabinet in Normal (**green**) status.

Click the cabinet icon to drill down to the cabinet identification and operational details:



The Cabinet Level

The cabinet icon  on a location image represents a specific cabinet in your data center. The following example shows a cabinet icon placed by the administrator on the data center location image named South Building:



The Humidity view shows the cabinet, named 002_555, in Normal (**green**) status. To drill down to the operational details listed for the cabinet, click the cabinet icon. The Cabinet details page displays:

02_555


Cabinet

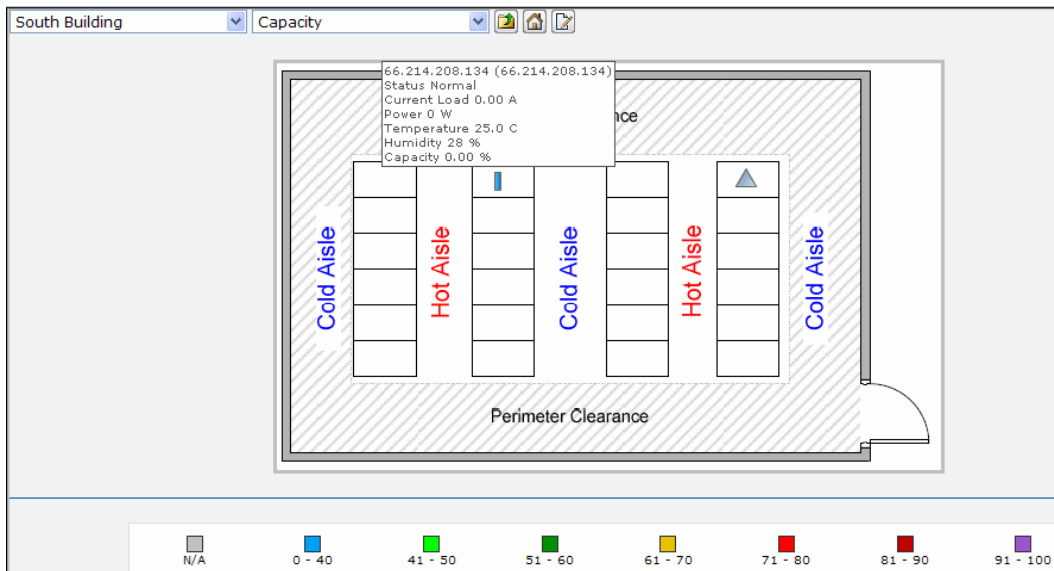
Cabinet Name: 02_555
 Status: Normal
 Total Load: 0.00 A
 Total Power: 0 W
 Power Density: 0.00 w / sq. ft.
 Highest Temperature: 25.0 C
 Capacity Used: 0.00 %

CDUs

CDU Name	IP Address	Type	Status	Temperature	Humidity	Power	Capacity Used
66.214.208.134	66.214.208.134		Normal	25.0 C	28 %	0 W	0.00 %

The CDU Level

The CDU icon  on a background image represents a specific CDU in your data center. The following example shows a CDU named “66.214.208.134” placed by the administrator on the background image named South Building:



The Capacity view shows the CDU, named 66.214.208.134, in the **blue** 0-40 capacity range. Click the CDU icon to drill down to the CDU details page that allows command control for the related outlets.

Tower	Infeed	Outlet Name	Status	Load	Power	Control State	Control Action
WarpDriveA	InputA	TowerA_Outlet1	On	0.00 A	0 W	Wake On	None
WarpDriveA	InputA	TowerA_Outlet2	On	0.00 A	0 W	On	None
WarpDriveA	InputA	TowerA_Outlet3	On	0.00 A	0 W	Wake On	None
WarpDriveA	InputA	TowerA_Outlet4	On	0.00 A	0 W	Wake On	None
WarpDriveA	InputA	TowerA_Outlet5	On	0.00 A	0 W	Wake On	None
WarpDriveA	InputA	TowerA_Outlet6	On	0.00 A	0 W	Wake On	None
WarpDriveA	InputA	TowerA_Outlet7	On	0.00 A	0 W	Wake On	None

The CDU details page displays the latest readings for individual outlet status, load, voltage, power, and control state. The page lets you monitor and control power to individual (or all) outlets.

Outlets are sorted on the page by outlet name under the infeed and enclosure names of the CDU. You can control the outlets by issuing On, Off, and Reboot control commands on specific outlets or globally to all outlets in a CDU. For information about issuing commands, see *CDU > Outlets* on page 23.

Managing Networked CDUs

The following options provide access to operational data for managing and controlling networked CDUs:

CDU Menu Options

Option	Description
Manage	Displays information about CDU status (critical, warning, unreachable, normal, and maintenance) as shown in the Status box, provides access to CDU details, and allows login to the Sentry firmware HTML interface where CDU parameters can be configured.
Infeeds	Displays the latest status, load, voltage, and power for the enclosures (towers) in the CDU; also shows detailed operational parameters for the CDU and infeed details for a specific infeed.
Outlets	Lets you issue outlet On, Off, and Reboot commands; displays the latest status, load, power, and control state for the outlets listed, and also shows detailed operational parameters for the CDU
Environmental Monitors	Lets you view networked environmental monitors by sensor name, temperature/humidity status, and temperature/humidity percentage.
Clusters	Reports total power usage (by cluster) for a CDU and provides operational details of cluster outlets within the CDU.

CDU > Manage

The CDU > Manage option displays information about CDU status (critical, warning, unreachable, normal, and maintenance) as shown in the Status box, provides access to CDU details, and allows login to the Sentry firmware HTML interface where CDU parameters can be configured.

The screenshot shows the Sentry Power Manager web interface. The top navigation bar includes 'View', 'CDU', 'Reports', 'Config', and 'Help'. The left sidebar shows the 'Status' section with a summary of CDU counts: Critical (1), Warning (0), Unreachable (0), Normal (2), and Maintenance (1). The main content area displays a table of reported CDUs. The table has the following columns: Date/Time, Name, IP Address, Reason, Location (Cabinet), NIC Serial Number, and Select. The data rows are as follows:

Date/Time	Name	IP Address	Reason	Location (Cabinet)	NIC Serial Number	Select
2009-05-28 11:26:01	192.168.30.12	192.168.30.12	Critical Alarm	Globe(no cabinet)	8124682	<input type="checkbox"/>
2009-05-28 12:41:50	66.214.208.132	66.214.208.132	System Repair	no location(no cabinet)	8107188	<input type="checkbox"/>
2009-05-28 11:26:01	66.214.208.146	66.214.208.146	Normal	no location(no cabinet)	8137868	<input type="checkbox"/>
2009-05-28 12:00:59	66.214.208.93	66.214.208.93	Normal	no location(no cabinet)	1627382	<input type="checkbox"/>

Each tab represents one of the status categories (also shown in the Status box in the left pane) that contain reported CDUs requiring your attention and management. The number of CDUs in each category shows on the tab. Use the All tab for a quick display of all CDUs in a status category.

Column Descriptions

Column	Description
Date/Time	Date and time the CDU was reported in the status category.
Name	Name of the CDU (user-configured). Provides a link to the CDU > Outlets option for outlet commands.
IP Address	IP address of the CDU. Provides a link to the Sentry firmware interface to configure CDU parameters.
Reason	The <i>first</i> reported reason for the CDU status. For status details, click .
Location(Cabinet)	The parent location of the cabinet or CDU and the cabinet containing the CDU.
NIC Serial Number	The Network Interface Card (NIC) of the CDU.
(Select checkbox)	When checked, allows you to set/remove a CDU from Maintenance Mode.

Using Maintenance Mode

The **CDU > Manage** option controls CDUs in and out of Maintenance Mode.

Date/Time	Name	IP Address	Reason	Location (Cabinet)	NIC Serial Number	Select
2009-07-01 21:03:14	66.214.208.132	66.214.208.132	Critical Alarm	no location(no cabinet)	8107188	<input type="checkbox"/>
2009-07-02 05:58:47	66.214.208.134	66.214.208.134	Normal	California(02_555)	8142016	<input type="checkbox"/>
2009-07-02 07:45:03	66.214.208.91	66.214.208.91	System Repair	no location(no cabinet)	8107189	<input type="checkbox"/>
2009-07-02 07:35:32	66.214.208.92	66.214.208.92	Normal	no location(no cabinet)	8010873	<input checked="" type="checkbox"/>
2009-07-01 21:03:14	66.214.208.93	66.214.208.93	Normal	no location(no cabinet)	1627382	<input type="checkbox"/>
2009-07-01 21:03:14	66.214.208.94	66.214.208.94	Normal	no location(no cabinet)	1608113	<input type="checkbox"/>

Remove
Indefinitely
5 Minutes
15 Minutes
30 Minutes
1 Hour
2 Hours
3 Hours
1 Day
2 Days
3 Days
1 Week
5 Minutes

Set/Remove Maintenance Mode Cancel

To move CDUs to Maintenance:

1. Select **CDU > Manage**.
2. Select the status category tab containing the CDU you want to move to Maintenance.
3. Check the Select checkbox to the right of one or more CDUs.
4. From the drop-down list, select the time period for the CDU(s) to remain in Maintenance Mode from the drop-down list, for example “5 Minutes” as shown above. To keep the CDU in the Maintenance for an unspecified time, select the Indefinitely option.
5. Click **Set/Remove Maintenance Mode**. The CDU(s) move to the Maintenance tab for the time period specified or until manually removed.

To remove CDUs from Maintenance:

1. Select **CDU > Manage**.
2. Select the Maintenance tab.
3. Check the Select checkbox to the right of one or more CDUs in Maintenance.
4. Select the Remove option.
5. Click **Set/Remove Maintenance Mode**. The CDU is removed from the Maintenance tab.

NOTE: When a device is in Maintenance, all SPM communication to and from the device is stopped, notification to the user is stopped, and CDU readings are zero. After Maintenance status is finished, the device moves to Normal status, data for the device is retrieved again, and the actual status of the device will be determined.

CDU > Infeeds

The **CDU > Infeeds** option displays the latest status, load, voltage, and power for the enclosures (towers) in the CDU. Detailed operational parameters for the CDU also display on this page.

CDU					
CDU Name:	66.214.208.91	sysLocation:	test5		
IP Address:	66.214.208.91	sysContact:	No Contact		
Watts/Unit Area:	0 W/m ²	sysDescription:	Sentry3_511c15		
Total Power:	0 W	Serial Number:	8107189		
Status:	Critical	Version:	Sentry Switched CDU Version 6.0g (Demo 1)		
Max Infeed Load:	0.00 A	Max Infeed Power:	0 W		
Max Temperature:	30.5 C	Max Humidity:	31 %		
Capacity Used:	0.00 %				
Infeeds					
Tower	Infeed	Infeed Status	Infeed Load	Infeed Voltage	Infeed Power
cdu20046.a	TowerA_InfeedA	On	0.00 A	220.0 V	0 W
cdu20046.b	TowerB_InfeedA	On	0.00 A	120.0 V	0 W

To connect to the Sentry firmware, click the IP Address of the CDU.

For more information about a specific infeed, click the infeed name to display the Infeed Details page:

Infeed Details	
Infeed Id:	AA
Infeed Name:	TowerA_InfeedA
Infeed Status:	On
Load:	0.00 A
Voltage:	220.0 V
Active Power:	0 W
Apparent Power:	N/A
Crest Factor:	N/A
Power Factor:	N/A

CDU > Outlets

The **CDU > Outlets** option lets you issue outlet On, Off, and Reboot commands. The page displays the latest status, load, power, and control state for the outlets listed, and also shows detailed operational parameters for the CDU.

CDU							
CDU Name:	66.214.208.134	sysLocation:					
IP Address:	66.214.208.134	sysContact:	No Contact				
Watts/Unit Area:	W/m ²	sysDescription:	Sentry3_51a420				
Total Power:	0 W	Serial Number:	8142016				
Status:	Normal	Version:	Sentry Switched CDU Version 6.0h (Demo 1) (090401)				
Max Infeed Load:	0.00 A	Max Infeed Power:	0 W				
Max Temperature:	21.7 C	Max Humidity:	33 %				
Capacity Used:	0.00 %						
Outlets							
Tower	Infeed	Outlet Name	Status	Load	Power	Control State	Control Action
WarpDriveA	InputA	TowerA_Outlet1	On	0.00 A	0 W	On	None ▾
WarpDriveA	InputA	TowerA_Outlet2	On	0.00 A	0 W	On	None ▾
WarpDriveA	InputA	TowerA_Outlet3	On	0.00 A	0 W	On	None ▾
WarpDriveA	InputA	TowerA_Outlet4	On	0.00 A	0 W	On	None ▾
WarpDriveA	InputA	TowerA_Outlet5	On	0.00 A	0 W	On	None ▾
WarpDriveA	InputA	TowerA_Outlet6	On	0.00 A	0 W	On	None ▾

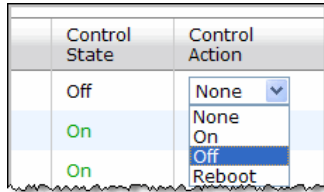
The CDU details page displays the latest readings for individual outlet status, load, voltage, power, and control state. The page lets you monitor and control power to individual (or all) outlets.

Outlets are sorted on the page by outlet name under the infeed and enclosure names of the CDU. You can control the outlets by issuing On, Off, and Reboot control commands on specific outlets or globally to all outlets in a CDU. For information about issuing commands, see *CDU > Outlets* on page 23.

Controlling Individual Outlets

The **CDU > Outlets** option allows you to control specific outlets for a CDU by issuing On, Off, and Reboot commands.

1. Select **CDU > Outlets**.
2. Select a CDU from the drop-down list.
3. For a single outlet (or multiple outlets) in the CDU, select a command from the Control Action drop-down list, as shown:



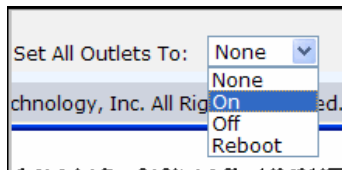
4. Click **Apply Outlet Control**.

NOTE: The level of your user access rights determines the available outlet commands.

Controlling All Outlets

The **CDU > Outlets** option allows you to control all outlets for a CDU by issuing On, Off, and Reboot commands.

