Server Technology
A brand of legrand

stay powered. be supported. get ahead.

User Guide

PRO2 Power Distribution Unit (PDU)

PRO2

Server Technology's newest platform for PDUs, featuring:

- HDOT Cx
- Switched POPS
- Smart POPS
- Switched
- Smart

Firmware 8.0

www.servertech.com

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.

Notices

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Reno, Nevada 89521 USA

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About Your User Guide

This user guide was designed for data center staff and administrators who monitor power, control outlet actions, and direct equipment operations in the data center network using Server Technology's firmware (version 8.0x or later), on the PRO1/PRO2 product group, which includes the following types of intelligent Power Distribution Units (PDUs):

- HDOT Cx
- Switched POPS
- Smart POPS
- Switched
- Smart

Your user guide highlights the unique hardware features of each of these units; provides the installation, connection, and mounting instructions for securing the unit in the equipment rack; and gives detailed, task-based information for working with the PDU through the firmware interface.

If you use the Web interface, this guide offers step-by-step instructions for daily operational tasks on the PRO1/PRO2, including GUI screen samples for each user action. You will find a chapter for monitoring functions and a chapter for configuration.

If you use the Command Line Interface (CLI), another separate chapter lists each user command in alphabetic order that links to detailed information about syntax, usage, and parameter descriptions.

More PRO1/PRO2 Resources

Visit www.servertech.com for a wide variety of information for the PRO1/PRO2 product you have. Brief instructional videos, product support information from our power strategy experts, brochures, a buying guide, questions and answers, detailed specifications, and many more resources – such as the innovate **Build Your Own PDU** and **Product Selector** – are available on the Server Technology website to assist you with product knowledge, best product usage, and an easy ordering process.

Contact Technical Support

Experience Server Technology's FREE 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. Pacific Time, Monday through Friday.

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Chapter 1. Your PRO2 PDU

Welcome to the Server Technology® PRO2

The PRO2 is the latest design in Server Technology's reliable power distribution units, providing flexibility for future power management, cost savings, and advanced solutions for data center customers.

PRO2 PDU

Key Features

The PRO2 offers many features for the next generation of power management, including:

- PIPS® and (optionally) POPS® high-accuracy measurements for current, voltage, power, and other key metrics. PIPS is a standard feature on all PRO2 units.
- Auto-Flip LED display gives the proper display orientation no matter how the PRO2 is mounted in the cabinet.
- Outlet naming on all PRO2 products (for both Switched and Smart products).
- Hot-swappable network interface card (NIC) allows swapping the card in the field without causing a change in outlet state. The NIC can easily be replaced even when power is applied.
- Support for IPv6 address names and support for SNMPv3.
- Branch current measurements (for both Switched and Smart products), and notification of fuse or breaker failure.
- Several new levels of power monitoring for high-low warning-alarm thresholds and threshold hysteresis.
- If the master unit loses power, redundant power is provided to the master via the first linked unit, ensuring uptime.
- On-board firmware file system to allow direct GUI downloads of system files, firmware version updates, and MIB/OID tree files without using FTP.
- Intuitive and soft-mapped naming conventions used in both the PRO2 hardware and firmware to reflect the system hierarchy of units, cords, lines, phases, over-current protectors (OCPs), branches, outlets, outlet groups, and sensors.

What's the PRO1?

Like the PRO2, the PRO1 (Switched and Smart) is another new PDU design from Server Technology to provide the same type of flexibility for power management, cost savings, and advanced data center solutions that the PRO2 delivers.

PRO1 PDU

What's Unique About the PRO1?

Server Technology's PRO1 design allows for PRO2 functionality in a CDU1 form factor. Like the PRO2, the PRO1 still uses the Sentry4-MIB and the PRO2 firmware, version 8.0.x, allowing PRO1 products to offer the latest features and functions of the PRO2 product family with a smaller form factor.

Feature Comparison: PRO1 vs. PRO2

The PRO1 is similar to the PRO2 in hardware architecture, object mapping, user interfaces (GUI and CLI), firmware (version 8.0.x or later), and the new Sentry4-MIB, but the PRO1 **does not** include the following PRO2 items:

- Branch Current Monitoring feature.
- TRMS Current Input Monitoring (in some cases rather than PIPS).

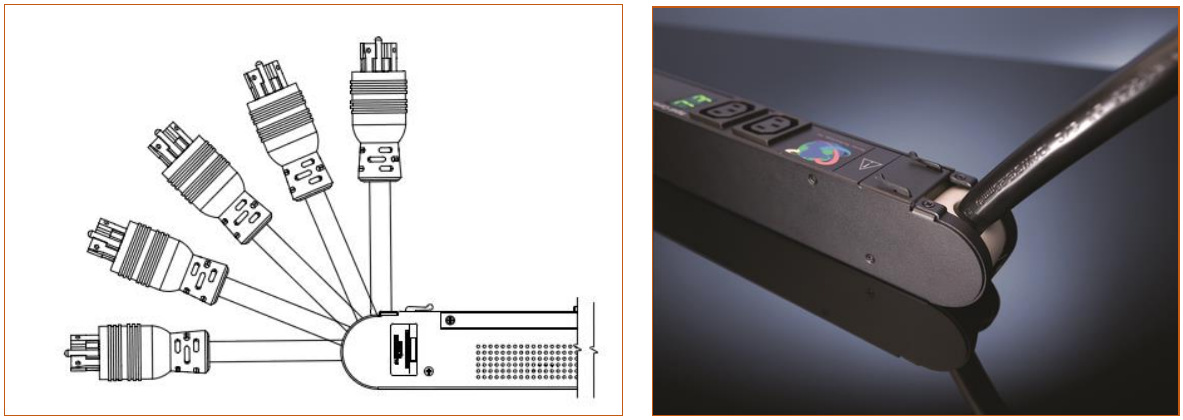
For a closer look, the following table compares PRO1 and PRO2 benefits:

Product	Benefits
PRO1	**PDU with the NIM2/PRO2 network card:** • Faster processor and more memory • Hot swap network card • Network card swap with no re-programming (PCM) • Features/functions can be added as needed • Multi-linking (up to 4 units) • Power from link unit keeps network up if power from master unit goes down • Sentry4-MIB allows additional alarm warning and threshold levels
PRO2	**PRO2 architecture with the NIM2 network card:** • PRO1 features, plus additional features • PIPS standard • Branch monitoring standard • Locking data and low voltage cables • Smart products with breaker/fuse branch circuit sensing • All products 60 degrees Celsius rated

PDU Power Pivot®

Server Technology's PDU Power Pivot® flexible infeed provides a simplified power cord routing to the PRO2 unit with a design that eliminates bend radius issues.

As illustrated below, the PDU Power Pivot capability can deliver a solution for several types of PDU installations and mountings, setting the correct cord angle for overhead power, offset overhead power, concrete floor, raised floor, and intra-rack power.



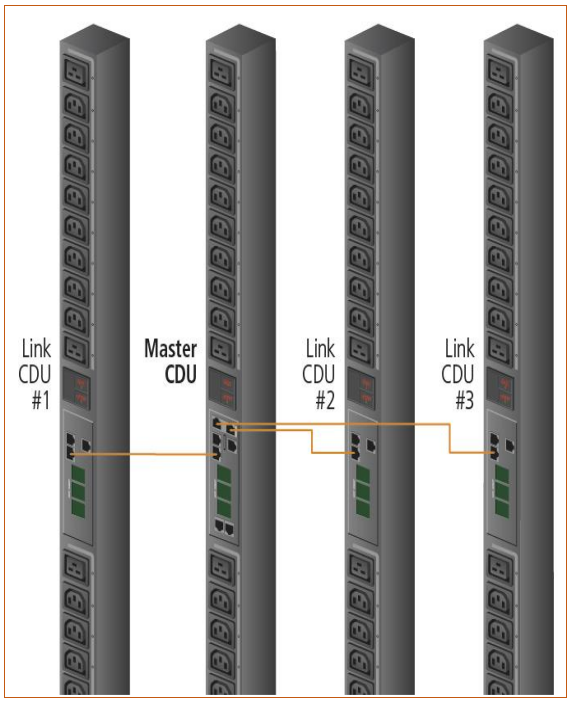
PDU Power Pivot – Flexible Cord Design

Star Linking Technology

Server Technology's PRO1/PRO2 product line introduces the Star Linking technology that supports the optional linking of up to three expansion (link) units per one master unit, allowing a single IP address for multiple cabinets.

Note: The Star Linking feature is available only with PRO1/PRO2 products.

The following illustrations show multi-linking between separate units and within the cabinet:



Multi-Linked PRO2 Units

Multi-Linking View in the Equipment Cabinet

Redundant Power and Communication

The Star Linking arrangement is fault tolerant, with redundant power coming from the first link unit. The arrangement also offers significant cost reduction as the link units do not require a network card. Another significant advantage of Star Linking technology is that if power in the master unit is lost, communication will continue with the other link units, which is a major improvement over a daisy-chain linking configuration.

Outlet Grouping

The multi-link arrangement allows outlet grouping across the master and three link units.

Cable Length

The maximum cable length allowed from link unit to master unit is 21-feet (6.4 meters).

Multi-Link Module or Dongle

In the Star Linking arrangement, the first link unit connects through the link port.

However, the second and third link units in this arrangement **attach to either an optional T-shaped module or to a dongle** that connects to the AUX port on the master unit through a 12-inch (30 cm) cable.

The optional multi-link feature is sold as a separate kit purchased from Server Technology. To use the multi-link feature, contact your sales representative to order either the module or dongle kit, described below.

All features and benefits in the multi-link arrangement are the same whether configured with a module or dongle, but for the module, PDU size requirements are noted as follows.

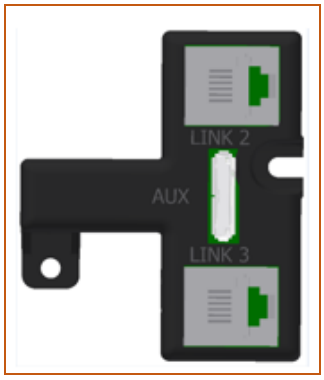
Multi-Link Module Kit

Note: The module fits only on PRO1/PRO2 products that are 2.2 inches (55.8 mm) wide.

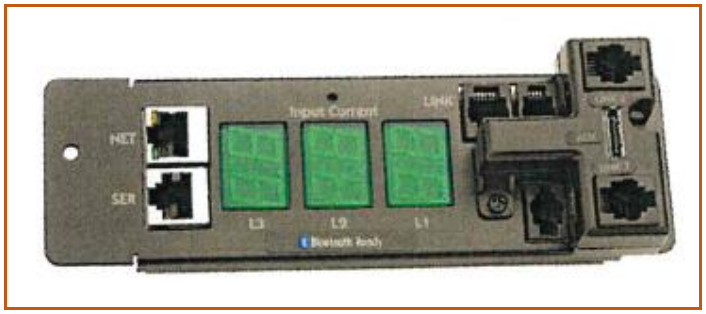
Part number: KIT-PRO2LINK-01M.

The module kit contains:

- One T-shaped link module (labeled to show the 2nd and 3rd link units).
- Two link cables: each 21 ft. (6.4 meters).
- Two labels marked: LINK 2 and LINK 3.
- One link cable: 7 in. (178 mm).
- One mounting screw: M3x6mm.



Multi-Link Module



Module Shown Connected to AUX Port

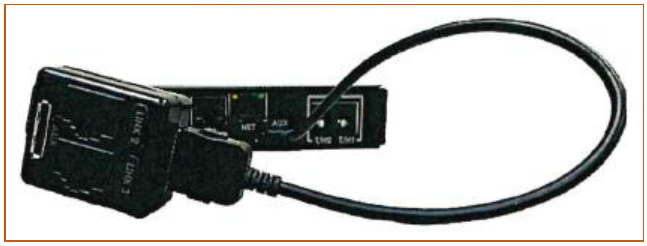
Multi-Linking Dongle Kit

Note: The dongle can be installed on any PRO1/PRO2 unit.

Part number: KIT-PRO2LINK-01D.

The dongle kit contains:

- One dongle.
- Two link cables: each 21 ft. (6.4 meters).
- Two labels marked: LINK 2 and LINK 3.
- One link cable: 7 in. (178 mm).
- One mounting screw: M3x6mm.



Multi-Link Dongle

Dongle Connected to AUX Port

The T-shaped module connects to the AUX port on the PRO2 master unit, as illustrated:

Connection to Bluetooth® Module Port

Unit Persistence

Unit Persistence is an internal PRO1/PRO2 feature that works as follows:

If a link unit is connected to a master unit, and the link unit is disconnected (powered down or accidentally disconnected), and the master unit is restarted, the link unit will be reported as "Not Found" after the restart because the link unit is no longer physically connected to the master.

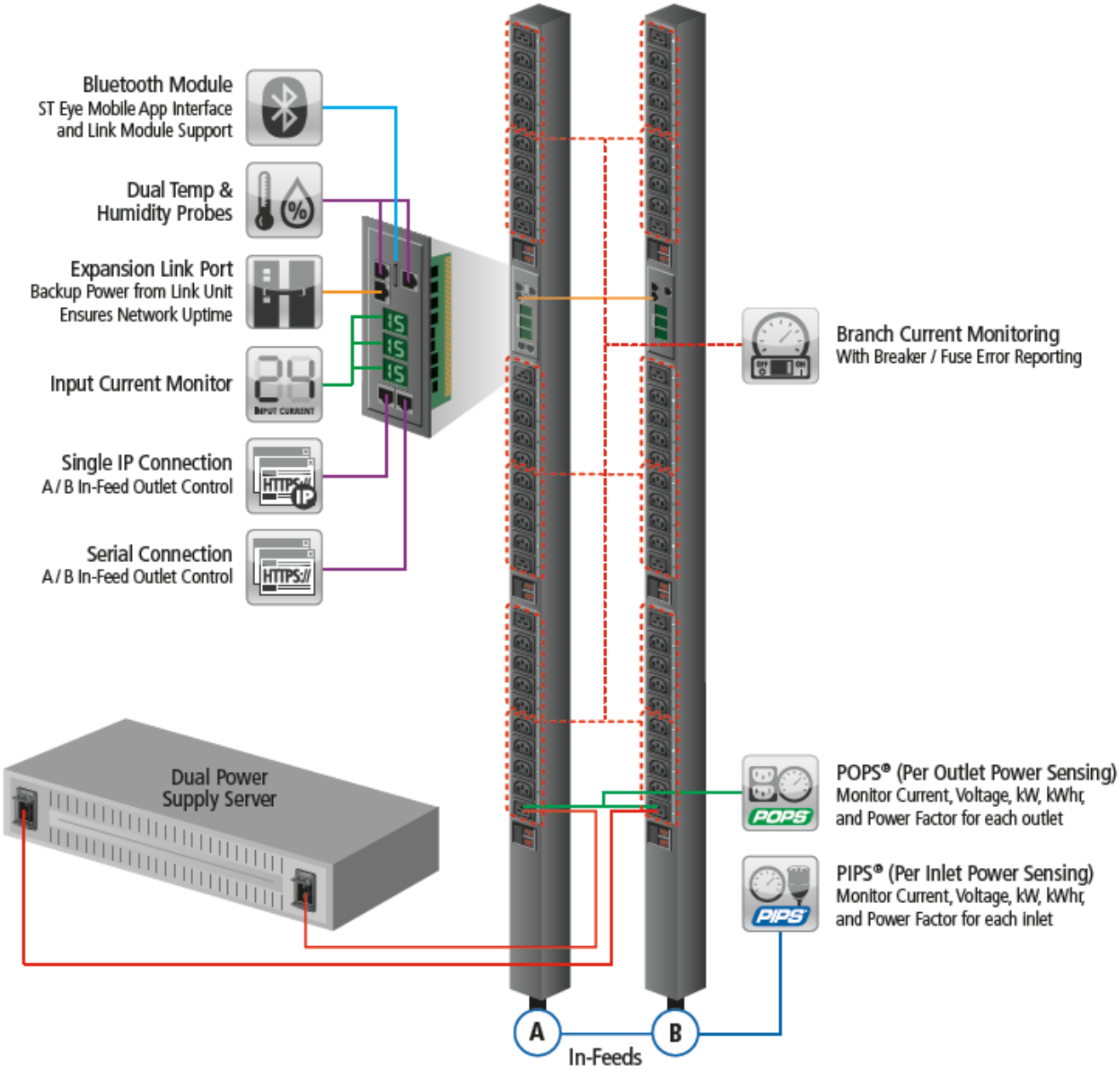
However, the association between the master/link units is retained to allow the continuation of alerts. If the disconnected link unit is physically re-connected to the master, the "Not Found" status will return to "Normal" status.

To intentionally remove a link unit from connection with a master unit, the link unit must be purged using the Purge function.

Unit persistence affects **all connected master/link units** whether or not they are connected in a multi-linking configuration.

PRO2 Equipment Overview

The following illustration highlights the key operational areas of the PRO2 unit:



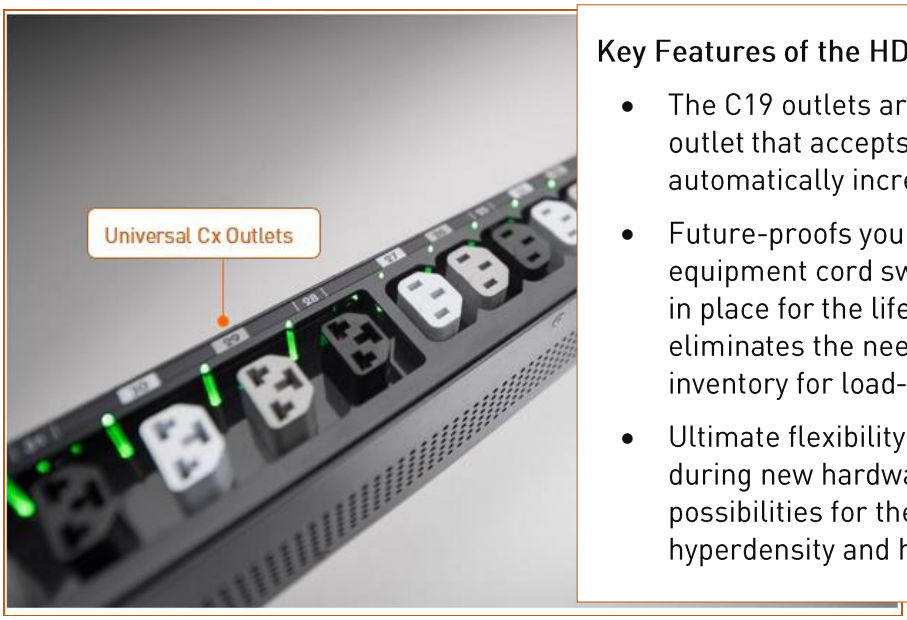
PRO2 – Equipment Overview

Chapter 2. HDOT Cx PDU

If you have a **PRO2 HDOT Cx PDU**, this chapter is for you.

Meet the HDOT Cx

With Server Technology's own leading-edge universal outlet, the **Cx**, the **HDOT Cx** rack PDU is a dramatic innovation in outlet technology. The HDOT Cx PDU is a single PDU that offers limitless possibilities in providing power and flexibility to alternating-phase and High Density Outlet Technology (HDOT).



HDOT Cx PDU

Key Features of the HDOT Cx:

- The C19 outlets are replaced with the universal Cx outlet that accepts either a C14 or C20 connector, automatically increasing the PDU's outlet count.
- Future-proofs your datacenter with fast and easy equipment cord swap-outs while the HDOT Cx stays in place for the lifetime of the PDU. The Cx outlet also eliminates the need to keep several types of cables in inventory for load-balancing.
- Ultimate flexibility for ever-changing rack needs during new hardware installation, as well as limitless possibilities for the power and growth demands of hyperdensity and hyperscale in your datacenter.

The Universal Cx Outlet

On the HDOT Cx PDU, the most common C13 and C19 outlets have been combined into Server Technology's new Cx outlet design, a fully-rated hybrid C13/C19 outlet that accepts either a C14 or C20 connector.

Universal Design of the CX Outlet

The unique Cx outlet is the latest innovation in outlet technology that provides ultimate flexibility for the PDU and its outlet count, ensuring that PDUs do not run out of outlets. The new technology of the Cx outlet is designed to meet data center requirements for outlet power today and in the future.

Notes:

- The Cx outlet is not an IEC connector.
- When plugging in a C14 or C20 connector into a Cx outlet, it is recommended to apply moderate force to ensure best cable retention.
- Not every outlet on the HDOT Cx PDU is a Cx outlet. Only the C19 outlets are replaced with Cx outlets. A bank of C13 outlets is still available on the HDOT Cx for use with C14 cables as needed.

About HDOT

High Density Outlet Technology (HDOT) is Server Technology's most advanced solution for limited physical space in data center equipment racks.

In addition, as the smallest form factor PDU, HDOT significantly increases equipment rack real estate by fitting 42 C13s in a 42U high-network managed PDU, over 20 per cent smaller than other similar PDUs using standard outlets, allowing for the most outlets per form factor.

The HDOT design provides a series of multi-outlet modules in a variety of configurations that fit into a typical upright equipment rack, as well as offering high native retention that reduces, or even eliminates, the need for custom locking cord devices. HDOT is also manufactured with robust high-temperature materials for the most demanding data center environments.

HDOT Gets Better with Cx

Server Technology added the innovate and flexible design of the Cx outlet to enhance HDOT alternating-phase rack PDUs. The Cx gives the HDOT higher performance by allowing you to plug in C14 and C20 cables into a single Cx outlet with no other parts needed, and no need to swap-out the PDU from the rack during equipment changes.

A C14 and C20 Plug Connected to Cx Outlets

The increased outlet count provided by the universal Cx outlet allows the HDOT Cx PDU's high-density benefits to continue uninterrupted because the PDU remains in the rack for its lifetime while you swap-out other data center equipment around it.

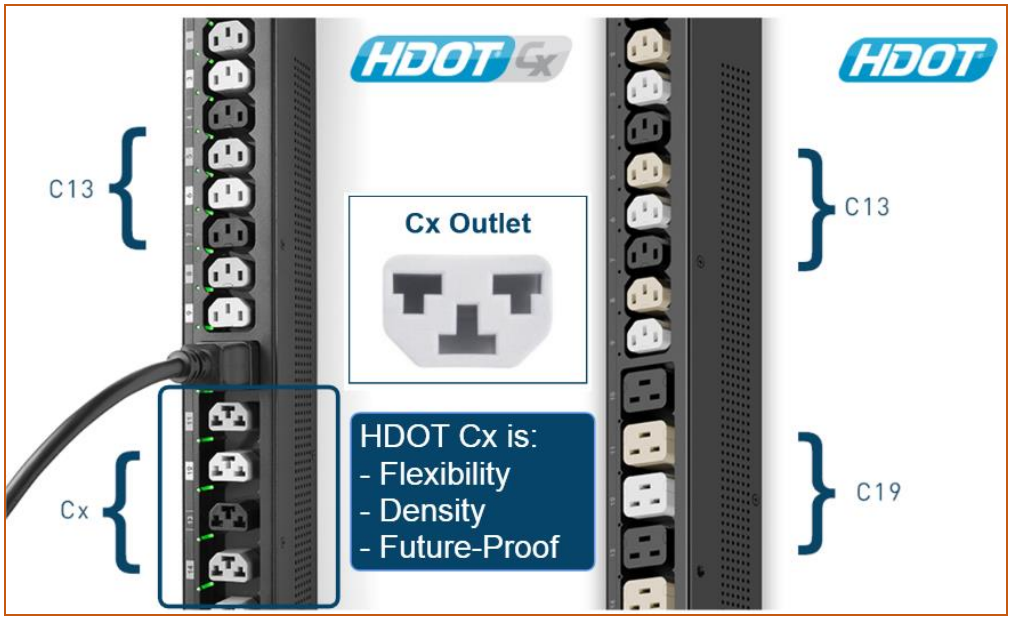
The Cx works as two outlets in one: a C13 and a C19 combined into one Cx outlet, allowing many different outlet swap-out configurations on demand.

The universal design of the CX outlet results in a fast, easy, and flexible outlet arrangement on the same PDU exactly where and when outlets are needed.

High-density solutions for power density, capacity planning, and uptime are enhanced by the ultimate flexibility of the Cx outlet.

HDOT and HDOT-Cx Side-by-Side

Note that C19 outlets on the HDOT-Cx PDU (left) are now replaced with universal Cx outlets.



Side-by-side comparison of the HDOT-Cx and HDOT PDUs showing the universal Cx outlet.

Locking C14 Cord Retention on the HDOT-Cx

Each HDOT-Cx unit is shipped with an adapter clipped into the Cx outlet to allow a fast and secure retention of the C14 locking plug when you want to use the Cx outlet as a C13 receptacle. The adapter allows retention of a locking C14 plug, ensuring it will be held in the Cx outlet and will not come loose accidentally.

The adapter is easy to remove, so If you are not using locking C14 plugs on your HDOT-Cx PDU, you can save the adapter for future use. For example, if you want to use the flexibility of the Cx outlet as a C19 outlet for a C20 connector, the adapter will be in the way; simply remove it from the PDU chassis.

Notes:

- The adapter is only for C14 locking cords connected to a Cx outlet on the HDOT-Cx PDU.
- The Cx outlet has superior cable retention. Moderate force is required when plugging in a C14 or C20 connector to fully seat the plug and to ensure proper installation. An incorrectly installed plug will be loose and will not provide a reliable connection.
- To greatly reduce the risk of accidental disconnection, all locking C14 connectors on the HDOT Cx PDU must use the adapter shipped with the unit.

Alternating Phase for Easy Load Balancing

Alternating Phase outlets distribute phases on a per receptacle basis, instead of discrete separate banks, and thereby provide shorter cable runs for better air flow, easier load balancing, and other efficiencies. Due to the high density outlet technology in the HDOT and HDOT-Cx PDUs, alternating phase outlets are a practical and beneficial feature resulting in improved efficiency.

Chapter 3. Switched and Smart PDUs

If your PDU is a PRO1/PRO2 Switched POPS or Smart POPS, this chapter is for you.

Switched PDUs

An outlet on a Switched PDU has the capability of being turned on and off, rebooted individually, and rebooted as multiple outlets within a user-defined outlet group. Switched outlets offer additional features, such as outlet lock-out, power-up sequencing to reduce inrush, and Server Technology's optional feature, Smart Load Shedding, for user-defined load shedding conditions.

The added feature of remote control of the on/off state of each outlet on the Switched PDU is valuable when equipment is locked up and needs to be powered off and powered back on for reboot. Remote rebooting is especially convenient for a 24/7 facility, whether the facility is nearby or thousands of miles away.

Switched POPS PDU

Smart PDUs

Server Technology designed the Smart PDU with ethernet and serial network connection. Beyond measuring current, Smart products provide power metrics, temperature and humidity, and an alarm function. The Smart PDU is the right choice for remote rack-level power monitoring, without the need to monitor or control individual outlets. The Smart PDU's network monitoring is the right feature for tracking power and environmental conditions for multiple data center racks.

What is POPS Technology?

Server Technology's Per Outlet Power Sensing (POPS) feature is **available in both Switched and Smart PDUs** as the added capability to measure current and voltage on every outlet.

POPS allows monitoring and notification if equipment is down so you can see when current is not drawn on a device. The accuracy of these infeed and outlet measurements is +/-1% billable-grade accuracy for energy consumption at each outlet for typical data center equipment loads.

With an all-in-one Switched POPS PDU, you can know how much power each device in your data center is using because POPS measurements provide ultimate efficiency and capacity analysis. The measurements include current, voltage, active power, apparent power, power factor, and crest factor at each outlet. In addition, POPS allows use alerts for high current, high/low voltage, and low power factor for extended visibility.

Chapter 5. Installing the Unit

Before installing your PRO1/PRO2 unit, look over the following lists to make sure you have all the items shipped with the unit, as well as any other items needed for proper installation.

Standard Accessories

Mounting Hardware

- Vertical Models: Two mounting buttons with two M4 (10 mm) screws.
- Horizontal Models: Two removable L-brackets with four M4 screws (for 1U models), or M5 screws (for 2U models).

Cables/Adapters

- For C2L, C2LG, C2X, C2XG, or SEV models – link cables (6P6C connectors).
- Link units are shipped with a 7-inch (17.8 cm) link cable and a 14-foot (426 cm) link cable.

Additional Items

- Units with IEC C20 power inlets: input power cords (ordered separately).

Optional Accessories

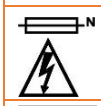
- The Star-Link Module Kit (Part No. KIT-PRO2LINK-01M) or the Star-Link Dongle Kit (Part No. KIT-PRO2LINK-01D).
- Temperature/Humidity Sensors (Part No. EMTH-1-1).
- Environmental Monitor (Part No. EMCU-1-1B).
- Water Sensor (Part No. EMWS-1-1, used with EMCU-1-1B).
- Vertical mounting brackets; additional mounting options are available in the Accessories section of www.servertech.com.

Additional Required Items

- Flathead and Phillip screwdrivers.
- Screws, washers, and nuts to attach the unit to your equipment rack.

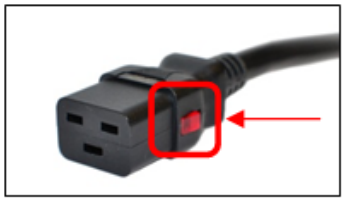
Safety Precautions

This section contains important safety and regulatory information that **must be reviewed** before installing and using the PRO1/PRO2 unit.

	Only for installation and use in a Restricted Access Location in accordance with the following installation and use instructions. **This equipment should only be installed by trained personnel.**	Destiné à l'installation et l'utilisation dans le cadre de Restricted Access Location selon les instructions d'installation et d'utilisation. **Cet équipement est uniquement destiné à être installé par personnel qualifié.**	Nur für Installation und Gebrauch in eingeschränkten Betriebszonen gemäß der folgenden Installations-und Gebrauchsanweisungen. **Dieses Gerät ist nur für den Einbau durch Personal vorgesehen.**
	This equipment is designed to be installed on a dedicated circuit. The power supply cord shall be a minimum of 1.5m (4.9ft) and a maximum of 4.5m (15ft). If using an extension power cord, the total length shall also be no more than the maximum allowed. The plug is considered the disconnect device and must be easily accessible.	Cet équipement a été conçu pour être installé que un circuit dédié. Le cordon d'alimentation doit être d'au moins 1,5M et un maximum de 4,5m. Si vous utilisez un cordon de rallonge, la longueur totale est également plus que le maximum autorise. La prise est considérée comme un dispositif de coupure et doit être facilement accessible.	Die Geräte sind für eine Installation an einer fest zugeordneten Leitung ausgelegt. Die Stromzuleitung hat eine Mindestlänge von 1,5m, und hochstens 4,5m. Sollten Sie ein Verlangerrungsnetzkabel, der Gesamtlange auch nicht mehr als die maximal zulassige sein. Der Stecker dient zur Trennung vom Netz und muss einfach erreichbar sein.
	The dedicated circuit must have circuit breaker or fuse protection. PDUs 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 PDU must be provided and must meet all applicable codes and regulations. In North America, protection must have a 10,000A interrupt capacity.	Le circuit spécialisé doit avoir un disjoncteur ou une protection de fusible. PDUs 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 équivalant 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.	Der feste Stromkreis muss mit einem Schutzschalter oder einem Sicherungsschutz versehen sein. PDUs 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.
	Models with unterminated power cords: Input connector must be installed by qualified service personnel. Input connector rating must meet all applicable codes and regulations.	Modèles avec cordons d'alimentation non terminées: Le connecteur d'entrée doit être installé par un personnel qualifié. Entrée cote de raccordement doit respecter tous les codes et règlements électriques applicables.	Modelle mit nicht abgeschlossenen Netzkabel: Der Eingangsstecker darf nur von qualifiziertem Wartungspersonal installiert werden. Eingangsanschluss Bewertung müssen alle geltenden und verbindlichen Normen und Vorschriften entsprechen.
	Do not block venting holes when installing this product. Allow for maximum airflow at all times.	Ne bloquez pas les orifices d'aération lors de l'installation de ce produit. Permettre une circulation d'air maximale à tout moment.	Achten Sie darauf, dass keine Belüftungslöcher bei der Installation dieses Produkts. Damit für maximalen Luftstrom zu allen Zeiten.
	Installation Orientation: Vertical units are designed to be installed in vertical orientation.	Installation Orientation: Les unités vertical sont conçues pour être installées dans une orientation verticale.	Installationsausrichtung: Vertical Einheiten sind zur vertikalen Installation vorgesehen.
	Always disconnect the power supply cord before servicing to avoid electrical shock. For products with two input power cords, both must be disconnected before servicing.	Toujours débrancher le cordon d'alimentation avant de l'ouverture pour éviter un choc électrique. Pour les produits avec deux cordons d'alimentation d'entrée, les deux doivent être déconnectés avant l'entretien.	Trennen Sie das Netzkabel, bevor Sie Wartungsarbeiten Öffnung einen elektrischen Schlag zu vermeiden. Für Produkte mit zwei Eingangsstromkabel, sowohl, müssen vor der Wartung abgeschaltet werden.
	WARNING! High leakage current! Earth connection is essential before connecting supply!	ATTENTION! Haut fuite très possible! Une connection de masse est essentielle avant de connecter l'alimentation !	ACHTUNG! Hoher Ableitstrom! Ein Erdungsanschluss ist vor dem Einschalten der Stromzufuhr erforderlich!
	WARNING! Cx-xxE-x units double pole/neutral fusing	ATTENTION! Les unités Cx-xxE-x Double Pôle/Fusible sur le Neutre	ACHTUNG!: Cx-xxE-x Zweipolige bzw. Neutralleiter-Sicherung
	ATTENTION! Observe precautions for handling Electrostatic Sensitive Devices.	Attention ! Respecter les mesures de sécurité en manipulant des dispositifs sensibles aux décharges électrostatiques.	Achtung! Vorsichtshinweise zur Handhabung elektrostatisch empfindlicher Geräte beachten.
	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.	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 correspond.	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 Betriebswerte des Gerätes und der Versorgungsspannung zueinander passen.

Input Power Cord Retention Options: PRO1/PRO2 Units with IEC C20 Inlets

Determine which Detachable Input Cord was supplied with your PRO2 unit:



For the following Detachable Input Cords with the self-locking IEC C19 feature, follow <u>Procedure A</u>.

PTCORD-L1, PTCORD-L2, PTCORD-L3, PTCORD-L5, PTCORD-L6, or PTCORD-L7.

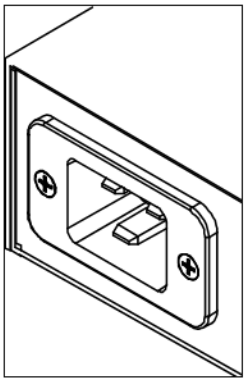
For the following Detachable Input Cords, follow <u>Procedure B</u>.

PTCORD-1, PTCORD-2, PTCORD-3, PTCORD-4, PTCORD-5, PTCORD-6, or PTCORD-7.

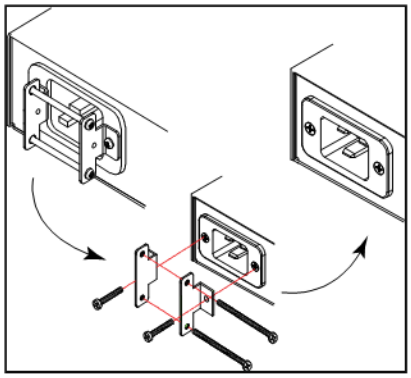
Procedure A

If the unit was supplied with a Detachable Input Power Cord with a self-locking IEC C19, install it directly into the C20 inlet.

1. Verify the Retention Bracket Assembly (part number KIT-0016) is not installed.
    a. If KIT-0016 is installed, remove the two screws attaching the bracket to the IEC 60320 C20 inlet to the enclosure.
    b. Remove the Retention Bracket Assembly.
    c. Re-attach the two screws to the IEC C20 and securely tighten.
2. Push the C19 from the Detachable Input Cord firmly into the C20 inlet to ensure it is properly seated.



C20 Inlet Without Retention Bracket Assembly



KIT-0016 Retention Bracket Assembly

Procedure B

If the unit was supplied with a Detachable Input Power Cord without the self-locking C19 feature, install with the Retention Bracket Assembly (part number KIT-0016), followed by the power cord.

1. Remove the two screws attaching the IEC 60320 C20 inlet to the enclosure.
2. Assemble and attach the Retention Bracket to the enclosure as shown
3. Connect the power cord. Ensure the C19 is fully seated against the C20 inlet. (It may be necessary to loosen some of the Retention Bracket Assembly screws to allow the C19 plug to be properly installed.)
4. Tighten the Retention Bracket Assembly to restrain the power cord.

Attaching Safety Earth Ground Connection

Server Technology PDUs are supplied with an external safety ground connection to provide an alternate ground path for fault currents, and to maintain the same ground reference between it and the equipment rack.

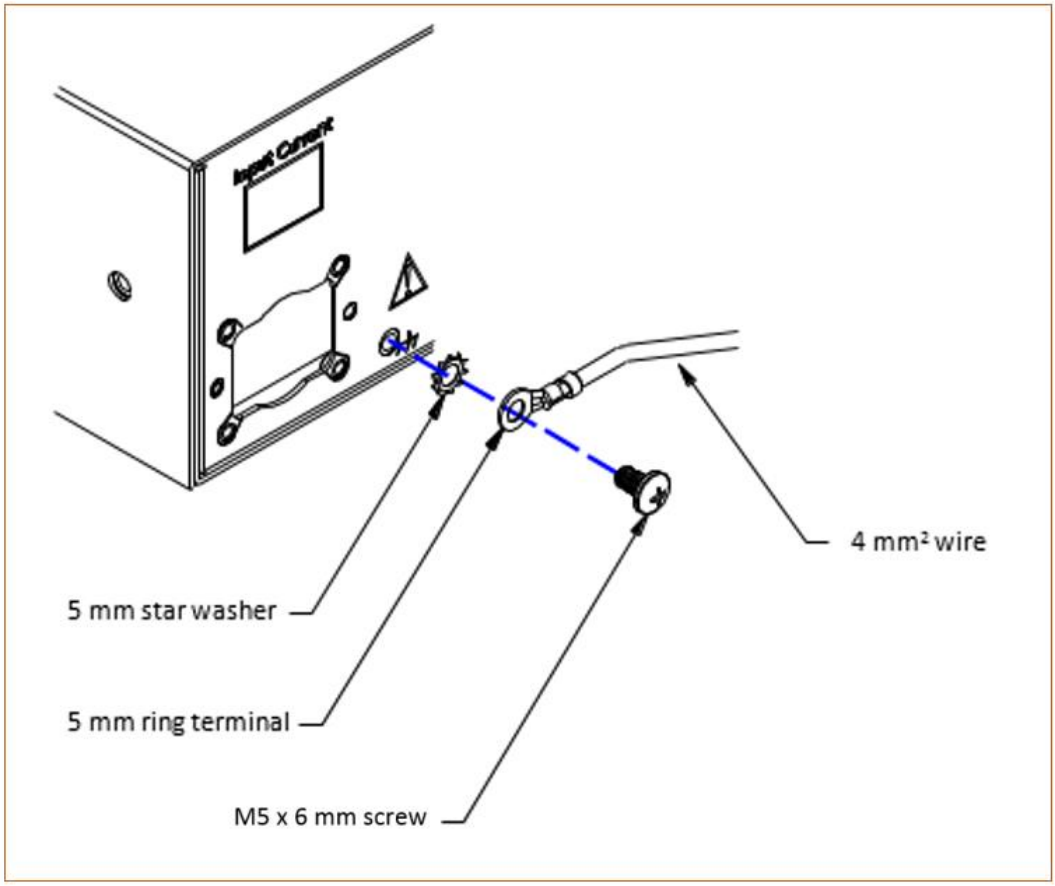
NOTE: The auxiliary external ground location may vary. Most PDUs will have it located near the power cord entry located near the ⏚ symbol.

User-Supplied Materials:

- One 5 mm internal (or external) tooth star washer;
- One 4.0 mm² (10 AWG) wire with 5 mm ring terminal;
- One metric M5 x 6 mm coarse pitch screw.

Instructions:

1. Connect one end of the ground wire to the equipment cabinet or local ground.
2. Locate the PDU external ground near the ⏚ symbol.
3. Connect the other end with a ring terminal and a M5 screw to the PDU external ground.
   To ensure proper grounding to chassis, use a star washer between ring terminal and PDU.

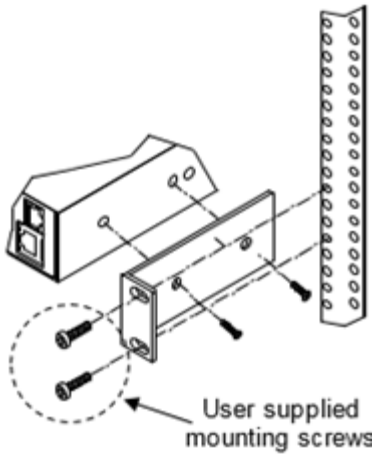


Mounting the Unit

The following illustration shows how to mount the unit in vertical or horizontal orientation:

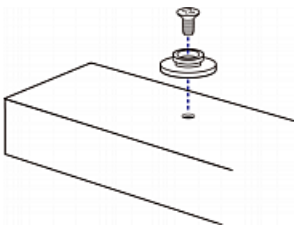
Horizontal/Rack

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 6 mm (0.25 inch) of horizontal adaptability to align with the mounting holes of your rack.



Vertical

1. Turn to the rear of the hardware.
2. Locate two screw holes on the rear panel: one near the bottom and the other near the top (the side of cable gland).
3. Screw a button in the screw hole near the bottom. The recommended torque for the button is 12 in lbf (13.82 kgf cm).
4. Screw a button in the screw hole near the top. The recommended torque for the button is 12 in lbf (13.82 kgf cm).
5. Ensure that the two buttons can engage their mounting holes in the rack or cabinet simultaneously.
6. Press the device forward, pushing the mounting buttons through the mounting holes, then letting the device drop slightly. This secures the device in place and completes the installation.



Attaching the Link Unit

Connect the PRO1/PRO2 link unit with the provided 6P6C crossover cable at the link port on the unit. The overall length of the crossover cable should not exceed 25 feet.

Connecting to the Power Source

On units with a rating ≥ 24 A, the input power cord is attached to the base of the unit. On units with a total maximum output < 24 A, you may need to 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 on the unit.
2. If using the Retention Bracket Assembly (Part No. KIT-0016), use a screwdriver to tighten the two screws on the retention bracket.

To connect to the power source:

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

Connecting Devices

To avoid the possibility of noise due to arching:

1. Keep the on/off switch on the device in the off position until after it is plugged into the outlet.
2. Connect the devices to the outlets.

Note: Server Technology recommends even distribution of attached devices across all available outlets to avoid exceeding the outlet, branch, or phase limitations.

	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 Netzleitung abziehen um elektrischen Schlag zu vermeiden.

Connecting the Sensors

The PRO1/PRO2 is equipped with two mini RJ11 temperature/humidity ports for attachment of the temperature/humidity sensors. Attach the mini RJ11 plug of the sensor(s) to the appropriate temperature/humidity port.

Connecting to the Unit

Connection can be made with a serial (RS232) port or with an Ethernet port, as described:

For the Serial (RS232) Port:

The 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 the RJ45-to-DB9F serial port adapter, as required.

For the Ethernet Port:

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

Network Defaults

The PRO1/PRO2 is configured with the following network defaults to allow unit configuration out-of-the-box through either Telnet or Web. However, note that when the unit is installed on a DHCP-enabled network, the following network defaults **do not apply** because the unit ships with DHCP support enabled by default.

Network Defaults (for **non**-DHCP-enabled networks):

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

Reconfigure the Network Connection

A local PC network connection must be reconfigured as follows. For detailed instructions about this connection, contact your system administrator. Note that a restart of the system may be required for the network reconfiguration to take effect.

- IP Address: 192.168.1.x (where "x" is 2-253)
- Subnet Mask: 255.255.255.0

Chapter 6: Getting Started with the Firmware

This chapter introduces several key features of the firmware (version 8.0x, or later) for the PRO1/PRO2.

Note: The PRO1/PRO2 firmware, version 8.0, is not compatible with other Server Technology PDUs. There is no upgrade path from earlier PDU products to PRO1/PRO2 products.

On-Board File System

The firmware Web Interface provides an embedded file system for quick access to system configuration files, as well as the on-board and downloadable Sentry4-MIB and OID Tree for the unit, eliminating website MIB/OID downloads. This UI page also allows GUI-based file uploads (without FTP) for system, configuration, and firmware versions. Note that all configuration/system files, MIB, and the OID Tree can also be accessed via FTP/SFTP.

Intuitive and Consistent Terminology

The design of the firmware includes intuitive and soft-mapped naming conventions between the interfaces (Web and CLI) and the PRO1/PRO2 products. For example, the firmware GUI areas (cords, lines, phases, over-current protectors, branches, outlets, sensors, etc.) match the same areas designed in the unit's hardware architecture.

Outlet numbers are named 1-n sequentially and the outlet name is not tied to infeeds or branches. Input cords are also simply named 1-n sequentially (like 1-24), no longer 1-n for each phase (like XY 1-8, YZ 1-8, ZX 1-8).

Also, firmware naming formats match the exact silkscreened names on the hardware unit.

Outlet Grouping

An outlet group is named group with a collection of outlets assigned to the group. Outlet groups can be granted access to selected outlets by the administrative user (via the Web interface or CLI), and outlet activity by group can be monitored on a separate Web interface page for outlet group monitoring.

Setting Thresholds

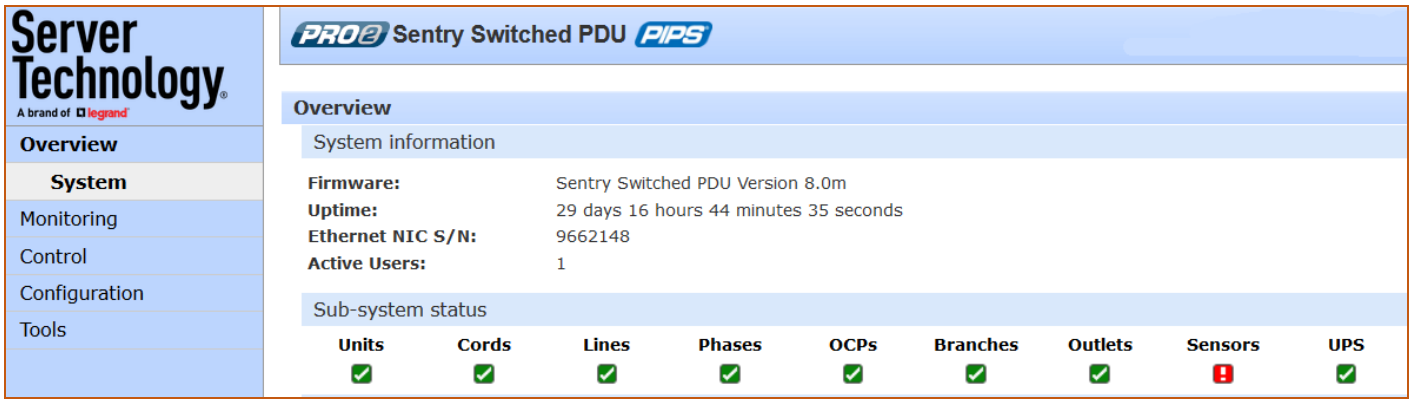
When setting threshold values, the firmware allows expanded alerting capabilities. Threshold values can be set by the administrative-user for multiple low/high warning/alarm levels (and threshold hysteresis), as listed below in the following areas of the unit. Every item shown in the following list – for which a threshold can be set – also has a corresponding Monitoring page for viewing the item's current threshold values and operational status.

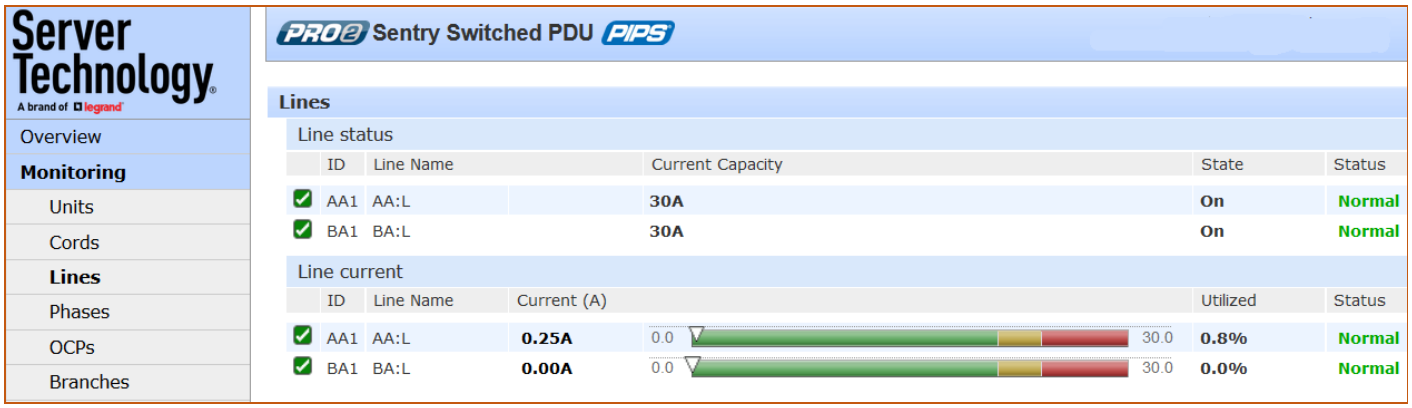
- Branch current (low and high).
- Cord power (low and high), cord apparent power (low and high), cord power factor (low), 3-phase out-of-balance (high).
- Line current (low and high).
- Outlet current (low and high), outlet power (low and high), outlet power factor (low).
- Phase voltage (low and high), phase power factor (low).
- Temperature sensor (low and high).
- Humidity sensor (low and high).
- Analog-to-Digital (ADC) sensor (low and high) – if an EMCU is connected to the PRO2 unit.

PRO2 Dashboard View

The firmware **Overview > System** page provides a fast and high-level view of the overall condition of the PRO1/PRO2 unit. The sub-system status view shows the current operational state of individual PDUs (units, cords, lines, etc.).

The color-coded status icon for each area is hot-linked to the corresponding monitoring page to show the operating details behind the status, for example:





The User Interfaces

The Switched unit offers two built-in user interfaces:

- Web interface (GUI) accessed via HTTP-enabled Ethernet connections.
- Command Line Interface (CLI) for serial and Telnet connections.

Both interfaces allow power monitoring of PIPS/POPS data points, temperature/humidity measurements, system/network configuration, outlet control, ST Eye Bluetooth® connection, user account management, and numerous other operations for the Switched unit.

Either interface can be used as preferred; most firmware operations can be performed on GUI screens or by CLI commands on the command line. When using either interface, the availability of firmware functions for your user login account depends on your current user access rights as granted by the system administrator.

Note: The GUI images shown in this manual were taken from a Switched POPS PDU. Some documented functionality will not apply to Smart PDUs or non-POPS PDUs.

Usernames and Passwords

The Switched PRO1/PRO2 units are shipped with one default administrative user account (username/password is admn/admn). There is no "i" in the admn username or password.

Only an administrative user can manage user accounts, such as creating new user accounts, removing user accounts, and changing user passwords.

The PDU supports a maximum of 112 defined user accounts with the following restrictions:

User Account	Length	Case-Sensitive	Spaces Allowed
Usernames	1-32 characters	No	No
Passwords	1-32 characters	Yes	Yes

Note: For security, Server Technology recommends first creating a new user account with administrative rights, and then removing the default admn account.

User Access Rights

The following table defines the user rights granted by the administrative user for access to PRO1/PRO2 operations using either the Web GUI or the Command Line interface (CLI). Only the options for which the user has access rights will be available in the firmware for the user.

User Access Level (highest to lowest)	Description
Administrator	Administrative user; full access for all configuration, user management, all outlet power control actions (On, Off, Reboot), status, and serial/pass-thru ports.
Power User	Full access for all outlet power control actions (On, Off, Reboot), status, and serial/pass-thru ports. **Note:** The Power User does not have access to user management.
User	Partial access for outlet power control actions (On, Off, Reboot), status, and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.
Reboot-Only User	Partial access for outlet power control actions (Reboot), status, and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.
On-Only User	Partial access for outlet power control actions (On), status, and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.
View-Only User	Partial access for status and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.

The administrative user can also grant administrative-level rights to other user accounts, allowing the PDU to have more than one administrative user.

Administrative access rights cannot be removed from the default **admn** user account until an administrative user grants administrative access rights to another user account.

To use administrative commands, the user must be granted administrative user access rights.

IPv4/IPv6 Support

Notes:

- Throughout the Web and CLI firmware interfaces, both IPv4 and IPv6 formats are accepted wherever a hostname or IP address is provided.
- IPv6 allows authentication via RADIUS and LDAP.

Server Technology uses IPv6 "dual stack" support in the firmware of the PRO1/PRO2 product lines. IPv6 has been designed to succeed IPv4 as the dominant communications protocol for internet traffic, to avoid depletions of the IPv4 address space, and to allow more IP address growth. Many devices already in use support IPv6.

IPv6 has several new operational methods:

- Static IPv6 Address: The IPv6 equivalent of Static IPv4.
- DHCPv6 Address: The IPv6 equivalent of a DHCP IPv4 address, also known as a "stateful" auto-configuration of DHCPv6.
- IPv6 Stateless Auto-Configured Address – (RFC 4862): An automatically-generated unique link-local IPv6 address used for client based configurations. This address is always present in the Server Technology dual stack and cannot be disabled.
- DHCPv6 Stateless Auto-Configured Address – (RFC 3736): A "stateless" Dynamic Host Configuration Protocol (DHCP) service for IPv6 (DHCPv6). This address is used by nodes to obtain configuration information, such as addresses of DNS recursive name servers that do not require the maintenance of any dynamic state for individual clients.

Protocol Support for PRO1/PRO2 Firmware

IPv6 and IPv4 Protocols:

The firmware supports the following network IPv6 **and** IPv4 protocols:

- DNS Ping
- FTP (or SFTP) Server SNMPv1/2/3
- FTP (or SFTP) Updates SNTP
- HTTP or HTTPS
- SMTP
- Static IPv6 DHCPv6 (stateless and stateful)
- Syslog SNMPv1/2/3 Traps
- Telnet SSH

IPv4-Only Protocols:

The firmware supports the following network IPv4-only protocols:

- Cisco EnergyWise
- LDAP
- Load Shedding *
- RADIUS *
- TACACS+

* = may work with IPv6 addresses, but not tested.

Network-Enabled Modes

Notes:

- For all network-enabled modes described below, the PDU will set an auto-configured IPv6 address, and if IPv6 router announcements are active, a stateless DHCP IPv6 address will also be set. Further, in all network-enabled modes, at least one IPv4 **or** one IPv6 address will be active.
- For maximum backward compatibility, the default network mode is "IPv4 only".

Descriptions for the network-enabled modes:

- Network disabled – No IPv4 or IPv6 addresses available.
- IPv4 only, DHCP disabled (static IPv4) – If the IPv4 Static Address and Net Mask of the PDU are valid, they will be set.
- IPv4 only, DHCP enabled (DHCP IPv4) – The PDU will try to resolve an IPv4 DHCP address. If a DHCP address cannot be obtained after 90 seconds, the PDU can: (1) optionally fall back to its static IPv4 settings, or (2) indefinitely wait to acquire an address based on DHCP configuration settings. **This setting is the default.**
- Dual IPv6/IPv4, DHCP disabled (static IPv6/IPv4) – If the IPv6 Static Address and prefix of the PRO2 are valid, they will be set. Otherwise, the PDU will attempt to use DHCPv6 to obtain an IPv6 address. In addition, if the IPv4 Static Address and Net Mask of the PDU are valid, they will be set.
- Dual IPv6/IPv4, DHCP enabled (DHCP IPv6/IPv4) – The PDU will try to resolve both its IPv6 and IPv4 addresses by DHCP. If both DHCP requests are answered, the **primary** DNS server of the PRO2 will become the **primary** IPv6 DNS server, and the **secondary** DNS server of the PRO2 will become the **primary** IPv4 DNS server. If only one of the DHCP requests is answered, the DNS servers of the PRO2 will map to the **primary** and **secondary** DNS server from that request. If a DHCP address cannot be obtained after 90 seconds, the PDU can: (1) optionally fall back to its static IPv4 and/or IPv6 settings, or (2) indefinitely wait to acquire an address based on DHCP configuration settings.

Viewing Network Status

You can obtain the IPv6 network status through the firmware Web Interface or Command Line Interface (CLI). For the CLI, use the **show network** command as follows:

```
Switched PDU: show network

Network Configuration
   State:           Static IPv4       Network:         Dual IPv6/IPv4
   Link:            Up                Negotiation:     Auto
   Speed:           100 Mbps          Duplex:          Full
   MAC:             00-0A-9C-60-0029
   AutoCfg IPv6:    FE80::20A:9CFF:FE60:29/64
   IPv4 Address:    10.1.2.65         Subnet Mask:     255.255.0.0
   IPv4 Gateway:    10.1.1.1
   DNS1:            10.1.5.133
   DNS2:            10.1.5.134

 Static IPv4/IPv6 Settings
   IPv6 Address:    ::/64
   IPv6 Gateway:    ::
   IPv4 Address:    10.1.2.65         Subnet Mask:     255.255.0.0
   IPv4 Gateway:    10.1.1.1
   DNS1:            10.1.5.133
   DNS2:            10.1.5.134

 DHCP Settings
   DHCP:            disabled
   FQDN:            enabled [sentry-600029]
   Boot Delay:      disabled
   Static Fallback: disabled
   ZTP <0-Touch>:   enabled <not provisioned>

 Network Services
   FTP Server:  enabled     Port:    21
   FTP Updates: disabled    Port:    21
   SSH:         enabled     Port:    22      Auth:      Password, Kb-Int
   Telnet:      enabled     Port:    23
   HTTP:        enabled     Port:    80
   HTTPS:       enabled     Port:   443      Installed Cert: Self Generated
     User Cert: Disabled                     Stored Files: None
                                             User Passphrase: (none)
   SNMPv1/2:    enabled     Port:   161      TrapPort:  162
   SNMPv3:      disabled    Port:   161      TrapPort:  162
   SPM Access:  enabled
```

Note: The fields IPv4 Address, IPv4 Subnet Mask, IPv4 Gateway, DNS1, and DNS2 are equivalent to existing PRO1/PRO2 IPv4 settings except that current network settings and static settings are displayed separately. This allows you to view both static configuration settings and active network settings that can be obtained using DHCP. DNS addresses may be in IPv4 or IPv6 (based on RFC4291) format at this time.

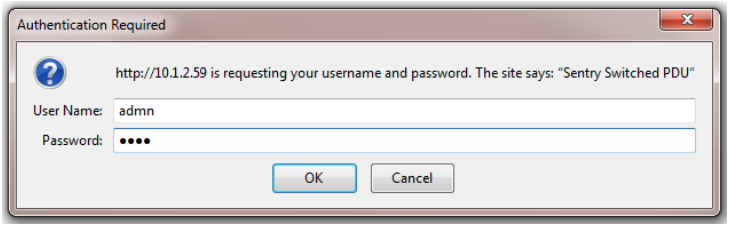
Chapter 7: Using the Web Interface

This chapter shows how to work with the firmware GUI (version 8.0x or later) for the PRO1/PRO2.

Logging In

Logging into the Web interface directs the Web client to the configured IP address of the Switched unit.

To login by Web interface:



In the firmware login window, provide a valid username and password, and click **OK**. If you enter an invalid username or password, you will be prompted again. Three attempts are given for a valid username/password combination, after which the session ends and a protected page will be displayed

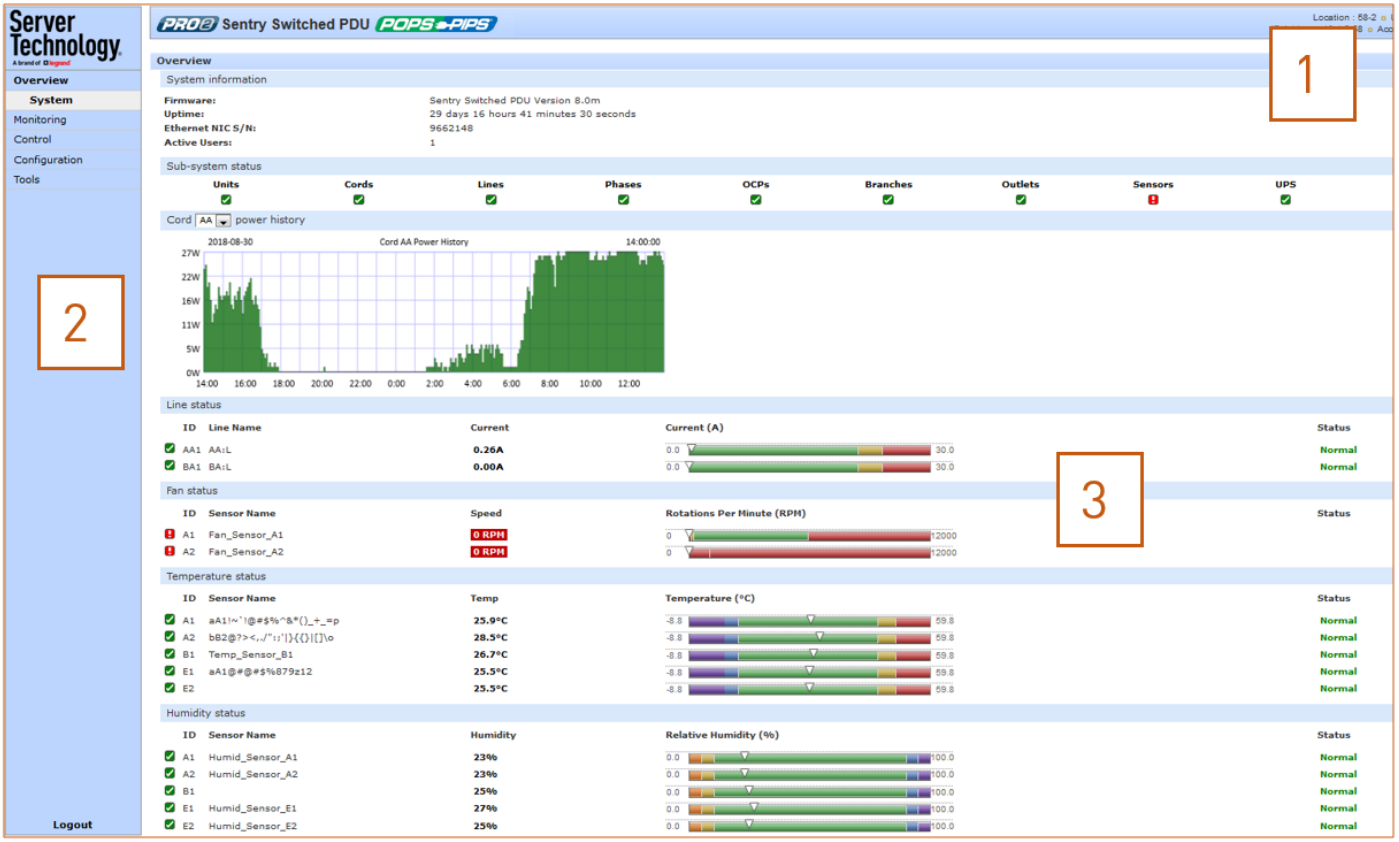
Note: The default firmware username/password is admn/admn. There is no "i" in admn.

Quick Tour of the GUI

Note: The GUI images shown in this manual were taken from a Switched POPS PDU. Some documented functionality will not apply to Smart PDUs or non-POPS PDUs.

