EN

Smart Power Distribution Unit
DK 7856.510 / 520

Assembly, Installation and Operation



FRIEDHELM LOH GROUP

A40194 00 IT 74

Microsoft Windows is a registered trademark of Microsoft Corporation.
Acrobat Reader is a registered trademark of Adobe Systems Incorporated.

EN

1 Table of Contents

1 Table of Contents 3

2 Documentation Notes 4

3 Safety Instructions 4

3.1 Safety Precautions 5
3.2 Life-Support Policy 6

4 Product Introduction 7

4.1 Technical Equipment 7
4.2 Power Supply 7
4.3 Usable Sensors 7
4.4 Accessories 8
4.5 Optional Accessories 8
4.6 Proper Use 8

5 Mounting 9

5.1 Mounting the PDU 9
5.2 Expansion Module 9

6 Installing 10

6.1 Security advices 10
6.2 Connecting to the Power Source 10
6.3 Connecting Devices 10
6.4 Connecting to the Unit 10

7 Operations 11

7.1 Interfaces 11
7.1.1 Usernames and Passwords 11
7.2 HTML Interface 11
7.2.1 Logging In 12
7.2.2 Power Monitoring 12
7.2.3 Environmental Monitoring 12
7.2.4 Configuration 12
7.2.5 Tools 21
7.3 Command Line Interface 21
7.3.1 Administration Commands 25

8 Advanced Operations 39

8.1 SSL 39
8.1.1 SSL Technical Specifications 40
8.2 SSH 40
8.2.1 SSH Technical Specifications 41
8.3 SNMP/Thresholds 41
8.3.1 SNMP Traps 43
8.3.2 Configuring Traps 44
8.4 LDAP 46
8.4.1 Configuring LDAP Groups 50
8.5 LDAP Technical Specifications 52
8.6 TACACS+ 53
8.6.1 Configuring TACACS+ Privilege Levels 55
8.6.2 TACACS+ Specifications 56
8.7 Logging 56
8.8 E-Mail 57
8.8.1 Upload/Download 59

9 Appendices 60

9.1 Resetting to Factory Defaults 60
9.2 Uploading Firmware 61

10 Technical Specifications 61

10.1 RS-232 port 62
10.2 RJ45 to DB9F serial port adapter 62
10.3 LED Indicators 62
10.4 Regulatory Compliance 62

11 Maintenance and Cleaning 63

11.1 Cleaning 63

12 Storage and Disposal 63

13 Customer Service 64

EN

2 Documentation Notes

The audience for this guide is the technical specialist familiar with the assembly, installation and operation of the Smart PDU System.

You should read this operating guide prior to commissioning and store the guide so it is readily accessible for subsequent use.

Rittal cannot accept any liability for damage and operational malfunctions that result from the non observance of this guide.

Retention of Documents

This guide and all associated documents are part of the product. They must be given to the operator of the unit and must be stored so they are available when needed.

Symbols Used

The following safety and other notes are used in this guide:

Symbol for handling instructions:

- This bullet point indicates that you should perform an action.

Safety and other notes:



Danger!
Immediate danger to health and life!



Warning!
Possible danger for the product and the environment!



Note!
Useful information and special features.

3 Safety Instructions

1. Assembly and installation of the Switched PDU, in particular for wiring the enclosures with mains power, may be performed only by a trained electrician. Other tasks associated with the PDU, such as the assembly and installation of system components with tested standard connectors, and the operation and configuration of the PDU may be performed only by instructed personnel.
2. Do not open the case, as there are no serviceable parts inside. Your warranty will be void.
3. Do not try to repair the unit yourself; contact your local supplier or your warranty will be void.
4. If liquids are spilt onto the PDU or foreign objects dropped into the unit, the warranty will be null and void.
5. Do not install the PDU in an environment with sparks, smoke or gas.
6. The PDU is designed to be installed and commissioned in a sheltered, controlled environment as follows:
   - Operating temperature 0-40℃ and 5-90% non-condensing humidity.
   - Always avoid contact with direct sunlight.
   - Do not install the PDU in inflammable or hazardous environment.
   - Dusty, corrosive and salty environments can do damage to the PDU.
   - Install the PDU indoors as it is not designed for installation outdoors.
7. Install the PDU away from objects that give off excessive heat and areas that are excessively wet.
8. Always switch off the PDU when relocating it.
9. Make sure that the AC main supply outlet is correctly grounded.
10. Please ensure that the input voltage of the PDU matches the utility supply voltage.
11. Observe the valid regulations for the electrical installation for the country in which the unit is installed and operated, and the national regulations for accident prevention. Also observe any company-internal regulations (work, operating and safety regulations).

Use only genuine or recommended parts and accessories. The use of other parts can void the liability for any resulting consequences.

3.1 Safety Precautions

This section contains important safety and regulatory information that should be reviewed before installing and using the Smart Power Distribution Unit.

Only for installation and use in a Service Access Location in accordance with the following installation and use instructions.	*Destiné à l'installation et l'utilisation dans le cadre de Service Access Location selon les instructions d'installation et d'utilisation.*	Nur für Installation und Gebrauch an Anschlusszugriffspunkten gemäß der folgenden Installations- und Gebrauchsanweisungen.
This equipment is designed to be installed on a dedicated circuit.	*Cet équipement est conçu à être installé sur un circuit spécialisé.*	Diese Ausrüstung ist zur Installation in einem festen Stromkreis vorgesehen.
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.
The plug on the power supply cord shall be installed near the equipment and shall be easily accessible.	*La prise sur le cordon d'alimentation sera installée près de l'équipement et sera facilement disponible.*	Der Stecker des Netzkabels muss in der Nähe der Ausrüstung installiert werden und leicht zugänglich sein.
Installation Orientation: PDUs are design to be installed in vertical orientation.	*Installation Orientation : PDUs sont conçues pour être installées dans une orientation verticale.*	Installationsausrichtung: PDUs sind zur vertikalen Installation vorgesehen.
Always disconnect the power supply cord before opening to avoid electrical shock.	*Toujours déconnecter le cordon d'alimentation avant d'ouvrir pour éviter un choque électrique.*	Ziehen Sie vor dem Öffnen immer das Netzkabel heraus, um die Gefahr eines elektrischen Schlags zu vermeiden.
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! Double Pole/Neutral Fusing	*ATTENTION!* *Double Pôle/Fusible sur le Neutre*	ACHTUNG!: Zweipolige bzw. Neutralleiter-Sicherung

EN

3.2 Life-Support Policy

As a general policy, Rittal does not recommend the use of any of its products in the following situations:

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

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

- the risks of injury or damage have been minimized,
- the customer assumes all such risks, and
- the liability of Rittal 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.

EN

4 Product Introduction

The Smart Power Distributing Unit (Smart PDU) is a compact Distribution Unit, which can be mounted easy and quick into every server rack. It featured several C13 and C19 Plugs and has a voltage and current measurement module.

By using the Web-Interface you can configure and switch the Unit in the cabinet.

If one or more values of the Unit crosses the determined thresholds level you decided, the information can be send via SNMP or email to several positions, which you can describe.

4.1 Technical Equipment

In Figure 1 the technical equipment of the Smart PDU is shown

1. Power conncetion Plug
2. LED displays the current load for each infeed
3. RJ-45 connectors for Serial (RS-232) and Ethernet connection
4. Mini RJ-11 connectors for sensors

4.2 Power Supply

The Smart PDU is powerd with the included Connection Plug. The unsed Voltage depends of the model which is used.

Order-Nr. DK	Plug	Power Supply
7856.510	1-phase	230V / 50 – 60 Hz
7856.520	3-phase	400V / 50 – 60 Hz

Tab. 1 Power Supply

4.3 Usable Sensors

The Smart PDU has two Mini RJ-11 T/H-Ports which can be used for several Sensors.

Connect the mini RJ-11 Plug from the sensor to the T/H-Port on the PDU.

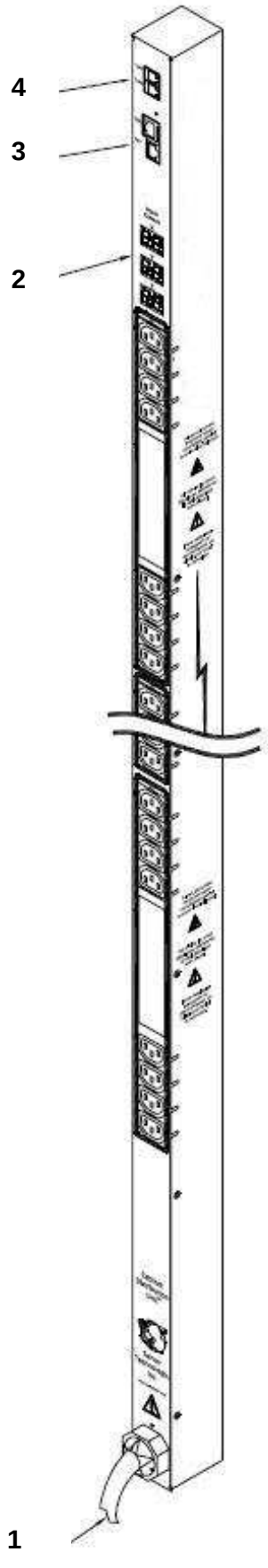


Abb. 1 Technical Equipment of the Smart PDU

EN

4.4 Accessories

Before installing your Smart PDU, refer to the following lists to ensure that you have all the items shipped with the unit as well as all other items required for proper installation.

- Look for obvious damages on the package

Value	Description
1	Smart PDU
1	Connection Cable 3 m (1-phase / 3-phase, depends on model)
1	RJ45-/RJ45 Crosscable
1	RJ45-/DB9F-Adapter for serial interface
1	RJ12-/RJ12 Crosscable
1	Clips for Outputs
1	Mounting material
1	Instrucion Manual

Tab. 2 Materials provided

4.5 Optional Accessories

Depending on the application it can be necessary to order some optional accessories. Rittal offers the following accessories for the Smart PDU:

Accessories	Description	Value	Order-Nr.
Expansion Module	Slave Modul	-	On request
Server concnetion plug	C13/C14 0,5 m	2	7856.014
	extension cord 1,5 m	1	7200.215

Tab. 3 Optional Accessories

4.6 Proper Use

A use different from that described here is considered to be an improper use. Rittal cannot accept any liability for damage resulting from the improper use or the non-observance of this guide. The guides for the used accessories may apply.

EN

5 Mounting

The included installation set allows the mounting of the unit on the cabinet frame and in 800 mm Cabinets also on the side of the 19 inch level.

Mounting hardware:

- Two removable flanges with four M4 screws
- Two mounting L-brackets with nut plates, four sets of screws and washers
- Optional button mounts.

Required Items:

- Flathead and Phillips screwdrivers
- Screws, washers and nuts to attach the Smart PDU to your rack

5.1 Mounting the PDU

The mounting steps are shown in figure 2.

1. Attach the removable flanges to the mount points on the rear of the enclosure using M4 screws.

2. Attach the mounting L-brackets to the flanges with the supplied screws, washers and nut plates. The slots allow about 1½ inches of vertical adaptability.

3. Attach the top and bottom brackets to your rack.

Optionally, the supplied button mounts may be used for mounting the PDU into cabinets supporting this method of equipment mounting.

Note!

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

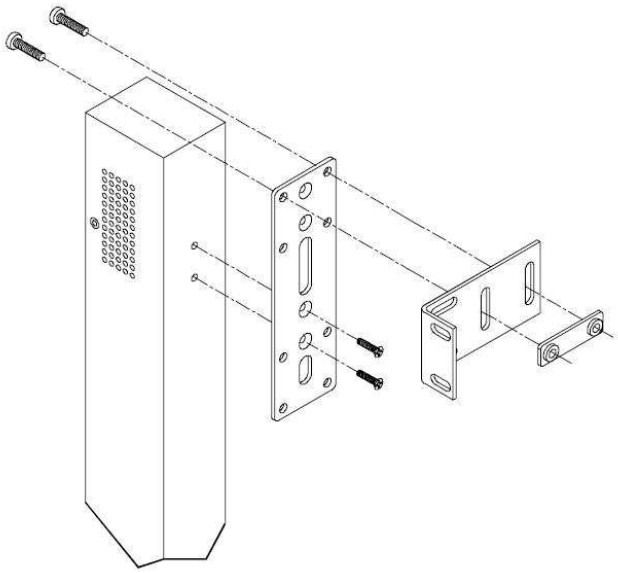


Abb. 2 Mounting the PDU

5.2 Expansion Module

Connect the Expansion Module PDU with the provided RJ12 crossover cable at the Link port on the Switched PDU.

Note!

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

EN

6 Installing



Danger!
The assembly and installation may be performed only by trained specialists.

6.1 Security advices

- The Rittal Smart PDU may be operated only with connected protective earth conductor. The protective earth conductor connection is made by plugging in the IEC connection cable. This requires that the IEC connection cable at the power supply side be connected with the protective earth conductor.

- The electrical connection voltage and frequency must conform to the rated values specified at the rear of the power supply unit and in the technical specifications
- Before commencing work on the Rittal Smart PDU, it must be disconnected from the mains power supply and protected against being reconnected.

Protect the connection cables using cable ties on the used housing or enclosure.

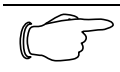
6.2 Connecting to the Power Source

- Plug the female end of the power cord firmly into its connector at the base.
- Use a screwdriver to tighten the two screws on the retention bracket.