1. Select **CDU > Outlets**.
2. Select a CDU from the drop-down list.
3. For all outlets in a CDU, select a command from the Set All Outlets To drop-down list, as shown:



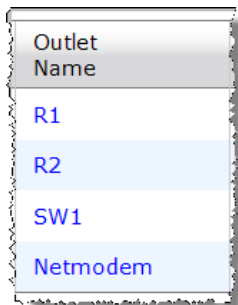
4. Click **Apply Outlet Control**.

NOTE: The level of your user access rights determines the available outlet commands.

Outlet Details

The **CDU > Outlets** option gives access to details about each outlet displayed.

1. Select **CDU > Outlets**.
2. Click an outlet name.



The Outlet Details page displays:

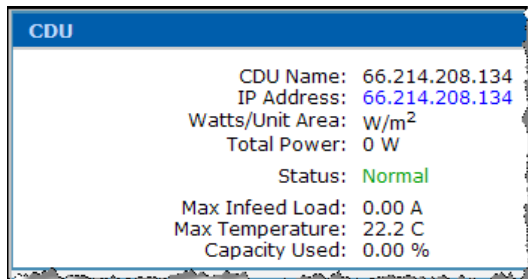
Outlet Details	
Outlet Id:	AA1
Outlet Name:	TowerA_Outlet1
Outlet Status:	On
Control State:	On
Capacity:	20.00 A
Load:	0.00 A
Voltage:	218.2 V
Active Power:	0 W
Apparent Power:	0 VA
Crest Factor:	N/A
Power Factor:	N/A

Accessing the Sentry Firmware

The **CDU > Outlets** option gives access to the Sentry firmware interface where you configure CDU parameters.

NOTE: You must know the local user account login to access the Sentry firmware.

1. Select **CDU > Outlets**.
2. Select a CDU from the drop-down list.
3. Click the IP Address link of the CDU:



The Login page for the Sentry firmware interface displays:



4. Log in using your local user account.
5. Configure CDU parameters as necessary. For more information about the firmware interface, refer to the *Installation and Operations* manual for your Sentry product located at www.servertech.com/support.

CDU > Environmental Monitors

The **CDU > Environmental Monitors** option shows the latest reported temperature, humidity, and sensor data about environmental monitors and sensors associated with a specific CDU. The page also shows detailed operational parameters for the CDU.

66.214.208.93

CDU

CDU Name: 66.214.208.93	sysLocation: Server Technology - Reno
IP Address: 66.214.208.93	sysContact: No Contact
Watts/Unit Area: W/m ²	sysDescription: Sentry3_106af6
Total Power: 0 W	Serial Number: 1627382
Status: Normal	Version: Sentry Version 5.3q (Demo 1)
Max Infeed Load: N/A	Max Infeed Power: N/A
Max Temperature: 25.0 C	Max Humidity: 43 %
Capacity Used: N/A	

Environmental Monitors

Env. Monitor	Sensor Name	Temp Status	Temperature	Humidity Status	Humidity
Environmental_Monitor_A1	Temp_Humid_Sensor_A1	Not Found	N/A	Not Found	N/A
Environmental_Monitor_A1	Temp_Humid_Sensor_A2	Normal	25.0 C	Normal	43 %

The names of the environmental monitors and related sensors display on the page in a list sorted by sensor name under monitor name. Current values for the sensor status, temperature, and relative humidity are reported from the devices.

To monitor the values of another environmental monitor, select a different CDU from the drop-down list.

CDU > Clusters

The **CDU > Clusters** option shows the latest status, load, power, capacity, and control state for the outlets the administrator has associated with a specific cluster. The page also provides the On, Off, and Reboot commands that you can issue on *all* outlets within the cluster.

Outlet Cluster 1

Cluster Based Subtotals By CDU

System Name	System IP Address	Total Power
66.214.208.132	66.214.208.132	N/A
66.214.208.134	66.214.208.134	0 W

Cluster Outlets

System Name	System IP Address	Outlet Name	Status	Load	Power	Capacity	Control State
66.214.208.132	66.214.208.132	TowerA_Outlet1	On	N/A	N/A	N/A	On
66.214.208.134	66.214.208.134	TowerA_Outlet3	On	0.00 A	0 W	15 A	On
66.214.208.132	66.214.208.132	TowerA_Outlet5	On	N/A	N/A	N/A	On
66.214.208.132	66.214.208.132	TowerB_Outlet1	On	N/A	N/A	N/A	On

Set All Outlets To: None
Apply Outlet Control

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www.servertech.com 1.775.284.2000

The page gives links to additional information about outlets and CDU systems:

- To display operational details for an outlet, click **Outlet Name**.
- To display operational details for a CDU, click **System Name**.
- To connect to the Sentry firmware, click **System IP Address**.
- To display a different cluster, select the cluster name from the drop-down list.

About Clusters and Groups

The administrator selects the outlets to be collected under a specific group or cluster at **Config > Clusters**.

An outlet *group* is a collection of outlets in a CDU system (up to two linked enclosures) with a single IP address.

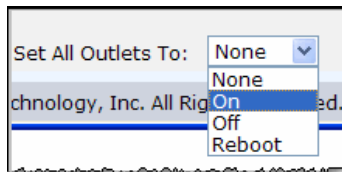
An outlet *cluster* is a collection of outlets across multiple CDU systems with multiple IP addresses.

On the **CDU > Clusters** page, the name in the drop-down list may be a group or cluster, depending on whether the administrator configures a single IP address (group) or configures multiple IP addresses (cluster).

Controlling All Outlets in Groups/Clusters

The **CDU > Clusters** option allows you to control all outlets within an outlet group (or cluster) by issuing On, Off, and Reboot commands.

1. Select **CDU > Clusters**.
2. Select a cluster name from the drop-down list.
3. For all outlets in the cluster, select a command from the Set All Outlets To drop-down list, as shown:



4. Click **Apply Outlet Control**.

NOTE: The level of your user access rights determines the available outlet commands.

Generating Reports and Logs

The Reports menu provides a variety of general data reports, graphical trend reports, and system activity logs. Report formats are HTML, XML, Microsoft Word, or Microsoft Excel. You can view reports and logs online or in print and most logs can be configured for Email alert.

The following options are available on the Reports menu:

Reports Menu Options

Option	Description
General Reports	Generates several hardware-based CDU reports for inventory, voltage, power, and environment; reports are produced by location, cabinet, and combined location/cabinet. <i>For the administrator</i> , POPS reports are also available for energy consumption (by timeframe) and energy utilization (by usage parameters).
Trends	Generates a graphic report on specific variables from CDU readings over a specified time frame as applicable data is available to be reported. Trend report choices are temperature, humidity, infeed/outlet load, infeed/outlet power, power density, and system total power.
Logs	Branches to options for detailed system activity logs: Discovery, User Login, Use Actions, Alarm Status, and Combined (combines all system activity into one report). The logs (with the exception of the Combined log), can be configured for Email alert.

NOTE: To print a report, use the Print function of your browser.

General Reports

The **Reports > Reports** option collects data from CDU readings and generates several general reports for inventory, input voltage, input power, total power, power density, environment, and cluster power. Note that only *available* data from CDU readings for the report type, location, and grouping you select will be reported.

General Reports - Examples

The following example shows an inventory report generated for all locations:

Inventory				
Run by admn at Wed, 08 Jul 09 03:06:52 -0700				
CDU Name	IP Address	Serial Number	Firmware Version	Capacity (W)
66.214.208.132	66.214.208.132	8107188	Sentry Switched CDU Version 6.0g (090420)	0
66.214.208.134	66.214.208.134	8142016	Sentry Switched CDU Version 6.0h (Demo 1) (090401)	0
66.214.208.91	66.214.208.91	8107189	Sentry Switched CDU Version 6.0g (Demo 1)	0
66.214.208.92	66.214.208.92	8010873	Sentry Smart CDU Version 6.0g (Demo 1)	0
66.214.208.93	66.214.208.93	1627382	Sentry Version 5.3g (Demo 1)	0
66.214.208.94	66.214.208.94	1608113	Sentry Version 5.3g (Demo 1)	0

The following example shows a detailed power report for all clusters:

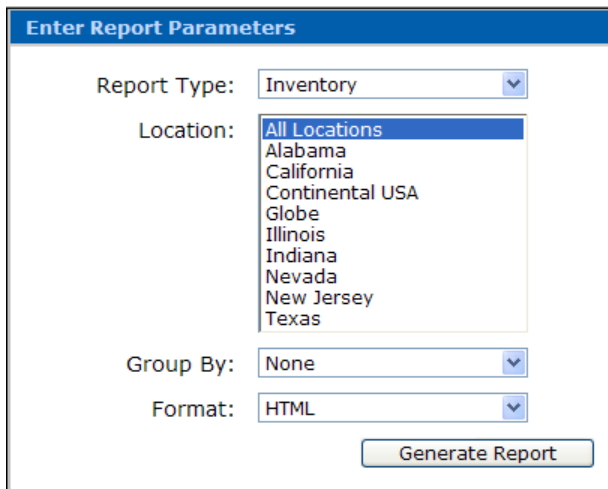
Detailed Power by Cluster			
Run by admn at Wed, 08 Jul 09 03:11:46 -0700			
Cluster	CDU Name	Outlet Name	Total Power (W)
Outlet Cluster 1			
	66.214.208.132(66.214.208.132)	TowerA_Outlet1	N/A
	66.214.208.132(66.214.208.132)	TowerA_Outlet5	N/A
	66.214.208.132(66.214.208.132)	TowerB_Outlet1	N/A
		TowerC_Outlet3	

The following example shows an input voltage report grouped by cabinet:

Input Voltage by Cabinet					
Run by admn at Wed, 08 Jul 09 03:14:29 -0700					
Cabinet	CDU Name	Enclosure Name	V1 (V)	V2 (V)	V3 (V)
02_555					
	66.214.208.134	WarpDriveA	208.0	N/A	N/A
None					
	66.214.208.132	TowerB	120.0	N/A	N/A
	66.214.208.132	TowerA	120.0	N/A	N/A
	66.214.208.91	cdu20046.a	220.0	N/A	N/A
	66.214.208.91	cdu20046.b	120.0	N/A	N/A
	66.214.208.92	TowerB	210.0	N/A	N/A
	66.214.208.92	TowerA	208.0	N/A	N/A
	66.214.208.93	TowerA	N/A	N/A	N/A

Generating a Report:

Depending on the Report Type you choose (for example, Inventory), only the networked CDUs that have measured readings will be reported. The report will be based on the location and grouping you select.



The screenshot shows a dialog box titled "Enter Report Parameters". It contains the following fields:

- Report Type: Inventory
- Location: A list box containing "All Locations", "Alabama", "California", "Continental USA", "Globe", "Illinois", "Indiana", "Nevada", "New Jersey", and "Texas".
- Group By: None
- Format: HTML

A "Generate Report" button is located at the bottom right of the dialog.

To generate a report:

1. Select the type of report (inventory, input voltage, input power, total power, power density, environment, and cluster power) from the Report Type drop-down list.
2. Select the desired location(s) to report on from the Location drop-down list as follows:
 - To select a block of adjacent locations, click the first location in the block, press the **Shift** key, and click the last location in the block.
 - To select non-adjacent locations, click the first location, press the **Ctrl** key, and click each additional location.
3. Select how the report will be grouped (by location, cabinet, location/cabinet, or no grouping) from the Group By drop-down list. Cluster reports cannot be grouped and are reported by selected cluster name(s).
4. Select how the report will be formatted (HTML, XML, Microsoft Word, or Microsoft Excel) from the Format drop-down list.
5. Click **Generate Report** to display the report.
6. To print a report, use the Print function of your browser.

POPS Reports

For the administrator: For networks with Per Outlet Power Sensing (POPS) units, reports are available at the **Reports > Reports** option to show energy value readings for consumption and usage, based on individual outlets, devices, groups/clusters, or the entire data center. For more information about the POPS feature, see www.servertech.com

Two types of POPS reports are available:

- **Energy Consumption:** Produces total energy consumption reports for outlet and infeed billing levels. Reports are available by location, cabinet, CDU, and outlet group/cluster. You can generate a total energy billing report by day, month, or year based on infeed or outlet data for the reporting period.
- **Energy Utilization:** Produces reports from energy value readings to measure and evaluate CDU and group/cluster outlet energy usage and efficiency. Reports are available by location, reading, CDU, group/cluster, and specified timeframe.

POPS Energy Consumption Report – Example

The following POPS example shows energy consumed on the outlet billing level for detailed CDUs at all locations:

Energy For CDUs Detailed On Outlet Readings By Day			
Run by admn at Wed, 08 Jul 09 03:51:06 -0700			
time	Name	Detail	Energy (kWh)
2009 - 06 - 25	66.214.208.134(66.214.208.134)	TowerA_Outlet1	0.000
	66.214.208.134(66.214.208.134)	TowerA_Outlet10	0.000
	66.214.208.134(66.214.208.134)	TowerA_Outlet11	0.000
	66.214.208.134(66.214.208.134)	TowerA_Outlet12	0.000
	66.214.208.134(66.214.208.134)	TowerA_Outlet13	0.000
	66.214.208.134(66.214.208.134)	TowerA_Outlet14	0.000
	66.214.208.134(66.214.208.134)	TowerA_Outlet15	0.000
	66.214.208.134(66.214.208.134)	TowerA_Outlet16	0.000
	66.214.208.134(66.214.208.134)	TowerA_Outlet2	0.000
	66.214.208.134(66.214.208.134)	TowerA_Outlet3	0.000
	66.214.208.134(66.214.208.134)	TowerA_Outlet4	0.000
	66.214.208.134(66.214.208.134)	TowerA_Outlet5	0.000
	66.214.208.134(66.214.208.134)	TowerA_Outlet6	0.000
	66.214.208.134(66.214.208.134)	TowerA_Outlet7	0.000
66.214.208.134(66.214.208.134)	TowerA_Outlet8	0.000	
66.214.208.134(66.214.208.134)	TowerA_Outlet9	0.000	
2009 - 06 - 26	66.214.208.134(66.214.208.134)	TowerA_Outlet1	0.000
	66.214.208.134(66.214.208.134)	TowerA_Outlet10	0.000
	66.214.208.134(66.214.208.134)	TowerA_Outlet11	0.000
	66.214.208.134(66.214.208.134)	TowerA_Outlet12	0.000
	66.214.208.134(66.214.208.134)	TowerA_Outlet13	0.000

NOTE: The detailed CDU report includes the Detail column of outlet names.