The web interface provides web-based access to the firmware for the Switched unit. The interface is designed with three major screen sections shown in the following screen example:

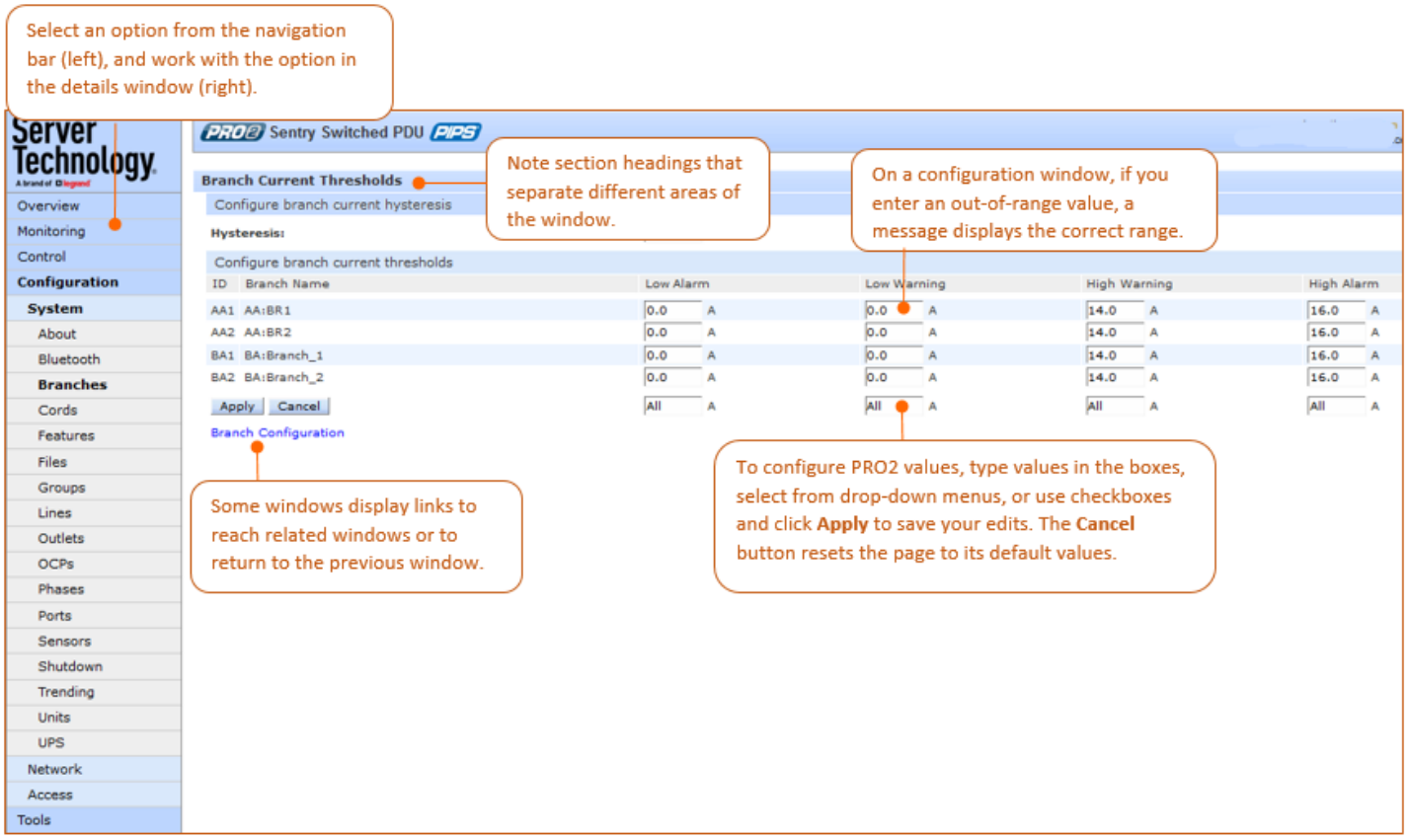
1. System Header: Displays PRO1/PRO2 description/location, IP address, and user/access level.
2. Navigation Bar: Provides access to the PDU's power monitoring, control actions, and configuration.
3. Details Window: Shows control/status information based on option selected in navigation bar.



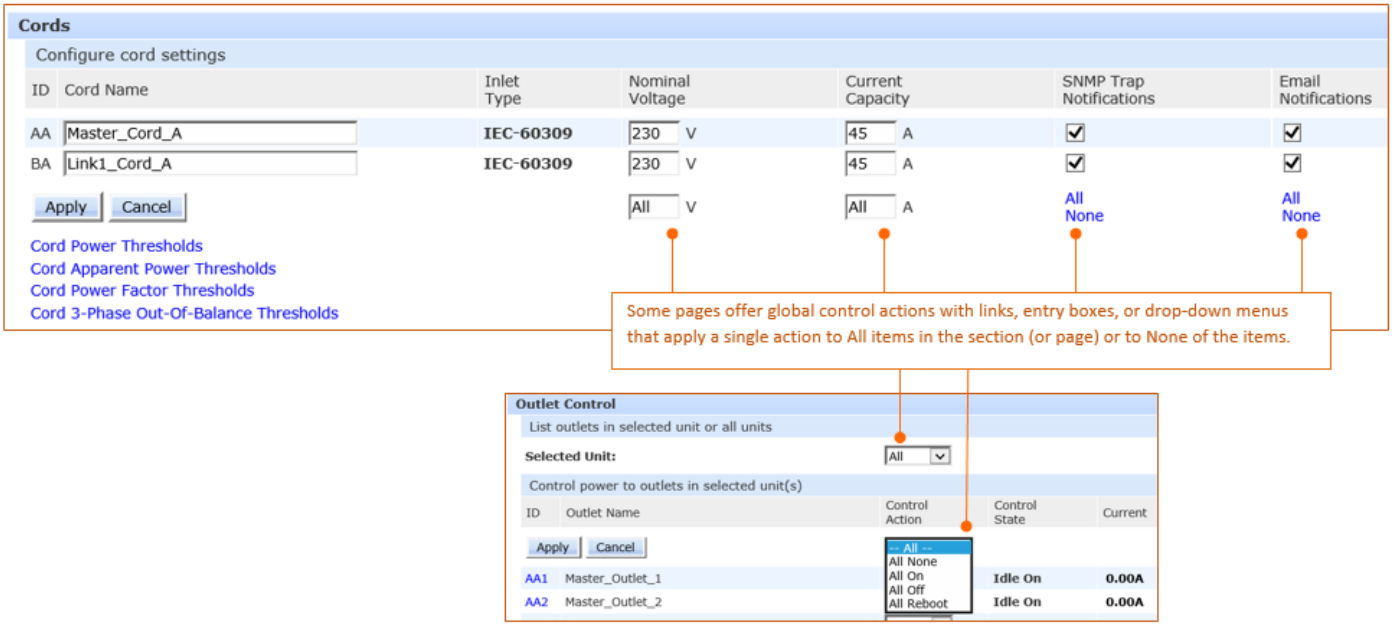
Example of Firmware Web Interface: Overview > System Page

Note that the optional blinking location string (IP address) in the System Header may not work with all web browsers.

Using a configuration page:



Using the All or None global action:



Summary of the GUI Options

Overview

The Overview > System option is the first stop for high-level and fast monitoring of major PDU operational areas. The page displays a quick view of color-coded icons showing current status of the units, cords, branches, lines, phases, sensors. Click an icon for the related monitoring page to view the metrics behind the status.

The System page also shows color-coded graphs for the operational status of line current and temperature/humidity sensor readings.

General system information displays on the page to show firmware version in use, uptime data, Ethernet NIC serial number, and current number of active users.

The System page dynamically updates status and threshold values with a full-screen refresh to reflect the latest PDU details for instant assessment and response.

Monitoring

The Monitoring option provides viewing of dynamically updated metrics for the PDU operational areas that have the highest power impact on the unit and the data center.

The design of the GUI monitoring pages follows the major areas in the hardware architecture of the PDU, providing a separate and detailed page for the overall status of units, cords, lines, OCPs, branches, outlets, groups, and sensors.

Each system object for which a threshold can be configured – such as line current and phase voltage – has a corresponding monitor page that displays up-to-the-minute power metrics.

Many metrics are presented on the pages in color-coded graphs for at-a-glance monitoring. A regular full-page refresh dynamically updates theses details to reflect the current condition of the PDU, providing the opportunity for instant assessment and fast response to critical system issues.

Control

The Control option allows the issuing of control actions On, Off, and Reboot for all the PDU's individual outlets, global outlets, and named outlet groups.

Outlet details are also available by individual outlet to provide the outlet's general identification, socket type, capacity, operational state, power factor, as well as color-coded graphs for current and power.

A PRO2 unit with Per Outlet Power Sensing (POPS) technology will also display values for current capacity used and reactance.

Configuration

The Configuration option allows administrative access to all options for setting PDU values. The pages are organized into three major areas of configuration:

- **System** (options for hardware areas)
- **Network** (options for setting up network protocols)
- **Access** (options for local/remote user access and management)

Network

The Network option provides network setup options for the protocols supported by PRO1/PRO2 units: DHCP/IP, Email/SMTP, FTP/SFTP, HTTP/HTTPS, LDAP, RADIUS, SNMP, SNTP, Syslog, TACACS+, and Telnet/SSH. The **Network** option only allows the administrator to set up network protocol parameters. To configure how the user will access and use the network and system, see the **Access** option.

Access

The Access option determines how a user works with the network and system by configuring the options related to a user: authentication, privilege levels, user access to the unit, and additional functions for individual local users and user groups. The **Access** option only allows the administrator to configure how the user will access and use the network and system. To set up network protocol parameters, see the **Network** option.

Tools

The Tools option is a collection of several utility options for miscellaneous system actions: changing user password, pinging other network devices, viewing the system/debug log, and uploading new firmware versions. Also included are several options for rebooting the PDU, resetting the PDU to factory defaults, and restarting the PDU with user preferences.

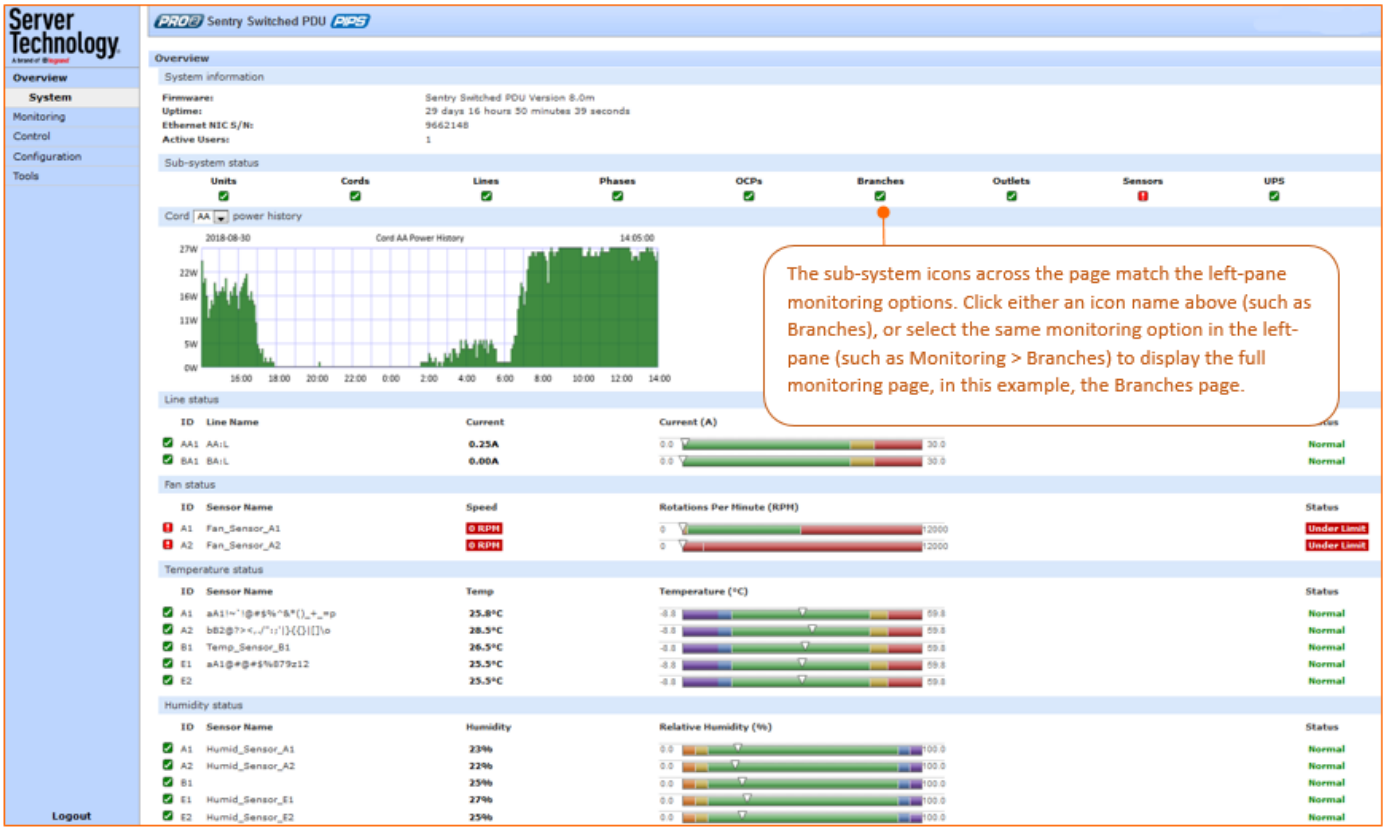
Overview (Viewing the System Dashboard)

The **System** page of the Web interface is the first stop for high-level and fast monitoring of major PRO1/PRO2 operational areas. The page displays a quick view of color-coded icons showing current status of the units, cords, branches, lines, phases, sensors. Click an icon for the related monitoring page to view the metrics behind the status.

The System page also shows color-coded graphs for the operational status of line current and temperature/humidity sensor readings.

General system information displays on the page to firmware version in use, uptime data, Ethernet NIC serial number, and current number of active users.

The System page dynamically updates status and threshold values with a full-screen refresh to reflect the latest PDU details for instant assessment and response.



How to Read the Metrics

The color-coded status icons and graphs on the System page update dynamically (normal-green, warning-yellow, critical-red) with the latest metrics of the unit, line status, and temperature/humidity sensor status.

About Auto-Scaling

The displayed graphs reflect the internal function of *auto-scaling*. This means that if the threshold range of values changes for the graph, the graph will auto-scale to the appropriate range, allowing the graphs to still present relevant and consistent information.

What To Look For

The dynamic performance of the System page is essential for monitoring new PDU installation or watching for power distribution changes in hi-density environments. High-level status information on the System page gives the chance to correct of an operating condition before it affects the entire device network.

System administrators and power users can also view the System graphs to quickly identify thermal and humidity issues that might otherwise escalate to infrastructure repairs if left unchecked.

Overview > System Page Definitions

The System page uses the following fields and definitions:

Field	Description
ID	System-assigned internal name that cannot be changed.
Name	User-defined descriptive name for each line or temperature/humidity sensor.
Current, Temp, Humidity	Current state of the reported input load (in amps), current temperature (temperature scale °C °F, as configured), or current percent of relative humidity (%RH).
Low Limit	User-defined low limit of the load, temperature, or humidity graph. These values depend on the sensor limitation and cannot be set by the user. For example, a 0°C low limit would be displayed as 0 for a temperature sensor graph in Celsius.
High Limit	Displays the high limit of the load, temperature, or humidity graph. For the temperature/humidity sensors, these values depend on the physical sensor limits and cannot be set by the user. For example, a 100°C high limit would be displayed as 100 in the high limit in a (Celsius) temperature sensor graph.
Sensor Graph and Level Indicator	The horizontal sensor graph shows current operating conditions with color-coded icons, described in the following table, Status Icons and Descriptions". The level indicator  appears in the graph to indicate relative position of the current data value with respect to the minimum (low limit) and maximum (high limit) values displayed at the left end and right end of the graph.

Status Icons and Descriptions

The System page uses the following icons to report current operating conditions:

Icon	Status	Description
	Reading	Unit is reading a new or restored sensor.
	Normal	Normal operation.
	Low/High Warning	Current value outside user-configured threshold range.
	Low/High Alarm	Current value outside user-configured threshold range.
	Lost	Connection has been lost to a sensor that was previously detected.
	Read Error	Error polling data from the PDU.

Sensor Graph Color-Coding

The sensor graph colors change dynamically to communicate operating conditions:

For Line (Load) Status:

Green = Normal

Yellow = low warning/high warning (threshold configured by user)

Red = low alarm/high alarm (threshold configured by user)

Configure line current thresholds and threshold hysteresis at **Configuration > System > Lines.**

For Temperature Status:

Violet = coldest; low alarm (threshold configured by user)

Blue = cold; low warning (threshold configured by user)

Green = acceptable temperature range

Yellow – warm; high warning (threshold configured by user)

Red = hot; high alarm (threshold configured by user)

Configure low/high temperature thresholds and threshold hysteresis at **Configuration > System > Sensors.**

For Humidity Status:

Violet = wettest; high alarm (threshold configured by user)

Blue = wet; high warning (threshold configured by user)

Green = acceptable percentage of relative humidity

Yellow = dry; low warning (threshold configured by user)

Red = driest; low alarm (threshold configured by user)

Configure low/high temperature thresholds and hysteresis at **Configuration > System > Sensors.**

System Information

This section of the Summary page provides general information:

- **Firmware:** Current firmware version
- **Uptime:** Cumulative time the PDU has been up and running since the last unit restarted. Shows continuous, real-time system updates with an approximate 5-second automatic refresh. A manual refresh is not required.
- **Ethernet NIC S/N:** The serial number of the PDU derived from the Ethernet NIC.

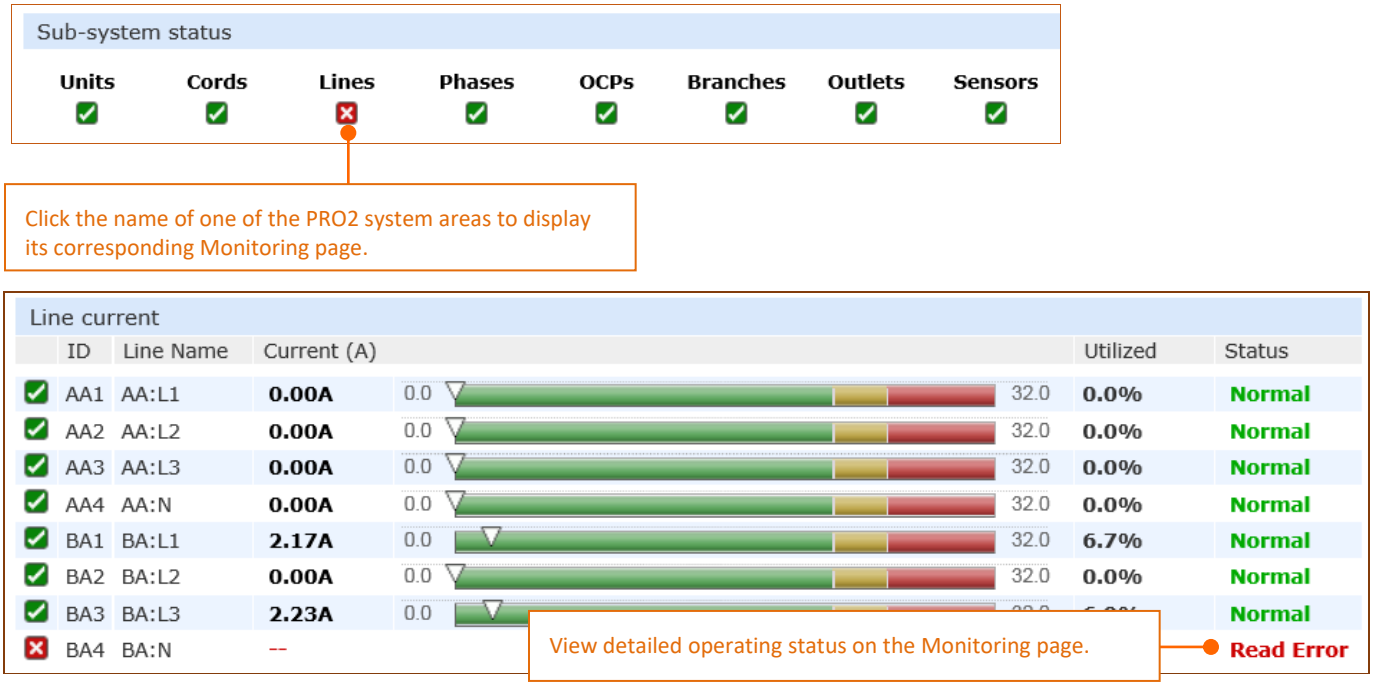
- **Active Users:** Number of active user sessions accessing the firmware. These sessions include serial, Telnet, SSH, and Web sessions. Also shows sessions that an unauthorized user may be attempting to access the system. The number changes instantly as the number of active user sessions changes. A total of 4 concurrent web user sessions are allowed (HTTPS or HTTPS).

  Note: Depending on the web browser, multiple web accesses from the same machine are often considered as one active user.

Sub-System Status

This Sub-System section of the Summary page provides a quick status view of the current operational state of major PDU areas (units, cords, branches, etc.) showing a color-coded status icon.

Also provided is a link from each of the sub-system areas to the related monitoring page:



Monitoring (Analyzing Metrics)

The **Monitoring** section of the Web interface provides viewing of dynamically updated metrics for the PDU operational areas that have the highest power impact on the unit and the data center.

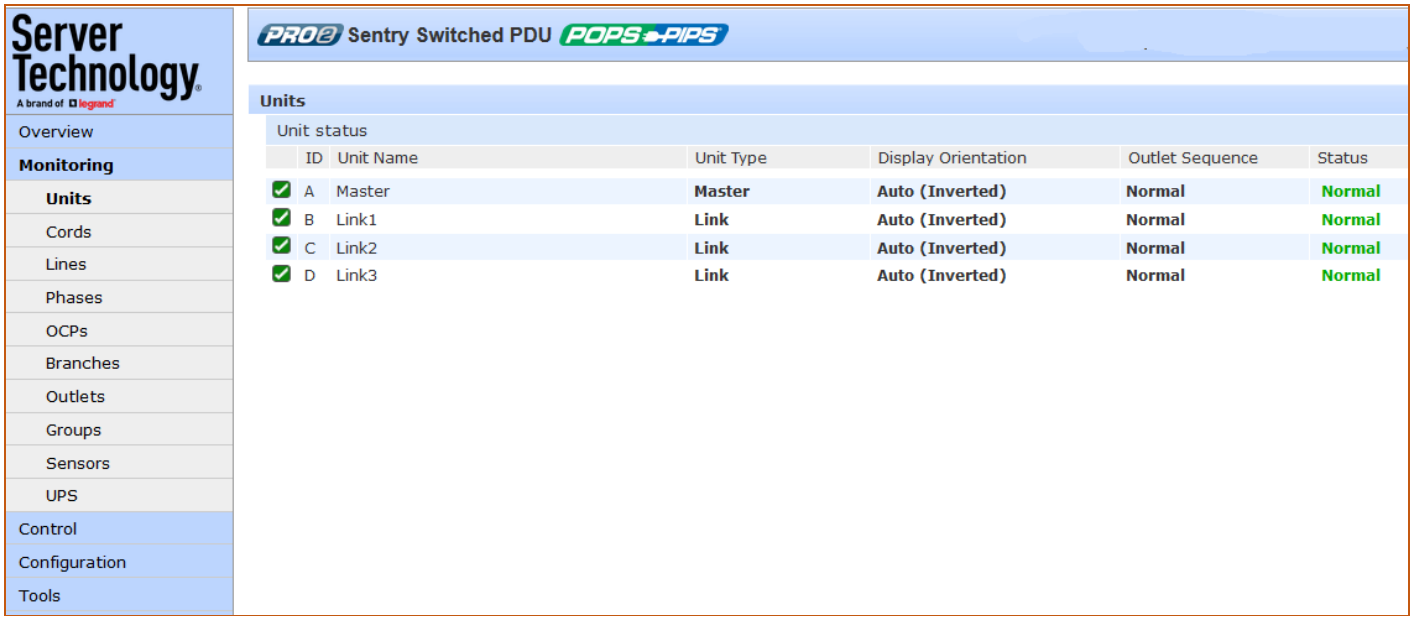
The design of the GUI monitoring pages follows the major areas in the hardware architecture of the PDU, providing a separate and detailed page for the overall status of units, cords, lines, OCPs, branches, outlets, groups, and sensors.

Each system object for which a threshold can be configured – such as line current and phase voltage – has a corresponding monitor page that displays up-to-the-minute power metrics.

Many metrics are presented on the pages in color-coded graphs for at-a-glance monitoring. A regular full-page refresh dynamically updates theses details to reflect the current condition of the PDU, providing the opportunity for instant assessment and fast response to critical system issues.

Monitoring > Units

The **Units** page is a high-level quick reference for the PRO1/PRO2 units in the network, identifying the connected master/link units (and any connected external monitoring devices), the current LED display orientation of the PRO2 units, and the overall current operational status of all units and devices.



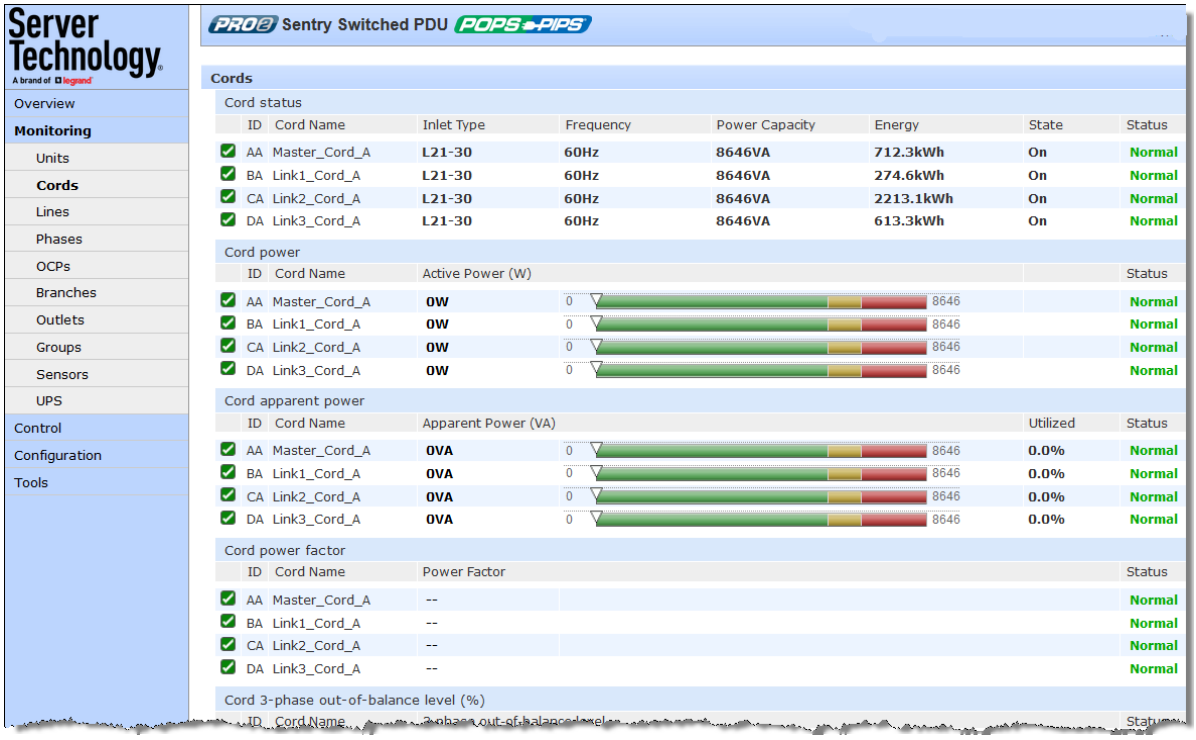
What to look for:

The operating status of all units (master and link) should be Normal (green). The Status field reports the overall health of the units and their connectivity, not an exceeded user-defined threshold. Depending on a yellow or red status message, basic troubleshooting will be needed to determine the best solution for the affected unit.

Monitoring > Cords

The **Cords** page displays cord hardware specifications, overall operational status of each cord, and individual color-coded graphs and status for cord active power (W), cord apparent power (VA), power factor (if present), and cord 3-phase out-of-balance level (%).

Note: The inlet type, frequency, power capacity, and energy rating of the cord were determined for the PRO1/PRO2 product at factory assembly and cannot be user-edited.



What to look for:

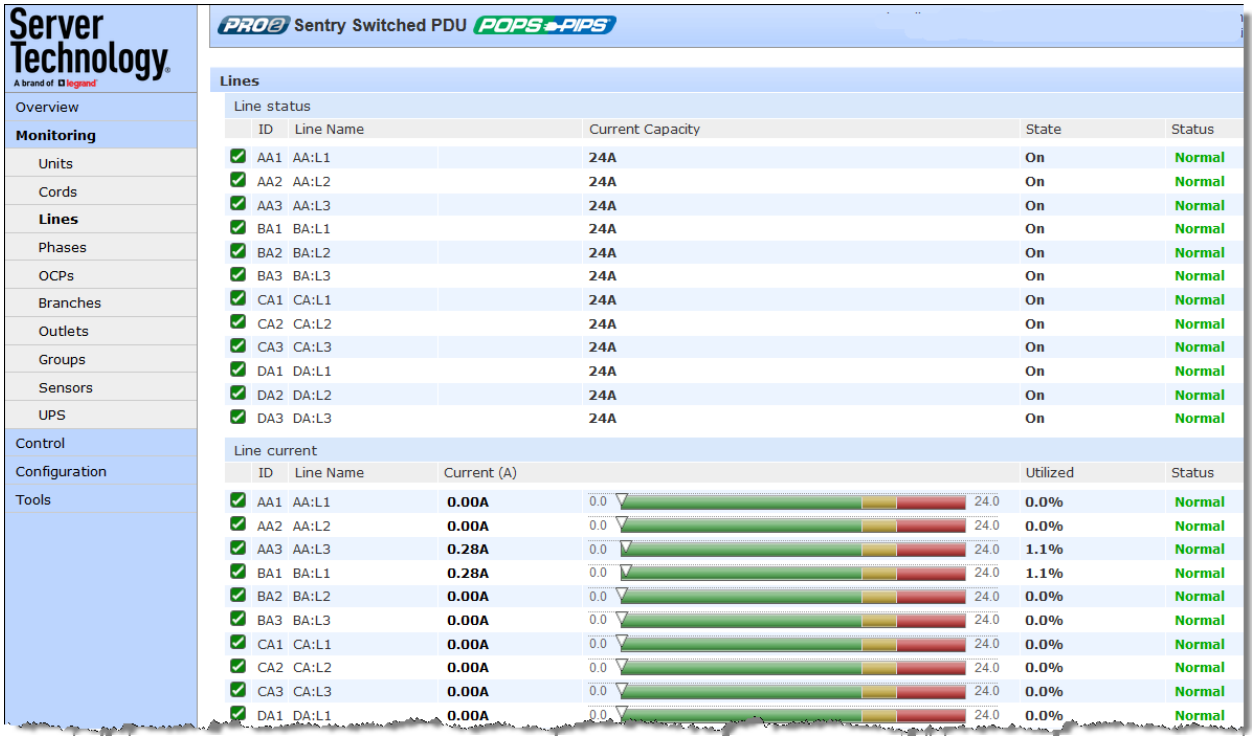
The cord power graphs display a blinking warning (yellow) when the total input load exceeds the user-defined threshold. If an overload occurs, a blinking error condition (red) is displayed. The unit continues to display yellow and red states until the condition changes or the issue has been resolved.

The default input feed high load threshold is 80% of the input feed maximum load capacity.

Cord power thresholds are user-defined **at Configuration > System > Cords**.

Monitoring > Lines

The **Lines** page shows overall line operational status, line load capacity, line state, and a color-coded graphic for the current used by each line.



What to look for:

The line status and line current status should be Normal, and the line current should be operating within defined thresholds.

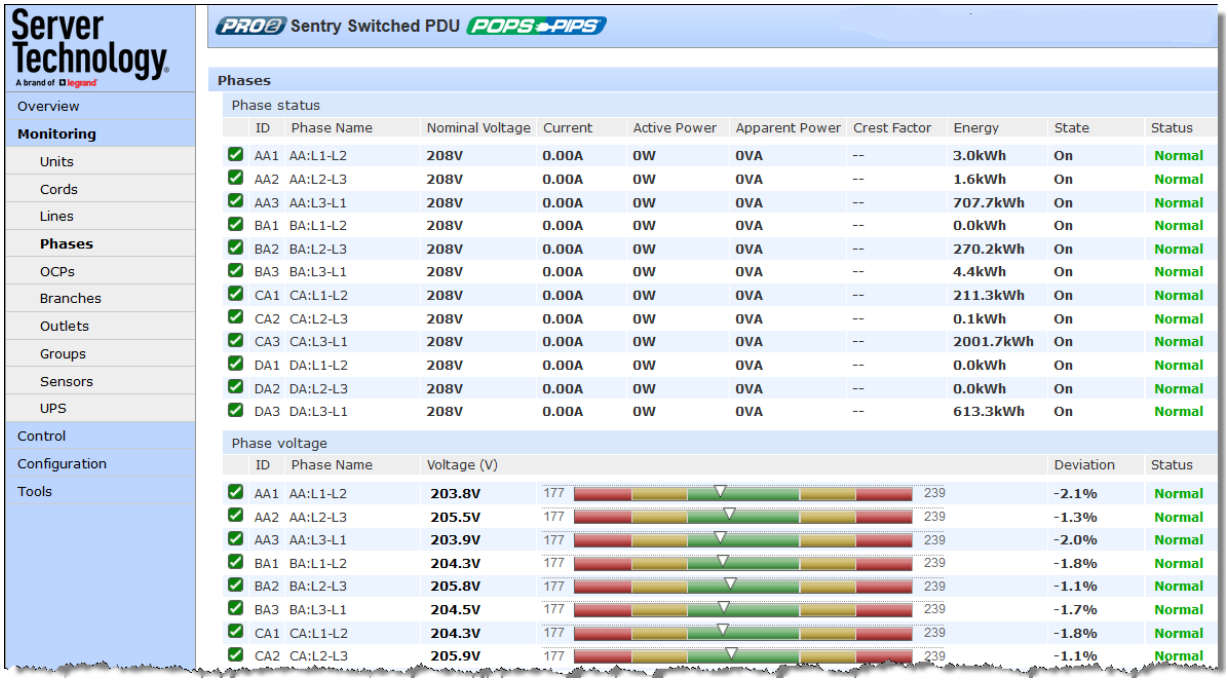
The line current graph displays a blinking warning (yellow) when the total input load on an infeed exceeds the user-defined threshold. If an overload occurs, a blinking error condition (red) is displayed. The unit continues to display yellow and red states until the condition changes or the issue has been resolved.

The default input feed high load threshold is 80% of the input feed maximum load capacity.

The line current thresholds are user-defined at **Configuration > System > Lines.**

Monitoring > Phases

The **Phases** page reports the current phase status, voltage, and power factor.



What to look for:

The phase status, voltage status, and phase power factor should be Normal, and the phase voltage and power factor should be operating within defined thresholds.

The phase voltage graph displays a blinking warning (yellow) when the total input load on an infeed exceeds the user-defined set threshold. If an overload occurs, a blinking error condition (red) is displayed.

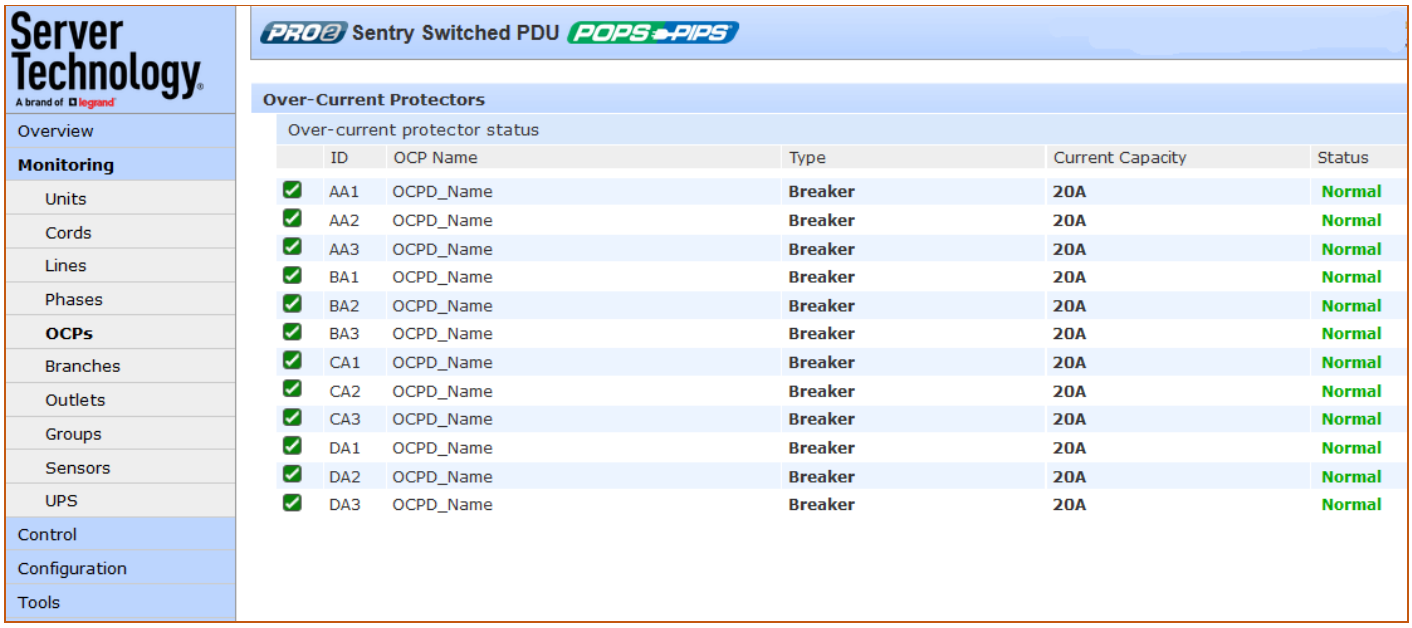
The unit continues to display yellow and red states until the condition changes or the issue has been resolved. The same color-coding applies to the phase power factor graph if the threshold is exceeded.

The default input feed high load threshold is 80% of the input feed maximum load capacity.

Phase voltage and power factor thresholds are user-defined at **Configuration > System > Phases.**

Monitoring > Over-Current Protectors

The **Over-Current Protectors (OCPs)** page displays the current status, type, and current capacity (A) for any OCPs connected to the PDU. If there are no OCPs on the unit, the OCP monitoring page will not be available.



What to look for:

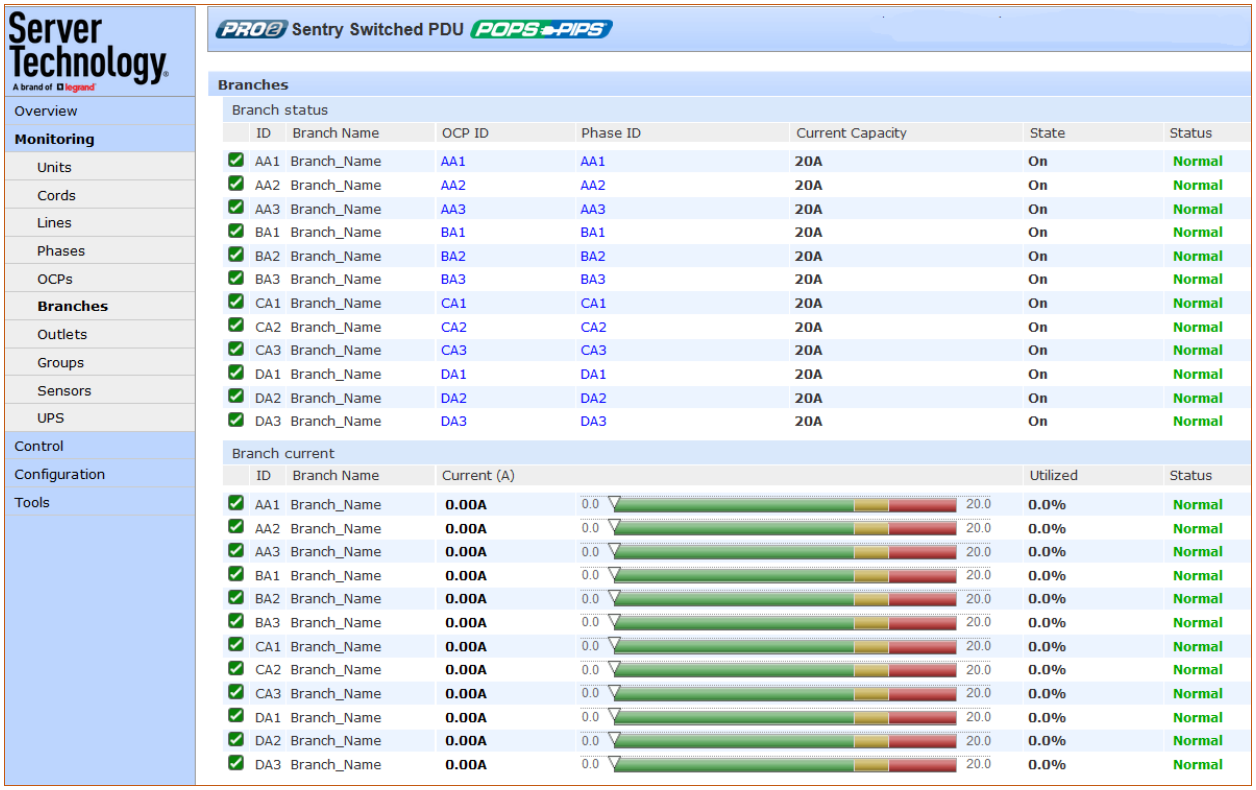
The operating status of all OCPs listed should be Normal.

Monitoring > Branches

The **Branches** page displays branch status for the standard Branch Current Monitoring feature of the PDU, which supports six branches (or units with more than six OCPs/branches).

Branch Current Monitoring allows the configuration of thresholds on the branch circuit to provide notification before a breaker trips. Displayed on the page are branch current (A), percentage of current utilized, and threshold status.

Note: The PDU allows the capability to load-shed based on branch current status.



What to look for:

Branch names are set internally on the unit at factory assembly and cannot be changed. Branch operations status should be Normal and branch current should be within defined thresholds. Branch threshold range values are affected by changing the current capacity of an over-current protector (OCP).

The branch status and branch current status displays a blinking warning (yellow) and red (error condition) when a branch exceeds the user-defined thresholds. The branch continues to display yellow and red states until the condition changes or the issue has been resolved.

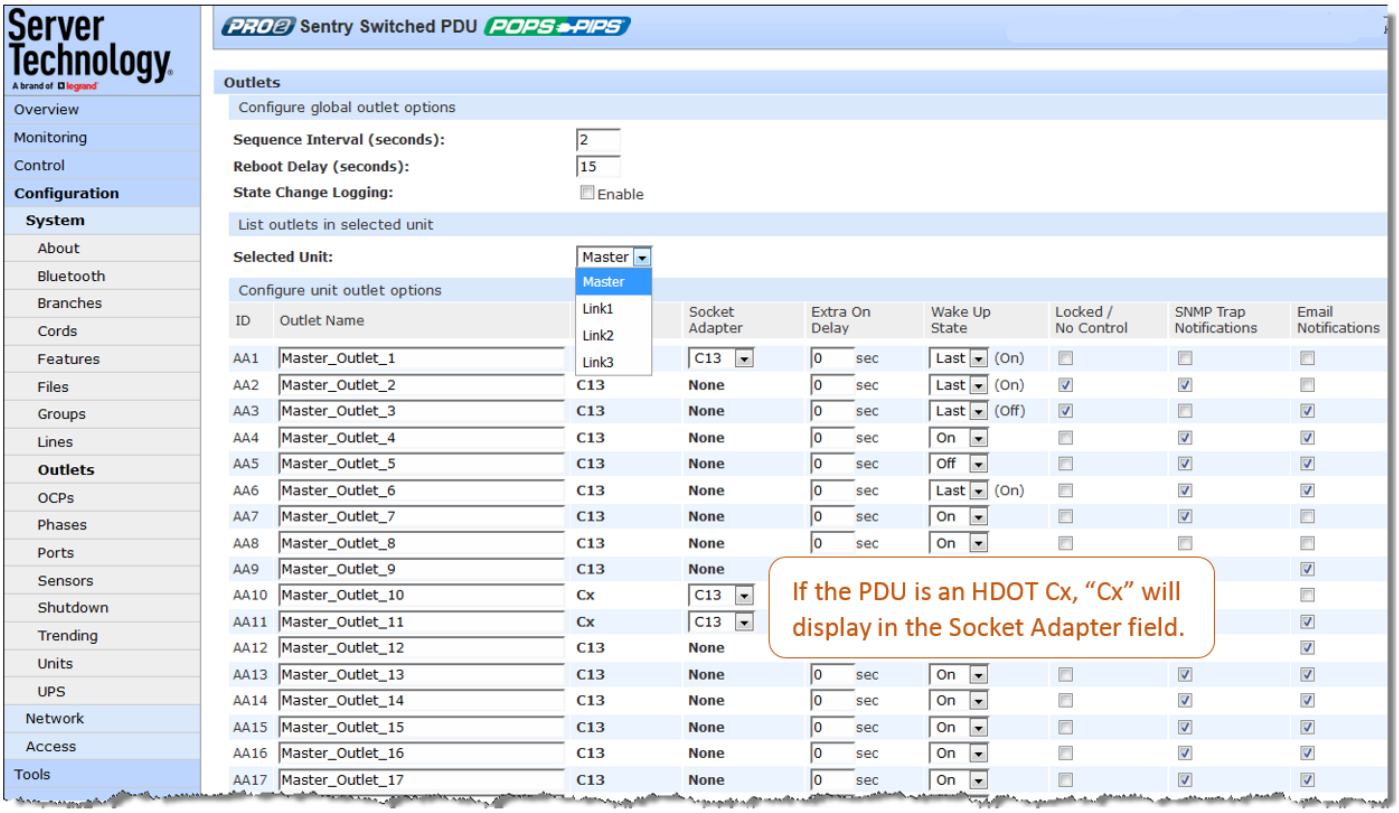
Branch current thresholds are user-defined at **Configuration > System > Branches**.

Monitoring > Outlets

The **Outlets** page lists the outlets in the PRO1/PRO2 unit with a quick overview of general outlet information, including operational status based on user-configured thresholds for current, active power, and power factor.

Also displayed are the last user action (on, off, reboot) issued on the outlet (shown in the State column), and the outlet's last reported condition (shown in the Control State column).

The page allows a fast drill-down from the ID link for more operational data about a specific outlet in the list.



What to look for:

The operating status of all outlets should be Normal. If necessary, view operational details for an outlet. The ID and socket type are determined at factory assembly and cannot be user-configured.

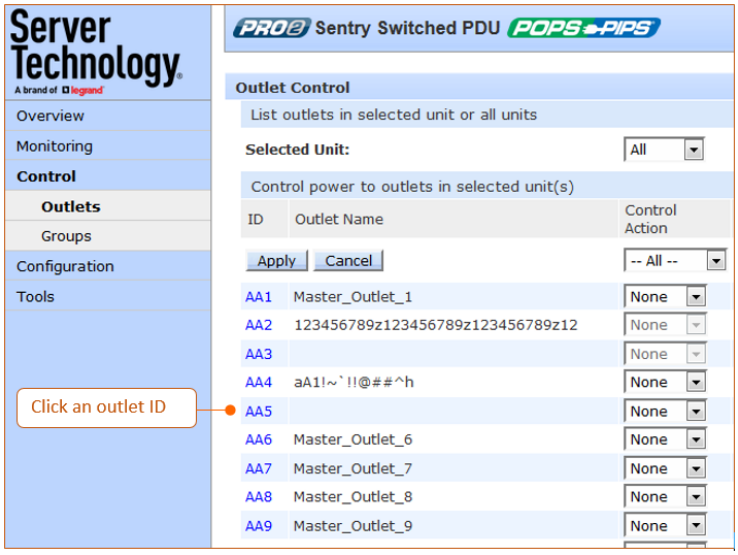
Each outlet has a unique number, and the numbering sequence of outlets is not associated with the unit's branch or phase number. For example, a 30-outlet PDU unit (either single-phase or 3-phase) unit will have outlet numbers sequenced from 1 to 30.

The outlet status displays a blinking warning (yellow) and red (error condition) when an outlet exceeds the user-defined thresholds. The status continues to display yellow and red states until the condition changes or the issue has been resolved.

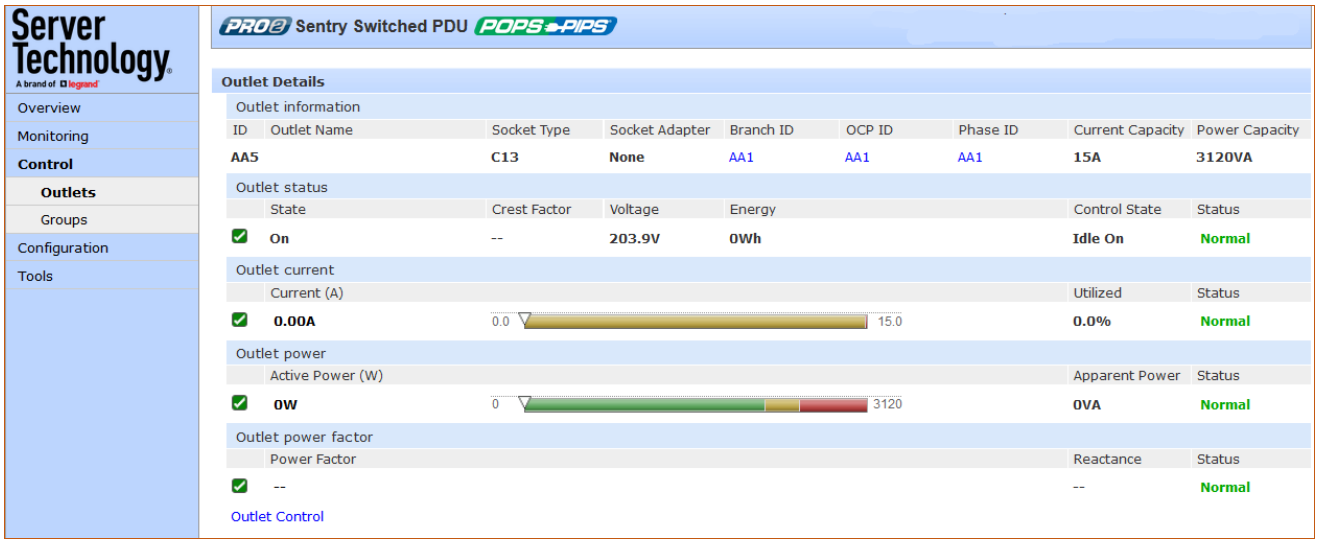
A descriptive text outlet name can be configured at **Configuration > System > Outlets**.

To view details for an outlet:

1. From the Control > Outlets page, click the ID link for any outlet in the list, such as AA2 in this example.



2. The Outlet Details page displays specific information about the selected outlet (AA2 in this example) that includes current/power capacity and usage, as well as the outlet's operational status. Note that POPS units may display additional outlet information and status graphs.

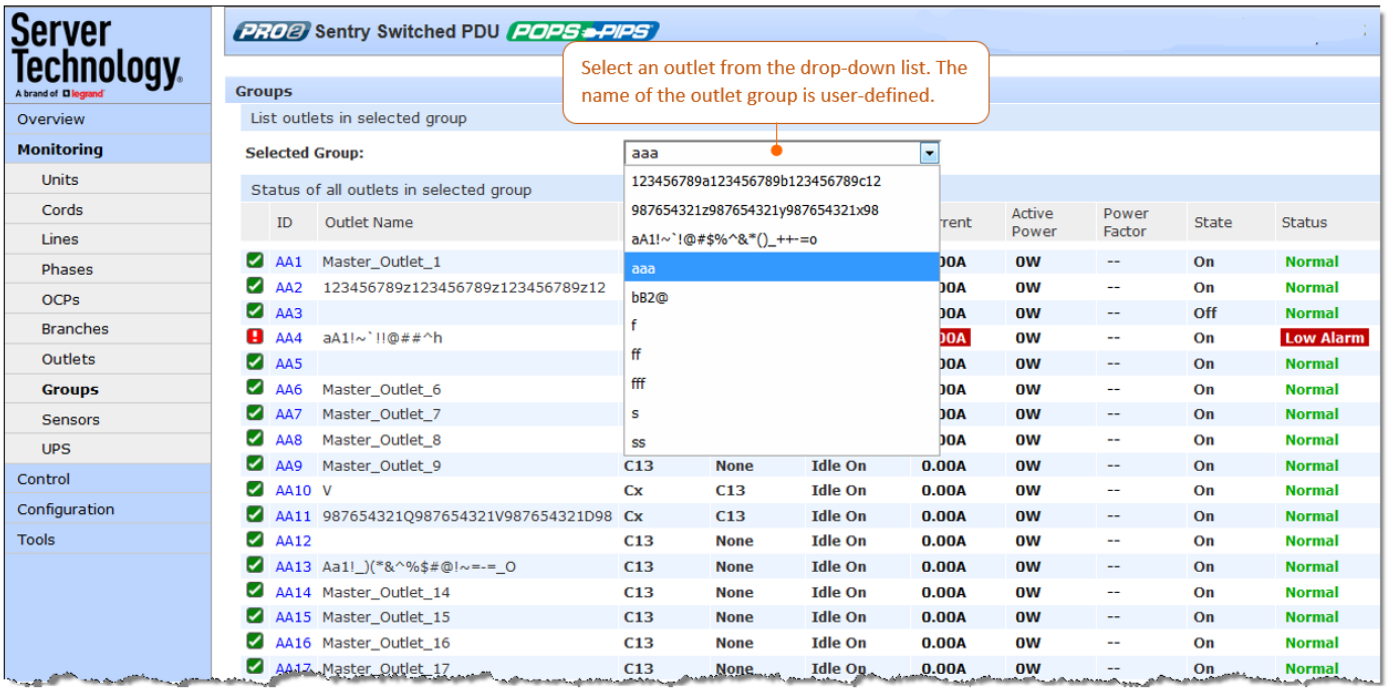


3. To return to the previous monitoring page, click the Outlet Control link.

Monitoring > Groups

The **Groups** page shows the status of all outlets in a user-defined outlet group. An outlet group is named group with a collection of PDU outlets assigned to the group.

The page also allows a fast drill-down by outlet ID for more details about the outlet.



What to look for:

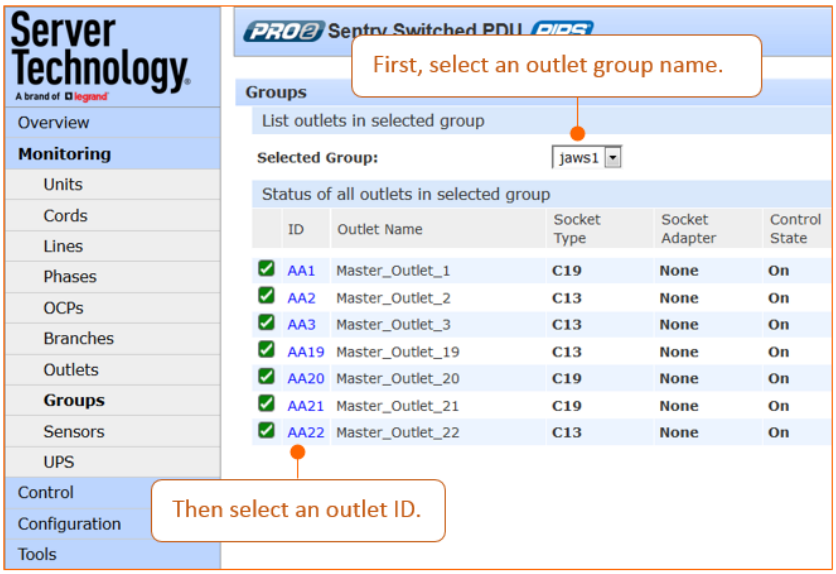
The operating status of all outlets within a selected group should be Normal. If necessary, view operational details for an outlet.

The outlet status for a group displays a blinking warning (yellow) and red (error condition) when an outlet exceeds the user-defined thresholds. The status continues to display yellow and red states until the condition changes or the issue has been resolved.

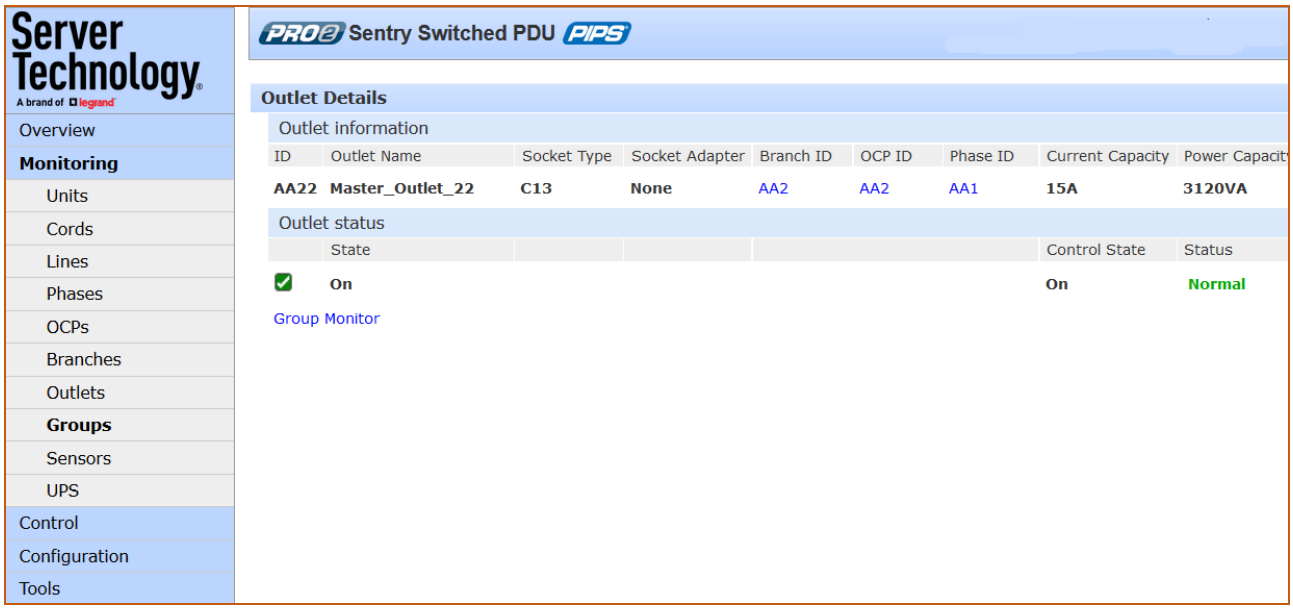
Creating an outlet group and assigning outlet access to the group is done at **System > Configuration > Groups**.

To view operational details for an outlet in an outlet group:

1. From the Groups page, select an outlet group from the drop down list.



2. When you click an outlet ID link in the list, the details page for that outlet displays:

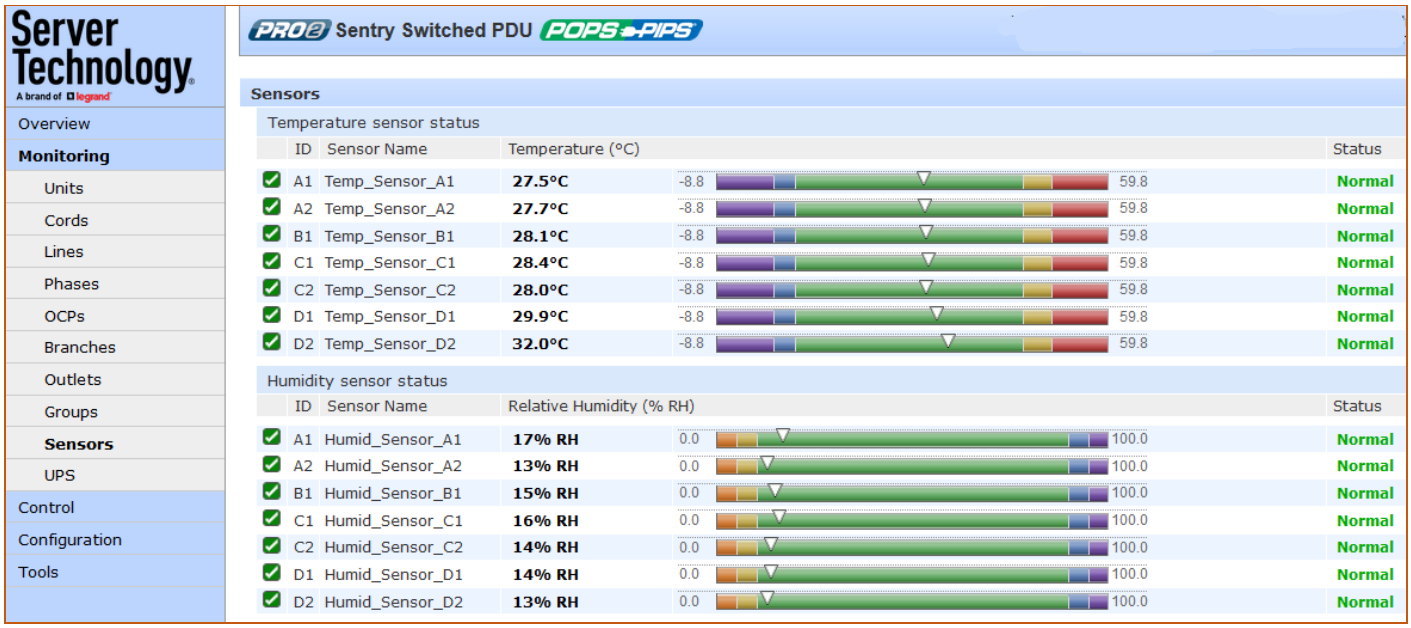


3. The Outlet Details page displays specific information for the selected outlet that includes capacity and usage, and status graphs for outlet current (A), and outlet power (W).
4. To return to the previous monitoring page, click the Group Monitor link.

Monitoring > Sensors

The **Sensors** page provides a quick view and color-coded graphic showing the current temperature/humility operating values of environmental sensors.

Note: If a fan is present on the PDU, the fan can also be monitored on this page.



What to look for:

The operating status of all sensors (and fan, if present) should be Normal, and operating temperature or relative humidity should be within defined thresholds.

Temperature Status

The Temperature graph displays a blinking warning or critical error whenever temperature exceeds low or high threshold. The PDU continues to display the status until the condition changes or the issue has been resolved.

Temperature graph colors:

- Violet = coldest; low alarm (threshold configured by user)
- Blue = cold; low warning (threshold configured by user)
- Green = acceptable temperature range
- Yellow – warm; high warning (threshold configured by user)
- Red = hot; high alarm (threshold configured by user)

The default range of low/high temperature threshold values is -40 to 123(C°). Temperature threshold values are user-defined at **Configuration > System > Sensors**.

Humidity Status

The Humidity graph displays a blinking warning or critical error whenever humidity exceeds low or high threshold. The PRO1/PRO2 continues to display the status until the condition changes or the issue has been resolved.

Humidity graph colors:

- Violet = wettest; high alarm (threshold configured by user)
- Blue = wet; high warning (threshold configured by user)
- Green = acceptable percentage of relative humidity
- Yellow = dry; low warning (threshold configured by user)
- Red = driest; low alarm (threshold configured by user)

The default range of low/high relative humidity threshold values is 0-100%RH. Humidity threshold values are user-defined at **Configuration > System > Sensors**.

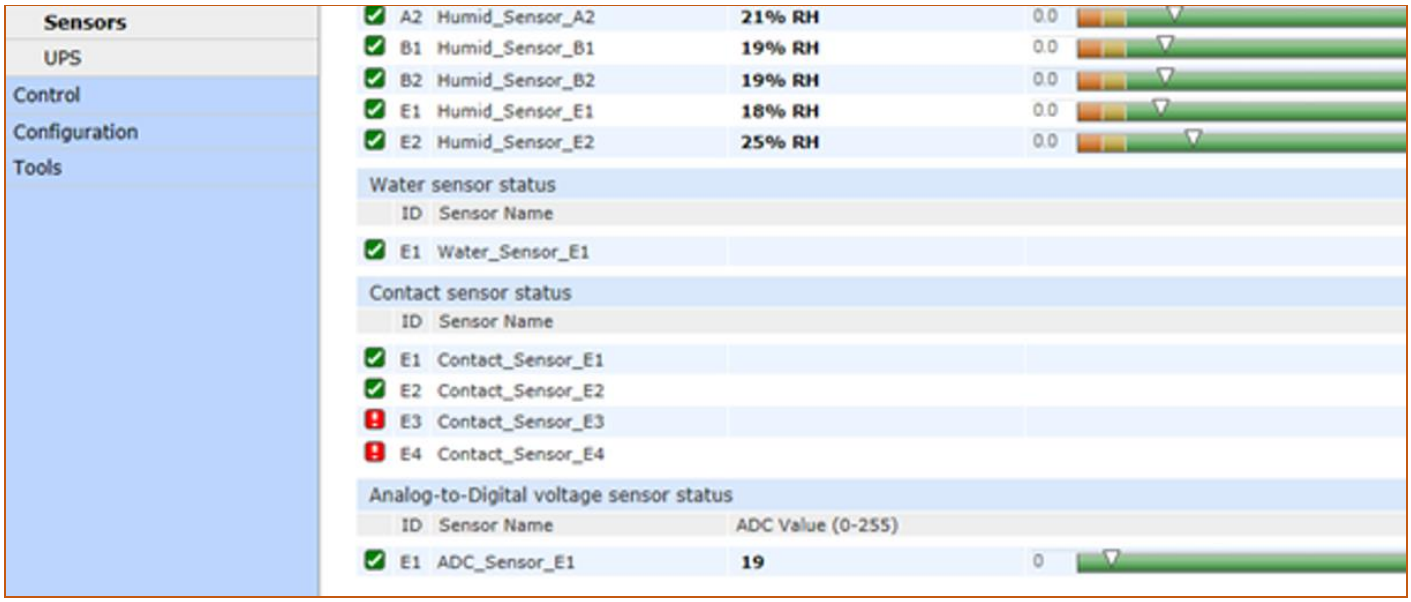
Temperature/Humidity Sensor Status

Status	Description
Found	The PDU found the sensor and connection is established.
Not Found	On a fresh reboot, the PDU does not find a sensor.
Lost	The connection to a previously found sensor is now lost.
No Comm	Communication loss occurred due to a hardware issue (not loss of communication with the probes).[1]

[1] The ENV part of the sensor supports two temperature/humidity (T/H) probes as part of the master unit, two T/H probes as part of the link unit, and the optional EMCU-1-18 (which can support two T/H probes, four contact-closure monitoring points, and one water sensor). The “No Comm” sensor status is not loss of communication with the probes themselves.

Environmental Monitor (EMCU) Status

If an EMCU is connected to the PDU, the Sensors pages will also include monitoring of water, contact closures, and analog-to-digital (ADC) sensors.