6.3 Connecting Devices

To avoid the possibility of noise due to arcing:

- Keep the device's on/off switch in the off position until after it is plugged into the outlet..
- Connect devices to the PDU outlets.



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

6.4 Connecting to the Unit

Serial (RS232) port

The Smart PDU is equipped with an RJ45 Serial RS-232 port for attachment to a PC or networked terminal server using the supplied RJ45 to RJ45 crossover cable and RJ45 to DB9F serial port adapter as required.

Ethernet port

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

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

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

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

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



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



Hinweis!
RiWatchIT is **not** supported

EN

7 Operations

7.1 Interfaces

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

7.1.1 Usernames and Passwords

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

Note!

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

operations such as creating/removing user accounts and command privileges, changing passwords and displaying user information.

An administrator may also view the status of all sensors and power inputs.

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

7.2 HTML Interface

The HTML interface is constructed of three major components:

1. System Location bar
2. User/Navigation bar
3. Control Screen.

(see Fig. 3)

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

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

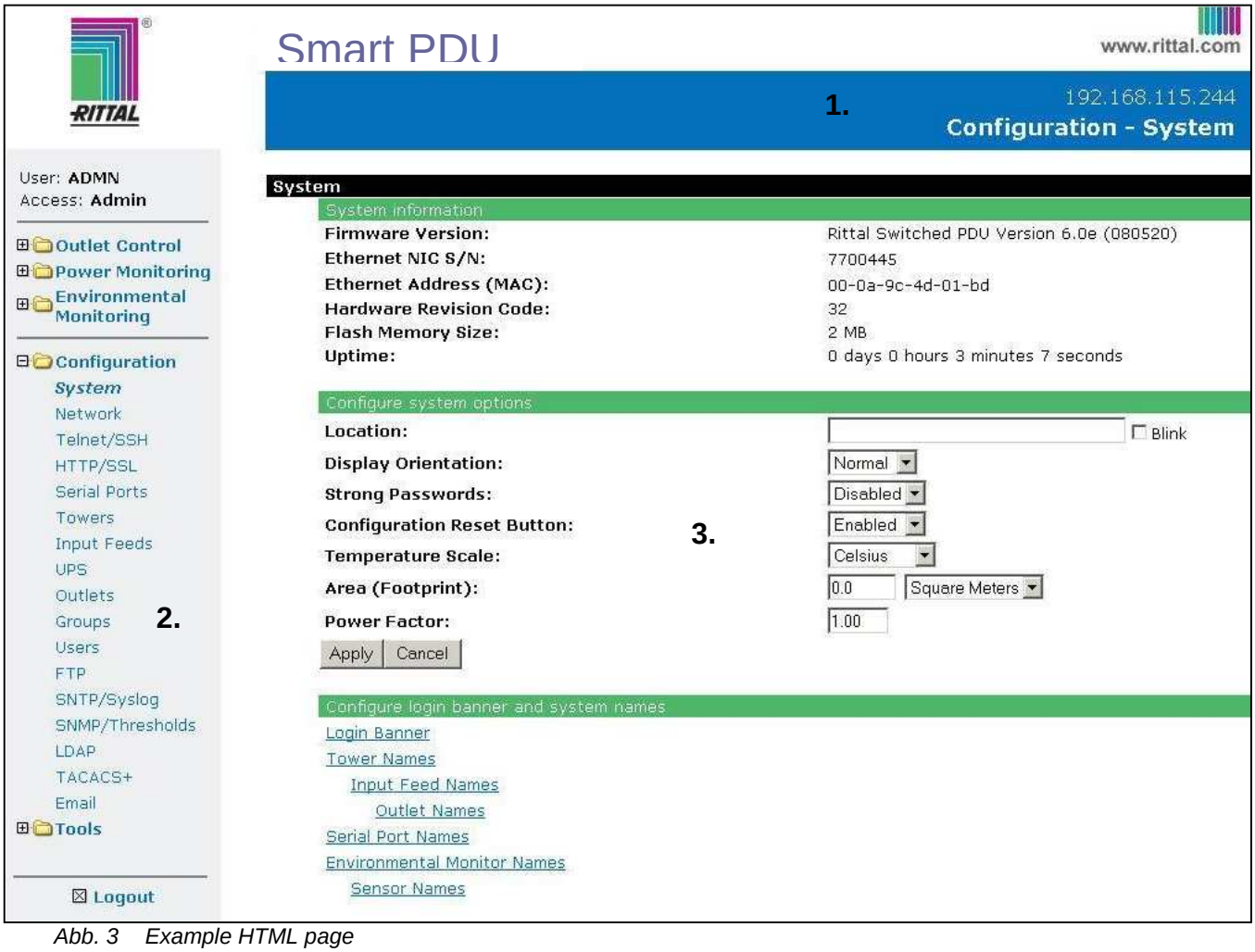


Abb. 3 Example HTML page

EN

7.2.1 Logging In

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

To log in by HTML:

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

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

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



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

7.2.2 Power Monitoring

Input Feeds

The Input Feeds page displays:

- Infeed's absolute and descriptive names
- Infeed status
- Input/branch phase load in amperes
- Input Voltage
- Calculated power usage in Watts.

This page will refresh automatically every 10 seconds.

System

The System page displays:

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

This page will refresh automatically every 10 seconds.

UPS

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

- Type
- Status
- Voltage
- Hostname/IP address

This page will refresh automatically every 10 seconds.

7.2.3 Environmental Monitoring

Input Feeds

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

Sensors

The Sensors page displays:

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

7.2.4 Configuration

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

System

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

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



Note!
Spaces may be used for the location description only.

Creating a pre-login banner:

Click on the **Login Banner** link.

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



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

Creating a descriptive system location name:

Enter a descriptive name and press **Apply**.

Configuring the Input Current LED display orientation:

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

Enabling or disabling strong password requirements:

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

Acceptable strong passwords:

```
n0tOnmyw@tch
john2STI?
H3reUgo!
```

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

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

Note!
The strong password requirement is applied against all new passwords.

Enabling or disabling the external reset button:

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

Creating a descriptive unit name:

Click on the **Tower Names** link.

On the subsequent Tower Names page, enter a descriptive name and press **Apply**.

Creating a descriptive input feed name:

Click on the **Input Feed Names** link.

On the subsequent Input Feed Names page, enter a descriptive name and press **Apply**.

Creating a descriptive serial port name:

Click on the **Serial Port Names** link which will open the Serial Ports configuration page.

You can change the names by clicking on the "Edit" button.

Creating a descriptive Environmental Monitor name:

Click on the **Environmental Monitor Names** link.

On the subsequent Environmental Monitor Names page, enter a descriptive name and press **Apply**.

Creating descriptive sensor names:

Click on the **Sensor Names** link.

On the subsequent Sensor Names page, enter a descriptive name and press **Apply**.

Network

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

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

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

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

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

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

Note!
The unit must be restarted after network configuration changes.

Enabling or disabling DHCP support:

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

EN

Setting the IP address, subnet mask, gateway or DNS address:

In the appropriate field, enter the IP address, subnet mask, gateway address or DNS address and press **Apply**.

Telnet/SSH

The Telnet/SSH configuration page used to enable or disable Telnet and SSH support and configure the port number that the Telnet or SSH server watches. For more information on SSH see page 40 in 8Advanced Operations.

Enabling or disabling Telnet or SSH support:

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

Changing the Telnet or SSH server port number:

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

Enabling or disabling SSH server authentication methods:

The PDU SSH server supports two authentication methods for security and validation: Password and Keyboard-Interactive.

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

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

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



Note!
At least one authentication method must be enabled.

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

HTTP/SSL

The HTTP/SSL configuration page used to enable or disable HTTP and SSL support, configure the port number that the HTTP server watches and responds to, selection of the method of authentication used and SSL access level.

Enabling or disabling HTTP or SSL support:

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

Changing the HTTP server port number:

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

Setting the HTTP authentication method:

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

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



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

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



Note!
MD5 is known to be fully supported by Internet Explorer 5.0+

Select **Basic** or **MD5** from the Authentication drop-down menu and press **Apply**.

Setting SSL access level:

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

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

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

Serial Ports

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



Note!
Pass-Thru connections may only be initiated from the command line interface via a Telnet/SSH session.Schnittstelle über eine Telnet/SSH-Sitzung initiiert werden.

Setting the data-rate for all serial ports:

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

Setting the serial port timeout value:

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

Creating a descriptive serial port name:

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

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

Enabling or disabling serial port active signal checking:

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

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

Towers

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

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



Note!
If set at the factory, the serial number, model number and voltage type WILL NOT be user-editable.

Creating a descriptive tower name:

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

Setting the tower serial number:

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

Setting the tower model number:

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

Setting the operational AC or DC voltage type:

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

Setting the operational AC voltage type:

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

Input Feeds

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

Creating a descriptive input feed name:

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

Setting the infeed operational voltage:

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

EN

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

Setting the infeed maximum load capacity:

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

UPS

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

To add a new UPS:

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

To edit the UPS type:

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

Selecting the UPS type:

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

Editing the UPS Hostname/IP Address:

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

Editing the UPS SNMP GET community string:

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

Enabling/Disabling UPS voltage polling:

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

Editing the UPS SNMP port number:

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

Associate the UPS with an infeed:

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

To remove a UPS:

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

Users

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

Creating a new user:

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

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

Removing a user:

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

Changing a user password:

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

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

Changing a user's access privilege level:

The PDU has the following defined privilege levels:

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

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



Note!
You cannot remove administrative privileges from the Admn user unless another user has already been given administrative access level privileges created.

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

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

Adding and Deleting serial port access:

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

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

FTP

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

See 9.2Uploading Firmware for more information on uploading firmware.

Setting the FTP Host Address:

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

Setting the FTP username:

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

Setting the FTP password:

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

Setting the filepath:

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

Setting the filename for upload:

Enter the filename of the file to be uploaded in the Filename field, and press **Apply**.

Testing the FTP upload configuration:

This test validates that the unit is able to contact and log onto the specified FTP server, download the firmware file and verify that the firmware file is valid for this unit.

Press **Test**.

Enabling or disabling automatic updates:

The PDU features the ability to schedule automatic firmware updates. When enabled and configured, the PDU will regularly check the FTP server for a new firmware image and upload it.

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

Setting the automatic update scheduled day:

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

Setting the automatic update scheduled hour:

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

Enabling or disabling the FTP server:

The PDU features the ability to upload and download system configuration files to ease implementation across multiple PDU devices.

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



Note!
The FTP server must be enabled for configuration upload or download.

SNTP/Syslog

The SNTP/Syslog configuration page is used for setup and maintenance of SNTP and Syslog support.

Setting the SNTP server address:

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

Setting the Local GMT offset:

Select the local offset from GMT value from the drop-down menu and press **Apply**.

EN

Setting the Syslog server address:

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

Changing the Syslog server port number:

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

SNMP/Thresholds

The SNMP/Thresholds configuration page is used for setup and maintenance of all settings required to enable SNMP support, and to provide access to the trap configuration pages.



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

Enabling or disabling SNMP support:

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

Setting the community strings:

Enter the community string in the appropriate field and press **Apply**.
Community strings may be 1 to 24 characters

Setting the trap timer:

Enter a trap timer value in the Error Trap Repeat Time field and press **Apply**.
The Error Trap Repeat Time value may be 1 to 65535 (in seconds).

Setting trap destinations:

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

Setting IP Restrictions:

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



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

Setting the SNMP SysName, SysLocation or SysContact objects:

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

Enabling or disabling tower traps:

Click on the **Tower Traps** link.

On the subsequent Tower Traps page, select or deselect the desired traps and press **Apply**.

Configuring input feed traps:

Click on the **Input Feed Traps** link.

On the subsequent Input Feed Traps page, select or deselect the desired traps and press **Apply**.

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

Enabling or disabling Environmental Monitor traps:

Click on the **Environmental Monitor Traps** link.

On the subsequent page, select or deselect the desired traps and press **Apply**.

Einstellen der SNMP SysName-, SysLocation- oder SysContact-Objekte

Geben Sie im entsprechenden Feld die SysName-, SysLocation- oder SysContact-Objekte ein und drücken Sie **Apply**.

Aktivieren oder Deaktivieren von Tower-Traps

Klicken Sie auf den Link „**Tower Traps“**.

Wählen Sie auf der folgenden Seite die gewünschten Traps aus bzw. heben Sie die Auswahl auf und drücken Sie **Apply**.

LDAP

The LDAP configuration page is used for setup and maintenance of all settings required to enable LDAP support.

Enabling or disabling LDAP support:

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

Changing the LDAP server port:

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

Setting the LDAP server address:

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

Enabling or disabling LDAP over TLS/SSL:

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



Note!
If LDAP over TLS/SSL is enabled, MD5 binding is disabled.

Setting the LDAP bind password type:

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

Setting the search bind Distinguished Name (DN):

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

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

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

Setting the user search base Distinguished Name (DN):

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

Setting the user search filter:

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

Setting the group membership attribute:

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

Setting the group membership value type:

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

Configuring the authentication order:

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

Einstellen des LDAP-Bind-Passworttyps

Wählen Sie aus dem Dropdown-Menü **„Bind Type“** die Option Simple oder MD5 aus und drücken Sie **Apply**.



Note!
Rittal recommends NOT setting the authentication order to Remote Only until TACACS has been fully configured and tested.

