User's Guide and Reference

ManageUPS® NET ADAPTER P-Series

ManageUPS® NET ADAPTER VP

Network Adapter for UPS Management

POWERVAR 3200 Series
Security Plus
ONEAC On Series
Sinergy

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ManageUPS® NET ADAPTER P-SERIES
Network Adapter for UPS Management

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SECTION I:

ABOUT MANAGEUPS NET ADAPTER

ManageUPS

ManageUPS Net Adapter provides a variety of monitoring and management-related services for uninterruptible power systems and associated auxiliary devices including SNMP Agent, web server, logging, email messaging, optional Modbus and optional environment sensor.

The ManageUPS Net Adapter with *MODBUS Services* option provides UPS Status information in MODBUS protocol for direct integration with Building Monitoring Systems via MODBUS RTU or MODBUS TCPIP.

UPS models with compatible communication expansion slots will use the *internal* adapter card.

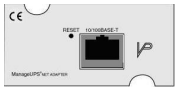
Other UPS models will use the adapter card with *external* chassis, power supply and communications cables.

Simplified Description of Services

- **Message:** Send a message when events occur that may risk uptime of the protected systems. Messages can be sent via SNMP trap or email.
- **Manage:** Integrate with *IT-Network* and *Building* management systems. Update ManageUPS firmware files. Configure Network, Server, Agent and Device settings. View system status in real-time. View or export data and event logs. MODBUS server for UPS status **P-Series Only**.
- **Shutdown**: Initiate controlled shutdown of computer systems on extended AC mains power failures, safeguard file integrity, and speed system recovery time when AC power returns.

ManageUPS Hardware Options

The services available on your ManageUPS Net Adapter depend upon hardware options.

Model Family	Connectivity	Device Coverage
VP	 10/100 BaseT Ethernet	UPS
P-Series	 10/100 BaseT Ethernet “Blue Bus” Sensor network Serial Port (RS485, RS422, RS232)	UPS, Modbus, & Environment Sensor Accessory 

Legacy Chassis

A *legacy conversion card* and *external chassis* enables *ManageUPS Net Adapter VP and P-Series* hardware options to be compatible with Security Plus series.

Service Mechanisms

- **Client:** A software element or program that requests information or actions from other software elements known as *servers.*
- **Server:** A program that provides some service to other (client) programs. The connection between client and server is normally by means of message passing, often over a network, and uses some protocol to encode the client's requests and the server's responses.
- **Agent**: Agents are software modules that first retrieve information about the managed devices they represent, stores this information in a management database, and finally provides it (proactively or reactively) to management entities within network management systems (NMSs) via a network management protocol.

MECHANISMS			SERVICES[1]		
Agents, Servers, & Clients			Message	Manage	Shutdown
BASE HARDWARE	C	DNS	Hostname resolution for NTP, SMTP, MopNSA and RCCMD		
	C/A	SMTP	email		
	A	SNMP	trap	**Integration**: SNMP NMS	
	C/S/A	MOPNET		**Integration:** ManageUPS CIO	MopUPS, MopNSA
	C/A	RCCMD			RCCMD
	C	NTP		Clock Synchronization	
	S	FTP/TFTP		Network Update	
	C	DHCP		Auto Net-Configuration	
	S	CONSOLE		Dial-in and Local RS232 Terminal access to Configuration and Status menus.	
	S	TELNET		Network access to Console	
	S	HTTP		Network Browser access	
P-Series Only	S	Modbus/JBus		Serial Communications - RS232, RS422, & RS485Half/Full Duplex TCP IP	

[1] The specific services available on your ManageUPS adapter may depend on model and firmware release. See the *Help* link on the *About ManageUPS* WEB page for information specific to your model and firmware build or license.

Installation Overview

There are two parts to the installation of ManageUPS Net Adapter:

1. **Hardware Installation** — Physical connection of ManageUPS to your UPS and attachment to the network.
2. **Configuration** — Confirm/Adjust network settings and set message triggers and destinations, shutdown targets, network security and other parameters.

Hardware Installation

Before installing ManageUPS Net Adapter you should be familiar with the hardware installation details outlined in the specific *Supplemental Installation Note:* for your UPS.