What to look for:

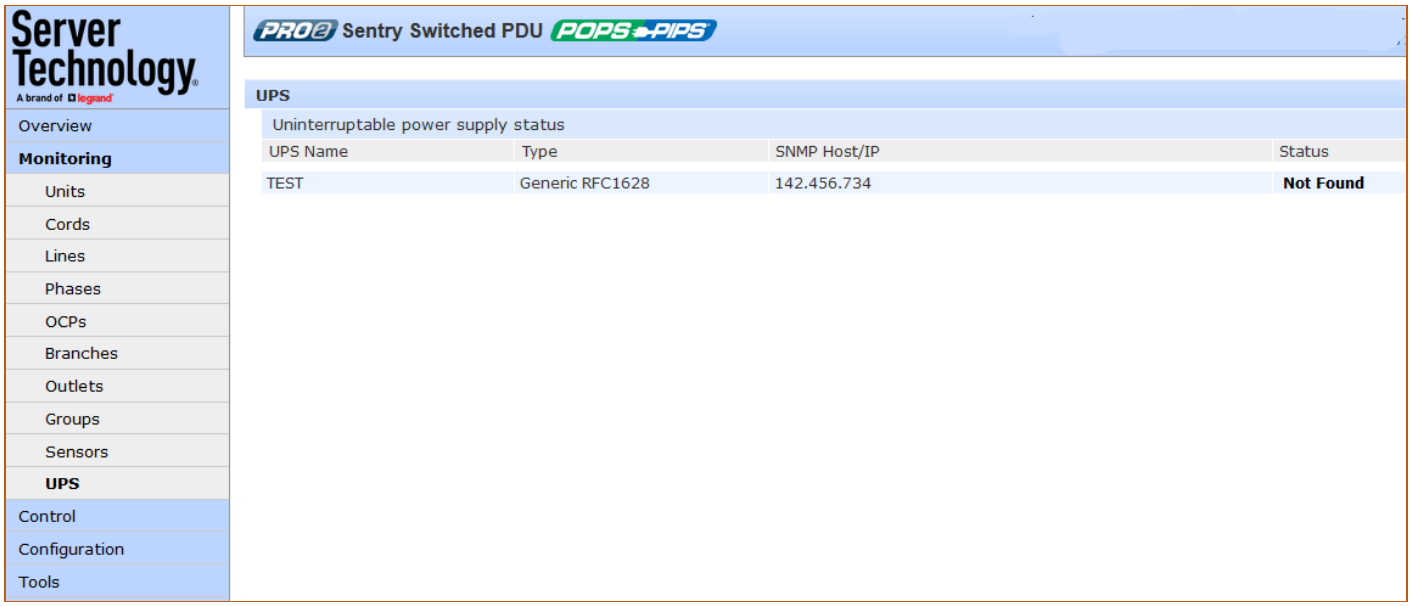
The operating status of all sensors should be Normal and operating within defined thresholds. View the color-coded graph showing current operating range within thresholds for the ADC.

Water and contact closure sensors can have either Normal or Alarm status – there are no other states or value ranges.

The ADC sensors can be configured at **Configuration > System > Sensors**

Monitoring > UPS

The **UPS** page identifies each UPS device connected to the PDU unit, displaying hostname/IP address and UPS status.



What to look for:

Monitoring page will be blank if a UPS has not been connected to, and configured for, the PDU. After connecting a UPS to the unit, configure the UPS and the lines to be powered by the UPS at **Configuration > System > UPS**.

Control (Managing Outlets)

The **Control** section of the Web interface allows the issuing of outlet control actions On, Off, and Reboot for individual outlets in a master unit (or in all units), for all outlets globally in a master unit (or in all units), and for named outlet groups.

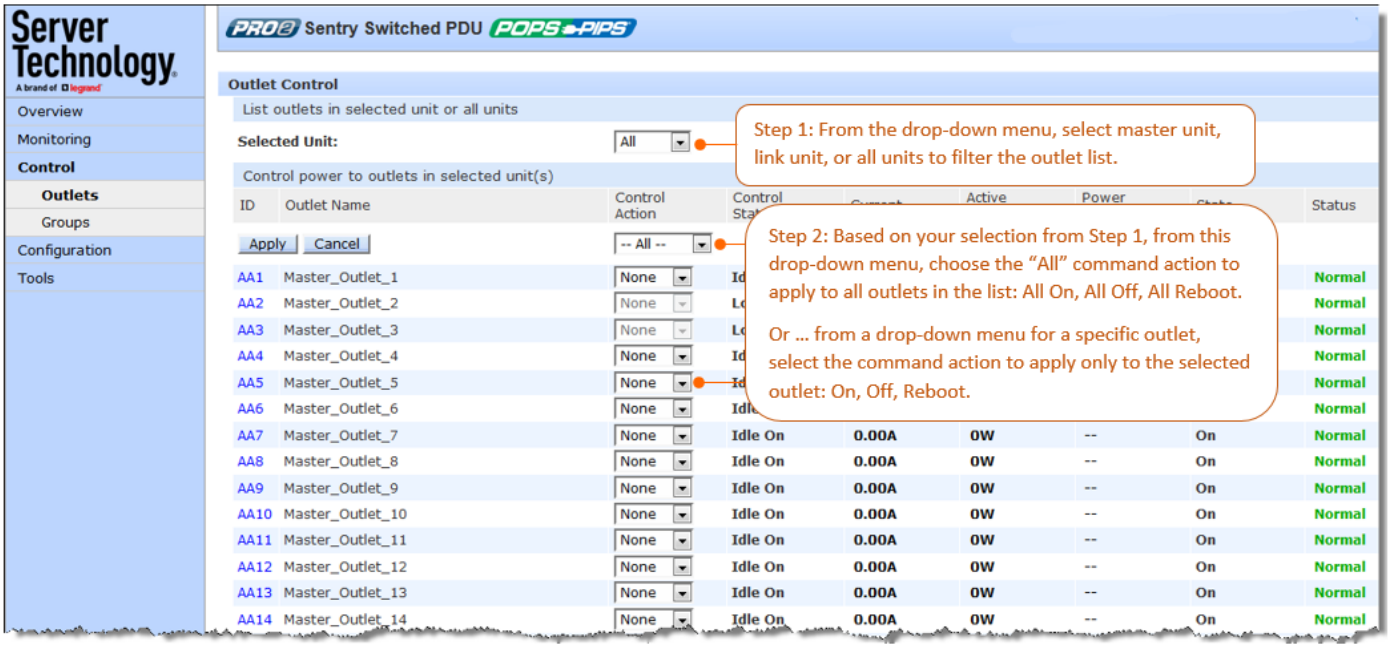
Outlet details are also available by individual outlet to provide the outlet's general identification, socket type, capacity, operational state, power factor, as well as color-coded graphs for current and power.

A PDU with Per Outlet Power Sensing (POPS)

technology will also display values for current capacity used and reactance.

Control > Outlets

The **Outlet Control** page displays outlets assigned to the current user:



What to look for:

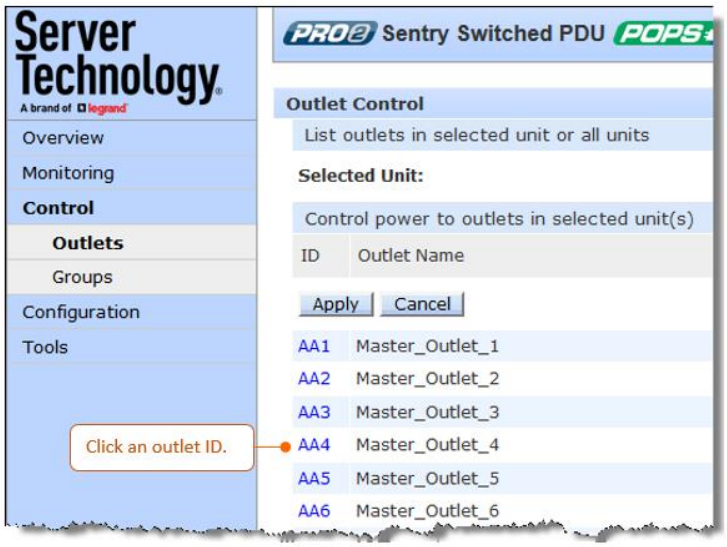
- Provides viewing of outlet current, power, power factor, current control state applied to the PDU, and status information.
- Includes an ID link for viewing detailed operational data about the outlet.
- Allows the issuing of outlet power control actions (On, Off, Reboot) on individual outlets or on all outlets globally, in a master unit or in all units.

To issue outlet control actions (globally on all outlets or on individual outlets):

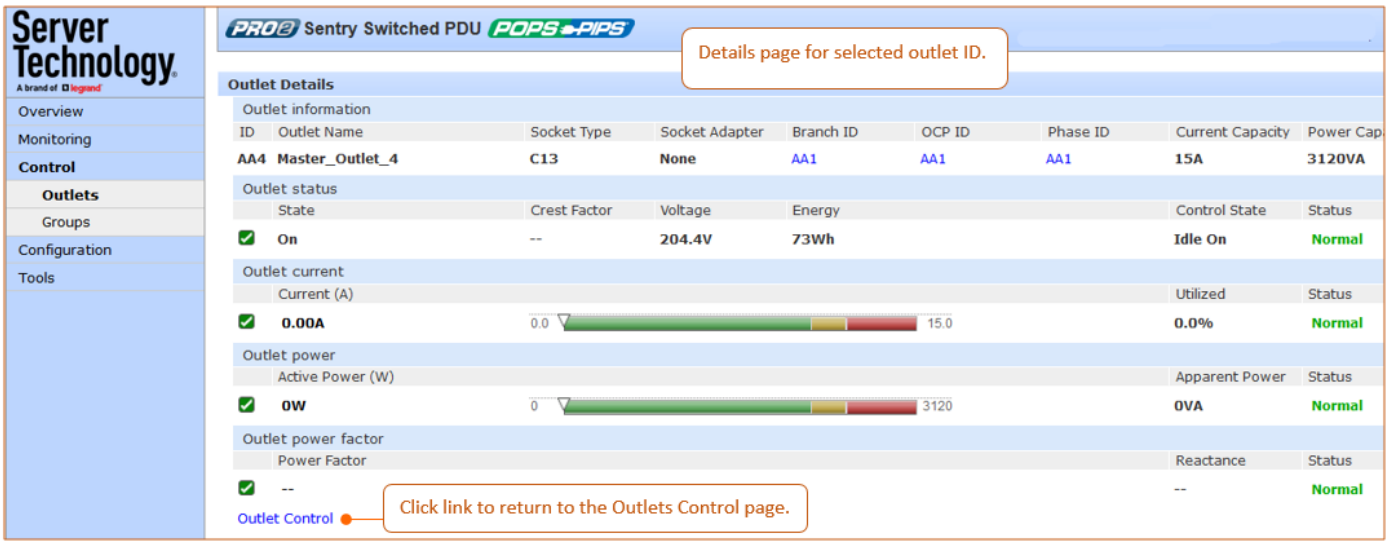
1. From the Selected Unit drop-down menu, choose All or Master. The page refreshes to show the outlets available for the selected unit.
2. To issue outlet control **globally** on all displayed outlets, from the Control Action drop-down menu, select All On, All Off, or All Reboot. To issue outlet control on one or more **individual** outlets, from the Control action drop-down menu for the individual outlet(s), select On, Off, or Reboot.
3. Click **Apply**. The command action is issued immediately on the specified outlet(s).

To view detailed operational details for an outlet:

1. From the Outlet Control page, click the Outlet ID link for any outlet in the list, such as AA2 in this example.



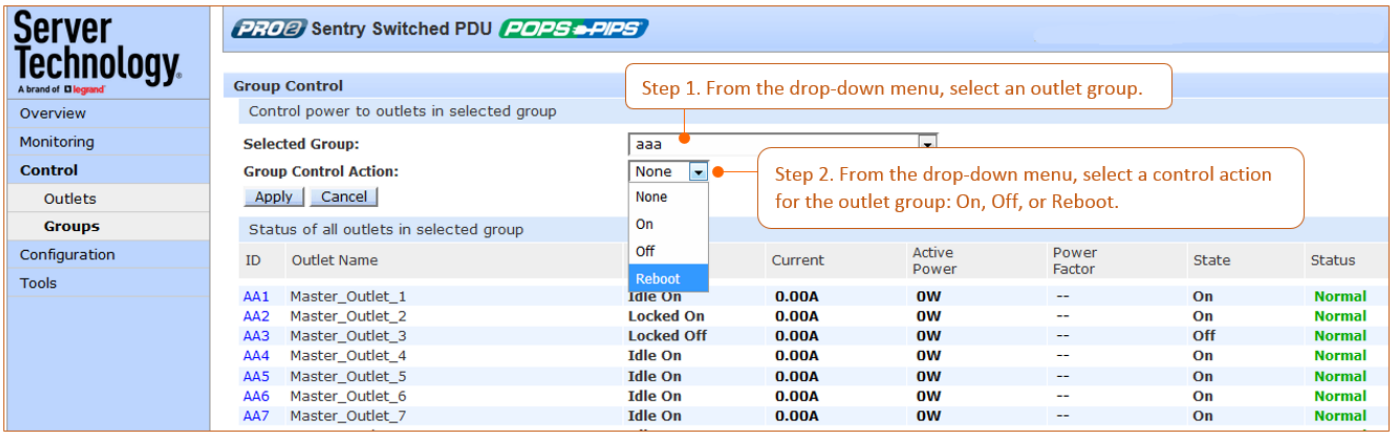
2. The Outlet Details page displays for outlet AA2 showing power, capacity, and other operational information:



Control > Groups

The **Control Groups** page displays outlet groups assigned to a current user and allows power control actions (On, Off, Reboot) to be applied to all outlets in a selected outlet group.

Note: An outlet group is a named collection of outlets in a PDU (up to four enclosures) with a single IP address.



To issue outlet control on a specific outlet group:

1. From the group drop-down menu, select the outlet group by name.
2. From the control action drop-down menu, select the outlet command On, Off, or Reboot.
3. Click **Apply**. The command is issued immediately on all outlets in the selected outlet group.

Outlet State/Control State Descriptions

The following table shows the differences between outlet state and control state

- The **outlet state** is the current operating state of the outlet.
- The **control state** is the last user-issued control action on the outlet.

Outlet State	Control State	Description
On	On	Outlet is on.
Off	Off	Outlet is off.
Off	Pend On	Outlet is off and about to turn on in response to a sequence timer.
Off	Reboot	Outlet is off and a Reboot action has been initiated.
On	Idle On	A restart has occurred – last control state has been maintained.
On	Idle Off	A restart has occurred – last control state has been maintained.
On	Wake On	A power-loss has occurred – wakeup state has been applied.
Off	Wake Off	A power-loss has occurred – wakeup state has been applied.
On/Wait	Off	Outlet state in transition – re-query of outlet status required.
Off/Wait	On	Outlet state in transition – re-query of outlet status required.
On/Error	(varies)	Error state – outlet should be off but current is sensed at the outlet.
Off/Error	(varies)	Error state – outlet should be on but no current is sensed at the outlet.
Off/Fuse	On	Outlet should be on but a blown fuse has been detected.
On/Fuse	On	Outlet should be on but a blown fuse has been detected downstream
No Comm	(varies)	Communication to the outlet has been lost – control state will be applied when communication is re-established.

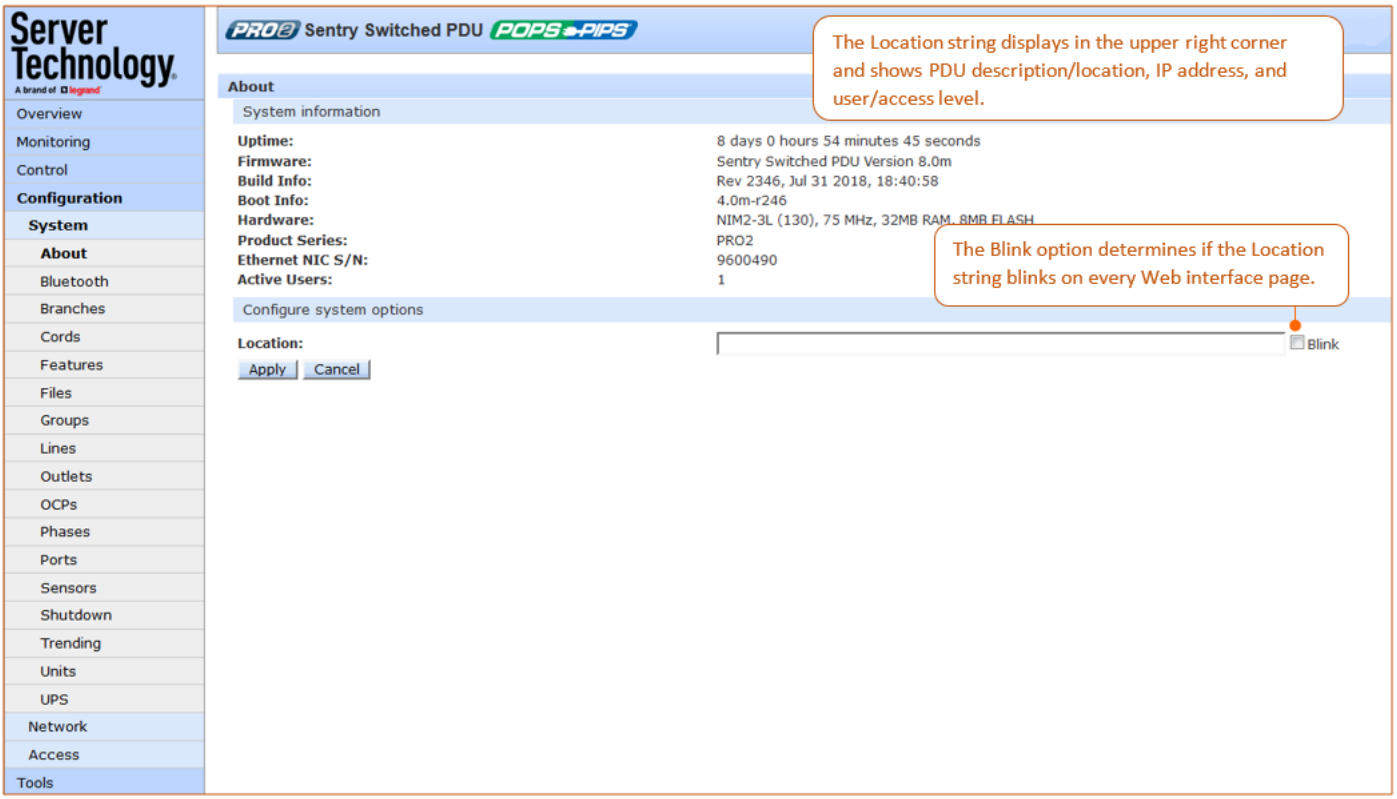
Configuration (Setting Values)

The **Configuration** section allows administrative access to all options for setting PDU values. The pages are organized into three major areas of configuration:

- **System** (options for hardware areas)
- **Network** (options for setting up network protocols)
- **Access** (options for local/remote user access and management)

System > About

The **About** page allows: (1) reference for system-wide configuration data, (2) configuration of the system location, and (3) the option for a blinking system location on GUI monitoring pages.



Viewing system reference information:

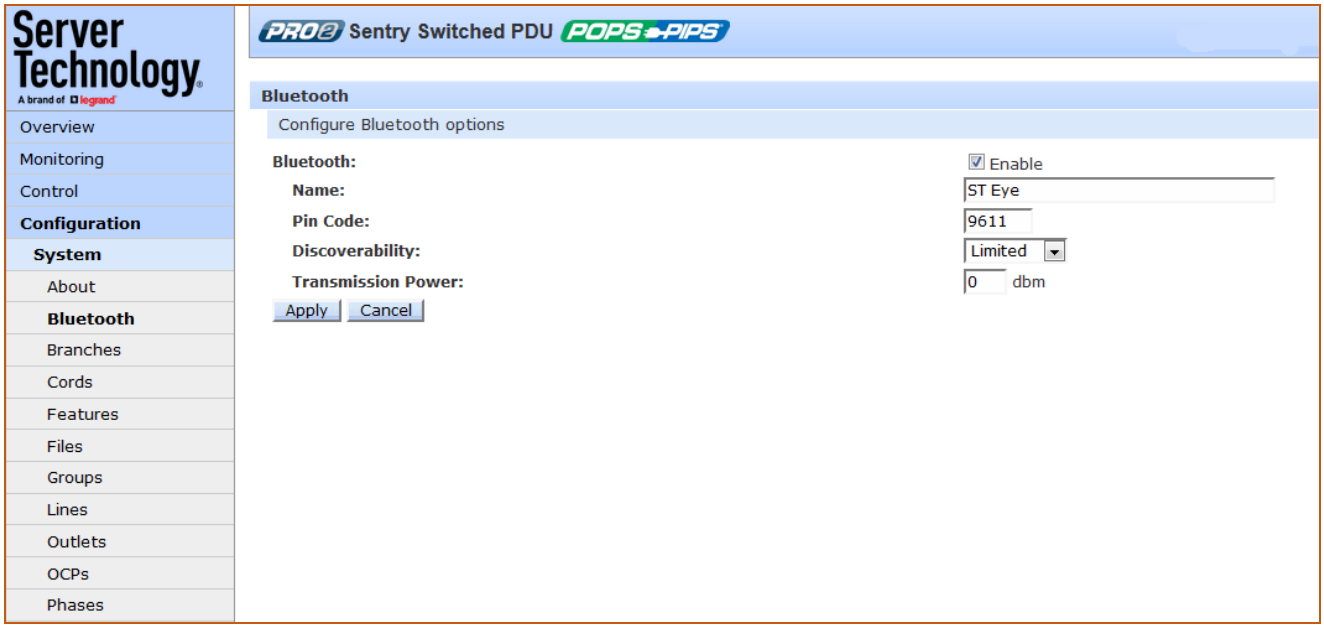
- Uptime: Cumulative time the PDU has been up and running since the last unit restarted. Shows continuous, real-time system updates with an approximate 5-second automatic refresh. A manual refresh is not required.
- Firmware: Current firmware version.
- Build Info: Displays revision number and date/time of most recent firmware version build.
- Boot Info: Identification number from the system boot loader.
- Hardware: Displays information about the PCB used in the PRO2 unit.
- Ethernet NIC S/N: The serial number of the unit derived from the Ethernet NIC.
- Active Users: Number of users currently logged in.

To set the blink option:

1. Type a descriptive PDU location name that appears in the system header section of every Web interface page (upper right corner).
2. (Optional) Check the Blink checkbox to enable blinking of the unit's location string (IP address) on the Web interface pages. Even if Blink is enabled, the blinking may not work with all web browsers.
3. Click **Apply**.

System > Bluetooth

The **Bluetooth** page allows parameter configuration needed for the Bluetooth™ mobile monitoring solution.



To configure Bluetooth™ options

1. To enable Bluetooth mobile monitoring, check Enable.
2. Provide a value for the Bluetooth parameters: name, pin code, discoverability, and transmission power, as described in the following table.
3. Click **Apply**.

Bluetooth™ Firmware Parameters

Parameter	Description and Values/Range
Bluetooth Name	Descriptive name of the Bluetooth module that displays in the list of discovered modules on the Android mobile device or Apple iPad/iPhone. The default module name is "ST Eye". Valid length of name is 1-31 characters; the name cannot be blank.
Bluetooth Discoverability	Settings that determine the current status of the pushbutton on the Bluetooth module: • Enabled: The Bluetooth module is discoverable, even without pressing the pushbutton. • Limited: (Default) The pushbutton on the Bluetooth module must be pressed to make the module discoverable for 60-seconds. • Disabled: The Bluetooth module is never in discoverable mode.
Bluetooth Pin Code	The pin code is available for legacy Bluetooth modules that require a pin to pair the module. Although not used in current Bluetooth modules, the pin code is supported if needed. Default is 9611; must be 4-digits; range is 0000 to 9999.
Bluetooth Transmission Power	Designated transmission power (dbm) for the Bluetooth module. Lowering the transmission power reduces the effective range of the module. Default is 0; range is -6 to 4 dbm.

Notes:

- The ST Eye mobile app and the Bluetooth module may not be included with the PRO1/PRO2 unit.
- The ST Eye mobile app supports one concurrent session.

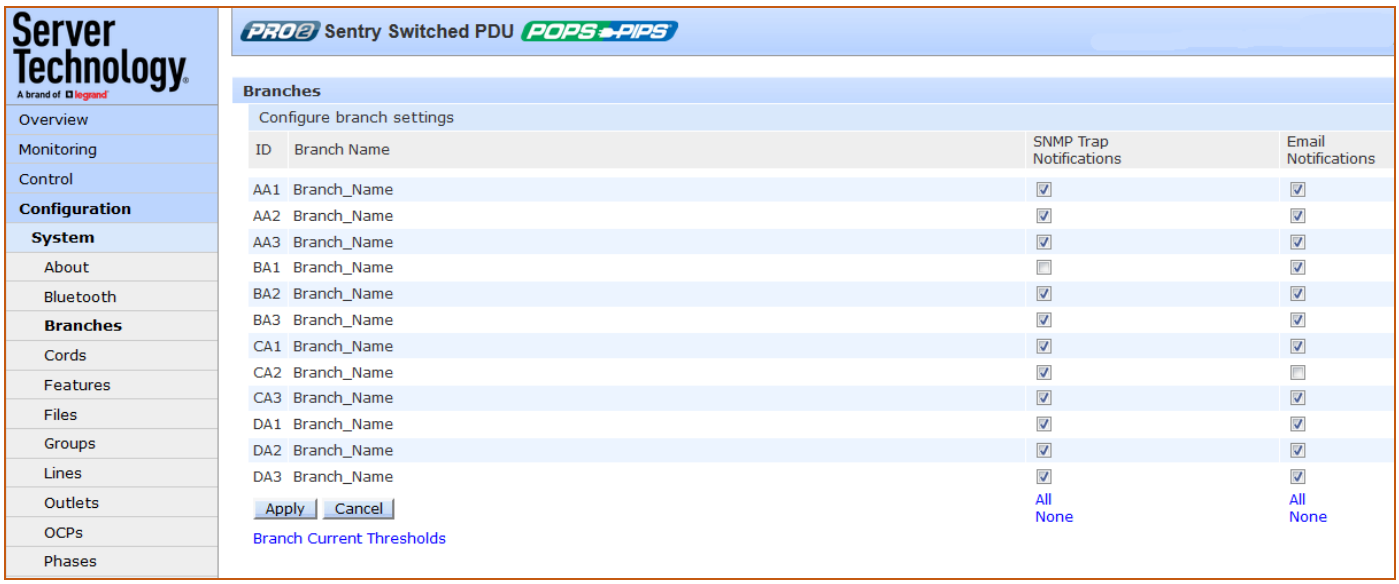
System > Branches

The **Branches** page provides the Branch Current Monitoring feature of the PDU which supports up to six branches (or units with more than six OCPs/branches), to measure, report, and alert (in Amps) per branch circuit for breaker and fuse errors.

The **Branches** pages allows setting multiple load levels for low/high warning/alarm values (A) for branch current thresholds, plus threshold hysteresis (A).

The page also sets sets SNMP Trap and Email notifications for branch events.

For dynamic monitoring of branch status and current, see the separate **Monitoring > Branches** page.



About the branches:

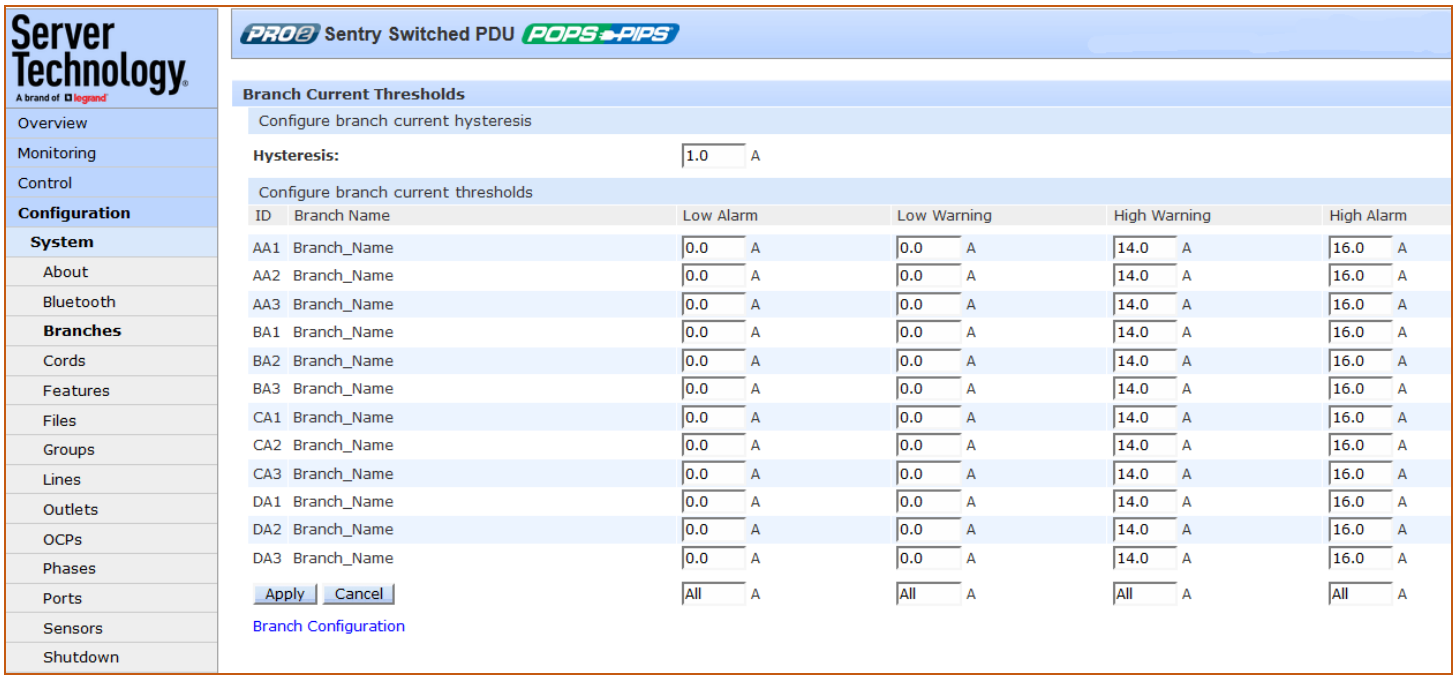
- Branch names are not user-defined and cannot be changed.
- Branch values affect the setting on the OCP, if an OCP is connected to the PDU. Not all units will have an OCP; therefore, branch threshold range values will be affected by changing the current capacity on the OCP.

To configure branch settings:

1. For each branch listed on the page, check (or uncheck) the SNMP Trap Notifications and/or Email Notifications checkboxes to enable (or disable) branch event notification for a specific branch.
2. Click **Apply**.

Setting Branch Current Thresholds

From the Branches page, click Branch Current Thresholds to display the related thresholds edit page:



To set branch current thresholds:

1. Set the threshold hysteresis value (in Amps). Hysteresis is the values between the event state and recovery. Provide 0.0 to 10.0A. Default is 1.0A.
2. Provide the current load (A) for low/high warning/alarm threshold for a displayed branch on the page. Valid range is between 0-max (Max Current) in **show branches** command.
3. Click **Apply**.

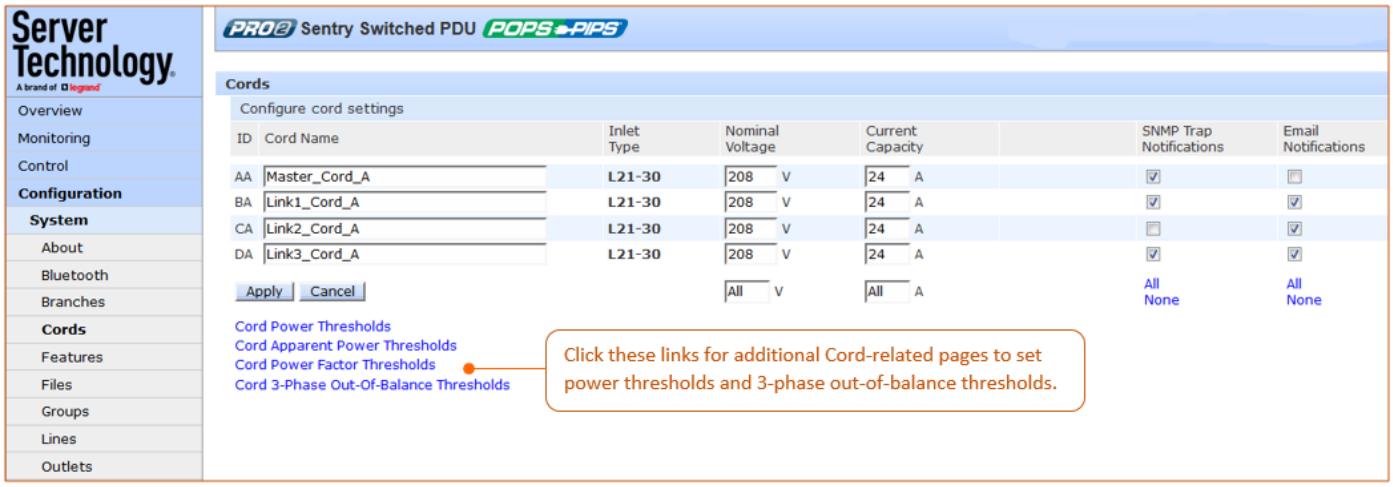
System > Cords

The **Cords** page configures the single input power cord in the PDU hardware architecture that reports infeed data for the unit, allowing the setting of multiple cord threshold levels for power, apparent power, power factor, 3-phase out-of-balance, and threshold hysteresis.

The value for *nominal voltage* – the point where an alert is received – is established on the **Cords** page.

The Cords page also sets SNMP Trap and Email notifications for cord events.

For dynamic monitoring of cord status, related power data, and out-of-balance levels, see the separate **Monitoring > Cords** page.

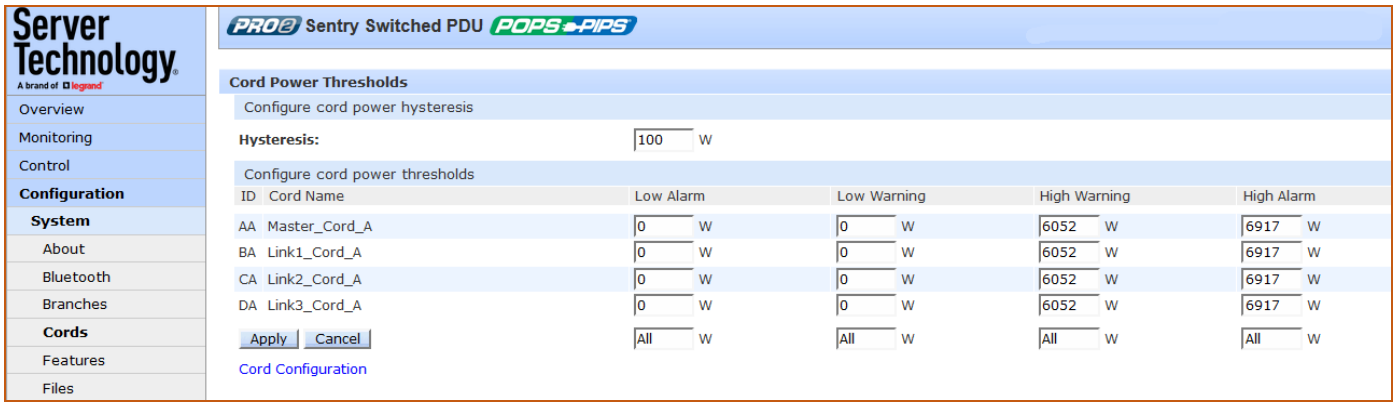


To configure cord settings:

1. In the Cord Name field, provide a descriptive text name, from 0-32 characters. The ID is a system-assigned internal name and cannot be changed.
2. View the reported type of inlet displayed for the cord.
3. In the Nominal Voltage field, set the value (in Volts) to be the mid-point of the Monitoring graphs, so that nominal voltage is the point where you are alerted for an alarm. Range is 0-max (max is factory nominal voltage) in the **show cords** command.
4. Set the current load for the cord in the Current Capacity field. Range is 0-max (max is factory current capacity) in the **show cords** command.
5. For each cord listed, check (or uncheck) SNMP Trap Notifications and/or Email Notifications to enable/disable notifications for cord events.
6. Click **Apply**.

Configuring Cord Power Thresholds

Click the **Cord Power Thresholds** link at the bottom of the Cords page to display the configuration page:

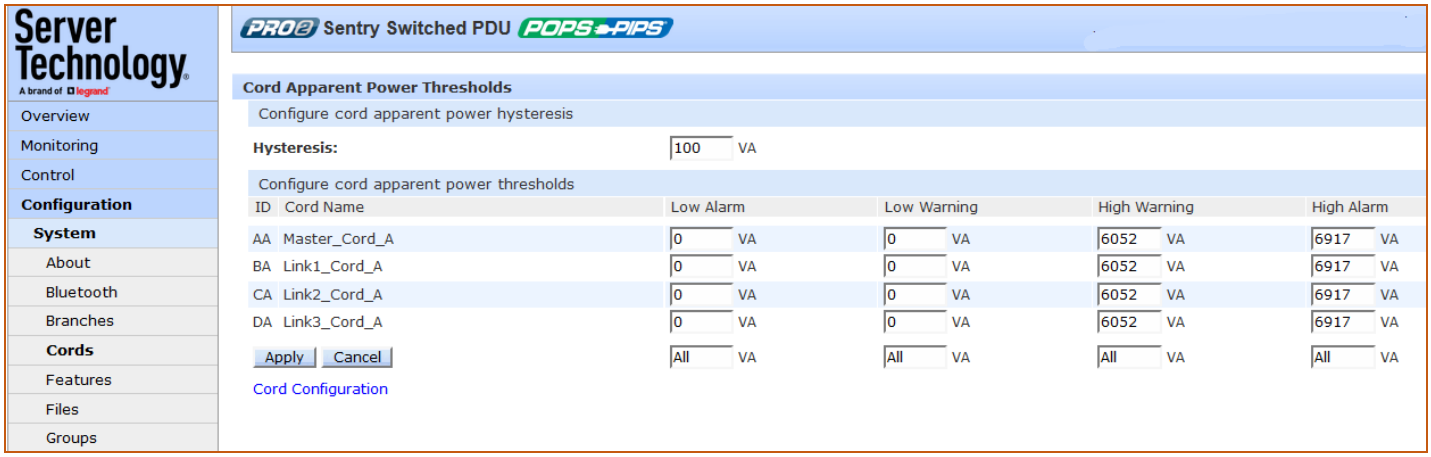


To set cord power thresholds:

1. Provide the threshold hysteresis between event state and recovery (W). Range is 0-1000W; default is 100W.
2. Set the low/high alarm and low/high warning threshold values (W). Cord power does not include power factor. Range is min 0W; max is power capacity shown in **cstat** command.
3. Click **Apply**.

Configuring Cord Apparent Power Thresholds

Click the **Cord Apparent Power Thresholds** link at the bottom of the Cords page to display the configuration page:

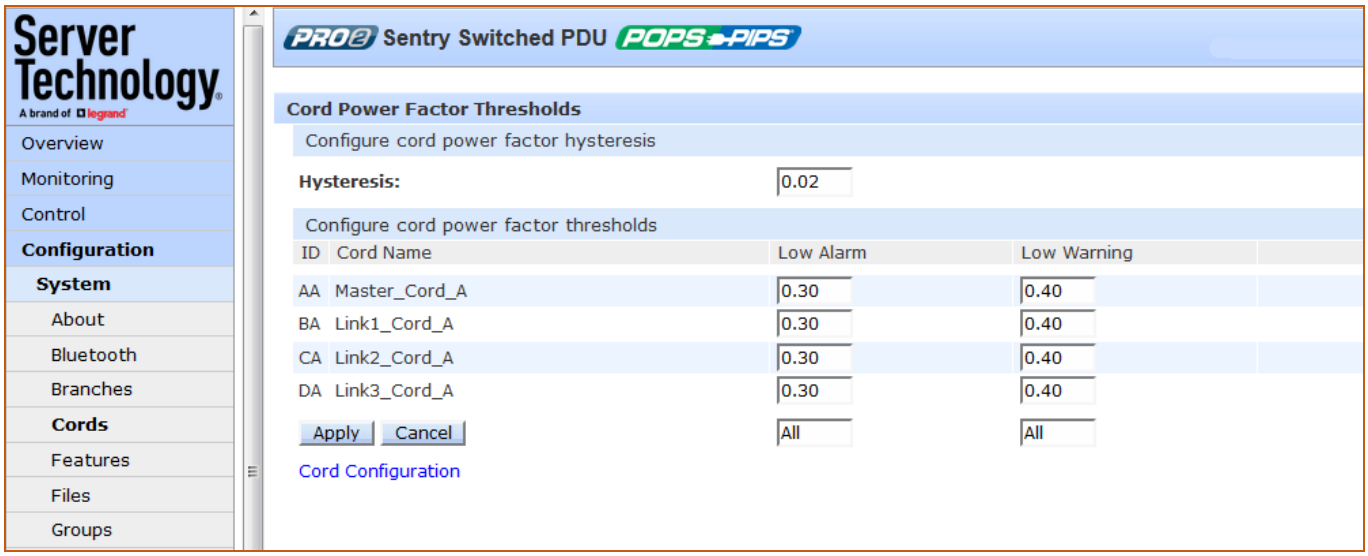


To set cord apparent power thresholds:

1. Provide the threshold hysteresis between event state and recovery (VA). Range is 0-1000VA; default is 100VA.
2. Set the low/high alarm and low/high warning threshold values (VA). Cord apparent power includes power factor. Range is min 0VA; max is power capacity shown in **cstat** command.
3. Click **Apply**.

Configuring Cord Power Factor Thresholds

Click **Cord Power Factor Thresholds** link at the bottom of the Cords page to display the configuration page:

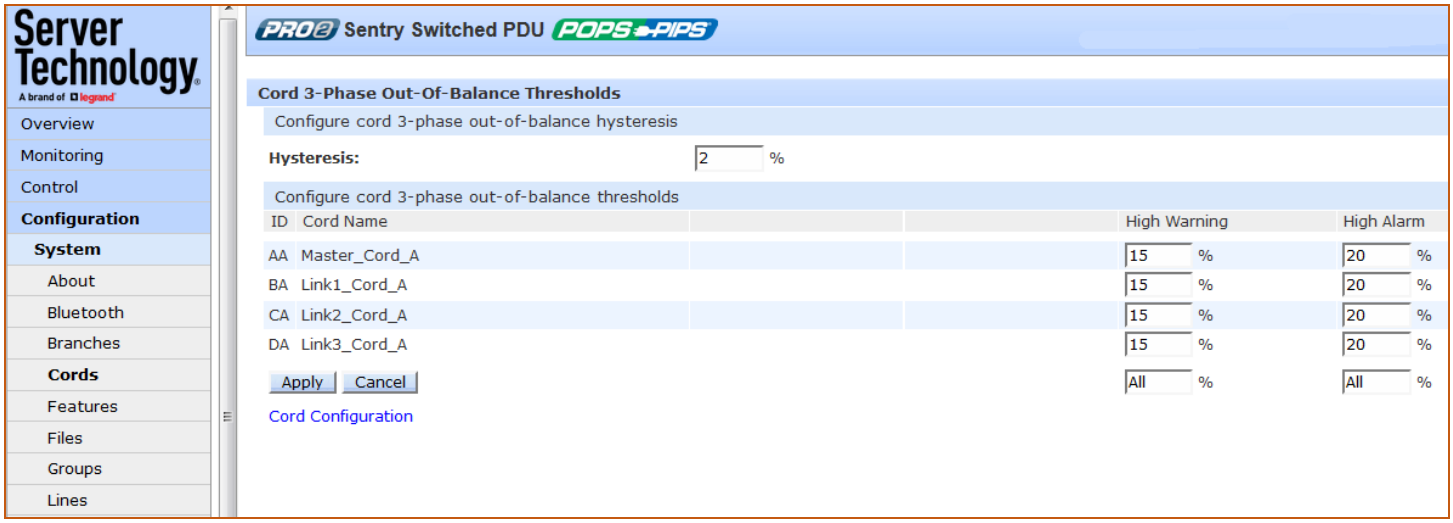


To set cord power factor thresholds:

1. Provide a numeric value for the threshold hysteresis between event state and recovery. Range is 0.0-0.20; default is 0.02.
2. Set numeric values for the low alarm/warning power factor thresholds. Range is min 0.00; max is 1.00.
3. Click **Apply**.

Configuring Cord 3-Phase Out-Of-Balance Thresholds

Click **Cord 3-Phase Out-Of-Balance** link at the bottom of the Cords page to display the configuration page:



To set cord 3-phase out-of-balance thresholds:

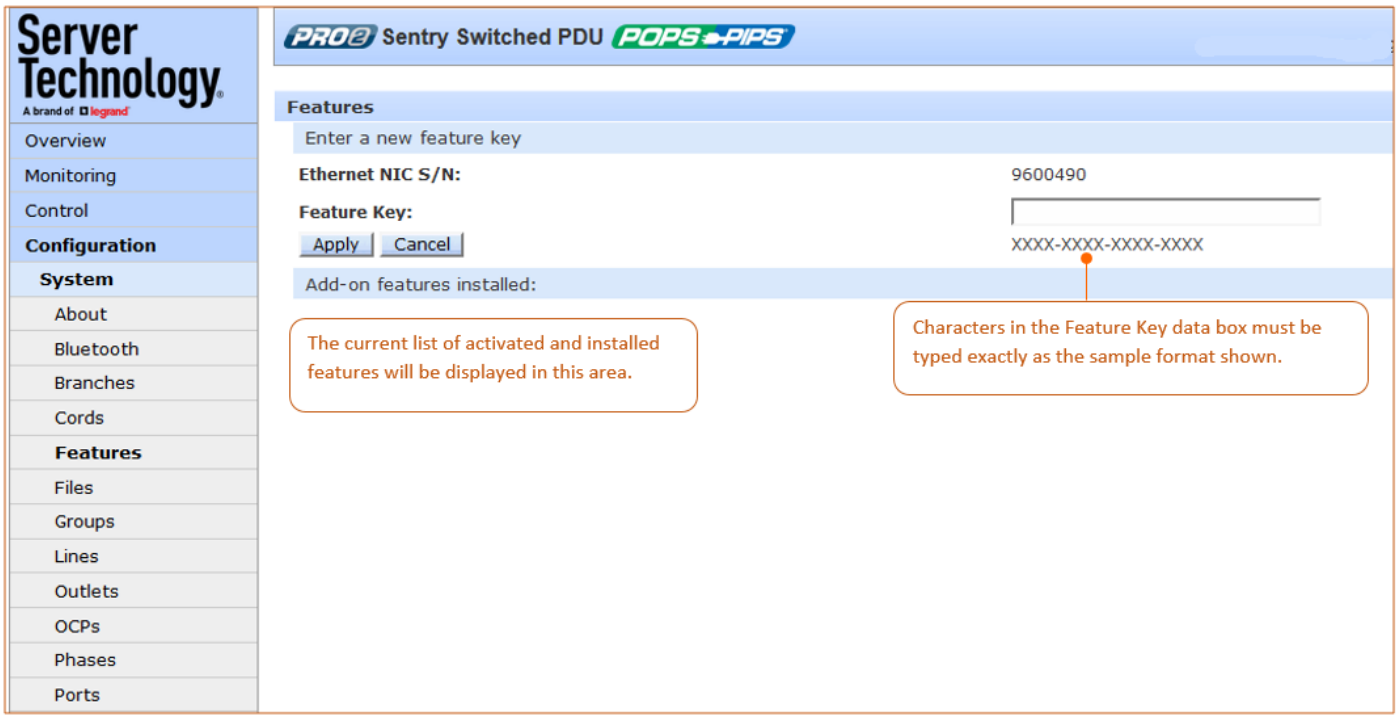
1. Provide a percent for threshold hysteresis between event state and recovery. Range is 0-10%; default is 2%.
2. Set percent for high warning/alarm out-of-balance thresholds. Range is min 0%, max is 200%.
3. Click **Apply**.

Notes:

- Out-of-balance is the percent power difference between phases of a cord.
- When a device with 3-phase input voltage is out-of-balance, efficiency is reduced and the unit is prevented from reaching maximum capacity, making it necessary to adjust distribution of the loads.

System > Features

The **Features** page allows the activation of add-on features available from Server Technology.



To activate a feature:

1. In the Feature Key field, type the key provided by Server Technology.
2. Click **Apply** (or press **Enter**). A restart of the unit is required after activating a feature.

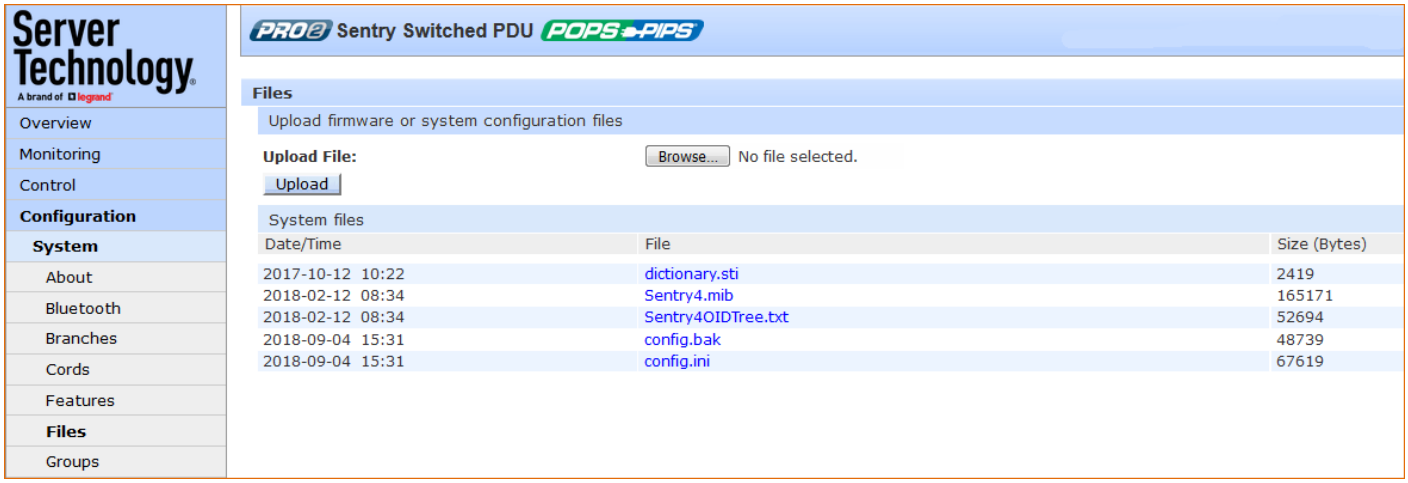
Note: For more information about add-on features, such as Smart Load Shedding, contact your Server Technology sales representative.

System > Files

The Files page provides a separate embedded file system to give quick access to system configuration files directly from the firmware GUI page, as well as the on-board and downloadable Sentry4-MIB and OID Tree for the PDU, eliminating website MIB/OID downloads.

Note: Legacy products continue to use the current Sentry3-MIB. The new Sentry4-MIB and its new OID tree are designed exclusively for the PRO1/PRO2 products.

The page also allows GUI-based file uploads (without FTP) for system, configuration, and firmware versions. However, all PDU configuration/system files, MIB, and OID Tree can also be accessed via FTP at Configuration > Network > FTP.



Note: There is no CLI equivalent function for the GUI Configuration > System > Files page.

Uploading Files

Simple file upload without the need for FTP. Upload a firmware version or specific system configuration file by browsing and selecting the file in the Upload File field, and clicking **Upload**. A confirmation message displays to indicate the upload was successful and the system will require a restart.

File View

The File View section of the page is a list of displayed files showing date/time stamp, file name, and file size. Several file types are shown in the list, described on the following pages:

dictionary.sti

This dictionary file contains the defined and formatted RADIUS vendor-specific attributes (VSA), generated by, and available from, Server Technology.

The PDU 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. For more information about the dictionary file and RADIUS, see About RADIUS Vendor-Specific Attributes (VSA).

```
#
# dictionary.sti
#
VENDOR    STI    1718

#
# Attributes
#
ATTRIBUTE  STI-Access-Level  1  integer  STI
ATTRIBUTE  STI-Env-Mon       2  integer  STI
ATTRIBUTE  STI-Outlets       3  string   STI
ATTRIBUTE  STI-Groups        4  string   STI
ATTRIBUTE  STI-Ports         5  string   STI

    VALUE  STI-Access-Level  Admin        1
    VALUE  STI-Access-Level  Power-User   2
    VALUE  STI-Access-Level  User         3
    VALUE  STI-Access-Level  Reboot-Only  4
    VALUE  STI-Access-Level  On-Only      5
    VALUE  STI-Access-Level  View-Only    6

    VALUE  STI-Env-Mon  Yes  1
    VALUE  STI-Env-Mon  No   2
```

sentry4.mib

For SNMP network monitoring, values from the PDU are reported using the new Sentry4-MIB. (Note that earlier PDU products continue to use the current Sentry3-MIB). The new Sentry4-MIB and its new OID tree are designed exclusively for PRO1/PRO2 products.

Reported MIB objects in the Sentry4-MIB are identified with a new "st4" prefix as part of the object name. You may be familiar with MIB objects for the PDU, for example, outletWakeupState. However, when the SNMP monitoring system displays a value for the MIB object name, st4outletWakeupState, based on the "st4" prefix in the name, you will recognize that the reported value is coming from a PRO1/PRO2 unit, not from an earlier PDU product.

The Sentry4-MIB and OID tree for the PDU can be accessed on-board in the GUI via **Configuration > System > Files**, or accessed by using the Server Technology FTP site the same way as with the Sentry3-MIB and OID tree for the earlier PDU products.

```
--
--  Copyright(C) 2003-2014 Server Technology, Inc.
--

    Sentry4-MIB DEFINITIONS ::= BEGIN

    IMPORTS
        MODULE-IDENTITY, enterprises, Integer32,
        OBJECT-TYPE, NOTIFICATION-TYPE                      FROM SNMPv2-SMI
        OBJECT-GROUP, NOTIFICATION-GROUP, MODULE-COMPLIANCE FROM SNMPv2-CONF
        TEXTUAL-CONVENTION, DisplayString                   FROM SNMPv2-TC;


    sentry4 MODULE-IDENTITY
        LAST-UPDATED "201412231130Z" -- 23 December 2014
        ORGANIZATION "Server Technology, Inc."
        CONTACT-INFO
            "Server Technology, Inc.
             1040 Sandhill Road
             Reno, NV 89521
             Tel: (775) 284-2000
             Fax: (775) 284-2065
             Email: mibmaster@servertech.com"
        DESCRIPTION
            "This is the MIB module for the fourth generation of the
             Sentry product family.  This includes the PRO2 series of
             Smart and Switched Cabinet Distribution Unit (CDU) and
             Power Distribution Unit (PDU) products."
        REVISION "201412231130Z" -- 23 December 2014
        DESCRIPTION
            "Initial release."
        ::= { serverTech 4 }
```

sentry4OIDTree.txt

The Sentry4OIDTree is the new OID tree structure that identifies data objects for SNMP network monitoring. The Sentry4OIDTree is not backward-compatible with the Sentry3OIDTree.

Continue to use the Sentry3OIDTree for SNMP network monitoring of PDU products, and use the Sentry4OIDTree exclusively for PRO1/PRO2 products.

```
serverTech Sentry4-MIB Object-Id Tree

-- created from sentry4 (201412231130Z)

<unit>   = st4UnitIndex, 1 to 6 per system
<cord>   = st4InputCordIndex, 1 to 4 per unit
<line>   = st4LineIndex, 1 to 4 per cord
<phase>  = st4PhaseIndex, 1 to 6 per cord
<ocp>    = st4OcpIndex, 1 to 64 per cord
<branch> = st4BranchIndex, 1 to 64 per cord
<outlet> = st4OutletIndex, 1 to 128 per cord
<temp>   = st4TempSensorIndex, 1 to 2 per unit
<humid>  = st4HumidSensorIndex, 1 to 2 per unit
<water>  = st4WaterSensorIndex, 1 per unit
<cc>     = st4CcSensorIndex, 1 to 4 per unit
<adc>    = st4AdcSensorIndex, 1 per unit

r- = read-only
rw = read-write
-- = not accessible

serverTech(enterprises 1718)              .1.3.6.1.4.1.1718
|                                                        |
+--sentry4(1.3.6.1.4.1.1718.4)                           +- .4
   |                                                        |
   +--st4Objects(1)                                        +- .1
   |  |                                                    |   |
   |  +--st4System(1)                                     |   +- .1
   |  |  |                                                 |   |   |
   |  |  +--st4SystemConfig(1)                             |   |   +- .1
   |  |     |                                              |   |       |
   |  |     +-- r- st4SystemProductName(1)                 |   |       +- .1 .0
   |  |     +-- rw st4SystemLocation(2)                    |   |       +- .2 .0
   |  |     +-- r- st4SystemFirmwareVersion(3)             |   |       +- .3 .0
   |  |     +-- r- st4SystemFirmwareBuildInfo(4)           |   |       +- .4 .0
   |  |     +-- r- st4SystemNICSerialNumber(5)             |   |       +- .5 .0
   |  |     +-- r- st4SystemNICHardwareInfo(6)             |   |       +- .6 .0
   |  |     +-- r- st4SystemFeatures(10)                   |   |       +- .10 .0
   |  |     +-- rw st4SystemFeatureKey(11)                 |   |       +- .11 .0
   |  |     +-- r- st4SystemConfigModifiedCount(20)        |   |       +- .20 .0
   |  |     +-- r- st4SystemUnitCount(21)                  |   |       +- .21 .0
```

config.bak (or *.bak)

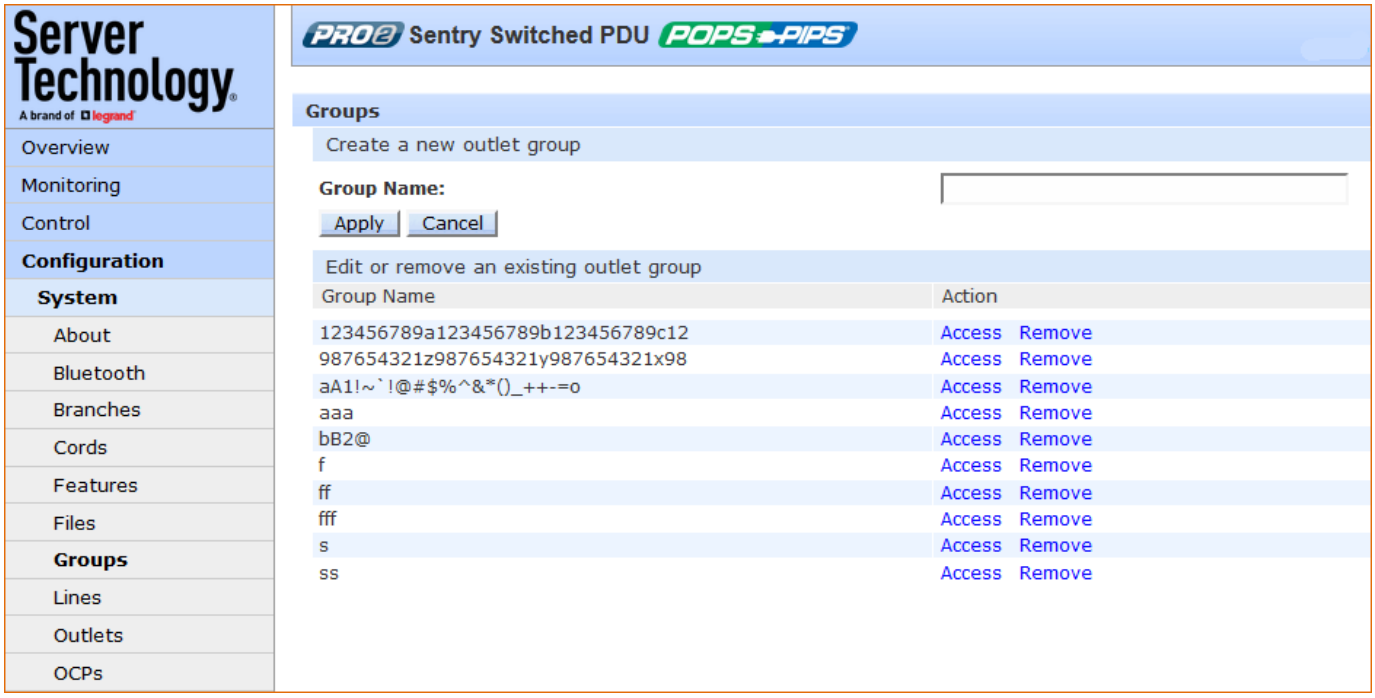
This configuration backup file (firmware version 8.0x or later), when uploaded, restores a unit, including network, SNTP, and FTP settings.

User-configuration values are restored, ***except***:

- DHCP/IP values in network settings
- SNAP password
- SNMP sysName (unless restoring to the same unit from which the backup came, based on NIC serial number, in which case the sysName is restored)
- User-loaded x-509 certificate and key
- Factory-configuration values, for example NIC serial number and profile, are not backed up or restored.

System > Groups

The **Groups** page lets the administrator create and name a new outlet group and assign to the group access rights to individual (or all) outlets. For dynamic monitoring of outlets assigned to a group, see the separate **Monitoring > Groups** page.

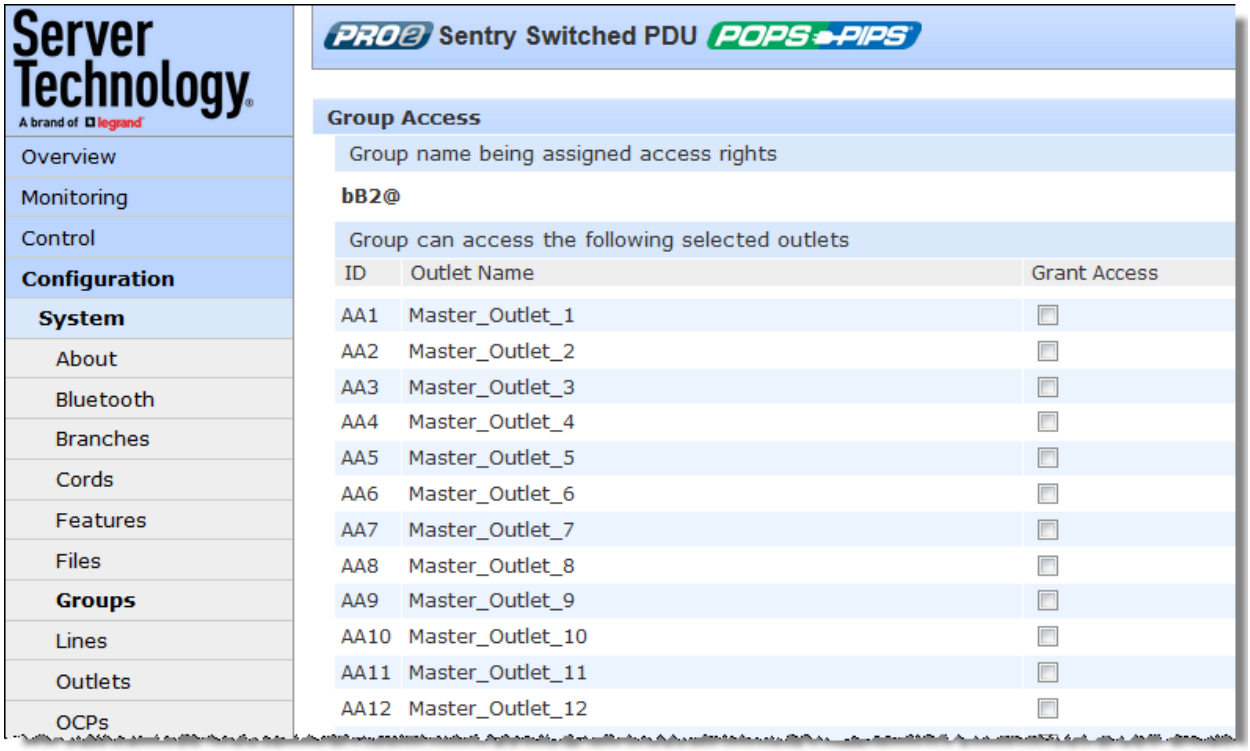


To create a new outlet group:

1. In the Group Name field, type the new name for the outlet group.
2. Click **Apply**. The newly added name displays in the lower part of the page in a list of group names for editing or removing.

To grant individual outlet access rights to an outlet group:

1. For the group name displayed in the list, click the Access link. The Group Access page displays to allow granting access rights to individual outlets by checking corresponding outlet checkboxes (or unchecking a checkbox to deny rights).
2. Click **Apply**. Access rights are applied to the outlets for the outlet group.