POPS Energy Utilization Report – Example

The following POPS example shows low energy used on outlets for all CDU readings:

Energy For CDUs On Outlets With Low Power For All Readings		
Run by admn at Wed, 08 Jul 09 03:58:25 -0700		
CDU	Outlet	Energy Used (kWh)
66.214.208.134(66.214.208.134)	TowerA_Outlet1	0.000
66.214.208.134(66.214.208.134)	TowerA_Outlet10	0.000
66.214.208.134(66.214.208.134)	TowerA_Outlet11	0.000
66.214.208.134(66.214.208.134)	TowerA_Outlet12	0.000
66.214.208.134(66.214.208.134)	TowerA_Outlet13	0.000
66.214.208.134(66.214.208.134)	TowerA_Outlet14	0.000
66.214.208.134(66.214.208.134)	TowerA_Outlet15	0.000
66.214.208.134(66.214.208.134)	TowerA_Outlet16	0.000
66.214.208.134(66.214.208.134)	TowerA_Outlet2	0.000
66.214.208.134(66.214.208.134)	TowerA_Outlet3	0.000
66.214.208.134(66.214.208.134)	TowerA_Outlet4	0.000
66.214.208.134(66.214.208.134)	TowerA_Outlet5	0.000
66.214.208.134(66.214.208.134)	TowerA_Outlet6	0.000
66.214.208.134(66.214.208.134)	TowerA_Outlet7	0.000
66.214.208.134(66.214.208.134)	TowerA_Outlet8	0.000

Generating a POPS Report

From the **Reports > Reports** option, the administrator accesses POPS report options from the Report Type drop-down list. POPS reports options are listed under the categories *Energy Consumed* and *Energy Utilization* as shown:

Enter Report Parameters

Report Type: Low Usage

Subtype: Inventory

Report On: Input Voltage

Location: Input Power

Environment

Cluster Power

Cluster Power Detailed

Energy Consumed

By Day

By Month

By Year

Energy Utilization

No Usage

Low Usage

High Usage

Start Date: 7/1/2009

End Date: 7/8/2009

Format: HTML

Generate Report

NOTE: POPS report options are displayed for administrator login accounts only.

To generate a POPS report:

1. Select the type of POPS report (*Energy Consumed* – by day, month, or year) or *Energy Utilization* (high, low, or no usage) from the Report Type drop-down list. The Report Parameters box displays with parameters specific to the type of POPS report you requested:

Enter Report Parameters

Report Type: High Usage

Subtype: All Readings

Report On: CDU

Location: All Locations

Alabama

California

Continental USA

Globe

Illinois

Indiana

Nebraska

Nebraska

Texas

Start Date:

End Date:

Format: HTML

Filter Report

Reset Close

< July 2009 August 2009 >

Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
28	29	30	1	2	3	4	26	27	28	29	30	31	1
5	6	7	8	9	10	11	2	3	4	5	6	7	8
12	13	14	15	16	17	18	9	10	11	12	13	14	15
19	20	21	22	23	24	25	16	17	18	19	20	21	22
26	27	28	29	30	31		23	24	25	26	27	28	29
							30	31					

2. Select the desired options from the drop-down lists, such as Subtype or Billing Level, Report On, and Location. Multiple locations can be selected from the Location drop-down list as follows:
 - To select a block of adjacent locations, click the first location in the block, press the **Shift** key, and click the last location in the block.
 - To select non-adjacent locations, click the first location, press the **Ctrl** key, and click each additional location.

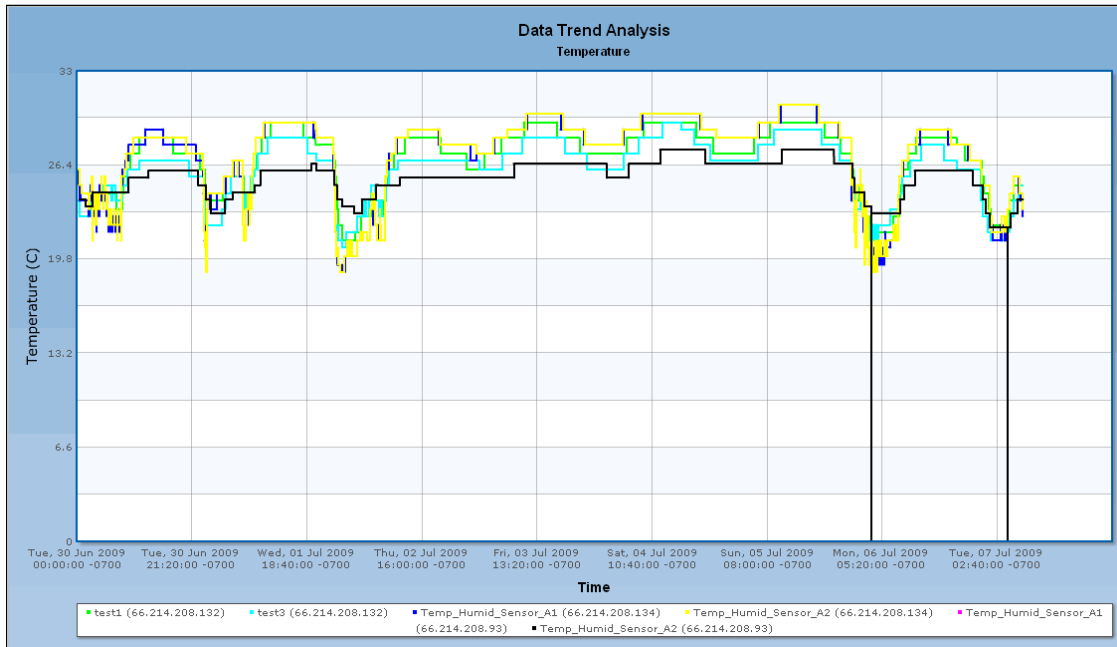
3. Click in the Start Date and End Date fields to select the trend report timeframe from the pop-up calendar.
4. Select how the report will be formatted (HTML, XML, Microsoft Word, or Microsoft Excel) from the Format drop-down list.
5. Click **Generate Report** to display the report.
6. To print a report, use the Print function on your browser.

Trend Reports

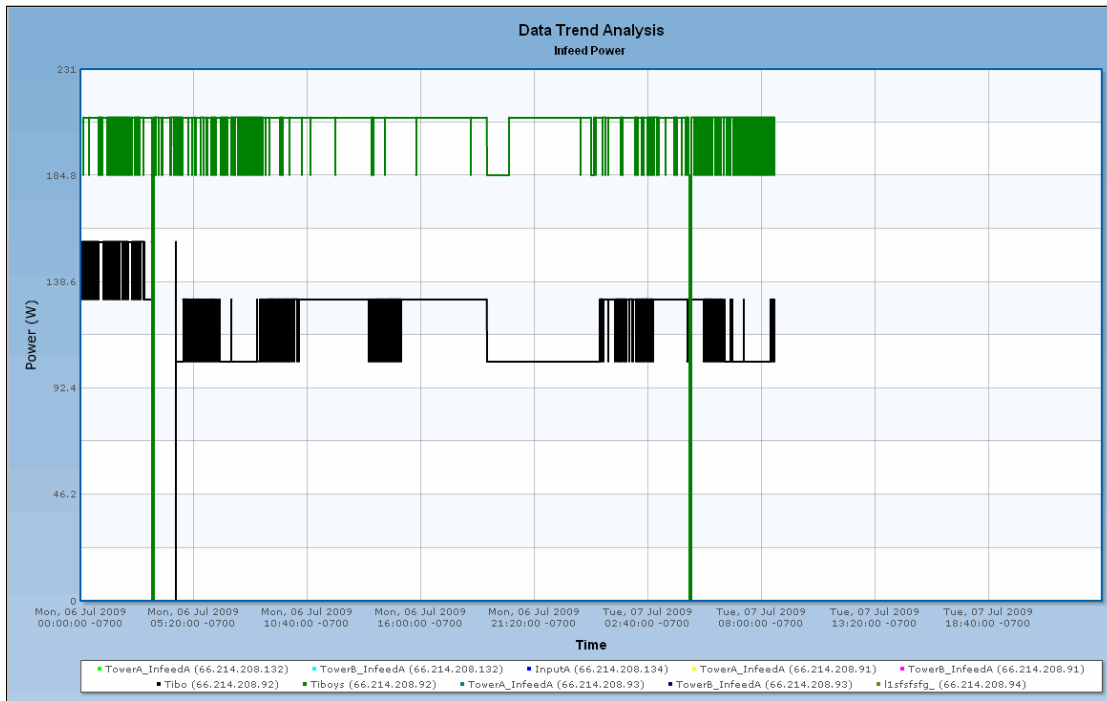
The **Reports > Trends** option uses data collected from CDU readings and converts the data into graphic charts based on the requested time frame. You can generate a trend report for several parameters during a specified time period, however, only *available* data from CDU readings for the designated parameter and time frame you select will be reported.

Trend Report Samples

The following example shows a Trend report generated over a specified time range for the historic reporting of variations in temperature for the selected sensors.



The following example shows a Trend report generated over a specified time range for the historic reporting of variations with infeed power for the selected infeed names.



Generating a Trend Report

Depending on the Trend Type you choose (for example, Temperature), only the networked sensors that have measured readings from the CDU for temperature will be collected and displayed in the Sensors list box, as shown below.

The trend report will be based on the sensors you select.

The 'Enter Trend Parameters' dialog box is shown with the following settings:

- Trend Type:** Temperature
- Sensors:** A list of sensors including Sensor test1 (66.214.208.132), Sensor test3 (66.214.208.132), Sensor Temp_Humid_Sensor_A1 (66.214.208.134), Sensor Temp_Humid_Sensor_A2 (66.214.208.134), Sensor Curry (66.214.208.91), Sensor Pepper (66.214.208.91), Sensor Rack, Sensor Rack, Sensor Temp, and Sensor Temp.
- Start Date:** 6/30/2009
- End Date:** 7/7/2009

A 'Filter Trend' sub-dialog is also visible, showing a calendar for July and August 2009. The calendar highlights the dates from July 30 to August 7, 2009.

To generate a trend report:

1. Select the type of report (temperature, humidity, outlet load, outlet power, infeed load, infeed power, power density, or system total power) from the Trend Type drop-down list.

Based on the Trend Type, the parameters with data readings appear in the related list box.

2. Select parameters from the list box as follows:
 - To select a block of adjacent parameters, click the first item in the block, press and hold down the **Shift** key, and click the last parameter in the block.
 - To select non-adjacent parameters, click the first item, press and hold down the **Ctrl** key, and click each additional parameter.
3. Click in the Start Date and End Date fields to select the trend report timeframe from the pop-up calendar.
4. Click **Generate Trend** to display the graphic trend report.
5. To print a trend report, use the Print function of your browser.

NOTE: The longer the timeframe requested for the trend report, the less detail will be available for reporting. In addition, some parameters you select for the trend report may not have available data as measured by the CDU for the specified timeframe, and those parameters will not be displayed on the trend report.

Logs

The **Reports > Logs** option provides access to specific system activity logs (Discovery, User Login, User Actions, Alarm Status, and Combined). The Combined log shows all SPM system activity combined into a single report.

Discovery Log

The **Reports > Logs > Discovery** option lists the events that occur during the discovery of CDUs in the network by Sentry Power Manager. The most current discovery activity displays first.

User Name	IP Address	Event Time	Description
System		2009-07-07 04:44:42	Device at 66.214.208.145 could not be managed, please check your device settings on the device and in SPM. The SPM server must have access to this device. You will need to either re-add or re-discover this device in order to manage it.
System		2009-07-07 04:44:27	Device at 66.214.208.145 could not be managed, please check your device settings on the device and in SPM. The SPM server must have access to this device. The system will try again later for 1 more time to connect.
System		2009-07-07 04:44:10	Device at 66.214.208.145 could not be managed, please check your device settings on the device and in SPM. The SPM server must have access to this device. The system will try again later for 2 more times to connect.
System		2009-07-07 04:43:56	Device at 66.214.208.145 could not be managed, please check your device settings on the device and in SPM. The SPM server must have access to this device. The system will try again later for 2 more times to connect.

The Discovery log shows the default “System” User Name, IP Address (blank for discovery), Event Time, and a detailed description of the discovery event, such as “Discovery process completed for IP 10.1.2.137 though IP 10.1.2.137”.

Working with the Discovery Log

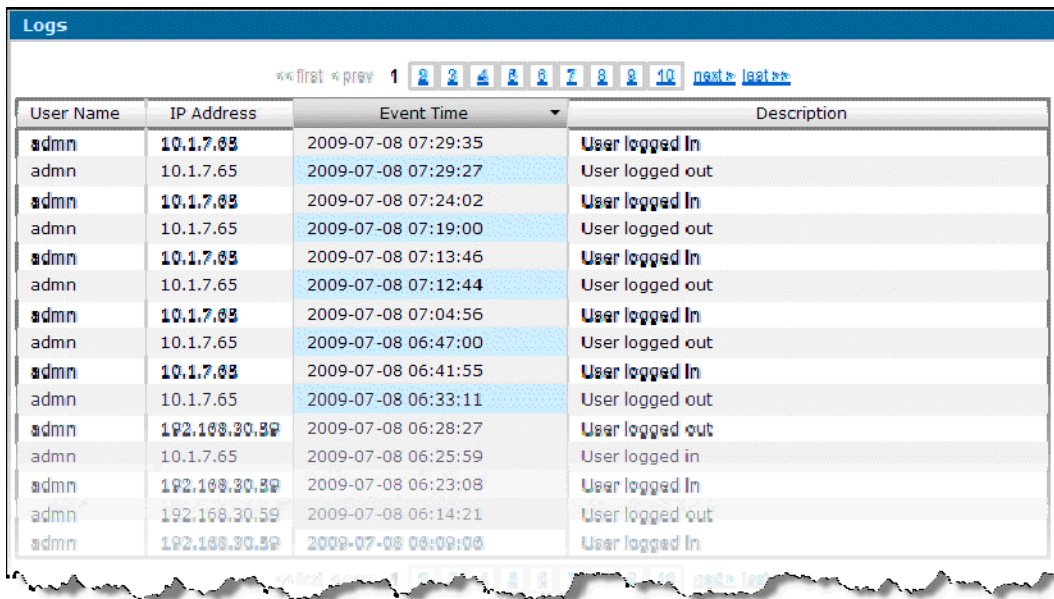
- To change the date range, click Start Date and End Date for a popup calendar.
- To sort the log data by a column heading, click the desired column heading (arranges data in ascending order by the heading), or click again (arranges data in descending order by the heading).
- The Discovery Log is available for delivery by Email alert.
- To print a report, use the Print function on your browser.