Installation notes are available from http://connectivity.powervar.com

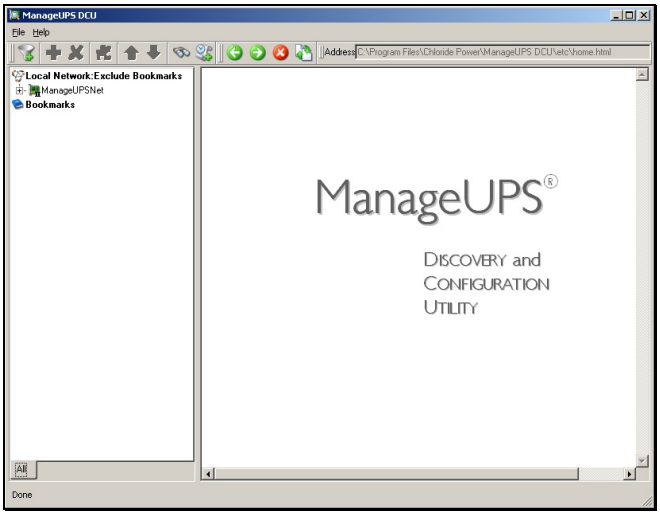
Some UPS models do not report all information needed by ManageUPS to represent the UPS accurately. ManageUPS will request missing information when the UPS Status WEB page is first accessed. Review *Section V: Device Settings,* in the User Guide for more information.

Configuration

ManageUPS is designed to be easily configured over the network.

A windows-based utility is offered to *discover* adapters on your network and simplify *configuration* of network settings and service options.

Refer to the *Quick Start Guide* for a simplified overview of adapter configuration using the *ManageUPS DCU* application.

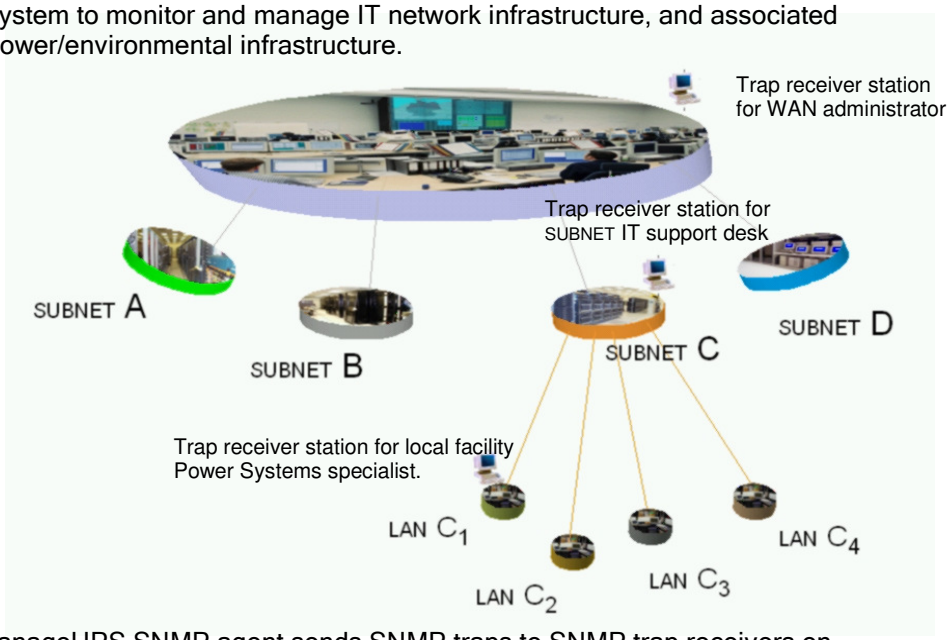


Application Profiles:

"The UPS is the critical foundation to my network. If something isn't right — the NOC (Network Operations Center) needs to know about it."

SNMP Agent

SCENARIO: Network administrators at a central operations center use an SNMP management system to monitor and manage IT network infrastructure, and associated power/environmental infrastructure.

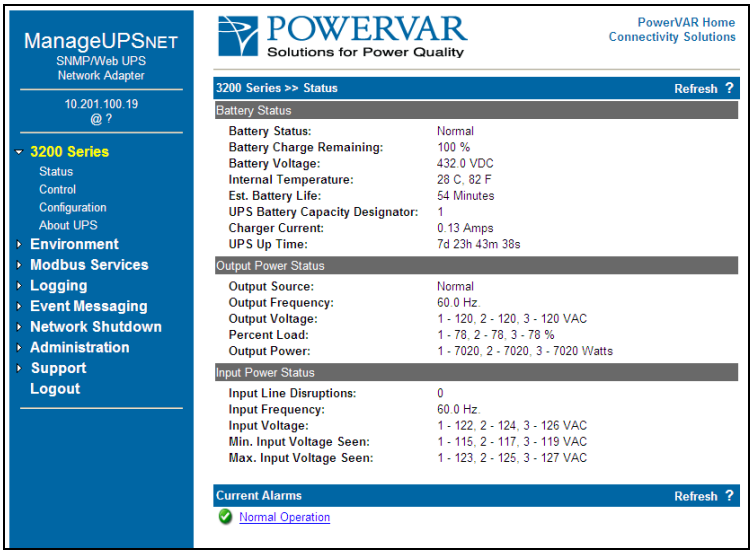


SOLUTION: ManageUPS SNMP agent sends SNMP traps to SNMP trap receivers on power fail and UPS or environment alarm conditions.