To grant access rights to all outlets for an outlet group:

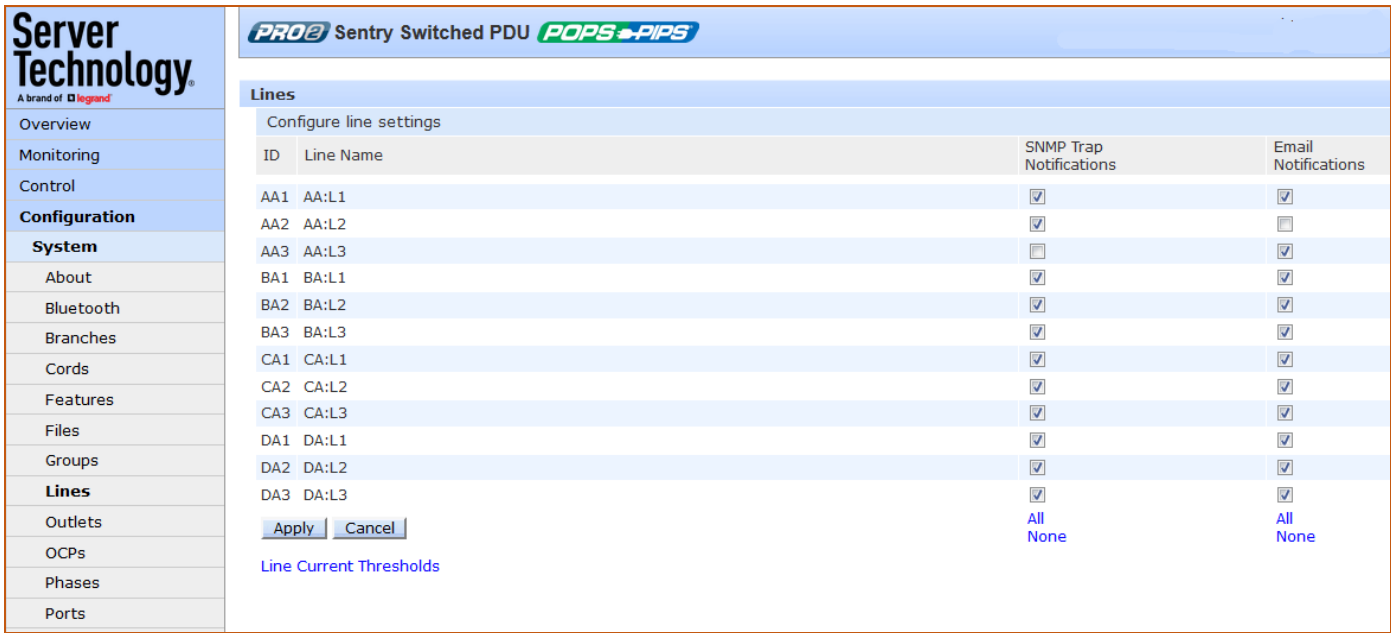
1. For the group name displayed in the list, click the Access link.

2. At the bottom of the Group Access page, click the All link to grant access to all outlets listed on the page (or click the None link to deny access to all outlets listed).
3. Click **Apply**.

System > Lines

The Lines page configures the separate area of the PDU's cord architecture that reports current line load, allowing the setting of multiple line threshold levels, plus threshold hysteresis. The page also sets SNMP Trap and Email notifications for line events.

For dynamic monitoring of line status and current, see the separate **Monitoring > Lines** page.



To configure line settings:

1. For each line listed, check (or uncheck) SNMP Trap Notifications and/or Email Notifications to enable/disable notifications for line events. To enable (or disable) all lines for SNMP Trap or Email notifications, click All (or None).
2. Click **Apply**.

Note: The format of PRO1/PRO2 line names is a standard and fixed naming structure and cannot be edited.

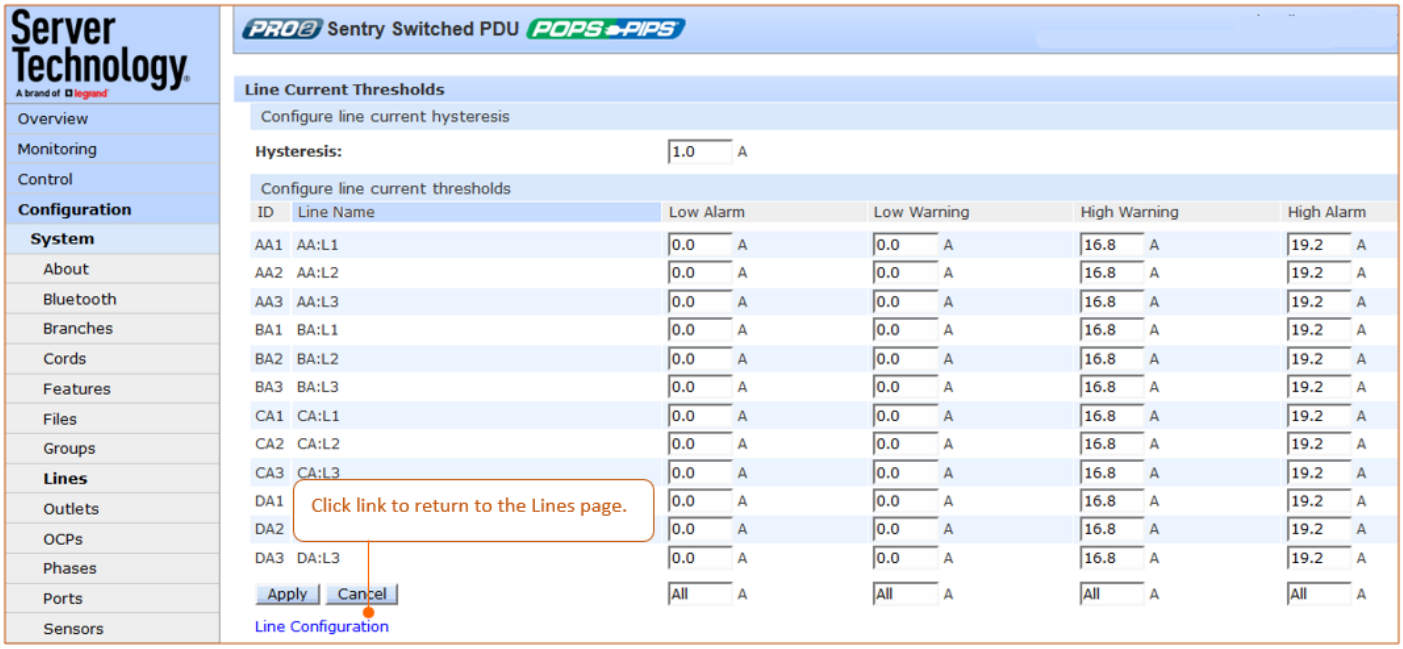
Example of line names:

AA:L1, AA:L2, AA:L3, AA:N (Master unit: Lines 1, 2, 3, and Line N for neutral)

BA:L1, BA:L2, BA:L3, BA:N (Link unit: Lines 1, 2, 3, and Line N for neutral)

Configuring Line Current Thresholds

Click the Line Current Thresholds link at the bottom of the Lines page to display the configuration page:



To set line current thresholds:

1. Provide the threshold hysteresis between event state and recovery (A). Range is 0.0-10.0A; default is 1.0A.
2. Set the low/high alarm and low/high warning current load threshold values (A). Range is min 0A; max is current limit displayed in **show lines** command.
3. Click **Apply**.

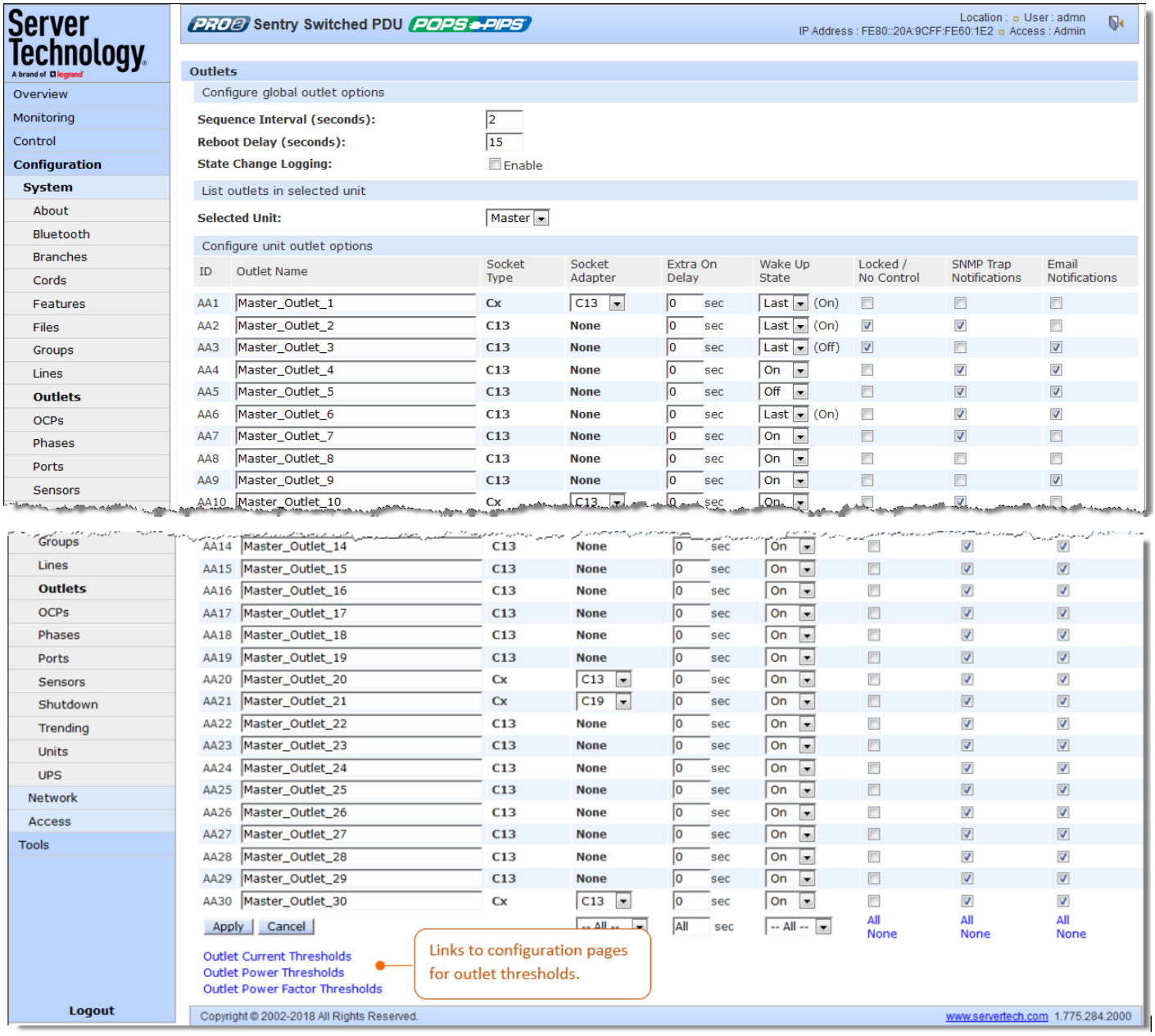
System > Outlets

The **Outlets** page allows configuration of global outlet parameters and outlet shutdown options, including the setting of multiple threshold levels for outlet current, outlet power, and outlet power factor, plus the threshold hysteresis. The page also sets sets SNMP Trap and Email notifications for outlet events.

For outlet management: the issuing of On, Off, and Reboot commands on individual outlets and all outlets globally, see the separate **Control > Outlets** page and **Control > Groups** page.

For dynamic monitoring of outlet status, see the separate **Monitoring > Outlets** page.

For configuring and the assignment of outlets to user-defined outlet groups, see the separate **Configuration > Groups** page.



To configure outlet options:

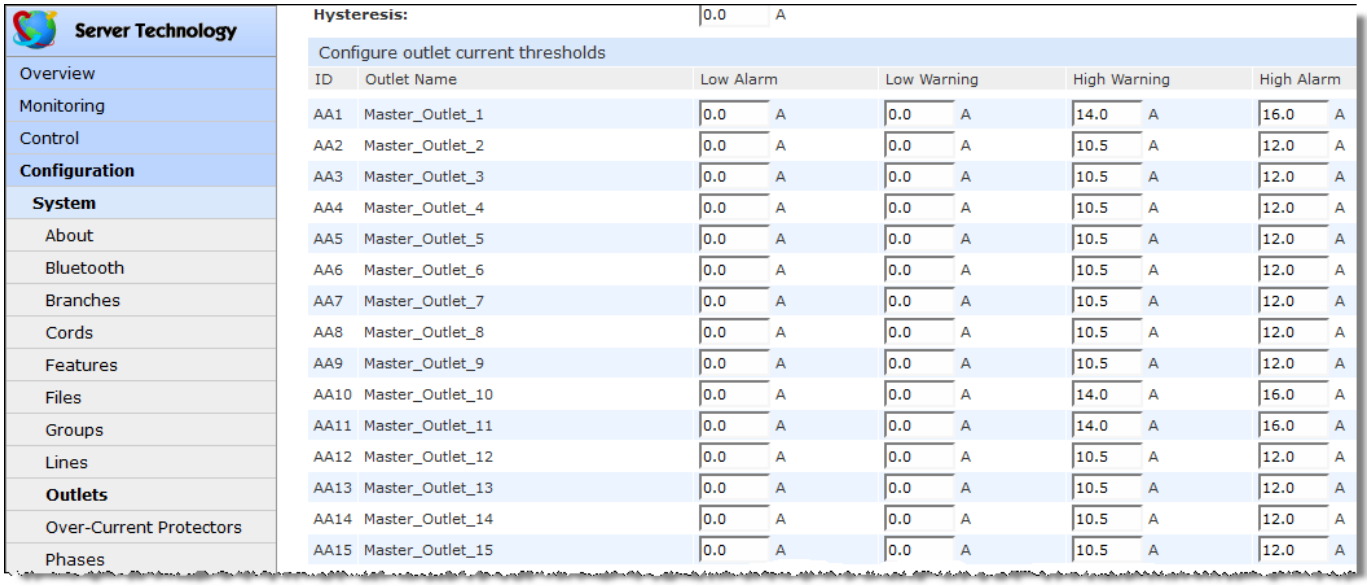
1. Set the Sequence Delay (in seconds) to determine the delay between turning on the outlets. Range is 0-15 seconds.
2. Set the Reboot Delay (in seconds) to set an extra on delay when rebooting an outlet.
3. Check to enable the State Change Logging feature. This option shows outlet state change as a reported event in all system/debug logs.
4. In the Outlet Name field, provide a descriptive text name, from 0-32 characters. The ID is a system-assigned internal name and cannot be changed
5. View the reported type of socket displayed for the outlet.
6. In the Extra On Delay field, for a specific outlet, set the value (in seconds) for an extra delay when turning on the outlet. Range is 0-900 seconds.
7. From the drop-down menu, select the On, Off, Last option for the wakeup state of the outlet. Wakeup state sets the default outlet control state after system power up. The option Last is the last known power state of the outlet.
8. For the Locked/No Control checkbox, check (to lock the outlet) or uncheck (to unlock the outlet). The Locked feature determines if control actions (on, off, reboot) are enabled/disabled for the outlet after the wakeup state is applied. When an outlet is configured in the locked state, the outlet locks at its current control state (on or off), and the outlet control state changes to Locked On or Locked Off.

   Notes:

   - The locked outlet will not be affected by group actions or Smart Load Shedding actions.
   - SNMP and CLI control actions will be ignored for a locked outlet.
9. For each outlet listed, check (or uncheck) SNMP Trap Notifications and/or Email Notifications to enable (or disable) notifications for outlet events.
10. Click **Apply**.

Configuring Outlet Current Thresholds

Click **Outlet Current Thresholds** at the bottom of the Outlets page to display the configuration page:

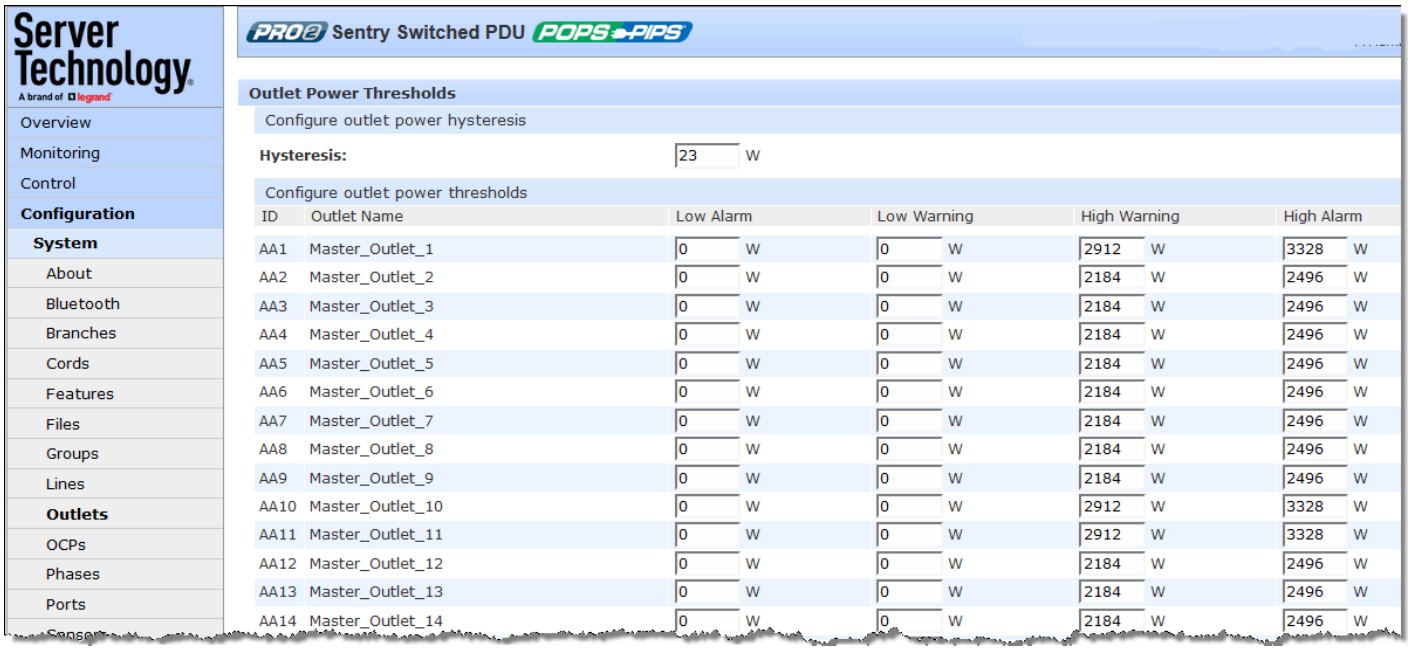


To set outlet current thresholds:

1. Provide threshold hysteresis between event state and recovery (A). the range is 0.0-10.0A; the default is 1.0A.
2. Set the low/high alarm and low/high warning threshold values (A) for outlet current load. The range is min 0.0A; max is max current shown in the **show outlets** command.
3. Click **Apply**.

Configuring Outlet Power Thresholds

Click the **Outlet Power Thresholds** link at the bottom of the Outlets page to display the configuration page:

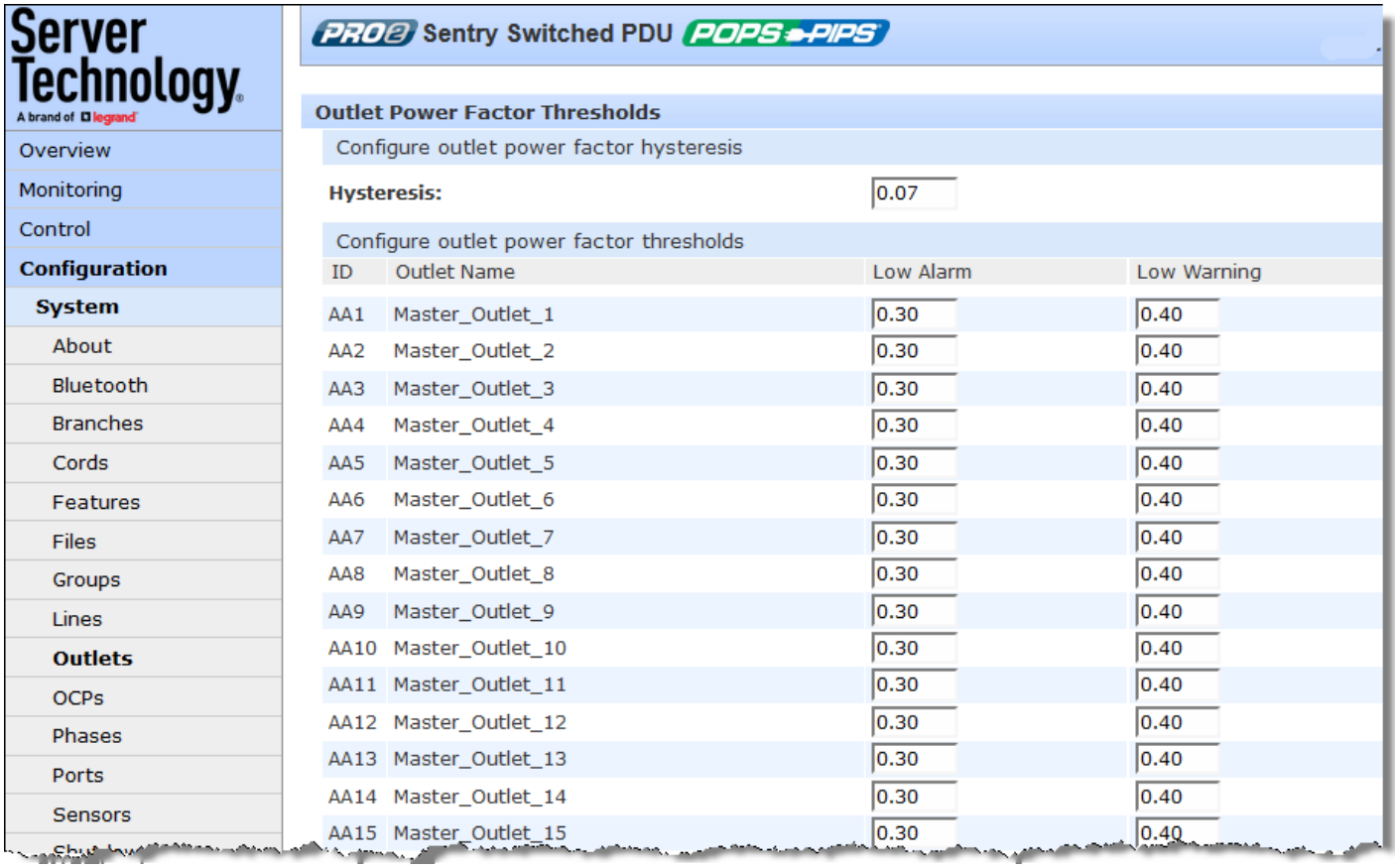


To set outlet power thresholds:

1. Provide the threshold hysteresis between event state and recovery (W). Range is 0-1000W; default is 10W.
2. Set the low/high alarm and low/high warning threshold values (W) for outlet power (without power factor). Range is min 0W, max is power capacity in **ostat** details command.
3. Click **Apply**.

Configuring Outlet Power Factor Thresholds

Click the **Outlet Power Factor** thresholds link at the bottom of the Outlets page to display the configuration page:



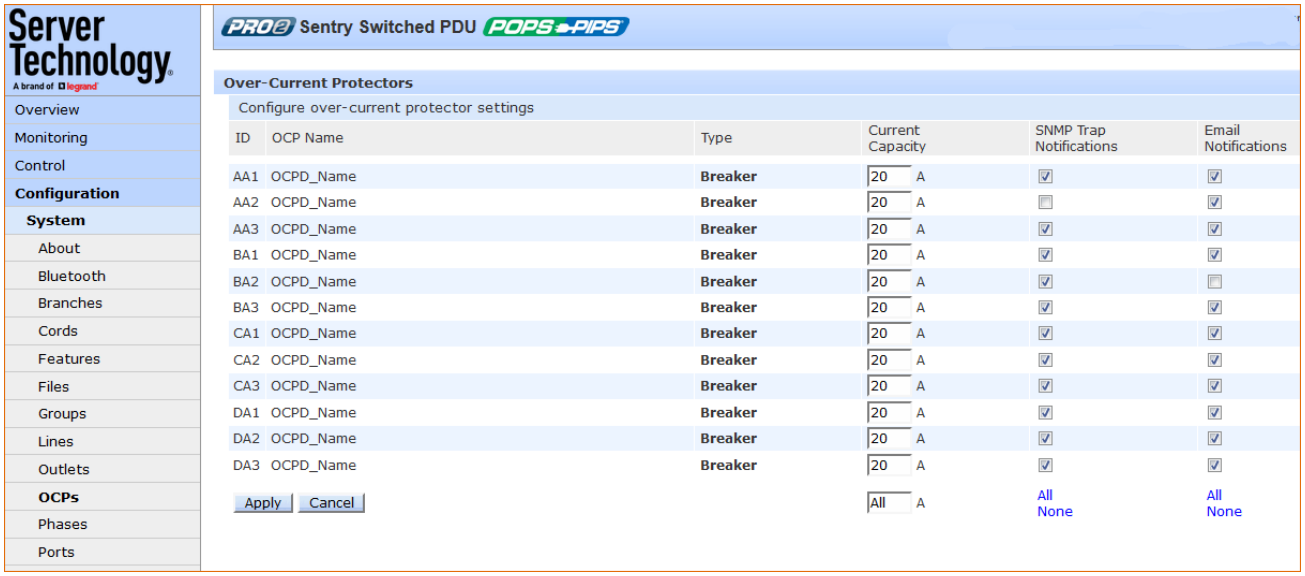
To set outlet power factor thresholds:

1. Provide a numeric value for the threshold hysteresis between event state and recovery. Range is 0.0-0.20; default is 0.02.
2. Set numeric values for the low alarm/warning outlet power factor thresholds. Range is min 0.00; max is 1.00.
3. Click **Apply**.

System > Over-Current Protectors (OCPs)

The **Over-Current Protectors** page configures current load settings for each OCP connected to the unit as a standard and separate area of the PDU's architecture. The page also sets sets SNMP Trap and Email notifications for OCP events.

For dynamic monitoring of OCP status, see the separate **Monitoring > Over-Current Protectors** page. A failed OCP status (for either Switched or Smart PRO1/PRO2 products) is reported on the monitoring page.



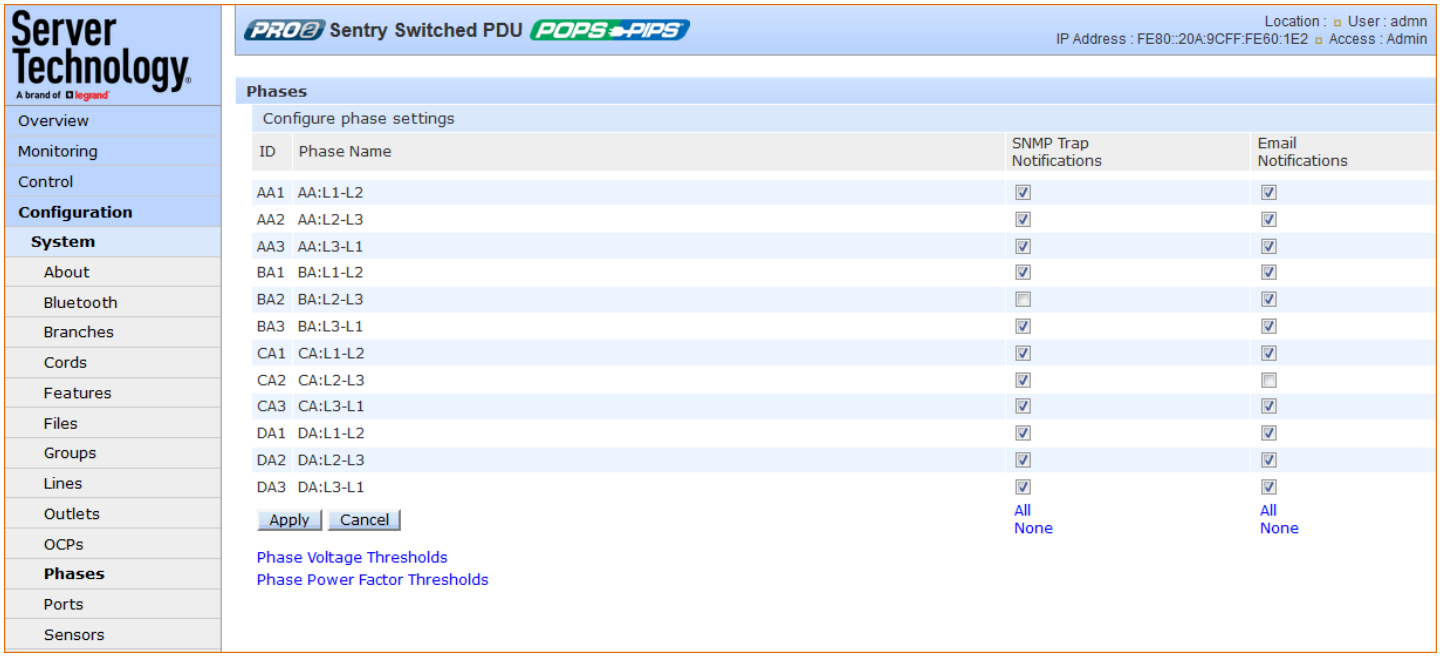
To configure the OCP:

1. View the reported type of OCP as displayed on the page, either breaker or fuse.
2. Set the Current Capacity (A) for the OCP as its maximum current load. Range is 1-max current as displayed in the **show ocps** command.
3. For each outlet listed, check (or uncheck) SNMP Trap Notifications and/or Email Notifications to enable (or disable) notifications for OCP events.
4. Click **Apply**.

System > Phases

The **Phases** page configures multiple threshold levels for phase voltage and power factor, plus threshold hysteresis (for AC products only). The page also sets sets SNMP Trap and Email notifications for phase events.

For dynamic monitoring of phase status, voltage, and power factor, see the separate **Monitoring > Phases** page.

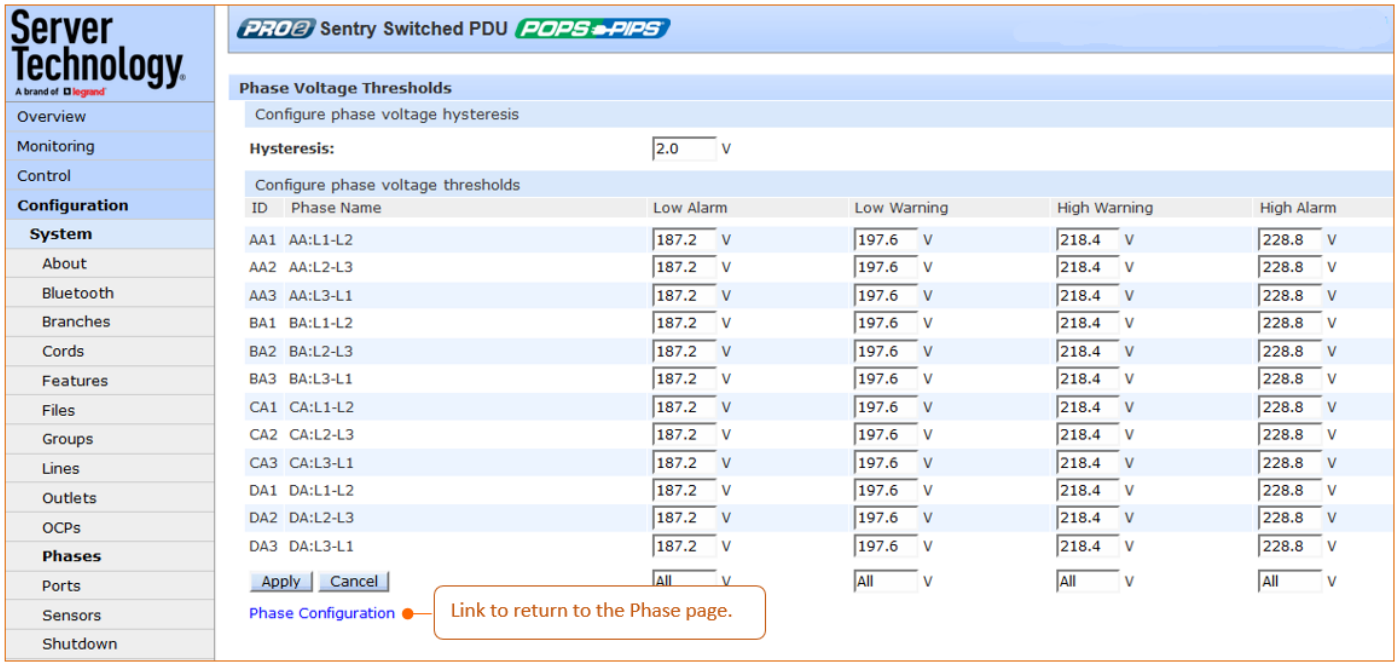


To set phase event notifications:

1. For each phase listed, check (or uncheck) SNMP Trap Notifications and/or Email Notifications to enable (or disable) notifications for phase events.
2. Click **Apply**.

Configuring Phase Voltage Thresholds

Click the phase voltage thresholds link at the bottom of the Phases page to display the configuration page:



To set phase voltage power thresholds:

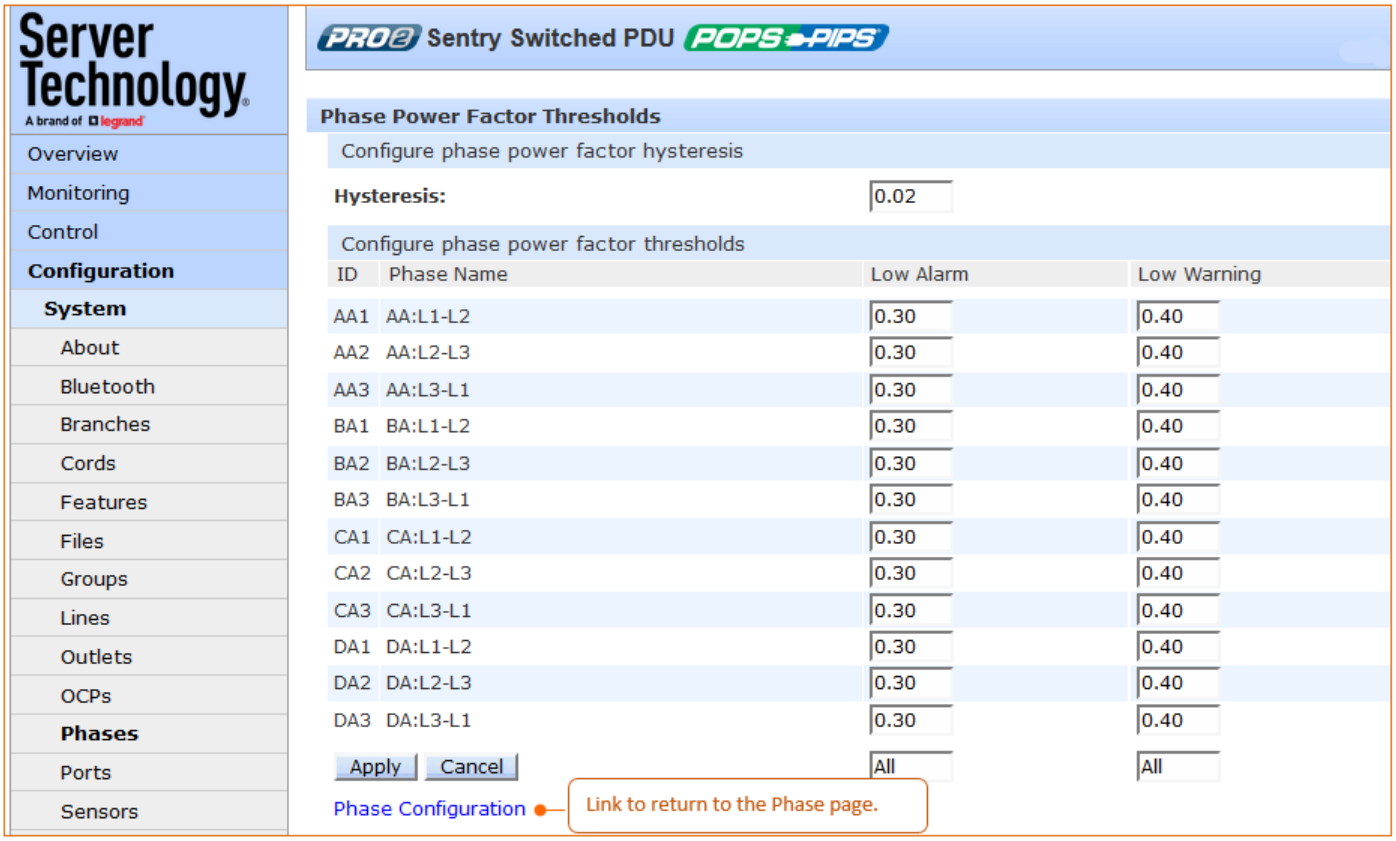
1. Provide the threshold hysteresis between event state and recovery (V). Range is 0.0-20.0V; default is 2.0V.
2. Set the low/high alarm and low/high warning threshold values(V) for phase voltage.
3. Click **Apply**.

Note: The range of phase voltage minimum and maximum values varies by product. To verify the nominal phase voltage by product, issue the CLI command **set cord nomvolts**, for example:

```
Switched PDU: set cord nomvolts
     Cord name or ID: Master_Cord_A
     Cord nominal voltage (200-240 Volts):
```

Configuring Phase Power Factor Thresholds

Click Phase Power Factor Thresholds link at the bottom of the Phases page to display configuration page:

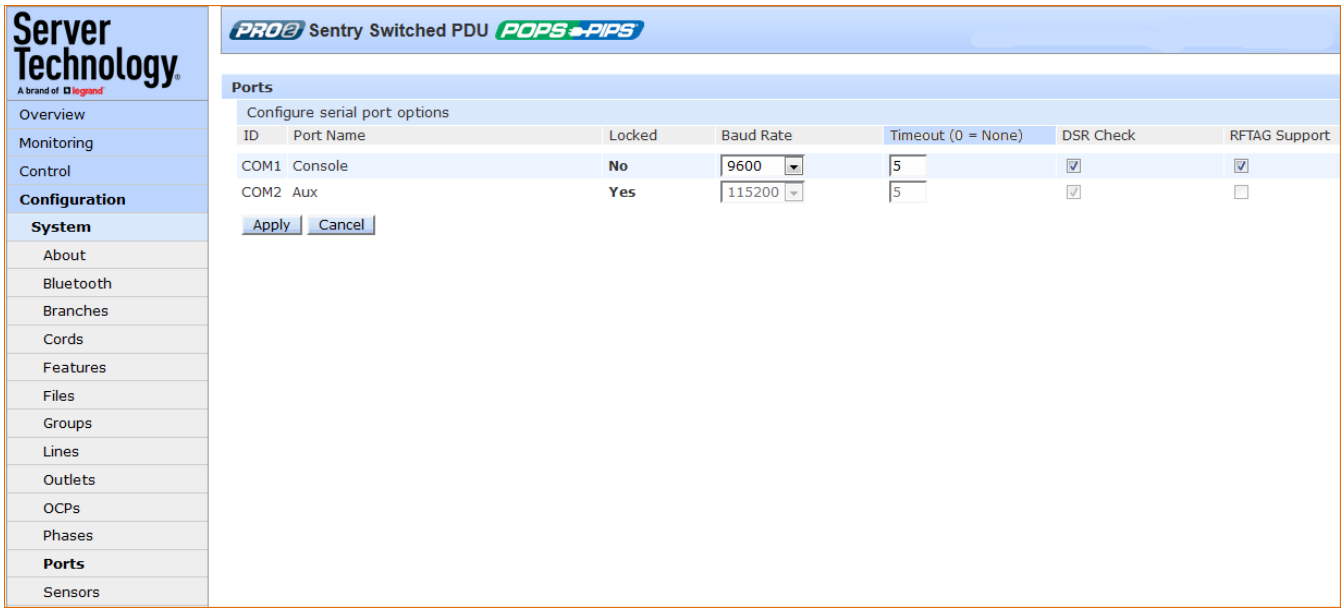


To set phase power factor thresholds:

1. Provide a numeric value for the threshold hysteresis between event state and recovery. he range is 0-0.20; default is 0.02.
2. Set numeric values for the low alarm/warning phase power factor thresholds. The range is min 0.00; max is 1.00.
3. Click **Apply**.

System > Ports

The **Ports** page configures options for the external serial port on the PDU.



To configure the serial port:

1. From the Baud Rate drop-down menu, select the data rate.
2. Set the Timeout value (in minutes) for the serial port inactivity timeout period. The timeout period defines the maximum period of inactivity before automatically closing the pass-thru session. Range is 0-60 (minutes); default is 5 minutes; setting the value to "0" disables the timeout.
3. From the DSR Check drop-down menu, select On or Off to enable or disable serial port active signal checking.
4. Check the RFTAG Support box to enable RF Code tag (RFTAG) support for the selected (and unlocked) port. If the port is locked, any attempts to change this setting will be ignored.
5. Click **Apply**.

Notes:

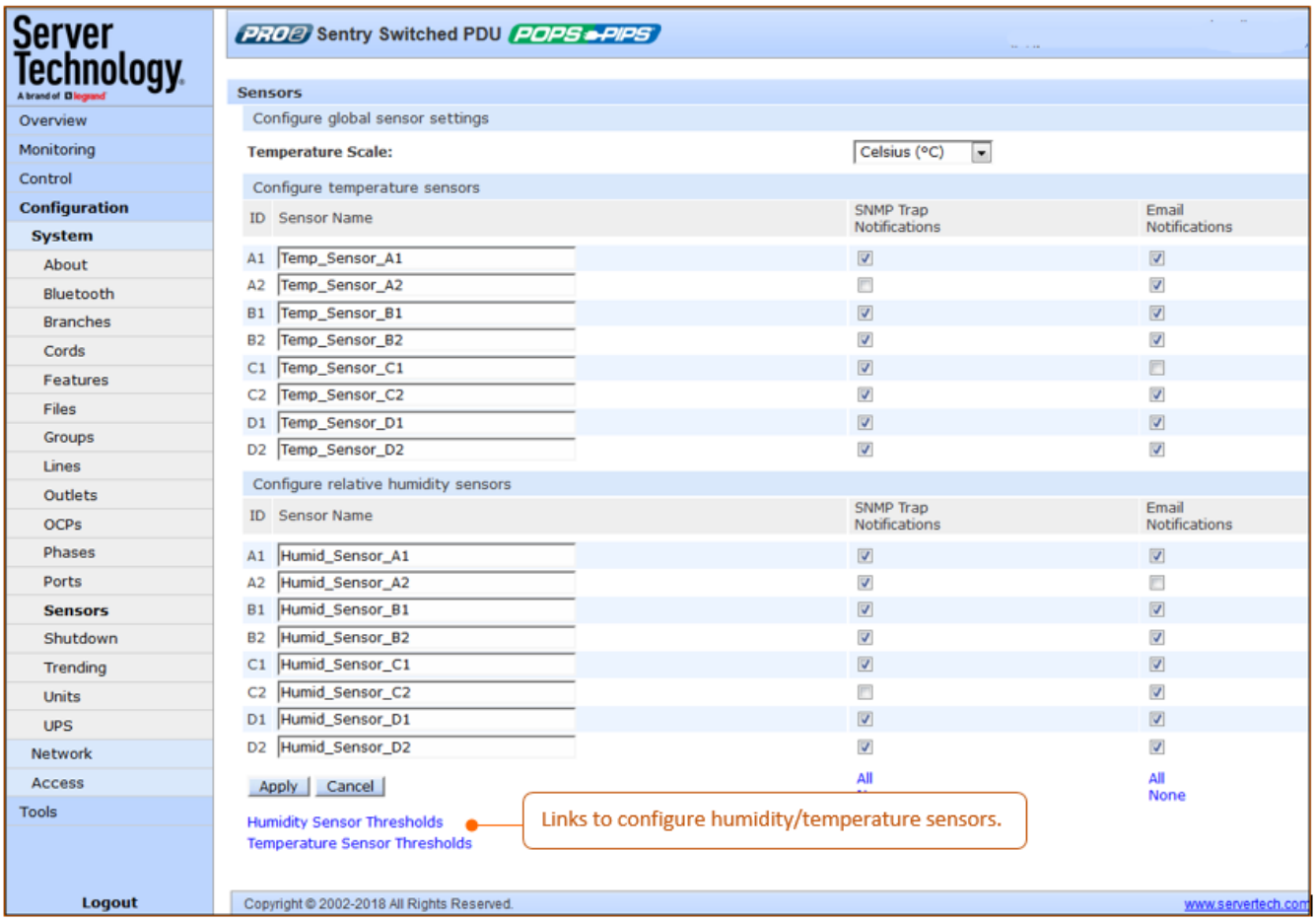
- Pass-Thru connections can only be initiated from the Command Line Interface (CLI) in a Telnet/SSH session.
- One concurrent Serial session is allowed. If the unit has two serial ports, then two simultaneous serial sessions will be supported.

System > Sensors

The **Sensors** page configures multiple threshold levels for global temperature sensors and relative humidity sensors, plus threshold hysteresis. The page also determines the system-wide temperature scale and sets SNMP Trap and Email notifications for sensor events.

For dynamic monitoring of sensor temperature/humidity and operational status, see the separate **Monitoring > Sensors** page.

Note: If a fan is present on the PDU, the "Fan Sensor Thresholds" link will be displayed on this page to allow configuration of fan operating values. Fan hysteresis and thresholds will be rotations per minute (RPM).

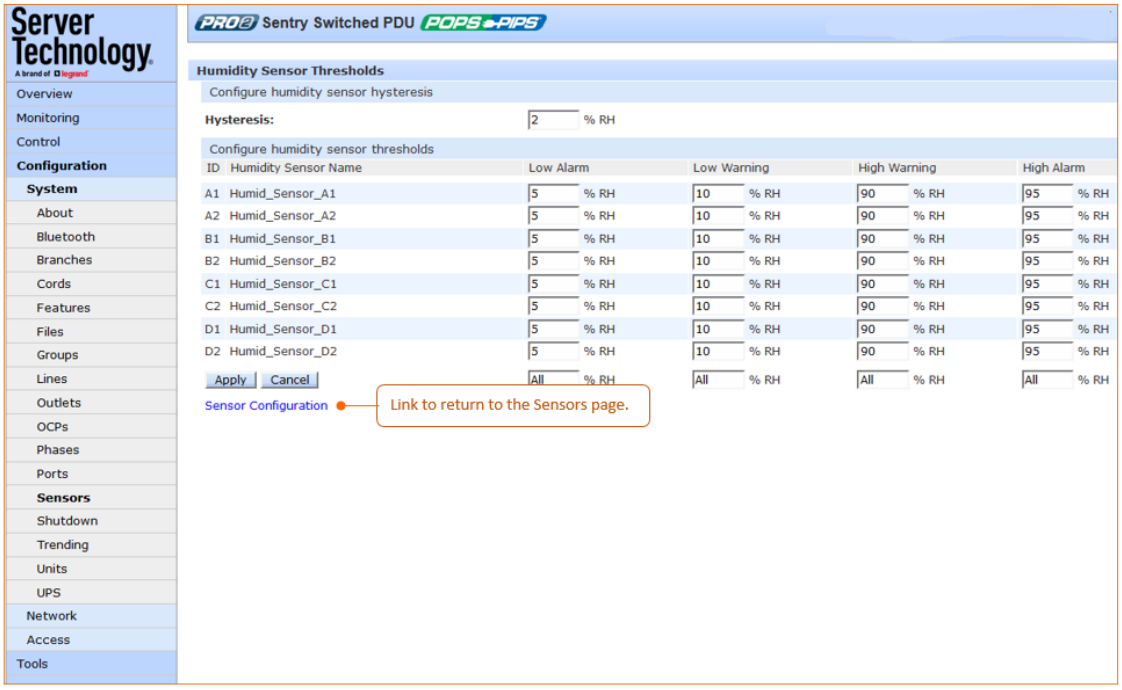


To configure global sensor settings:

1. From the Temperature Scale drop-down menu, select the desired system-wide scale as Celsius (°C) or Fahrenheit (°F).
2. In the Sensor Name field, provide a descriptive text name for individual temperature sensors and/or relative humidity sensors. The ID is a system-assigned internal name and cannot be changed.
3. For each sensor listed (and fan, if present), check (or uncheck) SNMP Trap Notifications and/or Email Notifications to enable (or disable) notifications for sensor events.
4. Click **Apply**.

Configuring Humidity Sensor Thresholds

Click **Humidity Sensor Thresholds** at the bottom of the Sensors page to display the configuration page:

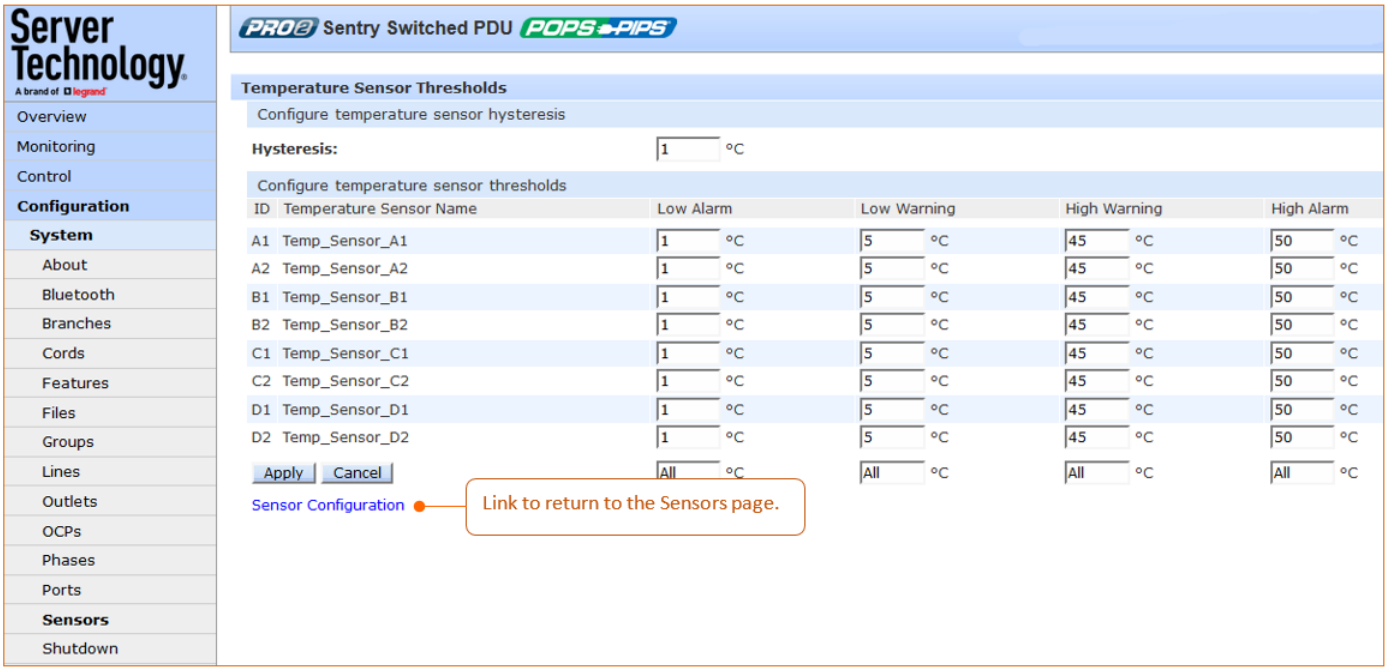


To set humidity sensor thresholds:

1. Provide the threshold hysteresis between event state and recovery(%RH). Range is 0-20%RH; default is 2%RH.
2. Set the low/high alarm and low/high warning threshold values for the humidity sensor(%RH). Range is min 0%RH, max100%RH.
3. Click **Apply**.

Configuring Temperature Sensors Thresholds

Click the Temperature Sensor Thresholds link at the bottom of the Sensors page to display this configuration page:



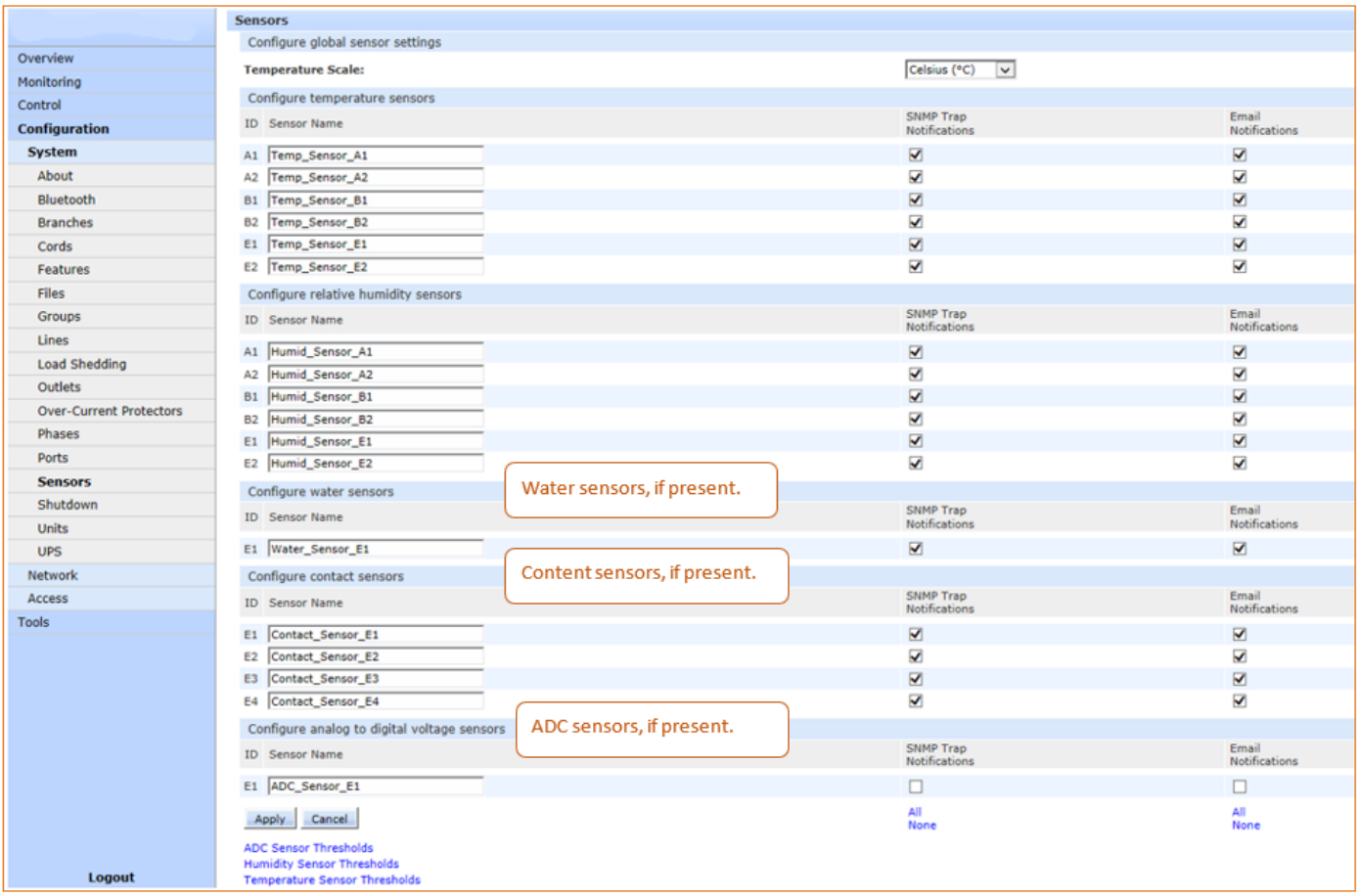
To set temperature sensor thresholds:

1. Provide the threshold hysteresis between event state and recovery temperature. Range is 0-30° Celsius,
   or 0-54° Fahrenheit; default is 1° Celsius or 2° Fahrenheit.
2. Set the low/high alarm and low/high warning threshold values for the temperature sensor(°). Range is minimum -40° to maximum 123° Celsius, or minimum -40° to maximum 253° Fahrenheit.
3. Click **Apply**.

Configuring Environmental Monitoring (EMCU) Thresholds

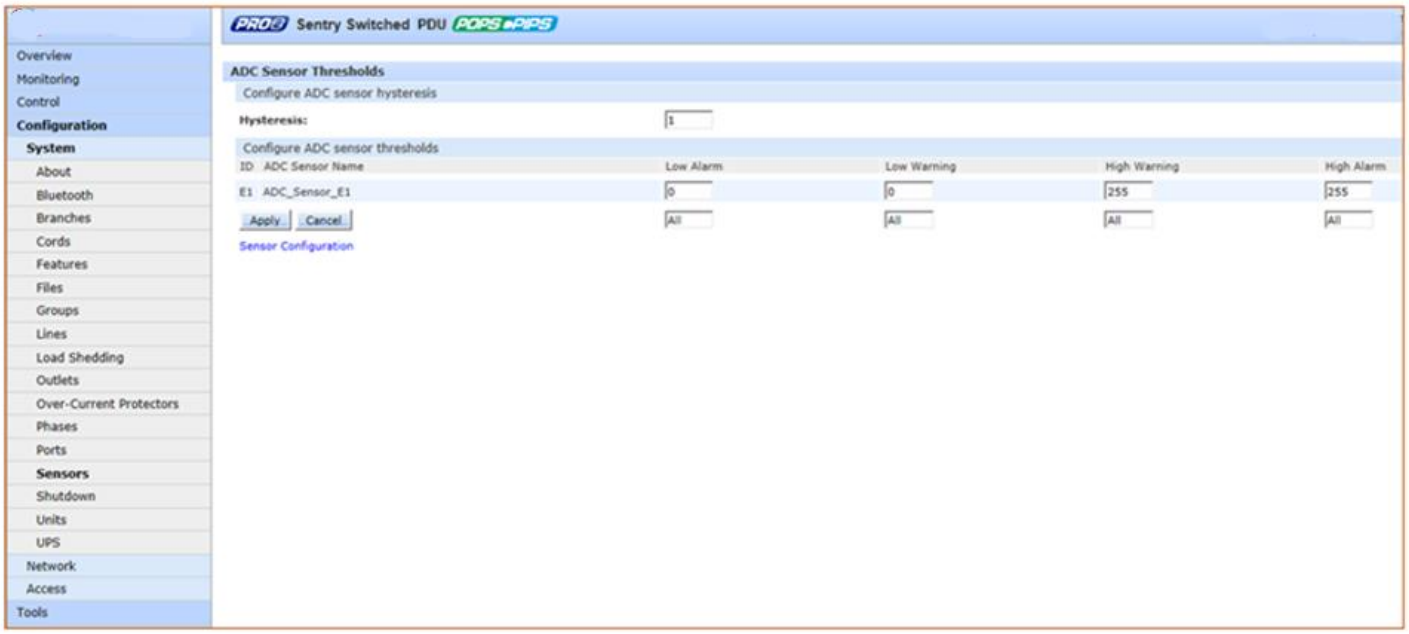
If an EMCU is connected to the PDU, the Sensors page will also allow configuration of water, contact closure and analog-to-digital (ADC) voltage sensors – to provide sensor name and SNMP/Email notifications.

In addition, for ADC voltage sensors only, high/low warning/alarm thresholds can be set. Water and contact closure sensors can have either Normal or Alarm status – there are no other states or value ranges.



To set ADC voltage sensor thresholds:

1. Click ADC Sensor Thresholds link at the bottom of the Sensors page to display configuration page:



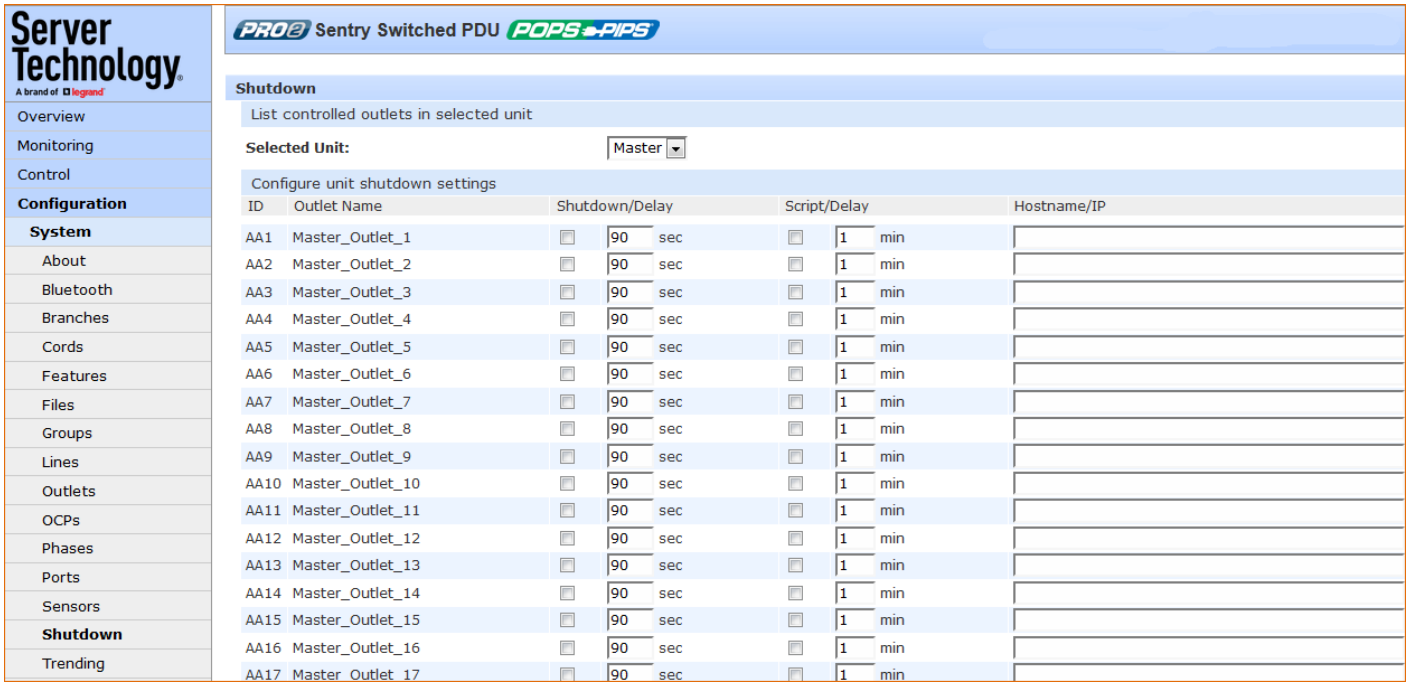
2. Provide the threshold hysteresis between event state and recovery. Range is 0-20; default is 1.
3. Set the low/high alarm and low/high warning threshold values for the ADC sensor. Range is 0-255; default is 0.
4. Click **Apply**.

System > Shutdown

The **Shutdown** page configures the remote shutdown options for outlets (for Switched PRO1/PRO2 products only).

The PDU supports the ability to initiate an orderly shutdown of a specific outlet or outlet group after performing a user-specified shutdown operation.

The shutdown also protects open application files prior to a server being powered down. Shutdown signaling is initiated over the existing TCP/IP network and requires the use of a remote shutdown agent.



To configure shutdown settings:

1. For an individual outlet in the list, type the desired Shutdown/Delay for the outlet (in seconds), or accept the 90-second default, and check the corresponding checkbox. The shutdown/delay sets the time to wait after the shutdown notification before changing outlet state; range is 1-900 seconds; default is 90 seconds.
2. For an individual outlet in the list, type the desired Script/Delay for the outlet (in minutes) to set the time to wait after the script has executed to change outlet state, and check the corresponding checkbox; range is 1-15 minutes; default is 1 minute.
3. Provide the hostname/IP address for the target server.
4. Click **Apply**.

About the Remote Shutdown Feature

When the Remote Shutdown Agent is installed on the server and the Shutdown feature is configured on the PDU, the following **shutdown process** occurs:

1. The Off or Reboot command is received by the PDU.
2. Shutdown signal is sent to the Remote Shutdown Agent on the target server.
3. The Remote Shutdown Agent initiates a systematic shutdown of the target server for all actions that remove power from the outlet (such as the Off and Reboot commands), and allows the execution of user-defined scripts to perform custom activities, like safely shutting down open databases.
4. The PDU removes power from the outlet.

Shutdown and Smart Load Shedding

The Smart Load Shedding feature allows the load shedding of outlet loads, both on the PRO1/PRO2 and legacy PDU products, based on UPS condition (on-battery), temperature level, and input current load.

The Shutdown feature for Switched products is also supported by the extended license-key feature Smart Load Shedding. A systematic shutdown is initiated by Smart Load Shedding events such as high temperature, high infeed load, and UPS "on battery" conditions.

Supported Operating Systems for Shutdown

Remote Shutdown Agents are available for the following operating systems:

- Windows: 2000, 2003, XP.
- Linux: Red Hat 7.3, 8.0; Red Hat Enterprise 2.1 ES (update 5); 3.0 ES (update 4); Novell SUSE Linux Enterprise Server.
- Unix: HP-UX 11.0, 11i v1, 11i v2; IBM AIX 4.3, 5.3; Sun Solaris 8, 9, 10.
- Novell Netware: 6

Installing the Shutdown Agent

Note: For all operating systems shown below, if the IP address of the PDU is left blank in the last step of these installation instructions, any PRO1/PRO2 unit can send a shutdown signal to the server.

Windows

1. Browse to the location of the Remote Shutdown Agent installation files.
2. Run **setup.exe** by double-clicking the icon.
3. Reply to the standard installation prompts.
4. For additional security, when prompted, enter the IP address of the PDU that will be sending the shutdown signal.

Linux

1. Browse to the location of the Remote Shutdown Agent installation files.
2. Run **SetupRA**.
3. For additional security, when prompted enter the IP address of the PDU that will be sending the shutdown signal.

