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.

Life-Support Policy
As a general policy, Server Technology does not recommend the use of any of its products in the following situations:

- life-support applications where failure or malfunction of the Server Technology product can be reasonably expected to cause failure of the life-support device or to significantly affect its safety or effectiveness.
- direct patient care.

Server Technology will not knowingly sell its products for use in such applications unless it receives in writing assurances satisfactory to Server Technology that:

- the risks of injury or damage have been minimized,
- the customer assumes all such risks, and
- the liability of Server Technology is adequately protected under the circumstances.

The term life-support device includes but is not limited to neonatal oxygen analyzers, nerve stimulators (whether used for anesthesia, pain relief or other purposes), auto-transfusion devices, blood pumps, defibrillators, arrhythmia detectors and alarms, pacemakers, hemodialysis systems, peritoneal dialysis systems, neonatal ventilator incubators, ventilators (for adults or infants), anesthesia ventilators, infusion pumps, and any other devices designated as “critical” by the U.S. FDA.
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Chapter 1: Introduction

Quick Start Guide

The following instructions will help you quickly install and configure your Smart CDU for use in your data center equipment cabinet. For detailed information on each step, go to the page number listed to the right.

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   • Create new administrative user account ........................................................................ 17
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7. Connect the Smart CDU to the network.

Technical Support

Experience Server Technology’s FREE SMARTER Technical Support

Server Technology understands that there are often questions when installing and/or using a new product. Free Technical Support is provided from 8 a.m. to 5 p.m. PST, Monday through Friday. After-hours service is provided to ensure your requests are handled quickly no matter what time zone or country you are located in.

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Reno, Nevada 89521 USA Fax: 775.284.2065 Email: support@servetech.com
**Equipment Overview**

1. The power inlet/cord(s) connects the CDU to the electrical power source.
2. The Input Current LED(s) displays the current load for each infeed or electrical phase per infeed.
3. Two RJ45 connectors for Serial (RS-232) and Ethernet connection
4. Two mini RJ11 connectors for Temperature/Humidity sensors.

**Figure 1.1 Cabinet Distribution Unit Views**
Chapter 2: Installation

Before installing your Sentry Smart Cabinet Distribution Unit (CDU), refer to the following lists to ensure that you have all the items shipped with the unit as well as all other items required for proper installation.

### Standard Accessories

- Mounting hardware:
  - **Vertical models** - Two removable flanges with four M4 screws. Two mounting L-brackets with nut plates, four sets of screws and washers. Optional button mounts.
  - **Horizontal models** - Two removable L-brackets with M4 screws.

- Cables/Adapters:
  - RJ45 to RJ45 crossover cable.
  - RJ45 to DB9F serial port adapter (for connection to standard DB9M DTE serial port).

- Outlet retention clips (208-240V models).

Additional items for Cx-xxx-C20 models:

- Separate power input cord.
- Power input retention bracket hardware (may be installed): Two removable T-brackets with two 40mm screws per input.

### Optional Accessories

- Temperature/Humidity sensors

### Additional Required Items

- Flathead and Phillips screwdrivers
- Screws, washers and nuts to attach the CDU to your rack
Safety Precautions

This section contains important safety and regulatory information that should be reviewed before installing and using the Sentry Smart Cabinet Distribution Unit. For input and output current ratings, see Power Ratings in Appendix C: Technical Specifications.

<table>
<thead>
<tr>
<th>Only for installation and use in a Service Access Location in accordance with the following installation and use instructions.</th>
<th>Destiné à l'installation et l'utilisation dans le cadre de Service Access Location selon les instructions d'installation et d'utilisation.</th>
<th>Nur für Installation und Gebrauch an Anschlusszugriffspunkten gemäß der folgenden Installations- und Gebrauchsanweisungen.</th>
</tr>
</thead>
<tbody>
<tr>
<td>This equipment is designed to be installed on a dedicated circuit.</td>
<td>Cet équipement est conçu à être installé sur un circuit spécialisé.</td>
<td>Diese Ausrüstung ist zur Installation in einem festen Stromkreis vorgesehen.</td>
</tr>
<tr>
<td>Dedicated circuit must have circuit breaker or fuse protection. CDUs have been designed without a master circuit breaker or fuse to avoid becoming a single point of failure. It is the customer’s responsibility to provide adequate protection for the dedicated power circuit. Protection of capacity equal to the current rating of the CDU must be provided and must meet all applicable codes and regulations. In North America, protection must have a 10,000A interrupt capacity.</td>
<td>Le circuit spécialisé doit avoir un disjoncteur ou une protection de fusible. CDUs ont été conçus sans disjoncteur général ni fusible pour éviter que cela devient un seul endroit de panne. C'est la responsabilité du client de fournir une protection adéquate pour le circuit-alimentation spécialisé. Protection de capacité équivalent à la puissance de l'équipement, et respectant tous les codes et normes applicables. Les disjoncteurs ou fusibles destinés à l'installation en Amérique du Nord doivent avoir une capacité d'interruption de 10.000 A.</td>
<td>Der feste Stromkreis muss mit einem Schutzschalter oder einem Sicherungsschutz versehen sein. CDUs verfügt über keinen Hauptschutzschalter bzw. über keine Sicherung, damit kein einzelner Fehlerpunkt entstehen kann. Der Kunde ist dafür verantwortlich, den Stromkreis sachgemäß zu schützen. Der Kapazitätsschutz entspricht der aktuellen Stromstärke der Geräte und muss alle relevanten Codes und Bestimmungen erfüllen. Für Installation in Nordamerika müssen Ausschalter bzw. Sicherung über 10.000 A Unterbrechungskapazität verfügen.</td>
</tr>
<tr>
<td>The plug on the power supply cord shall be installed near the equipment and shall be easily accessible.</td>
<td>La prise sur le cordon d'alimentation sera installée près de l'équipement et sera facilement disponible.</td>
<td>Der Stecker des Netzkabels muss in der Nähe der Ausrüstung installiert werden und leicht zugänglich sein.</td>
</tr>
<tr>
<td>Installation Orientation: Cx-xxVx-x units are design to be installed in vertical orientation.</td>
<td>Installation Orientation: Les unités Cx-xxVx-x sont conçues pour être installées dans une orientation verticale.</td>
<td>Installationsausrichtung: Cx-xxVx-x Einheiten sind zur vertikalen Installation vorgesehen.</td>
</tr>
<tr>
<td>Always disconnect the power supply cord before opening to avoid electrical shock.</td>
<td>Toujours déconnecter le cordon d'alimentation avant d'ouvrir pour éviter un choc électrique.</td>
<td>Vor dem Öffnen immer Netzleitung abziehen um elektrischen Schlag zu vermeiden.</td>
</tr>
<tr>
<td>WARNING! High leakage current! Earth connection is essential before connecting supply!</td>
<td>ATTENTION ! Haut fuite très possible ! Une connection de masse est essentielle avant de connecter l'alimentation !</td>
<td>ACHTUNG! Hoher Ableitstrom! Ein Erdungsanschluss ist vor dem Einschalten der Stromzufuhr erforderlich!</td>
</tr>
<tr>
<td>WARNING! Cx-xxE-x units Double Pole/Neutral Fusing</td>
<td>ATTENTION ! Les unités Cx-xxE-x Double Pôle/Fusible sur le Neutre</td>
<td>ACHTUNG!: Cx-xxE-x Zweipolige bzw. Neutraleiter-Sicherung</td>
</tr>
<tr>
<td>This equipment should only be installed by trained personnel.</td>
<td>Cet équipement est uniquement destiné à être installé par personnel qualifié.</td>
<td>Dieses Gerät ist nur für den Einbau durch Personal vorgesehen.</td>
</tr>
<tr>
<td>Products rated for 240/415VAC may be fitted with a plug that is rated for a higher voltage. Caution must be taken to assure that the rating of the unit and the supply voltage match.</td>
<td>Les produits prévus pour 240/415VAC peut être équipé d'un bouchon qui est conçu pour une tension plus élevée. Des précautions doivent être prises pour assurer que la cote de l'unité et la tension d'alimentation correspondent.</td>
<td>Produkte die für 240/415VAC zugelassen sind können mit einem Stecker der für eine höhere Spannung ausgestattet sein. Vorsicht ist geboten, um sicherzustellen, dass die erlaubten Betriebsspannungen der Geräte und der Versorgungsspannung zueinander passen.</td>
</tr>
</tbody>
</table>
Installing the Power Input Retention Bracket

For units with a total maximum output <30A, it may be necessary to install the power input retention bracket prior to mounting the unit within the rack.

To install the power input retention bracket:

1. Remove the two screws attaching the IEC 60320 C19 inlet to the enclosure.
2. Assemble and attach the retention bracket to the enclosure as shown.

Mounting

Horizontal/Rack

1. Select the appropriate bracket mounting points for proper mounting depth within the rack.
2. Attach the L-brackets to these mounting points with two screws for each bracket.
3. Install the enclosure into your rack, using the slots in each bracket. The slots allow about ¼ inch of horizontal adaptability to align with the mounting holes of your rack.

NOTE: A mounting bracket kit for 23” wide racks or cabinets is available. Contact your Server Technology Sales Representative for more information.

Vertical

1. Attach the removable flanges to the mount points on the rear of the enclosure using M4 screws.
2. Attach the mounting L-brackets to the flanges with the supplied screws, washers and nut plates. The slots allow about 1½ inches of vertical adaptability.
3. Attach the top and bottom brackets to your rack.

NOTE: Contact your Server Technology Sales Representative for information regarding custom bracket design and fabrication services if you are unable to find a suitable manner for utilizing the included mounting brackets.

Optionally, the supplied button mounts may be used for mounting the CDU into cabinets supporting this method of equipment mounting.
**Attaching the Expansion Module**

If supported, connect the Linking Smart CDU with the provided RJ12 crossover cable at the Link port on the Smart CDU.

NOTE: The overall length of the RJ12 crossover cable should not exceed 10 feet.

**Connecting to the Power Source**

On 30A units, the input power cord is attached to the base of the unit. On units with a total maximum output <30A, you must first attach the power cord to the unit before connecting the unit to the power source.

**To attach a power cord to the unit:**
1. Plug the female end of the power cord firmly into its connector at the base.
2. Use a screwdriver to tighten the two screws on the retention bracket.

**To connect to the power source:**

Plug the male end of the power cord into the AC power source.

**Connecting Devices**

**To avoid the possibility of noise due to arcing:**
1. Keep the device’s on/off switch in the off position until after it is plugged into the outlet.
2. Connect devices to the CDU outlets.

NOTE: Server Technology recommends even distribution of attached devices across all available outlets to avoid exceeding the outlet, branch or phase limitations. See Power Ratings on page 90 for more information.

Always disconnect ALL power supply cords before opening to avoid electrical shock.

Afin d’éviter les chocs électriques, débranchez TOUTES les cables électrique avant d’ouvrir.

Vor dem Offnen immer Netzleitungen abziehen um elektrischen Schlag zu vermeiden.

**Connecting the Sensors**

The Smart CDU is equipped with two mini RJ11 T/H ports for attachment of the Temperature/Humidity sensors. Attach the mini RJ11 plug of the sensor(s) to the appropriate T/H port.

**Connecting to the Unit**

**Serial (RS232) port**

The Smart Cabinet Distribution Unit is equipped with an RJ45 Serial RS-232 port for attachment to a PC or networked terminal server using the supplied RJ45 to RJ45 crossover cable and RJ45 to DB9F serial port adapter as required. See Data Connections in Appendix C: Technical Specifications for more information on the Serial RS-232 port.

**Ethernet port**

The Smart Cabinet Distribution Unit is equipped with an RJ45 10/100Base-T Ethernet port for attachment to an existing network. This connection allows access to the Smart CDU via Telnet or Web.

The Smart Cabinet Distribution Unit is configured with the following network defaults to allow unit configuration out-of-the-box through either Telnet or Web:

- IP address: 192.168.1.254
- Subnet Mask: 255.255.255.0
- Gateway: 192.168.1.1

The local PC network connection must be configured as noted below:

NOTE: Contact your system administrator for instructions in reconfiguring the network connection. Reconfiguration of your network connection may require a restart to take effect.

- IP address: 192.168.1.x (where x is 2-253)
- Subnet Mask: 255.255.255.0
# Chapter 3: Operations

## INTERFACES

**Usernames and Passwords**

## WEB INTERFACE

- **Logging In**
- **Power Monitoring**
  - Input Feeds
  - System
  - UPS
- **Environmental Monitoring**
  - Input Feeds
  - Sensors
- **Configuration**
  - System
  - Network
  - Telnet/SSH
  - HTTP/SSL
  - Serial Ports
  - Towers
  - Input Feeds
  - UPS
  - Users
  - FTP
  - SNTP/Syslog
  - SNMP/Thresholds
  - LDAP
  - TACACS+
  - RADIUS
  - Email

## COMMAND LINE INTERFACE

- **Logging In**
- **Operations Commands**
- **Administration Commands**
  - User Administration
  - Input Feed Administration
  - Tower Administration
  - Environmental Monitor Administration
  - Serial Port Administration
  - System Administration
  - TCP/IP Administration
  - HTTP Administration
  - Telnet Administration
  - FTP Administration
  - SNTP Administration
  - UPS Administration
Interfaces

The Smart Cabinet Distribution Unit has two interfaces: the Web interface accessed via the HTTP enabled Ethernet connections, and the command line for serial and Telnet connections.

Usernames and Passwords

The Smart Cabinet Distribution Unit has one predefined administrative user account (username/password: admn/admn), and supports a maximum of 128 defined user accounts.

NOTE: For security, Server Technology recommends removal of the predefined administrative user account after a new account with administrative rights has been created.

Only an administrative-level user may perform operations such as creating/removing user accounts and command privileges, changing passwords and displaying user information. An administrator may also view the status of all sensors and power inputs.

Usernames may contain from 1-16 characters and are not case sensitive; spaces are not allowed. Passwords may contain up to 16 characters, and are case sensitive.

Web Interface

The Web interface is constructed of three major components:

- System Location bar
- User/Navigation bar
- Control Screen

The System Location bar displays the Sentry’s location and IP address as well as the current Control Screen title. The User/Navigation bar displays the current user and privilege level and provides access to all Web pages. The Control Screen is used to display current data and allow changes to outlet states or system configuration.

The following sections describe each interface section/page and their use.

![Example Web page](image)

Figure 3.2 Example Web page
Logging In

Logging in through Web requires directing the Web client to the configured IP address of the unit.

To log in by Web:

In the login window, enter a valid username and password and press OK.

If you enter an invalid username or password, you will be prompted again.

You are given three attempts to enter a valid username and password combination. If all three fail, the session ends and a protected page will be displayed.

NOTE: The default Sentry username/password is admn/admn.

Power Monitoring

Input Feeds

The Input Feeds page displays:

- Absolute and descriptive names of infeed
- Infeed status
- Input/branch phase load in amperes
- Input Voltage
- Calculated power usage in Watts.

This page will refresh automatically every 10 seconds.

System

The System page displays:

- Calculated power usage for ALL infeeds in Watts
- Configured total system area in square feet.
- Calculated power usage in Watts/square foot.

This page will refresh automatically every 10 seconds.

UPS

The UPS page displays the following information for each UPS device associated with the Sentry unit:

- Status
- Voltage
- Hostname/IP address

This page will refresh automatically every 10 seconds.

Environmental Monitoring

Input Feeds

The Input Feeds page displays the tower’s absolute and descriptive name and the input, branch or phase load in amperes of all devices attached to the Sentry at the time the page was loaded. This page will refresh automatically every 10 seconds.

Sensors

The Sensors page displays:

- Temperature/humidity sensor’s absolute and descriptive names
- Temperature/humidity sensor readings in degrees Celsius and percent relative humidity
Configuration

The Configuration section offers access to all unit configuration options. This section is available to administrative level users only.

System

The System configuration page is used for reference of system information such as Ethernet NIC Serial Number, Ethernet MAC address and system firmware and hardware revisions as well as assignment and maintenance of other system wide configurations.

For descriptive names, enter up to 24 alphanumeric and other typed characters - (ASCII 33 to 126 decimal) are allowed; spaces are not allowed.

NOTE: Spaces may be used for the location description only.

Creating a pre-login banner:

Click on the Login Banner link.

On the subsequent Login Banner page, enter a pre-login banner and press Apply.

NOTE: The pre-login banner may be up to 2070 characters in length and is displayed prior to the login prompt. If left blank, no system banner will be displayed prior to login prompt.

Creating a descriptive system location name:

Enter a descriptive name and press Apply.

Configuring the Input Current LED display orientation:

Select Normal or Inverted from the drop-down menu and press Apply.

Enabling or disabling strong password requirements:

Sentry supports enforcement of strong passwords for enhanced security. When enabled, all new passwords must be a minimum of 8 characters in length with at least one uppercase letter, one lowercase letter, one number and one special character.

Acceptable strong passwords:

n0tOnmyw@tch
john2STI?
H3reUgo!

NOTE: Strong password requirements also enforce a minimum change of four character positions when defining new strong passwords.

Select Enabled or Disabled from the Strong Passwords drop-down menu and press Apply.

NOTE: The strong password requirement is applied against all new passwords.

Enabling or disabling the external reset button:

Select Enabled or Disabled from the External Reset Button drop-down menu and press Apply.

Setting the temperature scale:

Select Celsius or Fahrenheit from the Temperature Scale drop-down menu and press Apply.

Setting the system area:

Enter a system area value in the Area field and press Apply.

Setting the system area unit of measure:

Select the unit of measure from the Unit of Measure drop-down list and press Apply.

Setting the system input power factor:

The Power Factor value is used to provide calculated power usage displayed in the Power Monitoring pages.

Enter a numeric value in the Power Factor field from 0.50 to 1.00, and press Apply.
Setting the 3-phase load out-of-balance threshold:
This setting is used for devices with 3-phase input voltages to notify of a system imbalance between the three phases of power.
In the 3-Phase Load Out-of-Bounds Threshold field, enter a value from 0 to 100% and press Apply.

Configuring the Command Line Interface (CLI) session timeout:
Enter a timeout period (in minutes) in the CLI Session Timeout field, and press Apply. The valid timeout range is 1 to 1440 minutes (24 hours); the default is 5 minutes.

Configuring the Web session (Web Interface) timeout:
Enter a timeout period (in minutes) in the Web Session Timeout field. The valid timeout range is 1 minute to 1440 minutes (24 hours); the default Web session timeout is 5 minutes.

Creating a descriptive unit name:
Click on the Tower Names link.
On the subsequent Tower Names page, enter a descriptive name and press Apply.

Creating a descriptive input feed name:
Click on the Input Feed Names link.
On the subsequent Input Feed Names page, enter a descriptive name and press Apply.

Creating a descriptive serial port name:
Click on the Serial Port Names link which will open the Serial Ports configuration page. See Serial Ports on page 17 for additional information on creating descriptive serial port names.

Creating a descriptive Environmental Monitor name:
Click on the Environmental Monitor Names link.
On the subsequent Environmental Monitor Names page, enter a descriptive name and press Apply.

Creating descriptive sensor names:
Click on the Sensor Names link.
On the subsequent Sensor Names page, enter a descriptive name and press Apply.

Network
The Network configuration page is used for maintenance of the network interface. From this page an administrator may configure the IP address, subnet mask, gateway address, DNS addresses as well as view the link status, speed and duplex value.

The Sentry is configured with the following network defaults to allow unit configuration out-of-the-box through either Telnet or Web:

- IP address: 192.168.1.254
- Subnet Mask: 255.255.255.0
- Gateway: 192.168.1.1

The initial local PC network connection must be configured as noted below:

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP address</td>
<td>192.168.1.x (where x is 2-253)</td>
</tr>
<tr>
<td>Subnet Mask</td>
<td>255.255.255.0</td>
</tr>
</tbody>
</table>

**NOTE:** Contact your system administrator for instructions in reconfiguring the network connection. Reconfiguration of your network connection may require a restart to take effect.

Enabling or disabling DHCP support:
Select Enabled or Disabled from the DHCP drop-down menu and press Apply.

Setting the IP address, subnet mask, gateway or DNS address:
In the appropriate field, enter the IP address, subnet mask, gateway address or DNS address and press Apply.
Telnet/SSH
The Telnet/SSH configuration page used to enable or disable Telnet and SSH support and configure the port number that the Telnet or SSH server watches. For more information on SSH see page 57 in Chapter 4: Advanced Operations.

Enabling or disabling Telnet or SSH support:
Select Enabled or Disabled from the appropriate Server drop-down menu and press Apply.

Changing the Telnet or SSH server port number:
In the appropriate Port field, enter the port number and press Apply.

Enabling or disabling SSH server authentication methods:
The Sentry SSH server supports two authentication methods for security and validation: Password and Keyboard-Interactive.

Password is a method where the SSH client gathers username/password credentials and makes the authentication request to the SSH server with the credentials. The Password method is controlled by the SSH client.

Keyboard-Interactive is an authentication method where the SSH server controls an information field followed by one or more prompts requesting credential information from the SSH client. The client gathers credential information keyed-in by the user and sends it back to the server. The Keyboard-Interactive method is controlled by the SSH server.

Individual enabling and disabling of the Password and Keyboard-Interactive authentication methods are supported to allow an SSH client to be forced to use a specific method. Although both methods are available, by enabling the Keyboard-Interactive method and disabling the Password method, the SSH client is forced to use Keyboard-Interactive, which is required to display the login banner.

NOTE: At least one authentication method must be enabled.

Select the Password checkbox and/or the Keyboard-Interactive checkbox and press Apply.

HTTP/SSL
The HTTP/SSL configuration page used to enable or disable HTTP and SSL support, configure the port number that the HTTP server watches and responds to, selection of the method of authentication used and SSL access level. For more information on SSL see page 55 in Chapter 4: Advanced Operations.

Enabling or disabling HTTP or SSL support:
Select Enabled or Disabled from the appropriate Server drop-down menu and press Apply.

Changing the HTTP server port number:
In the HTTP Port field, enter the port number and press Apply.

Setting the HTTP authentication method:
The Sentry HTTP server supports two authentication methods for security and validation of the username-password – Basic and MD5 digest.

The Basic method utilizes Base64 encoding to encode and deliver the username-password over the network to the HTTP server for decoding and authentication. This basic method is supported by all Web browsers and offers a minimum level of security.

NOTE: The Base64 algorithm is widely-known and susceptible to packet-sniffer attack for acquisition of the encoded username-password string.

The MD5 digest method provides stronger protection using one-way encoded hash numbers, never placing the username-password on the network. Instead, the sending browser creates a challenge code based on the hash algorithm, provided username-password and unique items such as the device IP address and timestamp, which is compared against the HTTP server internal user database of valid challenge codes. The MD5 digest method offers a higher level of security than the Basic method but at present is not supported by all browsers.

NOTE: MD5 is known to be fully supported by Internet Explorer 5.0+

Select Basic or MD5 from the Authentication drop-down menu and press Apply.
Setting SSL access level:

Sentry SSL supports configuration of SSL connections as being either optional or required. The default access level is set to optional.

- Optional – Both non-secure (HTTP) and SSL encrypted connections (HTTPS) are allowed access.
- Required – ONLY SSL encrypted connections (HTTPS) are allowed access.

Select Optional or Required from the Secure Access drop-down menu and press Apply.

Serial Ports

The Serial Ports configuration page is used for maintenance of the serial port.

**NOTE:** Pass-Thru connections may only be initiated from the command line interface via a Telnet/SSH session.

Setting the data-rate for all serial ports:

Select the serial port data-rate from the drop-down menu and press Apply.

Setting the serial port timeout value:

Enter the timeout value (in minutes) in the Connection Timeout field and press Apply.

Creating a descriptive serial port name:

Click on the Edit link in the Action column next to the port to be configured.

On the subsequent Serial Port Edit page, enter a descriptive name. Up to 24 alphanumeric and other typed characters (ASCII 33 to 126 decimal) are allowed; spaces are not allowed. Press Apply.