SNMP NMS are configured for threshold monitoring and scheduled collection intervals for the specific MIB objects of interest. *(ManageUPS supports MIB II (RFC1213), the standard UPS MIB (RFC1628 -- SNMPv1 translation)* and the Environment Sensor MIB).

The ManageUPS IP address is entered in the *Management URL* control in the node description form offered by the NMS. This makes it easy for the administrator to navigate to the ManageUPS WEB page to learn more about the UPS' status.

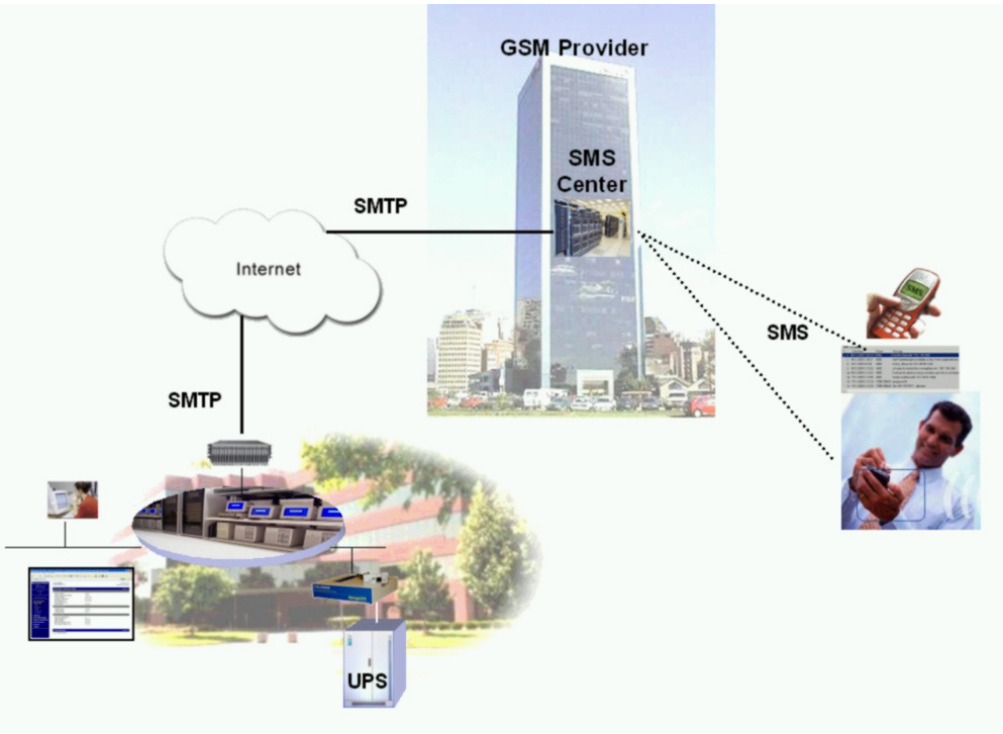
ManageUPS embedded WEB server offers all UPS MIB measures and controls.



Application Profiles:

"In a batch system, everything is entered during the day, but nothing is posted until the 'batch' runs at night. Often time 'jobs' need to be rerun."

Email-WEB



SCENARIO: The IT administrator for a campus network wants the Help Desk to be aware of any power-fail conditions or UPS service alerts that may impact IT resource availability.

SOLUTION: When UPS alarm conditions occur, ManageUPS will initiate email to identified email recipients. The *long* form email — intended for desktop email clients — includes a URL link back to the ManageUPS WEB server to make it convenient to research the conditions that may be causing the alarm.

Short form email options are offered for routing to pagers or SMS phones via email-forwarding services offered by most wireless service providers.