Unix

1. Browse to the location of the Remote Shutdown Agent installation files.
2. Run **Install**.
3. For additional security, when prompted enter the IP address of the PDU that will be sending the shutdown signal.

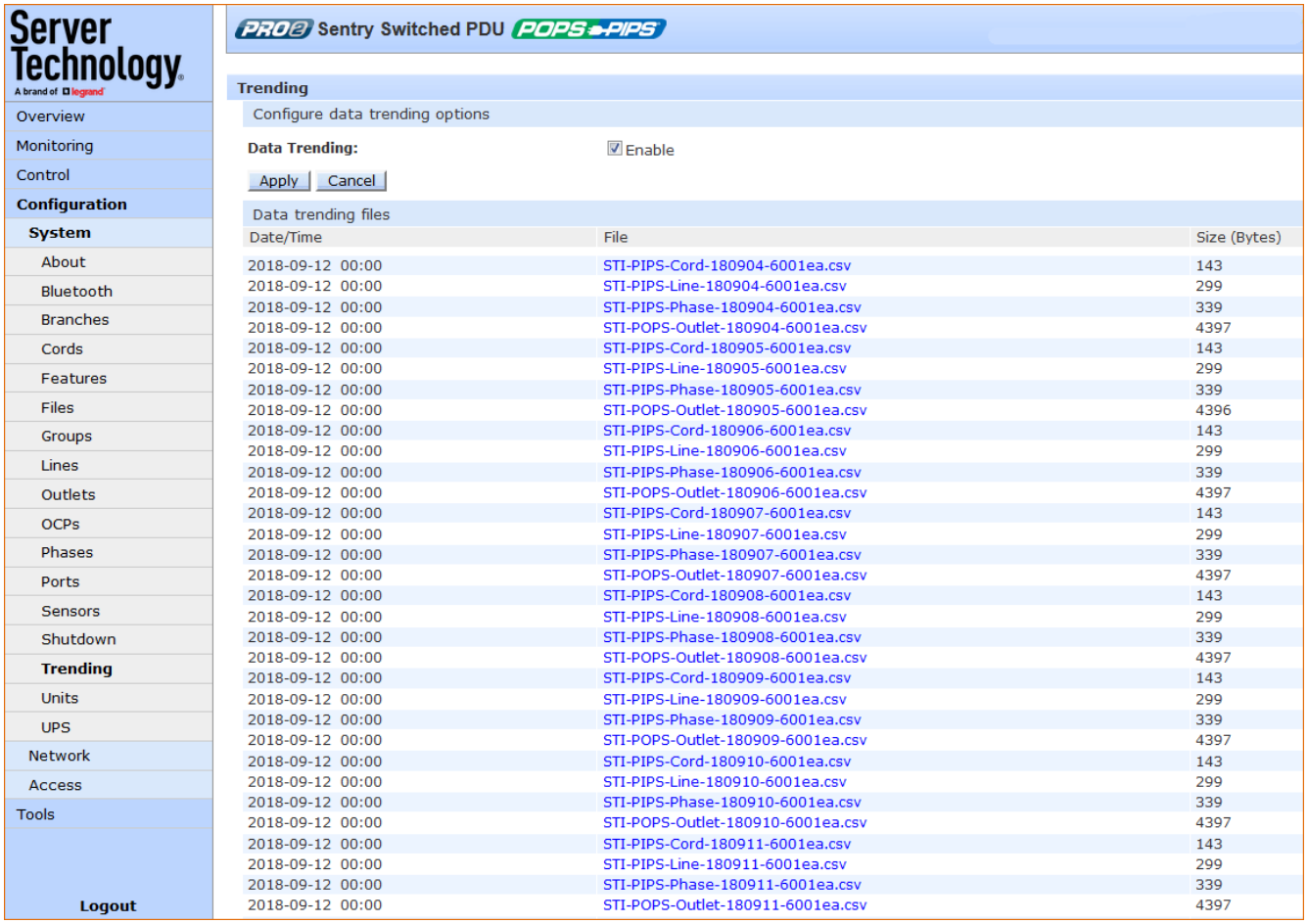
Novell Netware

1. Browse to the location of the Remote Shutdown Agent installation files.
2. From the NetWare system console, load the configuration module (**pmconfig.nlm**) using the default path.
3. For additional security, when prompted enter the IP address of the PDU that will be sending the shutdown signal.

System > Trending

The **Trending** page generates a report (and related source data sets) of measured system trends over a 7-day period, with the range of each day from midnight to midnight. The trend data in the report is for viewing and analysis only – no actions occur automatically based on the data.

Each time a measurement is taken on the unit, the measurement is aggregated into the metrics for the current day. The aggregation process includes updating the maximum and minimum values for each measurement, as well as updating the average with the new measurement.



To activate the trending feature:

1. Check the Enable checkbox.
2. Click **Apply**. The page automatically displays generated .csv trend report files, along with related source data sets, for viewing.

System requirements for trending:

- Firmware, version 8.0x or later.
- SNTP must be enabled (to keep track of when the daily measurements are taken).

What data does trending measure?

■ REQUIREMENTS

For the Trending feature to occur and display (for viewing only) in the GUI at **System > Trending**, SNTP must be enabled to keep track of when daily measurements are taken.

Certain measurements for PIPS and POPS (if POPS is present) are tracked by the Trending feature:

For all PIPS cords/phases/lines, the following measurements are tracked:

- Phase voltage
- Line current
- Cord watts
- Cord power factor

■ WHAT IS MEASURED?

For all POPS outlets, the following measurements are tracked:

- Current
- Watts
- Power factor

■ ADDITIONAL TRACKED METRICS

For all of the above PIPS/POPS measurements, the following metrics will also be tracked:

- Minimum measurement
- Maximum measurement
- "In-use average" measurement

Note: PIPS is a standard feature on all PRO1/PRO2 units, but if the unit does not have POPS, then only the PIPS measurements will be tracked.

■ REQUIREMENTS

For the Trending feature to occur and display (for viewing only) in the GUI at **System > Trending**, SNTP must be enabled to keep track of when daily measurements are taken.

Certain measurements for PIPS and POPS (if POPS is present) are tracked by the Trending feature:

For all PIPS cords/phases/lines, the following measurements are tracked:

- Phase voltage
- Line current
- Cord watts
- Cord power factor

How Does the Trending Feature Work?

Each time a measurement is taken on the PDU, the measurement is aggregated into the metrics for the current day. The aggregation process includes updating the maximum and minimum values for each measurement, as well as updating the average with the new measurement.

Any measurements that have no current or are turned off will not be aggregated; this means the "in-use average" metric will be the reported metric.

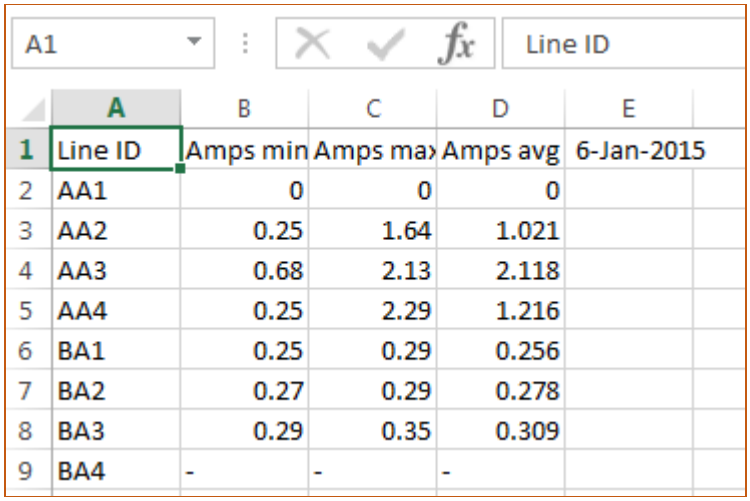
Each day's worth of data will be stored in flash memory with a timestamp for use in generating a trending report. Only data from the last 8 days is kept. The report is not stored in flash memory but is regenerated into RAM after a system reboot.

If there is no data set that is 8 days old (1 week ago) for comparison, the trending data will indicate 100% increase for all reported trending data.

If the system is updated or units are moved/changed/removed/added, all trending will be restarted. In the event of communication loss to link units, trending data will not be lost.

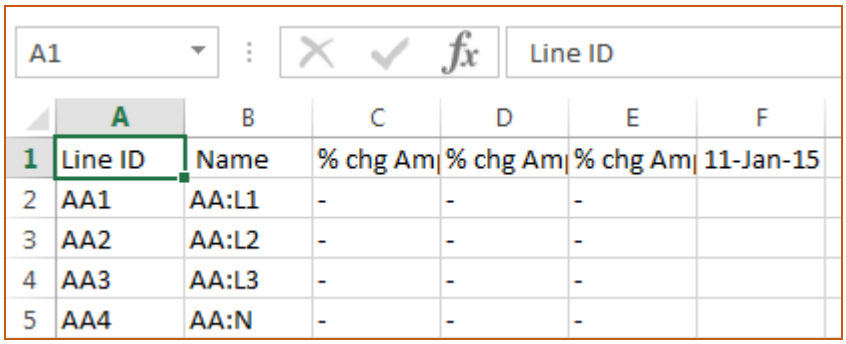
About the Trending Report

- The report (and the data sets the report is generated from) are all stored separately.
- The report is created at midnight.
- The report contains the percent change of the average, maximum, and minimum measurements of the day compared to the daily metrics from the same day on the previous week (7 days ago).
- The data set contains the actual values that the report was generated from: the average, maximum, and minimum for the day



	A	B	C	D	E
1	Line ID	Amps min	Amps max	Amps avg	6-Jan-2015
2	AA1	0	0	0	
3	AA2	0.25	1.64	1.021	
4	AA3	0.68	2.13	2.118	
5	AA4	0.25	2.29	1.216	
6	BA1	0.25	0.29	0.256	
7	BA2	0.27	0.29	0.278	
8	BA3	0.29	0.35	0.309	
9	BA4	-	-	-	

Example of Line source data set



	A	B	C	D	E	F
1	Line ID	Name	% chg Am	% chg Am	% chg Am	11-Jan-15
2	AA1	AA:L1	-	-	-	
3	AA2	AA:L2	-	-	-	
4	AA3	AA:L3	-	-	-	
5	AA4	AA:N	-	-	-	

Example of Line trend report

Accessing and Distributing the Trend Report and Data Sets

The report (and the individual data sets the report is generated from) are available at all times at **Configuration > System > Trending** as comma delimited text files (HTTP, HTTPS, FTP, SFTP interfaces).

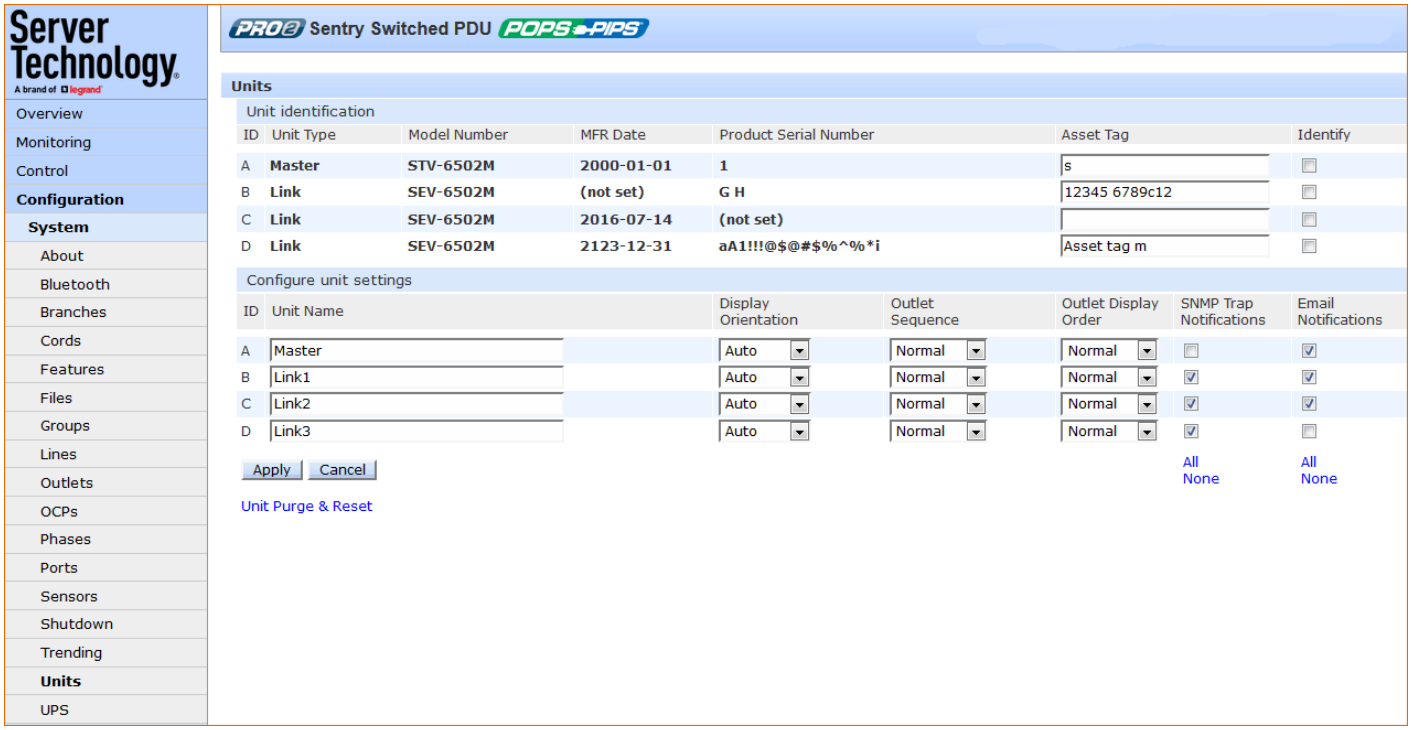
The file format name of the report and data sets is "STI-trend-(object)-yymmdd-macaddress.csv".

Optionally, after the report is generated, the report (and the most recent 24-hour period of data in a data set file) can be sent as an attachment to the primary and secondary "send to" email addresses.

System > Units

The **Units** page sets a descriptive system name for each PDU, configures asset management identification, determines outlet sequence, sets the display orientation of the mounted unit, and sets the Web GUI and CLI display order of the outlets. The page also sets sets SNMP Trap and Email notifications for unit events.

The Purge and Restore link on the Units page displays another page to allow the clearing of current values in non-volatile (NV) memory from individual units, and the resetting of those values back to factory defaults.



To configure the PDU:

1. (Optional) Provide an asset tag identification for listed master and/or link units, and check the Identity checkbox.
2. In the Unit Name field, provide a descriptive text name for the unit, from 0-32 characters. The ID is a system-assigned internal name and cannot be changed.
3. From the Display Orientation drop-down menu, select an option:
    - Normal: Sets the LED display to be right-side up (for vertical mounting of the unit), and outlet sequencing to be 1 to n.
    - Inverted: Sets the LED display to be upside down.
    - Auto (Default): Sets automatic LED display orientation using internal orientation sensor.

4. For Switched products, the PDU allows configuration of the power-on sequence of the outlets with the following available options. From the Outlet Sequence drop-down menu, select an option:
    - Normal: (Default) Powers on outlets in ascending numeric order by outlet number, for example, from outlet 1-8.
    - Reversed: Powers on outlets in descending order by outlet number; such as, from outlet 8-1.

5. For Switched products, from the Outlet Display Order drop-down menu, select an option to set the Web GUI or CLI outlet display order for the selected unit. Any attempt to change this setting on a device that does not have sequential switched outlets will be ignored:
    - Normal: (Default) Displays outlets in ascending numeric order by outlet number, for example, from outlet 1-8.
    - Reversed: Displays outlets in descending order by outlet number; for example, from outlet 8-1. The Reversed option is useful when the PDU is mounted with inverted orientation and the last outlet (in this example, outlet 8) is in the first position.

6. Check (or uncheck) the SNMP Trap Notifications and/or Email Notifications checkboxes to enable (or disable) unit event notification for a specific unit.
7. Click **Apply**.

Set Unit Defaults – System Settings Unchanged

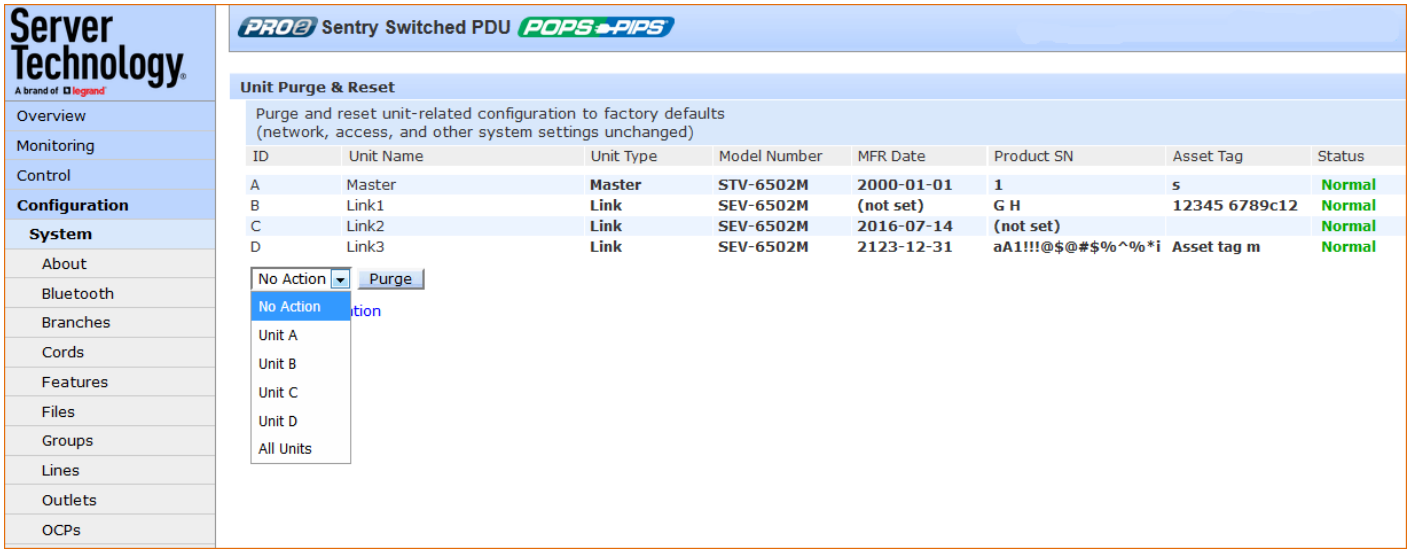
The Set Unit Defaults – System Settings Unchanged function resets the following subset of configuration items (in the NIC of the master unit) to factory default values:

- Power items: Cords, lines, phases, over-current protectors (OCPs), branches, outlets.
- Sensor items: Temperature, humidity, water*, contact closure*, ADC*
  (* = EMCU unit only)
- User-configuration items related to the above power/sensor areas: Object names, thresholds, hysteresis, nominal values, limits, system location, notification enables, shutdown settings, Bluetooth® options, Smart Load Shedding options, outlet options, and more.

Note: User-configured system-level items **will not be reset** to factory defaults: Users, groups, network, LDAP, TACACS, features, UPS devices, login banner, etc.

To purge/reset NV memory:

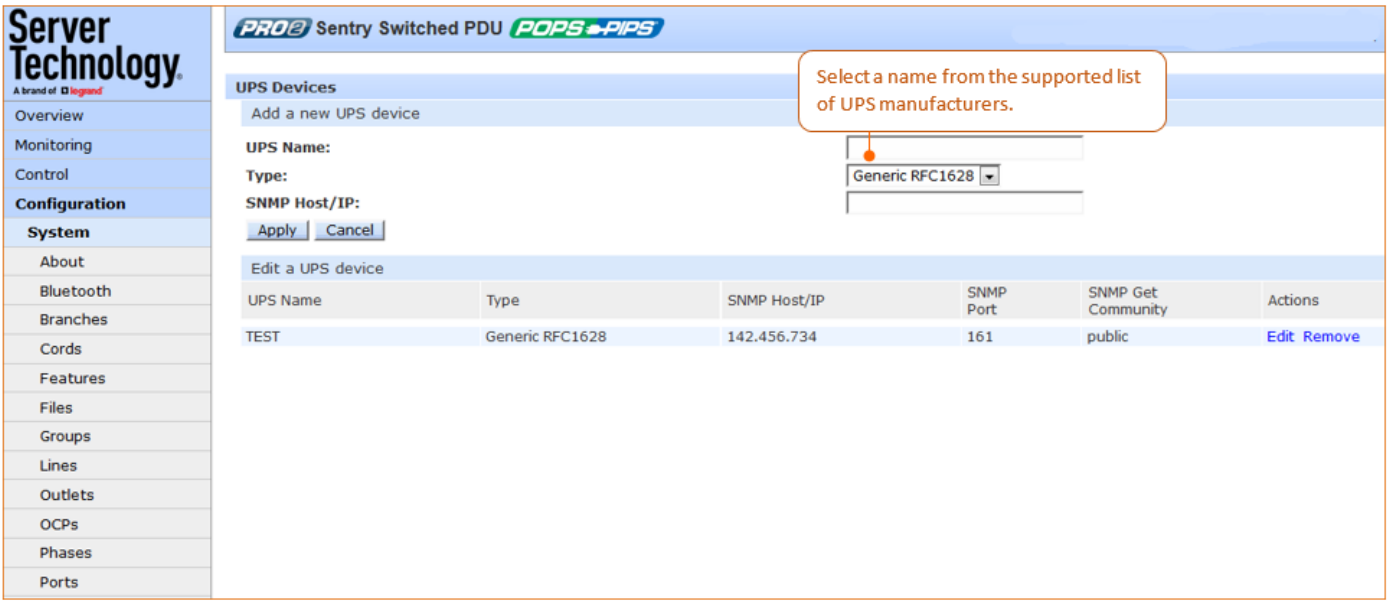
1. From the **Units** page, click the Unit Purge & Reset link to display the following page:



2. From the drop-down menu, select a unit as listed on the page by its internal system-assigned number shown in the ID field, such as unit A, unit B, etc., or select the All Units option.
3. Click **Purge**. A message displays to confirm the purge action. The units selected will have NV memory purged and restored to factory default values.

System > UPS

The **UPS** page manages UPS devices connected to a PRO1/PRO2 PDU. A connected UPS device can be added to or deleted from the system. Several device options are available for configuration, including a configurable UPS name, and assignment of the PDU's lines to be powered by the UPS.

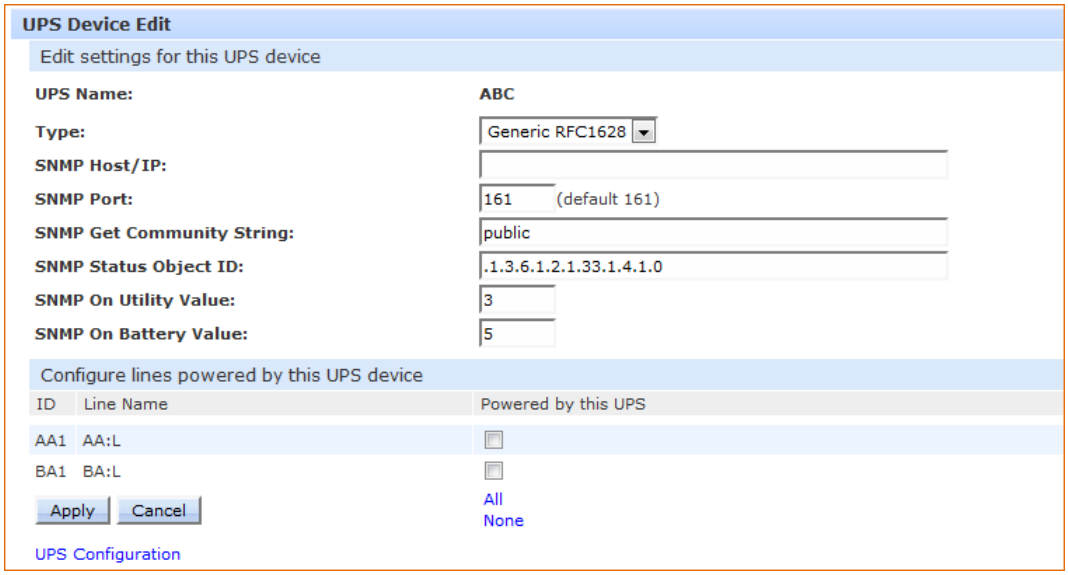


To add a new UPS:

1. Type a UPS name.
2. Select the UPS manufacturer from the Type drop-down menu.
3. Type an SNMP hostname/IP address in the field provided.
4. Click **Apply**. The new UPS displays in the list of UPS devices. The list displays in alphabetic order by UPS name.

Configuring a UPS:

For a UPS listed on the page, click the Edit link to display the edit window:



To configure a UPS:

1. From the Type drop-down list, select the UPS manufacturer.
2. Type the desired values for the SNMP-related fields or accept the defaults as shown on the page.
3. Check the corresponding checkboxes for the line(s) that are powered by the UPS. To select all lines for the UPS, click All (or click None to deselect all lines).
4. Click **Apply**.

To remove a UPS:

1. For a UPS listed, click the Remove link. You will be prompted to confirm the removal of the UPS.

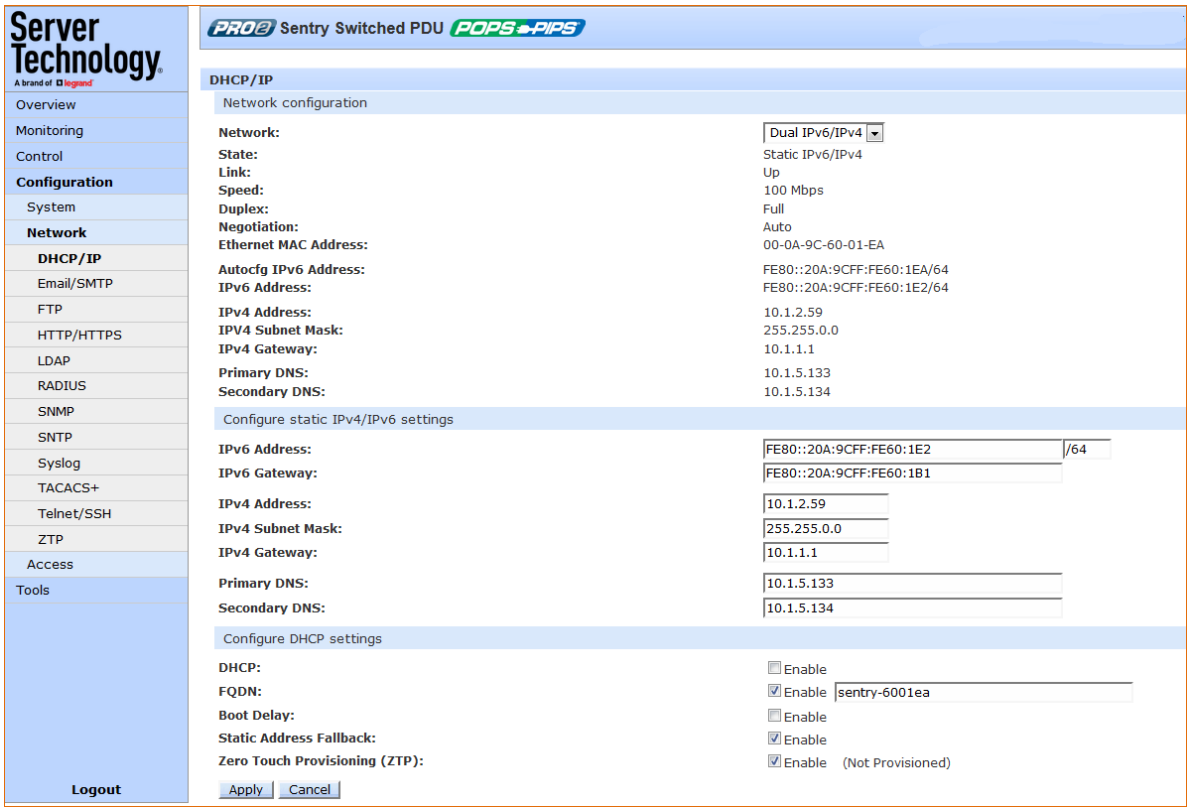
Network (Setting Up Network Protocols)

The **Network** section of the Web interface provides network setup options for the protocols supported by the PRO1/PRO2 PDU: DHCP/IP, Email/SMTP, FTP, HTTP/HTTPS, LDAP, RADIUS, SNMP, SNTP, Syslog, TACACS+, and Telnet/SSH.

Note: The **Network** section only allows the administrator to set up network protocol parameters. To configure how the PDU user will access and use the network and system, see the **Access** section.

Network > DHCP/IP

The **DHCP/IP** page allows configuration of the acquisition method for the protocol stack, viewing of current network communication settings, determining static IPv4/IPv6 address formats, and the enabling of DHCP options.



To configure DHCP/IP:

1. Network: Determines the acquisition method used for the protocol stack: "Disabled", "Dual IPv6/IPv4", or "IPv4 only". For maximum backward compatibility, accept the default network mode "IPv4 only".
2. View the fields in the next section of the page as a quick reference for current network parameters:

   For more information about how the PDU handles the network with IPv6/IPv4 options, see Network-Enabled Modes in this user guide.

To configure static IPv4/IPv6:

1. IPv4/IPv6 Address/Gateway: Provide the address for these fields in either IPv4 or IPv6 format.
2. IPv4 Subnet Mask: If IPv4 is used, supply the IP address for the subnet mask in IPv4 format.
3. Primary/Secondary DNS: Provide the IP address for the primary and secondary DNS hostnames.

To configure DHCP settings:

1. DHCP: Check or uncheck to enable/disable DHCP support. Default is disabled.
2. FQDN: Provide the fully-qualified domain name (FQDN) name and check Enable. Default is enabled.
3. Boot Delay: Check or uncheck to enable/disable Boot Delay with the following results:
   - Enable: The Boot Delay option gives the PDU approximately 100-seconds to establish a connection through a DHCP server. The interval allows various network component activities to occur as the unit powers up (such as obtaining SNTP time stamps for logging).
   - Disable: (Default) The Boot Delay option forces the PDU to boot after approximately 5-seconds regardless of the DHCP acquisition state. This speeds up a boot when a DHCP server is connected to one of the outlets in the unit. In this configuration, SNMP traps, SNTP, and other protocols will not be available until a DHCP address has been resolved.

   Notes:

   - The Boot Delay option executes only when DHCP is enabled.
   - The firmware can detect network link integrity and will wait for network connection. This means that if the network is not currently connected, the enabled Boot Delay option will be ignored.
4. Static Address Fallback: Check or uncheck to enable/disable Static Address Fallback with the following results:
   - Enable: (Default) The Static Address Fallback option informs the unit to automatically fall back to a static address if a DHCP server does not respond after 90-seconds.
   - Disable: The Static Address Fallback option generates DHCP server requests until the unit obtains a dynamic address.

   Notes:

   - The Static Address Fallback option executes only when DHCP is enabled.
   - If the DHCP server boot time is excessive, you may need to disable the DHCP Static Address Fallback option.
   - The DHCP Static Address Failback option does not apply when WLAN is enabled.

1. Zero Touch Provisioning (ZTP): Check or uncheck to enable/disable ZTP with the following results:
    - Enable: The ZTP option allows automated configuration for PRO1/PRO2 products. PDUs can be provisioned and configured automatically during the initial bootup, or whenever needed, to automate network setup, user permission updates, and other PDU modifications as necessary.
    - Disable: (Default) The ZTP option is turned off and the "Non Provisioned" state displays.

To reset ZTP:

Reset is available only when ZTP is enabled. When reset to "Not Provisioned", the PDU will attempt ZTP again after the next RESTART, behaving as it did prior to being provisioned.

After a PDU has been successfully provisioned by ZTP, to use the GUI to reset ZTP to re-provision the PDU again either after the next RESTART or next DHCP lease renewal, click the **Reset** button on the ZTP window.

Note that the PDU's provisioned state ("provisioned" or, "not provisioned") is not reset by disabling ZTP. When ZTP is re-enabled on a previously provisioned PDU, the state will still show as provisioned.

Note: For more information about the automatic provisioning methodology used with PRO1/PRO2 products, see the Server Technology website www.servertech.com for Technical Note: 303-9999-44, "Zero Touch Provisioning".

Network Defaults

The PDU has the following network defaults to allow unit configuration through 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 follows:

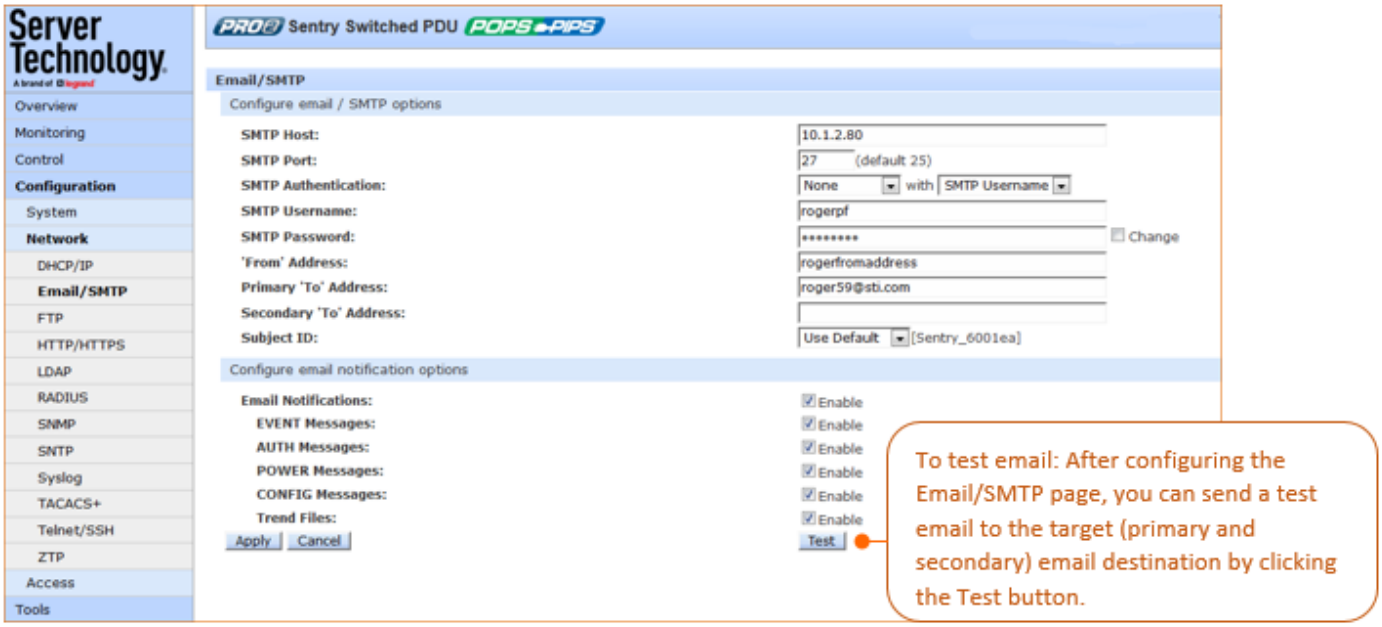
IP Address: 192.168.1.x (where x is 2-253).

Subnet Mask: 255.255.255.0

Note: The PDU must be restarted after network configuration changes.

Network > Email/SMTP

The **Email/SMTP** page allows configuration of the Email/SMTP protocol and email options.



Authentication Notes:	• SMTP authentication allows the mail client in the PDU to log into the mail server during the process of sending an email. The mail server may require this login to relay mail to another mail server. • The supported SMTP authentication types are: None (default, no SMTP authentication); Digest-MD5; CRAM-MD5, Login, Plain, and Any. SMTP authentication occurs with a configured username/password, or the address in the 'From' Address field with 'From' Address selected can be used in place of the username.

To configure SMTP protocol options:

1. Type the hostname/IP address in the SMTP Host field (either IPv4 or IPv6 format).
2. Provide the port number or accept the default as shown.
3. From the drop-down menu, select the authentication method, and from the "with" menu, select username or 'from' as described directly above in the notes.
4. Type the desired Email/SMTP username; spaces are not allowed.
5. Type the password for the username. The password sets the SMTP authentication with the username. Acceptable passwords are 1-32 alphanumeric characters, case-sensitive, and spaces are not allowed. To change the password, type over it, and check the Change box.
6. Provide the 'From' email address.
7. Provide the Primary/Secondary 'Send To' email address. If the primary 'send to' address fails, the system then attempts to send the email to the secondary 'send to' address.
8. From the Subject ID drop-down menu, select the "Sentry_nnnnnn" default option (where "nnnnnn" is the last 3 octets of the MAC address), or select the "Location" option to specify the email subject line.
9. Click **Apply**.

To configure Email notification options:

1. Check the Enable checkbox to enable Email notifications to be sent.
2. For the event notifications shown, check the corresponding Enable checkbox to enable an alert message via email. The events are:

   EVENT: System activity event

   AUTH: Authentication event

   POWER: Power event

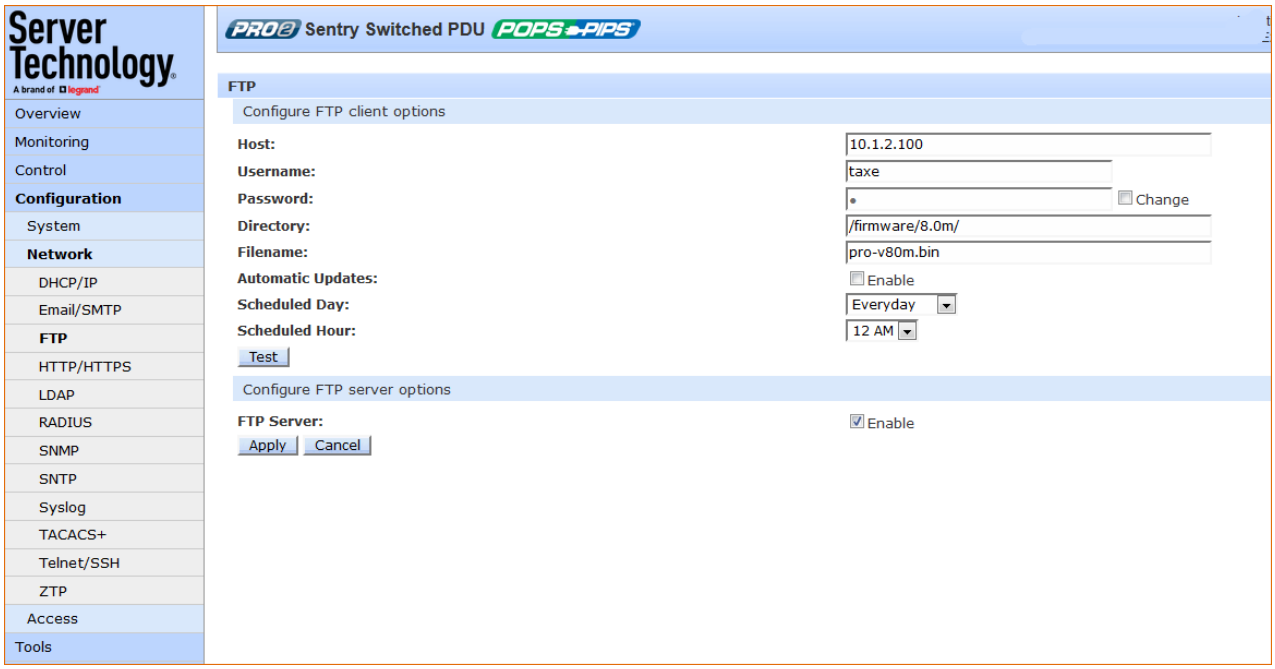
   CONFIG: System configuration event

   Trend Files: Sends the trend files via Email

3. Click **Apply**.

Network > FTP

The FTP configuration page allows configuring the settings required for the FTP client to perform FTP firmware uploads and automatic system uploads/downloads.



To configure FTP client options:

1. Type the hostname/IP addresses in the Host field (IPv4 or IPv6 format).
2. Type the FTP username in the Username field, 1-32 characters, spaces are allowed.
3. Provide a password for the FTP username. To change the password, check the Change box and type the new password.
4. Type the file path to be uploaded to the Directory field.
5. Type the filename to be uploaded in the Filename field.
6. The PDU is capable of scheduling automatic firmware updates. When enabled and configured, the PDU regularly checks the FTP server for a new firmware image and uploads the image. To enable Automatic Updates, check the Enable checkbox.
7. From the Scheduled Day and Scheduled Hour drop-down menus, select the desired day/hour for the automatic update to occur.
8. The FTP upload configuration validates that the unit is able to contact and log into the specified FTP server, download the firmware file, and verify that the firmware file is valid for the unit. To initiate the test, click the **Test** button.

To configure FTP server options:

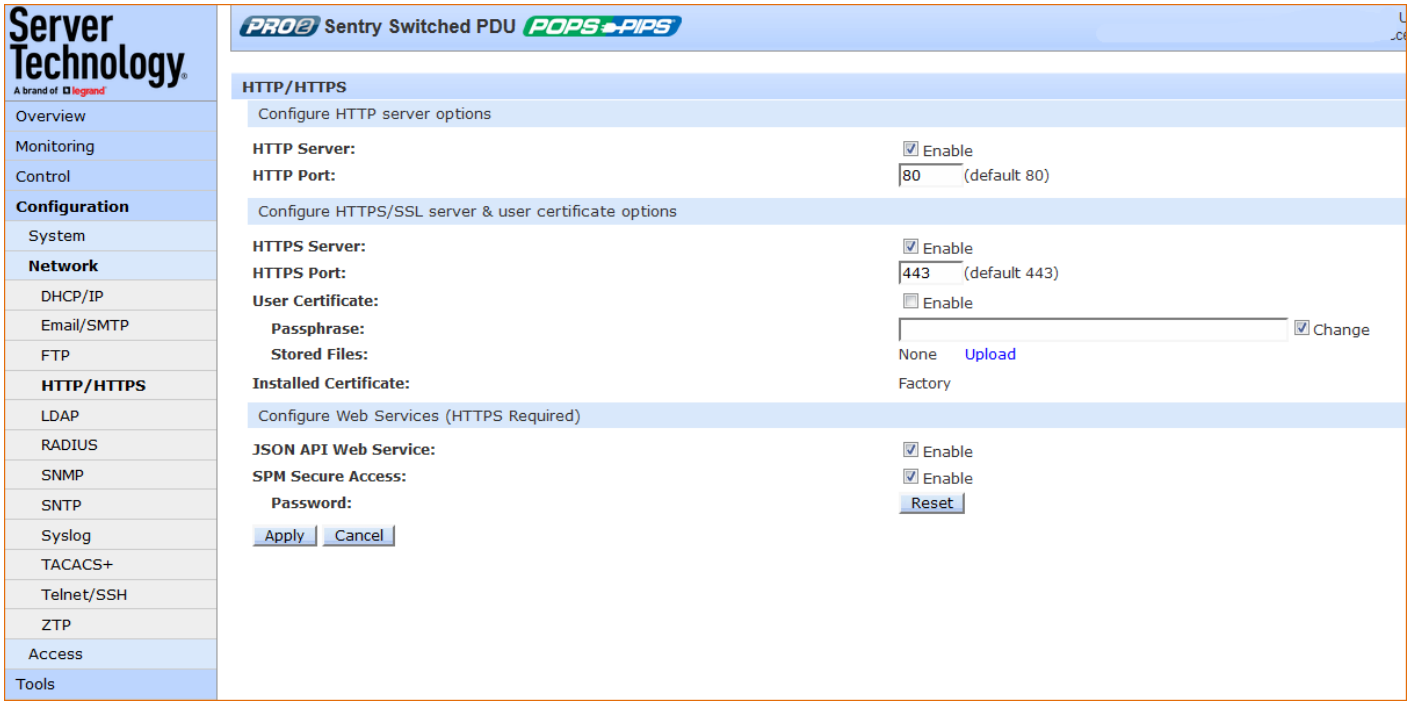
1. In the FTP Server area at the bottom of the page, check the **Enable** checkbox.

Notes:

- The FTP server must be enabled for configuration upload or download.
- Secure File Transport Protocol (SFTP) is also supported for encrypted SSH transport over the network.

Network > HTTP/HTTPS

The **HTTP/HTTPS** page configures server options for HTTP, HTTPS (secure web server), and SSL, including user-defined certificates. The page also determines secure access settings for the Sentry Power Manager (SPM) enterprise software product and for the Web services API.



To configure HTTP and HTTPS/SSL servers/ports:

1. Server: Check (or uncheck) the Enable checkboxes to enable/disable support for the HTTP and/or HTTPS/SSL server options.
2. Port: Type a port number or accept the default HTTP/HTTPS/SSL port numbers as displayed. The HTTP default port number is 80; the SSL default port number is 443.
3. Click **Apply**.

NOTES:	
	• SSL-encrypted (HTTPS) must be used for secure website connections. • A current web browser with TLS1.2 support is required. Current version of IE, Firefox, Chrome, Opera, and Safari are supported. • The HTTPS server uses the first matching cipher from the client preference list. For more information about PRO1/PRO2 firmware-supported ciphers, go to www.servertech.com for the technical note: 303-9999-12, PDU Security. • With the support of TLS1.2, self-signed X.509 certificates now use a 2048-bit key and SHA256 as the signature hash algorithm. It is highly recommended (and may even be required by some web browsers), that old/weaker self-signed certificates be removed from certificate stores and new/stronger certificates be regenerated and accepted into certificate stores. • The number of concurrent HTTP/S sessions supported depends on the web browser in use.

To configure user certificate options:

1. User Certificate: Check (or uncheck) the Enable checkbox to enable/disable support for custom user certificates.
2. Passphrase: Provide a passphrase (0-63 characters) for the new user certificate. To change the passphrase, type a new passphrase and check the Change checkbox
3. Stored Files: This section displays a message (described in the following table) to confirm the upload status of the user certificate and its related public key.

Custom User Certificate Messages

Message	Description and Valid Values/Range
Cert & Key	Both the user certificate and its key were uploaded successfully.
Cert	User certificate was uploaded without a key.
No Cert	User certificate was not uploaded.
Factory Encrypted	User certificate was encrypted and uploaded at product assembly.
None	Neither the user certificate nor its key were uploaded.

4. Installed Certificate: Shows the type of certificate that was installed – Factory, User, Company.
5. Click **Apply**.

To configure web services:

Web Services API Option:

1. Check the JSON API Web Services checkbox to enable this service.

Sentry Power Manager (SPM) options:

The Sentry Power Manager (SPM) is Server Technology's enterprise management software product for the data center. The configuration options provided allow you to enable/disable SPM and reset the SPM password to its default.

1. SPM Secure Access: Check (or uncheck) the Enable checkbox to enable/disable SPM Secure Access. If your operation does not currently use SPM, you can disable this option. However, when the option is disabled, the PDU will not be able to use the secure network features or advanced remote configuration provided by SPM.
2. SPM Password: Each PRO1/PRO2 unit has a unique default SPM password that communicates between SPM and the PDU. For added security, when SPM discovers a PRO1/PRO2 PDU in the network, SPM changes the default password to a different (and unique) password and continues to manage or alter passwords as required for on-going system security. To reset the SPM password, click the **Reset** button.
3. Click **Apply**.

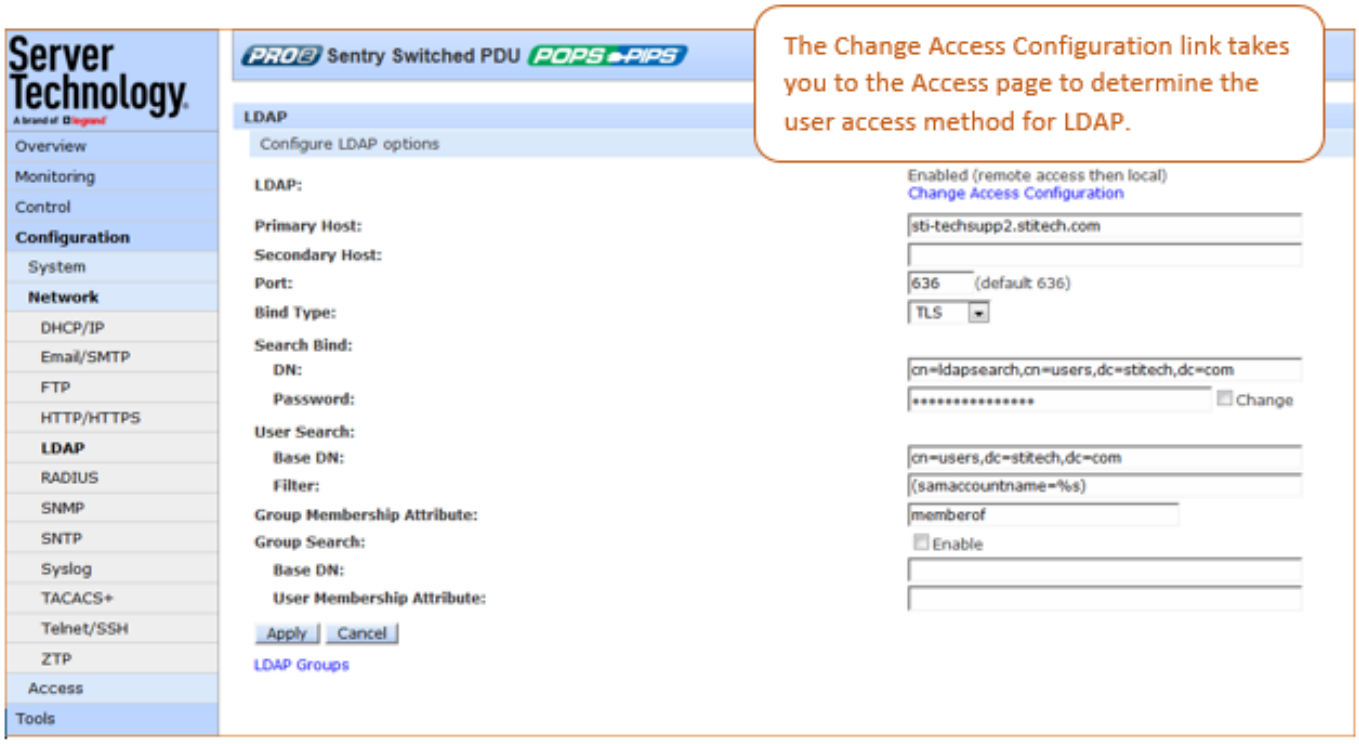
Notes:

- The SPM options apply only if you are currently using SPM.
- Both HTTP and HTTPS/SSL must be enabled or the SPM Secure Access will not be allowed. When allowed, the SPM Secure Access checkbox is enabled by default.
- Do not reset the SPM Password if SPM communication has already been established.

Network > LDAP

The **LDAP** page determines the protocol settings required to enable LDAP support.

Note: The **Network > LDAP** page is for LDAP network protocol management only. To manage LDAP user groups, see the **Access > LDAP Groups** page.



To configure LDAP:

1. LDAP: Enabled or Disabled displays on the page to show current LDAP status.
2. Primary/Secondary Host: Provide the hostname/IP address of the Directory Services server.
3. Port: Set the port number for the LDAP server, 1-65535 (Default is 389).
4. Bind Type: Sets the bind method for the LDAP server. The PDU supports three standard LDAP bind methods:
    1. Simple: Uses unencrypted delivery of username-password over the network to the LDAP server for authentication, showing user credentials in plain text.
    2. TLS: Uses a trusted authority certificate to provide encryption of LDAP authentication.
    3. MD5: Provides strong protection using 1-way hash encoding that does not transmit the username-password over the network.

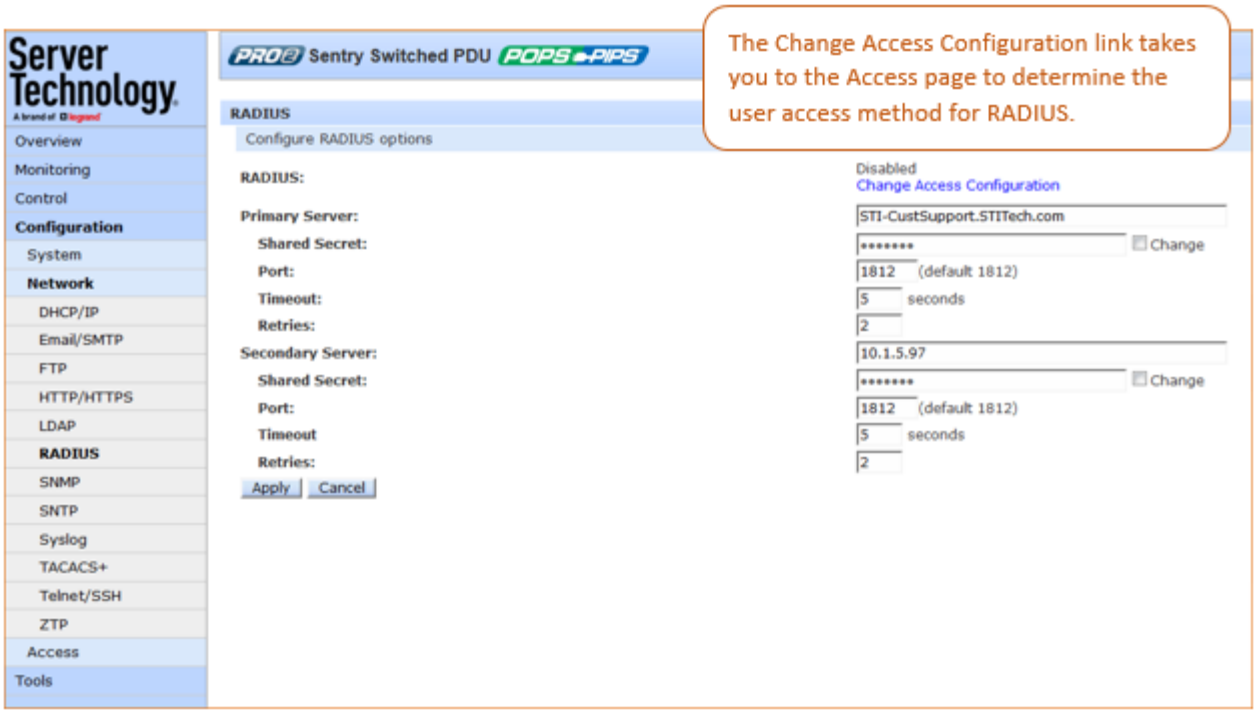
    From the Bind Type drop-down menu, select Simple, TLS, or MD5. If TLS is selected, MD5 binding is disabled.

    Note: IPv6 allows authentication via LDAP.
5. Search Bind: Provide the base distinguished name (DN) for the search bind and the Search Bind Password for the base DN. To change the password, type the new password, and check the Change checkbox.

6. User Search: Provide the distinguished name (DN) for the user search.
7. Filter: The User Search Filter sets the filter used for the username search at login.
8. Group Membership Attribute: Sets the user class distinguished name (DN) or names of groups a user is a member of.
9. Group Search: Click to enable the setting of the bind to search groups for the username (in addition to searching the usernames for its list of group memberships).
10. Base DN: Indicates where the LDAP group search will start.
11. User Membership Attribute: The user membership option allows the searching of directory entries of groups for a user membership attribute to find the groups for which the user is a member. Provide a comma-delimited string of up to two attribute names whose values in the search results are the users that are members of the group. Maximum numbers of characters is 61.
12. Click **Apply**.

Network > RADIUS

The **RADIUS** page provides configuration options for RADIUS server support.



To configure the RADIUS server:

1. RADIUS: Enabled or Disabled displays on the page to show current RADIUS status.
2. Sets the Primary/Secondary RADIUS server hostname/IP address used for RADIUS authentication requests. Maximum 63 characters.
3. Shared Secret: The RADIUS authentication key used for authentication requests. Up to 48 uppercase and lowercase alphanumeric and other typed characters (ASCII 33 to 126 decimal) are allowed; spaces are allowed; control characters are not allowed. To change the secret, edit the Shared Secret field (characters are not displayed) and check the Change checkbox.

   Notes:

   - The secret that was set for the primary server will not be cleared when setting the secret for the secondary server, and vice versa.
   - IPv6 allows authentication via RADIUS.

4. Port Number: Used by the RADIUS server for incoming RADIUS authentication requests. Provide a custom port number or accept the default port numbers as displayed. Valid range is 1-65535; default as shown on the screen is 1812.
5. Timeout: Specifies the time interval (in seconds) to wait for a reply from the RADIUS server before resending an authentication request. Provide the custom timeout value or accept the default timeout as displayed. Valid range is 1-30 seconds; default is 5 seconds.

6. Retries: Indicates the number of times an authentication request is sent to the RADIUS server. The PDU attempts authentication on the primary server until the number of retries is reached, then attempts authentication with the secondary server. If the PDU does not receive a response from the retry attempts, the authentication request will be rejected. Provide a number in the Retries field. Valid range is 0-10; default is 2.
7. Click **Apply**.

About RADIUS Vendor-Specific Attributes (VSA)

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 PRO1/PRO2 PDU in the RADIUS authentication process.

Server Technology has defined and formatted RADIUS vendor-specific attributes (VSA) in the dictionary.sti file, which is available from Server Technology. The PDU 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.servertech.com), the PRO1/PRO2 RADIUS implementation supports the following vendor-specific attributes:

Vendor-Specific Attribute (VSA) Descriptions

Attribute	Description
STI-Access-Level	Indicates user access level for the Switched PRO1/PRO2; values are 1-6 as follows; a valid access level is required or access to the unit 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 (Admn), 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 (Admn) 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 (Admn) 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 (Admn) 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 PDU.