Enabling or disabling serial port active signal checking:

Click on the Edit link in the Action column next to the port to be configured.

On the subsequent Serial Port Edit page, select On or Off from the DSR Check drop-down menu and press Apply.

Towers

The Towers configuration page is used for assignment and/or editing of:

- Descriptive names
- Serial and Model numbers
- Operation voltage types

**NOTE:** If set at the factory, the serial number, model number and voltage type WILL NOT be user-editable.

Creating a descriptive tower name:

In the Tower Name field, enter a descriptive name and press Apply.

Setting the tower serial number:

In the Serial Number field, enter the serial number of the unit and press Apply.

Setting the tower model number:

In the Model Number field, enter the model number of the unit and press Apply.

Setting the operational AC or DC voltage type:

From the AC/DC drop-down menu, select AC or DC, and press Apply.

Setting the operational AC voltage type:

From the 3-Phase drop-down menu, select yes or no, and press Apply.
**Input Feeds**

The Input Feeds configuration page is used for assignment and/or editing of input feed descriptive names, operational voltage and maximum load capacity.

**Creating a descriptive input feed name:**

In the Input Feed Name field, enter a descriptive name and press **Apply**.

**Setting the infeed operational voltage:**

In the Input Feed Voltage field, enter a value from 0 to 480 and press **Apply**.

**NOTE:** If Smart Load-Shedding has been activated and UPS voltage polling configured for an infeed, the polled voltage value will be used for all power calculations.

**Setting the infeed maximum load capacity:**

In the Input Feed Load Capacity field, enter a value from 1 to 255 and press **Apply**.

**UPS**

The UPS Configuration page is used for adding a new UPS device and configuring the UPS devices connected to Sentry units.

**To add a new UPS:**

Select the UPS manufacturer type from the Type drop-down list, type an IP address (or hostname) for the UPS, and press **Apply**.

**To edit the UPS type:**

Under the Action heading, click the **Edit** link for the UPS to be configured. The Configuration UPS page reformats to an edit page where UPS device settings are configured and UPS devices are associated with an infeed.

**Selecting the UPS type:**

Select the UPS manufacturer type from the UPS Type drop-down list and press **Apply**.

**Editing the UPS Hostname/IP Address:**

In the Hostname/IP field, type an IP Address or Hostname and press **Apply**.

**Editing the UPS SNMP GET community string:**

In the SNMP GET Community String field, type the community string configured on the UPS device and press **Apply**.

**Enabling/Disabling UPS voltage polling:**

From the Poll UPS Voltage drop-down list, select **Enabled** or **Disabled** and press **Apply**.

**Editing the UPS SNMP port number:**

In the Port field, type the port number and press **Apply**.

**Associate the UPS with an infeed:**

Select the infeed(s) powered by the UPS and press **Apply**.

**To remove a UPS:**

On the Configuration UPS page, under the Action heading, click the **Remove** link for the UPS you want to remove.
**Users**

The Users configuration page is used for creation and removal of usernames, assignment of accessible outlets and group, assignment of privilege levels and the changing of user passwords.

**Creating a new user:**

Enter a user name in the Username field. Up to 16 alphanumeric and other typed characters (ASCII 33 to 126 decimal) are allowed; spaces are not allowed.

Enter a password for the new user and verify in the Password and Verify Password fields. For security, password characters are not displayed. Press **Apply**.

**Removing a user:**

Click on the **Remove** link in the Action column for the user to be removed and press **Yes** on the subsequent confirmation window.

**Changing a user password:**

Click on the **Edit** link in the Action column for the associated user.

On the subsequent User Edit page, enter a password and verify the new password for the new user in the Password and Verify Password fields. For security, password characters are not displayed. Press **Apply**.

**Changing a user’s access privilege level:**

The Sentry has the following defined privilege levels:

- **Admin:** Full-access for all configuration, control (On, Off, Reboot), status and serial/Pass-Thru ports.
- **User:** Partial-access for control (On, Off, Reboot), status and Pass-Thru of assigned outlets, groups and serial/Pass-Thru ports.

The administrator may also grant administrative privileges to other user accounts allowing the Sentry to have more than one administrative-level user.

*NOTE:* You cannot remove administrative privileges from the Admin user unless another user has already been given administrative access level privileges created.

Click on the **Edit** link in the Action column for the associated user.

On the subsequent User Edit page, select **Admin** or **User** from the Access Level drop-down menu and press **Apply**.

**Adding and Deleting serial port access:**

Click on the **Ports** link in the Access column for the associated user.

On the subsequent User Ports page, select or deselect ports to be accessed by the user and press **Apply**.

**FTP**

The FTP configuration page is used for setup and maintenance of all settings required to perform an FTP firmware upload, configure automatic FTP updates or system configuration uploads/downloads.

See Appendix B: Uploading Firmware for more information on uploading firmware.

**Setting the FTP Host Address:**

Enter the IP address or hostname in the Host field and press **Apply**.

**Setting the FTP username:**

Enter the FTP server username in the Username field, and press **Apply**.

**Setting the FTP password:**

Enter the FTP server password in the Password field, and press **Apply**.

**Setting the Directory (filepath):**

Enter the path of the file to be uploaded in the Directory field, and press **Apply**.

**Setting the filename for upload:**

Enter the filename of the file to be uploaded in the Filename field, and press **Apply**.
Testing the FTP upload configuration:
This test validates that the unit is able to contact and log onto the specified FTP server, download the firmware file and verify that the firmware file is valid for this unit.

Press Test.

Enabling or disabling automatic updates:
The Sentry features the ability to schedule automatic firmware updates. When enabled and configured, the Sentry will regularly check the FTP server for a new firmware image and upload it.
Select Enabled or Disabled from the drop-down menu and press Apply.

Setting the automatic update scheduled day:
Select the desired day for the automatic update from the drop-down menu and press Apply.

Setting the automatic update scheduled hour:
Select the desired hour for the automatic update from the drop-down menu and press Apply.

Enabling or disabling the FTP server:
The Sentry features the ability to upload and download system configuration files to ease implementation across multiple Sentry devices. See Chapter 4: Advanced Operations - Upload/Download for more information on configuration upload and download.
Select Enabled or Disabled from the drop-down menu and press Apply.

NOTE: The FTP server must be enabled for configuration upload or download.

SNTP/Syslog
The SNTP/Syslog configuration page allows setup and maintenance of SNTP and Syslog support. For additional information and configuration requirements for Syslog support, see Logging on page 83.

Setting the SNTP server address:
Enter the IP address or hostname in the Primary and/or Secondary Host field and press Apply.

Setting the Local GMT offset:
Select the local offset from GMT value from the drop-down menu and press Apply.

Setting the Syslog server address:
Enter the IP address or hostname in the Primary and/or Secondary Host field and press Apply.

Changing the Syslog server port number:
In the Syslog Port field, enter the port number and press Apply.

SNMP/Thresholds
The SNMP/Thresholds configuration page allows setup and maintenance of all settings required to enable SNMP support and provides access to the trap configuration pages. For additional information on SNMP support and detailed descriptions of available traps, see SNMP on page 59.

NOTE: Traps are generated according to a hierarchical architecture; i.e. if a Tower Status enters a trap condition, only the Tower Status trap is generated. Infeed and Outlet Status traps are suppressed until the Tower Status returns to Normal.

Enabling or disabling SNMP support:
Select Enabled or Disabled from the drop-down menu and press Apply.

Setting the community strings:
Enter the community string in the appropriate field and press Apply.
Community strings may be 1 to 24 characters
Setting the trap timer:
Enter a trap timer value in the Error Trap Repeat Time field and press **Apply**.
The Error Trap Repeat Time value may be 1 to 65535 (in seconds).

Setting trap destinations:
Enter an IP address or hostname in the appropriate Trap Destination field and press **Apply**.

Setting IP Restrictions:
Select **No Restrictions** or **Trap Destinations Only** from the IP Restrictions drop-down menu and press **Apply**.

**NOTE:** When Trap Destinations Only is selected, SNMP Manager GET and SET requests are only allowed from the IP addresses of the defined traps destinations.

Setting the SNMP SysName, SysLocation or SysContact objects:
In the appropriate field, enter the SysName, SysLocation or SysContact objects and press **Apply**.

Enabling or disabling tower traps:
Click on the **Tower Traps** link.
On the subsequent Tower Traps page, select or deselect the desired traps and press **Apply**.

Configuring input feed traps:
Click on the **Input Feed Traps** link.
On the subsequent Input Feed Traps page, select or deselect the desired traps and press **Apply**.

For Load traps, enter a maximum load value for the infeed in the High Load Threshold field and press **Apply**.
The default input feed high load threshold is 80% of the input feed maximum load capacity.

Enabling or disabling Environmental Monitor traps:
Click on the **Environmental Monitor Traps** link.
On the subsequent page, select or deselect the desired traps and press **Apply**.

Configuring the Temperature and Relative Humidity sensor traps:
Click on the **Sensor Traps and Thresholds** link.
On the subsequent Sensor Traps and Thresholds page, select or deselect the desired trap checkboxes and press **Apply**.

Configuring the Temperature and Relative Humidity sensor thresholds:
Click the **Sensor Traps and Thresholds** link.
For temperature thresholds, type a low and high temperature value in the Low Temp and High temp fields and press **Apply**.
For relative humidity thresholds, type a low and high humidity percentage in the Low Humid and High Humid fields, and press **Apply**.

**NOTE:** For temperature thresholds, the valid range is 0 to 123 degrees Celsius or 32 to 254 degrees Fahrenheit. For relative humidity, the valid range is 0 to 100 (in percent relative humidity).

Configuring Temperature Recovery Delta:
Click on the **Sensor Traps and Thresholds** link.
The Recovery Delta field allows configuration of the number of degrees of change needed to recover from a temperature alarm. After exceeding the high-temperature threshold, the temperature value must fall below the high-temperature threshold by the number of degrees specified in the Recovery Delta field before the sensor recovers.
For example, if the High Temp value is 80 degrees Fahrenheit, and the Recovery Delta field is 2 degrees Fahrenheit, the sensor will not recover until a temperature value of 78 degrees Fahrenheit is reported.
To configure a temperature recovery delta, type a value (in degrees) in the Recovery Delta field and press **Apply**.

**NOTE:** The acceptable value range for the Recovery Delta field is 0-10 degrees for Celsius and 0-18 degrees for Fahrenheit. The default value for the Recovery Delta field is 1 degree Celsius and 2 degrees Fahrenheit.
The LDAP configuration page is used for setup and maintenance of all settings required to enable LDAP support. For additional information and configuration requirements, see LDAP on page 67.

**Enabling or disabling LDAP support:**

Select **Enabled** or **Disabled** from the LDAP drop-down menu and press **Apply**.

**Setting the LDAP server address:**

Enter the IP address or hostname in the Primary and/or Secondary Host field and press **Apply**.

**Changing the LDAP server port:**

Enter the port number in the LDAP Port field and press **Apply**.

**Enabling or disabling LDAP over TLS/SSL:**

Select **Yes** or **No** from the Use TLS/SSL drop-down menu and press **Apply**.

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

**Setting the LDAP bind password type:**

Select **Simple** or **MD5** from the Bind Type drop-down menu and press **Apply**.

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

For more information on LDAP bind password types, see **Setting the LDAP bind password type** on page 69.

**Setting the search bind Distinguished Name (DN):**

Enter the fully-qualified distinguished name (FQDN) in the Search Bind field and press **Apply**.

**Setting the search bind password for Distinguished Name (DN):**

Enter the Search Bind Password in the Search Bind Password field and press **Apply**.

**Setting the user search base Distinguished Name (DN):**

Enter the User Search Base DN in the User Search Base DN field and press **Apply**.

**Setting the user search filter:**

Enter the User Search Filter in the User Search Filter field and press **Apply**.

**Setting the group membership attribute:**

Enter the group membership attribute in the Group Membership Attribute Field and press **Apply**.

**Setting the group membership value type:**

Select the appropriate value from the drop-down menu and press **Apply**.

**Configuring the authentication order:**

Select **Remote -> Local** or **Remote Only** from the drop-down menu and press **Apply**.

For more information on remote authentication order, see **Setting the authentication order** on page 71.

*NOTE: Server Technology recommends NOT setting the authentication order to Remote Only until TACACS has been fully configured and tested.*
Setting the DNS IP address:

See Network on page 15 for information on how to set the DNS IP address.

Configuring LDAP groups:

Click on the LDAP Groups link at the bottom of the page.

Creating an LDAP group:

Enter a descriptive group name in the LDAP Group Name field. Up to 24 alphanumeric and other typed characters (ASCII 33 to 126 decimal) are allowed; spaces are not allowed. Press Apply.

Removing an LDAP group:

Click on the Remove link in the Action column for the group to be removed and press OK on the subsequent confirmation window.

Changing an LDAP group’s access privilege level:

Click on the Edit link in the Action column for the associated LDAP Group.

On the subsequent LDAP Group - Edit page, select Admin, User, On-only or View-only from the Access Level drop-down menu and press Apply.

For more information on access privilege levels, see Changing a user’s access privilege level: on page 19.

Granting or removing Environmental Monitoring viewing privileges:

Click on the Edit link in the Action column for the associated LDAP Group.

On the subsequent LDAP Group - Edit page, select Yes or No from the Environmental Monitoring drop-down menu and press Apply.

Adding and Deleting serial port access:

Click on the Ports link in the Access column for the associated LDAP Group.

On the subsequent LDAP Group - Ports page, select or deselect ports to be accessed by the LDAP Group and press Apply.
TACACS+

The TACACS+ configuration page is used for setup and maintenance of all settings required to enable TACACS+ support. For additional information and configuration requirements, see TACACS+ on page 75.

**Enabling or disabling TACACS+ support:**

Select **Enabled** or **Disabled** from the TACACS+ drop-down menu and press **Apply**.

**Setting the TACACS+ server address:**

Enter the IP address or hostname in the Primary and/or Secondary Host field and press **Apply**.

**Changing the TACACS+ server port:**

Enter the port number in the Port field and press **Apply**.

**Configuring the authentication order:**

Select **Remote -> Local** or **Remote Only** from the drop-down menu and press **Apply**.

For more information on remote authentication order, see Setting the authentication order: on page 76.

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

**Setting the TACACS+ encryption key:**

Enter a new key and verify it with the Encryption Key and Verify Encryption Key fields. Press **Apply**.

For security, key characters are not displayed.

**Configuring TACACS+ privilege levels:**

Click on the **TACACS+ Privilege Levels** link at the bottom of the page.

**Changing a TACACS+ Privilege Level’s access privilege level:**

Click on the **Edit** link in the Action column for the associated TACACS+ Privilege Level.

On the subsequent TACACS+ Privilege Level - Edit page, select **Admin**, **User**, **On-only** or **View-only** from the Access Level drop-down menu and press **Apply**. For more information on access levels, see Changing a user’s access privilege level: on page 19.

**Adding and Deleting serial port access:**

Click on the **Ports** link in the Access column for the associated TACACS+ Privilege Level.

On the subsequent LDAP Group - Ports page, select or deselect ports to be accessed by the TACACS+ Privilege Level and press **Apply**.
RADIUS

The Remote Authentication Dial-in User Service (RADIUS) configuration page is used for setup and maintenance of all settings required to enable RADIUS support. For additional information and configuration requirements, see RADIUS on page 79.

Enabling or disabling RADIUS support:

Select Enabled or Disabled from the RADIUS drop-down menu and press Apply.

Configuring the authentication order:

Select Remote->Local or Remote Only from the drop-down menu and press Apply.

For more information about remote authentication order, see Setting the authentication order on page 79.

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

Changing the RADIUS server address:

Enter the IP address or hostname in the Primary and/or Secondary Server field and press Apply.

Setting the RADIUS shared secret:

The shared secret is the RADIUS authentication key.

Enter the shared secret in the Primary and Secondary Shared Secret field. Up to 48 upper and lowercase alphanumeric and other typed characters (ASCII 33 to 126 decimal) and spaces are allowed; control characters are not allowed. Press Apply.

To change the shared secret, check the Change checkbox to clear the Shared Secret field, enter the new shared secret, and press Apply.

Changing the RADIUS server port:

This field specifies the port number used by the RADIUS server for incoming RADIUS authentication requests.

Enter the port number in the Primary and/or Secondary Port field and press Apply.

The valid port number range is 1-65535; default is 1812.

Setting the RADIUS server timeout value:

The Timeout field specifies the time interval (in seconds) to wait for a reply from the RADIUS server before resending an authentication request.

Enter the timeout value (in seconds) in the Primary and/or Secondary Timeout field and press Apply.

The valid timeout range is 1-30 seconds; default is 5 seconds.

Setting the number of RADIUS server retries:

The Set RADIUS Retries command specifies the number of times an authentication request is sent to the RADIUS server. The Sentry will attempt authentication with the primary server until the number of retries is reached, then will attempt authentication with the secondary server. If the Sentry does not receive a response from these attempts, the authentication request will be rejected.

Enter the number of retries in the Primary and/or Secondary Retries field and press Apply.

The valid retries range is 0-10; default is 2.
Email

The Email configuration page is used for setup and maintenance Email log support. For additional information and configuration requirements for Email support, see Email on page 84.

Enabling or disabling Email support:
Select **Enabled** or **Disabled** from the Email Notifications drop-down menu and press **Apply**.

Setting the SMTP server address:
Enter the IP address or hostname in the SMTP Host field and press **Apply**.

Changing the SMTP server port:
Enter the port number in the SMTP Port field and press **Apply**.

Setting the ‘From’ email address:
Enter the ‘from’ email address in the ‘From’ Address field and press **Apply**.

Setting the ‘To’ email address:
Enter the ‘to’ email address in the Primary or Secondary ‘Send To’ Address field and press **Apply**.

Enabling or disabling event type notifications:
Select **Enabled** or **Disabled** from the Include…Messages drop-down menus and press **Apply**.

Tools

The Tools section contains access to rebooting the unit, uploading new firmware as well as resetting the unit to factory defaults. This section is available to administrative level users only.

Restart

Performing a warm boot:
Select the **Restart** from the Action drop-down menu and press **Apply**.

*Note: System user/outlet/group configuration or outlet states are NOT changed or reset with this command.*

Resetting to factory defaults:
See Chapter 5: for more information on resetting a Sentry to factory defaults from the Web interface.

Uploading new firmware:
See Appendix B: for more information on uploading new firmware from the Web interface.

Generating a new SSL X.509 certificate:
Select the **Restart and generate a new X.509 certificate** from the Action drop-down menu and press **Apply**.

Computing new SSH security keys:
Select the **Restart and compute new SSH keys** from the Action drop-down menu and press **Apply**.

Ping

The Ping feature may be used to test the Sentry’s ability to contact another Ethernet enabled device’s IP address. For LDAP support, it may also be used to test the configuration of the Domain Name System (DNS) server IP address by testing for proper name resolution.
**Change Password**

The Change Password feature allows users to change their own password.

*NOTE: An administrator can always assign a new password.*

**Changing a password:**

Enter the current password, enter a new password and verify the new password. Press **Apply**.

**View Log**

The View Log feature enables viewing of the internal system log. This feature logs all authentication attempts, power actions, configuration changes and other system events. The system memory stores more than 4000 entries in a continuously aging log. For permanent off-system log storage, the Syslog protocol is supported. For additional information and configuration requirements for the system log and Syslog support, see Syslog on page 83.

*NOTE: The system log is viewable only by users with administrative privileges.*

**Reviewing the system log:**

Click on the **Previous 100 entries** or **Next 100 entries** link to navigate through the log.
**Command Line Interface**

**Logging In**

Logging in through Telnet requires directing the Telnet client to the configured IP address of the unit.

Logging in through the Console (RS232) port requires the use of a terminal or terminal emulation software configured to support ANSI or VT100 and a supported data rate (300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, or 115200 BPS) - 8 data bits-no parity-one stop bit and Device Ready output signal (DTR or DSR).

**To log in by RS-232 or Telnet:**

1. Press **Enter**. The following appears, where *x.xx* is the firmware version:
   
   Sentry Version *x.xx*
   
   Username:

   **NOTE**: Logging in by Telnet will automatically open a session. It is not necessary to press Enter.

2. At the Username: and Password: prompts, enter a valid username and password. And press **Enter**.

   You are given three attempts to enter a valid username and password combination. If all three fail, the session ends.

   **NOTE**: The default Sentry username/password is admn/admn.

When you enter a valid username and password, the command prompt (Smart CDU:) appears. If a location identifier was defined, it will be displayed before the Smart CDU: prompt. See Creating a location description: on page 39 for more information.

Commands may be entered in any combination of uppercase and lowercase. All command characters must be entered correctly; there are no command abbreviations. A user must have administrative privileges to use the administration commands. The following tables list and briefly describe each command.

**Operations Command Summary**

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<th>Description</th>
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<td>Connects to a serial/Pass-Thru port</td>
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<tr>
<td>Envmon</td>
<td>Displays the status of the integrated Environmental Monitor</td>
</tr>
<tr>
<td>IStat</td>
<td>Displays the status of the infeeds</td>
</tr>
<tr>
<td>List Ports</td>
<td>Lists all accessible serial/Pass-Thru ports for the current user</td>
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<tr>
<td>Login</td>
<td>Ends the current session and brings up the Username: prompt</td>
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<td>Logout</td>
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<tr>
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<tr>
<td>UPSStat</td>
<td>Displays the status of the associated UPS devices</td>
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</table>
## Administrative Command Summary

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
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<tr>
<td><strong>Add Porttouser</strong></td>
<td>Grants a user access to one or all serial/Pass-Thru ports</td>
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<td><strong>Create User</strong></td>
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</tr>
<tr>
<td><strong>List User</strong></td>
<td>Displays all accessible outlets/groups/ports for a user</td>
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<tr>
<td><strong>List Users</strong></td>
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<td><strong>Set Environ Name</strong></td>
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<tr>
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<tr>
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<td>Enables or disables automatic FTP update support</td>
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<td><strong>Set FTP Autoupdate Day</strong></td>
<td>Sets the automatic FTP update day</td>
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<td>Sets the automatic FTP update hour</td>
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<td>Specifies the directory for the file to be uploaded</td>
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<td>Specifies the HTTP server authentication method</td>
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<td>Enables or disables the 'more' prompt</td>
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<td>Enables or disables strong password requirements</td>
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<td><strong>Set Option Tempscale</strong></td>
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<th>Description</th>
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<tr>
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<td>Sets the percent load out-of-balance threshold for 3-phase systems</td>
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</tr>
<tr>
<td>Set Telnet</td>
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</tr>
<tr>
<td>Set Telnet Port</td>
<td>Sets the Telnet server port number</td>
</tr>
<tr>
<td>Set Tower 3Phase</td>
<td>Specifies the AC voltage type for the tower</td>
</tr>
<tr>
<td>Set Tower Model</td>
<td>Specifies the model number for the tower</td>
</tr>
<tr>
<td>Set Tower Name</td>
<td>Specifies a descriptive field for the Sentry</td>
</tr>
<tr>
<td>Set Tower ProdSN</td>
<td>Specifies the serial number for the tower</td>
</tr>
<tr>
<td>Set Tower</td>
<td>Specifies the AC or DC voltage type for the tower</td>
</tr>
<tr>
<td>Set User Access</td>
<td>Sets the access level for a user</td>
</tr>
<tr>
<td>Set User Envmon</td>
<td>Grants or removes privileges to view input/environmental monitoring status</td>
</tr>
<tr>
<td>Set User Password</td>
<td>Changes the password for a user</td>
</tr>
<tr>
<td>Set UPS AddInfeed</td>
<td>Adds an infeed association to a UPS</td>
</tr>
<tr>
<td>Set UPS DelInfeed</td>
<td>Deletes an infeed association from a UPS</td>
</tr>
<tr>
<td>Set UPS GETComm</td>
<td>Sets the UPS ‘get’ community string</td>
</tr>
<tr>
<td>Set UPS Host</td>
<td>Sets the UPS Host IP address or hostname</td>
</tr>
<tr>
<td>Set UPS Port</td>
<td>Specifies the target port for a UPS</td>
</tr>
<tr>
<td>Set UPS Type</td>
<td>Sets the UPS type</td>
</tr>
<tr>
<td>Set UPS VPoll</td>
<td>Enables or disables UPS voltage polling</td>
</tr>
<tr>
<td>Show FTP</td>
<td>Displays FTP configuration information</td>
</tr>
<tr>
<td>Show Infeeds</td>
<td>Displays infeed configuration information</td>
</tr>
<tr>
<td>Show Network</td>
<td>Displays network configuration information</td>
</tr>
<tr>
<td>Show Options</td>
<td>Displays system option information</td>
</tr>
<tr>
<td>Show Ports</td>
<td>Displays serial/Pass-Thru port configuration information</td>
</tr>
<tr>
<td>Show SNTP</td>
<td>Displays SNTP configuration information</td>
</tr>
<tr>
<td>Show System</td>
<td>Displays system configuration information</td>
</tr>
<tr>
<td>Show Towers</td>
<td>Displays tower configuration information</td>
</tr>
<tr>
<td>Show UPS</td>
<td>Displays UPS configuration information</td>
</tr>
<tr>
<td>System Status</td>
<td>Displays system status configuration information</td>
</tr>
<tr>
<td>Version</td>
<td>Displays the Sentry firmware version</td>
</tr>
</tbody>
</table>


**To display the names of commands that you may execute:**

At the command prompt, press **Enter**. A list of valid commands for the current user appears.