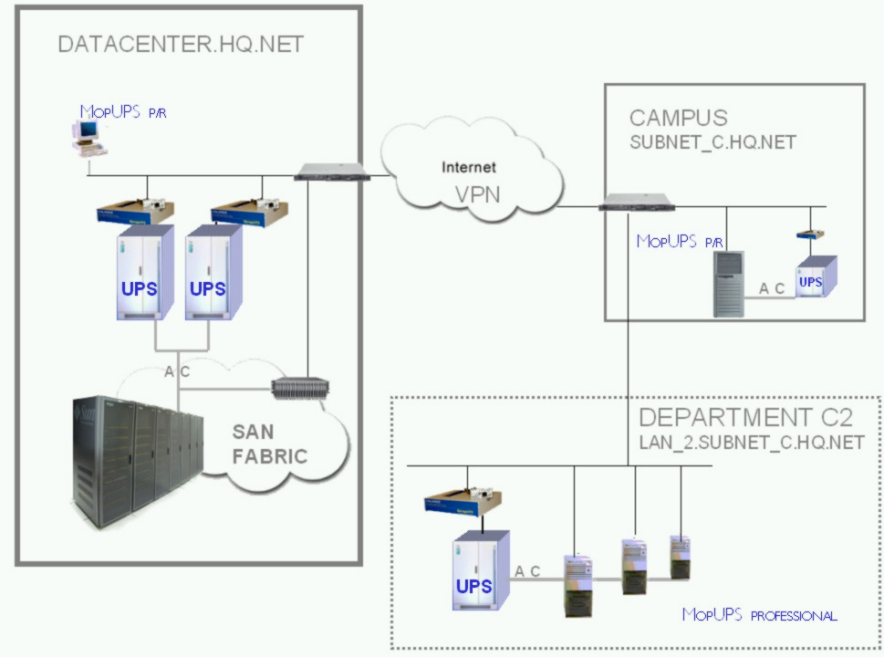
In both cases, ManageUPS routes email messages through the local SMTP (email) server operating on your premise network — or through the remote SMTP server offered by your internet service provider.

Application Profiles:

"If you know about your downtime, then you can control anything."

UPS status server for UPS monitoring software

ManageUPS hosts a UPS status server (MopNet server) that allows copies of *MopUPS* software (MopNet client) installed on network computers to retrieve UPS status information over the network and initiate *server-specific* responses to power systems events.



SCENARIO: In Department C2, three servers are supported by a shared UPS represented on the network by a *ManageUPS Net Adapter*. Each server is administered separately and requires individual automatic responses to power-fail conditions.

SOLUTION: A copy of *MopUPS PROFESSIONAL* is installed on each server to monitor UPS status via TCPIP and initiate individual shutdown scripts in the event of a prolonged AC power failure.

SCENARIO: At HQ.net, a facilities power systems manager is tasked with responsibility for power systems in the building. A dedicated pair of UPS modules configured for parallel redundant operation supports the data center.

SOLUTION: The facilities manager runs a copy of the *Special Edition of MopUPS for Parallel Systems* (MOPUPS P/R EDITION) on a personal workstation. MopUPS collects information from both UPS' over the IP network, analyses changing load conditions, and other UPS module events that may affect redundancy or overall availability and calls the manager's pager.

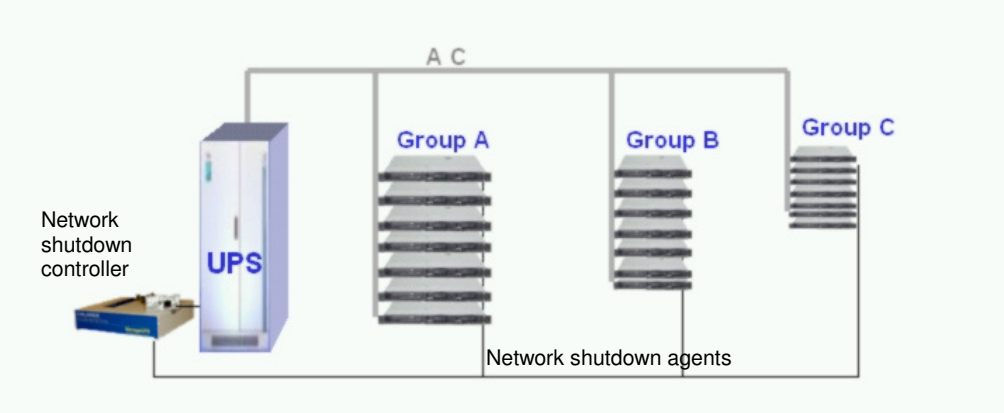
SCENARIO: At Campus C SUBNET, a backup-server is supported by a UPS shared with the campus PABX, router/switch, email server and other infrastructure devices located in the campus communications center. Some of the backup server's clients are in Department 2. The backup repository is the SAN (Storage Area Network) housed remotely in the HQ data-center. The backup administrator wants to ensure all three UPS' are reporting normal power status before allowing the backup job to start.