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:

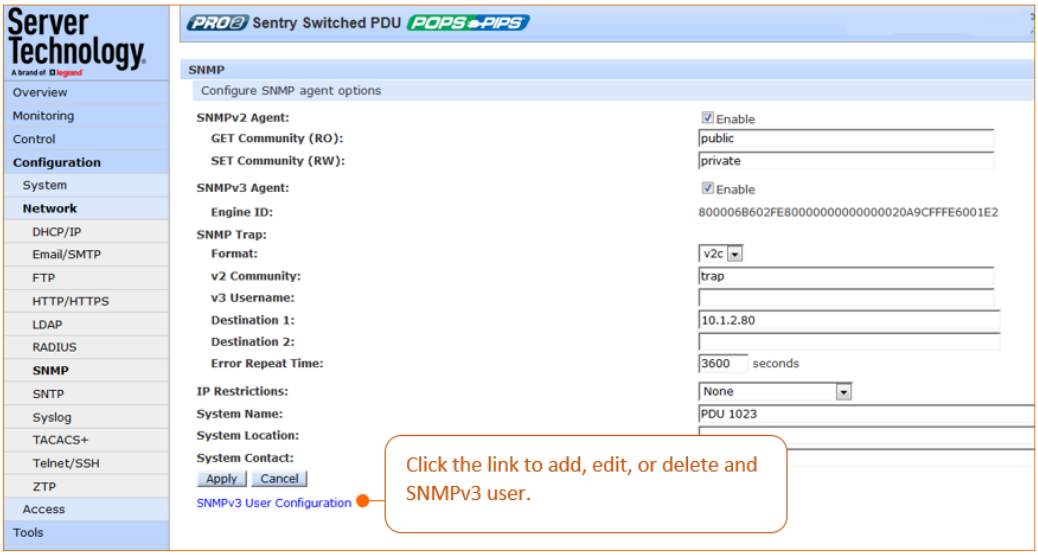
```
sti-user Auth-Type := Local, User-Password == "user"
     STI-Access-Level = User,
     STI-Env-Mon = No,
     STI-Outlets = ".A1 .A2 Rtr1 Rtr2 Srvr1 Srvr2",
     STI-Outlets += ".A3 .A4 Rtr3 Rtr4 Srvr3 Srvr4",
     STI-Groups = "Routers Servers",
     STI-Ports = "Console"
```

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-Outlets = "ALL"
```

Network > SNMP

The **SNMP** page provides the network protocol and agent configuration settings for SNMP support.



About Concurrent Sessions:

SNMP does not use sessions; therefore, multiple simultaneous manager operations are supported.

About SNMP Versions

- The firmware supports SNMP v1, v2c, and v3.
- SNMP version 3 supports authentication and encryption on a per user basis. Authentication types are None and MD5. Encryption types are None and DES. If you use authentication, you must use encryption.
- Up to eight SNMPv3 users are supported. For each SNMPv3 user you can set access as read only, write only, read/write, or disabled. All eight users have the same configuration parameters, and you can configure each user independently.
- SNMPv2c and SNMPv3 can be enabled or disabled independently. You can have SNMPv2 and/or SNMPv3, or none.

To configure the SNMP v2 agent:

1. Check (or uncheck) the Enable checkbox to enable/disable SNMP v2 Agent support.
2. GET community (RO): Community strings for GET commands.
3. SET community (RW): Community strings for SET commands.
4. Click **Apply**.

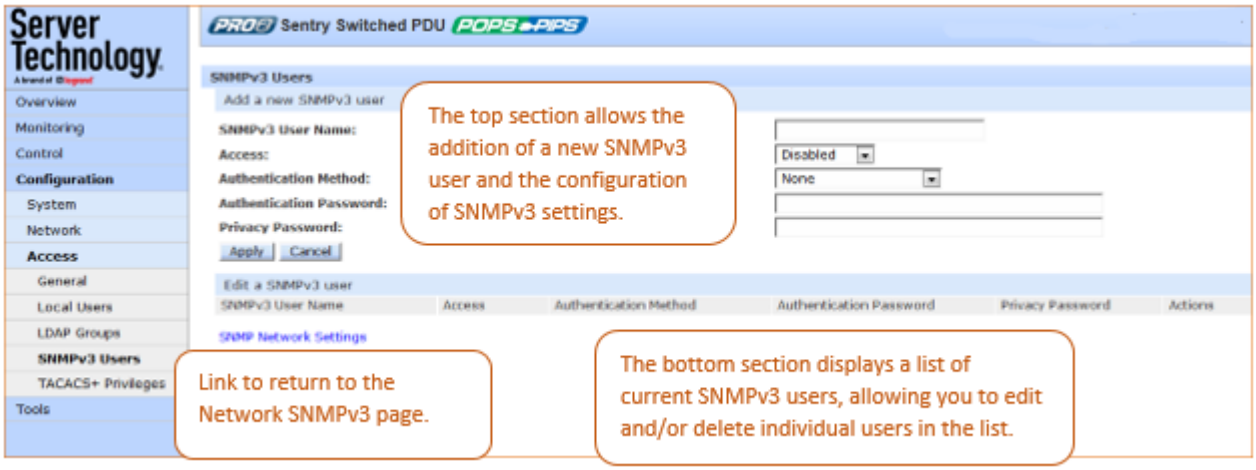
Note: The default for SNMP support is **Enabled**. When Server Technology products are shipped, the default SNMP configuration for the GET community string is set to "**public**" and the SET community string is left **blank**.

To configure the SNMP trap:

1. Format: Configures the SNMP trap format version. The trap format can be SNMP v1, v2c, or v3. The default is v1, regardless of the versions that are enabled for the agent.
2. v2 Community: SNMP trap community for the PDU.
3. v3 Username: (Optional). Provide a trap username to display on SNMP v3 activity logs to identify user actions. The trap username can be 1-31 alphanumeric characters; spaces are allowed; the name is case sensitive.
4. For Destination 1 and Destination 2: Provide first and second trap destinations as a hostname or IP address.
5. Error Repeat Time: Sets the SNMP trap repeat time for an object in an event condition. Provide a time value from 1 to 65535 (in seconds).
6. IP Restrictions: From the drop-down menu, select None (default) or Trap Destinations Only. If Trap Destinations Only is selected, SNMP Manager GET and SET requests are allowed only from the IP address of the defined trap destinations.
7. System Name/Location/Contact: (Optional) Type the system name, location, and contact string from 1-63 characters.
8. Click **Apply**.

To configure the SNMPv3 agent:

1. Check (or uncheck) the Enable checkbox to enable/disable SNMP v3 Agent support.
2. Engine ID: Unique system-assigned ID for each PRO1/PRO2 unit that cannot be user-edited.
3. Click the SNMPv3 User Configuration link at the bottom of the **Network > SNMP** page. The following user configuration page displays to allow you to add (or edit/delete) an SNMPv3 user.



To add a new user:

Note: Up to eight new users can be added to SNMPv3, each user with its own access rights.

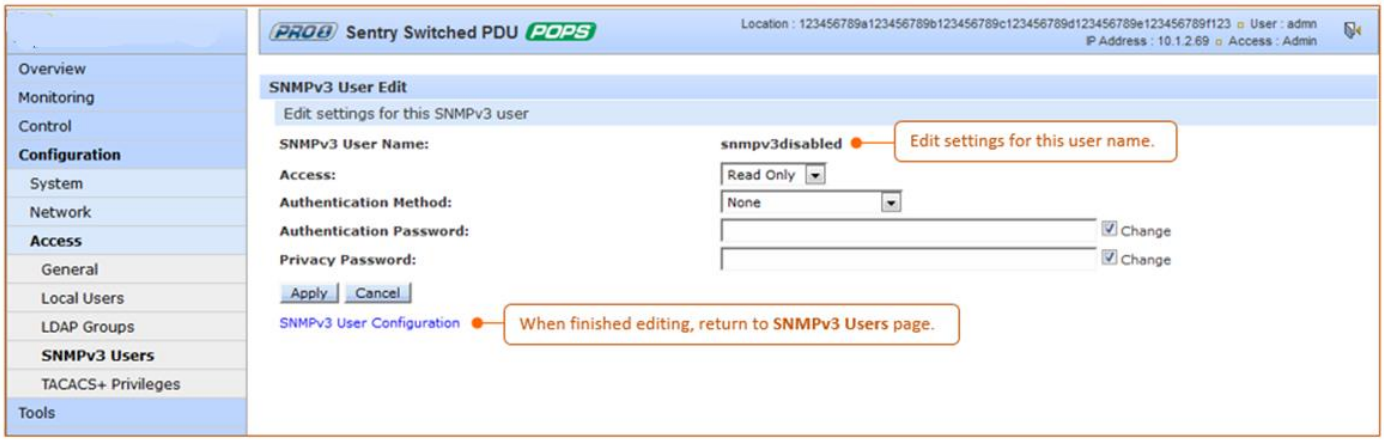
From the **SNMPv3 Users** page (at top of page):

1. In the SNMPv3 User Name field, provide a name (1-31 characters) for the new user.
2. From the Access drop-down menu, select an option to determine SNMPv3 access rights for the new user: Disabled (default), Read Only, Write Only, or Read/Write.
3. Select an Authentication Method from the drop-down menu: None (default), MD5 authentication only, or MD5 authentication and DES privacy.
4. Provide an authentication password (1-31 characters) for the new user.
5. Provide a privacy password (1-31 characters) for the new user.
6. Click **Apply**.

To edit an SNMP user:

From the **SNMPv3 Users** page (at bottom of page):

1. For an SNMPv3 user in the list, click the Edit link to display the following page:



2. Confirm that the user name selected is the one you want to edit.
3. Revise settings as needed for Access, Authentication Method, Authentication Password, and Privacy Password.
4. Click **Apply**.

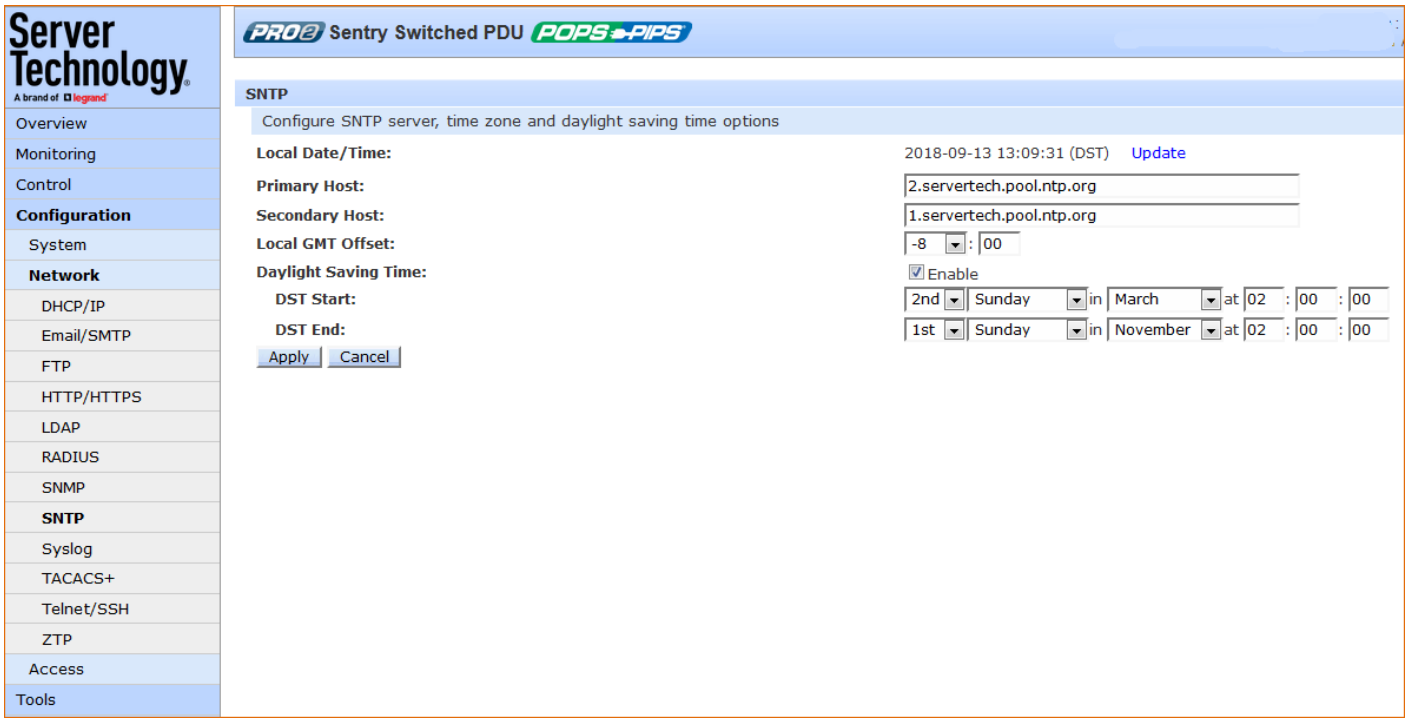
To delete an SNMP user:

From the **SNMPv3 Users** page (at bottom of page):

1. For an SNMPv3 user in the list, click the Remove link.
2. The prompt "Are you sure" displays to confirm or cancel the deletion. Click **OK** or **Cancel**. If OK, the user will be permanently removed from the SNMPv3 user list.

Network > SNTP

The **SNTP** page provides configuration options for the SNTP server, time zone, and Daylight Saving Time (DST) automatic clock adjustment.



About Daylight Saving Time (DST)

Support for DST is enabled by default. When enabled, the date and time are automatically adjusted forward one hour between the starting and ending dates/times, which can be configured.

Note: If DST is enabled, all system time displays will be shown with the current DST start/end date/time settings.

The default time zone is set for the United States until at least 2015. The time zone format is **mo.w.d/h:m:s**, described as follows:

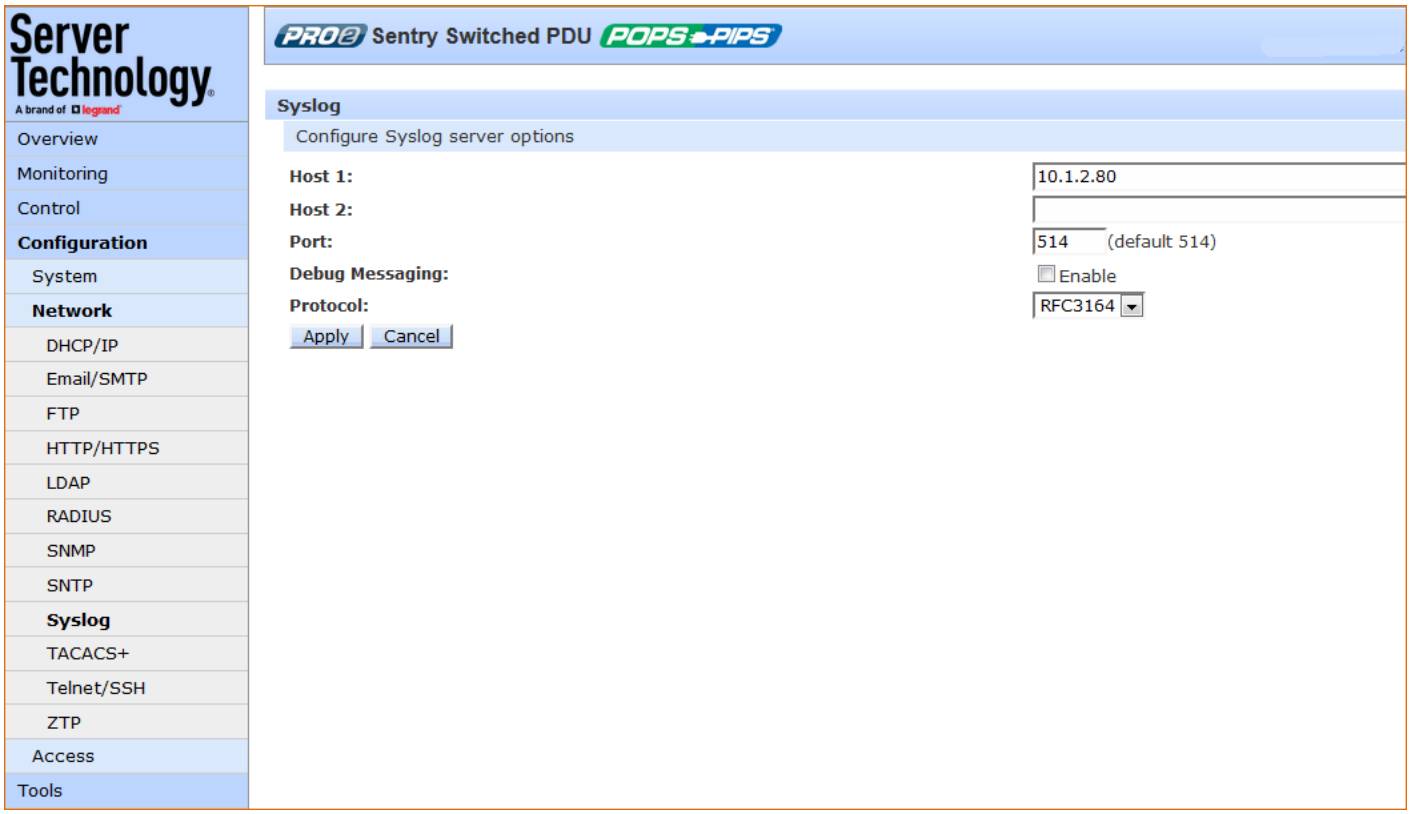
DST Parameter	Description	Value
mo	Both from January to December	1-12
w	Week number	1-4, or last week
d	Day of the week from Sunday to Saturday	0-6
h	Hour	0-23
m	Minute	0-59
s	Second	0-59

To configure the SNTP server:

1. Local Date/Time: Displayed to show the local and current DST settings. To increment the settings (based on updates to the options for DST Start/DST End and day/time), click the Update link.
2. The Primary/Secondary Host fields contact the SNTP server. The fields are populated with the the external NTP pool time zones "2.servertech.pool.ntp.org" and "1.servertech.pool.ntp.org" as the default for new units that have not yet been time set. To edit the host fields, type the desired hostname/IP address in the Primary/Secondary Host fields.
3. From the Local GMT Offset drop-down menu, select the extended local offset hours and provide minutes. The GMT offset supports all standard international time zones from -12:59 to +14:59. The GMT offset can be set in minutes to accommodate partial-hour time zones.
4. To enable Daylight Saving Time (DST), check the Enable box.
5. From the DST Start/End drop-down menus, set the start/end date/time options.
6. Click **Apply**.

Network > Syslog

The **Syslog** page supports RFC3164 and RFC5424 compliance and the configuration for standard message logging to enable offline storage and viewing of firmware log messages and system events.

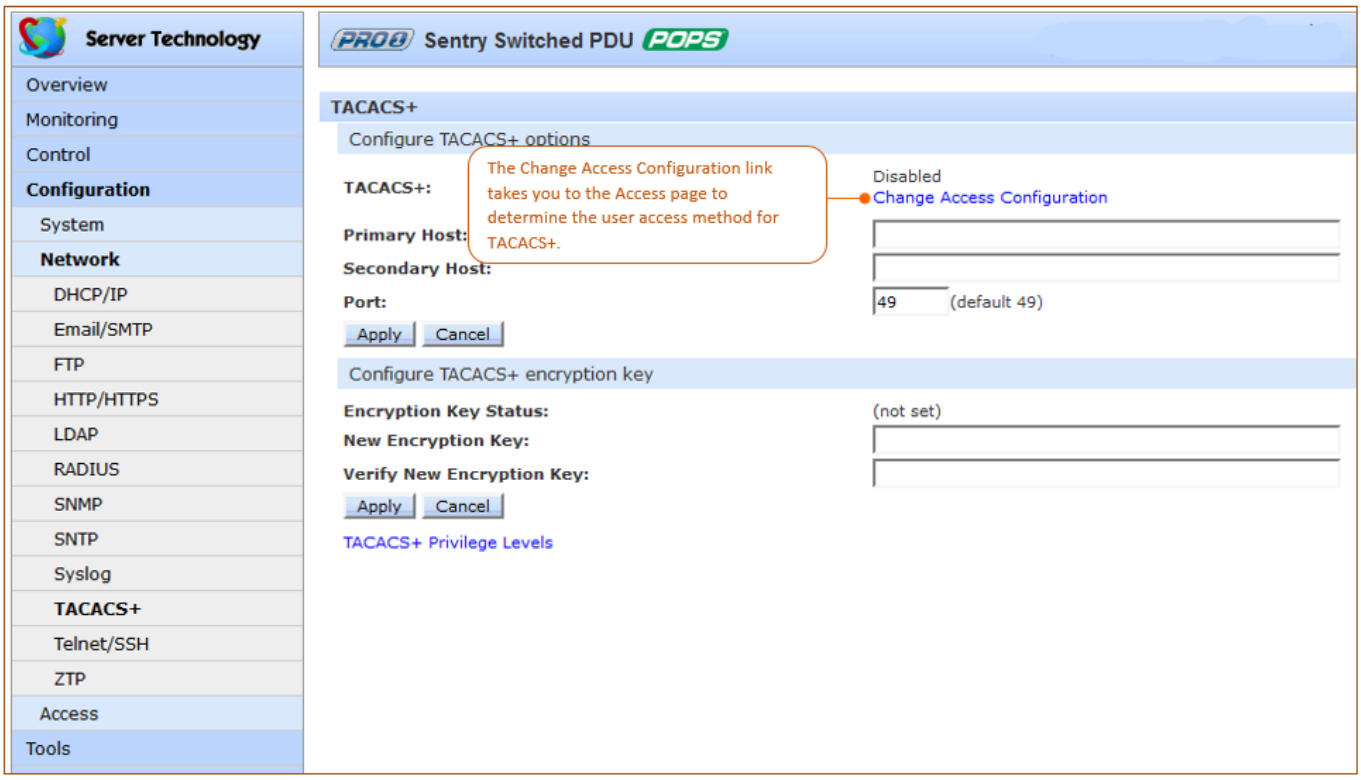


To configure the Syslog server:

1. Host 1/Host2: Set the Syslog server address by typing the hostname/IP address in the Host1 and/or Host2 field(s). Both IPv4 and IPv6 IP address formats are allowed.
2. Port: When Syslog support is enabled, the Syslog server responds to requests on the default Syslog port number 514 as displayed on the page. If necessary, edit the port number.
3. Debug Messaging: To enable debug messaging in the Syslog debug log, check the Enable box.
4. Protocol: From the drop-down menu, select the RFC protocol that determines behavior of the Syslog server and message transmission
5. Click **Apply**.

Network > TACACS+

The **TACACS+** page allows configuration for TACACS+ server options, encryption key, and user privilege levels.



To configure TACACS+ server options:

1. Type the hostname/IP address in the Primary/Secondary Host fields (IPv4 or IPv6 format).
2. Type the new port number or accept the default 49 as shown in the screen example. The PDU uses the port number to send TACACS+ requests.
3. Click **Apply**.

About the TACACS+ Encryption Key

The encryption key is used to encrypt all data packets between the PDU and the TACACS+ server:

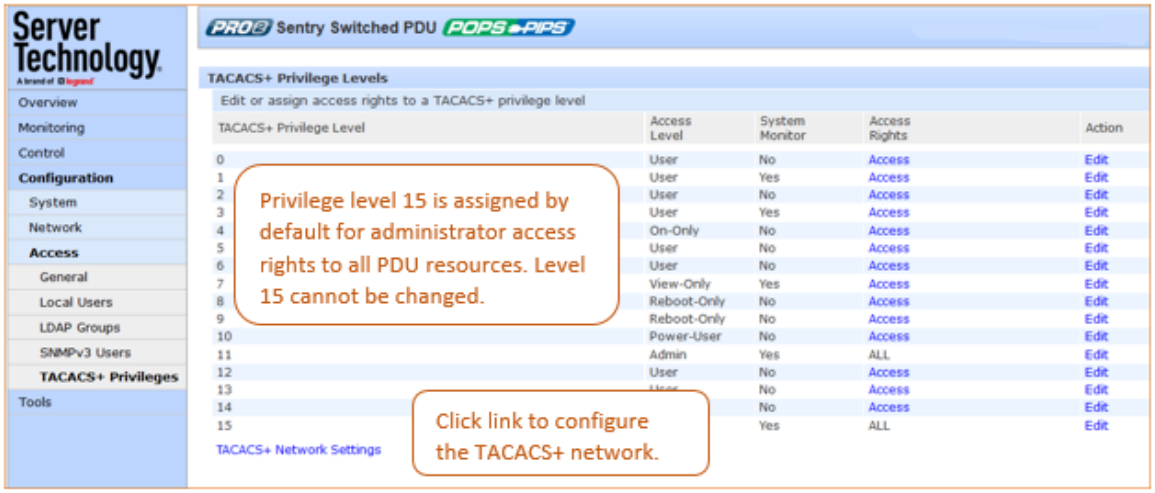
- The key must match the key configured on the TACACS+ server.
- The key can be up to 60 alphanumeric characters and is case sensitive.
- For security, characters in the key are not displayed.
- If you provide "0" for the key, the result may be that the key is not applied, as "0" may not be supported by the TACACS+ server. It is recommended for product environment and security not to enter "0" for the key.
- The Encryption Key Status field on the screen displays "(set)" or "(not set)" to indicate current status of the key.

To configure the encryption key:

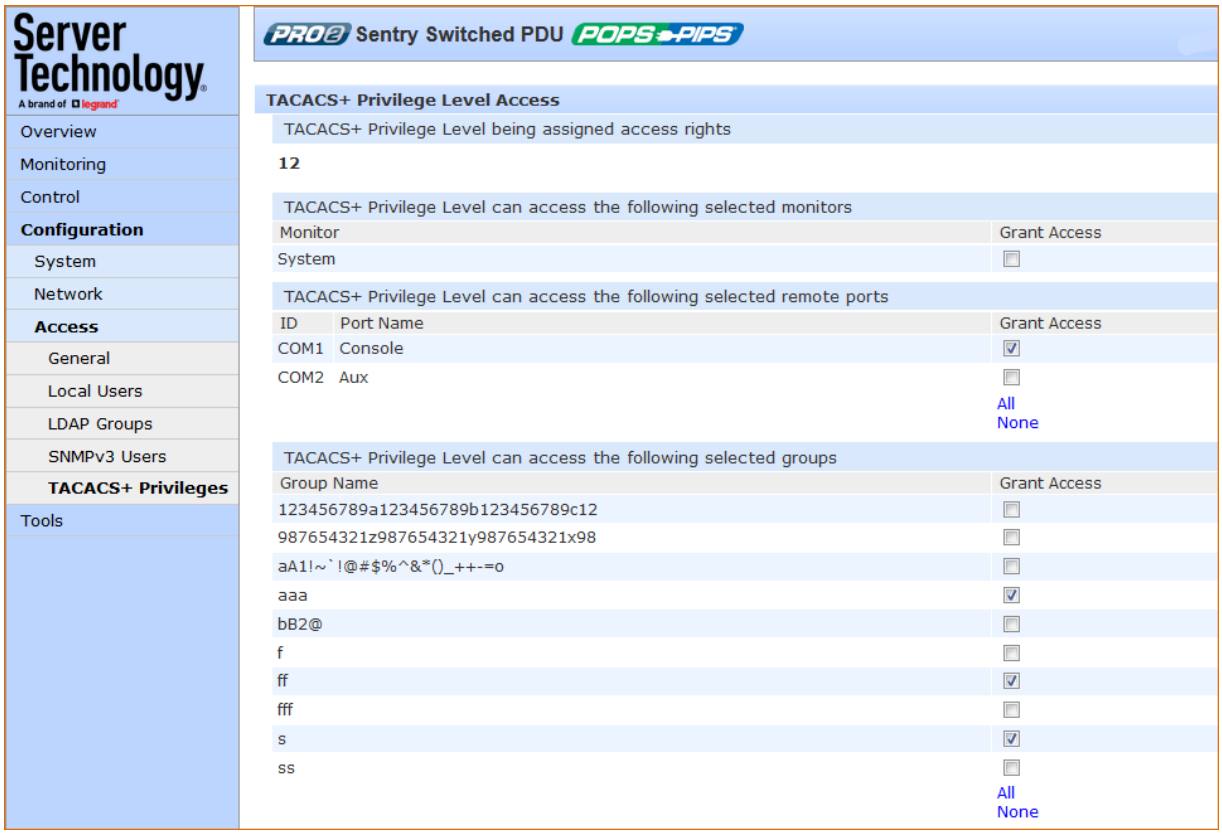
1. Type the New Encryption Key in the field provided.
2. In the Verify New Encryption Key field, retype the key.
3. Click **Apply**.

Assigning User Access Rights to TACACS+ Privilege Levels

1. At the bottom of the TACACS+ screen, click the TACACS+ Privilege Levels link to display the following edit page which shows the current user access level for each TACACS+ privilege level.



2. For a privilege level shown in the above list, click **Access** to display the Privilege Level Access page:



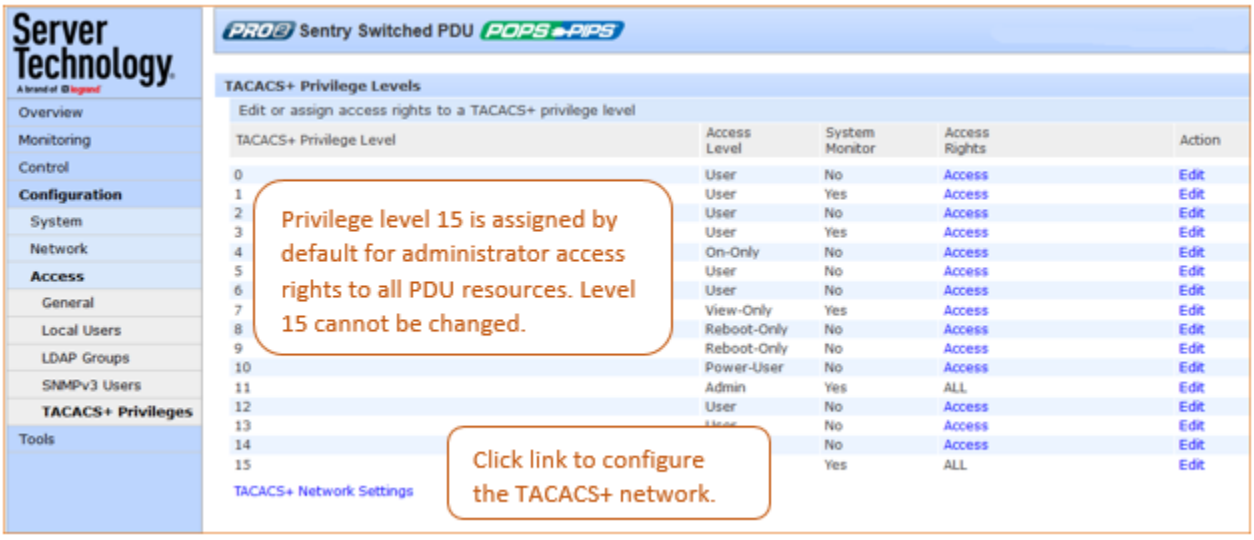
3. Check individual boxes to grant user access (or uncheck boxes to deny access) to specific system resources: monitors, remote ports, outlet groups, and individual outlets. To grant (or deny) access to all (or none) of the resources in a group, click All or None.

4. Click **Apply**.

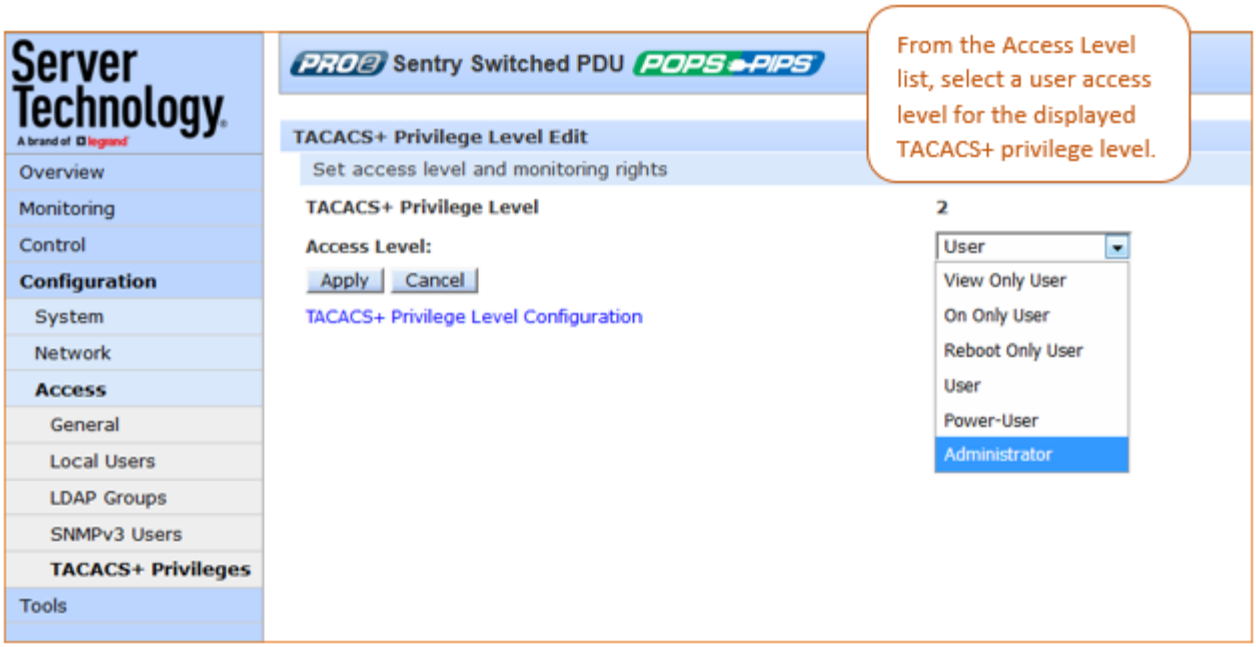
Configuring TACACS+ Privilege Levels

The PRO1/PRO2 supports 16 different TACACS+ privilege levels. The administrative-level user can configure 15 privilege levels. One level is reserved by default for access to all PDU resources by the administrative-level user. Six defined user privilege levels are available: Admin, Power User, User, On-Only User, Reboot-Only User, and View-Only User.

1. At the bottom of the TACACS+ screen, click the TACACS+ Privilege Levels link to display the following edit page which shows the current user access level for each TACACS+ privilege level.



2. For a privilege level shown in the above list, click **Edit** to display the TACACS+ Privilege Level Edit page:



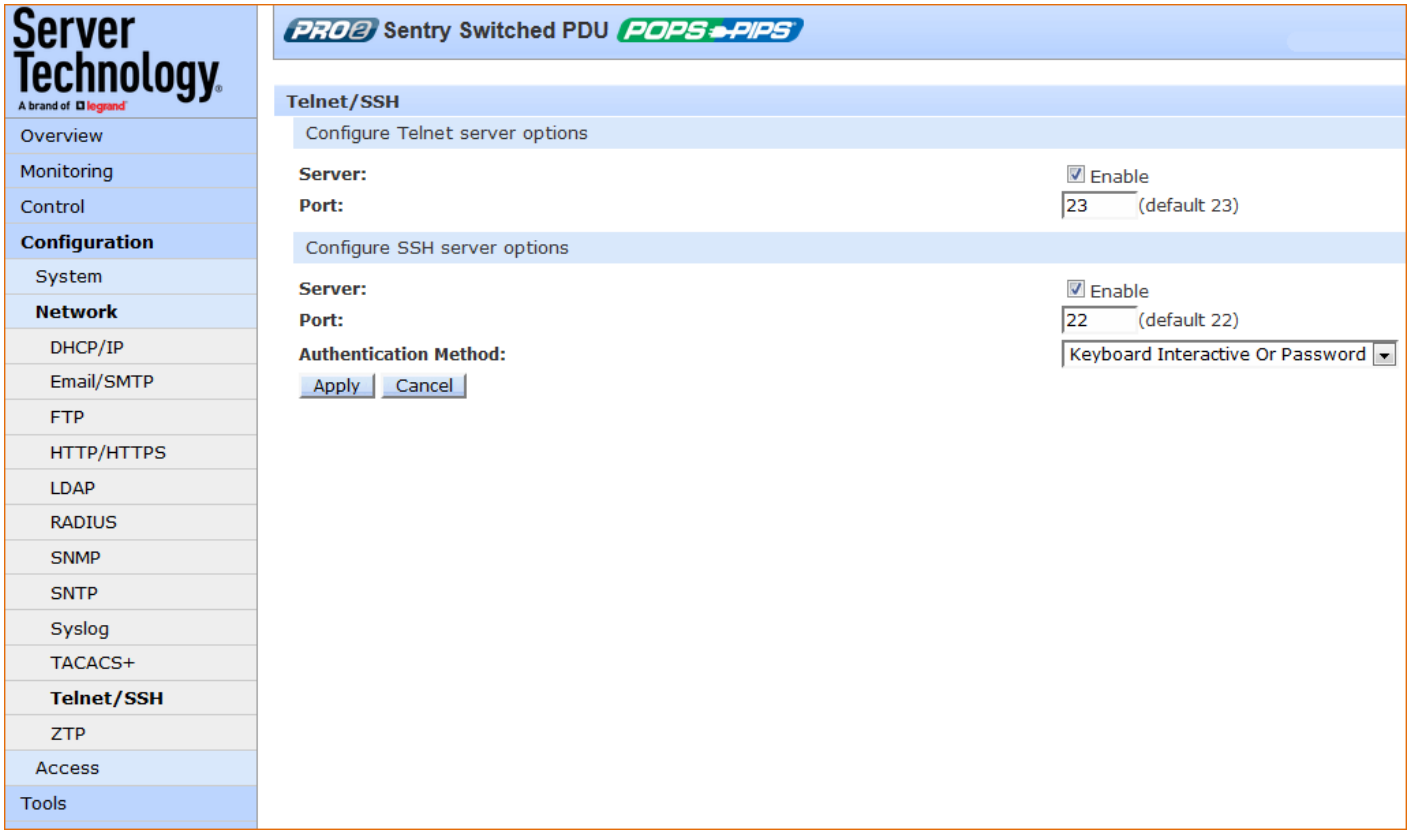
3. From the Access Level drop-down menu, select a user access level for the displayed TACACS+ privilege level, as described:

User Access Level (highest to lowest)	Description
Administrator	Administrative user; full access for all configuration, all outlet power control actions (On, Off, Reboot), status, and serial/pass-thru ports.
Power User	Full access for all outlet power control actions (On, Off, Reboot), status, and serial/pass-thru ports. **Note:** The Power User does not have access to user management.
User	Partial access for outlet power control actions (On, Off, Reboot), status, and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.
Reboot-Only User	Partial access for outlet power control actions (Reboot), status, and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.
On-Only User	Partial access for outlet power control actions (On), status, and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.
View-Only User	Partial access for status and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.

4. Click **Apply**.

Network > Telnet/SSH

The **Telnet/SSH** page provides server, port, and authentication options for support of Telnet and SSH.



To configure the Telnet server and/or SSH server:

1. Server: Check (or uncheck) the Enable checkbox to enable/disable support for Telnet and/or SSH.
2. Port: Type a custom port number or accept the default port number 23 (for Telnet) or the default port number 22 (for SSH), as displayed on the page.
3. For SSH only – Authentication Method: The SSH server supports the following authentication methods.
   - Keyboard Interactive: 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 typed by the user and sends it back to the server. The Keyboard Interactive method is controlled by the SSH server.
   - Password: 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 or Password: (Default). Allows either method.
4. From the drop-down menu, select one of the security methods described above, or accept the default, as displayed
5. Click **Apply**.

Telnet/SSH Concurrent Sessions

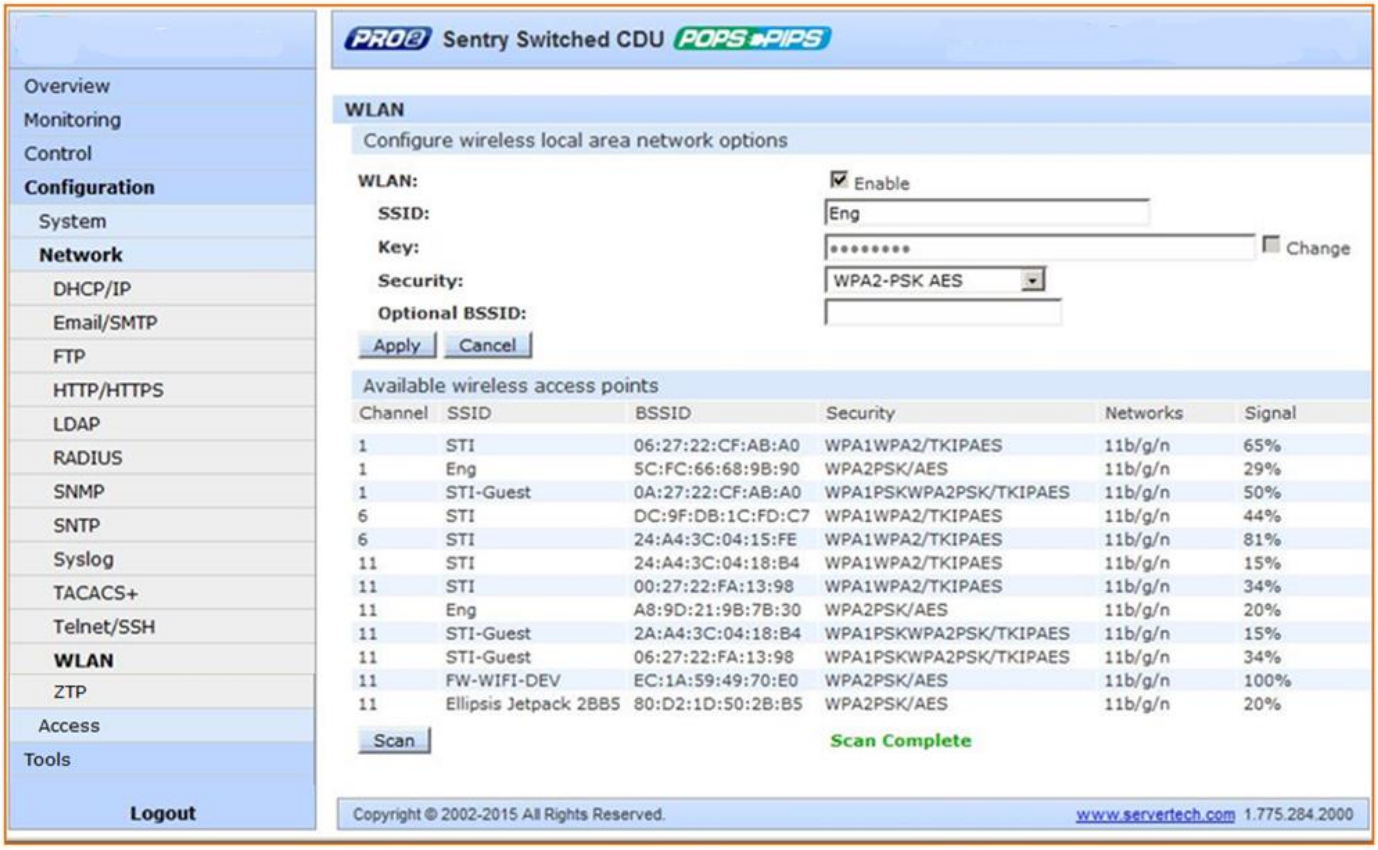
- For Telnet: 4 concurrent sessions allowed; also allowed are 4 Telnet **and** 4 SSH sessions simultaneously.
- For SSH: 4 concurrent sessions allowed; also allowed are 4 SSH **and** 4 Telnet sessions simultaneously.

The WLAN Solution

A high performance Wireless Local Area Network (WLAN) solution is available, for firmware 8.0c or later, and using Wi-Fi capable PRO1/PRO2 products.

The wireless network solution is designed according to IEEE standards 802.11b/g/n 2.4 GHz for implementing network connectivity using Wi-Fi.

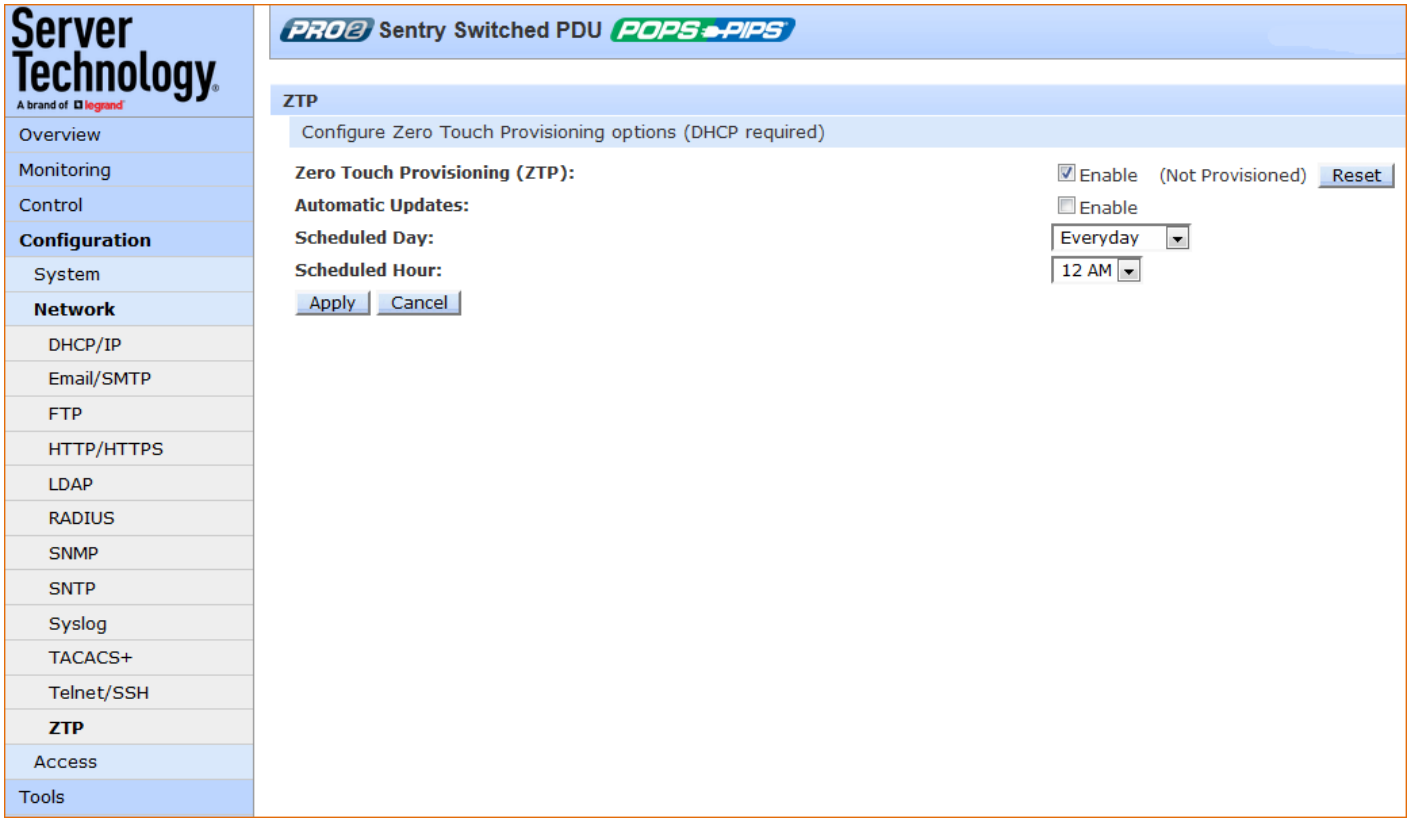
When enabled, the **Configuration > Network** page displays the WLAN option, as follows, where Wi-Fi settings are configured:



For more information about setting network configurations for the wireless network, a description of the PRO1/PRO2 products designated for this solution, and considerations for access point (AP) installation, see Server Technology's website, www.servertech.com, for Technical Note, 303-9999-37, "Wi-Fi Solution with 802.11b/g/n Support for Wi-Fi Capable PRO1/PRO2 Products."

Network > ZTP

The Network > ZTP page provides the settings for using the optional Zero Touch Provisioning (ZTP) feature. ZTP allows PDUs to be provisioned and configured automatically during the initial bootup, or whenever needed, to automate network setup, user permission updates, and other PDU modifications as necessary.



About Automatic Provisioning:

Automatic and continuous provisioning means you can revise the ZTP configuration file (config.ini) as needed and push the file down through the ZTP process multiple times. ZTP will recognize the latest revisions in the configuration file, giving you the flexibility of a ZTP process for maintenance as well as for initial provisioning.

Note: For more information about ZTP and the automatic provisioning methodology used with PRO1/PRO2 products, see the Server Technology website www.servertech.com for Technical Note: 303-9999-44, "Zero Touch Provisioning".

Resetting ZTP:

Reset is available only when ZTP is enabled. When reset to "Not Provisioned", the PDU will attempt ZTP again after the next RESTART, behaving as it did prior to being provisioned.

After a PDU has been successfully provisioned by ZTP, to use the GUI to reset ZTP to re-provision the PDU again either after the next RESTART or next DHCP lease renewal, click the **Reset** button on the ZTP window.

Note that the PDU's provisioned state ("Provisioned" or, "Not Provisioned") is not reset by disabling ZTP. When ZTP is re-enabled on a previously provisioned PDU, the state will still show as provisioned.

To configure Zero Touch Provisioning:

Note: ZTP is enabled "out of the box" by default for PDUs running firmware version 8.0g or later. The Automatic Updates option of ZTP is shipped disabled by default.

1. Zero Touch Provisioning (ZTP): Check or uncheck the checkbox to enable/disable ZTP with the following results:
   - Enable: The ZTP option allows automated configuration for PRO1/PRO2 products.
   - Disable: (Default) The ZTP option is turned off and the "Non Provisioned" state displays.

   If necessary, click the **Reset** button. See "Resetting ZTP" above.
2. Automatic Updates: Check or uncheck to enable/disable the automatic updates option. When enabled, Automatic Updates takes priority over the "Provisioned" or "Not Provisioned" status.
3. Select the Scheduled Day of the week (or Everyday) for automatic updates to occur.
4. Select the Scheduled Hour of the day for automatic updates to occur.
5. Click the **Apply** button.

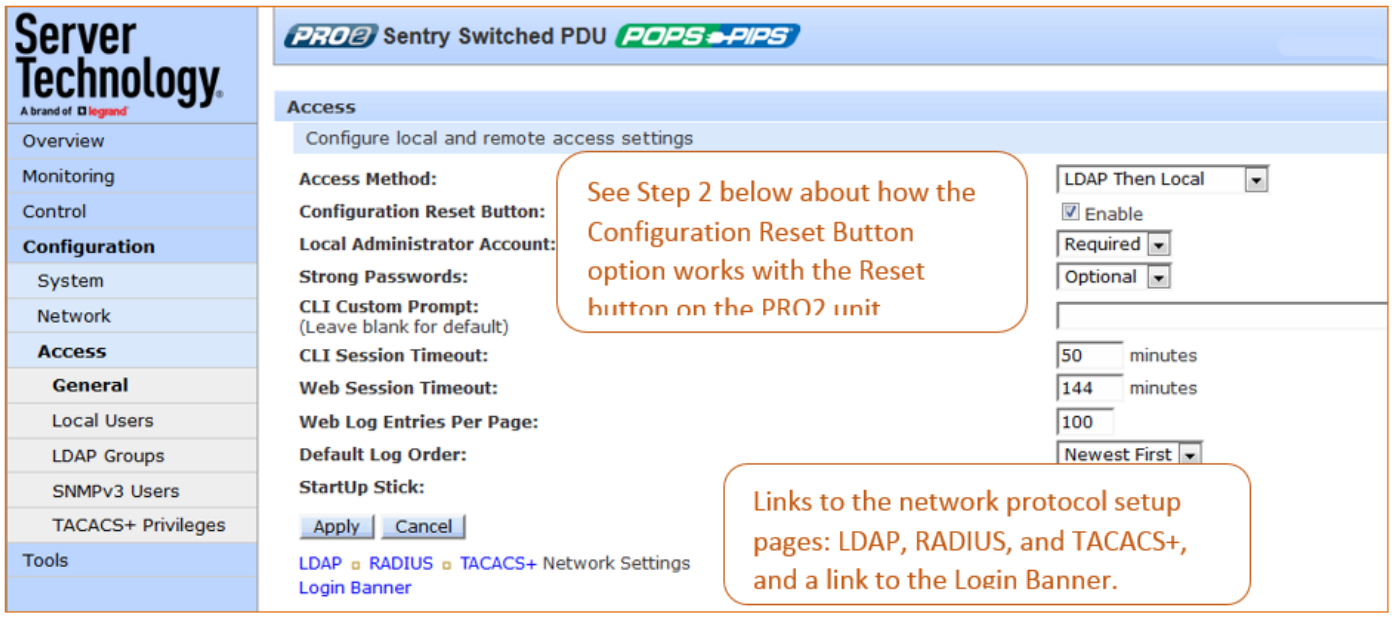
Access (Managing Users)

The **Access** section of the Web interface determines how a PRO1/PRO2 PDU user works with the network and system by configuring the options related to a user: authentication, privilege levels, user access to the unit, and additional functions for individual local users and user groups.

Note: The **Access** section only allows the administrator to determine how the user will access and use the network and system. To set up network protocol parameters, see the **Network** section.

Access > General

The **General** page allows configuration of local and remote access settings.



To configure general system access:

Access Method: From the drop-down menu, select an option to enable one of several authentication methods to control user access to the PDU. Only one method can be enabled at a time: Local Only (default), LDAP Only, LDAP Then Local, RADIUS Only, RADIUS Then Local, TACACS+ Only, TACACS+ Then Local.

Button Configuration Reset: Check (or uncheck) the Enable checkbox to enable (or disable) physical access to the **Reset** button on the PRO1/PRO2 hardware.

The PDU is designed with a reset button on the hardware unit that can be used when a forgotten firmware password prevents logging into the unit. The reset button sets all configuration values back to factory default settings, allowing the administrator to retrieve the admn/admn default administrator login.

To access the button on the unit, you need a non-conductive metallic tool that fits inside the recess. If you press and hold the **Reset** button on the unit for more than 15 seconds, the reset action will terminate.

Note: This method of physical access to the unit will not work if the reset button has already been disabled by the administrator through the firmware GUI at **Configuration > Access > General > Button Configuration Reset** (show in the screen example above) or through the firmware CLI with the **set access button [enabled/disabled]** command. For security, the administrator can choose to disable the button through firmware to inhiibit a user from causing a reset on the unit.

Local Administrator Account: Removes the last local administrator account when remote authentication (LDAP, TACACS+, or RADIUS) is in use. Only a remotely-authenicated administrator can remove the last local administrator account.

Accept the "Required" option (default), or select "Optional". Selecting "Optional" disables the restriction to remove the last local administrator, and also enables the Configuration Reset Button.

In turn, disabling the Configuration Reset Button automatically changes the Local Administrator Account to "Required". When this change occurs, if no local administrator accounts are present, the Configuration Reset Button will be set back to enabled.

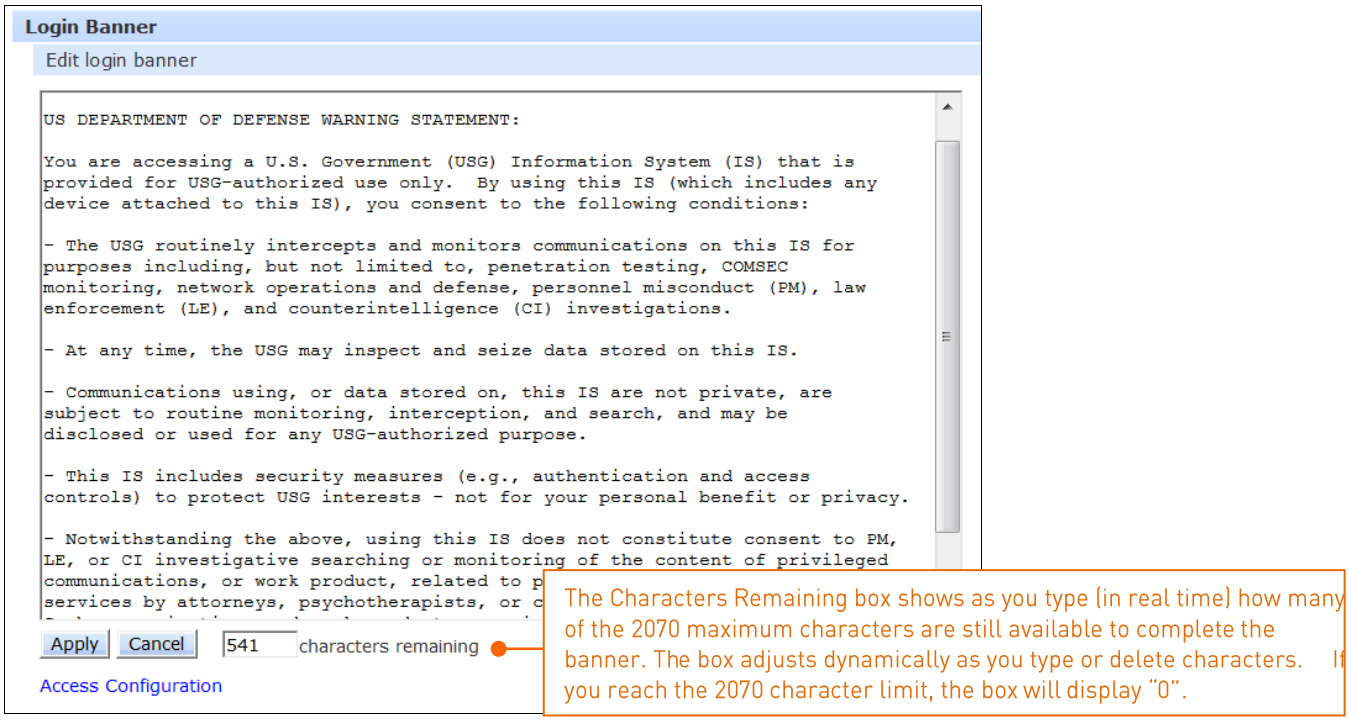
Both the Local Administrator Account drop-down and the Configuration Reset Button turn the other field on if one of them has an Optional setting or is unchecked (disabled).

Note: For PRO1/PRO2 units only. If LDAP, TACACS+, or RADIUS is unreachable, or if LDAP, TACACS+, or RADIUS parameters have changed, you may not be able to log into the unit.

1. Strong Passwords: From the drop-down menu, select Optional or Required. The PRO1/PRO2 supports strong passwords for enhanced system security. From the Strong Passwords drop-down menu, select Optional or Required. If Required, the strong password requirement is applied against all new passwords with the following rules:
   - Minimum of 8 characters long, at least one uppercase letter, at least one lowercase letter, one number, and one special character.
   - When a strong password is changed, a minimum of four characters positions must be changed to define the new password.
2. Custom CLI Prompt: Type a custom text string for the Command Line Interface (CLI) prompt, or leave blank for the default prompt "Switched PDU:"
3. CLI Session Timeout: Enter a timeout period (in minutes). The valid timeout range is 1 to 1440 minutes (24 hours); the default is 5 minutes.
4. Web Session Timeout: Enter a timeout period (in minutes). The valid timeout range is 1 to 1440 minutes (24 hours); the default is 5 minutes.
5. Web Log Entries Per Page: Set the number of entries displayed on the system log, from 10 to 250.
6. Default Log Order: From the drop-down menu, specify the order of the event entries on the system log – oldest events or newest events displayed first in the log.
7. StartUp Stick: Check (or uncheck) to enable (or disable) StartUp Stick®. StartUp Stick is a separate Server Technology tool for streamlining the mass configuration of PDU operating parameters.
8. Click **Apply**.

Login Banner:

Clicking the Login Banner link displays a blank banner edit window. The following example shows a custom message:



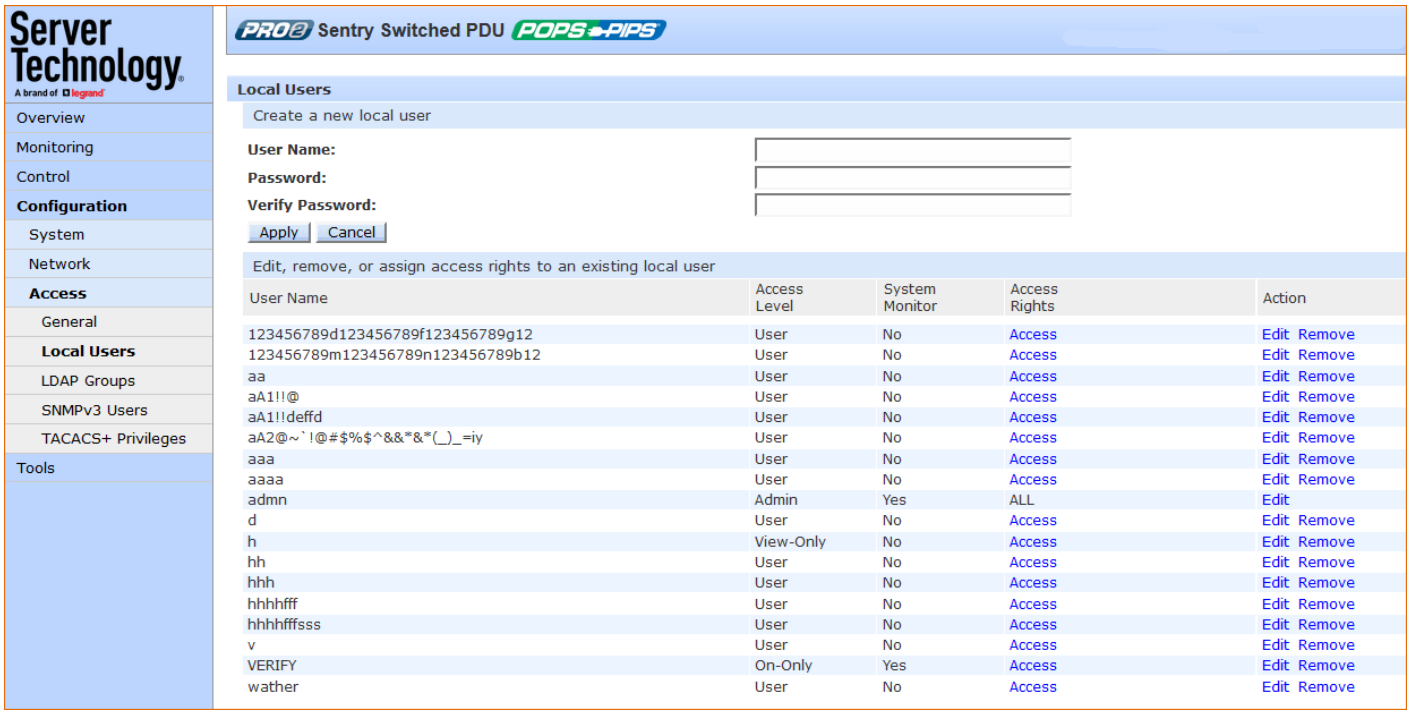
Type the banner text and click **Apply**. To clear the typed entry and start over, click **Cancel**.

Notes:

- The login banner can be up to 2070 characters long and will be displayed prior to the login prompt.
- If the login banner is left blank, the user will be taken directly to the login prompt.
- For an SSH connection, the banner length is truncated to 1500 bytes in SSH packets to avoid failure of the SSH connection when configured with a long text banner.

Access > Local Users

The **Local Users** page allows the administrator to manage options for local users, including creating new users, changing user passwords, setting user access level, and granting user access to various resources of the PDU.



To create a new local user:

1. In the User Name field, type a 1-32 character user name; no spaces; user names are not case-sensitive.
2. Type the user's password; type a 1-32 character password; ASCII 33 to 126 decimal characters are allowed; passwords are case-sensitive.
3. Verify the password.
4. Click **Apply**.

To grant access rights to a user:

1. For the user name displayed in the list, click the Access link. The Local User Access page displays to allow granting access rights to selected PDU monitors, remote ports, outlet groups, and individual outlets by checking corresponding checkboxes. To deny access to an individual resource, uncheck the related checkbox. To grant (or deny) access to all resources in a displayed group, click All or None.
2. Click **Apply**.

To set a user's access level:

1. For the user name displayed in the list, click the Edit link. The Local User Edit page displays.
2. From the Access Level drop-down menu, select the desired user access level as described in the table below.
3. Click **Apply**.

User Access Level (highest to lowest)	Description
Administrator	Administrative user; Full access for all configuration, all outlet power control actions (On, Off, Reboot), status, and serial/pass-thru ports.
Power User	Full access for all outlet power control actions (On, Off, Reboot), status, and serial/pass-thru ports. **Note:** The Power User does not have access to user management.
User	Partial access for outlet power control actions (On, Off, Reboot), status, and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.
Reboot-Only User	Partial access for outlet power control actions (Reboot), status, and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.
On-Only User	Partial access for outlet power control actions (On), status, and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.
View-Only User	Partial access for status and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.
System Monitor	Access to all "stat" commands on the Command Line Interface (CLI).

To change a user's password:

1. For the user name displayed in the list, click the Edit link. The Local User Edit page displays.
2. Type the user's new password; type a 1-32 character password; ASCII 33 to 126 decimal characters are allowed; passwords are case-sensitive.
3. Verify the new password.
4. Click **Apply**.

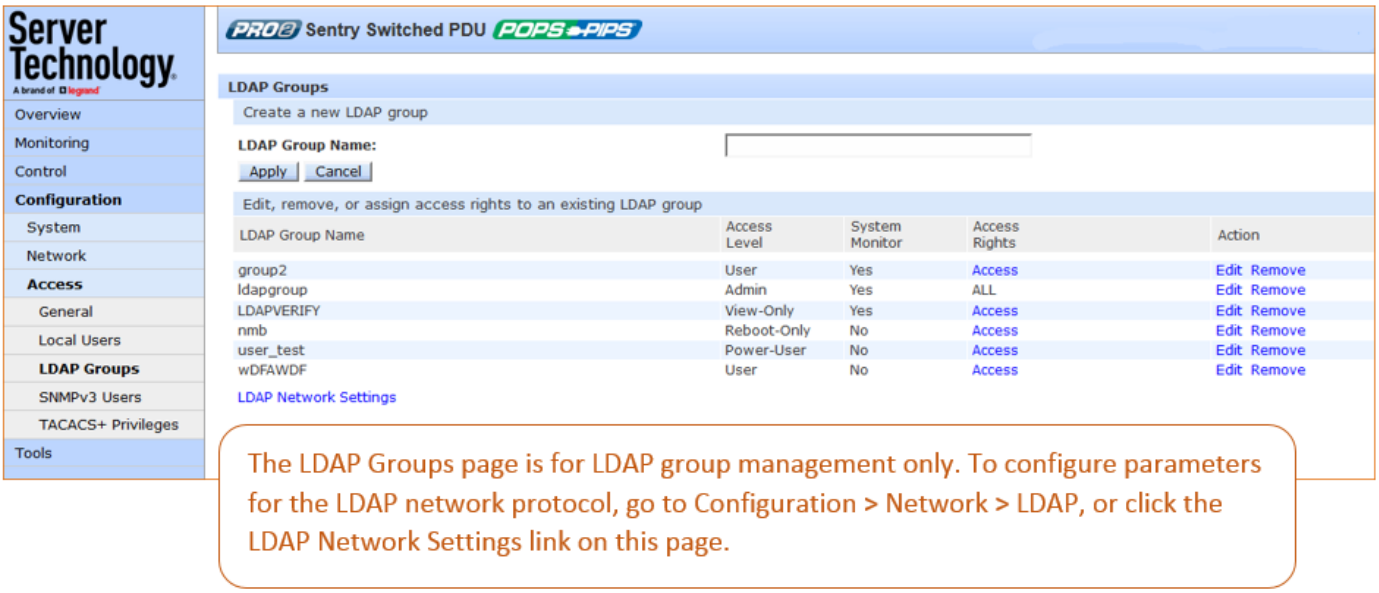
To delete a local user:

1. For the user name displayed in the list, click the Remove link. You will be prompted with a confirmation for the delete action.
2. Click **OK** or **Cancel**.

Note: The **admn** default administrator account cannot be removed unless administrative access has already been granted to another administrative account.

Access > LDAP Groups

The **LDAP Groups** page allows the administrator to manage options for LDAP user groups, including creating new LDAP groups, establishing the LDAP group access level, and granting LDAP group access to various resources of the PDU.



To create a new LDAP group:

1. In the LDAP Group Name field, type a 1-32 character LDAP group name; no spaces; LDAP group names are not case-sensitive.
2. Click **Apply**.

To grant access rights to an LDAP group:

1. For the LDAP group name displayed in the list, click the Access link. The LDAP Group Access page displays to allow granting access rights to selected PDU monitors, remote ports, outlet groups, and individual outlets by checking corresponding checkboxes. To deny access to an individual resource, uncheck the related checkbox. To grant (or deny) access to all resources in a displayed group, click All or None.
2. Click **Apply**.

To set an LDAP group's access level:

1. For the LDAP group name displayed in the list, click the Edit link. The LDAP Group Edit page displays.
2. From the Access Level drop-down menu, select the desired user access level as described in the table below.
3. Click **Apply**.

User Access Level (highest to lowest)	Description
Administrator	Administrative user; Full access for all configuration, all outlet power control actions (On, Off, Reboot), status, and serial/pass-thru ports.
Power User	Full access for all outlet power control actions (On, Off, Reboot), status, and serial/pass-thru ports. **Note:** The Power User does not have access to user management.
User	Partial access for outlet power control actions (On, Off, Reboot), status, and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.
Reboot-Only User	Partial access for outlet power control actions (Reboot), status, and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.
On-Only User	Partial access for outlet power control actions (On), status, and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.
View-Only User	Partial access for status and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.
System Monitor	Access to all "stat" commands on the Command Line Interface (CLI).

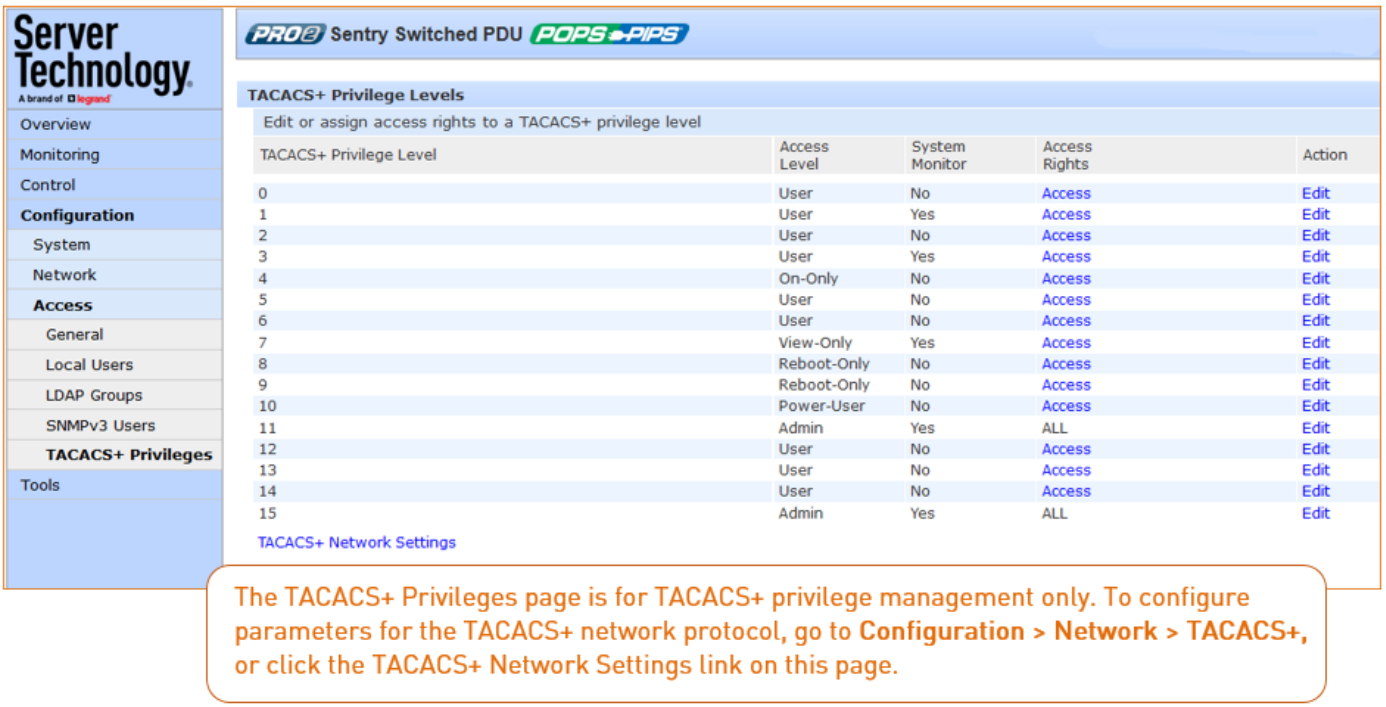
To delete an LDAP group:

1. For the LDAP group name displayed in the list, click the Remove link. You will be prompted with a confirmation for the delete action.
2. Click **OK** or **Cancel**.

Access > TACACS+ Privileges

The **TACACS+ Privileges** page allows the administrator to manage options for TACACS+ user groups, including establishing TACACS+ privilege levels and granting TACACS+ privilege level access to various areas of the PRO1/PRO2.

Note: The PDU supports 16 different TACACS+ privilege levels with 15 configurable levels and 1 level ("0") reserved by default for administrator-level access to all PDU resources.



To set a TACACS+ privilege level:

1. For the TACACS+ Privilege Level displayed in the list, click the Edit link. The TACACS+ Privilege Level Edit page displays.
2. From the Access Level drop-down menu, select the desired user access level as described in the table below.
3. Click **Apply**.

User Access Level (highest to lowest)	Description
Administrator	Administrative user; Full access for all configuration, all outlet power control actions (On, Off, Reboot), status, and serial/pass-thru ports.
Power User	Full access for all outlet power control actions (On, Off, Reboot), status, and serial/pass-thru ports. **Note:** The Power User does not have access to user management.
User	Partial access for outlet power control actions (On, Off, Reboot), status, and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.
Reboot-Only User	Partial access for outlet power control actions (Reboot), status, and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.
On-Only User	Partial access for outlet power control actions (On), status, and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.
View-Only User	Partial access for status and pass-thru of assigned outlets, outlet groups, and serial/pass-thru ports.
System Monitor	Access to all "stat" commands on the Command Line Interface (CLI).

To grant access rights to a TACACS+ privilege level:

1. For the TACACS+ Privilege Level displayed in the list, click the Access link. The TACACS+ Privilege Level Access page displays to allow granting access rights to selected PDU monitors, remote ports, outlet groups, and individual outlets by checking corresponding checkboxes. To deny access to an individual resource, uncheck the related checkbox. To grant (or deny) access to all resources in a displayed group, click All or None.
2. Click **Apply**.

Tools (Using Support Functions)

The **Tools** section of the Web interface is a collection of several utility options for miscellaneous system actions: changing user password, pinging other network devices, viewing the system/debug log, and uploading new firmware versions.

Also included are several options for rebooting the PDU, resetting the PDU to factory defaults, and restarting the PDU with user preferences.

Tools > Change Password

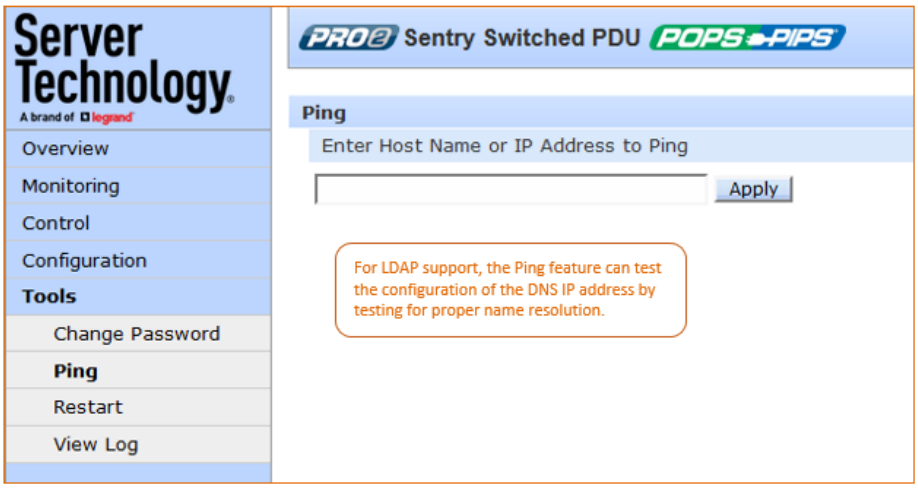
This **Change Password** option allows firmware users to change their own passwords.

To change your password:

1. Type your current password, your new password, and verify the new password.
2. Click **Apply**.

Tools > Ping

The **Ping** option tests the ability of the PDU to contact the IP address of another Ethernet-enabled device.



To issue a ping:

1. Type the hostname/IP address to ping (IPv4 or IPv6 format).
2. Click **Apply** (or press **Enter**).

   If the ping was successful, a responding message is displayed, similar to:

   10.1.1.70 is responding (<1ms)

Tools > Restart

The **Restart** option offers several options for restarting the PDU.

To initiate a system restart:

1. From the Action drop-down menu, select a restart option as described in the table below.
2. Click **Apply**.

Restart Options for the PRO1/PRO2:

Note about unit persistence:

The PRO1/PRO2 products support unit persistence. This means that if a link unit is connected to a master unit, and the link unit is disconnected (powered down or accidentally disconnected), and the master unit is restarted, the link unit will be reported as "Not Found" after the restart because the link unit is no longer physically connected to the master.

However, the association between the master/link units is retained to allow the continuation of alerts. If the disconnected link unit is physically re-connected to the master, the "Not Found" status will return to "Normal" status.

To intentionally remove a link unit from connection with a master unit, the link unit must be purged using the Purge function.

Unit persistence affects **all connected master/link units** whether or not they are connected in a multi-linking configuration.

This restart option …	performs this action on the PRO1/PRO2 …
Restart	Performs a warm boot; system user/outlet/outlet group configuration settings and outlet states are **not** changed or reset with the **restart** command.
Restart and reset to factory defaults	Resets the non-volatile RAM where configuration values are stored. This option clears all administrator-editabled fields and resets all CLI configurable options to their factory default values, including all user accounts. Resetting the PDU to factory default values also resets all TCP/IP and Telnet/Web configurations. Reconfiguring TCIP/IP and Telnet/Web settings is required.
Restart and reset to factory defaults, except network	Same action as "Restart and reset to factory defaults" described directly above, but network protocol settings are **not** changed.
Restart and download firmware via FTP	New versions of firmware can be uploaded using FTP. To begin an FTP upload session, you must first configure the FTP host address, username/password, filename, and filepath. When initiating an FTP upload session, the PDU restarts and uploads the firmware file specified with the FTP filename command from the previously configured FTP host.
Restart and generate a new X.509 certificate	Generates a new X.509 certificate issued and signed by a certificate-authority.
Restart and compute new SSH keys	Generates new private and public SSH keys with the proper location and permisssion.

About the Reset Button on the PRO1/PRO2 Unit:

The PDU is designed with a **Reset** button on the hardware unit that can be used when a forgotten firmware password prevents logging into the unit. The **Reset** button sets all configuration values back to factory default settings, allowing the administrator to retrieve the admn/admn default administrator login.

To access the button on the unit, you need a non-conductive metallic tool that fits inside the recess. If you press and hold the **Reset** button on the unit for more than 15 seconds, the reset action will terminate.

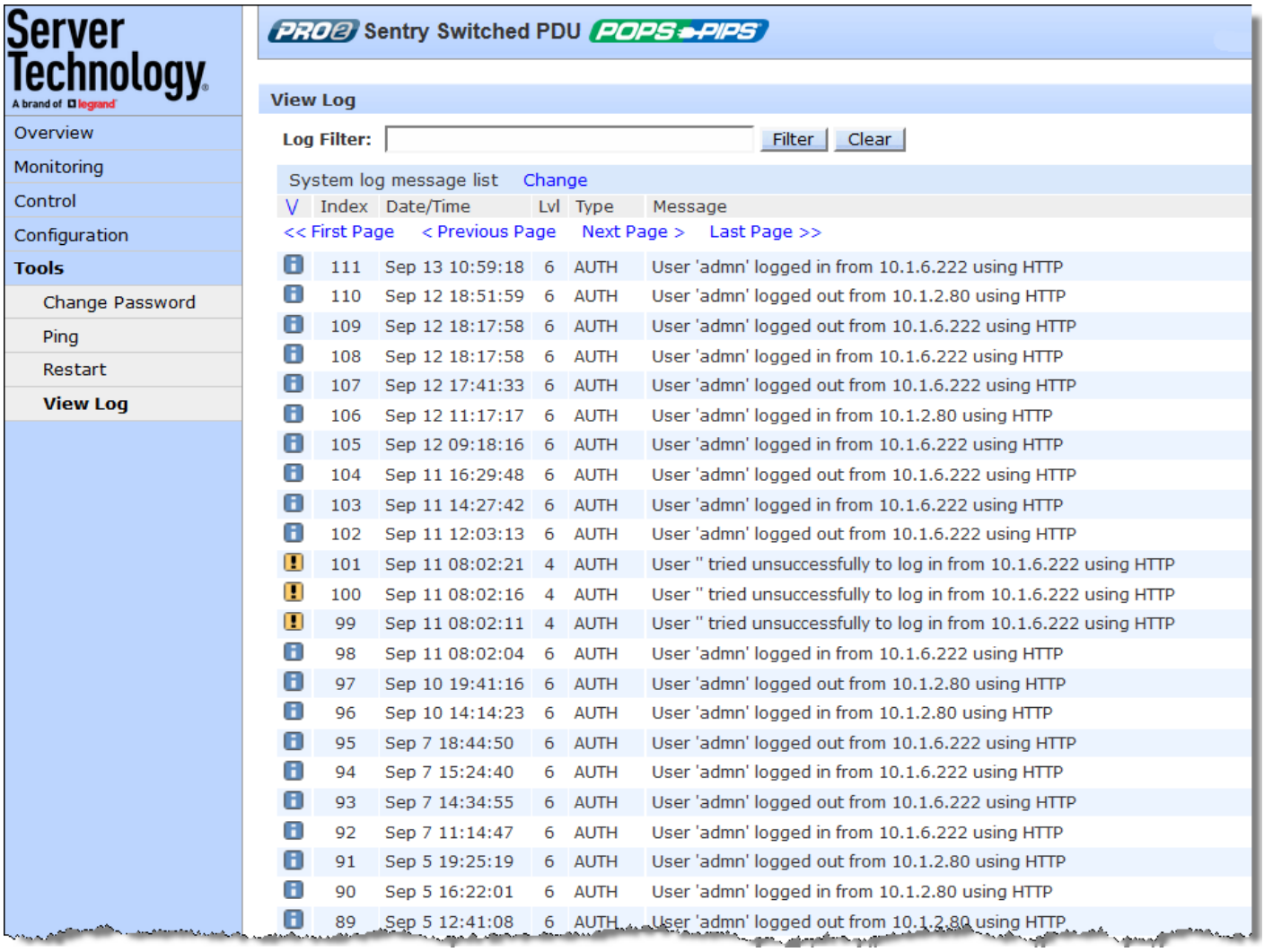
Note: This method of physical access to the unit will not work if the **Reset** button has already been disabled by the administrator through the firmware GUI at **Configuration > Access > General > Configuration Reset Button**, or through the firmware CLI with the **set access button [enabled/disabled]** command. For security, the administrator can choose to disable the button through firmware to inhiibit a user from causing a reset on the unit.

Tools > View Log

The View Log option displays the internal system log message list or debug log message list for viewing by the administrative user. System memory stores more than 4,000 entries in a continuously aging log. For permanent off-system log storage, the Syslog protocol is supported.

The System Log

The system log records all authentication attempts, power actions, configuration changes, and other system events, and also supports email notifications.

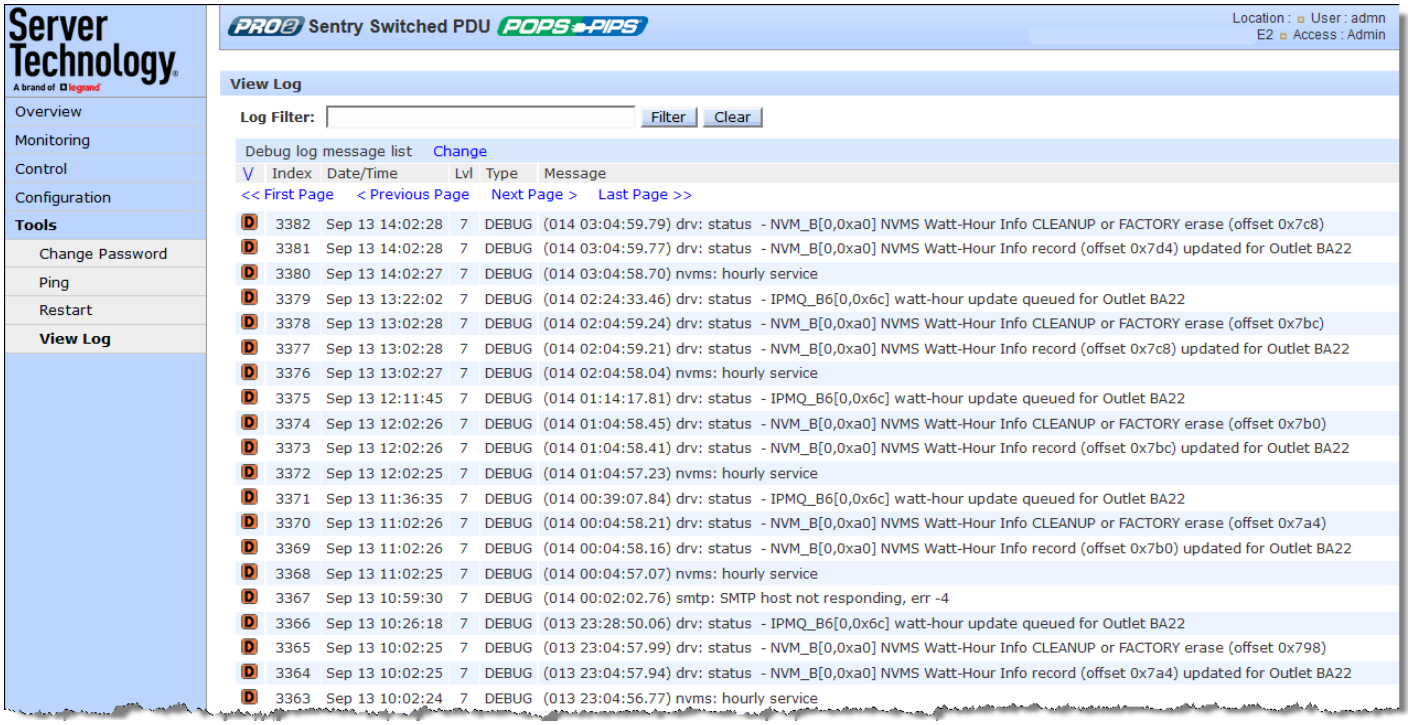


System log status icons:

	Normal Status
	Configuration Change
	Low/High Warning
	Low/High Alarm
	No Communication

The Debug Log

The Debug log displays a record of debugging statements and activities.



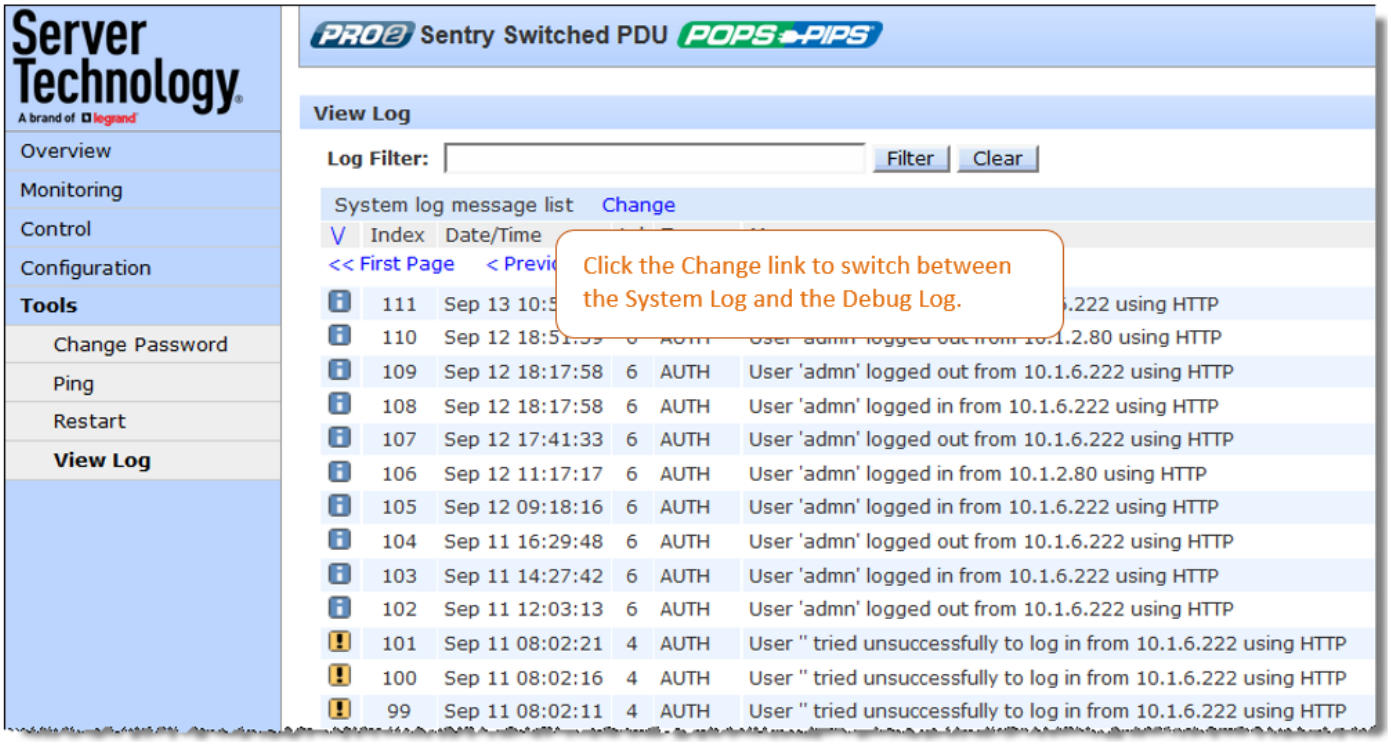
The Debug Log functions the same as the System log with the following exceptions:

- The only log type (noted in the Type column) is DEBUG.
- The only icon displayed on log entries indicates a debug entry: D.

Changing Log View

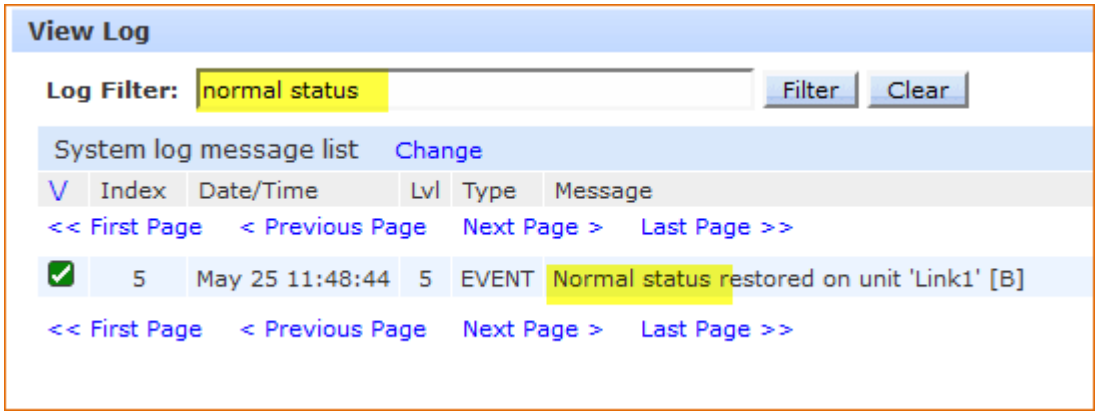
Either the System log or Debug log can be switched to the other log. To switch between logs, click the Change link as shown in the following example.

If you have a filter in place, such as "admn", and you change log views, the "admn" filter will stay in place and continue to filter on the changed log.



Filtering Logs

You can filter the System Log and Debug log to list returned entries for a specific search.



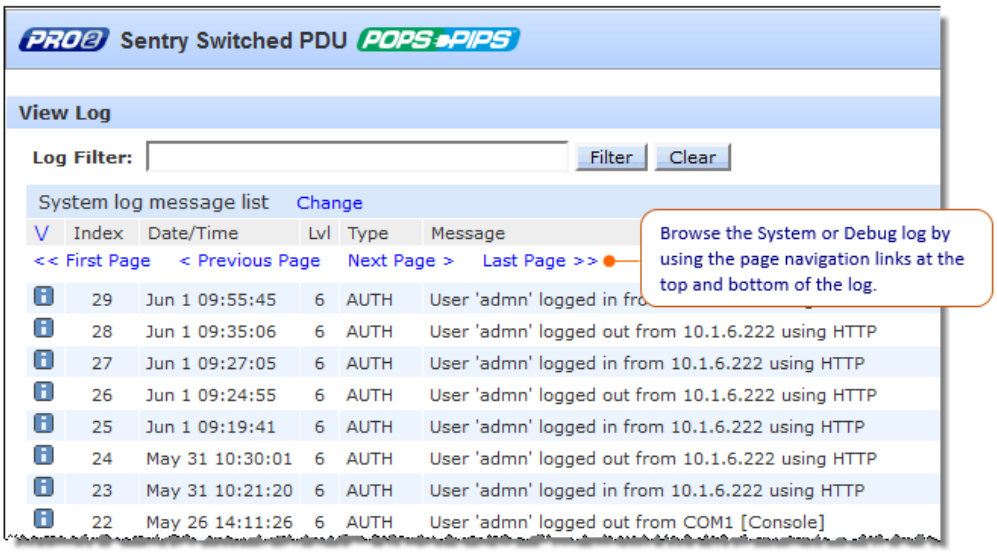
To filter a log:

1. Type a text string in the Log Filter box, such as "normal status" highlighted in the example above, and click the **Filter** button.
2. The log is searched by the entered text and displays only the matching entries. Note the highlighted "Normal status" returned in the filtered log.
3. To clear the filtered page and return to a full log, click the **Clear** button.

Log Filter Persistence: If you have a filter in place on either the System log or the Debug log, and you change views from one log to the other log using the Change link, your filter will stay in place on the changed log and will continue to filter. You can still change logs or clear the filter at any time.

Navigating the Logs

Navigation links for first, previous, next, and last page are available at the top and bottom of both logs.



Working with Log Headings

Sorting system log entries:

The entries in the System and Debug log can be displayed in ascending or descending order (based on the internal index number in the Index column) by clicking one of the following icons:

For ascending order, click  . For descending order, click  .

About the index:

The index number is assigned internally to control the sequence and identity of displayed System or Debug log entries. The Index cannot be user-edited.

Date/Time stamp:

The date and time stamp records the details of the system event timeframe. To display the date/time stamp, SNTP server support must be configured.

Level (Lvl):

Indicates the level of the status icons displayed in the System Log.

Type:

The System log supports the following types of event messages:

AUTH: All attempts to authenticate

CONFIG: All changes in system configuration

EVENT: All general system events, for example, exceeded threshold limits

POWER: All requests for a power state change

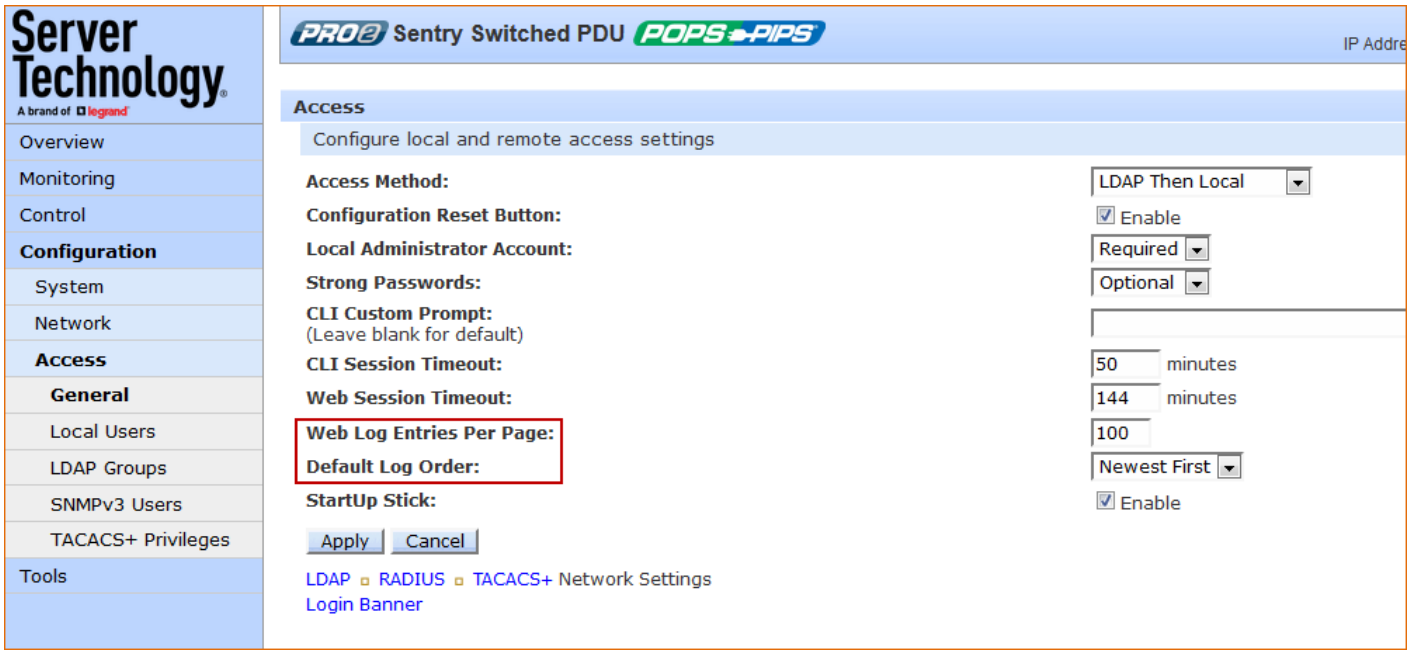
Note: The Debug log supports only one type of event message: DEBUG.

Message Text:

A text line that describes the detailed parameters of the event. For the System log, If the event is associated with a user, the user's name will be included in the message text.

Setting Options for Log Viewing

Viewing options for the System Log are set on the **Configuration > Access** page:



- **Web Log Entries Per Page**: Specifies the number of entries displayed on the System Log and the Debug Log. The maximum number of entries in the Debug Log can be set to 4,000. If the total number of entries exceed the maximum entries allowed, then Syslog will be used.
- **Default Log Order:** Sets the display of the Debug Log to the newest entry first or the oldest entry first.

Chapter 8: Using the Command Line Interface (CLI)

This chapter shows how to work with the firmware CLI (version 8.0x or later) for the PRO1/PRO2 products

Note: Certain CLI commands documented in this chapter may not apply to a Smart PDU or to non-POPS PDUs.

Logging In

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

A login 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 of 300, 1200, 2400, 4800, 9699, 19200, 38400, 57600, or 115200 bps (default rate is 9600); 8 data bits-no parity, 1 stop bit, and device ready output signal (DTR or DSR).

To login by Telnet or RS232 (CLI):

At the command prompt, initiate a Telnet session (telnet [IP address]). The Telnet session automatically opens the login prompt, showing the current product and firmware version.