Setting the DNS IP address:

See *Network* on page 13 for information on how to set the DNS IP address.

Configuring LDAP groups:

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

Creating an LDAP group:

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

Removing an LDAP group:

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

Changing an LDAP group's access privilege level:

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

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

EN

Granting or removing Environmental Monitoring viewing privileges:

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

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

Adding and Deleting serial port access:

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

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

TACACS+

The TACACS+ configuration page is used for setup and maintenance of all settings required to enable TACACS+ support. For additional information and configuration requirements, see *TACACS+* on page 53.

Enabling or disabling TACACS+ support:

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

Changing the TACACS+ server port:

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

Setting the TACACS+ server address:

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

Configuring the authentication order:

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



Note!
Rittal recommends NOT setting the authentication order to Remote Only until the LDAP has been fully configured and tested.

Setting the TACACS+ encryption key:

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

For security, key characters are not displayed.

Configuring TACACS+ privilege levels:

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

Changing a TACACS+ Privilege Level's access privilege level:

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

On the subsequent TACACS+ Privilege Level - Edit page, select **Admin**, **User**, **On-only, Power-user, Reboot-only** or **View-only** from the Access Level drop-down menu and press **Apply**.

Adding and Deleting serial port access:

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

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

E-Mail

The Email configuration page is used for setup and maintenance Email log support.

Enabling or disabling Email support:

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

Setting the SMTP server address:

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

Changing the SMTP server port:

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

Setting the 'From' email address:

Enter the 'from' email address in the 'From' Address field and press **Apply**.

Setting the 'To' email address:

Enter the 'to' email address in the Primary or Secondary 'Send To' Address field and press **Apply**.

Enabling or disabling event type notifications:

Select **Enabled** or **Disabled** from the Include…Messages drop-down menus and press **Apply**.

7.2.5 Tools

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

Restart

Performing a warm boot:

Select the **Restart** from the Action drop-down menu and press **Apply**.



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

Generating a new SSL X.509 certificate:

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

Computing new SSH security keys:

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

Ping

The Ping feature may be used to test the PDU's ability to contact another Ethernet enabled device's IP address. For LDAP support, it may also be used to test the configuration of the Domain Name server IP address by testing for proper name resolution.

Change Password

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



Note!
An administrator can always assign a new password.

Changing a password:

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

View Log

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



Note!
The system log is viewable only by users with administrative privileges.

Reviewing the system log:

Click on the **First Page, Previous Page, Next Page** or **Last Page** link to navigate through the log.

7.3 Command Line Interface

Logging In

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

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

To log in by RS-232 or Telnet:

1. Press **Enter**. The following appears, where **x.xx** is the firmware version:
```
Rittal Smart PDU - Version x.xx
Username:
```



Note!
Logging in by Telnet will automatically open a session. It is not necessary to press Enter.

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

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



Note!
The default PDU username/password is admn/admn.

When you enter a valid username and password, the command prompt (Smart PDU:) appears. If a location identifier was defined, it will be displayed before the Smart PDU: prompt.

EN

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

Operations Command Summary

Command	Description
Connect	Connects to a serial/Pass-Thru port
Envmon	Displays the status of the integrated Environmental Monitor
ILoad	Displays the status of the infeeds
IStat	Displays the status of the infeeds
List Ports	Lists all accessible serial/Pass-Thru ports for the current user
Login	Ends the current session and brings up the Username: prompt
Logout	Ends a session
Password	Changes the password for the current user
Quit	Ends a session
UPSStat	Displays the status of the associated UPSs

Administrative Command Summary

Add Porttouser	Grants a user access to one or all serial/Pass-Thru ports
Create User	Adds a user account
Delete Portfromuser	Removes access to one or all serial/Pass-Thru ports
List User	Displays all accessible outlets/groups/ports for a user
List Users	Displays privilege levels for all users
Remove User	Deletes a user account
Restart	Performs a warm boot
Set Banner	Set the pre-login banner text
Set DHCP	Enables or disables DHCP support
Set DNS	Sets the IP address of the Domain Name server
Set Envmon Name	Specifies a descriptive field fro the integrated Environmental Monitor
Set Envmon THS Name	Specifies a descriptive field for a temperature-humidity sensor
Set FTP Autoupdate	Enables or disables automatic FTP update support
Set FTP Autoupdate Day	Sets the automatic FTP update day
Set FTP Autoupdate Hour	Sets the automatic FTP update hour
Set FTP Directory	Specifies the directory for the file to be uploaded
Set FTP Filename	Specifies the file to be uploaded via FTP
Set FTP Filepath	Specifies the directory for the file to be uploaded
Set FTP Host	Sets the FTP Host IP address or hostname
Set FTP Password	Sets the password for the FTP Host
Set FTP Username	Sets the username for the FTP Host
Set FTP Server	Enables or disables the FTP server
Set Gateway	Sets the Gateway of the PDU
Set HTTP	Enables or disables HTTP access
Set HTTP Port	Specifies the target port for HTTP access
Set HTTP Security	Specifies the HTTP server authentication method
Set Infeed Name	Specifies a descriptive field for the infeed
Set IPAddress	Sets the IP address of the PDU
Set Infeed Loadmax	Specifies the maximum load capacity for the infeed
Set Infeed Voltage	Specifies the nominal input voltage for the infeed
Set LDAP UseTLS	Enables or disables LDAP over TLS/SSL support
Set Location	Specifies a descriptive field for the HTML control screen and login banner
Set Option Button	Enables or disables the external configuration reset button
Set Option Display	Sets the LED orientation for external Current displays
Set Option More	Enables or disables the ‘more’ prompt
Set Option StrongPasswords	Enables or disables strong password requirements
Set Option Tempscale	Sets the Environmental Monitor temperature scale
Set Port Name	Specifies a descriptive field for a serial/Pass-Thru port
Set Port DSRchk	Sets the DSR active signal checking for a serial/Pass-Thru port
Set Port Speed	Set the connection speed for all serial/Pass-Thru ports
Set Port Timeout	Sets the inactivity timer for Pass-Thru sessions
Set SNMP IPRestrict	Allows SNMP GET and SET requests from defined traps destinations only
Set SNTP	Sets the IP address or hostname of the SNTP servers
Set SNTP GMTOffset	Sets the local GMT offset applied to the SNTP date/time
Set Subnet	Sets the Subnet Mask of the PDU
Set Telnet	Enables or disables Telnet access
Set Telnet Port	Sets the Telnet server port number
Set Tower 3Phase	Specifies the AC voltage type for the tower
Set Tower Model	Specifies the model number for the tower
Set Tower Name	Specifies a descriptive field for the PDU
Set Tower ProdSN	Specifies the serial number for the tower
Set Tower	Specifies the AC or DC voltage type for the tower
Set User Access	Sets the access level for a user
Set User Envmon	Grants or removes privileges to view input/environmental monitoring status
Set User Password	Changes the password for a user
Set UPS AddInfeed	Adds an infeed association to a UPS
Set UPS DelInfeed	Deletes an infeed association from a UPS
Set UPS GETComm	Sets the UPS ‘get’ community string
Set UPS Host	Sets the UPS Host IP address or hostname
Set UPS Port	Specifies the target port for a UPS

EN

Set UPS Type	Sets the UPS type
Set UPS VPoll	Enables or disables UPS voltage polling
Show FTP	Displays FTP configuration information
Show Infeeds	Displays infeed configuration information
Show Network	Displays network configuration information
Show Options	Displays system option information
Show Ports	Displays serial/Pass-Thru port configuration information
Show SNTP	Displays SNTP configuration information
Show System	Displays system configuration information
Show Towers	Displays tower configuration information
Show UPS	Displays UPS configuration information
Version	Displays the PDU firmware version

To display the names of commands that you may execute:

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

Operations Commands

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

Displaying infeed status:

The IStat or ILoad command displays the status of one or more infeed.

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

To display status of one or more infeeds:

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

Type **iload** and press **Enter**.

Examples

The following command displays the infeed status:

```
Smart PDU: istat
   Input    Input            Input      Input
   Feed ID  Feed Name        Status     Load
   .AA      HQ_1_Infeed_A  On         10.5 Amps
```

Connecting to a serial device:

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

To connect to a serial device:

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

To disconnect from a serial device:

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

Changing a password:

The Password command changes the current user's password. For security, when you type a password, the characters are not displayed on the screen.

To change a password:

At the Smart PDU: prompt, type **password** and press **Enter**.

At the Enter Current Password: prompt, type the current password and press **Enter**.

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

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

Starting a new session:

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

To start a new session:

At the Smart PDU: prompt, type **login** and press **Enter**. The Username: prompt appears.

Ending a session:

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

To end a session:

At the Smart PDU: prompt, type **quit** and press **Enter**, or

Type **logout** and press **Enter**.

Displaying UPS status:

The UPSStat command displays the status of one or more UPS devices associated with the PDU.

The display includes UPS index number, type, line/battery status, and reported voltage.



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

To display status of one or more UPS devices:

At the Smart PDU: prompt, type **upsstat** and press **Enter**.

Example

The following command displays the UPS status:

```
Smart PDU: upsstat<Enter>
   UPS      UPS           UPS             UPS
   Index    Type          Status      Voltage
   1        Liebert       On Utility    119.9
   2        Powerware     On Battery    120.0
```

7.3.1 Administration Commands

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

User Administration

Creating a user account:

The Create User command creates a user account with the specified username and password.

To create a user account:

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

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

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

Example

The following command creates the user account JaneDoe:

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

For security, password characters are not displayed.

Removing a user account:

The Remove User command removes a user account.



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

To remove a user account:

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

Changing a password:

The Set User Password command changes a user's password. For security, when you type a password, the characters are not displayed on the screen.

To change a password:

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

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

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

Example

The following command changes the password for the user JohnDoe:

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

For security, password characters are not displayed.

EN

Setting user access level privileges:

The Set User Access command sets the access level privileges for a user. The PDU has the following defined access privilege levels; Admin and User.

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



Note!
You cannot remove administrative privileges from the Admn user unless another user has already been given administrative access level privileges created.

To set the access level privilege for a user:

At the Smart PDU: prompt, type **set user access**, followed by **admin**, **poweruser**, **user**, **rebootonly**, **ononly** or **viewonly**, optionally followed by a username and press **Enter**.

Examples

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

```
Smart PDU: set user access admin
johndoe<Enter>
```

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

```
Smart PDU: set user access user janedoe<Enter>
```

Displaying the access privilege levels:

The List Users command displays all defined users with their access privilege level.

To display user access privilege levels:

At the Smart PDU: prompt, type **list users** and press **Enter**.

Example

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

```
Smart PDU: list users<Enter>
   User          Privilege     Environmental
   Name          Level         Monitoring
   JOHNDOE       Admin         Allowed
   JANEDOE       User          Allowed
```

Adding serial port access to a user:

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

To grant serial port access to a user:

At the Smart PDU: prompt, type **add porttouser console** and a username. Press **Enter**.

Deleting serial port access for a user:

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

To delete serial port access for a user:

At the Smart PDU: prompt, type **delete portfromuser console** and a username. Press **Enter**.

Displaying user serial port access:

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

To display user outlet, group and serial port access:

At the Smart PDU: prompt, type **list user**, optionally followed by a username. Press **Enter**.

Example

The following command displays information about the user JaneDoe:

```
Smart PDU: list user janedoe<Enter>
   Username: JANEDOE
      Ports:
         Port      Port
         ID        Name
         Console   Console
```

Input Feed Administration

Creating a descriptive infeed name:

The Set Infeed Name command assigns a descriptive name to an infeed. This descriptive name is displayed when the Show Traps command is issued.

To create a infeed name:

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

Example

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

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

Setting the infeed operational voltage

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

To set the infeed operational voltage:

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

Example

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

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

Setting the infeed maximum load capacity

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

To set the infeed maximum load capacity:

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

Example

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

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

Displaying infeed information:

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

To display tower information:

At the Smart PDU: prompt, type **show infeeds** and press **Enter**.

Example

```
Smart PDU: show infeeds<Enter>
 Input   Input     Input          Input
 Feed ID Feed Name Feed Voltage   Feed Capacity

 .AA     HQ_1_Infeed_A  100           15
 .AB     HQ_1_Infeed_B  120           20
 .BA     HQ_2_Infeed_A  120           30
 .BB     HQ_2_Infeed_B  120           30
```

Tower Administration

Creating a descriptive tower name:

The Set Tower Name command assigns a descriptive name to a tower. This descriptive name is displayed when the Show Traps command is issued.

To create a tower name:

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

Example

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

```
Smart PDU: set tower name .a Flor-
ida_HQ_1<Enter>
```

Setting the tower serial number:

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



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

To set the tower serial number:

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

Example

The following command sets the serial number for tower .A to 'AA06F011157':

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

EN

Setting the tower model number:

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



Note!
If set at the factory, the model number WILL NOT be user-editable.

To set the tower model number:

At the Smart PDU: prompt, type **set tower model**, followed by the absolute tower name, and the tower model number. Press **Enter**.

Example

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

```
Smart PDU: set tower prodsn .a CS-24V2-
C20<Enter>
```

Setting the tower AC or DC voltage type:

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



Note!
If set at the factory, the voltage type WILL NOT be user-editable.

To set the tower AC/DC voltage type:

At the Smart PDU: prompt, type **set tower**, followed by **ac** or **dc**, and the absolute tower name. Press **Enter**.