Clearing the Log

For the administrator: To delete log data permanently, click **Clear Log**.

User Login

The **Reports > Logs > User Login** option shows all login attempts to SPM. The log is generated by the date range specified, and the most current user login activity displays first.



The screenshot shows a web interface titled "Logs" with a table of user login and logout events. The table has four columns: User Name, IP Address, Event Time, and Description. The events are listed in descending order of time. The interface includes navigation controls at the top, such as "first", "prev", "1", "2", "3", "4", "5", "6", "7", "8", "9", "10", "next", and "last".

User Name	IP Address	Event Time	Description
admn	10.1.7.65	2009-07-08 07:29:35	User logged In
admn	10.1.7.65	2009-07-08 07:29:27	User logged out
admn	10.1.7.65	2009-07-08 07:24:02	User logged In
admn	10.1.7.65	2009-07-08 07:19:00	User logged out
admn	10.1.7.65	2009-07-08 07:13:46	User logged In
admn	10.1.7.65	2009-07-08 07:12:44	User logged out
admn	10.1.7.65	2009-07-08 07:04:56	User logged In
admn	10.1.7.65	2009-07-08 06:47:00	User logged out
admn	10.1.7.65	2009-07-08 06:41:55	User logged In
admn	10.1.7.65	2009-07-08 06:33:11	User logged out
admn	192.168.30.39	2009-07-08 06:28:27	User logged out
admn	10.1.7.65	2009-07-08 06:25:59	User logged in
admn	192.168.30.39	2009-07-08 06:23:08	User logged In
admn	192.168.30.59	2009-07-08 06:14:21	User logged out
admn	192.168.30.39	2009-07-08 06:09:06	User logged In

The User Login displays the user name, user's IP address, time of login attempt, and a Description of user login or logout.

Working with the User Login

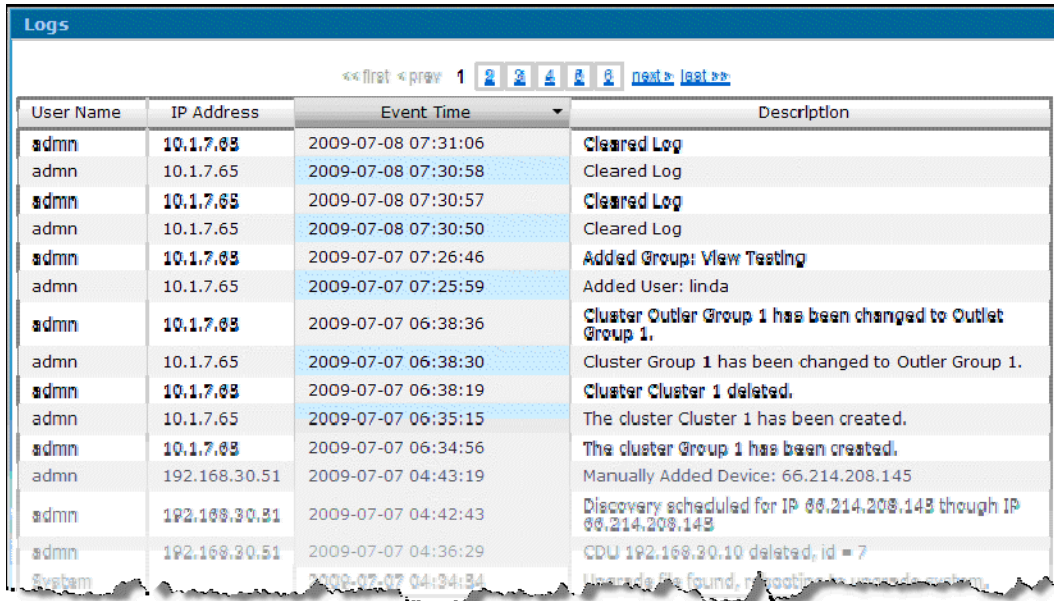
- To change the date range, click Start Date and End Date for a popup calendar.
- To sort the log data by a column heading, click the desired column heading (arranges data in ascending order by the heading), or click again (arranges data in descending order by the heading).
- The User Login is available for delivery by Email alert.
- To print a report, use the Print function on your browser.

Clearing the Log

- *For the administrator:* To delete log data permanently, click **Clear Log**.

User Actions

The **Reports > Logs > User Actions** option displays system activity details by specific username.



User Name	IP Address	Event Time	Description
admin	10.1.7.65	2009-07-08 07:31:06	Cleared Log
admin	10.1.7.65	2009-07-08 07:30:58	Cleared Log
admin	10.1.7.65	2009-07-08 07:30:57	Cleared Log
admin	10.1.7.65	2009-07-08 07:30:50	Cleared Log
admin	10.1.7.65	2009-07-07 07:26:46	Added Group: View Testing
admin	10.1.7.65	2009-07-07 07:25:59	Added User: linda
admin	10.1.7.65	2009-07-07 06:38:36	Cluster Outlier Group 1 has been changed to Outlier Group 1.
admin	10.1.7.65	2009-07-07 06:38:30	Cluster Group 1 has been changed to Outlier Group 1.
admin	10.1.7.65	2009-07-07 06:38:19	Cluster Cluster 1 deleted.
admin	10.1.7.65	2009-07-07 06:35:15	The cluster Cluster 1 has been created.
admin	10.1.7.65	2009-07-07 06:34:56	The cluster Group 1 has been created.
admin	192.168.30.51	2009-07-07 04:43:19	Manually Added Device: 66.214.208.145
admin	192.168.30.21	2009-07-07 04:42:43	Discovery scheduled for IP 66.214.208.145 through IP 66.214.208.145
admin	192.168.30.51	2009-07-07 04:36:29	CDU 192.168.30.10 deleted, id = 7
System		2009-07-07 04:34:34	Upgrade file found, no action was taken.

The most current activity displays first, showing chronological system activity. The User Actions log shows user name, IP address, time of system activity, and a description of the activity.

Working with the User Actions Log

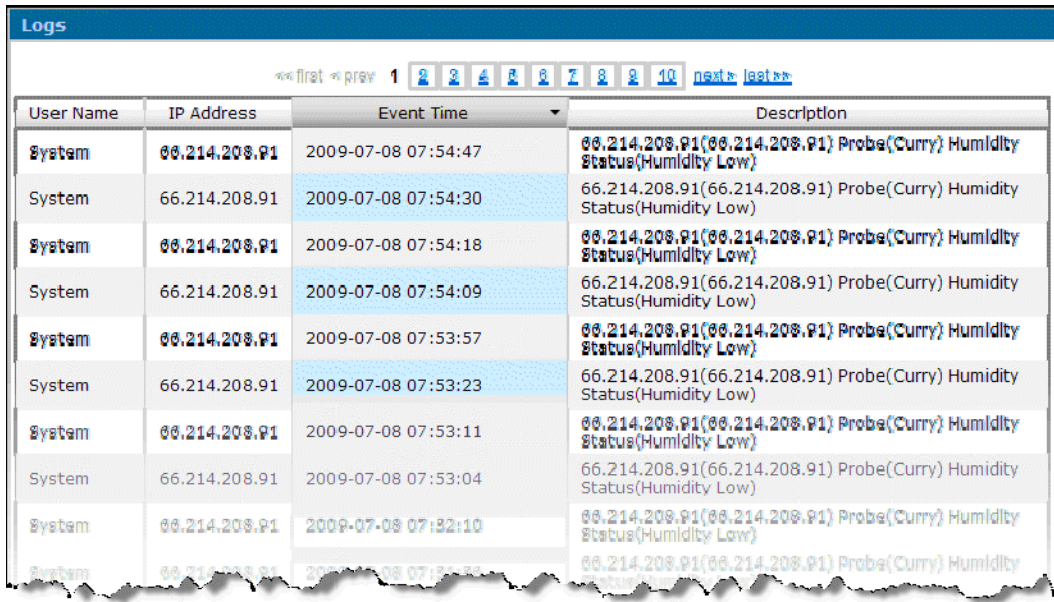
- To change the date range, click Start Date and End Date for a popup calendar.
- To sort the log data by a column heading, click the desired column heading (arranges data in ascending order by the heading), or click again (arranges data in descending order by the heading).
- The User Actions Log is available for delivery by Email alert.
- To print a report, use the Print function on your browser.

Clearing the Log

- *For the administrator:* To delete log data permanently, click **Clear Log**.

Alarm Status

The **Reports > Logs > Alarm Status** option provides system polling details about the changes in operational status of a CDU. The status of a CDU is one of the predetermined categories: Critical, Warning, Unreachable, Normal, and Maintenance. The most current reporting activity displays first.



The screenshot shows a web interface titled "Logs" with a navigation bar at the top containing "first", "prev", "1", "2", "3", "4", "5", "6", "7", "8", "9", "10", "next", and "last". Below the navigation bar is a table with the following columns: "User Name", "IP Address", "Event Time", and "Description". The table contains ten rows of log entries, each representing a humidity low alarm event.

User Name	IP Address	Event Time	Description
System	66.214.208.91	2009-07-08 07:54:47	66.214.208.91(66.214.208.91) Probe(Curry) Humidity Status(Humidity Low)
System	66.214.208.91	2009-07-08 07:54:30	66.214.208.91(66.214.208.91) Probe(Curry) Humidity Status(Humidity Low)
System	66.214.208.91	2009-07-08 07:54:18	66.214.208.91(66.214.208.91) Probe(Curry) Humidity Status(Humidity Low)
System	66.214.208.91	2009-07-08 07:54:09	66.214.208.91(66.214.208.91) Probe(Curry) Humidity Status(Humidity Low)
System	66.214.208.91	2009-07-08 07:53:57	66.214.208.91(66.214.208.91) Probe(Curry) Humidity Status(Humidity Low)
System	66.214.208.91	2009-07-08 07:53:23	66.214.208.91(66.214.208.91) Probe(Curry) Humidity Status(Humidity Low)
System	66.214.208.91	2009-07-08 07:53:11	66.214.208.91(66.214.208.91) Probe(Curry) Humidity Status(Humidity Low)
System	66.214.208.91	2009-07-08 07:53:04	66.214.208.91(66.214.208.91) Probe(Curry) Humidity Status(Humidity Low)
System	66.214.208.91	2009-07-08 07:52:10	66.214.208.91(66.214.208.91) Probe(Curry) Humidity Status(Humidity Low)
System	66.214.208.91	2009-07-08 07:52:00	66.214.208.91(66.214.208.91) Probe(Curry) Humidity Status(Humidity Low)

The Alarm Status log shows user name, IP address of the affected CDU, time of system event, and a description of the status activity.

Working with the Alarm Status Log

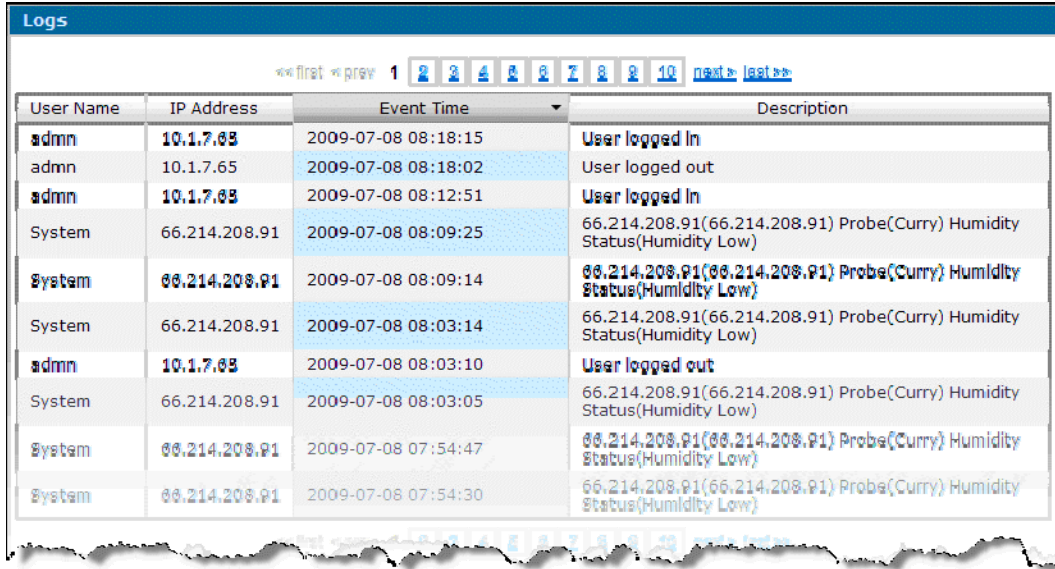
- To change the date range, click Start Date and End Date for a popup calendar.
- To sort the log data by a column heading, click the desired column heading (arranges data in ascending order by the heading), or click again (arranges data in descending order by the heading).
- The Alarm Status Log is available for delivery by Email alert.
- To print a report, use the Print function on your browser.

Clearing the Log

- *For the administrator:* To delete log data permanently, click **Clear Log**.

Combined

The **Reports > Logs > Combined** option is a combination of all system activities as reported by the individual Discovery, User Login, User Actions, and Alarm Status logs.



The screenshot shows a web-based interface for viewing logs. At the top, there is a navigation bar with 'first', 'prev', '1', '2', '3', '4', '5', '6', '7', '8', '9', '10', 'next', and 'last' buttons. Below this is a table with four columns: 'User Name', 'IP Address', 'Event Time', and 'Description'. The table contains several rows of log entries, including user logins and system status reports.

User Name	IP Address	Event Time	Description
admn	10.1.7.65	2009-07-08 08:18:15	User logged In
admn	10.1.7.65	2009-07-08 08:18:02	User logged out
admn	10.1.7.65	2009-07-08 08:12:51	User logged In
System	66.214.208.91	2009-07-08 08:09:25	66.214.208.91(66.214.208.91) Probe(Curry) Humidity Status(Humidity Low)
System	66.214.208.91	2009-07-08 08:09:14	66.214.208.91(66.214.208.91) Probe(Curry) Humidity Status(Humidity Low)
System	66.214.208.91	2009-07-08 08:03:14	66.214.208.91(66.214.208.91) Probe(Curry) Humidity Status(Humidity Low)
admn	10.1.7.65	2009-07-08 08:03:10	User logged out
System	66.214.208.91	2009-07-08 08:03:05	66.214.208.91(66.214.208.91) Probe(Curry) Humidity Status(Humidity Low)
System	66.214.208.91	2009-07-08 07:54:47	66.214.208.91(66.214.208.91) Probe(Curry) Humidity Status(Humidity Low)
System	66.214.208.91	2009-07-08 07:54:30	66.214.208.91(66.214.208.91) Probe(Curry) Humidity Status(Humidity Low)

The Combined log shows User Name, IP address, the time of the recorded system event, and a detailed description of the event. The most current activity displays first.