**Operations Commands**

Operations commands manage outlet states, provide information about the Sentry environment and control session operations.

**Displaying infeed status:**

The IStat command displays the status of one or more infeeds.

This display includes the infeed absolute and descriptive names and the Input Status and current Load reported to the Sentry by the infeed, branch, or phase.

**To display status of one or more infeeds:**

Type `istat` and press **Enter**, or

**Examples**

The following command displays the infeed status:

```
Smart CDU: istat
```

<table>
<thead>
<tr>
<th>Feed ID</th>
<th>Feed Name</th>
<th>Input Status</th>
<th>Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>.AA</td>
<td>HQ_1_Infeed_A</td>
<td>On</td>
<td>10.5 Amps</td>
</tr>
</tbody>
</table>

**Connecting to a serial device:**

The Connect command allows Pass-Thru serial connection to devices attached to the standard serial port (Console).

**To connect to a serial device:**

At the Smart CDU: prompt, type **connect console** and press **Enter**.

**To disconnect from a serial device:**

Type `!*break` and press **Enter**.

**Displaying the status of the Environmental Monitor:**

The Envmon command displays the status of the integrated Environmental Monitor.

By default, only administrative user accounts are allowed access to the Envmon command. An administrator may user the Set User Envmon command to enable and disable access for other user accounts.

**To display the status of the Environmental Monitor:**

At the Smart CDU: prompt, type **envmon** and press **Enter**.

**Example**

The following command displays the status of the Environmental Monitor.

```
Smart CDU: envmon<Enter>
```

**Environmental Monitor .A**

Name: Florida_HQ_1  Status: Normal

Temperature/Humidity Sensors

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>Temperature</th>
<th>Humidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>.A1</td>
<td>Temp_Humid_Sensor_A1</td>
<td>Not Found</td>
<td>Not Found</td>
</tr>
<tr>
<td>.A2</td>
<td>T/H2_Florida_HQ_1</td>
<td>23.5 Deg. C</td>
<td>22 % RH</td>
</tr>
</tbody>
</table>
Changing a password:
The Password command changes the current user’s password. For security, when you type a password, the characters are not displayed on the screen. See Usernames and Passwords for more information.

To change a password:
At the Smart CDU: prompt, type password and press Enter.
At the Enter Current Password: prompt, type the current password and press Enter.
At the Enter New Password: prompt, type the new password and press Enter. Passwords may contain 1-16 characters.
At the Verify Password: prompt, retype the new password and press Enter.

Starting a new session:
The Login command activates the Username: prompt. The current session ends, allowing a user to log in and start a new session under a different username.

To start a new session:
At the Smart CDU: prompt, type login and press Enter. The Username: prompt appears.

Ending a session:
The Quit or Logout commands ends a session. A session ends automatically when no activity is detected for five minutes, or upon loss of connection.

To end a session:
At the Smart CDU: prompt, type quit and press Enter, or
Type logout and press Enter.

Displaying UPS status:
The UPSStat command displays the status of one or more UPS devices associated with the Sentry unit.
The display includes UPS index number, type, line/battery status, and reported voltage.

NOTE: Access to this command requires enabling user privileges for environmental monitoring using the Set User Envmon command.

To display status of one or more UPS devices:
At the Smart CDU: prompt, type upsstat and press Enter.

Example
The following command displays the UPS status:

Smart CDU: upsstat<Enter>

<table>
<thead>
<tr>
<th>Index</th>
<th>Type</th>
<th>Status</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Generic(RFC1628)</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>2</td>
<td>Liebert</td>
<td>On Battery</td>
<td>120.0</td>
</tr>
<tr>
<td>3</td>
<td>MGE</td>
<td>On Utility</td>
<td>119.9</td>
</tr>
</tbody>
</table>
**Administration Commands**

Administration commands may only be issued by a user with administrative privileges, such as the predefined Admn user or another user who has been granted administrative privileges with the Set User Admnpriv command.

**User Administration**

**Creating a user account:**

The Create User command creates a user account with the specified username and password. See *Usernames and Passwords* in this chapter for more information.

*To create a user account:*

At the Smart CDU: prompt, type `create user`, optionally followed by a 1-16 character username (Spaces are not allowed, and usernames are not case sensitive). Press Enter.

At the Password: prompt, type a password of 1-16 alphanumeric and other typed characters - (ASCII 33 to 126 decimal) are allowed; passwords are case sensitive. Press Enter.

At the Verify Password: prompt, retype the password. Press Enter.

**Example**

The following command creates the user account JaneDoe:

```
Smart CDU: create user JaneDoe<Enter>
Password: <Enter>
Verify New Password: <Enter>
```

For security, password characters are not displayed.

**Removing a user account:**

The Remove User command removes a user account.

*NOTE: You may remove the predefined user account Admn only if another user account has been granted administrative privileges using the Set User Admnpriv command.*

*To remove a user account:*

At the Smart CDU: prompt, type `remove user`, optionally followed by a username. Press Enter.

**Changing a password:**

The Set User Password command changes a user’s password. For security, when you type a password, the characters are not displayed on the screen. See *Usernames and Passwords* for more information.

*To change a password:*

At the Smart CDU: prompt, type `set user password`, followed by a username and press Enter.

At the Password: prompt, type the new password and press Enter. Passwords may contain 1-16 characters.

At the Verify Password: prompt, retype the new password and press Enter.

**Example**

The following command changes the password for the user JohnDoe:

```
Smart CDU: set user password johndoe<Enter>
Password: <Enter>
Verify Password: <Enter>
```

For security, password characters are not displayed.
Setting user access level privileges:
The Set User Access command sets the access level privileges for a user. The Sentry has the following defined access privilege levels; Admin and User. For more information on user access levels, see Changing a user’s access privilege level: on page 19.

The administrator may also grant administrative privileges to other user accounts allowing the Sentry to have more than one administrative-level user.

NOTE: You cannot remove administrative privileges from the Admin user unless another user has already been given administrative access level privileges created.

To set the access level privilege for a user:
At the Smart CDU: prompt, type set user access, followed by admin, poweruser, user, rebootonly, ononly or viewonly, optionally followed by a username and press Enter.

Examples
The following command sets the user access level for JohnDoe to Admin:

Smart CDU: set user access admin johndoe<Enter>

The following command sets the user access level for JaneDoe to User:

Smart CDU: set user access user janedoe<Enter>

Displaying the access privilege levels:
The List Users command displays all defined users with their access privilege level.

To display user access privilege levels:
At the Smart CDU: prompt, type list users and press Enter.

Example
The following command displays all users with their access privilege level:

Smart CDU: list users<Enter>

<table>
<thead>
<tr>
<th>User</th>
<th>Privilege</th>
<th>Environmental Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>JOHNDOE</td>
<td>Admin</td>
<td>Allowed</td>
</tr>
<tr>
<td>JANEDOE</td>
<td>User</td>
<td>Allowed</td>
</tr>
</tbody>
</table>

Adding serial port access to a user:
The Add PortToUser command grants a user access to the serial port.

To grant serial port access to a user:
At the Smart CDU: prompt, type add porttouser console and a username. Press Enter.

Deleting serial port access for a user:
The Delete PortFromUser command removes a user’s access to the serial port. You cannot remove access to the serial port for an administrative level user.

To delete serial port access for a user:
At the Smart CDU: prompt, type delete portfromuser console and a username. Press Enter.

Displaying user serial port access:
The List User command displays all accessible outlets, groups and serial ports for a user.

To display user outlet, group and serial port access:
At the Smart CDU: prompt, type list user, optionally followed by a username. Press Enter.

Example
The following command displays information about the user JaneDoe:

Smart CDU: list user janedoe<Enter>

Username: JANEDOE

<table>
<thead>
<tr>
<th>Port ID</th>
<th>Port Name</th>
<th>Console Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Console</td>
</tr>
</tbody>
</table>
**Input Feed Administration**

**Creating a descriptive infeed name:**

The Set Infeed Name command assigns a descriptive name to an infeed. This descriptive name is displayed when the Show Traps command is issued. See *Displaying trap configuration information* on page 66 for more information on the Show Traps command.

*To create a infeed name:*

At the Smart CDU: prompt, type `set infeed name` followed by the absolute infeed name, then a descriptive name of up to 24 alphanumeric and other typed characters - (ASCII 33 to 126 decimal) are allowed; spaces are not allowed. Press Enter.

*Example*

The following command adds the descriptive name HQ_1_Infeed_A to the infeed on the Smart CDU:

```
Smart CDU: set infeed name .aa HQ_1_Infeed_A<Enter>
```

**Setting the infeed operational voltage**

The Set Infeed Voltage command is use to edit the input operational voltage.

*To set the infeed operational voltage:*

At the Smart CDU: prompt, type `set infeed voltage`, followed by the absolute infeed name, and a value from 0 to 480. Press Enter.

*Example*

The following commands sets the operational voltage for input .AA to 100V:

```
Smart CDU: set infeed voltage .aa 100<Enter>
```

**Setting the infeed maximum load capacity**

The Set Infeed LoadMax command is use to edit the input maximum load capacity.

*To set the infeed maximum load capacity:*

At the Smart CDU: prompt, type `set infeed loadmax`, followed by the absolute infeed name, and a value from 1 to 255 (in amperes). Press Enter.

*Example*

The following commands sets the maximum load capacity for input .AA to 15 amperes:

```
Smart CDU: set infeed loadmax .aa 15<Enter>
```

**Displaying infeed information:**

The Show Infeeds command displays information about all infeeds. This information includes the absolute and descriptive infeed names, operational voltages and maximum load capacities.

*To display tower information:*

At the Smart CDU: prompt, type `show infeeds` and press Enter.

*Example*

```
Smart CDU: show infeeds<Enter>
```

<table>
<thead>
<tr>
<th>Input Feed ID</th>
<th>Input Feed Name</th>
<th>Input Voltage</th>
<th>Input Feed Capacity (Amps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>.AA</td>
<td>HQ_1_Infeed_A</td>
<td>100</td>
<td>15</td>
</tr>
<tr>
<td>.AB</td>
<td>HQ_1_Infeed_B</td>
<td>120</td>
<td>20</td>
</tr>
<tr>
<td>.BA</td>
<td>HQ_2_Infeed_A</td>
<td>120</td>
<td>30</td>
</tr>
<tr>
<td>.BB</td>
<td>HQ_2_Infeed_B</td>
<td>120</td>
<td>30</td>
</tr>
</tbody>
</table>
Creating a descriptive tower name:
The Set Tower Name command assigns a descriptive name to a tower. This descriptive name is displayed when the Show Traps command is issued. See Displaying trap configuration information on page 66 for more information on the Show Traps command.

To create a tower name:
At the Smart CDU: prompt, type `set tower name` followed by the absolute tower name, then a descriptive name of up to 24 alphanumeric and other typed characters - (ASCII 33 to 126 decimal) are allowed; spaces are not allowed. Press Enter.

Example
The following command adds the descriptive name Florida_HQ_1 to tower .a:

```
Smart CDU: set tower name .a Florida_HQ_1<Enter>
```

Setting the tower serial number:
The Set Tower ProdSN command is use to set the product serial number.

NOTE: If set at the factory, the serial number WILL NOT be user-editable.

To set the tower serial number:
At the Smart CDU: prompt, type `set tower prodsn`, followed by the absolute tower name, and the tower serial number. Press Enter.

Example
The following command sets the serial number for tower .A to ‘AA06F011157’:

```
Smart CDU: set tower prodsn .a AA06F011157<Enter>
```

Setting the tower model number:
The Set Tower Model command is use to set the product model number.

NOTE: If set at the factory, the model number WILL NOT be user-editable.

To set the tower model number:
At the Smart CDU: prompt, type `set tower model`, followed by the absolute tower name, and the tower model number. Press Enter.

Example
The following command sets the model number for tower .A to ‘CS-24V2-C20’:

```
Smart CDU: set tower model .a CS-24V2-C20<Enter>
```

Setting the tower AC or DC voltage type:
The Set Tower command is used to set the product input AC or DC voltage type.

NOTE: If set at the factory, the voltage type WILL NOT be user-editable.

To set the tower AC/DC voltage type:
At the Smart CDU: prompt, type `set tower`, followed by `ac` or `dc`, and the absolute tower name. Press Enter.

Example
The following command sets the AC/DC voltage type for tower .A to AC:

```
Smart CDU: set tower ac.a<Enter>
```
Setting the tower AC voltage type:

The Set Tower 3phase command is used to set the product input AC voltage type.

**NOTE:** If set at the factory, the voltage type WILL NOT be user-editable.

**To set the tower AC voltage type:**

At the Smart CDU: prompt, type `set tower 3phase`, followed by the absolute tower name and `yes` or `no`. Press Enter.

**Example**

The following command sets the AC voltage type for tower .A to non-3-phase:

```
Smart CDU: set tower 3phase .A no<Enter>
```

Displaying tower information:

The Show Towers command displays information about the Sentry. This information includes the absolute and descriptive Sentry names, serial and model numbers, and voltage types.

**To display tower information:**

At the Smart CDU: prompt, type `show towers` and press Enter.

**Example**

```
Smart CDU: show towers<Enter>
```

Environmental Monitor Administration

Creating a descriptive Environmental Monitor name:

The Set Envmon Name command assigns a descriptive name to the integrated Environmental Monitor. This descriptive name is displayed when the Evnmon command is issued.

**To create an Environmental Monitor name:**

At the Smart CDU: prompt, type `set envmon name` followed by the absolute environmental monitor name, then a descriptive name of up to 24 alphanumeric and other typed characters - (ASCII 33 to 126 decimal) are allowed; spaces are not allowed. Press Enter.

**Example**

The following command adds the descriptive name Florida_HQ_1 to the Environmental Monitor:

```
Smart CDU: set envmon name .a Florida_HQ_1<Enter>
```

Creating a descriptive temperature/humidity sensor name:

The Set Envmon THS Name command assigns a descriptive name to a temperature/humidity sensor. This descriptive name is displayed when the Evnmon command is issued.

**To create a temperature/humidity sensor name:**

At the Smart CDU: prompt, type `set envmon ths name` followed by the absolute name of the temperature/humidity sensor, then a descriptive name of up to 24 alphanumeric and other typed characters - (ASCII 33 to 126 decimal) are allowed; spaces are not allowed. Press Enter.

**Example**

The following command adds the descriptive name T/H2_Florida_HQ_1 to the second temperature/humidity sensor:

```
Smart CDU: set envmon ths name .a2 T/H2_Florida_HQ_1<Enter>
```
Serial Port Administration

Creating a descriptive serial port name:

The Set Port Name command assigns a descriptive name to a serial port. You may use this name in commands that require a port name as an alternative to using the port’s absolute name.

To create a port name:

At the Smart CDU: prompt, type `set port name` followed by the absolute outlet name, then a descriptive name of up to 24 alphanumeric and other typed characters - (ASCII 33 to 126 decimal) are allowed; spaces are not allowed; port names are not case sensitive. Press `Enter`.

Example

The following command adds the descriptive name Rack1 to Console port:

```
Smart CDU: set port name console Rack1<Enter>
```

Setting the serial ports data-rate:

The Set Port Speed command sets the default data-rate for the serial port. Valid data-rates are 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200.

To set the serial port data-rate:

At the Smart CDU: prompt, type `set port speed`, follow by the data-rate and press `Enter`.

Example

The following command sets the serial ports data-rate to 38400 BPS:

```
Smart CDU: set port speed 38400<Enter>
```

Enabling or disabling active signal checking for serial connections:

The Set Port DSR Check command enables or disables active signal checking for serial connections to devices attached to any of the available serial ports.

To enable or disable active signal checking for serial connections:

At the Smart CDU: prompt, type `set port dsrcheck console`, on or off, and press `Enter`.

Setting the serial port timeout value:

The Set Port Timeout command is used to set the serial port inactivity timeout period. The timeout period defines the maximum period of inactivity before automatically closing the Pass-Thru session. The valid range for the period parameter is 0 to 5 (in minutes). The default period is 5.

NOTE: Setting the timeout to ‘0’ disables the timer.

To set the serial port timeout value:

At the Smart CDU: prompt, type `set port timeout`, followed by a value from 0 to 5 (in minutes) and press `Enter`.

Displaying serial port information:

The Show Ports command displays information about all serial ports. This information includes:

- Serial port data rate
- Descriptive port name, if applicable
- DSR signal checking settings

To display serial port information:

At the Smart CDU: prompt, type `show ports` and press `Enter`.

Example

The following command displays all serial port information:

```
Smart CDU: show ports<Enter>
Serial Port Configuration
ALL Ports:
    Baud Rate: 38400   Connection Timeout: 5 minutes
    Port ID: Console   Port Name: CONSOLE
    DSR Check: ON
```
System Administration

Creating a pre-login banner:

The Set Banner command specifies text that appears prior to the login authentication. This feature allows administrators to configure a message up to 2070 characters for display of legal, disclaimer or other text as required by application. If left blank, the user will be taken directly to the login prompt.

NOTE: For SSH sessions, the ‘keyboard-interactive’ authentication method must be used for the banner to display.

To create a pre-login banner:

At the Smart CDU: prompt, type `set banner` and press Enter. Type the desired pre-login banner text and when finished type Ctrl-z.

Creating a location description:

The Set Location command specifies text that appears in the Web control screen’s Location field. The text is also appended to a Welcome to banner that appears when a user successfully logs in serially or through a Telnet session.

If you do not issue this command, or if you issue this command without specifying any text, the control screen’s Location field will be blank and no Welcome to banner will be displayed.

To create a location description:

At the Smart CDU: prompt, type `set location` followed by a descriptive name of up to 24 alphanumeric and other typed characters - (ASCII 33 to 126 decimal) are allowed; spaces are allowed. Press Enter.

Omitting any characters after typing ‘set location’ deletes any previously specified text.

Examples

The following command specifies Florida HQ as the descriptive location for the control screen and the login banner:

Smart CDU: set location Florida HQ<Enter>

The following command deletes any previously specified location description:

Smart CDU: set location<Enter>

In this case, the control screen’s Location field will be blank, and no welcome banner will be displayed after a successful login.

Displaying system configuration information:

The Show System command displays all system configuration information.

- Firmware version
- NIC module serial number and MAC address
- Hardware revision code and Flash size
- Uptime since last system restart
- System location description

See Chapter 4: Advanced Operations on page 55 for more information on SNMP.

To display system configuration information:

At the Smart CDU: prompt, type `show system` and press Enter.

Example

```
System Information
F/W Version:       Sentry Version 5.2b
NIC S/N:           1600001
MAC Address:       00-0a-9c-10-00-01
H/W Rev Code:      0
Flash Size:        1 MB
Uptime:            0 days 6 hours 14 minutes 1 second
Location:          Florida HQ
Area <Footprint>:  95.5 square meters
Power Factor:      0.90
3-Phase Load
Out-of-Balance
Threshold:         15 percent
```
Displaying system power status:
The System Status command displays all power status information.

To display system power status:
At the Smart CDU: prompt, type `sysstat` and press Enter.

Example
Smart CDU: sysstat
System Power Status
Total Power Consumption: 170 Watts
Area <Footprint>: 100.0 Square Meters
Watts Per Area Unit: 2 Watts Per Square Meter

Setting the LED display orientation:
The Set Option Display command is used to configure the Current LED(s) display orientation.

To set the LED display orientation:
At the Smart CDU: prompt, type `set option display`, followed by `normal` or `inverted` and press Enter.

Example
The following set the LED display orientation to Inverted:
Smart CDU: set option display inverted<Enter>

NOTE: When set to Inverted, the load will be reported in whole ampere increments

Enabling or disabling strong passwords:
The Set Option Strong Password command is used to enable or disable the requirements for strong passwords. When enabled, all new passwords must be a minimum of 8 characters in length with at least one uppercase letter, one lowercase letter, one number and one special character.

To enable or disable strong passwords:
At the Smart CDU: prompt, type `set option strong password`, followed by `enabled` or `disabled` and press Enter.

Enabling or disabling the external configuration reset button:
The Set Option Button command enables or disables the external configuration reset button. This feature can enhance system security by protecting the Sentry configurations from being reset locally.

NOTE: If this feature has been enabled and the administrative account username/password has been lost, then the Sentry must be returned to the factory for non-warranty reset of the configuration.

To enable or disable the configuration reset button:
At the Smart CDU: prompt, type `set option button`, followed by `enabled` or `disabled` and press Enter.

Enabling or disabling the ‘more’ prompt:
The Set Option More command enables or disables the ‘more’ prompt for display of data larger than the terminal window.

To enable or disable ‘more’:
At the Smart CDU: prompt, type `set option more`, followed by `enabled` or `disabled` and press Enter.

Setting the temperature scale:
The Set Option TempScale command sets the temperature scale that the Sentry will report in.

To set the temperature scale:
At the Smart CDU: prompt, type `set option tempscale`, followed by `celsius` or `fahrenheit` and press Enter.
Displaying system options:
The Show Options command displays all system option information.

To display system option information:
At the Smart CDU: prompt, type show options and press Enter.

Example
Smart CDU: show options
System Options
  Display Orientation: NORMAL
  Strong Passwords: DISABLED
  Configuration Reset Button: ENABLED
  More Prompt: ENABLED
  Temperature Scale: CELSIUS
  CLI Session Timeout: 10 minutes
  Web Session Timeout: 10 minutes
  Coldboot Alert <SCP>: DISABLED

Setting the system area:
The Set System Area command specifies the numeric value for the system area that is used to calculate total system watts per area unit.

To set the system area:
At the Smart CDU: prompt, type set system area, followed by a value (0.0-100.0), and press Enter.

Example:
The following command sets the system area to 95.5:
  Smart CDU: set system area 95.5<Enter>

Setting the system area unit of measure:
The Set System Area Unit command sets the value for the system area footprint in either square meters or square feet. The default unit of area is a square meter.

To set the system area unit of measure:
At the Smart CDU: prompt, type set system areaunit, followed by squaremeter or squarefoot, and press Enter.

Setting the power factor:
The Set System PF command sets the power factor used in the total system power calculation. The valid range is .50 to 1.00.

To set the power factor:
At the Smart CDU: prompt type set system pf, followed by the power factor, and press Enter.

Setting the 3-phase load out-of-balance threshold:
The Set System Balance command sets the percent load out-of-balance threshold for 3-phase systems.

To set the 3-phase load out-of-balance threshold:
At the Smart CDU: prompt, type set system balance, followed by the load out-of-balance threshold (in percent), and press Enter.