Example

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

```
Smart PDU: set tower ac.a<Enter>
```

Setting the tower AC voltage type:

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



Note!
If set at the factory, the voltage type WILL NOT be user-editable.

To set the tower AC voltage type:

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

Example

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

```
Smart PDU: set tower 3phase.a no<Enter>
```

Displaying tower information:

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

To display tower information:

At the Smart PDU: prompt, type **show towers** and press **Enter**.

Example

```
Smart PDU: show towers<Enter>
       Tower ID:       .A
         Name:         TowerA
         Product S/N:  AA06F011157
         Model No.:    CS-24V2-C20
         3-Phase:      No
         Power Type:   AC

              More (Y/es N/o):
```

Environmental Monitor Administration

Creating a descriptive Environmental Monitor name:

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

To create an Environmental Monitor name:

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

Example

The following command adds the descriptive name Florida_HQ_1to the Environmental Monitor:

```
Smart PDU: set envmon name .a Flor-
ida_HQ_1<Enter>
```

Creating a descriptive temperature/humidity sensor name:

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

To create a temperature/humidity sensor name:

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

Example

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

```
Smart PDU: set envmon ths name .a2
T/H2_Florida_HQ_1<Enter>
```

Serial Port Administration

Creating a descriptive serial port name:

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

To create a port name:

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

Example

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

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

Setting the serial ports data-rate:

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

To set the serial port data-rate:

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

Example

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

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

Enabling or disabling active signal checking for serial connections:

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

To enable or disable active signal checking for serial connections:

At the Smart PDU: prompt, type **set port dsrchk console**, **on** or **off,** and press **Enter**.

Setting the serial port timeout value:

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



Note!
Setting the timeout to '0' disables the timer.

To set the serial port timeout value:

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

Displaying serial port information:

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

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

To display serial port information:

At the Smart PDU: prompt, type **show ports** and press **Enter**.

Example

The following command displays all serial port information:

```
Smart PDU: show ports<Enter>
  Serial Port Configuration
    ALL Ports:
      Baud Rate: 38400  Timeout: 5 min.
      Port ID: Console   Port Name: CONSOLE
               DSR Check: ON
```

System Administration

Creating a pre-login banner:

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



Note!
For SSH sessions, the 'keyboard-interactive'authentication method must be used for the banner to display.

To create a pre-login banner:

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

Creating a location description:

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

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

To create a location description:

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

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

Examples

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

```
Smart PDU: set location Florida HQ<Enter>
```

The following command deletes any previously specified location description:

```
Smart PDU: set location<Enter>
```

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

Displaying system configuration information:

The Show System command displays all system configuration information.

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

To display system configuration information:

At the Smart PDU: prompt, type **show system** and press **Enter**.

Example

```
System Information
  F/W Version:  Rittal Smart PDU - Version 5.2b
  NIC S/N:      1600001
  MAC Address:  00-0a-9c-10-00-01
  H/W Rev Code: 0
  Flash Size:   1 MB
  Uptime:       0 days 6 hours 14 min 1 sec

   Location:      Florida HQ
```

Setting the LED display orientation:

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

To set the LED display orientation:

At the Smart PDU: prompt, type **set option display**, followed by **normal** or **inverted** and press **Enter**.

Example

The following set the LED display orientation to Inverted:

```
Smart PDU: set option display inverted<Enter>
```

Note!
When set to Inverted, the load will be reported in whole ampere increments

Enabling or disabling strong passwords:

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

To enable or disable strong passwords:

At the Smart PDU: prompt, type **set option strong password**, followed by **enabled** or **disabled** and press **Enter**.

Enabling or disabling the external configuration reset button:

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

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

To enable or disable the configuration reset button:

At the Smart PDU: prompt, type **set option button**, followed by **enabled** or **disabled** and press **Enter**.

Enabling or disabling the 'more' prompt:

The Set Option More command enables or disables the 'more' prompt for display of data larger than the terminal window.

To enable or disable 'more':

At the Smart PDU: prompt, type **set option more**, followed by **enabled** or **disabled** and press **Enter**.

Setting the temperature scale:

The Set Option TempScale command sets the temperature scale that the PDU will report in.

To set the temperature scale:

At the Smart PDU: prompt, type **set option tempscale**, followed by **celsius** or **fahrenheit** and press **Enter**.

Displaying system options:

The Show Options command displays all system option information.

To display system option information:

At the Smart PDU: prompt, type **show options** and press **Enter**.

Example

```
PDU: show options
   System Options
      Display Orientation:          NORMAL
      Strong Passwords:             DISABLED
      Configuration Reset Button:   ENABLED
      More Prompt:                  ENABLED
      Temperature Scale:            CELSIUS
```

Creating a descriptive tower name:

The Set Tower Name command assigns a descriptive name to a tower. This descriptive name is displayed when the Show Traps command is issued. See

Displaying trap configuration information on page 45 for more information on the Show Traps command.

To create a tower name:

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

Example

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

```
Smart PDU: set tower name .a Flor-
ida_HQ_1<Enter>
```

EN

Displaying tower information:

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

To display tower information:

At the Smart PDU: prompt, type **show towers** and press **Enter**.

Example

```
Smart PDU: show towers<Enter>
              Tower   Tower
              ID      Name
              .A      Florida_HQ_1
```

Creating a descriptive infeed name:

The Set Infeed Name command assigns a descriptive name to an infeed. This descriptive name is displayed when the Show Traps command is issued.

To create an infeed name:

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

Example

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

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

Displaying infeed information:

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

To display tower information:

At the Smart PDU: prompt, type **show infeeds** and press **Enter**.

Example

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

Displaying the PDU firmware version:

The Version command displays the PDU firmware version.

To display the firmware version:

At the Smart PDU: prompt, type **version** and press **Enter**.

Performing a warm boot:

The Restart command performs a warm boot of the PDU.



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

To perform a warm boot:

At the Smart PDU: prompt, type **restart** and press **Enter**.

TCP/IP Administration



Note!
A restart of the PDU is required after setting or changing ANY TCP/IP configurations.

Enabling or disabling DHCP support:

The Set DHCP command enables or disables DHCP support.

To enable or disable DHCP support:

At the Smart PDU: prompt, type **set dhcp**, followed by **enabled** or **disabled** and press **Enter**.

Setting the IP address:

The Set IPAddress command sets the TCP/IP address of the network interface controller.

To set the IP address:

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

Example

The following command sets the IP address to 12.34.56.78:

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

Setting the subnet mask:

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

To set the subnet mask:

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

Example

The following command sets the subnet mask to 255.0.0.0

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

Setting the gateway:

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

To set the gateway IP address:

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

Example

The following command set the gateway IP address to 12.34.56.1:

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

Setting the DNS IP address:

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

To set the DNS IP address:

At the Smart PDU: prompt, type **set**, followed by **dns1** or **dns2** and the Domain Name server's IP address. Press **Enter**.

Example

The following command sets the primary Domain Name server IP address to 98.76.54.254:

```
Smart PDU: set dns1 98.76.54.254<Enter>
```

Displaying network configuration information:

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

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

To display network configuration information:

At the Smart PDU: prompt, type **show network** and press **Enter**.

Example

The following command displays the network configuration information:

```
Smart PDU: show network<Enter>
   Network Configuration
      IP Address:    12.34.56.78
DNS1: 98.76.54.254
      Subnet Mask:   255.0.0.0
DNS2: 0.0.0.0
      Gateway:       12.34.56.1
                  Telnet:        Enabled
            Port:    23
                  SSH:           Enabled
            Port: 65535         Auth:     Pass-
            word, Kb-Int
                  HTTP:          Enabled
            Port:    80     Security: BASIC
                  SSL:           Enabled
            Access:   Required
                  SNMP:          Enabled
               Network Status
                  Link:          Up
                  Speed:         100 Mbps
                  Duplex:        Full
                  Negotiation:   Auto
```

EN

HTTP Administration



Note!
A restart is required after setting or changing ANY Telnet/Web configurations.

Enabling and disabling HTTP support:

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

To enable or disable HTTP support:

At the Smart PDU: prompt, type **set http**, followed by **enabled** or **disabled** and press **Enter**.

Changing the HTTP server port:

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

To change the HTTP port:

At the Smart PDU: prompt, type **set http port**, followed by the port number and press **Enter**.

Example

The following changes the HTTP port number to 2048:

```
Smart PDU: set HTTP port 2048<Enter>
```

Setting the HTTP authentication method:

The Set HTTP Security command is used to set the method of authentication. The PDU HTTP server supports two authentication methods for security and validation of the username-password – Basic and MD5 digest.

To set the HTTP authentication method:

At the Smart PDU: prompt, type **set http security**, followed by **basic** or **md5** and press **Enter**.



Note!
A restart of the PDU is required after setting or changing ANY Telnet/Web configurations.

Enabling and disabling Telnet support:

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

To enable or disable Telnet support:

At the Smart PDU: prompt, type **set telnet**, followed by **enabled** or **disabled** and press **Enter**.

Changing the Telnet port:

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

To change the Telnet socket:

At the Smart PDU: prompt, type **set telnet port**, followed by the port number and press **Enter**.

Example

The following changes the Telnet port number to 7001:

```
Smart PDU: set telnet port 7001<Enter>
```

FTP Administration

You may upload new versions of firmware into the PDU using File Transfer Protocol (FTP). This allows access to new firmware releases for firmware improvements and new features additions. The following commands are used to configure the PDU for an FTP firmware upload. See 9.2Uploading Firmware for more information on initiating a FTP firmware upload.

Setting the FTP host address:

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

To set the FTP Host address:

At the Smart PDU: prompt, type **set ftp host**, followed by the IP address or hostname and press **Enter**.

Examples

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

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

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

```
Smart PDU: set ftp host ftp.rittal.com<Enter>
```

Setting the FTP username:

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

To set the FTP username:

At the Smart PDU: prompt, type **set ftp username**, followed by the FTP username and press **Enter**.

Example

The following command sets the FTP username to Guest:

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

Setting the FTP Password:

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

To set the FTP password:

At the Smart PDU: prompt, type **set ftp password**, followed by the FTP password and press **Enter**.

Example

The following command sets the FTP password to OpenSesame:

```
Smart PDU: set ftp password OpenSesame<Enter>
```

Setting the filename to be uploaded:

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

To set the FTP filename:

At the Smart PDU: prompt, type **set ftp filename**, followed by the firmware filename and press **Enter**.

Example

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

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

Setting the directory for the file to be uploaded:

The Set FTP Directory or Set FTP Filepath commands set the directory for the firmware file to be uploaded.

To set the FTP directory:

At the PDU: prompt, type **set ftp directory**, followed by the directory and press **Enter**.

Or, type **set ftp filepath**, followed by the directory and press **Enter**

Example

The following command sets the FTP directory to ftp://PDU:

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

Enabling or disabling automatic updates:

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

To enable or disable automatic updates:

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

Setting the automatic update scheduled day:

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

To set the automatic update day:

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

Example

The following command sets the automatic update day to Sunday:

```
Smart PDU: set ftp autoupdate day sun-
day<Enter>
```

Setting the automatic update scheduled hour:

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

To set the automatic update hour:

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

EN

Examples

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

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

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

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

Displaying FTP configuration information:

The Show FTP command displays all FTP configuration information.

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

To display FTP configuration information:

At the Smart PDU: prompt, type **show ftp** and press **Enter**.

Example

The following command displays the FTP configuration information:

```
Smart PDU: show ftp<Enter>
   FTP Configuration
      Host:      ftp.rittal.de
      Username:  guest
      Password:  OpenSesame
      Directory: ftp://PDU
      Filename:  snb_s52a.bin
   FTP Automatic Updates Configuration
      Automatic Updates:  12.34.56.99
      Scheduled Day:      Sunday
      Scheduled Hour:     3 PM
```

SNTP Administration

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

Setting the SNTP server address:

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

To set the SNTP server address:

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

Examples

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

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

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

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

Setting the local GMT offset:

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

Note!
The PDU does not support automatic adjustment for daylight savings.

To set the local GMT offset:

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

Examples

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

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

Displaying SNTP configuration information:

The Show SNTP command displays all SNTP configuration information.

To display SNTP configuration information

At the Smart PDU: prompt, type **show sntp** and press **Enter**.

Example

The following command displays the SNTP configuration information:

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

EN

UPS Administration

Creating a UPS record:

The Create UPS command adds a new UPS device to the PDU.

To create a UPS record:

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

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

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

Example

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

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

Removing a UPS record:

The Remove UPS command removes a UPS record.

To remove a UPS record:

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

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

Example

The following command removes the UPS record at index 3:

```
Smart PDU: remove ups<Enter>
   1   Type:    Liebert
       Host/IP: DC1Liebert1
   2   Type:    Powerware
       Host/IP: DC1Powerware1
   3   Type:    Toshiba
       Host/IP: DC1Toshiba1
   Select UPS(1-8): 3<Enter>
```

Changing the UPS type:

The Set UPS Type command is used to change the type of UPS for each UPS record.

To change a UPS record:

At the Smart PDU: prompt, type **set ups type** and press **Enter**.

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

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

Example

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

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

Changing the UPS host address:

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

To change a UPS host address:

At the Smart PDU: prompt, type **set ups host** and press **Enter**.

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

At the prompt, type IP address or hostname for the UPS and press **Enter**.