Working with the Combined Log

- To change the date range, click Start Date and End Date for a popup calendar.
- To sort the log data by a column heading, click the desired column heading (arranges data in ascending order by the heading), or click again (arranges data in descending order by the heading).
- To print a report, use the Print function on your browser

Clearing the Log

- *For the administrator:* To delete log data permanently, click **Clear Log**.

Configuring Sentry Power Manager

For the administrator: The Configuration menu provides the options necessary for configuring the control settings of SPM. The settings configured in SPM specifically for the CDU (names of enclosures, infeeds, and outlets, as well as infeed/outlet load thresholds) are downloaded directly (“pushed down”) from SPM to the CDU.

The following options are available for the administrator on the Config menu:

Config Menu Options

Option	Description
Locations	Configures and manages default and custom location images (used as the background on the Views page) where the administrator places icons for data center locations, cabinets, and CDUs.
Cabinets	Adds, edits, and deletes cabinets; specifies cabinet area (in square ft.) for optional calculation of power density; includes entry of optional actual/theoretical capacities, and associates a cabinet with a location.
CDUs	Branches to options for specific CDU administrative tasks: CDU discovery, configuration of CDU parameters, and the editing of environmental monitors, sensors, temperature/humidity thresholds, enclosures, infeeds, and outlets; associates a CDU with a cabinet/location.
Clusters	Structures the data center by allowing the administrator to select CDU power outlets and place them into a collection of named “groups” or “clusters” for faster administration.
Users & Groups	Allows administration of individual user names and passwords, associates user with a specific user group, and determines user access rights to clusters, locations, cabinets, CDUs, and outlets; and configures LDAP parameters.
Settings	Allows configuration of SPM network access parameters for email alerts, system, network, web, Telnet, serial connection, and connection to the SPM database connection.

NOTE: The administrator login has full access to all background images and icons that display on the Views page. The administrator must grant each user (or user group) access to individual location, cabinet, and CDU icons using **Config > Users & Groups > Permissions**.

Config > Locations

The **Config > Locations** option allows the administrator to configure and manage default and custom (location) images which are displayed on the Views page as the background for location, cabinet, and CDU icons.

Enabled	Name	View	Parent	Actual Capacity (W)	Theoretical Capacity (W)	Delete
<input checked="" type="checkbox"/>	Alabama	View	None	2	2	<input type="checkbox"/>
	California	View	None	0	0	
	Continental USA	View	None	0	0	
<input checked="" type="checkbox"/>	Globe	View	None	0	0	<input type="checkbox"/>
<input checked="" type="checkbox"/>	Illinois	View	None	0	0	<input type="checkbox"/>
	Indiana	View	None	0	0	
<input checked="" type="checkbox"/>	Nevada	View	Continental USA	0	0	<input type="checkbox"/>
<input checked="" type="checkbox"/>	New Jersey	View	None	0	0	<input type="checkbox"/>
	South Building	View	California	0	0	
<input checked="" type="checkbox"/>	Texas	View	None	0	0	<input type="checkbox"/>

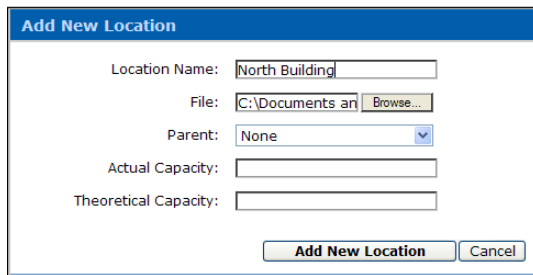
Location images include default maps installed with SPM and any custom images the administrator uploads to SPM.

The administrator configures default and custom images (to provide the working backgrounds displayed on the Views page) and places icons on the images to represent actual data center locations, cabinets, and CDUs.

Acceptable graphic file formats for location images are JPG, PNG, and GIF. The recommended width of the image is less than 800 pixels wide.

Adding a New Location Image

1. Select **Config > Locations**.
2. Click **Add New Location** to display the following box:



3. (Required) Type a **Location Name** for the location image.
4. (Required) Click **Browse** to locate the graphics file for the location image.
5. (Optional) Select a **Parent** location image. Default is None.
6. (Optional) Type a numeric value in the **Actual Capacity** field. Actual Capacity is a user-defined value to show the maximum capacity of the sum of the infeed circuits; for example, $2 \times L630P - 208V * 30A * 2 = 12,480W$.
7. (Optional) Type a numeric value in the **Theoretical Capacity** field. Theoretical Capacity is a user-defined value to show the desired "safety rating" of the sum of the infeed circuits, 20% in this example: $2 \times L630P - 208V * 30A * 2 * .8 = 9,984W$.
8. Click **Add New Location**. The message *Operation Succeeded* displays and the new image is added by name to the drop-down location list on the Views page.

The image is also added to the **Config > Locations** option and shows a checkmark in the Enabled checkbox:



Disabling a Location Image

1. Select **Config > Locations**.
2. Uncheck the Enabled checkbox next to the image name(s) you want to disable and click **Apply Changes**. The disabled image remains in SPM (to be enabled later, if desired) but the image does not appear in the location drop-down list on the Views Page.

Enabling a Location Image

1. Select **Config > Locations**.
2. Check the Enabled checkbox next to the image name(s) you want to enable, and click **Apply Changes**. The enabled image appears in the location drop-down list on the Views Page.

Editing a Location Image Name

1. Select **Config > Locations**.
2. Type over the name of the image(s) in the Name field and click **Apply Changes**. The edited image name appears in the drop-down list on the Views Page.

Viewing a Location Image Thumbnail

1. Select **Config > Locations**.
2. Click the **View** button to the right of an image name to see a thumbnail version.

Deleting a Location Image

1. Select **Config > Locations**.
2. Check the Delete checkbox to the far right of the image name you want to delete and click **Apply Changes**. The image is permanently removed from SPM.

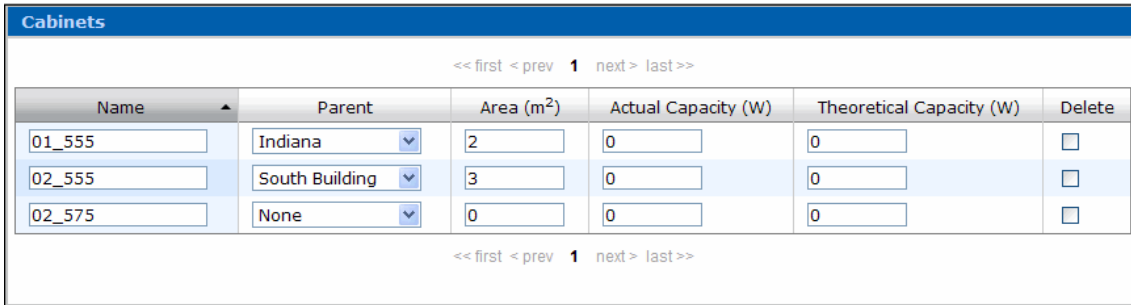
NOTE: Only *empty* background images can be deleted. If a background image contains at least one location, cabinet, or CDU, the Delete checkbox will not display on the **Config > Locations** page.

Changing a Parent Location Image

1. Select **Config > Locations**.
2. For the desired image name, select a different parent location image from the Parent drop-down list.
3. Click **Apply Changes**. The image name is associated with the new parent location image.

Config > Cabinets

The **Config > Cabinets** option allows the administrator to configure and manage data center cabinets.



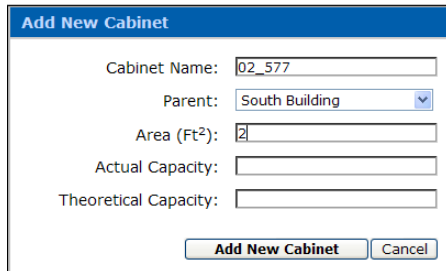
Name	Parent	Area (m ²)	Actual Capacity (W)	Theoretical Capacity (W)	Delete
01_555	Indiana	2	0	0	<input type="checkbox"/>
02_555	South Building	3	0	0	<input type="checkbox"/>
02_575	None	0	0	0	<input type="checkbox"/>

The **Config > Cabinets** option allows the adding, editing, and deleting of cabinets. In addition, cabinets can be associated with parent location images. When a cabinet is added and associated with a location, the cabinet appears as a cabinet icon on the Views page.

The area of the cabinet (for the calculation of total system watts) and capacity planning data for the cabinet (actual capacity/theoretical capacity) are optional values for cabinet configuration.

Adding a New Cabinet

1. Select **Config > Cabinets**.
2. Click **Add New Cabinet** to display the following box:



Add New Cabinet

Cabinet Name:

Parent:

Area (Ft²):

Actual Capacity:

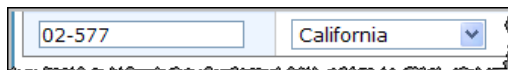
Theoretical Capacity:

3. (Required) In the Cabinet Name field, type a name for the new cabinet.
4. From the Parent drop-down list, select a parent location image to be associated with the cabinet. Default is None.

NOTE: The None option in the Parent drop-down list disassociates the cabinet from all location images (the cabinet does not appear on the Views page) but keeps the cabinet available in SPM.

5. (Optional) In the Area field, type a numeric value (in square ft.). Use whole numbers only – no fractions.
6. (Optional). Type a numeric value in the Actual Capacity field. The Actual Capacity field is a user-defined value to show the maximum capacity of the sum of the infeed circuits; for example, 2 x L630P – 208V * 30A*2 = 12,480W.
7. (Optional). Type a numeric value in the Theoretical Capacity field. The Theoretical Capacity field is a User-defined value to show the desired “safety rating” of the sum of the infeed circuits, 20% in this example: 2 x L630P – 208V*30A*2*.8 = 9,984W.
8. Click **Add New Cabinet**. The message *Operation Succeeded* displays and the new cabinet is added by name to the parent location image on the Views page.

The image is also added to the **Config > Cabinets** page:



Editing a Cabinet

1. Select **Config > Cabinets**.
2. For one or more cabinets, type over the Name, Area, Actual Capacity, and Theoretical Capacity fields, and select a different parent location image from the Parent drop-down list, as desired.

NOTE: The Area field is sq. ft. and must be a whole number.

3. Click **Apply Changes**. The edits to the cabinet(s) are applied throughout SPM.

Deleting a Cabinet

1. Select **Config > Cabinets**.
2. For one or more cabinets shown on the list, check the Delete checkbox.
3. Click **Apply Changes**. The cabinets are removed from SPM.

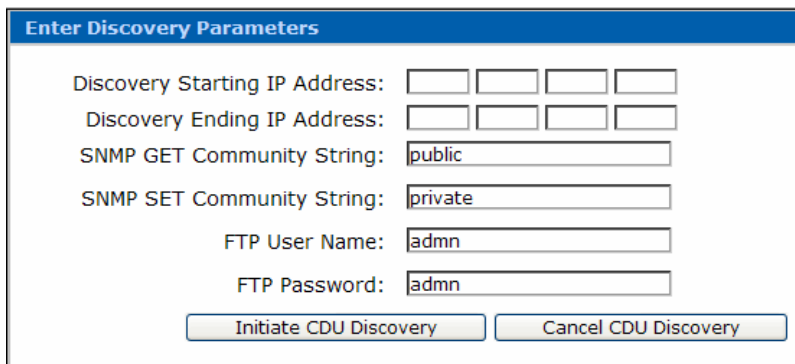
NOTE: Only *empty* cabinets can be deleted. If a cabinet contains one or more CDUs, the Delete checkbox will not display on the **Config > Cabinets** page.

Config > CDUs

The **Config > CDUs** option branches to additional options for CDU administrative tasks: discovery of CDUs, adding and configuring CDUs, and configuring environmental monitors, sensors, enclosures, and outlets.

Discover CDUs

The **Config > CDUs > Discover CDUs** option allows the administrator to define parameters for CDU manual discovery as SPM searches by IP address for SNMP-enabled CDUs. The Discover option also allows editing of SNMP GET/SET community string and FTP login.



The screenshot shows a dialog box titled "Enter Discovery Parameters". It has the following fields and values:

- Discovery Starting IP Address: [][][][]
- Discovery Ending IP Address: [][][][]
- SNMP GET Community String: public
- SNMP SET Community String: private
- FTP User Name: adm
- FTP Password: adm

At the bottom, there are two buttons: "Initiate CDU Discovery" and "Cancel CDU Discovery".

Use the Discovery feature for the initial discovery of CDUs when SPM is installed, and then to discover new CDUs as they are installed in the network.

Discovered CDUs communicate with SPM to report alarms and CDU status changes to assist in the global management of your data center network.

The Discovery feature can discover a single CDU by exact IP address or multiple CDUs in a range of IP addresses.

NOTE: The CDU Discovery is executed immediately upon request and cannot be scheduled.

About the FTP Fields

SPM uses the FTP configuration of the CDU to obtain CDU group information for discovery. Therefore, the FTP User Name and FTP Password fields – which are the valid administrative user name/password for direct access of the CDU through the Sentry firmware interface – are also required fields for SPM discovery.

Discovering a Single CDU

1. Select **Config > CDUs > Discover CDUs**.
2. Type the Discovery Starting IP Address in the field provided. Be sure to type an IP address, not a hostname.
3. In the Discovery Ending IP Address field, type the last node of the starting IP address. For example, if the starting IP address typed was 10.1.1.74, then type “74” in the Discovery Ending IP Address field. The previous nodes are auto-filled. The Discovery feature will search, discover, and connect only the one CDU specifically named 10.1.1.74.
4. Type the SNMP community string from the SNMP settings on the CDU in the network. The community string is used during the discovery process.
5. In the FTP User Name and FTP Password fields, type the valid administrative user name and password used for direct access of the CDU through the Sentry firmware interface. The FTP fields must be different than your administrative login user name/password for SPM.
6. Click **Initiate CDU Discovery** to perform an immediate discovery on the single CDU requested.