SOLUTION: A copy of *MopUPS P/R* is installed on the backup server to monitor the parallel UPS supporting the SAN, the shared UPS supporting the servers in Department-2, and its own Campus communications UPS. If any UPS system is reporting an AC fail condition, MopUPS runs a command / script that pauses the backup scheduler until all UPSs are reporting normal operating status.

Application Profiles:

"All I need is a simple solution to call graceful shutdown for a few groups of servers."

Network Shutdown Controller (NSC) for MopNSA or RCCMD agents.



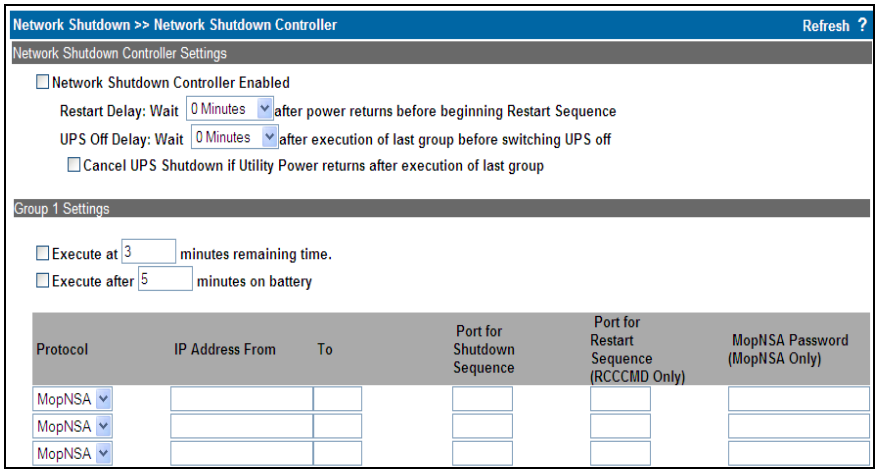
SCENARIO: An administrator with three sets of servers needs to trade off capacity for uptime in the event of a prolonged AC failure.

SOLUTION: Server shutdown agents (MopNSA or RCCMD software) are installed on each server. The agent listens on the network for a shutdown command from ManageUPS network shutdown controller (NSC).

ManageUPS NSC is configured to connect to the first group and call OS shutdown five minutes after an AC failure has been reported by the UPS. As this group finishes its shutdown and power off sequence, the UPS load on the battery is reduced by about 1/3 — increasing the autonomy available to the remaining groups.

Shutdown is called on the second group after 15 minutes on battery have elapsed.

The third group is configured to wait until the UPS reports only a few minutes of battery time remaining to allow the maximum system uptime before bringing the servers off line.



SECTION II:

NETWORK SETUP

Understand Your Network Environment:

To determine the simplest configuration method for your network environment, you may want to review the *Quick Start Guide* (QS) and the *Application Profiles* in *Section I*, *About ManageUPS* with your network administrator.

An important question you may need to answer is whether ManageUPS will need a *fixed* or "static" IP address on your network.

If the preferred policy on your network is to allocate a *fixed* IP to server and management devices, will the fixed IP be "reserved" in a DHCP table and assigned and re-assigned automatically? Or, should a "static" address be configured manually?

The answer will depend on your network policies and procedures and on how you plan to use ManageUPS:

- ❑ Will ManageUPS be used across multiple subnets within a multi-tiered network / Enterprise WAN? Or, only within a local subnet or LAN-side of a *Router?*
- ❑ Does your network manage network address registration automatically?
- ❑ What is your network administrator's policy or procedure for assignment of static IP addresses and entry of server host names in DNS tables?
- ❑ Does you network operate a local Network Time (NTP) Server?
- ❑ Does your network operate an SMTP server?

Basic Network Parameters

If your network operates a DHCP server and registers IP addresses manually, your network registrar or administrator may need the ***MAC address*** of your adapter. ManageUPS *MAC address* is printed on the carton label and on the faceplate.

- ♦ ***MAC address*** of your adapter:

__:__:__:__:__:__

If your network supports DNS, your administrator may need to add a specific *Host Name* and associated *IP address* to the network DNS server.