Example

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

```
Smart PDU: set ups host<Enter>
              1   Type:    Liebert
                  Host/IP: DC1Liebert1
              2   Type:    MGE
                  Host/IP: DC1Powerware1
              Select UPS(1-8): 2<Enter>
              Host/IP: DC1MGE1<Enter>
```

EN

Changing the UPS SNMP port:

With a UPS record configured, the PDU sends data requests to the default UPS SNMP port number 161. This port number may be changed using the Set UPS Port command.

To change the UPS SNMP port:

At the Smart PDU: prompt, type **set ups port** and press **Enter**.

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

At the prompt, type the desired port number and press **Enter**.

Example

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

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

Changing the UPS SNMP Get community string:

With a UPS record configured, the PDU sends data requests to the UPS using the default Get community string of 'public'. This string may be changed using the Set UPS Port command.



Note!
The GET community string configured on the PDU MUST match the read-only community string configured on the UPS.

To change a UPS record:

At the Smart PDU: prompt, type **set ups get-comm** and press **Enter**.

At the prompt, type the index number for the UPS record to be c and press **Enter**.

At the prompt, type the Get community string for the UPS and press **Enter**.

Example

The following command changes Get community string for the record at index number 2 to 're-adonly':

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

Enabling/disabling UPS voltage polling:

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

To enable/ disable UPS voltage polling:

At the Smart PDU: prompt, type **set ups vpoll** and press **Enter**.

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

At the prompt, type **on** or **off**, and press **Enter**.

Example

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

```
Smart PDU: set ups vpoll<Enter>
   UPS     UPS          Voltage
   Index   Type         Polling
   1       Liebert      On
   2       MGE          On
   Select UPS(1-8): 2<Enter>
   Voltage Polling: Off<Enter>
```

Adding an infeed to a UPS:

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

To add an infeed to a UPS:

At the Smart PDU: prompt, type **set ups addin-feed** and press **Enter**.

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

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

Example

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

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

Removing an infeed from a UPS:

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

To remove an infeed from a UPS:

At the Smart PDU: prompt, type **set ups delinfeed** and press **Enter**.

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

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

Example

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

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

Displaying UPS configuration:

The Show UPS command displays information about all UPS devices.

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

To display UPS configuration information:

At the Smart PDU: prompt, type **show ups** and press **Enter**.

Example

The following command displays UPS configuration information:

```
Smart PDU: show ups<Enter>
   1   Type:    Liebert
       Host/IP: DC1Liebert1
       Voltage Polling:     ON
       SNMP Configuration
          Community String: public
          SNMP Port:        162
          SNMP Objects/Expected Values
             Voltage:
.1.3.6.1.2.1.33.1.4.4.1.2.1
             Utility Status:
.1.3.6.1.2.1.33.1.4.1.0
                On Battery:    0x5
                On Utility:    0x3
              More (Y/es N/o):
```

8 Advanced Operations

8.1 SSL

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

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

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

SSL Command Summary

Command	Description
Set SSL	Enables/disables SSL support
Set SSL Access	Sets SSL access as optional or required

EN

Enabling and Setting up SSL Support



Note!
A restart of the PDU is required after setting or changing ANY SSL configurations.

Enabling or disabling SSL support:

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

To enable or disable SSL support:

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

Setting SSL access level:

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

To change the access level:

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

Example

The following changes the access level to required:

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

8.1.1 SSL Technical Specifications

Secure Socket Layer (SSL) version 3

Transport Layer Security (TLS) version 1 (RFC 2246)

SSL/TLS-enabled HTTPS server (RFC 2818)

Self-Signed X.509 Certificate version 3 (RFC 2459)

Asymmetric Cryptography:
1024-bit RSA Key Exchange

Symmetric Cryptography Ciphers:

- TLS_RSA_WITH_AES_256_CBC_SHA
- TLS_RSA_WITH_3DES_EDE_CBC_SHA
- TLS_RSA_WITH_AES_128_CBC_SHA
- TLS_RSA_WITH_DES_CBC_SHA

8.2 SSH

Secure Shell (SSH) version 2 enables secure network terminal sessions between a PDU Remote Power Manager and a remote user over insecure network. SSH provides encrypted terminal sessions with strong authentication of both the server and client, using public-key cryptography and is typically used as a replacement for unencrypted Telnet. In addition to enabling secure network terminal sessions to the PDU for configuration and power management, the SSH session may be used for secure Pass-Thru connections to attached devices.

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

SSH Command Summary

Command	Description
Set SSH	Enables/disables SSH support
Set SSH AuthMethod	Enables/disables the SSH server authentication methods
Set SSH Port	Sets the SSH server port number

Enabling and Setting up SSH Support



Note!
A restart of the PDU is required after setting or changing ANY SSH configurations.

Enabling or disabling SSH support:

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

To enable or disable SSH support:

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

Changing the SSH server port:

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

To change the SSH port:

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

Example

The following changes the SSH port number to 65535:

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

Enabling or disabling SSH server authentication methods:

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

To enable the SSH authentication methods:

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

Example

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

```
Smart PDU: set ssh authmethod kbint en-
abled<Enter>
```

8.2.1 SSH Technical Specifications

Secure Shell (SSH) version 2

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

Symmetric Cryptography:
AES256-CBC RIJNDAEL256-CBC

3DES-192-CBC
AES192-CBC RIJNDAEL192-CBC

BLOWFISH-128-CBC
AES128-CBC RIJNDAEL128-CBC

ARCFOUR-128

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

Authentication: Username/Password

Session Channel Break Extension (for RS232 Break)

8.3 SNMP/Thresholds

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

The PDU includes an SNMP v2c agent supporting standard MIB I and MIB II objects. A private enterprise MIB extension (PDU3 MIB) is also supported to provide remote power control.



Note!
For security, SNMP support is disabled by default.

SNMP Command Summary

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

Enabling and Setting up SNMP Support

PDU SNMP support must be enabled and configured for access to PDU3 MIB objects and generation of all PDU3 traps.

Enabling/disabling SNMP support:

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

To enable SNMP support:

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



Note!
A restart of the PDU is required after enabling or disabling SNMP support.

EN

Setting trap destinations:

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

To set the trap destination:

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

Examples

The following sets the trap destination 1 to 64.42.31.208:

```
Smart PDU: set snmp trapdest1
64.42.31.208<Enter>
```

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

```
Smart PDU: set snmp trapdest2
snmp.rittal.de<Enter>
```

To reset the trap destination:

At the Smart PDU: prompt, type **set snmp, trapdest1** or **trapdest2, 0.0.0.0** and press **Enter**.

Setting the trap timer:

The Set Traptime command sets the timer period between repeated error-condition traps. The valid range for the timer period is 1 to 65535 (in seconds).
The default value for the timer period is 60 seconds.

To set the trap timer:

At the Smart PDU: prompt, type **set traptime**, followed by the timer period and press **Enter**.

Example

The following sets the timer period to 180 seconds:

```
Smart PDU: set traptime 180<Enter>
```

Setting the Get/Set community strings:

The PDU supports two SNMP community strings that provide varying levels of access to objects defined in the PDU3 MIB.

Community strings may be 1 to 24 characters.

Setcomm:

The Setcomm string provides read-write access to PDU3 MIB objects.
The default Setcomm string is “private”

To set the Setcomm community string:

At the Smart PDU: prompt, type **set snmp setcomm**, followed by the string and press **Enter**.

Getcomm:

The Getcomm string provides read-only access to PDU3 MIB objects.
The default Getcomm string is “public”.

To set the Getcomm community string:

At the Smart PDU: prompt, type **set snmp getcomm**, followed by the string and press **Enter**.

Setting SNMP IP Restrictions:

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

To set SNMP IP Restrictions:

At the Smart PDU: prompt, type **set snmp iprestrict trapdests** and press **Enter**.

To remove SNMP IP Restrictions:

At the Smart PDU: prompt, type **set snmp iprestrict none** and press **Enter**.

Setting the SNMP SysName:

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

To set the SysName object:

At the Smart PDU: prompt, type **set snmp sysname**, followed by the object name and press **Enter**.

Setting the SNMP SysLocation:

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

To set the SysLocation object:

At the Smart PDU: prompt, type **set snmp syslocation**, followed by the object location and press **Enter**.

Setting the SNMP SysContact:

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

To set the SysContact object:

At the Smart PDU: prompt, type **set snmp syscontact**, followed by the object contact and press **Enter**.

Setting the Trap community string:

The Set SNMP Trapcomm command is used to set the community string that is included with all generated traps. This string must be defined to enable trap generation.

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

To set the Trapcomm community string:

At the Smart PDU: prompt, type set snmp trapcomm, followed by the string and press Enter.

Displaying SNMP configuration information:

The Show SNMP command displays all SNMP configuration information.

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

To display SNMP configuration information:

At the Smart PDU: prompt, type **show snmp** and press **Enter**.

Example

The following command displays the SNMP configuration information:

```
Smart PDU: show snmp<Enter>
   SNMP Configuration
      SNMP:                          Enabled
      GET Community String:           public
      SET Community String:           private
      TRAP Community String:          trap
      Error Trap Repeat Time (sec): 180
      Trap Destination 1:          64.42.31.208
      Trap Destination 2:        snmp.rittal.de
      IP Restrictions:  Trap Destinations Only
      SysName:                        No Name
      SysLocation:                  No Location
      SysContact:                    No Contact
```

8.3.1 SNMP Traps

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

Trap Summary

Name	Level(s)	Description
Status	T, I, O, E, S	Operational status change
Load	I	Input load out of limit
Temp	S	Temperature is out of range
Humid	S	Relative Humidity is out of range

All traps include the Location of the PDU as defined with the Set Location command.

Status trap

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

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

Tower Status traps

Status	Error	Description
Normal		Tower is working correctly
NoComm	x	Communication to the tower has been lost

EN

Infeed Status traps

Status	Error	Description
On		Infeed is on
OffError	x	Infeed should be on but no current is sensed at the infeed
NoComm	x	Communication to the infeed has been lost

Environmental Monitor Status traps

Status	Error	Description
Normal		Environmental Monitor is working correctly
NoComm	x	Communication to the Environmental Monitor has been lost



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

Load Trap

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

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

Load traps

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

8.3.2 Configuring Traps

SNMP Trap Command Summary

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

Enabling or Disabling a Status trap:

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

To Enable or Disable a Status trap:

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

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

Examples

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

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

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

```
Smart PDU: set trap tower status Florida_HQ_1
on<Enter>
```

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

Enabling or Disabling a Load trap:

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

To Enable or Disable a Load trap:

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

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

Examples

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

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

The following command disables the Load trap for all infeeds:

```
Smart PDU: set trap infeed load all off<Enter>
```

Note!
Enabling lower hierarchical traps automatically enables traps of higher hierarchical value: i.e. enabling an Infeed Load trap automatically enables the Infeed and Tower Status traps for that infeed.

Setting the Infeed Load limit:

The Set Trap Infeed Loadhigh command is used to set the upper load limits for an input feed.

To set the infeed load limit:

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

Example

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

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

Enabling or Disabling the Humid trap:

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

To Enable or Disable the Humid trap:

At the Smart PDU: prompt, type **set trap ths humid**, followed by the sensor name and **on** or **off**. Press **Enter**.

Example

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

```
Smart PDU: set traps ths humid .a1 on<Enter>
```

Setting the Humidity sensor threshold limits:

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

To set the Humidity threshold limits:

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

Example

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

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

Displaying trap configuration information:

The Show Traps command displays information about all traps.

To display trap information:

At the Smart PDU: prompt, type **show traps** and press **Enter**.

EN

Example

The following command requests trap configuration information:

```
Smart PDU: show traps <Enter>
Tower trap configuration:
   Tower    Tower                Status
   ID       Name                 Trap
   .A       Florida_HQ_1         ON
   .B       Florida_HQ_2         ON
   More (Y/es N/o): y
Input feed trap configuration:
  Input   Input         Status  Load    High
  Feed ID Feed Name     Trap    Trap    Thresh
  .AA     HQ_1_Infeed_A ON       ON     255A
  .BA     HQ_2_Infeed_A ON       ON      255 A
   More (Y/es N/o): y
```

8.4 LDAP

The PDU family of products supports Lightweight Directory Access Protocol (LDAP) Version 3. This support enables authentication with LDAP servers; user accounts do not need to be individually created locally on each PDU device.

This allows administrators to pre-define and configure (in each PDU product, and in the LDAP server) a set of necessary LDAP Groups, and access rights for each. User's access rights can then be assigned or revoked simply by making the user a member of one-or-more pre-defined PDU LDAP Groups. User accounts can be added, deleted, or changed in the LDAP server without any changes needed on individual PDU products.