Discovering Multiple CDUs

1. Select **Config > CDUs > Discover CDUs**.
2. Type the Discovery Starting IP Address in the box provided. Be sure to type an IP address, not a hostname.
3. In the Discovery Ending IP Address field, type the IP address of the last CDU you want discovered. For example, if the starting IP address typed was 10.1.1.74, and the Discovery Ending IP Address field is 10.1.1.125, the Discovery feature will search, discover, and connect to all valid CDUs in the range between the IP addresses 10.1.1.74 and 10.1.125.
4. Type the SNMP community string from the SNMP settings on the CDU in the network. The community string is used during the discovery process.
5. In the FTP User Name and FTP Password fields, type the valid administrative user name and password you use for direct access of the CDU through the Sentry firmware interface. The FTP fields must be different than your administrative login user name/password for SPM.
6. Click **Initiate CDU Discovery** to perform an immediate discovery on the range of CDUs requested.

Configure CDUs

The **Config > CDUs > Configure CDUs** option allows the administrator to manage individual CDUs in the SPM network and configure detailed operational parameters for the CDU.

CDUs					
<< first < prev 1 next > last >>					
Name	SNMP Get	SNMP Set	Capacity (W)	Cabinet/Location	Delete
66.214.208.132	public	private	0	None	<input type="checkbox"/>
66.214.208.134	public	private	0	South Building	<input type="checkbox"/>
66.214.208.91	public	private	0	None	<input type="checkbox"/>
66.214.208.92	public	private	0	None	<input type="checkbox"/>
66.214.208.93	public	private	0	None	<input type="checkbox"/>
66.214.208.94	public	private	0	None	<input type="checkbox"/>

<< first < prev 1 next > last >>

The Configure CDUs page lists the current settings of discovered CDUs and shows the associated cabinet or location image. The settings on this page are downloaded directly (“pushed down”) from SPM to the CDU.

To Add a CDU

The Add New CDU function allows the administration to add one discovered CDU at a time (by exact IP address) to the SPM device network. The Add New CDU function works the same way as the Discover CDUs function, but only for a single CDU at a time, providing a quick way to add one CDU to the network after bulk discovery.

1. Select **Config > CDUs > Configure CDUs**.
2. Click **Add New CDU** to display the following box:

Add New CDU

IP Address:

SNMP Get:

SNMP Set:

FTP User Name:

FTP Password:

3. Provide the IP Address, SNMP Get/Set parameters, FTP username/password, and click **Add New CDU**.

To Configure CDU Parameters

1. Select **Config > CDUs > Configure CDUs**.
2. For one or more CDUs, edit the CDU Name, SNMP Get/Set parameters, CDU capacity (numeric watts value), and the cabinet/location associated with the CDU.
3. Click **Apply Changes**.

To Delete a CDU

1. Select **Config > CDUs > Configure CDUs**.
2. For one or more CDUs shown in the list, check the Delete checkbox.
3. Click **Apply Changes**. The CDUs are removed from SPM.

Environmental Monitors

The **Config > CDUs > Environmental Monitors** option lets the administrator edit the names of environmental monitors and sensors, and set the sensor high/low thresholds for temperature/humidity.

Environmental Monitors					
Env. Monitor	Sensor Name	Temp Low (C)	Temp High (C)	Humidity Low (%)	Humidity High (%)
Environmental_Monit	Temp_Humid_Sensor	10	30	0	100
Environmental_Monitor_A	Temp_Humid_Sensor	10	30	0	100

High/low sensor *temperature* thresholds are measured in degrees Celsius. High/low sensor *humidity* thresholds are measured in percentage.

To Configure Environmental Monitor Name, Sensor Name, and Sensor Values

1. Select **Config > CDUs > Environment Monitors**.
2. For one or more Environmental Monitors shown on the list, edit the environmental monitor name, sensor name, temperature values, and humidity values as necessary.
3. Click **Apply Changes**.

Enclosures

The **Config > CDUs > Enclosures** option allows the administrator to edit the names of CDU components: enclosures, infeeds, and outlets; also allows configuration of load threshold (in amperes) and low/high power limits (in watts).

66.214.208.91

Enclosures							
Enclosure Name	Infeed Name	Infeed Load (A)	Outlet Index	Outlet Name	Outlet Load (A)	Low Power Limit (W)	High Power Limit (W)
cdu20046.a	TowerA_InfeedA	12	1	Exchange_Server1	N/A	N/A	N/A
		12	2	Jeffer_server	N/A	N/A	N/A
		12	3	StripA_Outlet3	N/A	N/A	N/A
		12	4	Outlet4	N/A	N/A	N/A
		12	5	TowerA_Outlet5	N/A	N/A	N/A
		12	6	TowerA_Outlet6	N/A	N/A	N/A
		12	7	TowerA_Outlet7	N/A	N/A	N/A
		12	8	TowerA_Outlet8	N/A	N/A	N/A
cdu20046.b	TowerB_InfeedA	12	1	TowerB_Outlet1	N/A	N/A	N/A
		12	2	TowerB_Outlet2	N/A	N/A	N/A
		12	3	TowerB_Outlet3	N/A	N/A	N/A
		12	4	TowerB_Outlet4	N/A	N/A	N/A

An enclosure is a Sentry unit (made up of infeeds and outlets) that is part of an overall Sentry CDU. In the example above, the Sentry Switched 66.214.208.91 is made up of the following units:

- A Switched master unit named cdu20046.a, which is the first enclosure with an infeed named TowerA_InfeedA. TowerA_InfeedA has eight related outlets, starting with Exchange_Server1 and so on.
- A Switched extension unit named cdu20046.b, which is the second enclosure with an infeed named TowerB_InfeedA. TowerB_InfeedA has several related outlets, starting with TowerB_Outlet1 and so on.

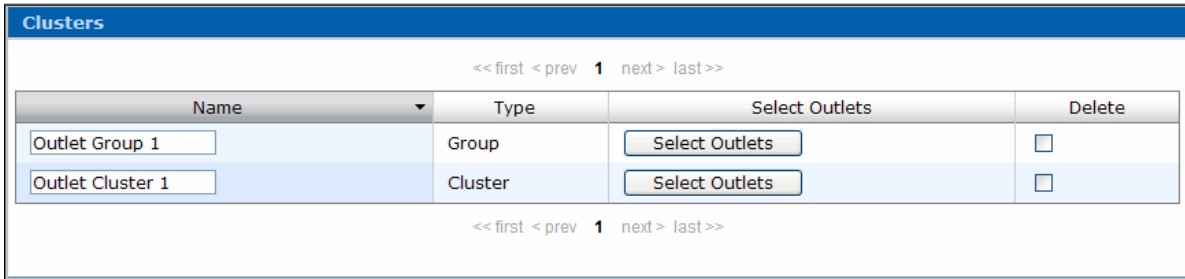
Both the master and extension units (cdu20046.a and cdu20046.b) are two separate enclosures in the single Sentry CDU system named 66.214.208.93.

To Configure Enclosure Settings:

1. Select a CDU from the drop-down list.
2. Edit the names of one or more enclosures, infeeds, and outlets, and change outlet load values (in amperes) and high/low power limits (in watts), as necessary.
3. Click **Apply Changes**.

Config > Clusters

The **Config > Clusters** option allows the administrator to structure the data center for fast control of outlets by configuring collections of CDU power outlets into named clusters (or groups) for remote reboot and power information. Outlets are selected and associated with an outlet cluster (or group).



Name	Type	Select Outlets	Delete
Outlet Group 1	Group	Select Outlets	<input type="checkbox"/>
Outlet Cluster 1	Cluster	Select Outlets	<input type="checkbox"/>

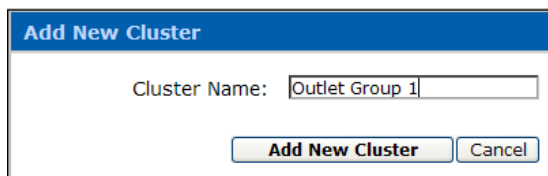
An outlet **group** is a collection of outlets on a CDU system (up to two linked enclosures) with a single IP address.

An outlet **cluster** is a collection of outlets across multiple CDU systems with multiple IP addresses.

NOTE: The Type field is determined by the outlet configuration of the CDU, either “Group” or “Cluster” depending on the configuration of physical outlets in the CDU – either a single IP address (Group), or multiple IP addresses (Cluster).

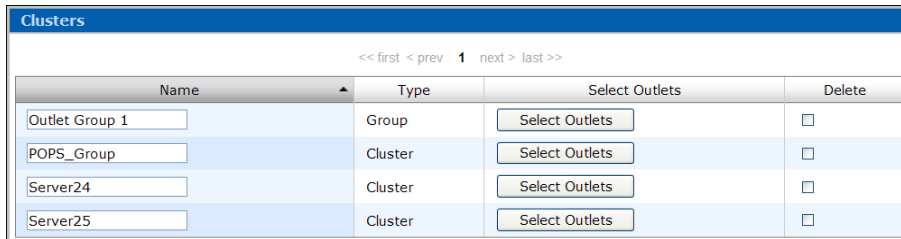
Add a Cluster

1. Select **Config > Clusters**.
2. Click **Add New Cluster** to display the following box:



Cluster Name:

3. Type the new cluster name and click **Add New Cluster**. The Clusters page displays showing the new name:



Name	Type	Select Outlets	Delete
Outlet Group 1	Group	Select Outlets	<input type="checkbox"/>
POPS_Group	Cluster	Select Outlets	<input type="checkbox"/>
Server24	Cluster	Select Outlets	<input type="checkbox"/>
Server25	Cluster	Select Outlets	<input type="checkbox"/>

NOTE: The Type field on the Clusters page is determined by the outlet configuration of the CDU, either “Group” or “Cluster” depending on the configuration of physical outlets in the CDU – either a single IP address (Group), or multiple IP addresses (Cluster).

- For the new name, click **Select Outlets** to display the following box:

Enabled	CDU	Outlet
<input checked="" type="checkbox"/>	10.1.2.130	TowerA_Outlet1
<input checked="" type="checkbox"/>	10.1.2.130	TowerA_Outlet2
<input type="checkbox"/>	10.1.2.130	TowerA_Outlet3
<input type="checkbox"/>	10.1.2.130	TowerA_Outlet4
<input checked="" type="checkbox"/>	10.1.2.130	TowerA_Outlet5
<input type="checkbox"/>	10.1.2.130	TowerA_Outlet6
<input type="checkbox"/>	10.1.2.130	TowerA_Outlet7
<input type="checkbox"/>	10.1.2.130	TowerA_Outlet8
<input type="checkbox"/>	10.1.2.130	TowerA_Outlet9
<input type="checkbox"/>	10.1.2.130	TowerA_Outlet10

- Determine the filter by selecting an option from the Filter By drop-down list in the upper left corner of the box, for example, “CDU”, which provides an additional drop-down list for selecting the desired CDU.

- For the “CDU” option, all outlets in the selected CDU display in the Select Outlets box. Check the Enabled checkbox for each outlet you want to be within the new cluster:

Enabled	CDU	Outlet
<input checked="" type="checkbox"/>	10.1.2.130	TowerA_Outlet1
<input checked="" type="checkbox"/>	10.1.2.130	TowerA_Outlet2
<input type="checkbox"/>	10.1.2.130	TowerA_Outlet3
<input type="checkbox"/>	10.1.2.130	TowerA_Outlet4
<input checked="" type="checkbox"/>	10.1.2.130	TowerA_Outlet5
<input type="checkbox"/>	10.1.2.130	TowerA_Outlet6
<input type="checkbox"/>	10.1.2.130	TowerA_Outlet7
<input type="checkbox"/>	10.1.2.130	TowerA_Outlet8
<input type="checkbox"/>	10.1.2.130	TowerA_Outlet9
<input type="checkbox"/>	10.1.2.130	TowerA_Outlet10

- Click **Apply Changes**. The selected outlets are associated with the new cluster name.

8. Select the **CDU > Clusters** option, and from the displayed window, select the new cluster name from the drop-down list in the upper left corner:

The screenshot shows a web interface window titled 'Outlet Group 1'. It contains two tables. The first table, 'Cluster Based Subtotals By CDU', has columns for System Name, System IP Address, and Total Power. The second table, 'Cluster Outlets', has columns for System Name, System IP Address, Outlet Name, Status, Load, Power, Capacity, and Control State.

Cluster Based Subtotals By CDU		
System Name	System IP Address	Total Power
10.1.2.133	10.1.2.133	N/A

Cluster Outlets							
System Name	System IP Address	Outlet Name	Status	Load	Power	Capacity	Control State
10.1.2.133	10.1.2.133	TowerA_InfeedA_Outlet1	On	0.00 A	N/A	N/A	Idle On
10.1.2.133	10.1.2.133	TowerA_InfeedA_Outlet2	On	0.00 A	N/A	N/A	Idle On
10.1.2.133	10.1.2.133	TowerA_InfeedA_Outlet5	Off	0.00 A	N/A	N/A	Off

The selected outlets for the new cluster are listed, and the window provides the following links:

- To issue On, Off, and Reboot commands for an outlet, click the System Name.
- To access the Sentry firmware login, click the System IP Address.
- To display operating details for an outlet, click the Outlet Name.

Edit a Cluster

1. Select **Config > Clusters**.
2. Type over the group or cluster name in the Name field and click **Apply Changes**. The edited name appears on the drop-down list on the **CDU > Clusters** page, and all outlets are associated with the edited name.

Delete a Cluster

1. Select **Config > Clusters**.
2. Check the Delete checkbox to the right of one or more groups or clusters listed.
3. Click **Apply Changes**. All outlets remain in SPM but are deleted from the cluster name.

Config > Users & Groups

The **Config > Users & Groups** option allows the administrator to configure and maintain the parameters of SPM users and user groups. Multiple SPM users can be logged in concurrently.