```
Sentry Switched PDU Version 8.0g

Username: admn
Password:

Location: STIC input again and again

Switched PDU:
```

The default administrative-level user login (admn/admn) was used for this example.

Press **Enter**.

The command line prompt, such as "Switched PDU:" (for Power Distribution Unit) in this example, displays for the PRO1/PRO2 product, and you are now logged into the firmware Command Line Interface (CLI).

If a location identifier was user-defined, that location will also be displayed, as shown in the example.

Quick Tour of the Command Line

The features and requirements of the command line are presented in this section.

Running Commands

To run a command, type the command, and while it is displayed on the command line, press **Enter**.

When a command is used to edit configuration settings, the values will be updated immediately.

Commands can be typed in any combination of uppercase and lowercase characters. All characters in the command must be entered correctly and command abbreviations are invalid.

If an invalid command or an incorrectly typed command is entered, one of the following messages displays:

- "Invalid parameter" with a display of the correct menu options, or
- "[command] is not recognized as an internal or external command, operable program, or batch file."

Using the Escape (ESC) Feature

At any time during the typing of a command, press ESC to cancel and clear all typed characters from the command line.

Even when setting a user password or other command where a specific prompt has displayed, pressing ESC quickly cancels the displayed prompt and the typed command.

Using CTRL-C to Cancel Commands

CLI command operations can be cancelled by using the keys CTRL-C, where applicable.

Editing Commands

Several editing actions are available when typing a command:

This edit action...	does this on the command line...
Left Arrow ←	Moves cursor to the left to correct a typed character.
Right Arrow →	Moves cursor to the right to correct a typed character.
Backspace Key	Deletes typed command one character at a time.
Insert Key	Inserts a character in the command.
Delete Key	Deletes a character in the command.
Home Key	Moves to the first character of the command.
End Key	Moves to the last character of the command.
Esc	Clears typed characters from the command line.
CRTL-C	Cancels CLI operations, where applicable.

Retrieving Command History

The CLI provides a command history feature for the last X commands entered, using the **Up** and **Down** keys.

To display a previously entered command, press the ↑ arrow key. After the ↑ arrow key has been pressed, you can then press the ↓ arrow key to display a previously entered command in reverse order. Pressing the keys displays one command at a time.

To erase the command history, press **Esc**.

Displaying the Command Menu

The main menu of valid top-level commands can be displayed at any time during a CLI session.

At the command prompt, do one of the following:

- Type **help** and press **Enter**
- Type **?** and press **Enter**

Example:

```
Switched PDU: help

  Switched PDU commands:

    add  bstat  connect  create  cstat  delete  dir  list  login  logmon
    logout  lstat  ocpstat  off  on  ostat  password  ping  pstat  reboot
    remove  restart  senstat  set  show  shutdown  status  sysstat  upsstat
    ustat  version
```

Example:

```
Switched PDU: ?

  Switched PDU commands:

    add  bstat  connect  create  cstat  delete  dir  list  login  logmon
    logout  lstat  ocpstat  off  on  ostat  password  ping  pstat  reboot
    remove  restart  senstat  set  show  shutdown  status  sysstat  upsstat
    ustat  version
```

Displaying the Submenus

To view submenus of valid options for a command, type the main command and press Enter:

Example:

```
Switched PDU: set

  'set' menu options:

    access  banner  bluetooth  branch  config  cord  dhcp  dns  email
    energywise  feature  ftp  http  https  ipv4  ipv6  ldap  ldapgroup  line
    loadshed  location  net  ocp  outlet  phase  port  radius  sensor  snmp
    sntp  spm  ssh  syslog  tacacs  tacpriv  telnet  unit  ups  user
```

Example::

```
Switched PDU: show

  'show' menu options:

    access  bluetooth  branches  config  cords  email  energywise  features
    ftp  ldap  lines  loadshed  log  network  ocps  outlets  phases  ports
    radius  sensors  shutdown  snmp  sntp  syslog  system  tacacs  units  ups
```

Command Syntax Notes

The following conventions apply to the command syntax shown in the Command Details section:

[argument] mandatory argument that is not prompted for.

[*argument*] optional argument that is not prompted for.

<argument> argument that will be prompted for if not specified on the command line.

{argument} argument that can only be prompted for.

Example (set access command):

set access

Sets user access configurations.

Command Syntax

set access button [disabled | enabled]
set access clitimeout <value>
set access localadmin [required | optional]
set access logorder [newest | oldest]
set access method [localonly | ldaponly | ldaplocal | radiusonly | radiuslocal | tacacsonly | tacacslocal]
set access prompt <prompt string>
set access strongpw [optional | required]
set access webloglen <value>
set access webtimeout <value>

List of Commands

Click a linked command name in the following table to display detailed information about using the command.

Command	Description
Add Commands	**The Add command group adds control access for outlets/outlet groups, and connection pass-thru to specified ports for LDAP, TACACS+, and local users.**
add grouptoldap	Adds control access for an outlet group to an LDAP group.
add grouptotacacs	Adds control access for an outlet group to a TACACS+ privilege level.
add grouptouser	Adds control access for an outlet group to a local user.
add outlettogroup	Adds control access for an outlet to an outlet group.
add outlettoldap	Adds control access for an outlet to an LDAP group.
add outlettotacacs	Adds control access for an outlet to a TACACS+ privilege level.
add outlettouser	Adds control access for an outlet to a local user.
add porttoldap	Adds access to use a connection pass-thru to a specified port to an LDAP group.
add porttotacacs	Adds access to use a connection pass-thru to a specified port to a TACACS+ privilege level.
add porttouser	Adds access to use a connection pass-thru to a specified port to a local user.
bstat	Displays the latest status and metrics for all branches in the system.
connect	Redirects the current CLI session to the target port.
Create Commands	**The Create command group creates new outlet groups, LDAP groups, UPS devices, and local users.**
create group	Creates a new outlet group.
create ldapgroup	Creates a new LDAP group.
create snmpuser	Adds a new SNMPv3 user.
create ups	Creates a new uninterruptable power supply (UPS).
create user	Creates a new local user.
cstat	Displays the latest status and metrics for all cords in the system.
Delete Commands	**The Delete command group deletes access for outlets, outlet groups, and connection pass-thru to a specified port from LDAP groups, TACACS+ privilege levels, and local users.**
delete groupfromldap	Deletes control access for an outlet group from an LDAP group.

Command	Description
delete groupfromtacacs	Deletes control access for an outlet group from a TACACS+ privilege level.
delete groupfromuser	Deletes control access for an outlet group from a local user.
delete outletfromgroup	Deletes control access for an outlet from an outlet group.
delete outletfromldap	Deletes control access for an outlet from an LDAP group.
delete outletfromtacacs	Deletes control access for an outlet from a TACACS+ privilege level.
delete outletfromuser	Deletes control access for an outlet from a local user.
delete portfromldap	Deletes access to use a connection pass-thru to a specified port from an LDAP group
delete portfromtacacs	Deletes access to use a connection pass-thru to a specified port from a TACACS+ privilege level.
delete portfromuser	Deletes access to use a connection pass-thru to a specified port to a local user.
dir	Directory; displays the contents of the active working path in the file system.
List Commands	**The List command displays outlets in an outlet group, users, user groups, outlets, ports, and TACACS+ privileges.**
list group	Lists the outlets that are collected in an outlet group.
list groups	Lists all outlet groups.
list ldapgroup	Lists the access level of an LDAP group and any outlet groups, outlets, and ports assigned to that LDAP group.
list ldapgroups	Lists all LDAP groups.
list outlets	Lists all outlets.
list ports	Lists all ports.
list snmpuser	Lists all details for an SNMPv3 user (or all users).
list snmpusers	Lists access level and authentication method for all SNMPv3 users.
list tacpriv	Lists the access level of a TACACS+ privilege level and any outlet groups, outlets, and ports assigned to that TACACS+ privilege level.
list tacprivs	Lists all TACACS+ privilege levels.
list ups	Lists configurations for all UPS's.
list upss	Displays all UPS's.
list user	Lists the access level of a local user and any outlet groups, outlets, and ports assigned to that user.

Command	Description
list users	Lists all local users.
login	Performs system login and access verification.
logmon	Displays the system log (monitor) messages in the CLI session as they occur.
logout	Quits the current CLI session.
lstat	Displays the latest status and metrics for all lines in the system.
ocpstat	Displays the latest status and metrics for all over-current protectors (OCPs) in the system.
off	Turns off the specified outlet or outlet group. **Note:** For Switched products only.
on	Turns on the specified outlet or outlet group. **Note:** For Switched products only.
ostat	Displays the latest status and metrics for all outlets in the system.
password	Changes the password for the current local user.
ping	Tests the ability of the PDU to contact an IP address for another Ethernet-enabled device.
pstat	Displays the latest status and metrics for all phases in the system.
reboot	Turns off the specified outlet or outlet group, and then turns it back on after a delay. **Note:** For Switched products only.
Remove Commands	**The Remove command group removes outlet groups, LDAP groups, UPS devices, and local users from the system.**
remove group	Removes an outlet group from the system.
remove ldapgroup	Removes an LDAP group from the system.
remove snmpuser	Removes an SNMPv3 user from the system.
remove ups	Removes a UPS from the system.
remove user	Removes a local user from the system.
restart	Restarts the system.
senstat	Displays the latest status and metrics for all sensors in the system.
Set Commands	**The Set command group sets the configuration values for numerous system areas.**
set access	Sets user configuration access.
set banner	Sets the system banner that displays before a user authenticates a user session.
set bluetooth	Sets Bluetooth® configuration values.

Command	Description
set branch	Sets branch configuration values.
set cord	Sets cord configuration values.
set dhcp	Sets DHCP configuration values.
set dns	Sets Domain Name System (DNS) server configuration values.
set email	Sets email configuration values.
set energywise	Sets Cisco EnergyWise configuration values.
set feature	Enables new system features.
set ftp	Sets FTP configuration values.
set http	Sets HTTP configuration values.
set https	Sets HTTPS configuration values.
set ipv4, set ipv6	Sets IPv4 and IPv6 configuration values.
set ldap	Sets LDAP configuration values.
set ldapgroup	Sets configuration values for LDAP group access rights.
set line	Sets line configuration values.
set loadshed	Sets Smart Load Shedding configuration values. **Note:** Only available if the Smart Load Shedding feature is activated.
set location	Sets the system location string.
set net	Sets network mode configuration values.
set ocp	Sets over-current protector (OCP) configuration values.
set outlet	Sets outlet configuration values.
set phase	Sets phase configuration values.
set port	Sets serial port configuration values.
set radius	Sets Radius server configuration values.
set sensor	Sets sensor configuration values.
set snmp	Sets SNMP configuration values.
set snmpuser	Sets SNMPv3 user configuration values.

Command	Description
set sntp	Sets SNTP configuration values.
set spm	Sets Sentry Power Manager (SPM) access configuration values.
set ssh	Sets SSH configuration values.
set syslog	Sets Syslog configuration values.
set tacacs	Sets TACACS+ server configuration values.
set tacpriv	Sets TACACS+ configuration values for privilege level access rights.
set telnet	Sets Telnet configuration values.
set trend	Sets power trending configurations.
set unit	Sets configuration values.
set ups	Sets UPS device configuration values.
set user	Sets configuration values for local user access rights.
set web	Sets configuration parameters for Web services.
set wlan	Sets the wireless network configuration (for the WLAN solution on specific Wi-Fi capable units).
set ztp	Sets the Zero Touch Provisioning (ZTP) feature and related parameters.
Show Commands	**The Show command group displays the current configuration values in the system.**
show access	Shows user access configuration values.
show bluetooth	Shows Bluetooth configuration values.
show branches	Shows branch configuration values.
show cords	Shows cord configuration values.
show email	Shows email configuration values.
show energywise	Shows Cisco EnergyWise configuration values.
show features	Shows the enabled system features.
show ftp	Shows FTP configuration values.
show ldap	Shows LDAP configuration values.
show lines	Shows line configuration values.

Command	Description
show loadshed	Shows Smart Load Shedding configuration values. **Note:** Only available if the Smart Load Shedding feature is activated.
show log	Shows the system event log.
show network	Shows network configuration values.
show ocps	Shows over-current protector (OCP) configuration values.
show outlets	Shows outlet configuration values.
show phases	Shows phase configuration values.
show ports	Shows port configuration values.
show radius	Shows Radius server configuration values.
show sensors	Shows sensor configuration values.
show shutdown	Shows outlet shutdown configuration values. **Note:** For Switched products only.
show snmp	Shows SNMP configuration values.
show sntp	Shows SNTP configuration values.
show syslog	Shows Syslog configuration values.
show system	Shows system uptime, firmware version, firmware build information, boot version, number of active users, and location string.
show tacacs	Shows TACACS+ configuration values.
show trend	Shows power trending configurations.
show units	Shows configuration values.
show waps	Displays the available wireless access points (for the WLAN solution on specific Wi-Fi capable units).
show wlan	Displays the wireless network configurations (for the WLAN solution on specific Wi-Fi capable units).
show ztp	Displays the Zero Touch Provisioning (ZTP) network configurations.
shutdown	Turns off a specified outlet or outlet group after performing a user-specified shutdown operation. **Note:** For Switched products only.

status	Displays the latest status and control state for a specified outlet or outlet group. **Note:** For Switched products only.
sysstat	Displays the count of all system objects (by type), the latest status of the objects, and the count of objects currently in an event condition.
upsstat	Displays the latest status and metrics for all UPS devices in the system.
ustat	Displays the latest status and metrics for all units in the system.
version	Displays the current firmware version.

Command Details

add grouptoldap

Adds control access for an outlet group to an LDAP group.

Command Syntax

add grouptoldap <group name | ALL> <LDAP group name>
add gtl <group name | ALL> <LDAP group name>

Command Access

Admin level only

add grouptotacacs

Adds control access for an outlet group to an TACACS+ privilege level.

Command Syntax

add grouptotacacs <group name | ALL> <TACACS+ privilege level>
add gtt <group name | ALL> <TACACS+ privilege level>

Command Access

Admin level only

add grouptouser

Adds control access for an outlet group to a local user.

Command Syntax

add grouptouser <group name | ALL> <local user name>
add gtu <group name | ALL> <local user name>

Command Access

Admin level only

add outlettogroup

Adds control access for an outlet to an outlet group.

Command Syntax

add outlettogroup <outlet name | id | ALL> <group name>
add otg <outlet name | id | ALL> <group name>

Command Access

Admin level only

add outlettoldap

Adds control access for an outlet to an LDAP group.

Command Syntax

add outlettoldap <outlet name | id | ALL> <LDAP group name>
add otl <outlet name | id | ALL> <LDAP group name>

Command Access

Admin level only

add outlettotacacs

Adds control access for an outlet to a TACACS+ privilege level.

Command Syntax

add outlettotacacs <outlet name | id | ALL> <TACACS+ privilege level>
add ott <outlet name | id | ALL> <TACACS+ privilege level>

Command Access

Admin level only

add outlettouser

Adds control access for an outlet to a local user.

Command Syntax

add outlettouser <outlet name | id | ALL> <local user name>
add otu <outlet name | id | ALL> <local user name>

Command Access

Admin level only

add porttoldap

Adds access to use a connection pass-thru to a specified port to an LDAP group.

Command Syntax

add porttoldap <port name | id | ALL> <LDAP group name>
add ptl <port name | id | ALL> <LDAP group name>

Command Access

Admin level only

add porttotacacs

Adds access to use a connection pass-thru to a specified port to a TACACS+ privilege level.

Command Syntax

add porttotacacs <port name | id | ALL> <TACACS+ privilege level>
add ptt <port name | id | ALL> <TACACS+ privilege level>

Command Access

Admin level only

add porttouser

Adds access to use a connection pass-thru to a specified port to a local user.

Command Syntax

add porttouser <port name | id | ALL> <local user name>
add ptu <port name | id | ALL> <local user name>

Command Access

Admin level only

bstat

Displays the latest status and metrics for all branches in the system.

Command Syntax

bstat

Command Access

System Monitor access

connect

Redirects the current CLI session to the target port.

Command Syntax

connect <target port>

Command Access

Any access level for command; for user level lower than admin, access must be granted to a port for successful connection.

create group

Creates a new outlet group.

Command Syntax

create group <name>

Command Access

Admin level only

create ldapgroup

Creates a new LDAP group.

Command Syntax

create ldapgroup <name>

Command Access

Admin level only

create ups

Creates a new uninterruptable power supply (UPS).

Command Syntax

create ups <name | ups type |> <hostname>

Parameters

The **create ups** command uses the following parameters:

hostname	Hostname or IP address of the UPS.
ups type	Selects UPS type from list of manufacturers. (1-11).

Command Access

Admin level only

create snmpuser

Adds a new SNMPv3 user.

Note: Up to eight new users can be added to SNMPv3, each user with its own access rights.

Command Syntax

create <snmpuser>

Command Access

Admin level only

list snmpuser

Lists all details for an SNMPv3 user (or all users).

Command Syntax

list <snmpuser> | ALL

Command Access

Admin level only

list snmpusers

Lists the access level and authentication method for all SNMPv3 users.

Command Syntax

list <snmpusers>

Command Access

Admin level only

create user

Creates a new local user.

Command Syntax

create user <name> {password} {verify password}

Command Access

Admin level only

cstat

Displays the latest status and metrics for all cords in the system.

Command Syntax

cstat

Command Access

System Monitor access

delete groupfromldap

Deletes control access for an outlet group from an LDAP group.

Command Syntax

delete groupfromldap <group name | ALL> <LDAP group name>
delete gfl <group name | ALL> <LDAP group name>

Command Access

Admin level only

delete groupfromtacacs

Deletes control access for an outlet group from a TACACS+ privilege level.

Command Syntax

delete groupfromtacacs <group name | ALL> <TACACS+ privilege level>
delete gft <group name | ALL> <TACACS+ privilege level>

Command Access

Admin level only

delete groupfromuser

Deletes control access for an outlet group from a local user.

Command Syntax

delete groupfromuser <group name | ALL> <local user name>
delete gfu <group name | ALL> <local user name>

Command Access

Admin level only

delete outletfromgroup

Deletes control access for an outlet from an outlet group.

Command Syntax

delete outletfromgroup <outlet name | id | ALL> <group name>
delete ofg <outlet name | id | ALL> <group name>

Command Access

Admin level only

delete outletfromldap

Deletes control access for an outlet from an LDAP group.

Command Syntax

delete outletfromldap <outlet name | id | ALL> <LDAP group name>
delete ofl <outlet name | id | ALL> <LDAP group name>

Command Access

Admin level only

delete outletfromtacacs

Deletes control access for an outlet from a TACACS+ privilege level.

Command Syntax

delete outletfromtacacs <outlet name | id | ALL> <TACACS+ privilege level>
delete oft <outlet name | id | ALL> <TACACS+ privilege level>

Command Access

Admin level only

delete outletfromuser

Deletes control access for an outlet from a local user.

Command Syntax

delete outletfromuser <outlet name | id | ALL> <local user name>
delete ofu <outlet name | id | ALL> <local user name>

Command Access

Admin level only

delete portfromldap

Deletes access to use a connection pass-thru to a specified port from an LDAP group.

Command Syntax

delete portfromldap <port name | id | ALL> <LDAP group name>
delete pfl <port name | id | ALL> <LDAP group name>

Command Access

Admin level only

delete portfromtacacs

Deletes access to use a connection pass-thru to a specified port from a TACACS privilege level.

Command Syntax

delete portfromtacacs <port name | id | ALL> <TACACS+ privilege level>
delete pft <port name | id | ALL> <TACACS+ privilege level>

Command Access

Admin level only

delete portfromuser

Deletes access to use a connection pass-thru to a specified port to a local user.

Command Syntax

delete portfromuser <port name | id | ALL> <local user name>
delete pfu <port name | id | ALL> <local user name>

Command Access

Admin level only

dir

(Directory) Displays the contents of the active working path in the file system.

Command Syntax

.
dir [.]
dir [path] [volume]

Parameters

The **dir** command uses the following parameters.

"."	Displays the current path.
path	Specifies a path.
volume	(FLASH0 | RAM0)

Command Access

Admin level only

list group

Lists the outlets that are contained in an outlet group.

Command Syntax

list group <group name | ALL>

Command Access

Any access level

list groups

Lists all outlet groups.

Command Syntax

list groups

Command Access

Any access level

list ldapgroup

Lists access level of an LDAP group and any outlet groups, outlets, and ports assigned to that LDAP group.

Command Syntax

list ldapgroup <LDAP group name>

Command Access

Admin level only

list ldapgroups

Lists all LDAP groups.

Command Syntax

list ldapgroups

Command Access

Admin level only

list outlets

Lists all outlets.

Command Syntax

list outlets

Command Access

Any access level

list ports

Lists all ports.

Command Syntax

list ports

Command Access

Any access level

list tacpriv

Lists access level of a TACACS+ privilege level and any outlet groups, outlets, and ports assigned to that TACACS+ privilege level.

Command Syntax

list tacpriv <TACACS+ privilege level>

Command Access

Admin level only

list tacprivs

Lists all TACACS+ privilege levels.

Command Syntax

list tacprivs

Command Access

Admin level only

list ups

Displays configurations for all UPS's.

Command Syntax

list ups <name | ALL>

Command Access

Admin level only

list upss

Displays all UPS's.

Command Syntax

list upss

Command Access

Admin level only

list users

Lists all local users.

Command Syntax

list users

Command Access

Admin level only

list users

Lists all local users.

Command Syntax

list users

Command Access

Admin level only

login

Performs system login and access verification.

Command Syntax

login

Command Access

Any access level

logmon

Log Monitor. Displays the system log (monitor) messages in the CLI session as they occur.

Command Syntax

logmon [filter]

Parameters

The **logmon** command uses the following parameter.

filter	Keyword filter for log entries.

Usage Guidelines

The log monitor command runs until ESC or RETURN is pressed.

Command Access

Admin level only

logout

Quits the current CLI session.

Command Syntax

logout

Command Access

Any access level

lstat

Displays the latest status and metrics for all lines in the system.

Command Syntax

lstat

Command Access

System monitor access

ocpstat

Displays the latest status and metrics for all over-current protectors (OCPs) in the system.

Command Syntax

ocpstat

Command Access

System monitor access

off

Note: For Switched products only.

Turns off the specified outlet or outlet group.

Command Syntax

off <name | id | group | ALL>

Usage Guidelines

The **off** command is for Switched PRO1/PRO2 products only.

Command Access

User level and above

on

Note: For Switched products only.

Turns on the specified outlet or outlet group.

Command Syntax

on <name | id | group | ALL>

Usage Guidelines

The **on** command is for Switched PRO1/PRO2 products only.

Command Access

On-Only users or User level and above

ostat

Displays the latest status and metrics for all outlets in the system.

Command Syntax

ostat <name | outlet | outlet id | group | ALL>

Command Access

System monitor access

password

Changes the password for the current local user.

Command Syntax

Password {password} {verify password}

Command Access

Any access level

ping

Tests the reachability of a host on the IP network.

Command Syntax

ping <hostname>

Parameters

The **ping** command uses the following parameter.

hostname	Specifies the host to ping, 0-63 characters.

Command Access

Any access level

pstat

Displays the latest status and metrics for all phases in the system.

Command Syntax

pstat

Command Access

System monitor access

reboot

Note: For Switched products only.

Turns off the specified outlet or outlet group and then turns it back on after a delay.

Command Syntax

reboot <name | id | group | ALL>

Usage Guidelines

The Reboot command is for Switched PRO1/PRO2 products only.

Command Access

Reboot-Only users or User level and above

remove group

Removes an outlet group from the system.

Command Syntax

remove group <name>

Command Access

Admin level only

remove ldapgroup

Removes an LDAP group from the system.

Command Syntax

remove ldapgroup <name>

Command Access

Admin level only

remove snmpuser

Removes an SNMPv3 user from the system.

Command Syntax

remove snmpuser <name>

Command Access

Admin level only

remove ups

Removes an uninterruptable power supply (UPS) from the system.

Command Syntax

remove ups <name>

Command Access

Admin level only

remove user

Removes a local user from the system.

Command Syntax

remove ups <name>

Command Access

Admin level only

restart

Restarts the system.

Command Syntax

restart [factkeepnet | factory | ftpload | newx509cert | newsshkeys | normal]

Parameters

The **restart** command uses the following parameters.

Note: None of the parameters in the following table performs a normal system restart.

factkeepnet	Removes all system configurations except network configuration.
factory	Removes all system configurations.
ftpload	Performs a system update through an FTP load.
newx509cert	Creates a new self-signed SSL X509 certificate.
newsshkeys	Creates a new set of public and private SSH keys.
normal	Performs a normal system restart.

Command Access

Admin level only; no access in Demo mode

senstat

Displays the latest status and metrics for all sensors (and fan, when present) in the system.

Command Syntax

senstat

Command Access

System monitor access

set access

Sets user access configurations.

Command Syntax

set access button [disabled | enabled]
set access clitimeout <value>
set access localadmin [required | optional]
set access logorder [newest | oldest]
set access method [localonly | ldaponly | ldaplocal | radiusonly | radiuslocal | tacacsonly | tacacslocal]
set access prompt <prompt string>
set access startupstick [disabled | enabled]
set access strongpw [optional | required]
set access webloglen <value>
set access webtimeout <value>

Parameters

The **set access** command uses the following parameters:

button	Sets if the Configuration Reset button can reset the system configuration.
clitimeout	Set the CLI session idle time before automatic logout [1-1440 minutes].
localadmin	Removes the restriction to not allow the last local administrator to be removed when remote authentication (LDAP, TACACS+, or RADIUS) is in use.
logorder	Sets the default order of the system log when displayed.
method	Sets the allowed access methods for users.
prompt	Sets the system CLI prompt (0-32 characters).
startupstick	Enables/disables the Startup Stick tool for mass PDU configuration.
strongpw	Sets if strong passwords are required for local users.
webloglen	Sets the number of log entries per page when viewing the log on the Web [10-250 entries].
webtimeout	Sets the Web session idle time before automatic logout [1-1440 minutes].

Sub-Parameters

The **set access** command uses the following sub-parameters:

localonly	Local authentication only.
ldaponly	Authentication using only the configured LDAP servers.
ldaplocal	Authentication using the configured LDAP servers, then locally if no LDAP match is found.
radiusonly	Authentication using only the configured Radius servers.
radiuslocal	Authentication using the configured Radius servers, then locally if no Radius match is found.
tacacsonly	Authentication using only the configured TACACS servers.
tacacslocal	Authentication using the configured TACACS+ servers, then locally if no TACACS+ match is found.

Command Access

Admin level only

set banner

Sets the system banner that displays before a user authenticates a user session.

Command Syntax

set banner <banner text>

Parameters

The **set banner** command uses the following sub-parameters:

banner text	Text for system banner, 0-2070 characters.

Usage Guidelines

- The banner accepts all printable ASCII characters, plus CRLF.
- CTL-Z terminates banner input.

Command Access

Admin level only; no access in Demo mode

set bluetooth

Sets Bluetooth® configuration values.

Command Syntax

set bluetooth [disabled | enabled]
set bluetooth discover [disabled | enabled | limited]
set bluetooth name <name>
set bluetooth pincode <value>
set bluetooth transpwr <value>

Parameters

The **set bluetooth** command uses the following parameters:

discover	Sets the discoverability of the Bluetooth module.
name	Sets the name of the Bluetooth module (1-31 characters).
pincode	Sets the pin code used for Bluetooth pairing (0000-9999).
transpwr	Sets the transmission power for Bluetooth communications.

Sub-Parameters

The **set bluetooth** command uses the following sub-parameter:

limited	The Bluetooth module will be discoverable to 60-seconds after the module button has been pressed.

Command Access

Admin level only; no access in Demo mode.

set branch

Sets branch configuration values.

Command Syntax

set branch email [disabled | enabled] <name | id | ALL>
set branch load [alarmhi | alarmlo | warnhi | warnlow] <name | id | ALL> <value>
set branch load hyst <value>
set branch snmpt [disabled | enabled] <name | id | ALL>

Parameters

The **set branch** command uses the following parameters:

email	Email notifications for branch events.
hyst	Hysteresis between event state and recovery (0.0 to 10.0).
load	Current load for a branch. min=0A; max (max current) in **show branches** command; hyst=0.0-10.0A; default-1.0A.
snmpt	SNMP trap notifications for branch events.

Sub Parameters

The **set branch** command uses the following sub-parameters:

alarmhi	High alarm value.
alarmlo	Low alarm value.
warnhi	High warning alarm.
warnlo	Low warning alarm.

Usage Guidelines

min <= alarmlo <= warnlo <= warnhi <= alarmhi <= max

Command Access

Admin level only

set cord

Sets cord configuration values.

Command Syntax

set cord email [disabled | enabled] <name | id | ALL>
set cord loadmax <name | id | ALL> <value>
set cord name <name | id> <name string>
set cord nomvolts <name | id | ALL> <value>
set cord outofbal [alarmhi | warnhi] <name | id | ALL> <value>
set cord outofbal hyst <value>
set cord pf [alarmlo | warnlo] <name | id | ALL> <value>
set cord pf hyst <value>
set cord snmpt [disabled | enabled] <name | id | ALL>
set cord va [alarmhi | alarmlo | warnhi | warnlo] <name | id | ALL> <value>
set cord va hyst <value>
set cord watts [alarmhi | alarmlo | warnhi | warnlo] <name | id | ALL> <value>
set cord watts hyst <value>

Parameters

The **set cord** command uses the following parameters:

email	Email notifications for cord events.
hyst	Hysteresis between event state and recovery.
loadmax	Maximum current load for a cord. 1-max factory current in **show cords** command.
name	Name for the cord. 0-32 characters.
nomvolts	Nominal voltage for the cord. 0-max factory voltage in **show cords** command.
outofbal	Out-of-balance; the percent power difference between phases of a cord. min 0%, max 200%, hyst 0-10% (default 2%).
pf	Power factor. min 0.00, max 1.00, hyst 0.0-0.20 (default 0.02).
snmpt	SNMP trap notifications for cord events.
va	Power (with power factor included). min 0VA, max (power capacity) in **cstat** command, hyst 0-1000VA (default 100VA).
watts	Power (without power factor included). Min 0W, max (power capacity) in **cstat** command, hyst 0-1000W (default 100W).

Sub-Parameters

The **set cord** command uses the following sub-parameters:

alarmhi	High alarm value.
alarmlo	Low alarm value.
warnhi	High warning alarm.
warnlo	Low warning alarm.

Usage Guidelines min <=alarmlo <=warnlo <=warnhi <=alarmhi <=max

Command Access Admin level only

set dhcp

Sets DHCP configuration values.

Command Syntax

set dhcp [disabled | enabled]
set dhcp fqdn [disabled | enabled]
set dhcp fqdn name <name>
set dhcp staticfallback [disabled | enabled]
set dhcp bootdelay [disabled | enabled]

Parameters

The **set dhcp** command uses the following parameters:

fqdn	Fully-qualified domain name (FQDN).
staticfallback	Falls back to static IP address if DHCP fails. **Note:** The staticfallback option does not apply when WLAN is enabled.
bootdelay	Delays system boot by 100 seconds.

Sub-Parameters

The **set dhcp** command uses the following sub-parameter:

name	FQDN name. 0-63 characters.

Command Access

Admin level only

set dns

Sets domain name system (DNS) server configuration values.

Command Syntax

set dns [primary | secondary] <ipv4/ipv6>

Parameters

The **set dns** command uses the following parameters:

primary	Sets the first DNS server. 0-46 characters.
secondary	Sets the secondary DNS server. 0-46 characters.

Command Access

Admin level only; no access in Demo mode

set email

Sets email configuration values.

Command Syntax

set email auth [disabled | enabled]
set email config [disabled | enabled]
set email [disabled | enabled]
set email event [disabled | enabled]
set email fromaddr <email addr>
set email power [disabled | enabled] See **Note** below.
set email smtp authtype [any | crammd5 | digestmd5 | login | plain | none]
set email smtp host <hostname>
set email smtp password <password>
set email smtp port <port>
set email smtp usefromaddr
set email smtp username <user name>
set email smtp useusername
set email test
set email toaddr1 <email addr>
set email toaddr2 <email addr>
set email trendfiles [disabled | enabled]
set email usesubjloc
set email usesubjdef

Note: The **set email power** command is for Switched products only.

Parameters

The **set email** command uses the following parameters:

auth	Sets if authentication log messages are relayed by email
config	Sets if configuration log messages are relayed by email.
event	Sets if event log messages are relayed by email.
fromaddr	Sets the email address the messages are relayed from. 0-48 characters.
power	Sets if power log messages are relayed by email.
authtype	Sets the type of authentication to use when logging into the relay SMTP server.
host	Sets the host where the relay SMTP server is located. 0-63 characters.
password	Sets the password for logging into the relay SMTP server 0-32 characters.
port	Sets the port number for the relay SMTP server, 1-65535 (default 25).
toaddr1	Sets the first address to send email messages to. 0-48 characters.
toaddr2	Sets the second address to send email messages to. 0-48 characters.

trendfiles	Sets the preference to have new trending report files sent out daily to both "toaddrr" addresses at midnight.
userfromaddr	Sets to log into the relay SMTP server using the from address.
username	Sets the username for logging into the relay SMTP server. 0-32 characters, spaces are not allowed.
test	Tests the email setting for logging into the relay SMTP.
usesubjloc	Uses the location string as the subject of the relayed emails.
usesubjdef	Uses the default subject as the subject of the relayed emails. (sentry@macoui).
useusername	Set to log into the relay SMTP server using the SMTP username.

Sub-Parameters

The **set email** command uses the following sub-parameters:

any	Uses any of the authentication methods described in this table.
crammd5	Uses only CRAM-MD5 for authentication.
digestmd5	Uses only Digest MD5 for authentication
login	Uses only login authentication.
plain	Uses only plain authentication.
none	Uses only no authentication.

Command Access

Admin level only; no access in Demo mode

set energywise

Sets Cisco EnergyWise configuration values.

Command Syntax

set energywise [disabled | enabled]
set energywise port <UDP port>
set energywise domain <domain name>
set energywise refresh <refresh rate>
set energywise secret <secret key>

Parameters

The **set energywise** command uses the following parameters:

port	Sets the port number of the EnergyWise host. 1-65535 (default 43440).
domain	Sets the domain of the EnergyWise host. 0-63 characters.
refresh	Sets the refresh rate that sends new EnergyWise discovery packets. 30-600 seconds.
secret	Sets the secret key for the EnergyWise server. 0-80 characters.

Command Access

Admin level only; no access in Demo mode

set feature

Enables new system features.

Command Syntax

set feature <feature key>

Parameters

The **set feature** command uses the following parameter:

feature key	Key for unlocking system features (XXXX-XXXX-XXXX-XXXX), where X = 0-9 or A-Z.

Command Access

Admin level only

set ftp

Sets FTP configuration values.

Command Syntax

set ftp autoupdate [disabled | enabled]
set ftp autoupdate day [sunday-saturday | everyday]
set ftp autoupdate hour [1am-12am | 1pm-12pm]
set ftp directory <path name>
set ftp filename <filename>
set ftp host <hostname>
set ftp password <password>
set ftp server [disabled | enabled]
set ftp test [*full*]
set ftp username <username>

Parameters

The **set ftp** command uses the following parameters:

autoupdate	Sets to use automatic system firmware updates.
directory	Sets the directory of the update file in remote FTP update server. 0-64 characters.
filename	Sets the name of the update file in remote FTP update server. 0-32 characters.
host	Sets the hostname of remote FTP update server. 0-63 characters.
password	Sets the password for logging into the remote FTP update server. 0-32 characters.
server	Sets if the system can be an FTP server to serve system files.
test	Tests current FTP settings. Using the ***full*** sub-parameter ensures connection to the FTP server is correct, verifies firmware can be sent to the PDU, and downloads firmware to the PDU (but does not install firmware).
username	Sets the username for logging into the remote FTP update server. 0-32 characters.

Sub-Parameters

The **set ftp** command uses the following sub-parameters:

day	Sets the day of the week to automatically update system firmware.
hour	Sets the hour of the day to automatically update system firmware.

Command Access

Admin level only; no access in Demo mode

set http

Sets HTTP configuration values.

Command Syntax

set http [disabled | enabled]
set http port <port>

Parameters

The **set http** command uses the following parameter:

port	Sets the port for HTTP connections. 1-65535 (default 443).

Command Access

Admin level only; no access in Demo mode

set https

Sets HTTPS configuration values.

Command Syntax

set https [disabled | enabled]
set https port <port>
set https usercert [disabled | enabled]
set https userpass <passphrase>

Parameters

The **set https** command uses the following parameters:

port	Sets the port for HTTPS connections.1-65535 (default 80).
usercert	Sets to use user-provided certificates instead of system self-signed certificates.
userpass	Sets the pass phrase for user-provided certificates. 0-63 characters.

Command Access

Admin level only; no access in Demo mode

set ipv4, set ipv6

Sets IPv4 and IPv6 configuration values.

Command Syntax

set ipv4 address <ipv4 address>
set ipv4 gateway <ipv4 address>
set ipv4 subnet <ipv4 address>
set ipv6 address <ipv6 address>
set ipv6 gateway <ipv6 address>
set ipv6 prefix <ipv6 CIDR prefix>

Parameters

The **set ipv4** and **set ipv6** commands use the following parameters:

Ipv4 address	Uses the format of XXX.XXX.XXX.XXX, where XXX=0-255.
Ipv6 address	Uses the format of XXX.XXX.XXX.XXX.XXX.XXX.XXX.XXX, where XXXX=0-0xFFFF.
Ipv6 CIDR prefix	Uses the format of /0-64.

Command Access

Admin level only; no access in Demo mode

set ldap

Sets LDAP configuration values.

Command Syntax

set ldap bind [simple | tls | md5]
set ldap binddn <distinguished name>
set ldap bindpw <password>
set ldap groupattr <group attribute>
set ldap groupsearch basedn <distinguished name>
set ldap groupsearch [disabled | enabled]
set ldap groupsearch useattr <user attribute>
set ldap primary <hostname>
set ldap secondary <hostname>
set ldap port <port>
set ldap userbasedn <distinguished name>
set ldap userfilter <filter>

Parameters

The **set ldap** command uses the following parameters:

bind	Sets the bind method for the LDAP server.
binddn	Sets the distinguished name (DN) for the bind.
bindpw	Sets the password for the bind.
groupattr	Sets the user class distinguished name (DN) or names of groups a user is a member of.
groupsearch	Sets the bind to search groups for the username in addition to searching the usernames for its list of group memberships.
hostname	Sets the hostname of the Directory Services server.
port	Sets the port number for the LDAP server. 1-65535 (default 389).
userbasedn	Sets the base distinguished name (DN) for the username search at login.
userfilter	Sets the filter used for the username search at login.

Sub-Parameters

The **set ldap** command uses the following sub-parameters:

simple	Uses simple bind method.
tls	Uses bind with TLS. (TLS version 1.2).
md5	Uses Digest MD5 bind.
basedn	Base Distinguished Name (DN).
useattr	Sets the user attribute to search for.

Command Access

Admin level only; no access in Demo mode

set ldapgroup

Sets configuration values for LDAP group access rights.

Command Syntax

set ldapgroup access [admin }| admin | ononly | poweruser | rebootonly | user | viewonly] <groupname>

set ldapgroup sysmon [disabled | enabled] <groupname>

Parameters

The **set ldap group** command uses the following parameters:

access	Sets the access type of an LDAP group. **Note:** On-Only, Reboot-Only, and View-Only are available for Switched PRO1/PRO2 products.
sysmon	Sets system monitor access for an LDAP group.

Sub-Parameters

The **set ldap group** command uses the following sub-parameter:

groupname	Name of the LDAP group to change access rights. 0-32 characters.

Command Access

Admin level only

set line

Sets line configuration values.

Command Syntax

set line email [disabled | enabled] <name | id | ALL>
set line load [alarmhi | alarmlo | warnhi | warnlo] <name | id | ALL> <value>
set line load hyst <value>
set line snmpt [disabled | enabled] <name | id | ALL>

Parameters

The **set line** command uses the following parameters:

Email	Email notification for line events.
Hyst	Hysteresis between event state and recovery.
Load	Current load for a line. min = 0A, max (current limit) in **show lines** command, hyst 0.0-10.0A (default 1.0A).
SNMPT	SNMP trap notifications for line events.

Sub-Parameters

The **set line** command uses the following sub-parameters:

alarmhi	High alarm value.
alarmlo	Low alarm value.
warnhi	High warning alarm.
warnlo	Low warning alarm.

min <= alarmlo <= warnlo <= warnhi <= alarmhi <= max

Command Access

Admin level only

set loadshed

Note: Only available if the Smart Load Shedding feature is activated.

Sets Smart Load Shedding configuration values.

Command Syntax

set loadshed branch [disabled | enabled]
set loadshed line [disabled | enabled]
set loadshed sensor [disabled | enabled]
set loadshed sensor contact [recoveroff | recoveron] <contact sensor name | id | ALL>
set loadshed sensor temp [recoveroff | recoveron] <temp sensor name | id | ALL>
set loadshed sensor water [recoveroff | recoveron] <water sensor name | id | ALL>
set loadshed ups [all | any] <line name | id | ALL>
set loadshed ups [disabled | enabled]
set loadshed ups [recoveroff | recoveron]
set loadshed ups [recoverdelay | sheddelay] <delay>

Parameters

The **set loadshed** command uses the following parameters:

branch	Sets to allow branch shedding events.
line	Sets to allow line shedding events.
sensor	Sets to allows sensor shedding events.
ups	Sets to allow UPS shedding events.

Sub-Parameters

The **set loadshed** command uses the following sub-parameters:

all	Sheds outlets only when all UP devices on an upstream line go to “on battery”.
any	Sheds outlets when any UPS device on an upstream line goes to “on battery”.
recoverdelay	The delay that a UPS device needs to be “on utility” before recovering outlets. 0-10 minutes.
recovery off	Shed outlets are not recovered Does not recover shed outlets when even conditions are cleared.
recovery on	Automatically recover shed outlets when event conditions are cleared.
sheddelay	The delay that a UPS device needs to be “on battery” before shedding outlets. 0-10 minutes.

Usage Guidelines

The Smart Load Shedding feature must be enabled.

Command Access

Admin level only

set location

Sets the system location string.

Command Syntax

set location <location string>

Parameters

The **set location** command uses the following parameter:

location string	Location string text for system location. 0-63 characters.

Command Access

Admin level only

set net

Sets network mode configuration values.

Command Syntax

set net [disabled | ipv4only | dualv6v4]

Parameters

The **set net** command uses the following parameters:

disabled	Disables network access to system.
ipv4only	System only allows IPv4 functionality.
Dualv6v4	System allows IPv6 and IPv4 functionality.

Command Access

Admin level only; no access in Demo mode.

set ocp

Sets over-current protector (OCP) configuration values.

Command Syntax

set ocp email [disabled | enabled] <name | id | ALL>
set ocp loadmax <name | id | ALL> <value>
set ocp snmpt [disabled | enabled] <name | id | ALL>

Parameters

The **set ocp** command uses the following parameters:

email	Email notifications for OCP events.
loadmax	Maximum current load for an OCP. Valid range is 1 to "max factory current" from the **show ocps** command.
snmpt	SNMP trap notifications for OCP events.

Command Access

Admin level only

set outlet

Sets outlet configuration values.

Command Syntax

set outlet branchevent [disabled | enabled] <name | id | ALL>
set outlet chglogging [disabled | enabled]
set outlet email [disabled | enabled] <name | id | ALL>
set outlet load [alarmhi | alarmlo | warnhi | warnlo] <name | id | ALL> <value>
set outlet load hyst <value>
set outlet name <name | id> <new name>
set outlet snmpt [disabled | enabled] <name | id | ALL>
set outlet watts [alarmhi | alarmlo | warnhi | warnlo] <name | id | ALL> <value>
set outlet watts hyst <value>

For Switched PRO1/PRO2 products only:

set outlet extondelay <name | id | ALL> <value>
set outlet host <name | id> <hostname>
set outlet lock [disabled | enabled] <name | id | ALL>
set outlet rebootdelay <value>
set outlet script [disabled | enabled] <name | id | ALL>
set outlet script delay <name | id | ALL> <value>
set outlet seqdelay <value>
set outlet shutdown [disabled | enabled] <name | id | ALL>
set outlet shutdown delay <name | id | ALL> <value>
set outlet wakeup [on | off | last] <name | id | ALL>

For the enabled Smart Load Shedding feature:

set outlet contactevent [disabled | enabled] <name | id | ALL> <contact sensor name | id | ALL>
set outlet lineevent [disabled | enabled] <name | id | ALL>
set outlet sensoraction [off | on]
set outlet tempevent [disabled | enabled] <name | id | ALL> <temp sensor name | id | ALL>
set outlet upsevent [disabled | enabled] <name | id | ALL>
set outlet waterevent [disabled | enabled] <name | id | ALL> <water sensor name | id | ALL>

For AC products only:

set outlet pf [alarmlo | warnlo] <name | id | ALL> <value>
set outlet pf hyst <value>

Parameters

The **set outlet** command uses the following parameters:

branchevent	Sets if load shedding (due to branch events) is allowed for an outlet.
chglogging	Sets logging for system outlet state changes
contactevent	Sets if load shedding (due to contact sensor events) is allowed for an outlet.
email	Sets email notifications for outlet events.

extondelay	Sets an extra on delay when turning on an outlet. 0-900 seconds.
host	Sets the hostname for an outlet for script or shutdown actions. 0-63 characters.
hyst	Sets the hysteresis between event state and recovery.
load	Sets the current load for an outlet. min 0.0A, max (max current) in **show outlets** command, hyst 1.0-10.0A (default 1.0A)
lineevent	Sets if load shedding (due to outlet current load events) is allowed for an outlet.
lock	Sets if control actions are disabled for an outlet after wakeup state is applied.
pf	Sets the power factor. min 0.00, max 1.00, hyst 0.0-0.20 (default 0.02)
rebootdelay	Sets an extra on delay when rebooting an outlet (5-600 seconds).
script	Sets to additionally send request to have shutdown agent run a script before shutting down the host.
sensoraction	Sets the load shedding outlet control action for all sensor alarm events.
seqdelay	Sets the delay between turning on outlets. 0-15 seconds.
shutdown	Sets if notification of pending off state of outlet is sent to outlet host before changing state.
shutdown delay	Sets the remote shutdown delay for an outlet. 1-900 seconds.
snmpt	Sets if SNMP trap notifications for outlet events.
tempevent	Sets if load shedding (due to temperature sensor events) is allowed for an outlet.
upsevent	Sets if load shedding (due to UPS events) are allowed for an outlet.
wakeup	Sets the default outlet control state after system power up.
waterevent	Sets if load shedding (due to water sensor events) is allowed for an outlet
watts	Sets the power (without power factor). min 0W, max (power capacity) in **ostat details**, hyst 0-1000W (default 10W).

Parameters

The **set outlet** command uses the following sub-parameters:

script delay	Sets the time to wait after the script has executed to outlet state change. 1-15 seconds.
shutdown delay	Sets the time to wait after the shutdown notification to host before outlet state change. Valid range is 1-900 seconds.
on	Sets outlet to sequence on after system boot.
off	Sets outlet to remain off after system boot.
last	Sets outlet to match its last state prior to system boot after system boot.
alarmhi	Sets high alarm value.
alarmlo	Sets low alarm value.
warnhi	Sets high warning value.
warnlo	Sets low warning value.

min <= alarmlo <= warnlo <= warnhi <= alarmhi <= max

Command Access

Admin level only

set phase

Sets phase configuration values.

Command Syntax

set phase email [disabled | enabled] <name | id | ALL>
set phase pf [alarmlo | warnlo] <name | id | ALL> <value>
set phase snmpt [disabled | enabled] <name | id | ALL>
set phase volts [alarmhi | alarmlo | warnhi | warnlo] <name | id | ALL> <value>
set phase volts hyst <value>

For AC products only:
set phase pf hyst <value>

Parameters

The **set phase** command uses the following parameters:

email	Sets email notifications for phase events.
hyst	Sets hysteresis between event state and recovery.
pf	Sets power factor. min 0.00, max 1.00, hyst 0.0-0.20 (default 0.02).
snmpt	Sets SNMP trap notifications for phase events.
volts	Sets voltage. min and max vary by product*, hyst 0.0-20 (default 0.02). * For the min-max range, issue **set cord nomvolts all** command (press ESC to quit command).

Sub-Parameters

The **set phase** command uses the following sub-parameters:

alarmhi	Sets high alarm value.
alarmlo	Sets low alarm value.
warnhi	Sets high warning value.
warnlo	Sets low warning value.

Command Access

Admin level only

set port

Sets serial port configuration values.

Command Syntax

set port [baud | speed] [1200 | 2400 | 4800 | 9600 | 19200 | 38400 | 57600 | 115200] <name | id >
set port dsrcheck [disabled | enabled] <name | id >
set port timeout <name | id > <timeout>

Parameters

The **set port** command uses the following parameters:

baud/speed	Sets the number of symbols per second of the serial port.
dsrcheck	Sets to use DSR before making a serial connection.
rftag	Sets RF Code tag (RFTAG) support for selected **unlocked** port. **Note:** If port is locked, any attempts to change this setting will be ignored.
timeout	Sets the connection idle timeout for pass-thru connections to this port. 0-60 minutes (default 5 minutes).

Command Access

Admin level only

set radius

Sets Radius server configuration values.

Command Syntax

set radius [primary | secondary] port <port>
set radius [primary | secondary] retries <retries>
set radius [primary | secondary] host <hostname>
set radius [primary | secondary] secret <shared secret>
set radius [primary | secondary] timeout <timeout>

Parameters

The **set radius** command uses the following parameters:

primary	Sets the first Radius server.
secondary	Sets the second Radius server.
port	Sets the port for Radius sever connections. 1-65535 (default 1812).
retries	Set the maximum retry count for the Radius server. 0-10 (default 2).
host	Sets the Radius server hostname. 0-63 characters.
secret	Sets the shared secret value for the Radius server. 0-48 characters. **Note:** The secret that was set for the primary server will not be cleared when setting the secret for the secondary server, and vice versa.
timeout	Sets the connection timeout for the Radius server. 1-30 seconds (default 5 seconds).

Command Access

Admin level only; No access in Demo mode

set sensor

Sets sensor configuration values.

Command Syntax

set sensor adc [alarmhi | alarmlo | warnhi | warnlo] <name | id | ALL> <value>
set sensor adc email [disabled | enabled] <name | id | ALL>
set sensor adc hyst <value>
set sensor adc name <name | id> <name>
set sensor adc snmpt [disabled | enabled] <name | id | ALL>
set sensor contact email [disabled | enabled] <name | id | ALL>
set sensor contact name <name | id> <name>
set sensor contact snmpt [disabled | enabled] <name | id | ALL>
set sensor fan [alarmlo | alarmhi | email | hyst | name | snmpt | warnlo | warnhi]
set sensor humid [alarmhi | alarmlo | warnhi | warnlo] <name | id | ALL> <value>
set sensor humid email [disabled | enabled] <name | id | ALL>
set sensor humid hyst <value>
set sensor humid name <name | id> <name>
set sensor humid snmpt [disabled | enabled] <name | id | ALL>
set sensor temp [alarmhi | alarmlo | warnhi | warnlo] <name | id | ALL> <value>
set sensor temp email [disabled | enabled] <name | id | ALL>
set sensor temp hyst <value>
set sensor temp name <name | id> <name>
set sensor temp snmpt [disabled | enabled] <name | id | ALL>
set sensor water email [disabled | enabled] <name | id | ALL>
set sensor water name <name | id> <name>
set sensor water snmpt [disabled | enabled] <name | id | ALL>
set sensor temp scale [celsius | fahrenheit]

Parameters

The **set sensor** command uses the following parameters:

adc	Sets the analog-to-digital converter sensor. min 0, max 255, hyst 0-20 (default 1).
contact	Sets the contact closure sensor.
fan	Sets the fan values when a fan is present.
humid	Sets the humidity sensor. min 0%RH, max 100%RH, hyst 0-20%RH (default 2%RH).
temp	Sets temperature sensor. For Celsius: min -40°, max 123°, hyst 0-30°, default 1°; For Fahrenheit: min -40°, max 253°, hyst 0-54°, default 2°.
water	Sets the water sensor.
email	Sets the email notifications for sensor events.
hyst	Sets the hysteresis between event state and recovery.
name	Sets the name of the sensor.
snmpt	SNMP trap notifications for sensor events.
scale	Sets temperature scale.

Sub-Parameters

The **set sensor** command uses the following sub-parameters:

alarmhi	Sets high alarm value.
alarmlo	Sets low alarm value.
warnhi	Sets high warning value.
warnlo	Sets low warning value.

min <= alarmlo <= warnlo <= warnhi <= alarmhi <= max

Command Access

Admin level only

set snmp

Sets SNMP configuration values.

Command Syntax

set snmp iprestrict [none | trapdests]
set snmp syscontact <system contact>
set snmp syslocation <location>
set snmp sysname <system name>
set snmp trap dest1 <hostname>
set snmp trap dest2 <hostname>
set snmp trap format [v1 | v2c | v3]
set snmp trap repeat <repeat time>
set snmp v2 [disabled | enabled]
set snmp v2 [getcomm | setcomm | trapcomm] <comm string>
set snmp v3 [disabled | enabled]

The **set snmp** command uses the following parameters:

iprestrict	Sets to only allow to trap destinations to have SNMP access
syscontact	System contact string. 0-63 characters.
syslocation	System location string. 0-63 characters.
sysname	System name string. 0-63 characters.
trap	Sets trap notification options.
v2	Sets to allow access with SNMPv2.
v3	Sets to allow access with SNMPv3.

Sub-Parameters

The **set snmp** command uses the following sub-parameters:

dest1	First SNMP trap destination. 0-63 characters.
dest2	Second SNMP trap destination. 0-63 characters.
format	Format of SNMP trap and header.
repeat	Sets the SNMP trap repeat time for object in an event condition. 1-65535 seconds.
getcomm	Read community string for SNMPv2. 0-32 characters. Default is public.
setcomm	Read/write community string in SNMPv3. 0-32 characters. Default is blank.
trapcomm	Community string in SNMPv2 traps for authentication. 0-32 characters.
none	No authentication or privacy is used (authpass and privpass are not used).
md5	Authentication but not privacy is used (privpass is not used).
md5des	Authentication and privacy are used.

Command Access

Admin level only; No access in Demo mode.

set snmpuser

Sets SNMPv3 user configuration values.

Command Syntax

set snmpuser access [disabled | readonly | writeonly | readwrite]
set snmpuser authmode [MD5 | MD5DES | none]
set snmpuser authpass
set snmpuser privpass

Parameters

The **set snmpuser** command uses the following parameters:

access	Sets
authmode	Sets
authpass	Sets
privpass	Sets

Sub-Parameters

The **set snmpuser** command uses the following sub-parameters:

disabled	Disables access to the the SNMPv3 user
readonly	Sets read only access for an SNMPv3 user.
writeonly	Sets write only access for an SNMPv3 user.
readwrite	Sets read/write access for an SNMPv3 user.
MD5	Sets Digest MD5 for SNMPv3 user authentication.
MD5DES	Sets MD5DES for SNMPv3 user authentication.
none	Uses no authentication method for an SNMPv3 user.
authpass	Sets the authentication password for an SNMPv3 user. 0-39 characters.
privpass	Sets the privacy password for an SNMPv3 user. 0-31 characters.

set sntp

Sets SNTP configuration values.

Command Syntax

set sntp dst [disabled | enabled]
set sntp dst [end | start] <tz string>
set sntp gmtoffset <offset>
set sntp primary <hostname>
set sntp secondary <hostname>

Parameters

The **set sntp** command uses the following parameters:

dst	Sets to automatically adjust for Daylight Saving Time (DST).
gmtoffset	Sets the adjustment from Coordinated Universal Time (UTC). (-12 to 14). GMT Offset includes both extended hours and minutes.
primary	Sets the first SNTP server. 0-63 characters.
secondary	Sets the second SNTP server. 0-63 characters.

Sub-Parameters

The **set sntp** command uses the following sub-parameters:

end	Date to end DST.
start	Date to start DST.

Command Access

Admin level only; no access in Demo mode

set spm

Sets Sentry Power Manager (SPM) access configuration values.

Command Syntax

set spm [disabled | enabled]
set spm resetpw

Parameters

The **set spm** command uses the following parameter:

resetpw	Sets to reset SPM secure password back to default.

Command Access

Admin level only; no access in Demo mode

set ssh

Sets SSH configuration values.

Command Syntax

set ssh [disabled | enabled]
set ssh port
set ssh authmethod [all | kbint | password]

Parameters

The **set ssh** command uses the following parameters:

port	Sets port for SSH connections 1-65535 (default is 22).
authmethod	Sets authentication method for SSH connections.

Sub-Parameters

The **set ssh** command uses the following sub-parameters:

all	Allows either of the authentication methods described in this table.
kbint	Allows only keyboard-interactive authentication.
password	Allows only password authentication.

Command Access

Admin level only; no access in Demo mode

set syslog

Sets Syslog configuration values.

Command Syntax

set syslog debugmsg [disabled | enabled]
set syslog host1 <hostname>
set syslog host2 <hostname>
set syslog port <port>
set syslog protocol [rfc3164 | rfc5424]

Parameters

The **set syslog** command uses the following parameters:

debugmsg	Sets to send debug log messages in addition to system log messages.
host1	Sets the first Syslog server. 0-63 characters.
host2	Sets the second Syslog server. 0-63 characters.
port	Sets the port for the Syslog servers. 1-65535 (default 514).
protocol	Sets the format of the Syslog messages.

Command Access

Admin level only; no access in Demo mode

set tacacs

Sets TACACS+ server configuration values.

Command Syntax

set tacacs primary <hostname>
set tacacs secondary <hostname>
set tacacs port <port>
set tacacs key {key}

Parameters

The **set tacacs** command uses the following parameters:

primary	Sets the first TACACS+ server (0-63 characters).
secondary	Sets the second TACACS+ server (0-63 characters).
port	Sets the port for the TACACS+ servers 1-65535 (default is 49).
key	Sets the key for authentication with the TACACS+ servers.

Command Access

Admin level only; no access in Demo mode

set tacpriv

Sets TACACS+ configuration values for privilege level access rights.

Command Syntax

set tacpriv access [admin | ononly | poweruser | rebootonly | user | viewonly] <priv level>
set tacpriv sysmon [disabled | enabled] <priv level>

Parameters

The **set tacpriv** command uses the following parameters:

access	Sets the access type for a level. **Note:** On-Only, Reboot-Only, and View-Only are available for Switched PRO1/PRO2 products.
sysmon	Sets the system monitor access for a level.

Sub-Parameters

The **set tacpriv** command uses the following sub-parameter:

priv level	The ID of the TACACS+ privilege level to change access rights (0-15).

Command Access

Admin level only

set telnet

Sets Telnet configuration values.

Command Syntax

set telnet [disabled | enabled]
set telnet port <port>

Parameters

The **set telnet** command uses the following parameters:

port	Sets the port for Telnet connections 1-65535 (default is 23).

Command Access

Admin level only; no access in Demo mode

set trend

Sets power trending configurations.

Command Syntax

set trend [disabled | enabled]

Command Access

Admin level only; no access in Demo mode

set unit

Sets PRO2 configuration values.

Command Syntax

set unit assettag <name | id> <asset tag>
set unit display [auto | inverted | normal] <name | id | ALL>
set unit email [disabled | enabled] <name |id | ALL>
set unit identify [disabled | enabled] <name | id | ALL>
set unit name <name | id> <new name>

For Switched PRO2 products only:

set unit osequence [normal | reversed] <name | id | ALL>
set unit odisporder [normal | reversed] <name | id | ALL>

Confirmation required:

set unit purge <name | id | ALL>
set unit snmpt [disabled | enabled] <name | id | ALL>

Parameters

The **set unit** command uses the following parameters:

assettag	The asset tag value of the unit. 0-32 characters.
display	Sets the orientation of the displays on a unit.
email	Email notifications for an event.
identify	Set to enable/disable flashing display.

name	The name of the unit. 0-32 characters.
odisporder	Sets the Web GUI and CLI outlet display order for a unit. **Note:** The unit must have sequential switched outlets or this parameter will be ignored.
osequence	Sets the outlet sequence order for a unit.
purge	Removes all stored information for a unit.
snmpt	SNMP trap notifications for unit events.

Sub-Parameters

The **set unit** command uses the following sub-parameters:

auto	Set automatic display orientation using internal orientation sensor.
Inverted	Set display to be upside down.
normal	Set display to be right-side up; set outlet sequencing to be 1 to n.
reversed	Set outlet sequencing to be n to 1.

Command Access

Admin level only

set ups

Sets UPS device configuration values.

Command Syntax

set ups addline <UPS#> <line name | id | ALL>
set ups commstr <UPS#> <get community string>
set ups delline <UPS#> <line name | id | ALL>
set ups host <UPS#> <hostname>
set ups oidspoll <UPS#> <oid>
set ups onbattery <UPS#> <value>
set ups onutility <UPS#> <value>
set ups port <UPS#> <port>
set ups type <UPS#> <value>

Parameters

The **set ups** command uses the following parameters:

UPS#	The number of the UPS to change. 1-8.
addline	Adds the specified line to be protected by the UPS.
commstr	Sets the community string for polling the UPS by SNMP. 0-32 characters.
delline	Removes the specified line from a UPS.

host	Hostname for polling the UPS by SNMP. 0-63 characters.
oidspoll	The OID for getting the "on battery"/"on utility" value when polling the UPS by SNMP.
onbattery	Value of the OID when the UPS is in an "on battery" state. 1-65535.
onutility	Value of the OID when the UPS is in an "on utility" state. 1-65535.
port	Port number for polling the UPS by SNMP. 1-65535 (default 161).
type	Sets the type of the UPS; sets default commstr, oidspoll, onbattery, onutility, and port. 1-11.

Sub-Parameters

The **set ups** command uses the following sub-parameter:

oid	The OID string with sequences of a dot and a number. 1-65535.

Command Access

Admin level only

set user

Sets configuration values for local user access rights.

Command Syntax

set user access [admin | ononly | poweruser | rebootonly | user | viewonly] <username>
set user password <username> {password} {verify password}
set user sysmon [disabled | enabled] <username>

Parameters

The **set user** command uses the following parameters:

access	Sets the access type of a local user. **Note:** On-Only, Reboot-Only, and View-Only are available for Switched PRO1/PRO2 products.
password	Sets the password for a local user.
sysmon	Sets system monitor access for a local user.

Sub-Parameters

The **set user** command uses the following sub-parameter:

username	The ID of the local user to change access rights. 0-32 characters.

Command Access

Admin level only

set web

Sets configuration parameters to provide Web services.

Command Syntax

set web http [disabled | enabled | port]
set web https [disabled | enabled | port]
set web https usercert [disabled | enabled]
set web https userpass {password}
set web svcapi [disabled | enabled]
set web spm [disabled | enabled | resetpw]

Parameters

The **set web** command uses the following parameters:

http	Enables/disables support for the HTTP server option.
https	Enables/disables support for the HTTPS server option.
usercert	Enables/disables user certificate, if needed.
userpass	Sets the password for the user certificate.
svcapi	Enables/disables the Web API service for PRO1 and PRO2 units.
spm	Enables/disables the SPM secure access option to use secure SPM network features and configuration.

Sub-Parameters

The **set web** command uses the following sub-parameter:

port	Sets the port number (1 to 65535) for the HTTP or HTTPS server options. Default port number is 80.
resetpw	Resets the unique SPM default password for a discovered PRO2 after SPM changed the password for network security.

Command Access

Admin level only

set wlan

Description:

Sets the wireless network configuration.

Command Syntax:

set wlan [disabled | enabled]
set wlan bssid <ap bssid>
set wlan key <ap key>
set wlan mac <mac address>
set wlan security [open | wep-open | wep-shared | wpapsk-aes | wpapsk-tkip | wpapsk-tkipaes | wpa2psk-aes | wpa2psk-tkip | wpa2psk-tkipaes]
set wlan ssid <ap ssid>

Command Access:

Admin level only; wireless module installed.

set ztp

Description:

Sets the Zero Touch Provisioning (ZTP) feature.

Command Syntax:

set ztp [autoupdate | disabled | enabled | resetprov]
set ztp autoupdate [day |disabled |enabled | hour]
set ztp resetprov

Parameters

The **set ztp** command uses the following parameters:

autoupdate	Sets the day and hour when Zero Touch Provisioning (ZTP) automatic updates will occur.
resetprov	Allows the resetting of the PDU provisioning state for the Zero Touch Provisioning (ZTP) feature.

Sub-Parameters

The **set ztp autoupdate** command uses the following sub-parameters:

day	Sets the day of the week (Sunday through Saturday), or Everyday when the Zero Touch Provisioning (ZTP) automatic updates will occur.
hour	Sets the hour of the day (12AM through 11PM), when the Zero Touch Provisioning (ZTP) automatic updates will occur.

Command Access:

Admin level only

show access

Shows user access configuration values.

Command Syntax

show access

Command Access

Admin level only

Example