PDU LDAP support has been tested in the following environments:

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

LDAP Command Summary

Command	Description
Set Authorder	Specifies the authentication order for each new session attempt
Set LDAP	Enables/disables LDAP support
Set LDAP Host	Sets the IP address or hostname of the Directory Services server
Set LDAP Port	Sets the LDAP server port number
Set LDAP Bind	Specifies the LDAP bind request password type
Set LDAP BindDN	Specifies the user account Fully-Qualified Distinguished Name (FQDN) for binds
Set LDAP BindPW	Specifies the user account password for binds
Set LDAP GroupAttr	Specifies the user class distinguished name (DN) or names of groups a user is a member of
Set LDAP GroupType	Specifies the data type for the Set LDAP GroupAttr command
Set LDAP UseTLS/SSL	Enables/disables LDAP over TLS/SSL support
Set LDAP UserBaseDN	Sets the base distinguished name (DN) for the username search at login
Set LDAP UserFilter	Sets the filter used for the username search at login
Show LDAP	Displays LDAP configurations
Set DNS	Sets the IP address of the Domain Name server
Ping	Verifies proper DNS configuration by name resolution
Show Network	Displays network configuration information
Create LDAPGroup	Adds an LDAP group name
Remove LDAPGroup	Deletes an LDAP group name
Add PorttoLDAP	Grants an LDAP group access to one or serial ports
Delete PortfromLDAP	Removes access to one or more serial ports for an LDAP group
Set LDAPGroup Access	Sets the access level for an LDAP group
Set LDAPGroup Envmon	Grants or removes privileges to view input and environmental monitoring status
List LDAPGroup	Displays all accessible ports for an LDAP group
List LDAPGroups	Displays privilege levels for all LDAP groups

Enabling and Setting up LDAP Support

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

Directory Services server configuration requirements:

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

PDU configuration requirements:

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



Note!
LDAP group names on the Directory Service server and the PDU must match.

Enabling and disabling LDAP support:

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

To enable or disable LDAP support:

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

Setting the LDAP host address:

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

To set the LDAP host address:

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

Examples

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

```
Smart PDU: set ldap host1 98.76.54.32<Enter>
```

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

```
Smart PDU: set ldap host2
ldap.rittal.de<Enter>
```

Changing the LDAP server port:

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

To change the LDAP server port:

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

Example

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

```
Smart PDU: set ldap port 8888<Enter>
```

Enabling and disabling LDAP over TLS/SSL support:

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

To enable or disable LDAP over TLS/SSL support:

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



Note!
If LDAP over TLS/SSL is enabled, MD5 binding is disabled.

Setting the LDAP bind password type:

The Set LDAP Bind command sets the password type used in the bind requests. The PDU supports two LDAP bind methods – Simple and MD5. If MD5 is entered, the Set LDAP UseTLS command will be disabled.

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

EN

The MD5 digest method provides much stronger protection utilizing one-way encoded hash numbers, never placing the username-password on the network.



Note!
Windows 2000 is known only to support Simple binding. Windows 2003 supports both Simple and MD5 binding.

To set the bind password type:

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



Note!
If MD5 binding is enabled, LDAP over TLS/SSL is disabled.

Setting the search bind Distinguished Name (DN):

The Set LDAP BindDN command is used to set the fully-qualified distinguished name (FQDN) for user accounts to bind with. This is required for directory services that do not support anonymous binds. This field is used ONLY with Simple Binds. Maximum string length is 124 characters.



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

To set the search bind DN:

At the Smart PDU: prompt, type **set ldap binddn**, and press **Enter**. At the following prompt, type the FQDN and press **Enter**.

Example

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

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

Setting the search bind Distinguished Name (DN) password:

The Set LDAP BindPW command is used to set the password for the user account specified in the Search Bind DN.
Maximum password size is 20 characters.

To set the Bind Password DN:

At the Smart PDU: prompt, type **set ldap bindpw** and press **Enter**. At the following prompt, type the bind password and press **Enter**.

Setting the group membership attribute:

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

To set Group Membership Attribute:

At the Smart PDU: prompt, type **set ldap groupattr** and press **Enter**. At the following prompt, type the group membership attribute and press **Enter**.

Example

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

```
Smart PDU:  set ldap groupattr<Enter>
Enter Group Member Attr (Max character 30):
memberof<Enter>
```

Setting the group membership value type:

The Set LDAP GroupType command is used to specify whether the values of Group Membership Attribute represent the Distinguished Name (DN) of a group or just the name of the group.

To set group membership value type:

At the Smart PDU: prompt, type **set ldap grouptype** followed by **DN** or **Name** and press **Enter**.

Example

The following sets group membership value to DN

```
Smart PDU:  set ldap grouptype DN<Enter>
```

Setting the user search base Distinguished Name (DN):

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

To set the user search base DN:

At the Smart PDU: prompt, type **set ldap userbasedn** and press **Enter**. At the following

prompt, type the search base DN and press E**nter.**

Example

The following sets the DN user search base for MSAD to 'cn=Users,dc=rittal,dc=com':

```
Smart PDU: set ldap userbasedn<Enter>
Enter User Search Base DN (Max characters
100):
cn=Users,dc=rittal,dc=com<Enter>
```

Setting the user search filter:

The Set LDAP UserFilter command is used to set the search filter for the username entered at the login prompt.

The search filter must be entered within parenthesis and adhere to the following format:

(searchfilter**=%s)**

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

To set the user search filter:

At the Smart PDU: prompt, type **set ldap userfilter** and press **Enter**. At the following prompt, type the User Search Filter and press **Enter**.

Example

The following sets the user search filter for MSAD to 'samaccountname':

```
Smart PDU:  set ldap userfilter<Enter>
Enter User Search Filter (Max characters 100):
(samaccountname=%s)<Enter>
```

Setting the authentication order:

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

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

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

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

To set the authentication order:

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

Note!
Rittal recommends NOT setting the authentication order to Remote Only until the LDAP has been fully configured and tested.

Displaying LDAP configuration information:

The Show LDAP command displays LDAP configuration information.

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

To display the LDAP configuration information:

At the Smart PDU: prompt, type **show ldap** and press **Enter**.

Example

The following command displays the LDAP configuration information:

```
Smart PDU: show ldap
   LDAP Configuration
      LDAP:         Enabled
      Host 1:       98.76.54.32
      Host 2:       ldap.rittal.de
      Port:         8888
      TLS/SSL:      Yes
      Bind Type:    MD5
      Auth Order:   Remote->Local
      Search Bind
         DN: cd=guest,cn=Users,dc=rittal,dc=de
         Password: OpenSesame
      User Search
         Base DN: cn=Users,dc=rittal,dc=com
         Filter: (samaccountname=%s)
      Group Membership
         Attribute: memberof
         Value Type: DN
```

EN

Setting the DNS IP address:

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



Note!
LDAP requires the definition of at least one Domain Name server.

To set the DNS IP address:

At the Smart PDU: prompt, type **set**, followed by **dns1** or **dns2** and the Domain Name server's IP address. Press **Enter**.

Example

The following command sets the primary Domain Name server IP address to 98.76.54.254:

```
Smart PDU: set dns1 98.76.54.254<Enter>
```

Verifying the DNS configuration:

The Ping command may be used to verify the configuration of the DNS IP address.

To verify the DNS configuration:

At the Smart PDU: prompt, type **ping**, followed by the domain component of the Directory Services server previously configured and press **Enter**.

Example

The following command verifies the DNS configuration:

```
Smart PDU:  ping rittal.de
   Pinging rittal.com [98.76.54.32] with 64
bytes of data:
   Reply from 98.76.54.32: bytes=64 pseq=0
triptime=0
   Reply from 98.76.54.32: bytes=64 pseq=1
triptime=0
   Reply from 98.76.54.32: bytes=64 pseq=2
triptime=0
   Reply from 98.76.54.32: bytes=64 pseq=3
triptime=0
   Reply from 98.76.54.32: bytes=64 pseq=4
triptime=0
```

8.4.1 Configuring LDAP Groups

Creating an LDAP group:

The Create LDAPGroup command creates an LDAP group.

To create an LDAP group:

At the Smart PDU: prompt, type **create ldapgroup**, optionally followed by a 1-16 character group name (Spaces are not allowed, and LDAP group names are not case sensitive). Press **Enter**.

Example

The following command creates the LDAP group PowerUser:

```
Smart PDU: create ldapgroup PowerUser<Enter>
```

Removing an LDAP group:

The Remove LDAPGroup command removes an LDAP group.

To remove an LDAP group:

At the Smart PDU: prompt, type **remove ldapgroup**, optionally followed by a group name. Press **Enter**.

Setting LDAP group access level privileges:

The Set LDAPGroup Access command sets the access level privileges for an LDAP group. The PDU has four defined access privilege levels; Admin, User, On-Only and View-Only.

To set the access level privilege for an LDAP group :

At the Smart PDU: prompt, type **set ldapgroup access**, followed by **admin**, **user**, **ononly** or **viewonly,** optionally followed by a LDAP group name and press **Enter**.

Examples

The following command sets the LDAP group access level for LDAPAdmin to Admin:

```
Smart PDU: set ldapgroup access admin ldapad-
min<Enter>
```

The following command sets the LDAP group access level for PowerUser to User:

```
Smart PDU: set ldapgroup access user pow-
eruser<Enter>
```

Granting and removing input status viewing privileges :

The Set LDAPGroup Envmon command grants or removes input status viewing privileges to/from an LDAP group.

To grant or remove input status viewing privileges for an LDAP group:

At the Smart PDU: prompt, type **set ldapgroup envmon** followed by **on** or **off**, optionally followed by a group name and press **Enter**.

Example

The following command grants input status viewing privileges to the LDAP group PowerUser:

```
Smart PDU: set ldapgroup envmon on pow-
eruser<Enter>
```

Displaying the LDAP access privilege levels:

The List LDAPGroups command displays all defined LDAP group with their access privilege level.

To display LDAP group access privilege levels:

At the Smart PDU: prompt, type **list ldapgroups** and press **Enter**.

Example

The following command displays all LDAP groups with their access privilege level:

```
Smart PDU: list ldapgroups<Enter>
 LDAP              Access        Environmental
 Group Name        Level         Monitoring
 LDAPAdmin          Admin         Allowed
 PowerUser          User          Allowed
 User               On-Only       Not Allowed
 Guest              View-Only     Not Allowed
```

Adding serial port access to an LDAP group:

The Add PortToLDAP command grants an LDAP group access to the serial port.

To grant serial port access to an LDAP group:

At the Smart PDU: prompt, type **add portto-ldap console** and a group name. Press **Enter**.

Deleting serial port access for an LDAP group:

The Delete PortFromLDAP command removes an LDAP group's access to the serial port. You cannot remove access to the serial port for an administrative level group.

To delete serial port access for a user:

At the Smart PDU: prompt, type **delete portfrom-ldap console** and a group name. Press **Enter**.

Displaying LDAP Group access:

The List LDAPGroup command displays all access rights for an LDAP group.

To display LDAP Group access:

At the Smart PDU: prompt, type **list ldapgroup**, optionally followed by a group name. Press **Enter**.

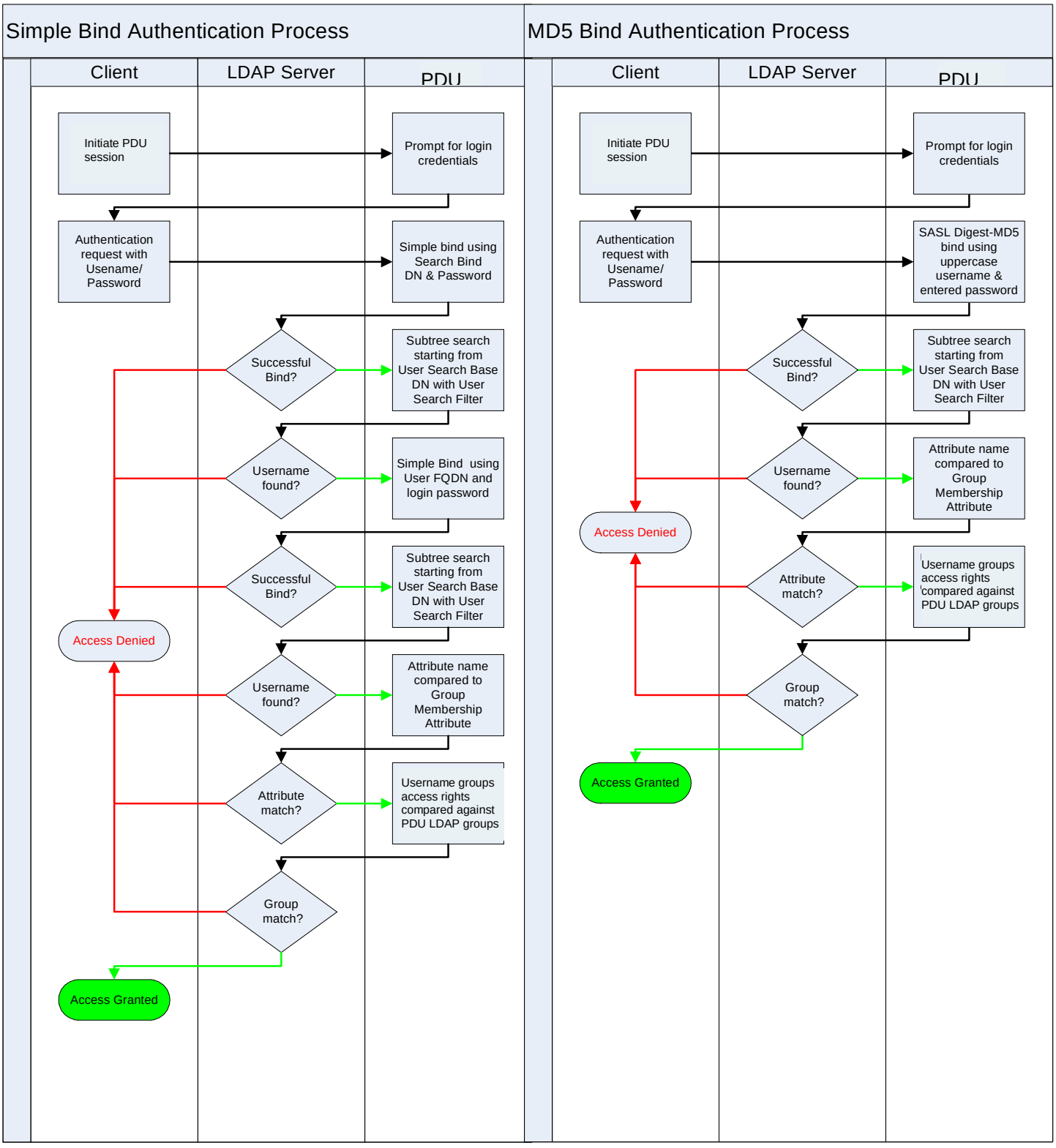
Example

The following command displays information about the LDAP group PowerUser:

```
Smart PDU: list ldapgroup poweruser<Enter>
  Username: PowerUser
    Ports:
      Port      Port
      ID        Name        Console   Console
```

EN

8.5 LDAP Technical Specifications



EN

8.6 TACACS+

The PDU family of products supports the Terminal Access Controller Access Control System (TACACS+) protocol. This enables authentication and authorization with a central TACACS+ server; user accounts do not need to be individually created locally on each PDU device.