User types are the predefined levels of access rights to SPM as granted by the administrator to individual users in named user groups. The following user types are recognized by SPM:

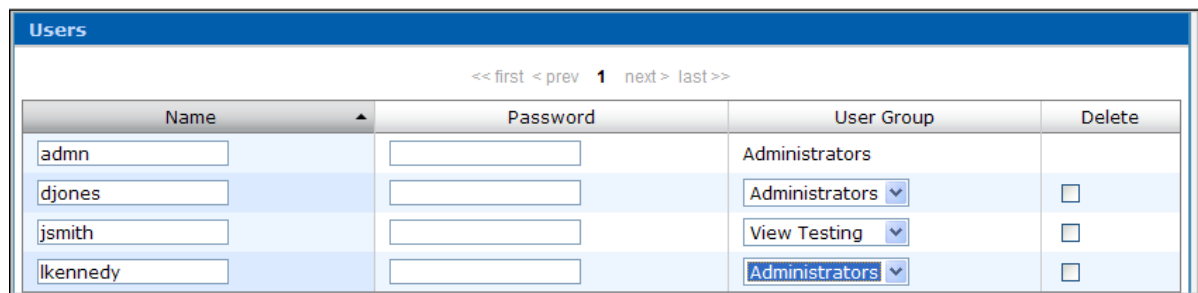
User Types

Type	Description
Admin	Administrative. Full access for all configuration, control (On, Off, Reboot), status, and serial/pass-thru ports. The SPM default administrative user is the adm n user account. (Note there is no "i" in the adm n name/password.) The adm n user may grant full administrative access level rights to other users. See Note below.
Regular User	Partial access for control (On, Off, Reboot), status, and pass-thru of assigned outlets, groups, clusters, and serial/pass-thru ports.
View Only	Partial access for status and pass-thru of assigned outlets, groups, clusters, and serial/pass-thru ports.
Reboot Only	Partial access for control (Reboot), status, and pass-thru of assigned outlets, groups, clusters, and serial/pass-thru ports.

NOTE: For security it is recommended that you first use the default **adm**n user account to grant access rights to another administrative user account. Use the new administrative account to then change the default **adm**n account username/password. Note that the **adm**n account cannot be deleted or demoted.

Configuring Users

The **Config > Users & Groups > Users** option allows maintenance of users, user passwords, and user group assignments.



Name	Password	User Group	Delete
adm		Administrators	
djones		Administrators	<input type="checkbox"/>
jsmith		View Testing	<input type="checkbox"/>
lkennedy		Administrators	<input type="checkbox"/>

To add a new user:

1. Select **Config > Users & Groups > Users**
2. Click **Add New User**.
3. Type the new username, password, password confirmation, and select a user group from the drop-down menu. Password is case-sensitive; strong passwords are supported by SPM but are not required.
4. Click **Add/Change**. The new user is added...

To change a username:

1. Select **Config > Users & Groups > Users**.
2. Type over the user's name in the Name field.
3. Click **Apply Changes**. The user name is changed.

To change a user's password:

1. Select **Config > Users & Groups > Users**
2. Enter the new password in the Password column next to the name of the user. Password is case-sensitive.
3. Click **Apply Changes**. The user's password is changed.

To change a user's group:

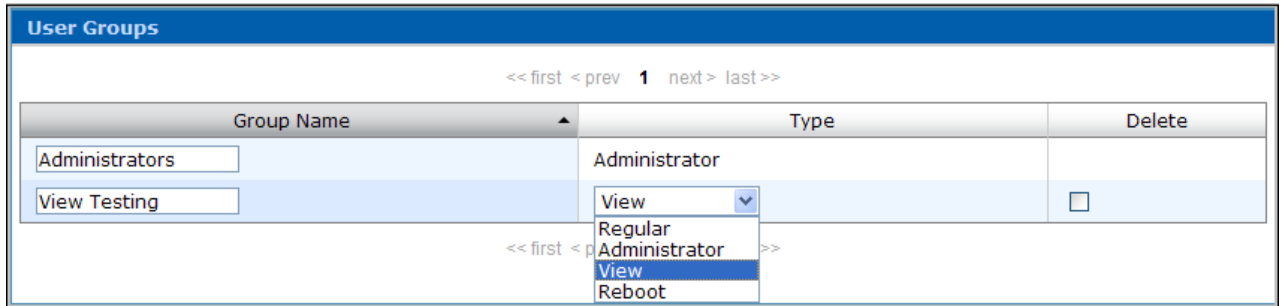
1. Select **Config > Users & Groups >Users**.
2. From the drop-down list next to the user's name, select a different user group.
3. Click **Apply Changes**. The user group association is changed.

To delete a user:

1. Select **Config > Users & Groups > Users**.
2. Check the Delete checkbox next to the user's name you want to delete.
3. Click **Apply Changes**. The user is deleted from SPM.

Configuring User Groups

The **Config > Users & Groups > User Groups** option allows the administrator to assign a user type (Regular, Administrator, View, and Reboot) to named user groups that contain individual SPM users.

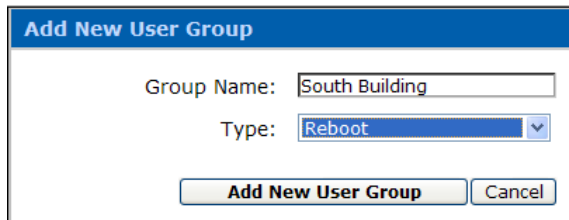


Group Name	Type	Delete
Administrators	Administrator	
View Testing	View	<input type="checkbox"/>

The User Groups page allows maintenance of user group names and the association of user groups to a specific user type. User types are the levels of access rights to SPM. User types are predefined and cannot be changed.

To Add a New User Group:

1. Select **Config > Users & Groups > User Groups**.
2. Click **Add New User Group** to display the following box:



Add New User Group

Group Name:

Type:

3. Type the new user Group Name and select the user Type from the drop-down list.
4. Click **Add New User Group**. The new user group (with the associated user type) is added.

To Change a User Group Name:

1. Select **Config > Users & Groups > User Groups**.
2. Edit the name in the Group Name field.
3. Click **Apply Changes**. The user group name is changed. Note that user *type* is not affected.

To Delete a User Group:

1. Select **Config > Users & Groups > User Groups**.
2. Check the Delete checkbox next to the user group you want to delete.
3. Click **Apply Changes**. The user group is removed from SPM.

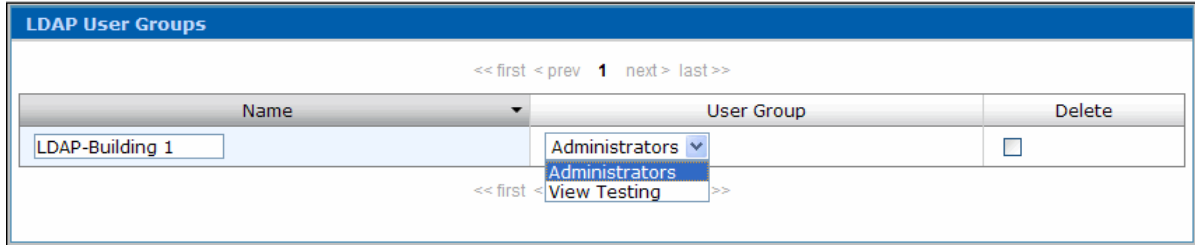
To Change a User Type:

1. Select **Config > Users & Groups > User Groups**.
2. From the Type drop-down list next to the user group name, select a different user type.
3. Click **Apply Changes**. The user group is associated with the new user type.

NOTE: Only *empty* user groups can be deleted. If a user group contains one or more users, the group cannot be deleted until the users are deleted or moved to another user group.

Configuring LDAP

The **Config > Users & Groups > LDAP** option allows the administrator to assign a user type (Regular, Administrator, View, and Reboot) to named LDAP user groups that contain individual SPM LDAP users.



Name	User Group	Delete
LDAP-Building 1	Administrators	<input type="checkbox"/>

The LDAP support enables authentication with LDAP servers so that user accounts do not need to be individually created locally on each Sentry CDU.

SPM administrators can pre-define and configure – in each Sentry product and in the LDAP server – a set of necessary LDAP groups, and access rights for each group.

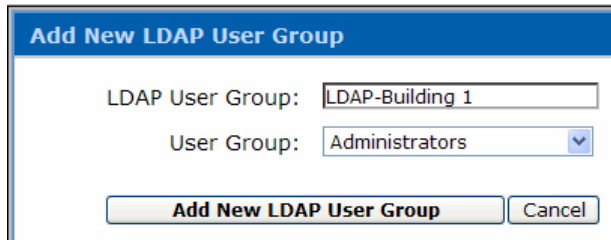
The user's access rights can then be granted or denied simply by making the user a member of one or more pre-defined Sentry LDAP Groups. User accounts can be added, deleted, or changed in the LDAP server without any changes needed on individual Sentry CDUs.

Sentry CDU support for LDAP has been tested in the following environments:

- Microsoft Active Directory (MSAD)
- Novell eDirectory (eDir)

To add a new LDAP user group:

1. Select **Config > Users & Groups > LDAP**.
2. Click **Add New LDAP User Group** to display the following box:



3. Type the new LDAP user group name and select a user group association from the drop-down menu.
4. Click **Add New LDAP User Groups**. The new LDAP user group is added.

To change an LDAP user group name:

1. Select **Config > Users & Groups > LDAP**.
2. Type over the LDAP user group name in the Name field.
3. Click **Apply Changes**. The LDAP user group name is changed.

To delete an LDAP user group:

1. Select **Config > Users & Groups > LDAP**.
2. Check the Delete checkbox next to the LDAP user group name you want to delete.
3. Click **Apply Changes**.

To change an LDAP user group association:

1. Select **Config > Users & Groups > LDAP**.
2. From the User Group drop-down list next to the LDAP name, select a different user group.
3. Click **Apply Changes**. The user group associated with the LDAP group is changed.

To configure LDAP:

1. Select **Config > Users & Groups > LDAP**.
2. Click **Configure LDAP** to display the following box:

Configure LDAP

LDAP: Disabled

Primary Host: 10.1.1.74

Secondary Host: 10.1.1.74

Port: 389

Use TLS/SSL: No

Bind Type: Simple

Search Bind DN:

Search Bind Password:

User Search Base DN:

User Search Filter: (sAMAccountName={

Group Membership Attribute: memberOf

Group Membership Value Type: DN

Authentication Order: Remote->Local

Apply Changes Cancel

3. Select Enabled or Disabled from the LDAP drop-down list.
4. Type the IP addresses (or hostnames) in the Primary and/or Secondary Host fields.
5. Type the server port number in the Port field.
6. Select Yes or No from the Use TLS/SSL drop-down list.

NOTE: If LDAP over TLS/SSL is enabled, MD5 binding is disabled.

7. Select **Simple** or **MD5** from the Bind Type drop-down list.

NOTE: If MD5 binding is enabled, LDAP over TLS/SSL is disabled.

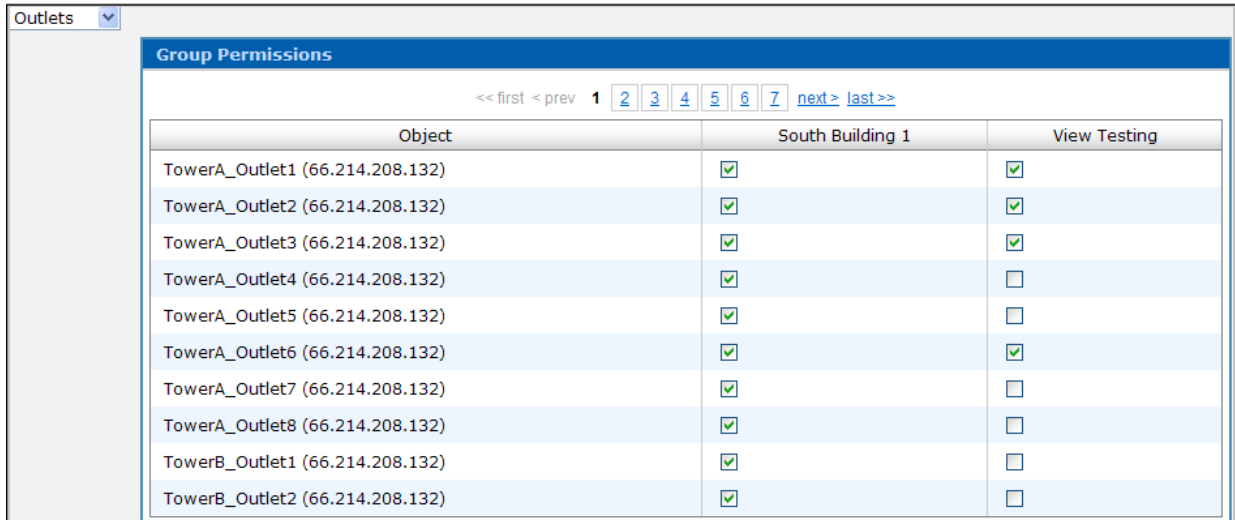
8. Type the fully-qualified distinguished name (FQDN) in the Search Bind DN field.
9. Type the Search Bind Password in the Search Bind Password field.
10. Type the User Search Base DN in the User Search Base DN field.
11. Type the User Search Filter in the User Search Filter field.
12. Type the group membership attribute in the Group Membership Attribute field.
13. Select **DN** or **Name** from the Group Membership Attribute drop-down list.
14. Select **Remote->Local** or **Remote Only** from the drop-down list.

NOTE: Server Technology recommends NOT setting the authentication order to Remote Only until the LDAP has been fully configured and tested.

15. Click **Apply Changes**.

Configuring Permissions

The **Config > Users & Groups > Permissions** option allows the administrator to grant or deny user group permission to locations, clusters, cabinets, CDUs and outlets.



The screenshot shows the 'Group Permissions' page for 'Outlets'. The page has a navigation bar with '<< first < prev 1 2 3 4 5 6 7 next > last >>'. Below the navigation bar is a table with three columns: 'Object', 'South Building 1', and 'View Testing'. The table lists 10 outlets with their IP addresses and permission checkboxes.

Object	South Building 1	View Testing
TowerA_Outlet1 (66.214.208.132)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TowerA_Outlet2 (66.214.208.132)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TowerA_Outlet3 (66.214.208.132)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TowerA_Outlet4 (66.214.208.132)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TowerA_Outlet5 (66.214.208.132)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TowerA_Outlet6 (66.214.208.132)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TowerA_Outlet7 (66.214.208.132)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TowerA_Outlet8 (66.214.208.132)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TowerB_Outlet1 (66.214.208.132)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TowerB_Outlet2 (66.214.208.132)	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The Group Permissions page shows a column for each user group and a row for each object currently selected. The administrator grants or denies permission by user group only, not by individual user.