Example:
The following command sets the 3-phase load out-of-balance threshold to 15%.
  Smart CDU: set system balance 15<Enter>

Creating a descriptive tower name:
The Set Tower Name command assigns a descriptive name to a tower. This descriptive name is displayed when the Show Traps command is issued. See Displaying trap configuration information on page 66 for more information on the Show Traps command.

To create a tower name:
At the Smart CDU: prompt, type `set tower name` followed by the absolute tower name, then a descriptive name of up to 24 alphanumeric and other typed characters - (ASCII 33 to 126 decimal) are allowed; spaces are not allowed. Press Enter.

**Example**

The following command adds the descriptive name Florida_HQ_1 to tower .a:

```
Smart CDU: set tower name .a Florida_HQ_1<Enter>
```

**Displaying tower information:**

The Show Towers command displays information about the Sentry. This information includes the absolute and descriptive Sentry names.

**To display tower information:**

At the Smart CDU: prompt, type `show towers` and press Enter.

**Example**

```
Smart CDU: show towers<Enter>
```

```
Tower ID   Tower Name
.A         Florida_HQ_1
```
Creating a descriptive infeed name:
The Set Infeed Name command assigns a descriptive name to an infeed. This descriptive name is displayed when the Show Traps command is issued. See Displaying trap configuration information on page 43 for more information on the Show Traps command.

To create an infeed name:
At the Smart CDU: prompt, type `set infeed name` followed by the absolute infeed name, then a descriptive name of up to 24 alphanumeric and other typed characters - (ASCII 33 to 126 decimal) are allowed; spaces are not allowed. Press Enter.

Example
The following command adds the descriptive name HQ_1_Infeed_A to the infeed on the Smart CDU:

```
Smart CDU: set infeed name .aa HQ_1_Infeed_A<Enter>
```

Displaying infeed information:
The Show Infeeds command displays information about all infeeds. This information includes the absolute and descriptive infeed names.

To display tower information:
At the Smart CDU: prompt, type `show infeeds` and press Enter.

Example
```
Smart CDU: show infeeds<Enter>
Input    Input
Feed ID  Feed Name
.AA      HQ_1_Infeed_A
.AB      HQ_1_Infeed_B
.BA      HQ_2_Infeed_A
.BB      HQ_2_Infeed_B
```

Displaying the Sentry firmware version:
The Version command displays the Sentry firmware version.

To display the firmware version:
At the Smart CDU: prompt, type `version` and press Enter.

Performing a warm boot:
The Restart command performs a warm boot of the Sentry.

NOTE: System user/outlet/group/port configuration or outlet states are NOT changed or reset with this command.

To perform a warm boot:
At the Smart CDU: prompt, type `restart` and press Enter.

TCP/IP Administration
NOTE: A restart of the Sentry is required after setting or changing ANY TCP/IP configurations. See Performing a warm boot on page 43 for more information.

Enabling or disabling DHCP support:
The Set DHCP command enables or disables DHCP support.

To enable or disable DHCP support:
At the Smart CDU: prompt, type `set dhcp`, followed by `enabled` or `disabled` and press Enter.
Setting the IP address:
The Set IPAddress command sets the TCP/IP address of the network interface controller.

*To set the IP address:*  
At the Smart CDU: prompt, type `set ipaddress`, followed by the IP address and press Enter.

*Example*  
The following command sets the IP address to 12.34.56.78:

```
Smart CDU: set ipaddress 12.34.56.78<Enter>
```

Setting the subnet mask:
The Set Subnet command sets the subnet mask for the network the PT40 will be attached to.

*To set the subnet mask:*  
At the Smart CDU: prompt, type `set subnet`, followed by the subnet mask and press Enter.

*Example*  
The following command sets the subnet mask to 255.0.0.0

```
Smart CDU: set subnet 255.0.0.0<Enter>
```

Setting the gateway:
The Set Gateway command sets the IP address of the default gateway the Sentry uses to access external networks.

*To set the gateway IP address:*  
At the Smart CDU: prompt, type `set gateway`, followed by the gateway IP address and press Enter.

*Example*  
The following command set the gateway IP address to 12.34.56.1:

```
Smart CDU: set gateway 12.34.56.1<Enter>
```

Setting the DNS IP address:
The Set DNS command sets the TCP/IP address of the Domain Name System (DNS) server.

*To set the DNS IP address:*  
At the Smart CDU: prompt, type `set`, followed by `dns1` or `dns2` and the Domain Name System (DNS) server’s IP address. Press Enter.

*Example*  
The following command sets the primary Domain Name System (DNS) server IP address to 98.76.54.254:

```
Smart CDU: set dns1 98.76.54.254<Enter>
```
Displaying network configuration information:

The Show Network command displays TCP/IP, Telnet, SSH, Web, SSL and SNMP configuration information.

- IP address, subnet mask, gateway and DNS IP addresses
- Enabled-disabled status and port numbers for Telnet, SSH, HTTP, SSL and SNMP support
- HTTP authentication method and SSL access setting
- Network status

See Chapter 4: Advanced Operations on page 55 for more information on SNMP and Remote Authentication

To display network configuration information:

At the Smart CDU prompt, type `show network` and press Enter.

Example

The following command displays the network configuration information:

```
Smart CDU: show network<Enter>
Network Configuration
  IP Address:    12.34.56.78                   DNS1: 98.76.54.254
  Subnet Mask:   255.0.0.0                     DNS2: 0.0.0.0
  Gateway:       12.34.56.1
  Telnet:        Enabled       Port:    23
  SSH:           Enabled       Port: 65535   Auth:     Password, Kb-Int
  HTTP:          Enabled       Port:    80     Security: BASIC
  SSL:           Enabled       Access:   Required
  SNMP:          Enabled

Network Status
  Link:          Up
  Speed:         100 Mbps
  Duplex:        Full
  Negotiation:   Auto
```

HTTP Administration

NOTE: A restart is required after setting or changing ANY Telnet/Webconfigurations. See Performing a warm boot on page 43 for more information.

Enabling and disabling HTTP support:

The Set HTTP command is used to enable or disable HTTP support.

To enable or disable HTTP support:

At the Smart CDU prompt, type `set http`, followed by `enabled` or `disabled` and press Enter.

Changing the HTTP server port:

With HTTP support enabled, the HTTP server watches and responds to requests on the default HTTP port number 80. This port number may be changed using the Set HTTP Port command.

To change the HTTP port:

At the Smart CDU prompt, type `set http port`, followed by the port number and press Enter.

Example

The following changes the HTTP port number to 2048:

```
Smart CDU: set HTTP port 2048<Enter>
```
Setting the HTTP authentication method:
The Set HTTP Security command is used to set the method of authentication. The Sentry HTTP server supports two authentication methods for security and validation of the username-password – Basic and MD5 digest.

For more information on authentication methods, see Setting the HTTP authentication method: on page 16.

To set the HTTP authentication method:
At the Smart CDU: prompt, type set http security, followed by basic or md5 and press Enter.

Telnet Administration

NOTE: A restart of the Sentry is required after setting or changing ANY Telnet/Webconfigurations. See Performing a warm boot on page 43 for more information.

Enabling and disabling Telnet support:
The Set Telnet command is used to enable or disable Telnet support.

To enable or disable Telnet support:
At the Smart CDU: prompt, type set telnet, followed by enabled or disabled and press Enter.

Changing the Telnet port:
With Telnet support enabled, the Telnet server watches and responds to requests on the default Telnet port number 23. This port number may be changed using the Set Telnet Port command.

To change the Telnet socket:
At the Smart CDU: prompt, type set telnet port, followed by the port number and press Enter.

Example
The following changes the Telnet port number to 7001:

    Smart CDU: set telnet port 7001<Enter>
FTP Administration

You may upload new versions of firmware into the Sentry using File Transfer Protocol (FTP). This allows access to new firmware releases for firmware improvements and new features additions. The following commands are used to configure the Sentry for an FTP firmware upload. See Appendix B: Uploading Firmware for more information on initiating a FTP firmware upload.

Setting the FTP host address:

The Set FTP Host command sets the FTP host IP address or hostname allowing for firmware file uploads.

To set the FTP Host address:
At the Smart CDU: prompt, type `set ftp host`, followed by the IP address or hostname and press Enter.

Examples
The following command sets the FTP host IP address to 12.34.56.99:

```
Smart CDU: set ftp host 12.34.56.99<Enter>
```

The following command sets the FTP hostname to ftp.servertech.com:

```
Smart CDU: set ftp host ftp.servertech.com<Enter>
```

Setting the FTP username:

The Set FTP Username command sets the username as required by the FTP Host.

To set the FTP username:
At the Smart CDU: prompt, type `set ftp username`, followed by the FTP username and press Enter.

Example
The following command sets the FTP username to Guest:

```
Smart CDU: set ftp username guest<Enter>
```

Setting the FTP Password:

The Set FTP Password command sets the password as required by the FTP Host.

To set the FTP password:
At the Smart CDU: prompt, type `set ftp password`, followed by the FTP password and press Enter.

Example
The following command sets the FTP password to ABC_123:

```
Smart CDU: set ftp password ABC_123<Enter>
```

Setting the filename to be uploaded:

The Set FTP Filename command sets the filename of the firmware file to be uploaded.

To set the FTP filename:
At the Smart CDU: prompt, type `set ftp filename`, followed by the firmware filename and press Enter.

Example
The following command sets the FTP filename to snb_s50a.bin:

```
Smart CDU: set ftp filename snb_s50a.bin<Enter>
```

Setting the directory for the file to be uploaded:

The Set FTP Directory command sets the directory for the firmware file to be uploaded.

To set the FTP directory:
At the Sentry: prompt, type `set ftp directory`, followed by the directory and press Enter.

Example
The following command sets the FTP directory to ftp://Sentry:

```
Sentry: set ftp directory ftp://Sentry<Enter>
```

Enabling or disabling automatic updates:

The Set FTP Autoupdate command is used to enable or disable automatic firmware update support.
To enable or disable automatic updates:

At the Smart CDU: prompt, type `set ftp autoupdate`, followed by `enabled` or `disabled` and press Enter.

Setting the automatic update scheduled day:

The Set FTP Autoupdate Day command is used to set the day when automatic updates occur.

To set the automatic update day:

At the Smart CDU: prompt, type `set ftp autoupdate day`, followed by a day of the week or `everyday` and press Enter.

Example

The following command sets the automatic update day to Sunday:

```
Smart CDU: set ftp autoupdate day sunday<Enter>
```

Setting the automatic update scheduled hour:

The Set FTP Autoupdate Hour command is used to set the hour of the day when automatic updates occur.

To set the automatic update hour:

At the Smart CDU: prompt, type `set ftp autoupdate hour`, followed by an hour of the day and press Enter.

Examples

The following command sets the automatic update hour to 12 AM:

```
Smart CDU: set ftp autoupdate hour 12am<Enter>
```

The following command sets the automatic update hour to 3 PM:

```
Smart CDU: set ftp autoupdate hour 3pm<Enter>
```

Displaying FTP configuration information:

The Show FTP command displays all FTP configuration information.

- FTP Host IP address
- FTP Host username and password
- Firmware filepath and filename

To display FTP configuration information:

At the Smart CDU: prompt, type `show ftp` and press Enter.

Example

The following command displays the FTP configuration information:

```
Smart CDU: show ftp<Enter>
FTP Configuration
Host: ftp.servertech.com
Username: guest
Password: ******
Directory: ftp://sentry
Filename: smcdu-v60g.bin
FTP Automatic Updates Configuration
Automatic Updates: 12.34.56.99
Scheduled Day: Sunday
Scheduled Hour: 3 PM
```
**SNTP Administration**

Sentry supports the use of a network time service to provide a synchronized time reference.

**Setting the SNTP server address:**

The Set SNTP command is used to set the primary and secondary SNTP server addresses.

*To set the SNTP server address:*

At the Smart CDU: prompt, type `set sntp`, followed by *primary* or *secondary*, and the SNTP server IP address or hostname. Press Enter.

**Examples**

The following command sets the primary SNTP server address to 204.152.184.72:

```
Smart CDU: set sntp primary 204.152.184.72<Enter>
```

The following command sets the secondary SNTP server address to cuckoo.nevada.edu:

```
Smart CDU: set sntp secondary cuckoo.nevada.edu<Enter>
```

**Setting the local GMT offset:**

The Set SNTP GMToffset command is used to set the offset from GMT for the date/time returned by SNTP. The offset can be configured in whole hours between -12 and 12 hours.

**NOTE:** The Sentry does not support automatic adjustment for daylight savings.

*To set the local GMT offset:*

At the Smart CDU: prompt, type `set sntp gmtoffset`, followed by the offset value, and press Enter.

**Examples**

The following command sets the local GMT offset to -12:

```
Smart CDU: set sntp gmtoffset -12<Enter>
```

**Displaying SNTP configuration information:**

The Show SNTP command displays all SNTP configuration information.

*To display SNTP configuration information*

At the Smart CDU: prompt, type `show sntp` and press Enter.

**Example**

The following command displays the SNTP configuration information:

```
Smart CDU: show sntp <Enter>
Date/Time (Local GMT Offset -12): 2006-02-21  21:32:48
Primary Host:    204.152.184.72
Secondary Host:  cuckoo.nevada.edu
```
**UPS Administration**

**Creating a UPS record:**

The Create UPS command adds a new UPS device to the Sentry unit.

*To create a UPS record:*

At the Smart CDU: prompt, type `create UPS` and press **Enter**.

At the prompt, type the corresponding number from the list of the UPS types and press **Enter**.

At the Host Name: prompt, type the UPS’s IP address or hostname and press **Enter**.

**Example**

The following command creates a UPS record for a Toshiba UPS with the hostname ‘DC1Toshiba1’:

```
Smart CDU: create ups<Enter>

UPS types:
  1 -- APC
  2 -- Liebert
  3 -- MGE
  4 -- Tripp Lite
  5 -- Generic (RFC1628)
  6 -- Hewlett Packard
  7 -- Minuteman
  8 -- Mitsubishi
  9 -- Powerware
 10 -- Toshiba
 Select type(1-10): 10<Enter>
 Host/IP: DC1Toshiba1<Enter>
```

**Removing a UPS record:**

The Remove UPS command removes a UPS record.

*To remove a UPS record:*

At the Smart CDU: prompt, type `remove ups` and press **Enter**.

At the prompt, type the index number of the UPS to be removed and press **Enter**.

**Example**

The following command removes the UPS record at index 3:

```
Smart CDU: remove ups<Enter>

  1   Type:    Liebert
       Host/IP: DC1Liebert1
  2   Type:    Powerware
       Host/IP: DC1Powerware1
  3   Type:    Toshiba
       Host/IP: DC1Toshiba1
 Select UPS(1-8): 3<Enter>
```
Changing the UPS type:
The Set UPS Type command is used to change the type of UPS for each UPS record.

To change a UPS record:
At the Smart CDU: prompt, type `set ups type` and press Enter.
At the prompt, type the index number for the UPS record to be changed and press Enter.
At the prompt, type the corresponding number from the list of the UPS types and press Enter.

Example
The following command changes UPS type for the record at index number 2 to ‘MGE’:

```plaintext
Smart CDU: set ups type<Enter>
1 Type: Liebert
     Host/IP: DC1Liebert1
2 Type: Powerware
     Host/IP: DC1Powerware1
Select UPS(1-8): 2<Enter>
UPS types:
  1 -- APC
  2 -- Liebert
  3 -- MGE
  4 -- Tripp Lite
  5 -- Generic (RFC1628)
  6 -- Hewlett Packard
  7 -- Minuteman
  8 -- Mitsubishi
  9 -- Powerware
 10 -- Toshiba
Select type(1-10): 3<Enter>
```

Changing the UPS host address:
The Set UPS Host command is used to change the IP address or hostname for each UPS record. Hostnames may be up to 60 characters long.

To change a UPS host address:
At the Smart CDU: prompt, type `set ups host` and press Enter.
At the prompt, type the index number for the UPS record to be changed and press Enter.
At the prompt, type IP address or hostname for the UPS and press Enter.

Example
The following command changes UPS hostname for the record at index number 2 to ‘DC1MGE1’:

```plaintext
Smart CDU: set ups host<Enter>
1 Type: Liebert
     Host/IP: DC1Liebert1
2 Type: MGE
     Host/IP: DC1Powerware1
Select UPS(1-8): 2<Enter>
Host/IP: DC1MGE1<Enter>
```
Changing the UPS SNMP port:
With a UPS record configured, the Sentry sends data requests to the default UPS SNMP port number 161. This port number may be changed using the Set UPS Port command.

To change the UPS SNMP port:
At the Smart CDU: prompt, type `set ups port` and press Enter.
At the prompt, type the index number for the UPS record to be changed and press Enter.
At the prompt, type the desired port number and press Enter.

Example
The following command changes port for the UPS record at index number 1 to ‘162’:

```
Smart CDU: set ups port<Enter>
UPS   UPS
Index Type   Port
1   Liebert   161
2   MGE       161
Select UPS(1-8): 1<Enter>
Port: 162<Enter>
```

Changing the UPS SNMP Get community string:
With a UPS record configured, the Sentry sends data requests to the UPS using the default Get community string of ‘public’. This string may be changed using the Set UPS Port command.

NOTE: The GET community string configured on the Sentry MUST match the read-only community string configured on the UPS.

To change a UPS record:
At the Smart CDU: prompt, type `set ups getcomm` and press Enter.
At the prompt, type the index number for the UPS record to be c and press Enter.
At the prompt, type the Get community string for the UPS and press Enter.

Example
The following command changes Get community string for the record at index number 2 to ‘readonly’:

```
Smart CDU: set ups getcomm<Enter>
UPS   UPS          Community
Index Type   String
1   Liebert      public
2   MGE          public
Select UPS(1-8): 2<Enter>
Community String: readonly<Enter>
```

Enabling/disabling UPS voltage polling:
With a UPS record configured, the Sentry by default enables voltage polling of the UPS. This feature may be enabled or disabled using the Set UPS VPoll command.

To enable/ disable UPS voltage polling:
At the Smart CDU: prompt, type `set ups vpoll` and press Enter.
At the prompt, enter the index number for the UPS record to be changed and press Enter.
At the prompt, type `on` or `off`, and press Enter.

Example
The following command disables voltage polling for the record at index number 2:

```
Smart CDU: set ups vpoll<Enter>
UPS   UPS          Voltage
Index Type   Polling
1   Liebert      On
2   MGE          On
Select UPS(1-8): 2<Enter>
Voltage Polling: Off<Enter>
```
Adding an infeed to a UPS:

The Set UPS AddInfeed command adds a logical association of an infeed to a UPS.

To add an infeed to a UPS:

At the Smart CDU: prompt, type `set ups addinfeed` and press Enter.

At the prompt, enter the index number for the UPS record to be changed and press Enter.

At the prompt, type the absolute infeed ID of the desired infeed, and press Enter.

Example

The following command associates infeed .aa to UPS record at index number 1:

```
Smart CDU: set ups addinfeed<Enter>
```

```
UPS     UPS          Infeed
Index   Type         IDs
1       Liebert     .AA
2       MGE         .AA
Select UPS(1-8): 1<Enter>
Infeed ID: .aa<Enter>
```

Removing an infeed from a UPS:

The Set UPS DelInfeed command removes a logical association of an infeed from a UPS.

To remove an infeed from a UPS:

At the Smart CDU: prompt, type `set ups delinfeed` and press Enter.

At the prompt, enter the index number for the UPS record to be changed and press Enter.

At the prompt, type the absolute infeed ID of the desired infeed, and press Enter.

Example

The following command removes the association of infeed .aa from UPS record at index number 2:

```
Smart CDU: set ups delinfeed<Enter>
```

```
UPS     UPS          Infeed
Index   Type         IDs
1       Liebert     .AA
2       MGE         .AA
Select UPS(1-8): 2<Enter>
Infeed ID: .aa<Enter>
```

Displaying UPS configuration:

The Show UPS command displays information about all UPS devices.

- UPS Type and Host/IP address
- UPS SNMP port and community string
- SNMP Objects OID values and expected return values

To display UPS configuration information:

At the Smart CDU: prompt, type `show ups` and press Enter.

Example

The following command displays UPS configuration information:

```
Smart CDU: show ups<Enter>
```

```
1  Type:  Liebert
    Host/IP:  DC1Liebert1
    Voltage Polling:  ON
    SNMP Configuration
    Community String:  public
    SNMP Port:  162
    SNMP Objects/Expected Values
    Voltage:  .1.3.6.1.2.1.33.1.4.1.2.1
    Utility Status:  .1.3.6.1.2.1.33.1.4.1.0
    On Battery:  0x5
    On Utility:  0x3
```

More (Y/es N/o):
# Chapter 4: Advanced Operations

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Secure Socket Layers (SSL) version 3 enables secure Web sessions between a Sentry Remote Power Manager and a remote user. SSL provides two chief features designed to make TCP/IP (Internet) transmitted data more secure:

- Authentication – The connecting client is assured of the identity of the server.
- Encryption – All data transmitted between the client and the server is encrypted rendering any intercepted data unintelligible to any third party.

SSL uses the public-and-private key encryption system by RSA, which also requires the use of digital certificates. An SSL Certificate is an electronic file uniquely identifying individuals or Websites and enables encrypted communication; SSL Certificates serve as a kind of digital passport or credential. The Sentry product’s SSL Certificate enables the client to verify the Sentry’s authenticity and to communicate with the Sentry securely via an encrypted session, protecting confidential information from interception and hacking.

### SSL Command Summary

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### Enabling and Setting up SSL Support

**NOTE:** A restart of the Sentry is required after setting or changing ANY SSL configurations. See Performing a warm boot on page 43 for more information.

**Enabling or disabling SSL support:**

The Set SSL command is used to enable or disable SSL support.

*To enable or disable SSL support:*

At the Smart CDU: prompt, type `set ssl`, followed by `enabled` or `disabled` and press Enter.

**Setting SSL access level:**

The Set SSL Access command is used to assign use of SSL as optional or required. The default access level is set to optional.

*To change the access level:*

At the Smart CDU: prompt, type `set ssl access`, followed `optional` or `required`, and press Enter.

**Example**

The following changes the access level to required:

```
Smart CDU: set ssl access required<Enter>
```

### SSL Technical Specifications

- Secure Socket Layer (SSL) version 3
- Transport Layer Security (TLS) version 1 (RFC 2246)
- SSL/TLS-enabled HTTPS server (RFC 2818)
- Self-Signed X.509 Certificate version 3 (RFC 2459)
- Asymmetric Cryptography:
  - 1024-bit RSA Key Exchange
- Symmetric Cryptography Ciphers:
  - TLS_RSA_WITH_AES_256_CBC_SHA
  - TLS_RSA_WITH_3DES_EDE_CBC_SHA
  - TLS_RSA_WITH_AES_128_CBC_SHA
  - TLS_RSA_WITH_DES_CBC_SHA
Secure Shell (SSH) version 2 enables secure network terminal sessions between a Sentry Remote Power Manager and a remote user over insecure network. SSH provides encrypted terminal sessions with strong authentication of both the server and client, using public-key cryptography and is typically used as a replacement for unencrypted Telnet. In addition to enabling secure network terminal sessions to the Sentry for configuration and power management, the SSH session may be used for secure Pass-Thru connections to attached devices.

SSH requires the configuration and use of a client agent on the client PC. There are many freeware, shareware or for-purchase SSH clients available. Two examples are the freeware client PuTTY and the for-purchase client SecureCRT® by VanDyke® Software. For configuration and use of these clients, please refer to the applicable software documentation.

### SSH Command Summary

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set SSH</td>
<td>Enables/disables SSH support</td>
</tr>
<tr>
<td>Set SSH AuthMethod</td>
<td>Enables/disables the SSH server authentication methods</td>
</tr>
<tr>
<td>Set SSH Port</td>
<td>Sets the SSH server port number</td>
</tr>
</tbody>
</table>

#### Enabling and Setting up SSH Support

**NOTE:** A restart of the Sentry is required after setting or changing ANY SSH configurations. See *Performing a warm boot* on page 43 for more information.

**Enabling or disabling SSH support:**

The Set SSH command is used to enable or disable SSH support.