```
Switched PDU: show access

  Access Configuration

    Access Method:                LDAP then local
    Configuration Reset Button:   enabled
    Local Administrator Account:  required
    Strong Passwords:             optional
    CLI Custom Prompt:            <none>
    CLI Timeout:                  5 minute<s>
    Web Timeout:                  5 minute<s>
    Web Log Entries:              100 <per page>
    Default Log Order:            newest first
    StartUp Stick:                enabled
```

show bluetooth

Shows Bluetooth® configuration values.

Command Syntax

show bluetooth

Command Access

Admin level only

Example

```
Switched PDU: show bluetooth

  Bluetooth Configuration

    Bluetooth:              enabled
    Name:                   BT-Mod1
    Pin code:               0000
    Discoverability:        enabled
    Transmission Power:     0 (dbm)
```

show branches

Shows branch configuration values.

Command Syntax

show branches

Command Access

Admin level only

Example

```
Switched PDU: show branches

  ID    Branch Name
  --    -----------
  AA1   AA:Branch_1
  AA2   AA:Branch_2
  AA3   AA:Branch_3
  BA1   BA:Branch_1
  BA2   BA:Branch_2
  BA3   BA:Branch_3

        SNMP        Email       Max         Current  Current  Current  Current
  ID    Notif.      Notif.      Current     Lo-Alrm  Lo-Warn  Hi-Warn  Hi-Alrm
  --    ------      ------      -------     -------  -------  -------  -------
  AA1   enabled     enabled     20A         0.0A     0.0A     14.0A    16.0A
  AA2   enabled     enabled     20A         0.0A     0.0A     14.0A    16.0A
  AA3   enabled     enabled     20A         0.0A     0.0A     14.0A    16.0A
  BA1   enabled     enabled     20A         0.0A     0.0A     14.0A    16.0A
  BA2   enabled     enabled     20A         0.0A     0.0A     14.0A    16.0A
  BA3   enabled     enabled     20A         0.0A     0.0A     14.0A    16.0A

  Common Branch Settings

    Branch Current Hysteresis:          1.0A
```

show cords

Shows cord configuration values.

Command Syntax

show cords

Command Access

Admin level only

Example

```
Switched PDU: show cords


ID    Cord Name
--    ---------
AA    Master_Cord_A
BA    Link_Cord_A

      SNMP     Email    User  / Factory    User  / Factory
ID    Notif.   Notif.   Current Capacity   Nominal Voltage
--    ------   ------   ----------------   ---------------
AA    enabled  enabled  30A   / 30A        230V    / 230V
BA    enabled  enabled  30A   / 30A        230V    / 230V

      Power    Power    Power    Power     Balance   Balance
ID    Lo-Alrm  Lo-Warn  Hi-Warn  Hi-Alrm   Hi-Warn   Hi-Alrm
--    -------  -------  -------  -------   -------   -------
AA    0W       0W       14490W   16560W    15%       20%
BA    0W       0W       14490W   16560W    15%       20%

      App Pwr  App Pwr  App Pwr  App Pwr  PF       PF
ID    Lo-Alrm  Lo-Warn  Hi-Warn  Hi-Alrm  Lo-Alrm  Lo-Warn
--    -------  -------  -------  -------  -------  -------
AA    0VA      0VA      14490VA  16560VA  0.70     0.80
BA    0VA      0VA      14490VA  16560VA  0.70     0.80

Common Cord Settings

  Cord Power Hysteresis:               100
  Cord Apparent Power Hysteresis:      100
  Cord Power Factor Hysteresis:        0.0
  Cord 3-Phase Out-Of-Balance Hyst:    2%
```

show email

Shows email configuration values.

Command Syntax

show email

Command Access

Admin level only

Example

```
Switched PDU: show email

  Email/SMTP Configuration

    SMTP Host:           (not set)
    SMTP Port:           25
    SMTP Authentication: None with SMTP Username
    SMTP Username:
    SMTP Password:       (not set)
    'From' Addr:
    'To' Address 1:
    'To' Address 2:
    Subject ID:          [Sentry_60000a]


    Email Notifications: disabled
      EVENT Messages:    enabled
      AUTH Messages:     disabled
      POWER Messages:    disabled
      CONFIG Messages:   disabled
      Trend Files:       disabled
```

show energywise

Shows Cisco EnergyWise configuration values.

Command Syntax

show energywise

Command Access

Admin level only

Example

```
Switched PDU: show energywise

  EnergyWise Configuration

    EnergyWise Endpoint: disabled
    Port:                43440
    Domain:              (not set)
    Refresh Rate:        180
    Secret:              (not set)
```

show features

Shows the enabled system features.

Command Syntax

show features

Command Access

Admin level only

Example

```
Switched PDU: show features

  Add-on features installed on this system:

    Smart Load Shedding
```

show ftp

Shows FTP configuration values.

Command Syntax

show ftp

Command Access

Admin level only

Example

```
Switched PDU: show ftp

  FTP Client Configuration

   Host:          10.1.2.230
   Username:      swcdu8
   Password:      <not set>
   Directory:
   Filename:      firmware.bin

   Auto Upgrades: disabled
   Update Day:    Everyday
   Update Hour    12 AM

 FTP Server Configuration

  Server:          enabled
```

show ldap

Shows LDAP configuration values.

Command Syntax

show ldap

Command Access

Admin level only

Example

```
Switched PDU: show ldap

  LDAP Configuration

    LDAP:             disabled
    Primary Host:     <not set>
    Secondary Host:   <not set>
    Port:             389
    Bind Type:        Simple

    Search Bind
      DN:
      Password:       <not set>

    User Search
      Base DN:
      Filter:

    Group Membership
      Attribute:

    Group Search:      disabled
      Base DN:
      User Member
      Attribute:
```

show lines

Shows line configuration values.

Command Syntax

show lines

Command Access

Admin level only

Example

```
Switched PDU: show lines

  ID    Line Name
  --    ---------
  AA1   AA:L1
  CA1   CA:L1
  DA1   DA:L1

        SNMP        Email       Max         Current  Current  Current  Current
  ID    Notif.      Notif.      Current     Lo-Alrm  Lo-Warn  Hi-Warn  Hi-Alrm
  --    ------      ------      -------     -------  -------  -------  -------
  AA1   enabled     enabled     30A         0.0A     0.0A     21.0A    24.0A
  CA1   enabled     enabled     30A         0.0A     0.0A     21.0A    24.0A
  DA1   enabled     enabled     30A         0.0A     0.0A     21.0A    24.0A

  Common Line Settings

    Line Current Hysteresis:            1.0A
```

show loadshed

Note: Only available if the Smart Load Shedding feature is activated.

Shows load shedding configuration values.

Command Syntax

show loadshed

Command Access

Admin level only

Example

```
Switched PDU: show loadshed
  General load shedding options:          Status         Action Delay
    UPS On-Battery Load Shedding:         disabled       0 minute(s)
    UPS On-Utility Auto Recovery:         enabled        0 minute(s)
    Line Load Shedding:                   disabled
    Branch Load Shedding:                 disabled
    Sensor Load Shedding:                 disabled
  Line shedding event settings:
    ID  Line Name                         On-Bat Shed    High Current
    --  ---------                         -----------    ------------
    AA1 AA:L1                             disabled       24.0A
    BA1 BA:L1                             disabled       24.0A
  Sensor shedding event settings:
    ID  Sensor Name                       Type   Auto-Rec   High Temp
    --  -----------                       ----   --------   ---------
    E1  Contact_Sensor_E1                 CS     disabled   --
    E2  Contact_Sensor_E2                 CS     disabled   --
    E3  Contact_Sensor_E3                 CS     disabled   --
    E4  Contact_Sensor_E4                 CS     disabled   --
    A1  Temp_Sensor_A1                    TS     disabled   50C
    A2  Temp_Sensor_A2                    TS     disabled   50C
    B1  Temp_Sensor_B1                    TS     disabled   50C
    B2  Temp_Sensor_B2                    TS     disabled   50C
    E1  Temp_Sensor_E1                    TS     disabled   50C
    E2  Temp_Sensor_E2                    TS     disabled   15C
    E1  Water_Sensor_E1                   WS     disabled   --

  Outlet load shedding events:
                                          -Enabled Load-Shed Events-
  ID    Outlet Name                       UPS       Line      Branch

  AA1   Master_Outlet_1                   -         -         -
  AA2   Master_Outlet_2                   -         -         -
  AA3   Master_Outlet_3                   -         -         -
  AA4   Master_Outlet_4                   -         -         -
  AA5   Master_Outlet_5                   -         -         -
```

show log

Shows the system event log.

Command Syntax

show log [*filter*]

Parameters

The **show log** command uses the following parameter:

filter	Keyword filter for long entries.

Command Access

Admin level only

Example

```
Switched PDU: show log

There are 8 messages in the system log (#1-#8)

[1] L6 EVENT: Network stack started

[2] L6 EVENT: System boot complete

[3] L2 EVENT: High alarm (temperature 22.9C) detected on temperature sensor 'Temp_Sensor_C2' [C2]

[4] L5 EVENT: Normal temperature restored on temperature sensor 'Temp_Sensor_C2'[C2]

[5] May  5 13:54:56 L2 EVENT: High alarm (power 1W) detected on outlet 'Master_Outlet_30' [AA30]

[6] May  5 13:54:56 L2 EVENT: Low alarm (power factor 0.03) detected on outlet 'Master_Outlet_30'
[AA30]

[7] May  5 13:54:56 L5 EVENT: Normal power factor restored on outlet 'Master_Outlet_30' [AA30]

[8] May  5 14:38:34 L6 AUTH: User 'admn' logged in from 10.1.7.30 using TELNET
```

show network

Shows network configuration values.

Command Syntax

show network

Command Access

Admin level only

Example

```
Switched PDU: show network

  Network Configuration

    State:           Static IPv4       Network:         IPv4 only
    Link:            Up                Negotiation:     Auto
    Speed:           100 Mbps          Duplex:          Full
    Ethernet MAC:    00-0A-9C-60-00-0A
    AutoCfg IPv6:    FE80::20A:9CFF:FE60:A/64
    IPv4 Address:    10.1.2.205        Subnet Mask:     255.255.0.0
    IPv4 Gateway:    10.1.1.1
    DNS1:            10.1.5.133
    DNS2:            10.1.5.134

  Static IPv4/IPv6 Settings

    IPv6 Address:    FD01::A01:305/64
    IPv6 Gateway:    FD01::A01:585
    IPv4 Address:    10.1.2.205        Subnet Mask:     255.255.0.0
    IPv4 Gateway:    10.1.1.1
    DNS1:            10.1.5.133
    DNS2:            10.1.5.134

  DHCP Settings

    DHCP:            disabled
    FQDN:            enabled [sentry-ffffff]
    Boot Delay:      disabled
    Static Fallback: enabled
    ZTP (0-Touch):   enabled (not provisioned)

  Network Services

    FTP Server:  enabled     Port:    21
    FTP Updates: disabled    Port:    21
    SSH:         enabled     Port:    22   Auth:      Password, Kb-Int
    Telnet:      enabled     Port:    23
    HTTP:        enabled     Port:    80
    HTTPS:       enabled     Port:   443   Installed Cert: Factory
      User Cert: enabled

                                           SSL User Certificates:   enabled
                                           User Passphrase: <none>
                                           Uploaded Files: None
    SNMPv1/2:    enabled     Port:   161   TrapPort:  162
    SNMPv3:      disabled    Port:   161   TrapPort:  162
    Web Svc API: enabled
    SPM Access:  enabled
```

show ocps

Shows over-current protection (OCP) configuration values.

Command Syntax

show ocps

Command Access

Admin level only

Example

```
Switched PDU: show ocps

                                                SNMP      Email     User   / Factory
ID    Over-Current Protector Name               Notif.    Notif.    Current Capacity
--    --------------------------                ------    ------    ---------------
AA1   AA:Breaker_1                              enabled   enabled   20A    / 20A
AA2   AA:Breaker_2                              enabled   enabled   20A    / 20A
AA3   AA:Breaker_3                              enabled   enabled   20A    / 20A
```

show outlets

Shows outlet configuration values.

Command Syntax

show outlets

Command Access

Admin level only

Example

```
Switched PDU: show outlets

                                          SNMP        Email       Max
ID    Outlet Name                         Notif.      Notif.      Current
--    -----------                         ------      ------      -------
AA1   Master_Outlet_1                     enabled     enabled     20A
AA2   Master_Outlet_2                     enabled     enabled     15A
AA3   Master_Outlet_3                     enabled     enabled     15A


      Extra On    Wakeup      Locked                PF       PF
ID    Delay       State       No-Ctl                Lo-Alrm  Lo-Warn
--    --------    ------      ------                -------  -------
AA1   0 sec       On          No                    0.70     0.80
AA2   0 sec       On          No                    0.70     0.80
AA3   0 sec       On          No                    0.70     0.80


      Current  Current  Current  Current  Power    Power    Power    Power
ID    Lo-Alrm  Lo-Warn  Hi-Warn  Hi-Alrm  Lo-Alrm  Lo-Warn  Hi-Warn  Hi-Alrm
--    -------  -------  -------  -------  -------  -------  -------  -------
AA1   0.0A     0.0A     14.0A    16.0A    0W       0W       2912W    3328W
AA2   0.0A     0.0A     10.5A    12.0A    0W       0W       2184W    2496W
AA3   0.0A     0.0A     10.5A    12.0A    0W       0W       2184W    2496W


Common Outlet Settings

  Sequence Delay:                     2 second(s)
  Reboot Delay:                       15 second(s)
  Outlet State Change Logging:        disabled
  Outlet Current Hysteresis:          1.0A
  Outlet Power Hysteresis:            10W
  Outlet Power Factor Hysteresis:     0.02
```

show phases

Shows phase configuration values.

Command Syntax

show phases

Command Access

Admin level only

Example

```
Switched PDU: show phases

  ID    Phase Name
  --    ----------
  AA1   AA:L1-L2
  AA2   AA:L2-L3
  AA3   AA:L3-L1

        SNMP        Email       Nominal
  ID    Notif.      Notif.      Voltage
  --    ------      ------      -------
  AA1   enabled     enabled     208V
  AA2   enabled     enabled     208V
  AA3   enabled     enabled     208V

        Voltage  Voltage  Voltage  Voltage  PF       PF
  ID    Lo-Alrm  Lo-Warn  Hi-Warn  Hi-Alrm  Lo-Alrm  Lo-Warn
  --    -------  -------  -------  -------  -------  -------
  AA1   187.2V   197.6V   218.4V   228.8V   --       --
  AA2   187.2V   197.6V   218.4V   228.8V   --       --
  AA3   187.2V   197.6V   218.4V   228.8V   --       --

  Common Phase Settings

    Phase Voltage Hysteresis:            2.0V
    Phase Power Factor Hysteresis:       0.02
```

show ports

Shows port configuration values.

Command Syntax

show ports

Command Access

Admin level only

Example

```
Switched PDU: show ports

  ID    Port Name          Locked    Baud     Timeout    DSR Chk     RFTAG
  --    ---------          ------    ----     -------    -------     -----
  COM1  Console            No        9600     5 min      enabled     enabled
  COM2  Aux                No        115200   5 min      enabled     disabled
```

show radius

Shows Radius server configuration values.

Command Syntax

show radius

Command Access

Admin level only

Example

```
Switched PDU: show radius

  RADIUS Configuration

  RADIUS:          disabled

  Primary
    Server:        (not set)
    Shared Secret: (not set)
    Port:          1812
    Timeout:       5 second(s)
    Retries:       2

  Secondary
    Server:        (not set)
    Shared Secret: (not set)
    Port:          1812
    Timeout:       5 second(s)
    Retries:       2
```

show sensors

Shows sensor (and fan, when present) configuration values.

Command Syntax

show sensors

Command Access

Admin level only

Example

```
Switched PDU: show sensors

   Sensor  ID  Sensor Name
   ------  --  -----------
   Temp    A1  Temp_Sensor_A1
   Temp    A2  Temp_Sensor_A2
   Temp    C1  Temp_Sensor_C1
   Temp    C2  Temp_Sensor_C2
   Humid   A1  Humid_Sensor_A1
   Humid   A2  Humid_Sensor_A2
   Humid   C1  Humid_Sensor_C1
   Humid   C2  Humid_Sensor_C2
   Contact C1  Contact_Sensor_C1
   Contact C2  Contact_Sensor_C2
   Contact C3  Contact_Sensor_C3
   Contact C4  Contact_Sensor_C4
   Water   C1  Water_Sensor_C1
   ADC     C1  ADC_Sensor_C1


               SNMP        Email
   Sensor  ID  Notif.      Notif.      Lo-Alrm  Lo-Warn  Hi-Warn  Hi-Alrm
   ------  --  ------      ------      -------  -------  -------  -------
   Temp    A1  enabled     enabled     1C       5C       45C      50C
   Temp    A2  enabled     enabled     1C       5C       45C      50C
   Temp    C1  enabled     enabled     1C       5C       45C      50C
   Temp    C2  enabled     enabled     1C       5C       45C      50C
   Humid   A1  enabled     enabled     5% RH    10% RH   90% RH   95% RH
   Humid   A2  enabled     enabled     5% RH    10% RH   90% RH   95% RH
   Humid   C1  enabled     enabled     5% RH    10% RH   90% RH   95% RH
   Humid   C2  enabled     enabled     5% RH    10% RH   90% RH   95% RH
   Contact C1  enabled     enabled     --       --       --       --
   Contact C2  enabled     enabled     --       --       --       --
   Contact C3  enabled     enabled     --       --       --       --
   Contact C4  enabled     enabled     --       --       --       --
   Water   C1  enabled     enabled     --       --       --       --
   ADC     C1  disabled    disabled    0        0        255      255

   Common Sensor Settings

     Temperature Scale:                  Celsius
     Temperature Sensor Hysteresis:      1C
     Humidity Sensor Hysteresis:         2% RH
     ADC Sensor Hysteresis:              1
```

show shutdown

Note: For Switched products only.

Shows outlet shutdown configuration values.

Command Syntax

show shutdown

Usage Guidelines

This command is for Switched products only.

Command Access

Admin level only

Example

```
Switched PDU: show shutdown

  ID    Outlet Name                    Shutdown/Delay   Script/Delay
  --    -----------                    --------------   ------------
  AA1   Master_Outlet_1                Off / 90 sec     Off / 1 min
  AA2   Master_Outlet_2                Off / 90 sec     Off / 1 min
  AA3   Master_Outlet_3                Off / 90 sec     Off / 1 min
  AA4   Master_Outlet_4                Off / 90 sec     Off / 1 min
  AA5   Master_Outlet_5                Off / 90 sec     Off / 1 min
  AA6   Master_Outlet_6                Off / 90 sec     Off / 1 min

  ID    Outlet Hostname/IP
  --    ------------------
  AA1   (not set)
  AA2   (not set)
  AA3   (not set)
  AA4   (not set)
  AA5   (not set)
  AA6   (not set)
```

show snmp

Shows SNMP configuration values.

Command Syntax

show snmp

Command Access

Admin level only

Example

```
Switched PDU: show snmp

  SNMP Configuration

  SNMPv2 Agent:            enabled

    Get Community <RO>:    public
    Set Community <RW>:

  SNMPv3 Agent:            disabled

    Engine ID:             8000006B602

    RW User Name:          <not set>
    RW User Auth Method:   none
    RW User Auth Password: <not set>
    RW User Privacy Pass:  <not set>
    RO User Name:          <not set>
    RO User Auth Method:   none
    RO User Auth Password: <not set>
    RO User Privacy Pass:  <not set>

  SNMP Trap:

    Format:               v1
    v2 Community:    trap
    v3 Username:     <not set>
    Destination 1:
    Destination 2:
    IP Restrictions:      No Restrictions
    Error Repeat Time:    60 second(s)

  SNMP SysName:           Sentry_60000a
  SNMP SysLocation:       FIRMWARE PIPS-POPS Switched 3P
  SNMP SysContact:
```

show sntp

Shows SNTP configuration values.

Command Syntax

show sntp

Command Access

Admin level only

Example

```
Switched PDU: show sntp

  SNTP Configuration

    Local Date/Time:       2014-05-06  14:30:41 (DST)
    Primary Host:          2.servertech.pool.ntp.org
    Secondary Host:        1.servertech.pool.ntp.org
    Local GMT Offset:      -8:00 hours

    Daylight Saving Time: enabled
      DST Start:           2nd Sunday in March at 02:00:00
      DST End:             1st Sunday in November at 02:00:00
```

show syslog

Shows Syslog configuration values.

Command Syntax

show syslog

Command Access

Admin level only

Example

```
Switched PDU: show syslog

  SYSLOG Configuration

    Host 1:          <not set>
    Host 2:          <not set>
    Port:            514
    Protocol:        RFC3164
    Debug Messaging: disabled
```

show system

Shows system uptime, firmware version, firmware build information, boot version, hardware version, number of active users, and location string.

Command Syntax

show system

Command Access

Admin level only

Example

```
Switched PDU: show system

  System Information

    Uptime:       1 day 20 hours 0 minutes 13 seconds
    Firmware:     Sentry Switched PDU Version 8.0a
    Build Info:   Rev 1032, January 7 2015, 10:52:42
    Boot Info:    4.0d-r139
    Hardware:     NIM2-1L (129), 75 MHz, 16MB RAM, 4MB FLASH
    NIC S/N:      9600165
    Active Users: 1

    Location:     PIPS-POPS Switched
```

show tacacs

Shows TACACS+ configuration values.

Command Syntax

show tacacs

Command Access

Admin level only

Example

```
Switched PDU: show tacacs

  TACACS+ Configuration

    TACACS+:        disabled
    Primary Host:   <not set>
    Secondary Host: <not set>
    Port:           49
    Key:            <not set>
```

show trend

Shows power trending configurations.

Command Syntax

show trend

Command Access

Admin level only

Example

```
Switched PDU: show trend

  Trending Configuration

    Data Trending:  enabled
```

show units

Shows PDU configuration values.

Command Syntax

show units

Command Access

Admin level only

Example

```
Switched PDU: show units

  Unit Name:          Master <A>
  Type:               Master
  Model Number:       STV-6503K
  Product S/N:        STVU0000118
  Asset Tag:          testtag1asdf
  Display Orient:     Auto <Normal>
  Outlet Sequence:    Normal
  SNMP Notif.:        enabled
  Email Notif.:       enabled

  Unit Name:          Link <B>
  Type:               Link
  Model Number:       SEV-4503K
  Product S/N:        <not set>
  Asset Tag:          AGHWERAFSasdf
  Display Orient:     Auto <Normal>
  Outlet Sequence:    Normal
  Outlet Dsp Order:   Normal
  SNMP Notif.:        enabled
  Email Notif:        enabled
```

show waps

Description:

Displays the available wireless access points.

Command Syntax:

show waps

Command Access:

Admin level only; wireless module installed.

show wlan

Description:

Displays the wireless network configurations.

Command Syntax:

show wlan

Command Access:

Admin level only; wireless module installed.

show ztp

Description:

Displays the Zero Touch Provisioning (ZTP) network configurations.

Command Syntax:

show ztp

Command Access:

Admin level only

Example

```
Switched PDU: show ztp

 Zero Touch Provisioning Configuration <DHCP required>

 ZTP:            enabled <not provisioned>
 Auto Updates:   disabled
 Update Day:     Everyday
 Update Hour:    12 AM
```

shutdown

Note: For Switched products only.

Turns off a specified outlet or outlet group after performing a user-specified shutdown operation.

Command Syntax

shutdown <name | id | group | ALL>

Usage Guidelines

For Switched PDU products only.

Command Access

Admin and Power User

Example

```
Switched PDU: shutdown
  Outlet name or ID, group name or ALL:
```

status

Note: For Switched products only.

Displays the latest status and control state for a specified outlet or outlet group.

Command Syntax

status <name | id | group | ALL>

Usage Guidelines

Command Access

Any access level

Example

```
Switched PDU: status all

  ID    Outlet Name                    Control State  State  Status
  --    -----------                    -------------  -----  ------
  AA1   Master_Outlet_1                Idle On        On     Normal
  AA2   Master_Outlet_2                Idle On        On     Normal
  AA3   Master_Outlet_3                Idle On        On     Normal
  AA4   Master_Outlet_4                Idle On        On     Normal
  AA5   Master_Outlet_5                Idle On        On     Normal
  AA6   Master_Outlet_6                Idle On        On     Normal
```

sysstat

Displays the count of all system objects (by type), the latest status of the objects, and the count of objects currently in an event condition.

Command Syntax

sysstat

Command Access

System Monitor access

Example

```
Switched PDU: sysstat

  Qty   Sub-System                    Status         Events
  ---   ----------                   ------         ------
  2     Units                        Normal         0
  1     Cords                        Normal         0
  3     Lines                        Normal         0
  3     Phases                       Normal         0
  3     OCPs                         Normal         0
  3     Branches                     Normal         0
  30    Outlets                      Normal         0
  14    Sensors                      Normal         0
  1     UPS                          Normal         0
```

upsstat

Displays the latest status and metrics for all UPS devices in the system.

Command Syntax

upsstat

Command Access

System Monitor access

Example

```
Switched PDU: upsstat
  ID    UPS Type                          Status
  --    --------                          ------
  1     Generic RFC1628                   Not Found
```

ustat

Displays the latest status and metrics for all PDUs in the system.

Command Syntax

ustat

Command Access

System Monitor access

Example

```
Switched PDU: ustat
  ID    Unit Name                  Type   Status
  --    ---------                  -----  ------
  A     Master                     Master Normal

  ID    Display Orientation
  --    -------------------
  A     Auto <Inverted>
```

version

Displays the current firmware version.

Command Syntax

version

Command Access

Any access level

Example

```
Switched PDU: version
Sentry Switched PDU Version 8.0
```

Appendix A: Hardware Items

LED Indicators

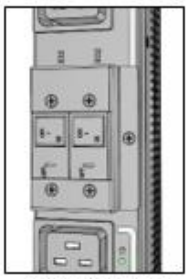
The following input current LED indicators can be displayed on the Switched PRO1/PRO2 products:

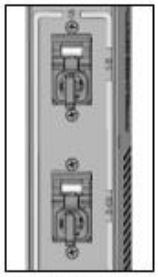
Behavior/Indicator	Description	Comments/User Action
"--" (flashing double dashes)	Occurs during normal boots, restarts, and firmware flash updates but should revert to displaying amperage values upon completion. Internal communication bus error is indicated if behavior is endless.	If the behavior is endless, contact Server Technology Technical Support at: 1-800-835-1515 or support@servertech.com
(flashing amperage value)	The current exceeds user-defined "high load" threshold (default setting is 80% of maximum input feed capacity).	Unit blinks a half-second on, half-second off.
"bE"	Breaker Error. The PDU has detected an error with the circuit-breaker Branch Circuit Protection.	Display alternates between showing amperage value for two seconds and flashing "bE" three times. Check to see if the breaker was tripped.
"FE"	Fuse Error. The PDU has detected an error with the fused Branch Circuit Protection.	Display alternates between showing amperage value for two seconds and flashing "FE" three times. Check to see if the fuse was blown or removed.
"oL" (flashing)	Overload.	Current exceeds the input feed capacity.
"UA", "Ub", "UC", "Ud"	Occurs when you select the **Configuration > Units > Identify** option.	Not an error code; no user action required. Display alternates between showing amperage value for two seconds and flashing "UA", "Ub", "UC", or "Ud" three times. If unit is a master, "UA" (unit A) flashes. If unit is one of up-to-three possible link types, these indicators flash: "Ub" (unit B), "UC" (unit C), or "Ud" (unit D).

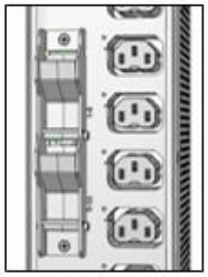
Branch Circuit Protection

Server Technology PDUs are equipped with one of several types of Branch Circuit Protection, including internal fuses, retractable fuse holders, and circuit breakers, as illustrated below.

These fuses and circuit breakers meet the strict safety requirements of UL 60950-1 and EN 60950-1 for Branch Circuit Protection.


Circuit Breaker


Compact Fuse Holder

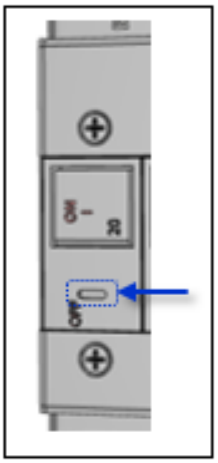

Fuse Retractor


Fuse Access Window


Fuse Access Cover

Circuit Breaker

If a circuit breaker is tripped, it can be reset by pressing or switching it back ON once the cause of the overload or short circuit has been identified, removed, or resolved. Intelligent PDUs with branch circuit sensing will display a flashing *FE* on the input current LED(s) to indicate *Fuse Error*.



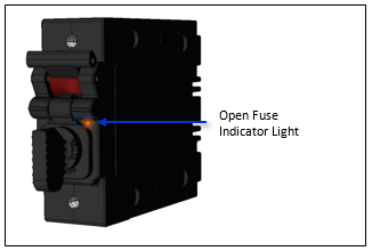
Alternatively, the circuit breaker can be turned OFF manually by inserting a slotted or flat-blade tool into the OFF switch as shown in the illustration on the left.

It is not necessary to disconnect the AC power source to perform this operation.

NOTE: This circuit breaker contains no user-serviceable parts. Do not open or disassemble this part.

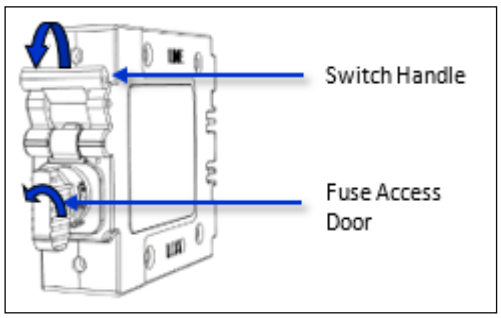
Compact Fuse Holder

The Compact Fuse Holder is a UL 98 listed Fused Disconnect Switch that allows the user to turn OFF the branch circuit and safely service the fuse without having to disconnect the PDU AC power source prior to performing this operation.



To help identify which fuse is open, blown, or missing, the Open Fuse Indicator Light glows **orange** when the PDU is powered and the Switch Handle is in the ON position.

Additionally, intelligent PDUs with branch circuit sensing will display a flashing *FE* on the input current LEDs to indicate *Fuse Error*.



To service the fuse or turn OFF the branch, rotate the Switch Handle toward the Fuse Access Door.

Next, rotate the Fuse Access Door counter clock-wise until it opens.

Only replace the fuse with the same size, type, and ratings as the original fuse.

Reverse these steps after the new fuse(s) is installed.

CAUTION:

- Failure to replace the fuse with the same size, type, and ratings will damage the PDU and the connected and nearby equipment, and will cause electrical shock, fire, explosion, or injury/death.
- Do not attempt to open the Fuse Access Door without first setting the Switch Handle in the OFF position. Forcibly rotating the Fuse Access Door will damage the fused holder.

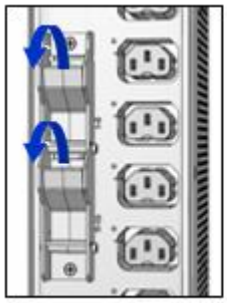
Fuse Retractor, Fuse Access Window, and Fuse Access Cover

The PDU AC power source must be disconnected prior to servicing a unit with the Fuse Retractor, Fuse Access Window, and Fuse Access Cover.

Intelligent PDUs with branch circuit sensing will display a flashing *FE* on the input current LEDs to indicate *Fault Error*.

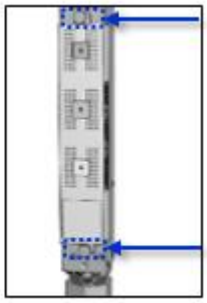
For the fuse retractor, rotate the fuse holder exposing the fuse.

For the fuse access window or cover, remove the screws that secure the plastic cover.



Fuse Retractor

Fuse Access Window



Fuse Access Cover

Once the fuses are exposed, carefully remove and replace with a new one of the same size, type, and ratings as the original. A fuse puller may be needed for fuse access windows and covers.

Reverse these steps after the new fuse(s) is installed.

CAUTION:

Failure to replace the fuse with the same size, type, and ratings will damage the PDU and the connected and nearby equipment, and will cause electrical shock, fire, explosion, or injury/death.

Data Connections

Although not provided with your PDU when shipped, the RJ45 rolled cable and the RJ45 to DB9F serial port adapter still work together to allow access to the serial CLI interface from a terminal with a standard DB9M serial port.

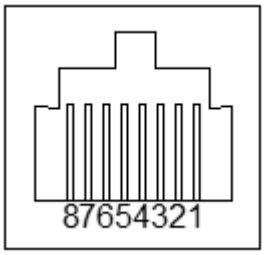
You can order the cable and adapter from Server Technology using the following part numbers:

- RJ45 to RJ45 Rolled Patch Cable: Part# CAB-1205
- RJ45 to DB9F Serial Port Adapter: Part# ADP-0019

RS-232 Port

The PRO1/PRO2 units are equipped standard with an RJ45 DTE RS-232c serial port. This connector can be used for direct local access or from other serial devices such as a terminal server.

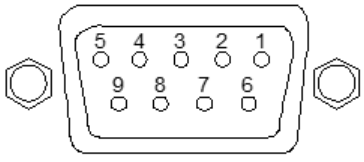
Pin	DTE Signal Name	Input/Output
1	Request to Send (RTS)	Output
2	Data Terminal Ready (DTR)	Output
3	Transmit Data (TD)	Output
4	Signal Ground	---
5	Signal Ground	---
6	Receive Data (RD)	Input
7	Data Set Ready (DSR)	Input
8	Clear to Send (CTS)	Input



RJ45 to DB9F Serial Port Adapter

In addition, an RJ45 to DB9F serial port adapter can be used in conjunction with the RJ45 rolled cable to connect to a PC DB9M DCE serial port. The pinouts below show the use of the serial port adapter with the RJ45 rolled cable.

Pin	DCE Signal Name	Input/Output
1	---	---
2	Receive Data (RD)	Output
3	Transmit Data (TD)	Input
4	Data Terminal Ready (DTR)	Input
5	Signal Ground	---
6	Data Set Ready (DSR)	Output
7	Request to Send (RTS)	Input
8	Clear to Send (CTS)	Output



Time-Delay Fuses – Class G

NOTE: Server Technology PDUs ship with Bussman SC-20 fuses.

Ampere Rating	Voltage	Interrupting Rating	Bussman Part No.*	Server Technology Part No.
20 A	600 Vac	100,000 A RMS Sym. AC	SC-20	FUSE-SC20G

* Cooper Bussman Technical Data Sheet 1024

For technical support or service with time-delay fuses, contact Server Technology as follows:

Experience Server Technology's FREE 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. Pacific Time, Monday through Friday.

Server Technology, Inc. (a brand of Legrand)

1040 Sandhill Road Tel:1-800-835-1515 Web: www.servertech.com

Reno, Nevada 89521 USA Fax: 775-284-2065 Email: support@servertech.com

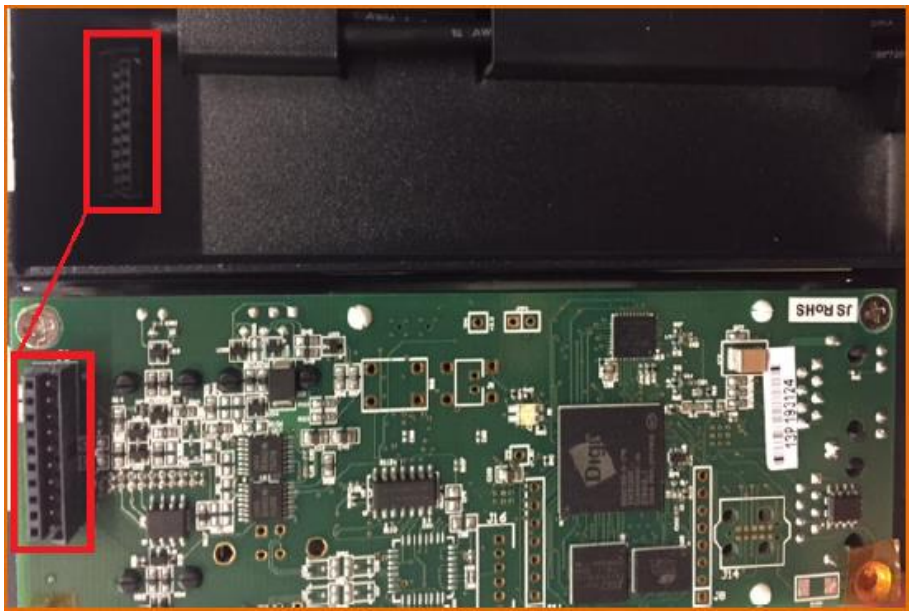
PROx Network Interface Card (NIC) Swap

The NIC in your PROx PDU is a hot-swappable assembly that can be removed and installed without the loss of output voltage, as described in the following instructions:

1. Remove the Phillips-head retention screws and save for step 4.

   Note: Some models have either one or two screws, shown in the following two images:

2. Using equal pressure on both sides, pull the NIC out of the PDU enclosure.
3. Install the new NIC, ensuring the NIC is orientated so that it lines up with the connector inside of the PDU enclosure, as illustrated below.



4. Install the Phillips-head retention screws.

Appendix B: Regulatory Compliance

Product Safety

Units have been safety tested and certified to the following standards:

- USA/Canada UL 62368-1:2019 and CAN/CSA 22.2 No. 62368-1:2019
- European Union EN IEC 62368-1:2020+A11:2020
- IEC CB Scheme IEC 62368-1:2018

This product is also designed for Norwegian IT power system with phase-to phase voltage 230V.

Notifications

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 operate 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

WARNING: This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.

Products with CE Marking comply with the EMC Directive (2014/30/EU), Low Voltage Directive (2014/35/EU) and RoHS 2 Directive (2011/65/EU) issued by the Commission of the European Community.

Compliance with the following harmonized standards demonstrate conformity with the EMC and Low Voltage Directives.

- EN 55032
- EN 55035
- EN IEC 62368-1

U.K. Notification

Products with UKCA Marking comply with the *The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (RoHS), Electrical Equipment (Safety) Regulations 2016 and Electromagnetic Compatibility Regulations 2016.*

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。

Republic of Korea Notification

이 기기는 업무용(A 급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기

바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다

Chinese Notification

关于符合中国《电气电子产品有害物质限制使用管理办法》的声明

产品中有毒有害物质的名称及含量

部件名称 (Parts)	有毒有害物质或元素 (Hazardous Substance)					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr (VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
机箱子组件 (Chassis Subassembly)	O	O	O	O	O	O
印刷板组件 (PCAs)	X	O	O	O	O	O

本表按照 SJ/T 11364-2014 **的规定编制** 。
This table has been prepared in accordance with the provisions of SJ/T 11364-2014.

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 GB/T 26572-2011 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 GB/T 26572-2011.

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 GB/T 26572-2011 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 GB/T 26572-2011.

Product Recycling

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 C: Product Support Information

Warranty

For Server Technology warranty information, visit our website: www.servertech.com

Contact Technical Support

Experience Server Technology's FREE 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. Pacific Time, Monday through Friday.

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Reno, Nevada 89521 USA	Fax:	775-284-2065	Email:	support@servertech.com

Return Merchandise Authorization (RMA)

If you have a product that is not functioning properly and needs technical assistance or repair, see the Server Technology **Return Merchandise Authorization** process at: www.servertech.com

Interested in learning more about how Server Technology can help you manage and distribute power in your datacenter?
Visit us online at: www.servertech.com/products

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