To grant or deny user group permissions to SPM devices

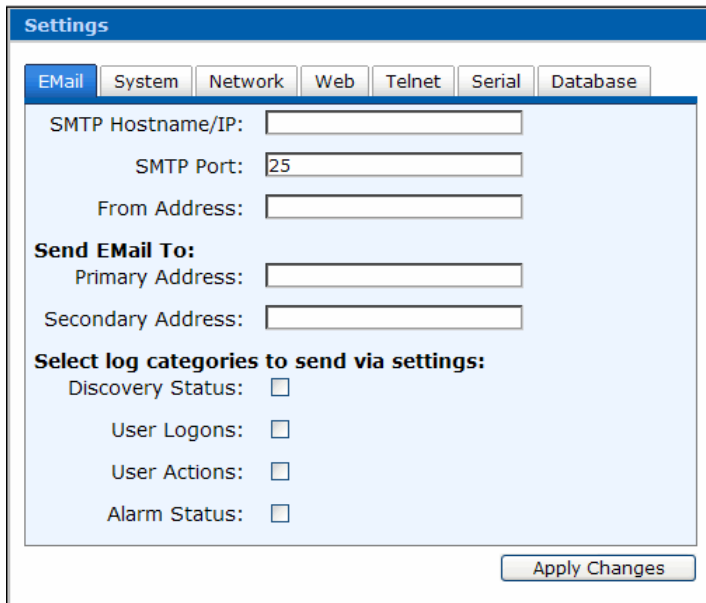
1. Select **Config > Users & Groups > Permissions**.
2. Select an item in the SPM network from the drop-down list, such as Outlets. SPM outlet names display in the Object field.
3. Check (to grant) or uncheck (to deny) the checkboxes under specific user group names for each object listed.
4. Click **Apply Changes**. User group permissions are updated.

Config > Settings

The **Config > Settings** option allows the administrator to set up SPM as an appliance, eliminating the need to configure these settings through the operating system. Standard default port numbers are provided or designated port numbers within the network firewall can be used.

Email

The Email option configures the email delivery of requested SPM system activity logs to a primary and/or secondary email address.



The screenshot shows the 'Settings' window with the 'Email' tab selected. The fields are as follows:

- SMTP Hostname/IP: []
- SMTP Port: [25]
- From Address: []
- Send Email To:**
 - Primary Address: []
 - Secondary Address: []
- Select log categories to send via settings:**
 - Discovery Status:
 - User Logons:
 - User Actions:
 - Alarm Status:

An 'Apply Changes' button is located at the bottom right of the form.

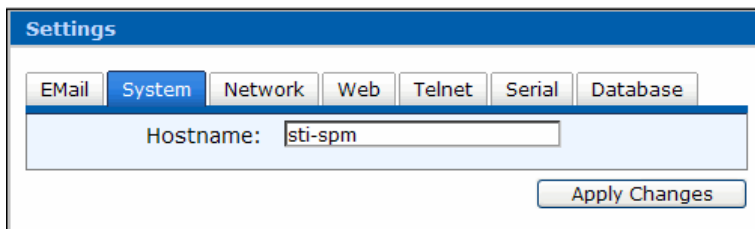
As system activity occurs, requested logs can be emailed to the configured email addresses. You can provide primary, secondary, or both recipient addresses. The primary and secondary addresses receive the same activity log alerts at the same time.

To configure email delivery:

1. Select **Config > Settings**.
2. Select the Email tab.
3. Provide the hostname/IP, port number, and from email address
4. In the Send Email To fields, type the primary and/or secondary email address.
5. Check the logs to be delivered. Both primary and secondary email recipients receive the same logs.
6. Click **Apply Changes**.

System

The System option configures the SPM hostname.



The screenshot shows the 'Settings' window with the 'System' tab selected. The field is as follows:

- Hostname: [sti-spm]

An 'Apply Changes' button is located at the bottom right of the form.

To configure SPM hostname:

1. Select **Config > Settings**.
2. Select the System tab.
3. Provide the SPM hostname/IP address.
4. Click **Apply Changes**.

Network

The Network option specifies the primary and secondary ports for accessing SPM remotely.

To configure the SPM network port:

1. Select **Config > Settings**.
2. Select the Network tab.
3. Select System Port or Device port and complete the fields, as described below.
4. Click **Apply Changes**.

The **System Port** option is the primary port for SPM. It is recommended that you select the default option that names the IP address, subnet mask, and gateway instead of selecting the option for automatic IP address used for DHCP.

The screenshot shows the 'Settings' window with the 'Network' tab selected. Under the 'System Port' section, the radio button 'Use the following IP Address' is selected. The fields are filled with: IP Address: 192.168.30.60, Subnet Mask: 255.255.255.0, and Gateway: 192.168.30.1. An 'Apply Changes' button is at the bottom right.

The **Device Port** option is the secondary port for SPM.

The screenshot shows the 'Settings' window with the 'Network' tab selected. Under the 'Device Port' section, the radio button 'Obtain an IP Address Automatically' is selected. The 'IP Address' and 'Subnet Mask' fields are empty. An 'Apply Changes' button is at the bottom right.

Web

The Web option specifies the web port for SPM.

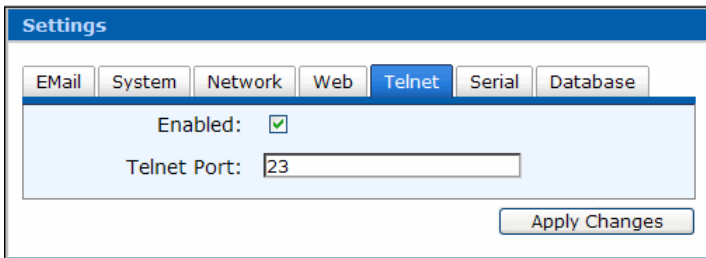
The screenshot shows the 'Settings' window with the 'Web' tab selected. The 'Web Port' field is set to 80. An 'Apply Changes' button is at the bottom right.

To configure SPM web port:

1. Select **Config > Settings**.
2. Select the Web tab.
3. Change the standard web port “80” to a port number within your network firewall.
4. Click **Apply Changes**.

Telnet

This option enables or disables Telnet and configures the standard Telnet port.



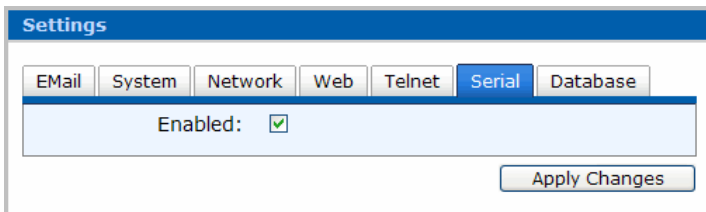
The screenshot shows the 'Settings' window with the 'Telnet' tab selected. The 'Enabled' checkbox is checked, and the 'Telnet Port' is set to 23. An 'Apply Changes' button is located at the bottom right of the form.

To configure SPM Telnet web port:

1. Select **Config > Settings**.
2. Select the Telnet tab.
3. Change the standard web port “23” to a port number within your network firewall.
4. Click **Apply Changes**.

Serial

This option enables or disables the serial connection to SPM through the serial port located on the back of the SPM appliance.



The screenshot shows the 'Settings' window with the 'Serial' tab selected. The 'Enabled' checkbox is checked. An 'Apply Changes' button is located at the bottom right of the form.

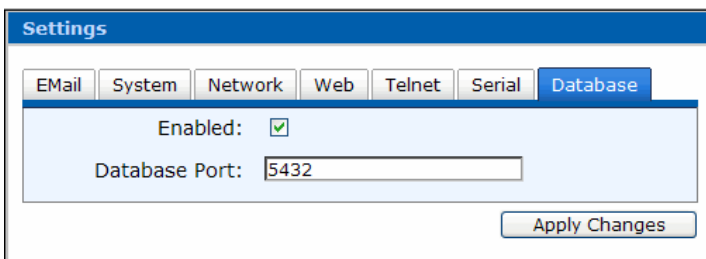
To configure SPM Serial connection:

1. Select **Config > Settings**.
2. Select the Serial tab.
3. Check (or uncheck) the Enabled checkbox.
4. Click **Apply Changes**.

Database

This option enables or disables the SPM database connection and configures the database port.

NOTE: The Database tab displays only if you have the ODBC option enabled through your software key.



The screenshot shows the 'Settings' window with the 'Database' tab selected. The 'Enabled' checkbox is checked, and the 'Database Port' is set to 5432. An 'Apply Changes' button is located at the bottom right of the form.

1. Select **Config > Settings**.
2. Select the Database tab.
3. Check (or uncheck) the Enabled checkbox.
4. Change the Database Port number, if necessary, but see NOTE below:

NOTE: The 5432 port number is for the ODBC default PostgreSQL. If you change the 5432 port number, devices may send connected or unreachable email messages from SPM.

5. Click **Apply Changes**.

About Telnet and Serial Connections

- The Telnet and serial connections allow for a Reboot command and display the serial number of the machine.
- The serial connection network parameters are:
 - Standard NULL modem cable
 - 115200 bits per second
 - Data Bits = 8
 - Parity Bits = none
 - Stop Bit = 1
 - For Windows: the flow control value is the Windows default.
- The default login name and password for Telnet and serial access is the same as the Sentry Power Manager web default (username/password = **adm**/**adm**). Any administrative user created also has a working username and password.
- Changing the password of the **adm** login is strongly suggested and can only be done through the web interface. The **adm** username and password can be changed but the **adm** account cannot be deleted.
- All SPM administrative user accounts created can login through the serial and Telnet connections.

Getting Help

The following options are available on the Help menu for technical information and product support:

Help Menu Options

Option	Description
Support	Contact information for SMARTER Technical Support and links to this user operations manual at Server Technology's website.
Licenses	(Administrator only) Allows update for an additional SPM license key; also displays the current number of supported CDUs, and other enabled features, such as Billing and ODBC.

Help > Support

The **Help > Support** option shows contact information for Server Technology's **SMARTER** Technical Support. In addition, links are provided to the Server Technology website and to the *Sentry Power Manager – Operations Manual*.

Support



Server Technology understands that there are often questions when installing and/or using a new product. Free Technical Support is provided from 6:00 AM to 7:00 PM, Monday-Friday, Pacific Time.

Experience Server Technology's **SMARTER** Technical Support

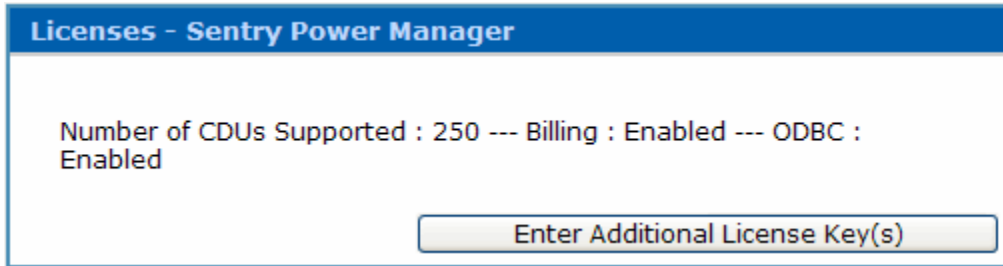
Sentry Power Manager - Version : 4.1.0

Server Technology, Inc. 1040 Sandhill Drive Reno, Nevada 89521 USA	Tel : 775.284.2000 Fax : 775.284.2065	Web : www.servertech.com Email : support@servertech.com	For access to the Sentry Power Manager Operations Manual and product support documentation - [click here]
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Help > License

For the administrator: The **Help > Licenses** option allows the administrator to update to an additional SPM license key that supports more CDUs in the network.

The page shows the number of CDUs supported under the current license key. The page also shows if the Billing reports feature and the ODBC feature are enabled.

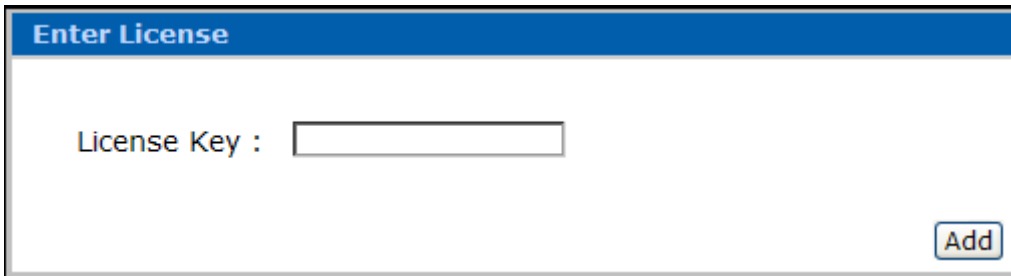


Licenses - Sentry Power Manager

Number of CDUs Supported : 250 --- Billing : Enabled --- ODBC : Enabled

Enter Additional License Key(s)

Click the **Enter Additional License Key(s)** button to display the following page:



Enter License

License Key :

Add

To apply a new SPM license key:

1. Obtain the new license key from your Server Technology Account Representative at 800.835.1515 (domestic) or +00 (1) 775.284.2000 (international). An alpha-numeric key will be generated for you based on the serial number of the appliance that contains SPM.
2. Type the new key you receive in the License Key field (shown above) and click **Add**.

NOTE: To purchase additional Sentry Power Manager SPM Licenses, please contact your Server Technology representative at 1-800-835-1515 (domestic), ++0 (1) 775.284.2000 (international), or sales@servertech.com.

Chapter 4: Appendices

Appendix A: Technical Specifications

Regulatory Compliance



Products with the following mark comply with the RoHS Directive (2002/95/EC) issued by the Commission of the European Community.

Recycling



Server Technology Inc. encourages the recycling of its products. Disposal facilities, environmental conditions and regulations vary across local, state and country jurisdictions, so Server Technology encourages consultation with qualified professional and applicable regulations and authorities within your region to ensure proper disposal.

Waste Electrical and Electronic Equipment (WEEE)



In the European Union, this label indicates that this product should not be disposed of with household waste. It should be deposited at an appropriate facility to enable recovery and recycling.

For information on how to recycle this product responsibly in your country, please visit:
www.servertech.com/support/recycling.

Appendix B: Warranty, Product Registration, and Technical Support

Warranty

For [Server Technology Warranty](#) information, please see our website.

Product Registration

Registration is your key to special offers and services reserved for Registered Users.

- Excellent Technical Support Services
- Special Update and Upgrade Programs
- Warranty Protection
- Extended Warranty Service
- New Product Information

[Register your products online today!](#)

Technical Support



Experience Server Technology's FREE **SMARTER** Technical Support - [Learn more...](#)

Server Technology understands that there are often questions when installing and/or using a new product. Free Technical Support is provided from 6:00 AM to 7:00 PM, Monday-Friday, Pacific Time.

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Fax: 775.284.2065

Web: www.servertech.com

Email: support@servertech.com

Return Merchandise Authorization

If you have a unit that is not functioning properly and is in need of technical assistance or repair:

Please review Server Technology's [Return Merchandise Authorization](#) process on our website.



Server Technology

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