This allows administrators to pre-define and configure (in each PDU product, and in the TACACS+ server) a set of necessary TACACS+ privilege levels, and users' access rights for each. User's access rights can then be assigned or revoked simply by making the user a member of one-or-more pre-defined PDU TACACS+ privilege levels. User account rights can be added, deleted, or changed within TACACS+ without any changes needed on individual PDU products.

The PDU supports 16 different TACACS+ privilege levels; 15 are entirely configurable by the system administrator (1 is reserved for default Admin level access to all PDU resources).

TACAC+ Command Summary

Command	Description
Set Authorder	Specifies the authentication order for each new session attempt
Set TACACS	Enables/disables SSL support
Set TACACS Host	Sets the IP address or hostname of the TACACS server
Set TACACS Key	Sets the TACACS encryption key
Set TACACS Port	Sets the TACACS server port number
Show TACACS	Displays TACACS configurations
Add PorttoTACACS	Grants a TACACS account access to one or serial ports
Delete PortfromTACACS	Removes access to one or more serial ports for a TACACS account
Set TacPriv Access	Sets the access level for a TACACS account
Set TacPriv Envmon	Grants or removes privileges to view input and environmental monitoring status
List TacPrivs	Displays access levels for all TACACS accounts
List TacPriv	Displays all accessible outlet/groups/ports for a TACACS account

Enabling and Setting up TACACS+ Support

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

1. Enable TACACS+ support.
2. Define the IP address and domain component of at least one TACACS+server.
3. Set the TACACS+ key configured on the supporting TACACS+server.

Enabling and disabling TACACS+ support:

The Set TACACS command is used to enable or disable TACACS+ support.

To enable or disable TACACS+ support:

At the Smart PDU: prompt, type **set tacacs**, followed by **enabled** or **disabled** and press **Enter**.

Setting the TACACS+ server address:

The Set TACACS Host command sets the IP address or hostname of the TACACS+ server.

To set the TACACS+ server address:

At the Smart PDU: prompt, type **set tacacs**, followed by **host1** or **host2** and the TACACS+ server's IP address or hostname. Press **Enter**.

Examples

The following command sets the primary TACACS+ server address to 98.76.54.32:

```
Smart PDU: set tacacs host1 98.76.54.32<Enter>
```

The following command sets the secondary TACACS+ server address to tacacs.rittal.de:

```
Smart PDU: set tacacs host2 ta-
cacs.rittal.de<Enter>
```

Setting the TACACS+ encryption key:

The Set TACACS Key command sets the encryption key used to encrypt all data packets between the PDU and the TACACS+ server. This key must match the key configured on the TACACS+ server.

To set the encryption key:

At the Smart PDU: prompt, type **set tacacs key** and press **Enter**.

EN

At the TACACS+ Key: prompt, type an encryption key of up to 60 alphanumeric and other typeable characters - (ASCII 33 to 126 decimal) are allowed; encryption keys are case sensitive. Press **Enter**. To specify no password, press **Enter**.

At the Verify TACACS+ Key: prompt, retype the key. Press **Enter**. To verify no password, press **Enter** at the prompt.

Example

```
Smart PDU: set tacacs key<Enter>
   TACACS+ Key: <Enter>
   Verify TACACS+ Key: <Enter>
```

For security, key characters are not displayed.



Note!
A key size of zero results in no encryption being applied which may not be supported by the TACACS+ server and is not recommended for a production environment.

Changing the TACACS port:

With TACACS support enabled, the PDU sends TACACS requests to the default TACACS port number 49. This port number may be changed using the Set TACACS Port command.

To change the TACACS port:

At the Smart PDU: prompt, type **set tacacs port**, followed by the port number and press **Enter**.

Example

The following changes the TACACS port number to 50:

```
Smart PDU: set tacacs port 50<Enter>
```

Setting the authentication order:

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

The Remote -> Local method first attempts authentication with the TACACS+ server and if unsuccessful with the local user database on the PDU device.

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



Note!
With the Remote Only method, if authentication fails due to a communication failure with the TACACS+ server automatic authentication fallback will occur to authenticate with the local user data base on the PDU device.

To set the authentication order:

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



Note!
Rittal recommends NOT setting the authentication order to Remote Only until the TACACS+ has been fully configured and tested.

Displaying TACACS+ configuration information:

The Show TACACS command displays TACACS+ configuration information.

To display the TACACS configuration information:

At the Smart PDU: prompt, type **show tacacs** and press **Enter**.

Example

The following command displays the TACACS configuration information:

```
Smart PDU: show tacacs<Enter>
              TACACS+ Configuration
                 TACACS+:        Enabled
                 Host 1:         98.76.54.32
                 Host 2:         ta-
          cacs.rittal.com
                 Port:           50
                 TACACS+ Key:    (Set)
                 Auth Order:     Remote->Local
```

8.6.1 Configuring TACACS+ Privilege Levels

Setting TACACS+ account access level privileges:

The Set TacPriv Access command sets the access level privileges for a TACACS+ account. The PDU has four defined access privilege levels; Admin, User, On-Only and View-Only.

To set the access level privilege for a TACACS+ account :

At the Smart PDU: prompt, type **set tacpriv access**, followed by **admin**, **user**, **ononly** or **viewonly,** optionally followed by a TACACS+ account number and press **Enter**.

Examples

The following command sets the TACACS+ account access level for account 14 to Admin:

```
Smart PDU: set tacpriv access admin 14<Enter>
```

The following command sets the TACACS+ account access level for account 5 to User:

```
Smart PDU: set tacpriv access user 5<Enter>
```

Granting and removing input status viewing privileges:

The Set TacPriv Envmon command grants or removes input status viewing privileges to/from a TACACS+ account.

To grant or remove input status viewing privileges for a TACACS+ account:

At the Smart PDU: prompt, type **set tacpriv envmon**, followed by **on** or **off**, optionally followed by a TACACS+ account number and press **Enter**.

Example

The following command grants input status viewing privileges to the TACACS+ account 5:

```
Smart PDU: set tacpriv envmon on 5<Enter>
```

Displaying the TACACS+ access privilege levels:

The List TacPrivs command displays all TACACS+ accounts with their access privilege levels.

To display TACACS+ account access privilege levels:

At the Smart PDU: prompt, type **list tacprivs** and press **Enter**.

Example

The following command displays all TACACS+ account with their access privilege level:

```
Smart PDU: list tacprivs<Enter>
  TACACS           Access        Environmental
  Account Name     Level         Monitoring
  TACAdmin         Admin         Allowed
  PowerUser        User          Allowed
  Use              On-Only       Not Allowed
  Guest            View-Only     Not Allowed
```

Adding serial port access to a TACACS+ account:

The Add PortToTACACS command grants a TACACS+ account access to the serial port.

To grant serial port access to a TACACS+ account:

At the Smart PDU: prompt, type **add porttotacacs console** and a TACACS+ account number. Press **Enter**.

Deleting serial port access for a TACACS+ account:

The Delete PortFromTACACS command removes a TACACS+ account's access to the serial port. You cannot remove access to the serial port for an administrative level account.

To delete serial port access for a TACACS+ account:

At the Smart PDU: prompt, type **delete portfromtacacs console** and a TACACS+ account number. Press **Enter**.

Displaying TACACS account access:

The List TacPriv command displays all access rights for a TACACS+ account.

To display TACACS account access:

At the Smart PDU: prompt, type **list tacpriv**, optionally followed by a TACACS+ account. Press **Enter**.

EN

Example

The following command displays information about the TACACS+ account 1:

```
Smart PDU: list tacpriv 1<Enter>
   TACACS+ Privilege Level: 1
      Ports:
         Port ID   Port Name
         Console   Console
```

8.6.2 TACACS+ Specifications

Authentication START Packet includes:

action = 1 (TAC_PLUS_AUTHEN_LOGIN)

priv_lvl = 0 (TAC_PLUS_PRIV_LVL_MIN)

authen_type = 1 (TAC_PLUS_AUTHEN_TYPE_ASCII)

service = 1 (TAC_PLUS_AUTHEN_SVC_LOGIN)

user = (entered username)

port = (access path into the PDU)

rem_addr = 'PDU3_xxxxxx' (xxxxxx is last six digits of MAC address)

data = '' (null)

Note!
The password is sent in a CONTINUE packet.

Authorization REQUEST Packet includes:

authen_method = 6 (TAC_PLUS_AUTHEN_METH_TACACSPLUS)

priv_lvl = 0 (TAC_PLUS_PRIV_LVL_MIN)

authen_type = 1 (TAC_PLUS_AUTHEN_TYPE_ASCII)

authen_service = 1 (TAC_PLUS_AUTHEN_SVC_LOGIN)

user = (entered username)

port = (access path into the PDU)

rem_addr = 'PDU3_*xxxxxx*' (xxxxxx is last six digits of Ethernet MAC address)

service = 'shell' (for exec)

cmd = '' (null)

Note!
The access paths into the PDU which support TACACS+ are 'Console', 'Telnet', 'SSH', 'HTTP' and 'HTTPS'. In the case of 'Console' and 'Modem', an administrator is allowed to rename these ports in which case the assigned name is used.

8.7 Logging

The PDU family of products supports logging of system events both internally and externally. An internal log of more than 4000 events is automatically maintained and is reviewable by administrative users. For permanent/long-term log storage, PDU supports the Syslog protocol. And for immediate notification, PDU supports Email notifications.

Log entries include a sequential entry number, a date/time stamp and an event message. The event message is preceded with a message 'type' heading and if the event is tied to a user, the username will be included.

Note!
For date/time stamp support, SNTP server support must be configured.

The PDU supports the following event message headers:

- AUTH: All authentication attempts.
- POWER: All power state change requests.
- CONFIG: All system configuration changes.
- EVENT: All general system events.

Example: over/under threshold event.

Internal System Log

The internal system log is stored in the local memory and has support for up to 4097 continuously aging entries. The internal system log is only available to administrative users.

Syslog

The PDU's Syslog support is RFC3164-compliant and enables off-PDU viewing and storage of log messages. The PDU supports external logging to up to two Syslog servers.

Syslog Command Summary

Command	Description
Set Syslog HostIP	Sets the IP address of the Syslog server
Set Syslog Port	Sets the Syslog server port number
Show Syslog	Displays all Syslog configuration information

Setting the Syslog server IP address:

The Set Syslog HostIP command sets the TCP/IP address of the Syslog server.

To set the Syslog server IP address:

At the Smart PDU: prompt, type **set syslog**, followed by **hostip1** or **hostip2** and the Syslog server's IP address. Press **Enter**.

Example

The following command sets the primary Syslog server IP address to 56.47.38.29:

```
Smart PDU: set syslog hostip1
56.47.38.29<Enter>
```

Changing the Syslog server port:

With Syslog support enabled, the Syslog server watches and responds to requests on the default Syslog port number 514. This port number may be changed using the Set Syslog Port command.

To change the Syslog port:

At the Smart PDU: prompt, type **set syslog port**, followed by the port number and press **Enter**.

Example

The following changes the Syslog port number to 411:

```
Smart PDU: set syslog port 411<Enter>
```

Displaying Syslog configuration information:

The Show Syslog command displays Syslog configuration information.

To display the Syslog configuration information:

At the Smart PDU: prompt, type **show syslog** and press **Enter**.

Example

The following command displays the Syslog configuration information:

```
Smart PDU: show syslog<Enter>
  SYSLOG Configuration
    Primary Syslog Server IP Address:
56.47.38.29
    Secondary Syslog Server IP Address:0.0.0.0
    Syslog Server Port:                  411
```

8.8 E-Mail

Email Command Summary

Command	Description
Set Email	Enables or disables Email notification support
Set Email SMTP Host	Sets the SMTP Host IP address or hostname
Set Email SMTP Port	Sets the SMTP server port number
Set Email From	Sets the email 'From' address
Set Email PrimaryTo	Sets the primary recipient email address
Set Email SecondaryTo	Sets the secondary recipient email address
Set Email Event	Enables or disables notification of general system events
Set Email Auth	Enables or disables notification of all authentication attempts
Set Email Power	Enables or disables notification of power state change requests
Set Email Config	Enables or disables notification of configuration changes
Show Email	Displays all Email configuration information

Enabling or disabling Email notification Support:

The Set Email command enables or disables Email notification support.