**To enable or disable SSH support:**

At the Smart CDU: prompt, type `set ssh`, followed by **enabled** or **disabled** and press **Enter**.

**Changing the SSH server port:**

With SSH support enabled, the SSH server watches and responds to requests on the default SSH port number 22. This port number may be changed using the Set SSH Port command.

**To change the SSH port:**

At the Smart CDU: prompt, type `set ssh port`, followed by the port number and press **Enter**.

**Example**

The following changes the SSH port number to 65535:

```
Smart CDU: set ssh port 65535<Enter>
```

**Enabling or disabling SSH server authentication methods:**

The Set SSH Authentication Method command is used to set the method of SSH server authentication. The Sentry SSH server supports two authentication methods for security and validation: Password and Keyboard-Interactive.

For information on SSH authentication methods, see *Enabling or disabling SSH server authentication methods:* on page 16.

**To enable the SSH authentication methods:**

At the Smart CDU: prompt, type `set ssh authmethod`, followed by **password** or **kbint**, followed by **enabled** or **disabled**, and press **Enter**.

**Example**

The following example sets the SSH authentication method to keyboard-interactive:

```
Smart CDU: set ssh authmethod kbint enabled<Enter>
```
SSH Technical Specifications

Secure Shell (SSH) version 2

Asymmetric Cryptography:
- Diffie-Hellman DSA/DSS 512-1024 (random) bits per NIST specification

Symmetric Cryptography:
- AES256-CBC
- AES192-CBC
- AES128-CBC
- RIJNDAEL256-CBC
- RIJNDAEL192-CBC
- RIJNDAEL128-CBC
- 3DES-192-CBC
- BLOWFISH-128-CBC
- ARCFOUR-128

Message Integrity:
- HMAC-SHA1-160
- HMAC-MD5-128
- HMAC-SHA1-96
- HMAC-MD5-96

Authentication:
- Username/Password

Session Channel Break Extension (for RS232 Break)
SNMP/Thresholds

The Sentry family of products supports the Simple Network Management Protocol (SNMP). This allows network management systems to use SNMP requests to retrieve information and control power for the individual outlets.

The Sentry includes an SNMP v2c agent supporting standard MIB I and MIB II objects. A private enterprise MIB extension (Sentry3 MIB) is also supported to provide remote power control.

See SNMP on page 20, for information on enabling and configuring SNMP.

NOTE: For security, SNMP support is disabled by default.

SNMP Command Summary

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set SNMP</td>
<td>Enables or disables SNMP support</td>
</tr>
<tr>
<td>Set SNMP Getcomm</td>
<td>Sets the 'get' community string</td>
</tr>
<tr>
<td>Set SNMP Setcomm</td>
<td>Sets the 'set' community string</td>
</tr>
<tr>
<td>Set SNMP Trapdest</td>
<td>Sets a destination IP address or hostname for traps</td>
</tr>
<tr>
<td>Set SNMP Traptime</td>
<td>Sets the delay for steady state condition traps</td>
</tr>
<tr>
<td>Set SNMP IPRestrict</td>
<td>Allows SNMP GET and SET requests from defined traps destinations only</td>
</tr>
<tr>
<td>Show SNMP</td>
<td>Displays all SNMP configuration information</td>
</tr>
</tbody>
</table>

MIB, OID and Support

The Sentry SNMP MIB and OID are available on the Server Technology Website:


Technical support is available 8:00AM to 5:00 PM Pacific Time, Monday-Friday.

For SNMP Support, email: mibmaster@servertech.com

Enabling and Setting up SNMP Support

Sentry SNMP support must be enabled and configured for access to Sentry3 MIB objects and generation of all Sentry3 traps.

Enabling/disabling SNMP support:

The Sentry SNMP command is used to enable or disable SNMP support.

To enable SNMP support:

At the Smart CDU: prompt, type `set snmp`, followed by `enabled` or `disabled` and press Enter.

NOTE: A restart of the Sentry is required after enabling or disabling SNMP support. See Performing a warm boot on page 43 for more information.

Setting trap destinations:

The Set SNMP Trapdest1 and Trapdest2 commands are used to set the IP addresses or hostname of SNMP management stations receiving all traps. Sentry supports a maximum of two trap destinations; one must be defined to enable trap generation.

To set the trap destination:

At the Smart CDU: prompt, type `set snmp, trapdest1` or `trapdest2`, the Ipaddress or hostname and press Enter.

Examples

The following sets the trap destination 1 to 64.42.31.208:

Smart CDU: set snmp trapdest1 64.42.31.208<Enter>

The following sets the trap destination 2 to snmp.servertech.com:

Smart CDU: set snmp trapdest2 snmp.servertech.com<Enter>

To reset the trap destination:

At the Smart CDU: prompt, type `set snmp, trapdest1` or `trapdest2, 0.0.0.0` and press Enter.
Setting the trap timer:
The Set SNMP Traptime command sets the timer period between repeated error-condition traps. The valid range for the timer period is 1 to 65535 (in seconds).
The default value for the timer period is 60 seconds.

To set the trap timer:
At the Smart CDU: prompt, type `set snmp traptime`, followed by the timer period and press Enter.

Example
The following sets the timer period to 180 seconds:

```
Smart CDU: set snmp traptime 180<Enter>
```

Setting the Get/Set community strings:
Sentry supports two SNMP community strings that provide varying levels of access to objects defined in the Sentry3 MIB.
Community strings may be 1 to 24 characters.

Setcomm:
The Setcomm string provides read-write access to sentry3 MIB objects.
The default Setcomm string is “private”

To set the Setcomm community string:
At the Smart CDU: prompt, type `set snmp setcomm`, followed by the string and press Enter.

Getcomm:
The Getcomm string provides read-only access to sentry3 MIB objects.
The default Getcomm string is “public”.

To set the Getcomm community string:
At the Smart CDU: prompt, type `set snmp getcomm`, followed by the string and press Enter.

Setting SNMP IP Restrictions:
The Set SNMP IP Restrictions command supports SNMP Manager GET and SET requests to only be allowed from the IP addresses of the defined traps destinations.

To set SNMP IP Restrictions:
At the Smart CDU: prompt, type `set snmp iprestrict trapdests` and press Enter.

To remove SNMP IP Restrictions:
At the Smart CDU: prompt, type `set snmp iprestrict none` and press Enter.

Setting the SNMP SysName:
The Set SNMP SysName command is used to set the SNMP MIB-II SysName object.

To set the SysName object:
At the Smart CDU: prompt, type `set snmp sysname`, followed by the object name and press Enter.

Setting the SNMP SysLocation:
The Set SNMP SysLocation command is used to set the SNMP MIB-II SysLocation object.

To set the SysLocation object:
At the Smart CDU: prompt, type `set snmp syslocation`, followed by the object location and press Enter.

Setting the SNMP SysContact:
The Set SNMP SysContact command is used to set the SNMP MIB-II SysContact object.

To set the SysContact object:
At the Smart CDU: prompt, type `set snmp syscontact`, followed by the object contact and press Enter.
Setting the Trap community string:
The Set SNMP Trapcomm command is used to set the community string that is included with all generated traps. This string must be defined to enable trap generation.

The trap community string may be 1 to 24 characters.
The default Trapcomm string is “trap”.

To set the Trapcomm community string:
At the Smart CDU: prompt, type set snmp trapcomm, followed by the string and press Enter.

Displaying SNMP configuration information:
The Show SNMP command displays all SNMP configuration information.

- SNMP support status
- SNMP community strings
- Trap timer value
- Trap destinations

To display SNMP configuration information:
At the Smart CDU: prompt, type show snmp and press Enter.

Example
The following command displays the SNMP configuration information:

```
Smart CDU: show snmp<Enter>
```

```
SNMP Configuration

SNMP:               Enabled
GET Community String:  public
SET Community String:  private
TRAP Community String:  trap
Error Trap Repeat Time (seconds):  180 seconds
Trap Destination 1:               64.42.31.208
Trap Destination 2:  snmp.servertech.com
IP Restrictions:             Trap Destinations Only
SysName:                      No Name
SysLocation:                   No Location
SysContact:                    No Contact
```

SNMP Traps

The Smart CDU supports four types of SNMP traps. Traps are enabled at the Tower (T), Infeed (I), Environmental Monitor (E) or sensor (S) level.

Trap Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>Level(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status</td>
<td>T, I, O, E, S</td>
<td>Operational status change</td>
</tr>
<tr>
<td>Load</td>
<td>I</td>
<td>Input load out of limit</td>
</tr>
<tr>
<td>Temp</td>
<td>S</td>
<td>Temperature is out of range</td>
</tr>
<tr>
<td>Humid</td>
<td>S</td>
<td>Relative Humidity is out of range</td>
</tr>
</tbody>
</table>

All traps include the Location of the Sentry as defined with the Set Location command.
**Status trap**

A Status trap is generated when an error condition occurs on a tower, infeed, Environmental Monitor or individual sensor. Status traps include the reported Status, the Location of the Sentry and identifier and name of the affected tower, infeed, outlet, environmental monitor or sensor.

Any error state generates a Status trap and triggers the trap timer. A new trap is generated at the end of every timer period until the Status returns to a non-error status. All status traps are enabled by default.

### Tower Status traps

<table>
<thead>
<tr>
<th>Status</th>
<th>Error</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td></td>
<td>Tower is working correctly</td>
</tr>
<tr>
<td>NoComm</td>
<td>x</td>
<td>Communication to the tower has been lost</td>
</tr>
</tbody>
</table>

### Infeed Status traps

<table>
<thead>
<tr>
<th>Status</th>
<th>Error</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>On</td>
<td></td>
<td>Infeed is on</td>
</tr>
<tr>
<td>OffError</td>
<td>x</td>
<td>Infeed should be on but no current is sensed at the infeed</td>
</tr>
<tr>
<td>NoComm</td>
<td>x</td>
<td>Communication to the infeed has been lost</td>
</tr>
</tbody>
</table>

### Environmental Monitor Status traps

<table>
<thead>
<tr>
<th>Status</th>
<th>Error</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td></td>
<td>Environmental Monitor is working correctly</td>
</tr>
<tr>
<td>NoComm</td>
<td>x</td>
<td>Communication to the Environmental Monitor has been lost</td>
</tr>
</tbody>
</table>

### Temperature/Humidity Sensor Status traps

<table>
<thead>
<tr>
<th>Status</th>
<th>Error</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Found</td>
<td></td>
<td>The sensor has been detected</td>
</tr>
<tr>
<td>NotFound</td>
<td></td>
<td>No sensor has been detected</td>
</tr>
<tr>
<td>Lost</td>
<td>x</td>
<td>Sensor initially detected but communication to the sensor has been lost</td>
</tr>
<tr>
<td>NoComm</td>
<td>x</td>
<td>Communication to the sensor has been lost</td>
</tr>
</tbody>
</table>

**NOTE:** Traps are generated according to a hierarchical architecture; i.e., if a Tower Status enters a trap condition, only the Tower Status trap will be generated. Infeed, Outlet, Environmental Monitor or Sensor Status and Temp and Humid traps will be suppressed until the Tower Status returns to Normal.

### Load Trap

The Load trap is generated whenever the total input load on an infeed exceeds a preset threshold. Load traps include the reported input load, load status, Location of the Sentry, and identifier and name of the affected infeed.

Any error state generates a Load trap and triggers the trap timer. A new trap is generated at the end of every timer period until the Load returns to a non-error status.

### Load traps

<table>
<thead>
<tr>
<th>Status</th>
<th>Error</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td></td>
<td>Infeed is on and within preset thresholds</td>
</tr>
<tr>
<td>NotOn</td>
<td></td>
<td>Infeed is off</td>
</tr>
<tr>
<td>Reading</td>
<td></td>
<td>Non-error state – Load status currently being read</td>
</tr>
<tr>
<td>LoadHigh</td>
<td>x</td>
<td>Infeed current load exceeds preset threshold</td>
</tr>
<tr>
<td>OverLoad</td>
<td>x</td>
<td>Infeed current load exceeds the measurable range for the infeed</td>
</tr>
<tr>
<td>ReadError</td>
<td>x</td>
<td>Unable to read Load status</td>
</tr>
<tr>
<td>NoComm</td>
<td>x</td>
<td>Communication to the infeed has been lost</td>
</tr>
</tbody>
</table>
Temp Trap

The Temp trap is generated whenever the temperature on a temperature/humidity sensor is beyond preset thresholds. Temp traps include the reported temperature, temp status, Location of the Sentry, and identifier and name of the affected sensor.

Any error state generates a Temp trap and triggers the trap timer. A new trap is generated at the end of every timer period until the Temp returns to a non-error status.

**Temp traps**

<table>
<thead>
<tr>
<th>Status</th>
<th>Error</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td></td>
<td>The sensor is working correctly and the temperature is within preset thresholds</td>
</tr>
<tr>
<td>NotFound</td>
<td></td>
<td>No sensor has been detected</td>
</tr>
<tr>
<td>Reading</td>
<td></td>
<td>Temp status currently being read</td>
</tr>
<tr>
<td>TempLow</td>
<td>x</td>
<td>Temperature at the sensor below preset low threshold</td>
</tr>
<tr>
<td>TempHigh</td>
<td>x</td>
<td>Temperature at the sensor exceeds preset high threshold</td>
</tr>
<tr>
<td>ReadError</td>
<td>x</td>
<td>Unable to read Temp status</td>
</tr>
<tr>
<td>Lost</td>
<td>x</td>
<td>Sensor initially detected but communication to the sensor has been lost</td>
</tr>
<tr>
<td>NoComm</td>
<td>x</td>
<td>Communication to the sensor has been lost</td>
</tr>
</tbody>
</table>

Humidity Trap

The Humidity trap is generated whenever the humidity on a temperature/humidity sensor is beyond preset thresholds. Humidity traps include the reported relative humidity, humidity status, Location of the Sentry, and identifier and name of the affected sensor.

Any error state generates a Humidity trap and triggers the trap timer. A new trap is generated at the end of every timer period until the Humidity returns to a non-error status.

**Humidity traps**

<table>
<thead>
<tr>
<th>Status</th>
<th>Error</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td></td>
<td>The sensor is working correctly and the relative humidity is within preset thresholds</td>
</tr>
<tr>
<td>NotFound</td>
<td></td>
<td>No sensor has been detected</td>
</tr>
<tr>
<td>Reading</td>
<td></td>
<td>Humidity status currently being read</td>
</tr>
<tr>
<td>HumidLow</td>
<td>x</td>
<td>Relative humidity at the sensor below preset low threshold</td>
</tr>
<tr>
<td>HumidHigh</td>
<td>x</td>
<td>Relative humidity at the sensor exceeds preset high threshold</td>
</tr>
<tr>
<td>ReadError</td>
<td>x</td>
<td>Unable to read Humidity status</td>
</tr>
<tr>
<td>Lost</td>
<td>x</td>
<td>Sensor initially detected but communication to the sensor has been lost</td>
</tr>
<tr>
<td>NoComm</td>
<td>x</td>
<td>Communication to the sensor has been lost</td>
</tr>
</tbody>
</table>
Configuring Traps

SNMP Trap Command Summary

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set Trap Tower Status</td>
<td>Enables or disables the Tower Status trap</td>
</tr>
<tr>
<td>Set Trap Infeed Status</td>
<td>Enables or disables the Infeed Status trap off</td>
</tr>
<tr>
<td>Set Trap Infeed Load</td>
<td>Enables or disables the Infeed Load trap</td>
</tr>
<tr>
<td>Set Trap Infeed HighThresh</td>
<td>Sets the Infeed Load trap high limit</td>
</tr>
<tr>
<td>Set Trap EM Status</td>
<td>Enables or disables the Environmental Monitor Status trap</td>
</tr>
<tr>
<td>Set Trap THS Status</td>
<td>Enables or disables a temperature/humidity sensor Status trap</td>
</tr>
<tr>
<td>Set Trap THS Temp</td>
<td>Enables or disables a temperature/humidity sensor Temp trap</td>
</tr>
<tr>
<td>Set Trap THS Temp Delta</td>
<td>Sets temperature recovery delta</td>
</tr>
<tr>
<td>Set Trap THS Temphigh</td>
<td>Sets a temperature/humidity sensor Temp trap high limit</td>
</tr>
<tr>
<td>Set Trap THS Templow</td>
<td>Sets a temperature/humidity sensor Temp trap low limit</td>
</tr>
<tr>
<td>Set Trap THS Humidhigh</td>
<td>Enables or disables a temperature/humidity sensor Humid trap</td>
</tr>
<tr>
<td>Set Trap THS Humidlow</td>
<td>Sets a temperature/humidity sensor Humid trap low limit</td>
</tr>
<tr>
<td>Show Traps</td>
<td>Displays trap configurations</td>
</tr>
</tbody>
</table>

Enabling or Disabling a Status trap:

The Set Trap … Status command is used to enable or disable Status traps for a Tower, Infeed or Outlet.

**To Enable or Disable a Status trap:**

At the Smart CDU: prompt, type `set trap (tower, infeed, em or ths) status`, followed by the tower, infeed or outlet name, and `on` or `off`. Press Enter, or

Type `set trap (tower, infeed, em or ths) Status all`, followed by `on` or `off` and press Enter.

**Examples**

The following command enables the Status trap for the first tower, using the tower’s absolute name:

Smart CDU: set trap tower status .a on<Enter>

The following command enables the Status trap for the tower named Florida_HQ_1:

Smart CDU: set trap tower status Florida_HQ_1 on<Enter>

**NOTE:** Enabling lower hierarchical traps automatically enables traps of higher hierarchical value: i.e. enabling an Outlet Status trap automatically enables the Infeed and Tower Status traps for that outlet. Conversely, if a Tower Status trap is disabled, all associated Infeed Status & Load and Outlet Status traps will be disabled.

Enabling or Disabling a Load trap:

The Set Trap Infeed Load command is used to enable or disable an Infeed Load trap.

**To Enable or Disable a Load trap:**

At the Smart CDU: prompt, type `set trap infeed load`, followed by the infeed name, and `on` or `off`. Press Enter, or

Type `set trap infeed load all`, followed by `on` or `off` and press Enter.

**Examples**

The following command enables the Load trap for second infeed on the first tower, using the infeed’s absolute name:

Smart CDU: set trap infeed load .AB on<Enter>

The following command disables the Load trap for all infeeds:

Smart CDU: set trap infeed load all off<Enter>

**NOTE:** Enabling lower hierarchical traps automatically enables traps of higher hierarchical value: i.e. enabling an Infeed Load trap automatically enables the Infeed and Tower Status traps for that infeed.
Setting the Infeed Load limit:
The Set Trap Infeed Loadhigh command is used to set the upper load limits for an input feed.

To set the infeed load limit:
At the Smart CDU: prompt, type set trap infeed loadhigh, followed by the infeed name, and a value from 0 to 255 in amperes. Press Enter.

Example
The following command sets the infeed load limit for the second infeed on the first tower to 25 amperes, using the infeed’s absolute name:

Smart CDU: set trap infeed loadhigh .ab 25<Enter>

Enabling or Disabling the Temp trap:
The Set Trap THS Temp command is used to enable or disable the Temp trap.

To Enable or Disable the Temp trap:
At the Smart CDU: prompt, type set trap ths temp, followed by the sensor name and on or off. Press Enter.

Example
The following command enables the Temp trap for the first temperature-humidity sensor:

Smart CDU: set trap ths temp .a1 on<Enter>

Setting the Temperature sensor threshold limits:
The Set Trap THS Templow and Set Trap THS Temphigh commands are used to set the lower and upper threshold limits for the Temperature sensor.

To set the Temperature threshold limits:
At the Smart CDU: prompt, type set trap ths, templow or temphigh, followed by the sensor name and a value from 0 to 123 degrees Celsius. Press Enter.

Example
The following command sets the second temperature high threshold limit to 95:

Smart CDU: set trap ths temphigh .a2 95<Enter>

Configuring Temperature Recovery Delta:
The Temperature Recovery Delta command allows configuration of the number of degrees of change needed to recover from a temperature alarm. For more information about the recovery delta, see Configuring Temperature Recovery Delta: on page 21.

To configure the temperature recovery delta:
At the Smart CDU: prompt, type set event temp tempdelta, followed by the sensor name, the number of degrees for the recovery delta, and press Enter.

NOTE: The acceptable value range for the Recovery Delta field is 0-10 degrees for Celsius and 0-18 degrees for Fahrenheit. The default value for the Recovery Delta field is 1 degree Celsius and 2 degrees Fahrenheit.

Example
The following command configures the recovery delta at 2 degrees Fahrenheit for temperature/humidity sensor .A1:

Smart CDU: event temp tempdelta temp_humid_sensor_A1 2<Enter>

Enabling or Disabling the Humid trap:
The Set Trap THS Humid command is used to enable or disable the Humid trap.

To Enable or Disable the Humid trap:
At the Smart CDU: prompt, type set trap ths humid, followed by the sensor name and on or off. Press Enter.

Example
The following command enables the Humid trap for the first temperature-humidity sensor:

Smart CDU: set traps ths humid .a1 on<Enter>
Setting the Humidity sensor threshold limits:

The Set Trap THS Humidlow and Set Trap THS Humidhigh commands are used to set the lower and upper threshold limits for the Humidity sensor.

To set the Humidity threshold limits:

At the Smart CDU: prompt, type `set trap ths, humidlow` or `humidhigh`, followed by the sensor name and a value from 0 to 100 in percent relative humidity. Press Enter.

Example

The following command sets the first humidity sensor low threshold limit to 5:

```
Smart CDU: set trap ths humidlow .a1 5<Enter>
```

Displaying trap configuration information:

The Show Traps command displays information about all traps.

To display trap information:

At the Smart CDU: prompt, type `show traps` and press Enter.

Example

The following command requests trap configuration information:

```
Smart CDU: show traps <Enter>
```

Tower trap configuration:

<table>
<thead>
<tr>
<th>Tower</th>
<th>Tower</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>Name</td>
<td>Trap</td>
</tr>
<tr>
<td>.A</td>
<td>Florida_HQ_1</td>
<td>ON</td>
</tr>
<tr>
<td>.B</td>
<td>Florida_HQ_2</td>
<td>ON</td>
</tr>
</tbody>
</table>

More (Y/es N/o): y

Input feed trap configuration:

<table>
<thead>
<tr>
<th>Input</th>
<th>Input</th>
<th>Status</th>
<th>Load</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed</td>
<td>Feed Name</td>
<td>Trap</td>
<td>Trap</td>
<td>Thresh</td>
</tr>
<tr>
<td>ID</td>
<td>Feed Name</td>
<td>Trap</td>
<td>Trap</td>
<td>Thresh</td>
</tr>
<tr>
<td>.AA</td>
<td>HQ_1_Infeed_A</td>
<td>ON</td>
<td>ON</td>
<td>255 A</td>
</tr>
<tr>
<td>.BA</td>
<td>HQ_2_Infeed_A</td>
<td>ON</td>
<td>ON</td>
<td>255 A</td>
</tr>
</tbody>
</table>

More (Y/es N/o): y

Environmental Monitor .A trap configuration:

Name: Florida_HQ_1
Status Trap: ON

Temperature/Humidity Sensor .A1
Name: Temp_Humid_Sensor_A1
Status Trap: ON
Temp Trap: ON
Low: 0 Deg.C
High: 123 Deg.C
Humid Trap: ON
Low: 5 % RH
High: 100 % RH

Temperature/Humidity Sensor .A2
Name: T/H2_Florida_HQ_1
Status Trap: ON
Temp Trap: ON
Low: 0 Deg.C
High: 95 Deg.C
Humid Trap: ON
Low: 0 % RH
High: 100 % RH
The Sentry family of products supports Lightweight Directory Access Protocol (LDAP) Version 3. This support enables authentication with LDAP servers; user accounts do not need to be individually created locally on each Sentry device.

This allows administrators to pre-define and configure (in each Sentry product, and in the LDAP server) a set of necessary LDAP Groups, and access rights for each. User’s access rights can then be assigned or revoked 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 products.

Sentry LDAP support has been tested in the following environments:

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

### LDAP Command Summary

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<td>Set LDAP BindPW</td>
<td>Specifies the user account password for binds</td>
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<td>Set LDAP GroupAttr</td>
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<td>Specifies the data type for the Set LDAP GroupAttr command</td>
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<td>Set LDAP UseTLS/SSL</td>
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Enabling and Setting up LDAP Support

There are a few configuration requirements for properly enabling and setting up LDAP support. Below is an overview of the minimum requirements.

Directory Services server configuration requirements:

1. Define at least one LDAP group.
2. Assign users to that LDAP group.

Sentry configuration requirements:

1. Enable LDAP support.
2. Define the IP address and domain component of at least one Directory Services server.
3. Set the LDAP bind request method being utilized by the Directory Services server.
4. Define the IP address of at least one DNS server.
5. Test DNS server configuration using Sentry ‘ping’ support.
6. Define at least one LDAP group and assign access rights for that group.

NOTE: LDAP group names on the Directory Service server and the Sentry must match.

Enabling and disabling LDAP support:

The Set LDAP command is used to enable or disable LDAP support.

To enable or disable LDAP support:

At the Smart CDU: prompt, type set ldap, followed by enabled or disabled and press Enter.

Setting the LDAP host address:

The Set LDAP Host command sets the TCP/IP address of the Directory Services server.

To set the LDAP host address:

At the Smart CDU: prompt, type set ldap, followed by host1 or host2 and the Directory Services server’s IP address or hostname. Press Enter.

Examples

The following command sets the primary Directory Services server IP address to 98.76.54.32:

Smart CDU: set ldap host1 98.76.54.32<Enter>

The following command sets the secondary Directory Services server hostname to ldap.servertech.com:

Smart CDU: set ldap host2 ldap.servertech.com<Enter>

Changing the LDAP server port:

The Set LDAP port command sets the port to which the Sentry sends LDAP requests to on the previously defined LDAP server. The default port is 389.

To change the LDAP server port:

At the Smart CDU: prompt, type set ldap port, followed by the port number and press Enter.

Example

The following command sets the LDAP server port number to 8888:

Smart CDU: set ldap port 8888<Enter>

Enabling and disabling LDAP over TLS/SSL support:

The Set LDAP UseTLS command is used to enable or disable LDAP over TLS/SSL support.

To enable or disable LDAP over TLS/SSL support:

At the Smart CDU: prompt, type set ldap usetls, followed by yes or no and press Enter.

NOTE: If LDAP over TLS/SSL is enabled, MD5 binding is disabled.
Setting the LDAP bind password type:
The Set LDAP Bind command sets the password type used in the bind requests. The Sentry supports two LDAP bind methods – Simple and MD5. If MD5 is entered, the Set LDAP UseTLS command will be disabled.

The Simple method utilizes unencrypted delivery of a username-password over the network to the Active Directory server for authentication.

The MD5 digest method provides much stronger protection utilizing one-way encoded hash numbers, never placing the username-password on the network. For more information on MD5, see Setting the HTTP authentication method: on page 16.

**NOTE:** Windows 2000 is known only to support Simple binding. Windows 2003 supports both Simple and MD5 binding.

To set the bind password type:
At the Smart CDU: prompt, type `set ldap bind`, followed by `simple` or `md5` and press **Enter**.

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

Setting the search bind Distinguished Name (DN):
The Set LDAP BindDN command is used to set the fully-qualified distinguished name (FQDN) for user accounts to bind with. This is required for directory services that do not support anonymous binds. This field is used ONLY with Simple Binds.

Maximum string length is 124 characters.

**NOTE:** If left blank, then an anonymous bind will be attempted. This field is used ONLY with Simple binds.

To set the search bind DN:
At the Smart CDU: prompt, type `set ldap binddn`, and press **Enter**. At the following prompt, type the FQDN and press **Enter**.

**Example**
The following sets the FQDN for MSAD to 'cn=guest, cn=Users, dc=servertech, dc=com':

Smart CDU: set ldap binddn<Enter>
Enter Search Bind DN (Max characters 124):
cn=guest, cn=Users, dc=servertech, dc=com<Enter>

Setting the search bind Distinguished Name (DN) password:
The Set LDAP BindPW command is used to set the password for the user account specified in the Search Bind DN. Maximum password size is 20 characters.

To set the Bind Password DN:
At the Smart CDU: prompt, type `set ldap bindpw` and press **Enter**. At the following prompt, type the bind password and press **Enter**.

Setting the group membership attribute:
The Set LDAP GroupAttr command is used to specify the name of user class attributes that lists distinguished names (DN), or names of groups that a user is a member of. Maximum string length is 30 characters.

To set Group Membership Attribute:
At the Smart CDU: prompt, type `set ldap groupattr` and press **Enter**. At the following prompt, type the group membership attribute and press **Enter**.

**Example**
The following sets the group membership attribute for MSAD to 'memberof':

Smart CDU: set ldap groupattr<Enter>
Enter Group Member Attr (Max character 30):
memberof<Enter>
Setting the group membership value type:
The Set LDAP GroupType command is used to specify whether the values of Group Membership Attribute represent
the Distinguished Name (DN) of a group or just the name of the group.

To set group membership value type:
At the Smart CDU: prompt, type `set ldap grouptype` followed by DN or Name and press Enter.

Example
The following sets group membership value to DN
```
Smart CDU: set ldap grouptype DN<Enter>
```

Setting the user search base Distinguished Name (DN):
The Set LDAP UserBaseDN command is used to set the base (DN) for the login username search. This is where the
search will start, and will include all subtrees. Maximum size is 100 characters.

To set the user search base DN:
At the Smart CDU: prompt, type `set ldap userbasedn` and press Enter. At the following prompt, type the search
dn and press Enter.

Example
The following sets the DN user search base for MSAD to ‘cn=Users,dc=servertech,dc=com’:
```
Smart CDU: set ldap userbasedn<Enter>
Enter User Search Base DN (Max characters 100):
cn=Users,dc=servertech,dc=com<Enter>
```

Setting the user search filter:
The Set LDAP UserFilter command is used to set the search filter for the username entered at the login prompt.
The search filter must be entered within parenthesis and adhere to the following format:

(searchfilter=%s)

where ‘searchfilter’ is the name of the attribute in the user class which has a value that represents the user’s login
name. In this string, the ‘%s’ will be replaced by the entered username. Maximum string length is 100 characters.

To set the user search filter:
At the Smart CDU: prompt, type `set ldap userfilter` and press Enter. At the following prompt, type the User Search
Filter and press Enter.

Example
The following sets the user search filter for MSAD to ‘samaccountname’:
```
Smart CDU: set ldap userfilter<Enter>
Enter User Search Filter (Max characters 100):
(samaccountname=%s)<Enter>
```
Setting the authentication order:

The Set Authorder command sets the authentication order for remote authentication sessions. The Sentry supports two methods for authentication order - Remote -> Local and Remote Only.

The Remote -> Local method first attempts authentication with the Active Directory server and if unsuccessful with the local user database on the Sentry device.

The Remote Only method attempts authentication only with the Active Directory server and if unsuccessful, access is denied.

NOTE: With the Remote Only method, if authentication fails due to a communication failure with the Active Directory server automatic authentication fallback will occur to authenticate with the local user data base on the Sentry device.

To set the authentication order:

At the Smart CDU: prompt, type `set authorder`, followed by `remotelocal` or `remoteonly` and press Enter.

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

Displaying LDAP configuration information:

The Show LDAP command displays LDAP configuration information.

- Enabled-disabled status of LDAP support
- Directory Services server IP address and port
- Bind request password type and remote authentication order
- Search bind distinguished name and password
- User search base distinguished name and filter
- Group membership attribute and type

To display the LDAP configuration information:

At the Smart CDU: prompt, type `show ldap` and press Enter.

Example

The following command displays the LDAP configuration information:

```
Smart CDU: show ldap
LDAP Configuration
LDAP:       Enabled
Host 1:      98.76.54.32
Host 2:      ldap.servertech.com
Port:        8888
TLS/SSL:     Yes
Bind Type:   MD5
Auth Order:  Remote->Local
Search Bind
   DN:  cd=guest,cn=Users,dc=servertech,dc=com
   Password: *******
User Search
   Base DN:  cn=Users,dc=servertech,dc=com
   Filter:  (samaccountname=%s)
Group Membership
   Attribute: memberof
   Value Type: DN
```
Setting the DNS IP address:
The Set DNS command sets the TCP/IP address of the Domain Name System (DNS) server.

NOTE: LDAP requires the definition of at least one Domain Name System (DNS) server.

To display the DNS configuration information, use the Show Network command as described on page 44.

To set the DNS IP address:
At the Smart CDU: prompt, type set, followed by dns1 or dns2 and the Domain Name System (DNS) server’s IP address. Press Enter.

Example
The following command sets the primary Domain Name System (DNS) server IP address to 98.76.54.254:

Smart CDU: set dns1 98.76.54.254<Enter>

Verifying the DNS configuration:
The Ping command may be used to verify the configuration of the DNS IP address.

To verify the DNS configuration:
At the Smart CDU: prompt, type ping, followed by the domain component of the Directory Services server previously configured and press Enter.

Example
The following command verifies the DNS configuration:

Smart CDU: ping servertech.com
Pinging servertech.com [98.76.54.32] with 64 bytes of data:
Reply from 98.76.54.32: bytes=64 pseq=0 triptime=0
Reply from 98.76.54.32: bytes=64 pseq=1 triptime=0
Reply from 98.76.54.32: bytes=64 pseq=2 triptime=0
Reply from 98.76.54.32: bytes=64 pseq=3 triptime=0
Reply from 98.76.54.32: bytes=64 pseq=4 triptime=0

Configuring LDAP Groups

Creating an LDAP group:
The Create LDAPGroup command creates an LDAP group.

To create an LDAP group:
At the Smart CDU: prompt, type create ldapgroup, optionally followed by a 1-16 character group name (Spaces are not allowed, and LDAP group names are not case sensitive). Press Enter.

Example
The following command creates the LDAP group PowerUser:

Smart CDU: create ldapgroup PowerUser<Enter>

Removing an LDAP group:
The Remove LDAPGroup command removes an LDAP group.

To remove an LDAP group:
At the Smart CDU: prompt, type remove ldapgroup, optionally followed by a group name. Press Enter.
Setting LDAP group access level privileges:
The Set LDAPGroup Access command sets the access level privileges for an LDAP group. The Sentry has four defined access privilege levels: Admin, User, On-Only and View-Only. For more information on user access levels, see Changing a user’s access privilege level: on page 19.

To set the access level privilege for an LDAP group:
At the Smart CDU: prompt, type `set ldapgroup access`, followed by `admin`, `user`, `ononly` or `viewonly`, optionally followed by a LDAP group name and press Enter.

Examples
The following command sets the LDAP group access level for LDAPAdmin to Admin:
```plaintext
Smart CDU: set ldapgroup access admin ldapadmin<Enter>
```
The following command sets the LDAP group access level for PowerUser to User:
```plaintext
Smart CDU: set ldapgroup access user poweruser<Enter>
```

Granting and removing input status viewing privileges:
The Set LDAPGroup Envmon command grants or removes input status viewing privileges to/from an LDAP group.

To grant or remove input status viewing privileges for an LDAP group:
At the Smart CDU: prompt, type `set ldapgroup envmon` followed by `on` or `off`, optionally followed by a group name and press Enter.

Example
The following command grants input status viewing privileges to the LDAP group PowerUser:
```plaintext
Smart CDU: set ldapgroup envmon on poweruser<Enter>
```

Displaying the LDAP access privilege levels:
The List LDAPGroups command displays all defined LDAP group with their access privilege level.

To display LDAP group access privilege levels:
At the Smart CDU: prompt, type `list ldapgroups` and press Enter.

Example
The following command displays all LDAP groups with their access privilege level:
```plaintext
Smart CDU: list ldapgroups<Enter>
```

<table>
<thead>
<tr>
<th>LDAP Group Name</th>
<th>Access Level</th>
<th>Environmental Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDAPAdmin</td>
<td>Admin</td>
<td>Allowed</td>
</tr>
<tr>
<td>PowerUser</td>
<td>User</td>
<td>Allowed</td>
</tr>
<tr>
<td>User</td>
<td>On-Only</td>
<td>Not Allowed</td>
</tr>
<tr>
<td>Guest</td>
<td>View-Only</td>
<td>Not Allowed</td>
</tr>
</tbody>
</table>

Adding serial port access to an LDAP group:
The Add PortToLDAP command grants an LDAP group access to the serial port.

To grant serial port access to an LDAP group:
At the Smart CDU: prompt, type `add porttoldap console` and a group name. Press Enter.

Deleting serial port access for an LDAP group:
The Delete PortFromLDAP command removes an LDAP group’s access to the serial port. You cannot remove access to the serial port for an administrative level group.

To delete serial port access for a user:
At the Smart CDU: prompt, type `delete portfromldap console` and a group name. Press Enter.
Displaying LDAP Group access:
The List LDAPGroup command displays all access rights for an LDAP group.

To display LDAP Group access:
At the Smart CDU: prompt, type `list ldapgroup`, optionally followed by a group name. Press **Enter**.

Example
The following command displays information about the LDAP group PowerUser:

```
Smart CDU: list ldapgroup poweruser<Enter>
Username: PowerUser
Ports:
  Port   Port
  ID     Name
  Console Console
```

LDAP Technical Specifications

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<td>Access Granted</td>
</tr>
<tr>
<td>Group match?</td>
<td></td>
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</tbody>
</table>

**LDAP Technical Specifications**

- **Simple Bind Authentication Process**
  - Client initiates the Sentry session.
  - Authentication request with Username/Password.
  - Successful Bind? if credentials are valid.
  - Username found? if the username is present.
  - Access Denied if credentials are invalid.
  - Attribute match? if the attribute matches.
  - Group match? if the group matches.
  - Access Granted if all conditions are met.

- **MD5 Bind Authentication Process**
  - Client initiates the Sentry session.
  - Authentication request with Username/Password.
  - SASL Digest-MD5 bind using uppercase username & entered password.
  - Successful Bind? if credentials are valid.
  - Username found? if the username is present.
  - Access Denied if credentials are invalid.
  - Attribute match? if the attribute matches.
  - Group match? if the group matches.
  - Access Granted if all conditions are met.
The Sentry family of products supports the Terminal Access Controller Access Control System (TACACS+) protocol. This enables authentication and authorization with a central TACACS+ server; user accounts do not need to be individually created locally on each Sentry device.

This allows administrators to pre-define and configure (in each Sentry product, and in the TACACS+ server) a set of necessary TACACS+ privilege levels, and users’ access rights for each. User’s access rights can then be assigned or revoked simply by making the user a member of one-or-more pre-defined Sentry TACACS+ privilege levels. User account rights can be added, deleted, or changed within TACACS+ without any changes needed on individual Sentry products.

The Sentry supports 16 different TACACS+ privilege levels; 15 are entirely configurable by the system administrator (1 is reserved for default Admin level access to all Sentry resources).

### TACACS+ Command Summary

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<th>Command</th>
<th>Description</th>
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<tr>
<td>List TacPriv</td>
<td>Displays all accessible outlet/groups/ports for a TACACS account</td>
</tr>
</tbody>
</table>

### Enabling and Setting up TACACS+ Support

There are a few configuration requirements for properly enabling and setting up TACACS+ support. Below is an overview of the minimum requirements:

1. Enable TACACS+ support.
2. Define the IP address and domain component of at least one TACACS+ server.
3. Set the TACACS+ key configured on the supporting TACACS+ server.

### Enabling and disabling TACACS+ support:

The Set TACACS command is used to enable or disable TACACS+ support.

**To enable or disable TACACS+ support:**

At the Smart CDU: prompt, type `set tacacs`, followed by `enabled` or `disabled` and press Enter.

### Setting the TACACS+ server address:

The Set TACACS Host command sets the IP address or hostname of the TACACS+ server.

**To set the TACACS+ server address:**

At the Smart CDU: prompt, type `set tacacs`, followed by `host1` or `host2` and the TACACS+ server’s IP address or hostname. Press Enter.

**Examples**

The following command sets the primary TACACS+ server address to 98.76.54.32:

```
Smart CDU: set tacacs host1 98.76.54.32<Enter>
```

The following command sets the secondary TACACS+ server hostname to tacacs.servertech.com:

```
Smart CDU: set tacacs host2 tacacs.servertech.com<Enter>
```
Setting the TACACS+ encryption key:
The Set TACACS Key command sets the encryption key used to encrypt all data packets between the Sentry and the TACACS+ server. This key must match the key configured on the TACACS+ server.

To set the encryption key:
At the Smart CDU: prompt, type `set tacacs key` and press Enter.

At the TACACS+ Key: prompt, type an encryption key of up to 60 alphanumeric and other typed characters - (ASCII 33 to 126 decimal) are allowed; encryption keys are case sensitive. Press Enter. To specify no password, press Enter.

At the Verify TACACS+ Key: prompt, retype the key. Press Enter. To verify no password, press Enter at the prompt.

Example

```
Smart CDU: set tacacs key<Enter>
TACACS+ Key: <Enter>
Verify TACACS+ Key: <Enter>
```

For security, key characters are not displayed.

NOTE: A key size of zero results in no encryption being applied which may not be supported by the TACACS+ server and is not recommended for a production environment.

Changing the TACACS port:
With TACACS support enabled, the Sentry sends TACACS requests to the default TACACS port number 49. This port number may be changed using the Set TACACS Port command.

To change the TACACS port:
At the Smart CDU: prompt, type `set tacacs port` followed by the port number and press Enter.

Example

```
The following changes the TACACS port number to 50:
```

```
Smart CDU: set tacacs port 50<Enter>
```

Setting the authentication order:
The Set Authorder command sets the authentication order for remote authentication sessions. The Sentry supports two methods for authentication order - Remote -> Local and Remote Only.

The Remote -> Local method first attempts authentication with the TACACS+ server and if unsuccessful with the local user database on the Sentry device.

The Remote Only method attempts authentication only with the TACACS+ server and if unsuccessful, access is denied.

NOTE: With the Remote Only method, if authentication fails due to a communication failure with the TACACS+ server automatic authentication fallback will occur to authenticate with the local user database on the Sentry device.

To set the authentication order:
At the Smart CDU: prompt, type `set authorder`, followed by remotelocal or remoteonly and press Enter.

NOTE: Server Technology recommends NOT setting the authentication order to Remote Only until the TACACS+ has been fully configured and tested.
Displaying TACACS+ configuration information:
The Show TACACS command displays TACACS+ configuration information.

To display the TACACS configuration information:
At the Smart CDU: prompt, type `show tacacs` and press Enter.

Example
The following command displays the TACACS configuration information:

```
Smart CDU: show tacacs<Enter>
```

```
TACACS+ Configuration
TACACS+:       Enabled
Host 1:        98.76.54.32
Host 2:        tacacs.servertech.com
Port:          50
TACACS+ Key:   (Set)
Auth Order:    Remote->Local
```

Configuring TACACS+ Privilege Levels

Setting TACACS+ account access level privileges:
The Set TacPriv Access command sets the access level privileges for a TACACS+ account. The Sentry has four defined access privilege levels; Admin, User, On-Only and View-Only. For more information on user access levels, see Changing a user’s access privilege level: on page 19.

To set the access level privilege for a TACACS+ account:
At the Smart CDU: prompt, type `set tacpriv access`, followed by `admin`, `user`, `oonly` or `viewonly`, optionally followed by a TACACS+ account number and press Enter.

Examples
The following command sets the TACACS+ account access level for account 14 to Admin:

```
Smart CDU: set tacpriv access admin 14<Enter>
```

The following command sets the TACACS+ account access level for account 5 to User:

```
Smart CDU: set tacpriv access user 5<Enter>
```

Granting and removing input status viewing privileges:
The Set TacPriv Envmon command grants or removes input status viewing privileges to/from a TACACS+ account.

To grant or remove input status viewing privileges for a TACACS+ account:
At the Smart CDU: prompt, type `set tacpriv envmon`, followed by `on` or `off`, optionally followed by a TACACS+ account number and press Enter.

Example
The following command grants input status viewing privileges to the TACACS+ account 5:

```
Smart CDU: set tacpriv envmon on 5<Enter>
```

Displaying the TACACS+ access privilege levels:
The List TacPrivs command displays all TACACS+ accounts with their access privilege levels.

To display TACACS+ account access privilege levels:
At the Smart CDU: prompt, type `list tacprivs` and press Enter.

Example
The following command displays all TACACS+ account with their access privilege level:

```
Smart CDU: list tacprivs<Enter>
```

```
TACACS Account Name Access Level Environmental Monitoring
TACAdmin Admin Allowed
PowerUser User Allowed
User On-Only Not Allowed
Guest View-Only Not Allowed
```
Adding serial port access to a TACACS+ account:
The Add PortToTACACS command grants a TACACS+ account access to the serial port.

To grant serial port access to a TACACS+ account:
At the Smart CDU: prompt, type `add porttotacacs console` and a TACACS+ account number. Press Enter.

Deleting serial port access for a TACACS+ account:
The Delete PortFromTACACS command removes a TACACS+ account’s access to the serial port. You cannot remove access to the serial port for an administrative level account.

To delete serial port access for a TACACS+ account:
At the Smart CDU: prompt, type `delete portfromtacacs console` and a TACACS+ account number. Press Enter.

Displaying TACACS account access:
The List TacPriv command displays all access rights for a TACACS+ account.

To display TACACS account access:
At the Smart CDU: prompt, type `list tacpriv`, optionally followed by a TACACS+ account. Press Enter.

Example
The following command displays information about the TACACS+ account 1:

```
Smart CDU: list tacpriv 1<Enter>
TACACS+ Privilege Level: 1
Ports:
    Port ID  Port Name
    Console  Console
```

TACACS+ Technical Specifications

Authentication START Packet includes:
- `action = 1` (TAC_PLUS_AUTHEN_LOGIN)
- `priv_lvl = 0` (TAC_PLUS_PRIV_LVL_MIN)
- `authen_type = 1` (TAC_PLUS_AUTHEN_TYPE_ASCII)
- `service = 1` (TAC_PLUS_AUTHEN_SVC_LOGIN)
- `user = (entered username)`
- `port = (access path into the Sentry)`
- `rem_addr = ‘Sentry3_xxxxxx’` (xxxxxx is last six digits of MAC address)
- `data = ‘’` (null)

**NOTE:** The password is sent in a CONTINUE packet.

Authorization REQUEST Packet includes:
- `authen_method = 6` (TAC_PLUS_AUTHEN_METH_TACACSPLUS)
- `priv_lvl = 0` (TAC_PLUS_PRIV_LVL_MIN)
- `authen_type = 1` (TAC_PLUS_AUTHEN_TYPE_ASCII)
- `authen_service = 1` (TAC_PLUS_AUTHEN_SVC_LOGIN)
- `user = (entered username)`
- `port = (access path into the Sentry)`
- `rem_addr = ‘Sentry3_xxxxxx’` (xxxxxx is last six digits of Ethernet MAC address)
- `service = ‘shell’` (for exec)
- `cmd = ‘’` (null)

**NOTE:** The access paths into the Sentry which support TACACS+ are ‘Console’, ‘Telnet’, ‘SSH’, ‘HTTP’ and ‘HTTPS’. In the case of ‘Console’ and ‘Modem’, an administrator is allowed to rename these ports in which case the assigned name is used.
The Sentry family of products supports the Remote Authentication Dial-in User Service (RADIUS) protocol. RADIUS provides a centralized network protocol to enable remote authentication and authorization, such as user names and passwords. With a central RADIUS server, user accounts do not need to be individually created locally on each Sentry device. This allows administrators to pre-define and configure (in each Sentry product and in the RADIUS server), a set of necessary RADIUS privilege levels and user access rights for each level.

RADIUS is also used in enterprise-wide networks because it provides the administrator with high performance, less memory usage, less CPU cycles on routers and switches, and an open standard that is easily interoperable within the network.