To enable or disable Email notification support:

At the Smart PDU: prompt, type **set email**, followed by **enabled** or **disabled** and press **Enter**.

Setting the SMTP server address:

The Set Email Host command sets the IP address or hostname of the SMTP server.

To set the SMTP server address:

At the Smart PDU: prompt, type **set email smtp host**, followed by the SMTP server's IP address or hostname and press **Enter**.

Examples

The following command sets the SMTP server address to 55.55.55.55:

```
Smart PDU: set email smtp 55.55.55.55<Enter>
```

The following command sets the SMTP server address to email.rittal.de:

```
Smart PDU: set email smtp
email.rittal.de<Enter>
```

EN

Changing the SMTP server port:

With SMTP support enabled, the PDU sends SMTP requests to the default SMTP port number 25. This port number may be changed using the Set Email SMTP Port command.

To change the TACACS port:

At the Smart PDU: prompt, type **set email smtp port**, followed by the port number and press **Enter**.

Example

The following changes the SMTP port number to 5555:

```
Smart PDU: set email smtp port 5555<Enter>
```

Setting the 'From' email address:

The Set Email From command sets the 'from' email address. By default, this is set to 'PDU3_' plus the last three octets of the unit's MAC address. Example: 'PDU3_510c90@'

To set the 'From' email address:

At the Smart PDU: prompt, type **set email from**, followed by the originating email address and press **Enter**.

Example

The following command sets the 'from' email address to Rack14PDU1@rittal.de:

```
Smart PDU: set email from
Rack14PDU1@rittal.de<Enter>
```

Setting the 'To' email address:

The Set Email PrimaryTo and Set Email SecondaryTo commands set the recipient email addresses.

To set the 'To' email address:

At the Smart PDU: prompt, type **set email**, followed by **primaryto** or **secondaryto** and the destination email address. Press **Enter**.

Examples

The following command sets the primary 'to' email address to DayAdmin@rittal.de:

```
Smart PDU: set email primaryto DayAd-
min@rittal.de<Enter>
```

The following command sets the secondary 'to' email address to NiteAdmin@rittal.de:

```
Smart PDU: set email secondaryto NiteAd-
min@rittal.de<Enter>
```

Enabling or disabling event notification types:

The Set Email Event, Set Email Auth, Set Email Power and Set Email Config commands enable or disable email notification of the event types as described

To enable or disable event notification types:

At the Smart PDU: prompt, type **set email**, followed by **event**, **auth**, **power** or **config** and **enabled** or **disabled**. Press **Enter**.

Examples

The following command sets the enables email notification general system events:

```
Smart PDU: set email event enabled<Enter>
```

The following command sets the disables email notification authentications attempts:

```
Smart PDU: set email auth disable<Enter>
```

Displaying Email configuration information:

The Show Email command displays Email configuration information.

To display the Email configuration information:

At the Smart PDU: prompt, type **show email** and press **Enter**.

Example

The following command displays the Email configuration information:

```
Smart PDU: show email
 Email Configuration
 Email Notifications:          Enabled
 SMTP Host:               email.rittal.de
 SMTP Port:                    5555
 'From' Address:     Rack14PDU1@rittal.de
 Primary 'Send To' Address: DayAdmin@rittal.de
 Secondary 'Send To' Address: NiteAd-
min@rittal.de
      Include EVENT Messages:       Enabled
      Include AUTH Messages:        Disabled
      Include POWER Messages:       Disabled
      Include CONFIG Messages:      Disabled
```

8.8.1 Upload/Download

The PDU family of product supports the ability to upload and download system configurations using a standard FTP client. This feature enables for backup and restoration of system configuration as well as upload of 'template' configurations to ease large initial equipment deployments.

Upload/Download Command Summary

Command	Description
Set FTP Server	Enables or disables the FTP server
Show FTP	Displays FTP configuration information

PDU Integrated FTP Server

The PDU supports an integrated FTP Server which must be enabled for Upload/Download support. The PDU FTP Server supports a single user at a time. Once an administrative user has authenticated with the PDU FTP Server, standard FTP client commands may be used to upload or download PDU configurations.

Note!
The integrated FTP Server does NOT support web browser FTP file transfers. A non-web-browser is required for all Upload/Download requests.

Enabling and disabling the FTP server:

The Set FTP Server command is used to enable or disable the integrated FTP server.

To enable or disable the FTP server:

At the Smart PDU: prompt, type **set ftp server**, followed by **enabled** or **disabled** and press **Enter**.

FTP Configuration Files

The PDU FTP server supports upload/download of two configuration files: CONFIG.BIN and NETWORK.INI. These files may be uploaded or downloaded using FTP PUT and GET operations.

- CONFIG.BIN — This file contains the entire configuration of the PDU excluding TCP/IP settings, serial/factory-only configurations, the x.509 certificate (SSL) and SSH keys. This file in encoded to keep all data (including usernames, passwords etc.) out of plain view. **This file is NOT editable.**
- FTP.INI — This file contains only the FTP settings (FTP Host, username, password, filepath, filename and automatic updates support). This file is user readable and editable 'plain text' file.
- NETWORK.INI — This file contains only the TCP/IP settings (IP address, subnet mask, gateway, DNS1 and DNS2). This file is user readable and editable 'plain text' file.
- SNTP.INI — This file contains only the SNTP settings (SNTP Hosts and GMT offset). This file is user readable and editable 'plain text' file.

Note!
The CONFIG.BIN file while *encoded* is not encrypted and susceptible to de-coding using simple tools.
Rittal recommends the secure storage of CONFIG.BIN backup images.

Upload/Download Process

GETting a configuration file (Download):

1. Open the FTP client.
   *In a Windows environment, in the Run window type **ftp** and press **Enter**.*
2. At the prompt, type **open**, followed by the IP address of the PDU and press **Enter**.

```
FTP> open 12.34.56.78<Enter>
```

3. Authenticate with the appropriate administrative username and password.
4. At the prompt, type **get**, followed by the filename and press **Enter**.

```
FTP> get config.bin<Enter>
```

5. At the prompt, type **close** to close the connection to the PDU.

```
FTP> close
```

EN

PUTting a configuration file (Upload):



Note!
Uploading the CONFIG.BIN file takes considerably longer than the NETWORK.INI file.
When uploading both, Rittal recommends uploading the NETWORK.INI file first.

1. Open the FTP client.
   *In a Windows environment, in the Run window type **ftp** and press **Enter**.*
2. At the prompt, type **open**, followed by the IP address of the PDU and press **Enter**.
   `FTP> open 12.34.56.78<Enter>`
3. Authenticate with the appropriate administrative username and password.
4. At the prompt, type **put**, followed by the filename and press **Enter**.
   `FTP> put network.ini<Enter>`
5. At the prompt, type **close** to close the connection to the PDU and force a restart of the device.
   `FTP> close`

9 Appendices

9.1 Resetting to Factory Defaults

You may reset the non-volatile RAM that stores all configurable options. This clears all administrator-editable fields and resets all command line configurable options to their default values, including all user accounts.

You may reset the unit to factory defaults from the command line or the HTML interface, or by pressing the reset button. You must have administrator-level privileges to issue the command. Using the reset button may be necessary when a forgotten password prevents administrator login. Each of the methods updates the current working configuration to the factory defaults.



Note!
Resetting the unit resets all TCP/IP and Telnet/Web configurations. Reconfiguring the TCP/IP and Telnet/web settings will be required.

To reset to factory defaults from the HTML interface

On the Restart page in the Tools section of the HTML interface, select **Restart and reset to factory defaults** from the drop-down menu and press **Apply**.

To reset to factory defaults from the command line

At the Smart PDU: prompt, type **restart factory** and press **Enter**.

To reset to factory defaults using the reset button

Locate the recessed reset button directly beside the Serial & Ethernet ports. You will need a non-conductive, non-metallic tool that fits inside the recess.



Note!
This method will NOT work if the reset button has been disabled by the administrator.

Insert the tool in the recess, then depress and hold the reset button for at least ten seconds.



Note!
If the reset button is depressed and held for more than 15 seconds, the reset will abort.

9.2 Uploading Firmware

You may upload new versions of firmware using File Transfer Protocol (FTP). This allows access to new firmware releases for firmware improvements and new features additions.

Note!
To begin an FTP upload session, you must first configure the FTP Host address, username/password, filename and filepath.

You may initiate an FTP upload session by issuing a command or from the HTML interface. You must have administrator-level privileges to initiate an upload.

To initiate an FTP upload session from the HTML interface

On the Restart page in the Tools section of the HTML interface, select **Restart and upload firmware via FTP** from the drop-down menu and press **Apply**.

Upon issuing this command the unit will restart and upload the firmware file specified with the FTP Filename command from the previously configured FTP Host.

To initiate an FTP upload session from the command line

The Restart FTPLoad command initiates an upload of firmware. Upon issuing this command the unit will restart and upload the firmware file specified with the FTP Filename command from the previously configured FTP Host.

To initiate an FTP firmware upload session:

At the Smart PDU: prompt, type **restart ftpload** and press **Enter**.

10 Technical Specifications

Designation	**Smart PDU**
Housing type	Sheet Steel
Environment	
Temperature	0 to +40 ℃ +32 to +104 ℉
Storage Temperature	-40 to +85 ℃ -40 to +185 ℉
Humidity	10 - 90 % RH, not condensing

Tab. 4 Technical specifications

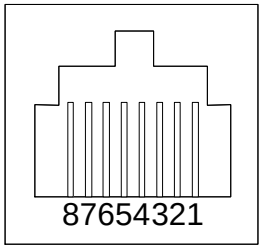
Order-Nr. DK 7856	**.510**	**.520**
Height in mm	1755	
Width in mm	45	
Depth in mm	57	
Weight without packaging in kg	8,7	
Voltage	230V	400V
Frequency (in Hz)	50/60	50/60
Power Supply	1 x 32A	3 x 32A
Connection Plugs		
CEE-Plug (1-phase)	■	-
CEE-Plug (3-phase)	-	■
Sockets		
C13	3 x 8	3 x 8
C19	3 x 2	3 x 2

Tab. 5 Overview

EN

10.1 RS-232 port

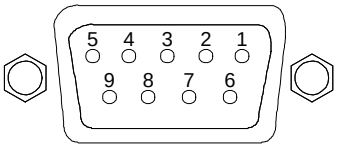
Smart PDUs are equipped standard with an RJ45 DTE RS-232c serial port. This connector may be used for direct local access or from other serial devices such as a terminal server. An RJ45 crossover cable is provided for connection to an RJ45 DCE serial port.



Pin	Name DTE-Signal		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

10.2 RJ45 to DB9F serial port adapter

Additionally, an RJ45 to DB9F serial port adapter is provided for use in conjunction with the RJ45 crossover cable to connect to a PC DB9M DCE serial port. The adapter pinouts below reflect use of the adapter with the provided RJ45 crossover cable.



Pin	Name DTE-Signal		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

10.3 LED Indicators

Input/Branch/Phase Current

Units are equipped with 7-segment LEDs for reporting of input, branch or phase current loading. Loading is reported in amperes and is displayed in ½ amp increments under 10A and whole amp increments at and above 10A. Additionally, the LED may display codes for events detected by the system for immediate local notification.

Code	Event description
FE	PDU has detected a removed/blown fuse

10.4 Regulatory Compliance

Product Safety

Units have been safety tested and certified to the following standards:

- USA/Canada UL 60950:2003 and CAN/CSA 22.2 No. 60950-1-03
- European Union EN60950-1:2001
-

This product is also designed for Norwegian IT power system with phase-to phase voltage 230V.

USA Notification

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's own expense.

Modifications not expressly approved by the manufacturer could void the user's authority to operated the equipment under FCC rules.

Canadian Notification

This Class A digital apparatus complies meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigencies du Règlement sur le matériel brouilleur du Canada.

European Union Notification

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms:

- EN55022 Electromagnetic Interference
- EN55024 Electromagnetic Immunity
- EN60950-1 Product Safety
- EN61000-3 Harmonics and Flicker

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

Japan

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。

Recycling

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

Elektro- und Elektronikalt-/schrottgeräte

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

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

11 Maintenance and Cleaning

The Rittal Smart Power Distribution Unit is a maintenance-free system. The housing does not need to be opened for the installation or during operation.

Note!

Opening the housing or any accessory components will void any warranty and liability claims.

11.1 Cleaning

Warning!

Danger of damage!
Do not use any aggressive substances, such as white spirit, acid, etc., for cleaning because such substances can damage the unit.

Use a slightly moistened soft cloth to clean the housing.

12 Storage and Disposal

Storage

If the device is not used for a longer period, we recommend that it is disconnected from the mains power supply and protected from dampness and dust.

Further information concerning the operating conditions is contained in the technical specifications.

Disposal

The Smart PDU must be disposed of through the electronic waste recycling system when it is no longer required.

EN

13 Customer Service

If you have any technical questions or questions concerning our product spectrum, contact the following service address:

Tel.: +49 (0)2772/505-1855
http://www.rimatrix5.de
E-Mail: info@rittal.de



Note!

To allow us to process your enquiry quickly and correctly, please always specify the article number in the subject line for e-mails.

Further information and the current operating guides and updates of the Rittal Smart PDU are available for download on the Rimatrix5 home-page:

http://www.rimatrix5.de/service_support/downloads.asp