In addition to the protocol-required attributes, the RADIUS authentication process can be extended by using private vendor-specific attributes (VSA). This extension allows Server Technology to create its own proprietary attributes to support features and services using the Sentry CDU in the RADIUS authentication process.

### RADIUS Command Summary

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set Authorder</td>
<td>Specifies the authentication order for each new session attempt</td>
</tr>
<tr>
<td>Set RADIUS</td>
<td>Enables or disables RADIUS support</td>
</tr>
<tr>
<td>Set RADIUS … Server</td>
<td>Configures the address of the RADIUS server</td>
</tr>
<tr>
<td>Set RADIUS … Secret</td>
<td>Sets the shared secret for the RADIUS server</td>
</tr>
<tr>
<td>Set RADIUS … Port</td>
<td>Sets the port number of the RADIUS server</td>
</tr>
<tr>
<td>Set RADIUS … Timeout</td>
<td>Configures the timeout interval for the RADIUS server</td>
</tr>
<tr>
<td>Set RADIUS … Retries</td>
<td>Sets the number of retries for the RADIUS server</td>
</tr>
<tr>
<td>Show RADIUS</td>
<td>Displays RADIUS configuration settings</td>
</tr>
</tbody>
</table>

### Enabling and Setting Up RADIUS Support

The following configuration tasks are required to properly enable and set up RADIUS support on the primary and secondary RADIUS servers.

**Enabling and disabling RADIUS support:**

The Set RADIUS command enables or disables RADIUS support.

*To enable or disable RADIUS support:*

At the Smart CDU: prompt, type `set radius`, followed by `enabled` or `disabled`, and press Enter.

**Setting the authentication order:**

The Set Authorder command sets the authentication order for remote authentication sessions. The Sentry supports two methods for authentication order: Remote -> Local and Remote Only.

The Remote -> Local method first attempts authentication with the RADIUS server, and, if unsuccessful, then attempts authentication with the local user database on the Sentry device.

The Remote Only method attempts authentication only with the RADIUS server, and, if unsuccessful, access is denied.

*NOTE:* With the Remote Only method, if authentication fails due to a communication failure with the RADIUS server automatic authentication fallback will occur to authenticate with the local user data base on the Sentry device.

*To set the authentication order:*

At the Smart CDU: prompt, type `set authorder`, followed by `remotelocal` or `remoteonly` and press Enter.

*NOTE:* Server Technology recommends NOT setting the authentication order to Remote Only until the RADIUS has been fully configured and tested.
Setting the RADIUS server address:
The Set RADIUS Server command sets the IP address or hostname of the primary or secondary server used for RADIUS authentication requests.

To set the RADIUS server address:
At the Smart CDU: prompt, type `set radius`, followed by `primary` or `secondary`, followed by `server`, and the RADIUS server’s IP address or hostname (maximum 63 characters). Press `Enter`.

Examples
The following command sets the primary RADIUS server address to 98.76.54.32:

```
Smart CDU: set radius primary server 98.76.54.32<Enter>
```

The following command sets the secondary RADIUS server address to radius.servertech.com:

```
Smart CDU: set radius secondary server radius.servertech.com<Enter>
```

Setting the RADIUS secret:
The Set RADIUS Secret command sets the shared secret for the server used for RADIUS authentication requests.

To set the shared secret:
At the Smart CDU: prompt, type `set radius`, followed by `primary` or `secondary`, and followed by `secret`. Press `Enter`.

Enter the shared secret and press `Enter`. For security, shared secret characters are not displayed.

Changing the RADIUS port number:
The Set RADIUS Port command sets the server port number for RADIUS authentication requests.

To change the port number:
At the Smart CDU: prompt, type `set radius`, followed by `primary` or `secondary`, followed by `port`, and the port number (1-65535). Press `Enter`.

The default is 1812.

Example
The following command sets the secondary RADIUS server port number to 1855:

```
Smart CDU: set radius secondary port 1855<Enter>
```

Setting the RADIUS timeout value:
The Set RADIUS Timeout command sets the time interval to wait for a reply from the RADIUS server before resending the authentication request.

To set the timeout value:
At the Smart CDU: prompt, type `set radius`, followed by `primary` or `secondary`, followed by `timeout`, and the time interval in seconds (1-30). Press `Enter`.

Examples
The following command sets the primary RADIUS server timeout value to 15 seconds:

```
Smart CDU: set radius primary timeout 15<Enter>
```

The following command sets the secondary RADIUS server timeout value to 5 seconds:

```
Smart CDU: set radius secondary timeout 5<Enter>
```
Setting the number of RADIUS server retries:

The Set RADIUS Retries command specifies the number of times an authentication request is sent to the RADIUS server. The Sentry will attempt authentication with the primary server until the number of retries is reached, then will attempt authentication with the secondary server. If the Sentry does not receive a response from these attempts, the authentication request will be rejected.

To set the number of retries:

At the Smart CDU: prompt, type set radius, followed by primary or secondary, followed by retries, and followed by the number of retries (0-10). Press Enter.

Examples

The following command sets the retries for the primary RADIUS server to 5:

Smart CDU: set radius primary retries 5<Enter>

The following command sets the retries for the secondary RADIUS server to 2:

Smart CDU: set radius secondary retries 2<Enter>

Displaying RADIUS configuration information:

The Show RADIUS command displays RADIUS configuration information.

To display the RADIUS configuration information:

At the Smart CDU: prompt, type show radius and press Enter.

Example

The following command displays the RADIUS configuration information:

Smart CDU: show radius<Enter>

RADIUS Configuration

RADIUS: Enabled
Auth Order: Remote->Local
Primary Server:
  Shared Secret: ****
  Port: 1812
  Timeout: 15 seconds
  Retries: 5
Secondary Server:
  Shared Secret:
  Port: 1855
  Timeout: 5 seconds
  Retries: 2
Vendor-Specific Attributes (VSA):

Server Technology has defined and formatted RADIUS vendor-specific attributes (VSA) in the `dictionary.sti` file, which is available from Server Technology. The Sentry device is configured to recognize and use the configuration values in the file as specified by the network administrator, indicating to the RADIUS server that the defined attributes are based on Server Technology’s unique enterprise vendor code.

Using the format of the `dictionary.sti` file (located on the Server Technology FTP site at ftp.servetech.com), the Sentry RADIUS implementation supports the following vendor-specific attributes:

### Vendor-Specific Attribute (VSA) Descriptions

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
</table>
| STI-Access-Level | Indicates user access level for the Smart CDU; values are 1-6 as follows; a valid access level is required or access to the CDU is denied.  
Valid Access Levels:  
1 = Admin  
2 = Power User  
3 = User  
4 = Reboot Only  
5 = On Only  
6 = View Only |
| STI-Env-Mon | Determines user access rights to environmental monitoring; values are Yes or No. For the STI-Access-Level value other than 1 (Admin), if STI-Env-Mon is not included for a user, default is no. |
| STI-Outlets | Specifies user access rights to outlets; values are space-delimited strings of absolute IDs, names, or the special keyword “ALL”. String values are case-sensitive and limited to 253 characters. This attribute can be repeated to append strings that declare additional access rights. For STI-Access Level values other than 1 (Admin) and 2 (Power User), if STI-Outlets is not included for a user, the default is no outlet. |
| STI-Groups | Specifies user access rights to groups of outlets; values are space-delimited strings of absolute IDs, names, or the special keyword “ALL”. String values are case-sensitive and limited to 253 characters. This attribute can be repeated to append strings that declare additional access rights. For STI-Access Level values other than 1 (Admin) and 2 (Power User), if STI-Groups is not included for a user, the default is no group. |
| STI-Ports | Specifies user access rights to ports; values are space-delimited strings of absolute IDs, names, or the special keyword “ALL”. String values are case-sensitive and limited to 253 characters. This attribute can be repeated to append strings that declare additional access rights. For STI-Access Level values other than 1 (Admin) and 2 (Power User), if STI-Ports is not included for a user, the default is no ports. |

NOTE: User access levels must be configured using the `dictionary.sti` file. If the administrator does not use the `dictionary.sti` file to configure a user, the user will not have access rights to the Sentry CDU.

### Examples:

**Administrator with full access and configuration rights:**

```
sti-admin Auth-Type := Local, User-Password == "admin"
STI-Access-Level = Admin
```

**Power user with environmental monitoring allowed and full outlet/group/port access rights:**

```
sti-power Auth-Type := Local, User-Password == "power"
STI-Access-Level = Power-User,
STI-Env-Mon = Yes
```

**User with environmental monitoring not allowed and specific outlet/group/port access rights:**

```
sti-user Auth-Type := Local, User-Password == "user"
STI-Access-Level = User,
STI-Env-Mon = No,
STI-Outlets = ".A1 .A2 Rtr1 Rtr2 Srvr1 Srvr2",
STI-Outlets += ".A3 .A4 Rtr3 Rtr4 Srvr3 Srvr4"
STI-Groups = "Routers Servers",
STI-Ports = "Console"
```

**View-only user with environmental monitoring allowed and all outlet and group access rights:**

```
sti-view Auth-Type := Local, User-Password == "view"
STI-Access-Level = View-Only,
STI-Env-Mon = Yes,
STI-Outlets = "ALL",
STI-Groups = "ALL"
```
Logging

The Sentry family of products supports logging of system events both internally and externally. An internal log of more than 4000 events is automatically maintained and is reviewable by administrative users. For permanent/long-term log storage, Sentry supports the Syslog protocol. And for immediate notification, Sentry supports Email notifications.

Log entries include a sequential entry number, a date/time stamp and an event message. The event message is preceded with a message ‘type’ heading and if the event is tied to a user, the username will be included.

**NOTE:** For date/time stamp support, SNTP server support must be configured. For information on SNTP, see page 20.

The Sentry supports the following event message headers:

- **AUTH:** All authentication attempts.
- **POWER:** All power state change requests.
- **CONFIG:** All system configuration changes.
- **EVENT:** All general system events. Example: over/under threshold event.

Internal System Log

The internal system log is stored in the local memory and has support for up to 4097 continuously aging entries. The internal system log is only available to administrative users. For instructions on reviewing the internal log, see page 27.

Syslog

The Sentry’s Syslog support is RFC3164-compliant and enables off-Sentry viewing and storage of log messages. The Sentry supports external logging to up to two Syslog servers.

**Syslog Command Summary**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set Syslog HostIP</td>
<td>Sets the IP address of the Syslog server</td>
</tr>
<tr>
<td>Set Syslog Port</td>
<td>Sets the Syslog server port number</td>
</tr>
<tr>
<td>Show Syslog</td>
<td>Displays all Syslog configuration information</td>
</tr>
</tbody>
</table>

Setting the Syslog server IP address:

The Set Syslog HostIP command sets the TCP/IP address of the Syslog server.

**To set the Syslog server IP address:**

At the Smart CDU: prompt, type `set syslog`, followed by `hostip1` or `hostip2` and the Syslog server’s IP address. Press Enter.

**Example**

The following command sets the primary Syslog server IP address to 56.47.38.29:

```
Smart CDU: set syslog hostip1 56.47.38.29<Enter>
```

Changing the Syslog server port:

With Syslog support enabled, the Syslog server watches and responds to requests on the default Syslog port number 514. This port number may be changed using the Set Syslog Port command.

**To change the Syslog port:**

At the Smart CDU: prompt, type `set syslog port`, followed by the port number and press Enter.

**Example**

The following changes the Syslog port number to 411:

```
Smart CDU: set syslog port 411<Enter>
```
Displaying Syslog configuration information:
The Show Syslog command displays Syslog configuration information.

To display the Syslog configuration information:
At the Smart CDU: prompt, type `show syslog` and press Enter.

Example
The following command displays the Syslog configuration information:

```
Smart CDU: show syslog<Enter>
SYSLOG Configuration
  Primary Syslog Server IP Address: 56.47.38.29
  Secondary Syslog Server IP Address: 0.0.0.0
  Syslog Server Port: 411
```

Email

Email Command Summary

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set Email</td>
<td>Enables or disables Email notification support</td>
</tr>
<tr>
<td>Set Email SMTP Host</td>
<td>Sets the SMTP Host IP address or hostname</td>
</tr>
<tr>
<td>Set Email SMTP Port</td>
<td>Sets the SMTP server port number</td>
</tr>
<tr>
<td>Set Email From</td>
<td>Sets the email 'From' address</td>
</tr>
<tr>
<td>Set Email PrimaryTo</td>
<td>Sets the primary recipient email address</td>
</tr>
<tr>
<td>Set Email SecondaryTo</td>
<td>Sets the secondary recipient email address</td>
</tr>
<tr>
<td>Set Email Event</td>
<td>Enables or disables notification of general system events</td>
</tr>
<tr>
<td>Set Email Auth</td>
<td>Enables or disables notification of all authentication attempts</td>
</tr>
<tr>
<td>Set Email Power</td>
<td>Enables or disables notification of power state change requests</td>
</tr>
<tr>
<td>Set Email Config</td>
<td>Enables or disables notification of configuration changes</td>
</tr>
<tr>
<td>Show Email</td>
<td>Displays all Email configuration information</td>
</tr>
</tbody>
</table>

Enabling or disabling Email notification Support:
The Set Email command enables or disables Email notification support.

To enable or disable Email notification support:
At the Smart CDU: prompt, type `set email`, followed by `enabled` or `disabled` and press Enter.

Setting the SMTP server address:
The Set Email Host command sets the IP address or hostname of the SMTP server.

To set the SMTP server address:
At the Smart CDU: prompt, type `set email smtp host`, followed by the SMTP server’s IP address or hostname and press Enter.

Examples
The following command sets the SMTP server address to 55.55.55.55:

```
Smart CDU: set email smtp 55.55.55.55<Enter>
```

The following command sets the SMTP server address to email.servetech.com:

```
Smart CDU: set email smtp email.servetech.com<Enter>
```
Changing the SMTP server port:

With SMTP support enabled, the Sentry sends SMTP requests to the default SMTP port number 25. This port number may be changed using the Set Email SMTP Port command.

To change the TACACS port:

At the Smart CDU: prompt, type set email smtp port, followed by the port number and press Enter.

Example

The following changes the SMTP port number to 5555:

Smart CDU: set email smtp port 5555<Enter>

Setting the ‘From’ email address:

The Set Email From command sets the ‘from’ email address. By default, this is set to ‘Sentry3_’ plus the last three octets of the unit’s MAC address. Example: ‘Sentry3_510c90@’

To set the ‘From’ email address:

At the Smart CDU: prompt, type set email from, followed by the originating email address and press Enter.

Example

The following command sets the ‘from’ email address to Rack14CDU1@servertech.com:

Smart CDU: set email from Rack14CDU1@servertech.com<Enter>

Setting the ‘To’ email address:

The Set Email PrimaryTo and Set Email SecondaryTo commands set the recipient email addresses.

To set the ‘To’ email address:

At the Smart CDU: prompt, type set email, followed by primaryto or secondaryto and the destination email address. Press Enter.

Examples

The following command sets the primary ‘to’ email address to DayAdmin@servertech.com:

Smart CDU: set email primaryto DayAdmin@servertech.com<Enter>

The following command sets the secondary ‘to’ email address to NiteAdmin@servertech.com:

Smart CDU: set email secondaryto NiteAdmin@servertech.com<Enter>

Enabling or disabling event notification types:

The Set Email Event, Set Email Auth, Set Email Power and Set Email Config commands enable or disable email notification of the event types as described on page 79.

To enable or disable event notification types:

At the Smart CDU: prompt, type set email, followed by event, auth, power or config and enabled or disabled. Press Enter.

Examples

The following command sets the enables email notification general system events:

Smart CDU: set email event enabled<Enter>

The following command sets the disables email notification authentications attempts:

Smart CDU: set email auth disable<Enter>
Displaying Email configuration information:

The Show Email command displays Email configuration information.

To display the Email configuration information:

At the Smart CDU: prompt, type `show email` and press Enter.

**Example**

The following command displays the Email configuration information:

```
Smart CDU: show email
Email Configuration
  Email Notifications:  Enabled  
  SMTP Host:           email.servertech.com  
  SMTP Port:           5555  
  'From' Address:      Rack14CDU1@servertech.com  
  Primary 'Send To' Address: DayAdmin@servertech.com  
  Secondary 'Send To' Address: NiteAdmin@servertech.com  
  Include EVENT Messages:  Enabled  
  Include AUTH Messages:  Disabled  
  Include POWER Messages:  Disabled  
  Include CONFIG Messages:  Disabled
```
Upload/Download

The Sentry family of product supports the ability to upload and download system configurations using a standard FTP client. This feature enables for backup and restoration of system configuration as well as upload of ‘template’ configurations to ease large initial equipment deployments.

### Upload/Download Command Summary

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set FTP Server</td>
<td>Enables or disables the FTP server</td>
</tr>
<tr>
<td>Show FTP</td>
<td>Displays FTP configuration information</td>
</tr>
</tbody>
</table>

### Sentry Integrated FTP Server

The Sentry supports an integrated FTP Server which must be enabled for Upload/Download support. The Sentry FTP Server supports a single user at a time. Once an administrative user has authenticated with the Sentry FTP Server, standard FTP client commands may be used to upload or download Sentry configurations.

**NOTE:** The integrated FTP Server does NOT support Webbrowser FTP file transfers. A non-Web-browser is required for all Upload/Download requests.

### Enabling and disabling the FTP server:

The Set FTP Server command is used to enable or disable the integrated FTP server.

**To enable or disable the FTP server:**

At the Smart CDU: prompt, type `set ftp server`, followed by `enabled` or `disabled` and press Enter.

### FTP Configuration Files

The Sentry FTP server supports upload/download of two configuration files: CONFIG.BIN and NETWORK.INI. These files may be uploaded or downloaded using FTP PUT and GET operations.

- **CONFIG.BIN**
  - This file contains the entire configuration of the Sentry excluding TCP/IP settings, serial/factory-only configurations, the x.509 certificate (SSL) and SSH keys. This file in encoded to keep all data (including usernames, passwords etc.) out of plain view. **This file is NOT editable.**

- **FTP.INI**
  - This file contains only the FTP settings (FTP Host, username, password, filepath, filename and automatic updates support). This file is user readable and editable ‘plain text’ file.

- **NETWORK.INI**
  - This file contains only the TCP/IP settings (IP address, subnet mask, gateway, DNS1 and DNS2). This file is user readable and editable ‘plain text’ file.

- **SNTP.INI**
  - This file contains only the SNTP settings (SNTP Hosts and GMT offset). This file is user readable and editable ‘plain text’ file.

**NOTE:** The CONFIG.BIN file while **encoded** is not encrypted and susceptible to decoding using simple tools. Server Technology recommends the secure storage of CONFIG.BIN backup images.
Upload/Download Process

GETting a configuration file (Download):

1. Open the FTP client.
   *In a Windows environment, in the Run window type *ftp* and press *Enter*. *
2. At the prompt, type *open*, followed by the IP address of the Sentry and press *Enter*.
   
   FTP> open 12.34.56.78<Enter>
3. Authenticate with the appropriate administrative username and password.
4. At the prompt, type *get*, followed by the filename and press *Enter*.
   
   FTP> get config.bin<Enter>
5. At the prompt, type *close* to close the connection to the Sentry.
   
   FTP> close

PUTting a configuration file (Upload):

NOTE: Uploading the CONFIG.BIN file takes considerably longer than the NETWORK.INI file. When uploading both, Server Technology recommends uploading the NETWORK.INI file first.

1. Open the FTP client.
   *In a Windows environment, in the Run window type *ftp* and press *Enter*. *
2. At the prompt, type *open*, followed by the IP address of the Sentry and press *Enter*.
   
   FTP> open 12.34.56.78<Enter>
3. Authenticate with the appropriate administrative username and password.
4. At the prompt, type *put*, followed by the filename and press *Enter*.
   
   FTP> put network.ini<Enter>
5. At the prompt, type *close* to close the connection to the Sentry and force a restart of the device.
   
   FTP> close
Appendix A: Resetting to Factory Defaults

You may reset the non-volatile RAM that stores all configurable options. This clears all administrator-editable fields and resets all command line configurable options to their default values, including all user accounts.

You may reset the unit to factory defaults from the command line or the Web interface, or by pressing the reset button. You must have administrator-level privileges to issue the command. Using the reset button may be necessary when a forgotten password prevents administrator login. Each of the methods updates the current working configuration to the factory defaults.

NOTE: Resetting the unit resets all TCP/IP and Telnet/Web configurations. Reconfiguring the TCP/IP and Telnet/Web settings will be required.

To reset to factory defaults from the Web interface

On the Restart page in the Tools section of the Web interface, select Restart and reset to factory defaults from the drop-down menu and press Apply.

To reset to factory defaults from the command line

At the Smart CDU: prompt, type restart factory and press Enter.

To reset to factory defaults using the reset button

Locate the recessed reset button directly beside the Serial & Ethernet ports. You will need a non-conductive, non-metallic tool that fits inside the recess.

NOTE: This method will NOT work if the reset button has been disabled by the administrator.

Insert the tool in the recess, then depress and hold the reset button for at least ten seconds.

NOTE: If the reset button is depressed and held for more than 15 seconds, the reset will abort.

Appendix B: Uploading Firmware

You may upload new versions of firmware using File Transfer Protocol (FTP). This allows access to new firmware releases for firmware improvements and new features additions.

NOTE: To begin an FTP upload session, you must first configure the FTP Host address, username/password, filename and filepath. For information on configuring the FTP settings required for firmware upload see Chapter 3: Operations.

You may initiate an FTP upload session by issuing a command or from the Web interface. You must have administrator-level privileges to initiate an upload.

To initiate an FTP upload session from the Web interface

On the Restart page in the Tools section of the Web interface, select Restart and upload firmware via FTP from the drop-down menu and press Apply.

Upon issuing this command the unit will restart and upload the firmware file specified with the FTP Filename command from the previously configured FTP Host. See FTP Administration in Chapter 3: for more information.

To initiate an FTP upload session from the command line

The Restart FTPLoad command initiates an upload of firmware. Upon issuing this command the unit will restart and upload the firmware file specified with the FTP Filename command from the previously configured FTP Host. See FTP Administration in Chapter 3: for more information.

To initiate an FTP firmware upload session:

At the Smart CDU: prompt, type restart ftpload and press Enter.
## Appendix C: Technical Specifications

### Domestic Models

#### Smart CDU

<table>
<thead>
<tr>
<th>Model</th>
<th>Rated Voltage</th>
<th>Input Cordset and Plug (10')</th>
<th>Outlets</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS-12HD2-L20</td>
<td>208-240V 50/60Hz</td>
<td>NEMA L620P, 20A/208V locking</td>
<td>12 IEC 60320 C19</td>
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<td>CS-16V1-C20M</td>
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</table>
## Smart CDU (continued)

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<tr>
<th>Model</th>
<th>Rated Voltage</th>
<th>Input Cordset and Plug (10')</th>
<th>Outlets</th>
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<td>3/PE 240V 50/60Hz</td>
<td>NEMA L1520, 20A/240V locking</td>
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## Linking Smart CDU

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<th>Model</th>
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<th>Outlets</th>
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<tr>
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<td>IEC 60309, 60A 4-pin 9Hr Blue</td>
<td>12 IEC 60320 C19</td>
</tr>
<tr>
<td>CL-12VY-P603</td>
<td>3/N/PE 208V 50/60Hz</td>
<td>IEC 60309, 60A 5-pin 9Hr Blue</td>
<td>12 IEC 60320 C19</td>
</tr>
<tr>
<td>CL-16V1-C20M</td>
<td>100-120V 50/60Hz</td>
<td>IEC 60320 C20</td>
<td>16 NEMA 5-20R</td>
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<td>CL-16V1-L30M</td>
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<td>NEMA L530P, 30A/120V locking</td>
<td>16 NEMA 5-20R</td>
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<td>CL-16V1-C20MX</td>
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<tr>
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<td>IEC 60309, 60A 4-pin 9Hr Blue</td>
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<td>IEC 60309, 60A 4-pin 9Hr Blue</td>
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<td>IEC 60309, 60A 5-pin 9Hr Blue</td>
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</table>

1. Input cordset selected at time of purchase
2. qty x 120V NEMA 5-20R / qty x 208V IEC 60320 C13
3. qty x IEC 60320 C13 / qty x IEC 60320 C19
4. qty x NEMA 5-20R / qty x IEC 60320 C13 / qty x IEC 60320 C19
5. qty x NEMA 5-20R / qty x IEC 60320 C13 / qty x IEC 60320 C19
### International Models

**Smart CDU**

<table>
<thead>
<tr>
<th>Model</th>
<th>Rated Voltage</th>
<th>Input Cordset and Plug (10’)</th>
<th>Outlets</th>
</tr>
</thead>
<tbody>
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<td>IEC 60309, 32A 3-pin 6Hr Blue</td>
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<tr>
<td>CS-12HDE-30932E</td>
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<td>IEC 60309, 32A 3-pin 6Hr Blue</td>
<td>12 IEC 60320 C19</td>
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<tr>
<td>CS-16VE-C20M</td>
<td>230V 50/60Hz</td>
<td>IEC 60309, 32A 3-pin 6Hr Blue</td>
<td>16 IEC 60320 C13</td>
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<tr>
<td>CS-16VE-P32M</td>
<td>230V 50/60Hz</td>
<td>IEC 60309, 32A 3-pin 6Hr Blue</td>
<td>16 IEC 60320 C13</td>
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<tr>
<td>CS-16VE-C20MX</td>
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<td>IEC 60309, 32A 3-pin 6Hr Blue</td>
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<td>CS-24VE-P32M</td>
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<td>IEC 60309, 32A 3-pin 6Hr Blue</td>
<td>24 IEC 60320 C13</td>
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<td>IEC 60309, 32A 3-pin 6Hr Blue</td>
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<td>IEC 60309, 32A 3-pin 6Hr Blue</td>
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1 Input cordset selected at time of purchase
2 qty x 120V NEMA 5-20R / qty x 208V IEC 60320 C13
3 qty x IEC 60320 C13 / qty x IEC 60320 C19
4 qty x NEMA 5-20R / qty x IEC 60320 C13 / qty x IEC 60320 C19

### Linking Smart CDU

<table>
<thead>
<tr>
<th>Model</th>
<th>Rated Voltage</th>
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<th>Outlets</th>
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<tr>
<td>CL-16VE-C20M</td>
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<td>IEC 60309, 32A 3-pin 6Hr Blue</td>
<td>16 IEC 60320 C13</td>
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<tr>
<td>CL-16VE-P32M</td>
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<td>IEC 60309, 32A 3-pin 6Hr Blue</td>
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<td>CL-16VE-C20MX</td>
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<td>IEC 60309, 32A 3-pin 6Hr Blue</td>
<td>16 IEC 60320 C13</td>
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<tr>
<td>CL-24VE-P32M</td>
<td>230V 50/60Hz</td>
<td>IEC 60309, 32A 3-pin 6Hr Blue</td>
<td>24 IEC 60320 C13</td>
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1 Input cordset selected at time of purchase
2 qty x 120V NEMA 5-20R / qty x 208V IEC 60320 C13
3 qty x IEC 60320 C13 / qty x IEC 60320 C19
4 qty x NEMA 5-20R / qty x IEC 60320 C13 / qty x IEC 60320 C19
### Power Ratings

#### Domestic Models

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<thead>
<tr>
<th>Model</th>
<th>Voltage</th>
<th>Current</th>
<th>Voltage</th>
<th>Outlet</th>
<th>Branch Circuit</th>
<th>Phase</th>
<th>Total</th>
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### Notes:
1. All current ratings are in amperes. Tous les indices de courant sont en ampères. Alle Angaben der Stromstärke erfolgen in Ampere.
2. Each branch circuit consists of: Chaque circuit de la branche comporte: Jeder Zweigstromkreis besteht aus:
   - 12HDx - 2 outlets, prises, Anschlüsse. Input, Entrée, Eingang A: 1+2, 3+4, 5+6
   - 24Vx, 48VDx Two 6-outlet modules; 12 outlets. 2 série de 6 prises de courants, soit au total 12 prises.
   - 84VDx Three 7-outlet modules; 21 outlets. 3 série de 7 prises de courants, soit au total 21 prises.
   - 16Vx 8 outlets, prises, Anschlüsse. Input, Entrée, Eingang A: 1+2

IEC 60320 C13 / IEC 60320 C19
### Domestic Models (continued)

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<thead>
<tr>
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<th>Voltage</th>
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### Input Current Ratings

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<td>B: 24</td>
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---

1. All current ratings are in amperes. *Tous les indices de courant sont en ampères.* Alle Angaben der Stromstärke erfolgen in Ampere.
2. Each branch circuit consists of: *Chaque circuit de la branche comporte:* Jeder Zweigstromkreis besteht aus:
   - 12HDx: 2 outlets, prises, Anschlüsse. Input, Entrée, Eingang A: 1+2, 3+4, 5+6
   - 12Vx: 6 outlets, prises, Anschlüsse. Input, Entrée, Eingang A: 1+2
   - 16Vx: 8 outlets, prises, Anschlüsse. Input, Entrée, Eingang A: 1+2
   - 18Vx-xA2: Two 3-outlet modules (1 x C13 and 3 x C19). ; 6 outlets. 2 série de 3 prises de courants, soit au total 6 prises.
   - 2 gekuppelten Modulen mit je 3 Anschlüssen: 6 Anschlüsse. Input, Entrée, Eingang A: 1a+1b, 2a+2b, 3a+3b
   - 21Vx: 7 outlets, prises, Anschlüsse. Input, Entrée, Eingang A: 1+2+3
   - 24Vx, 48VDx: 8 outlets, prises, Anschlüsse. Input, Entrée, Eingang A: 1+2+3
   - 24Vx-xMA: 8 outlets, prises, Anschlüsse (6 x C13 and 2 x C19). Input, Entrée, Eingang A: 1+2+3
   - 36Vx: Two 6-outlet modules; 12 outlets. 2 série de 6 prises de courants, soit au total 12 prises.
   - 2 gekoppelten Modulen mit je 6 Anschlüssen: 12 Anschlüsse. Input, Entrée, Eingang A: 1a+1b, 2a+2b, 3a+3b
   - 36Vx-xA4: Two 6-outlet modules (4 x C13 and 2 x C19). ; 12 outlets. 2 série de 6 prises de courants, soit au total 12 prises.
   - 2 gekoppelten Modulen mit je 6 Anschlüssen: 12 Anschlüsse. Input, Entrée, Eingang A: 1a+1b, 2a+2b, 3a+3b
   - 84VDx: Three 7-outlet modules; 21 outlets. 3 série de 7 prises de courants, soit au total 21 prises.
   - 3 gekoppelten Modulen mit je 7 Anschlüssen: 21 Anschlüsse. Input, Entrée, Eingang A, B: 1a+1b+1c, 2a+2b+2c

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3. IEC 60320 C13 / IEC 60320 C19
### Domestic Models (continued)

<table>
<thead>
<tr>
<th>Model</th>
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<th>Branch Circuits</th>
<th>Phase</th>
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1. All current ratings are in amperes. Tous les indices de courant sont en ampéres. Alle Angaben der Stromstärke erfolgen in Ampere.
2. Each branch circuit consists of: Chaque circuit de la branche comporte: Jeder Zweigstromkreis besteht aus:

#### 12HDx -
- 2 outlets, prises, Anschlussstücke. Input, Entrée, Eingang A, B: 1+2, 3+4, 5+6
- 12Vx
  - 6 outlets, prises, Anschlussstücke. Input, Entrée, Eingang A: 1+2
- 18Vx-xA2
  - Two 3-outlet modules (1 x C13 and 3 x C19): 6 outlets. 2 série de 3 prises de courants, soit au total 6 prises.
  - 2 gekoppelten Modulen mit je 3 Anschlüssen: 6 Anschlüsse. Input, Entrée, Eingang A: 1a+1b, 2a+2b, 3a+3b
- 21Vx
  - 7 outlets, prises, Anschlussstücke. Input, Entrée, Eingang A: 1+2+3
- 24Vx, 48VxDx
  - Two 6-outlet modules; 12 outlets. 2 série de 6 prises de courants, soit au total 12 prises.
  - 2 gekoppelten Modulen mit je 6 Anschlüssen: 12 Anschlüsse. Input, Entrée, Eingang B: 1a+1b, 2a+2b, 3a+3b
- 24Vx-xA
  - 8 outlets, prises, Anschlussstücke (6 x C13 and 2 x C19). Input, Entrée, Eingang A: 1+2+3
- 27Vx
  - 9 outlets, prises, Anschlussstücke. Input, Entrée, Eingang A: 1+2+3
- 3AxA
  - Four 120V outlets and one 6-outlet module (4 x C13 and 2 x C19): 10 outlets. 4 120V prises de courants y 1 série de 6 prises de courants, soit au total 10 prises. 120V Anschlusstücke und eine gekoppelten Modulen mit je 6 Anschlüssen: 10 Anschlüsse.
  - Input, Entrée, Eingang A, B: xy, yz, xz
- 36Vx
  - Two 6-outlet modules; 12 outlets. 2 série de 6 prises de courants, soit au total 12 prises.
  - 2 gekoppelten Modulen mit je 6 Anschlüssen: 12 Anschlüsse. Input, Entrée, Eingang A: 1a+1b, 2a+2b, 3a+3b
- 36Vx-xA4
  - Two 6-outlet modules (4 x C13 and 2 x C19): 12 outlets. 2 série de 6 prises de courants, soit au total 12 prises.
  - 2 gekoppelten Modulen mit je 6 Anschlüssen: 12 Anschlüsse. Input, Entrée, Eingang A: 1a+1b, 2a+2b, 3a+3b

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**Note:**

1. IEC 60320 C13 / IEC 60320 C19
2. NEMA 5-20R / IEC 60320 C13 / IEC 60320 C19
### Domestic Models (continued)

<table>
<thead>
<tr>
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<th>Outlet</th>
<th>Branch Circuits</th>
<th>Phase</th>
<th>Total</th>
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<td>Tension</td>
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2. Each branch circuit consists of: *Chaque circuit de la branche comporte:* Jeder Zweigstromkreis besteht aus:

#### International Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage</th>
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<td>Anschlussstelle</td>
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<td>A: 16</td>
</tr>
<tr>
<td>Cx-12HDE-303 216E</td>
<td>120V</td>
<td>9.2</td>
<td>A: 16</td>
<td>B: 16</td>
<td>9.2</td>
<td>A: 16</td>
</tr>
<tr>
<td>Cx-16VE-C20Mx</td>
<td>230V</td>
<td>9.2</td>
<td>A: 16</td>
<td>B: 16</td>
<td>9.2</td>
<td>A: 16</td>
</tr>
<tr>
<td>Cx-16VE-P32M</td>
<td>230V</td>
<td>9.2</td>
<td>A: 16</td>
<td>B: 16</td>
<td>9.2</td>
<td>A: 16</td>
</tr>
</tbody>
</table>

1. All current ratings are in amperes. *Tous les indices de courant sont en ampères. *Alle Angaben der Stromstärke erfolgen in Ampere.*
2. Each branch circuit or phase consists of: *Chaque circuit de la branche comporte:* Jeder Zweigstromkreis besteht aus:

#### Model Voltage Current Voltage Outlet Branch Circuit 2 Total

**Model** | **Voltage** | **Current** | **Voltage** | **Outlet** | **Branch Circuit** | **Phase** | **Total** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cx-48VDE-C20</td>
<td>230V</td>
<td>100-120V</td>
<td>208V</td>
<td>9.2</td>
<td>A: 27.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cx-48VDE-P32</td>
<td>230V</td>
<td>100-120V</td>
<td>208V</td>
<td>9.2</td>
<td>A: 27.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. All current ratings are in amperes. *Tous les indices de courant sont en ampères. *Alle Angaben der Stromstärke erfolgen in Ampere.*
2. Each branch circuit or phase consists of: *Chaque circuit de la branche comporte:* Jeder Zweigstromkreis besteht aus:
Installation and Operations Manual

International Models (continued)

1 All current ratings are in amperes. Tous les indices de courant sont en ampères. Alle Angaben der Stromstärke erfolgen in Ampere.

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage</th>
<th>Current</th>
<th>Voltage</th>
<th>Outlet</th>
<th>Branch Circuit</th>
<th>Phase</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cx-24V4-P16M</td>
<td>3/NPE 400V 60Hz</td>
<td>16</td>
<td>230V</td>
<td>10</td>
<td>L1a - 16 / L1b - 16</td>
<td>L1</td>
<td>16</td>
</tr>
<tr>
<td>Cx-24V4-P32M</td>
<td>3/NPE 400V 60Hz</td>
<td>32</td>
<td>230V</td>
<td>10</td>
<td>L1a - 20 / L2b - 20</td>
<td>L2</td>
<td>32</td>
</tr>
<tr>
<td>Cx-24V4-P16MA</td>
<td>3/NPE 400V 60Hz</td>
<td>16</td>
<td>230V</td>
<td>10/16</td>
<td>L1a - 16 / L1b - 16</td>
<td>L1</td>
<td>16</td>
</tr>
<tr>
<td>Cx-24V4-P32MA</td>
<td>3/NPE 400V 60Hz</td>
<td>32</td>
<td>230V</td>
<td>10/16</td>
<td>L1a - 20 / L2b - 20</td>
<td>L2</td>
<td>32</td>
</tr>
</tbody>
</table>

2 Each branch circuit or phase consists of: Chaque circuit de la branche comporte: Jeder Zweigstromkreis besteht aus:

24V4 4 outlets, prises, Anschlüsse. Input, Entrée, Eingang A: 1a+1b, 2a+2b, 3a+3b
24V4-xMA 4 outlets, prises, Anschlüsse (3 x C13 and 1 x C19). Input, Entrée, Eingang A: 1a+1b, 2a+2b, 3a+3b
84VDx Three 7-outlet modules; 21 outlets. 3 gekuppelte Modulen mit je 7 Anschlüssen: 21 Anschlüsse. 3 série de 7 prises de courants, soit au total 21 prises.

3 IEC 60320 C13 / IEC 60320 C19

Physical Specifications

<table>
<thead>
<tr>
<th>Operating</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>-40° to 185° F (-40° to 85° C)</td>
</tr>
<tr>
<td>Elevation (above MSL)</td>
<td>0 to 50,000 ft (0 to 15000m)</td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>10 to 90%, non-condensing</td>
</tr>
</tbody>
</table>

Dimensions (H x W x D) Weight

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cx-12Vx</td>
<td>45.7 x 3.5 x 3.5 in. (1160 x 89 x 89 mm)</td>
<td>22.4 lbs (10.2 kg)</td>
</tr>
<tr>
<td>Cx-12HDx</td>
<td>3.5 x 17.0 x 10.0 in. (89 x 437 x 254 mm)</td>
<td>6.5 lbs (2.9 kg)</td>
</tr>
<tr>
<td>Cx-16V1-xM</td>
<td>44.5 x 1.75 x 2.25in. (1130 x 45 x 57 mm)</td>
<td>9.4 lbs (4.3 kg)</td>
</tr>
<tr>
<td>Cx-16V2-xM</td>
<td>49.5 x 1.75 x 2.25in. (1257 x 45 x 57 mm)</td>
<td>9.4 lbs (4.3 kg)</td>
</tr>
<tr>
<td>Cx-16E2-xM</td>
<td>49.5 x 1.75 x 2.25in. (1257 x 45 x 57 mm)</td>
<td>9.4 lbs (4.3 kg)</td>
</tr>
<tr>
<td>Cx-16Vx-xMX</td>
<td>39.5 x 1.75 x 2.25 in. (1003 x 45 x 57 mm)</td>
<td>9.4 lbs (4.3 kg)</td>
</tr>
<tr>
<td>Cx-18Vx</td>
<td>68.0 x 1.75 x 3.5 (1727 x 45 x 89 mm)</td>
<td>19.8 lbs (9.0 kg)</td>
</tr>
<tr>
<td>Cx-21Vx</td>
<td>45.7 x 1.75 x 2.25 in. (1160 x 45 x 57 mm)</td>
<td>9.4 lbs (4.3 kg)</td>
</tr>
<tr>
<td>Cx-27Vx</td>
<td>69.0 x 1.70 x 3.5 in. (1753 x 45 x 89 mm)</td>
<td>10.8 lbs (4.9 kg)</td>
</tr>
<tr>
<td>Cx-24Vx-M</td>
<td>69.0 x 1.75 x 2.25 in. (1753 x 45 x 57 mm)</td>
<td>13.2 lbs (6.0 kg)</td>
</tr>
<tr>
<td>Cx-24Vx-xMA</td>
<td>69.0 x 1.75 x 2.25 in. (1753 x 45 x 57 mm)</td>
<td>13.2 lbs (6.0 kg)</td>
</tr>
<tr>
<td>Cx-3AVx</td>
<td>68.0 x 2.0 x 3.25 in. (1727 x 51 x 82 mm)</td>
<td>21.7 lbs (9.8 kg)</td>
</tr>
<tr>
<td>Cx-36Vx</td>
<td>68.0 x 1.75 x 3.25 (1727 x 45 x 83 mm)</td>
<td>15.3 lbs (6.9 kg)</td>
</tr>
<tr>
<td>Cx-36Vx-xA4</td>
<td>68.0 x 1.75 x 3.25 (1727 x 45 x 83 mm)</td>
<td>15.3 lbs (6.9 kg)</td>
</tr>
<tr>
<td>Cx-48VD1</td>
<td>54.3 x 3.5 x 2.25 in. (1372 x 89 x 57 mm)</td>
<td>17.8 lbs (8.1 kg)</td>
</tr>
<tr>
<td>Cx-48VD2</td>
<td>54.3 x 3.5 x 2.25 in. (1372 x 89 x 57 mm)</td>
<td>17.8 lbs (8.1 kg)</td>
</tr>
<tr>
<td>Cx-48VDY</td>
<td>63.5 x 3.5 x 2.25 in. (1617 x 89 x 57 mm)</td>
<td>17.8 lbs (8.1 kg)</td>
</tr>
<tr>
<td>Cx-54VDx</td>
<td>66.25 x 3.5 x 2.25 in. (1682 x 89 x 57 mm)</td>
<td>23.0 lbs (10.4 kg)</td>
</tr>
<tr>
<td>Cx-84VDx</td>
<td>66.25 x 3.5 x 2.25 in. (1682 x 89 x 57 mm)</td>
<td>22.7 lbs (10.3 kg)</td>
</tr>
</tbody>
</table>
Branch Circuit Protection

Always disconnect ALL power supply cords before opening to avoid electrical shock.
Afin d’éviter les chocs électriques, débranchez TOUTES les cables électrique avant d’ouvrir.
Vor dem Öffnen immer Netzleitungen abziehen um elektrischen Schlag zu vermeiden.

Smart CDUs feature Branch Circuit protection on all outlets in the form of internal fuses. These fuses meet the strict safety requirements of UL/CSA 60950-1 for Branch Circuit Protection.

Time-Delay Fuses – Class G

<table>
<thead>
<tr>
<th>Amperes</th>
<th>Bussman Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>SC-20</td>
</tr>
</tbody>
</table>

CooperBussman product data-sheet #1024

Data Connections

RS-232 port

Smart CDUs are equipped standard with an RJ45 DTE RS-232c serial port. This connector may be used for direct local access or from other serial devices such as a terminal server. An RJ45 crossover cable is provided for connection to an RJ45 DCE serial port.

<table>
<thead>
<tr>
<th>Pin</th>
<th>DTE Signal Name</th>
<th>Input/Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Request to Send</td>
<td>RTS</td>
</tr>
<tr>
<td>2</td>
<td>Data Terminal Ready</td>
<td>DTR</td>
</tr>
<tr>
<td>3</td>
<td>Transmit Data</td>
<td>TD</td>
</tr>
<tr>
<td>4</td>
<td>Signal Ground</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Signal Ground</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Receive Data</td>
<td>RD</td>
</tr>
<tr>
<td>7</td>
<td>Data Set Ready</td>
<td>DSR</td>
</tr>
<tr>
<td>8</td>
<td>Clear to Send</td>
<td>CTS</td>
</tr>
</tbody>
</table>

RJ45 to DB9F serial port adapter

Additionally, an RJ45 to DB9F serial port adapter is provided for use in conjunction with the RJ45 crossover cable to connect to a PC DB9M DCE serial port. The adapter pinouts below reflect use of the adapter with the provided RJ45 crossover cable.

<table>
<thead>
<tr>
<th>Pin</th>
<th>DCE Signal Name</th>
<th>Input/Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Receive Data</td>
<td>RD</td>
</tr>
<tr>
<td>3</td>
<td>Transmit Data</td>
<td>TD</td>
</tr>
<tr>
<td>4</td>
<td>Data Terminal Ready</td>
<td>DTR</td>
</tr>
<tr>
<td>5</td>
<td>Signal Ground</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Data Set Ready</td>
<td>DSR</td>
</tr>
<tr>
<td>7</td>
<td>Request to Send</td>
<td>RTS</td>
</tr>
<tr>
<td>8</td>
<td>Clear to Send</td>
<td>CTS</td>
</tr>
</tbody>
</table>
Regulatory Compliance

Product Safety

Units have been safety tested and certified to the following standards:

- USA/Canada  UL 60950:2003 and CAN/CSA 22.2 No. 60950-1-03
- European Union  EN60950-1:2001

This product is also designed for Norwegian IT power system with phase-to-phase voltage 230V.

USA Notification

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user’s own expense.

Modifications not expressly approved by the manufacturer could void the user's authority to operated the equipment under FCC rules.

Canadian Notification

This Class A digital apparatus complies meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigencies du Règlement sur le matériel brouilleur du Canada.

European Union Notification

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms:

- EN55022  Electromagnetic Interference
- EN55024  Electromagnetic Immunity
- EN60950-1  Product Safety
- EN61000-3  Harmonics and Flicker

RoHS Directive

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

Japanese Notification

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

本製品に同梱または付属しております電源コードは、本製品専用です。本製品以外の製品ならびに他の用途に使用しないで下さい。

Chinese Notification

关于符合中国《电子信息产品污染控制管理办法》的声明

产品中有毒有害物质的名称及含量

<table>
<thead>
<tr>
<th>部件名称 (Parts)</th>
<th>有毒有害物质或元素 (Hazardous Substance)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>汞 (Hg) 镉 (Cd) 六价铬 (Cr(VI)) 多溴联苯 (PBB) 多溴二苯醚 (PBDE)</td>
</tr>
<tr>
<td>机箱子组件 (Chassis Subassembly)</td>
<td>O O O O O</td>
</tr>
<tr>
<td>印刷板组件 (PCAs)</td>
<td>X O O O O</td>
</tr>
</tbody>
</table>

O 表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T 11363-2006 标准规定的限量要求以下。

Indicates that this hazardous substance contained in all homogeneous materials of this part is below the limit requirement in SJ/T 11363-2006.

X 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T 11363-2006 标准 规定的限量要求。

Indicates that this hazardous substance contained in at least one of the homogeneous materials of this part is above the limit requirement in SJ/T 11363-2006.
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.
Appendix D: Warranty, Product Registration and Support

**Warranty**

For the Server Technology warranty information, please see our Website at [www.servertech.com](http://www.servertech.com)

**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 at [www.servertech.com](http://www.servertech.com)

**Technical Support**

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

Server Technology understands that there are often questions when installing and/or using a new product. Free Technical Support is provided from 8 a.m. to 5 p.m. PST, Monday through Friday. After-hours service is provided to ensure your requests are handled quickly no matter what time zone or country you are located in.

Server Technology, Inc.
1040 Sandhill Drive  Tel: 775.284.2000  Web: [www.servertech.com](http://www.servertech.com)
Reno, Nevada  89521 USA  Fax: 775.284.2065  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 at [www.servertech.com](http://www.servertech.com).