- ♦ ***Host-Name*** assigned to your ManageUPS (not needed if no DNS)

_____

If your network uses DHCP and DNS together to automatically assign *Host-Name* and *IP-Address*, you should be able to deploy ManageUPS right out of the box and configure it over the network once the appropriate entries are made in the DHCP and DNS servers.

If your network does not support DHCP, or if your network supports DHCP, but not DNS, you will need to know the *static IP address* that will be assigned to your adapter by the network administrator.

- ***IP Address*** ___. ___ .___.___

If your network does not support DHCP, you will need to know the ***remaining parameters*** to be set along with the IP address.

IP Subnet Mask ___.___.___.___

Default Gateway ___.___.___.___

DNS Servers:

Primary ___.___.___.___

Secondary ___.___.___.___

Other Network Resources you may need to know:

Network Timeserver: (DNS name or IP address) _____

SMTP Server (DNS Name or IP Address) _____

SNMP Trap Receivers _____

Network Shutdown Targets: (DNS Name or IP Address)

Typical Questions:

Q. Is a static IP address necessary?

A. It is generally considered good practice — but may not be absolutely necessary. (See Section II Page 5 for more information)

Q. What happens if there is no DHCP server available?
(or, if there is no dynamic IP address available from the DHCP pool)

A. If ManageUPS is not able to obtain an IP address from a DHCP, it will negotiate an unused IP address from the reserved "link-local" IP range: 169.254.xxx.yyy. (See *DHCP client* in Section II Page 5 for more information) .

Q. Can I turn off the DHCP client? Can I turn off the automatic Link-Local negotiation?

A. Yes. If you set configure a static IP address in ManageUPS itself, the DHCP client and link local negotiation will be disabled.

Q. What is the network timeserver used for?

A. To automatically set the clock reference in ManageUPS. The clock reference is used to mark log entries with a date and time stamp. (See Section III, page 4 for more information on NTP options)

Q. What is the SMTP server for?

A. This is the network resource ManageUPS will use to send status alerts via email. (See Section III Page 5 for more information)

Q. What are network shutdown targets?

A. Computers running MopNSA software will initiate shutdown of their host system. This is initiated by ManageUPS. (See Section III Page 9 for more information.)

SETTING NETWORK PARAMETERS

Serial Configuration?

If you prefer to set network and other parameters using a terminal and RS232/serial connection, see *Appendix A*.

Network Configuration?

If you know the DNS name or fixed IP address that is going to be assigned to your adapter via DHCP, you can reach your adapter using *Telnet* or *WEB Browse*r.

If the IP address has been assigned randomly from the DHCP pool, or during the link-local negotiation, you should use *ManageUPS* DCU software to find ManageUPS on your network and navigate to various configuration menus.

Once you reach ManageUPS using Serial or Network methods, you will need to know the default username / password combination.

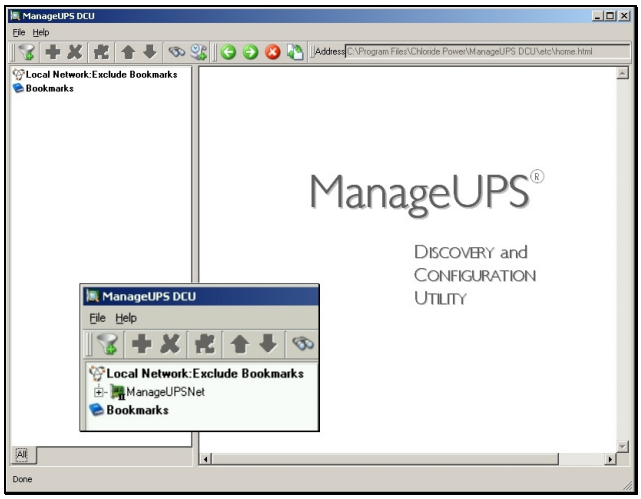
Default username = `admin`. Default password = `admin`.

The three options for configuring Network Settings manually via network connection are described below.

Configuration using ManageUPS DCU

ManageUPS DCU, Discovery and Configuration Utility is a software program that will help simplify initial configuration and ongoing management of ManageUPS adapters.

DCU will guide you through the setting of various network parameters, service settings, security settings and other options. *(Requires a PC running Windows 2000 or above.)*



Installation and use of ManageUPS DCU Discovery and Configuration Utility is covered in the *Quick Start Guide.*

Install ManageUPS DCU from http://connectivity.powervar.com/products/manageups.asp.

If you do not have access to a Windows workstation, or you prefer using a web browser, telnet client or local RS232 terminal, follow the methods outlined on the next page.

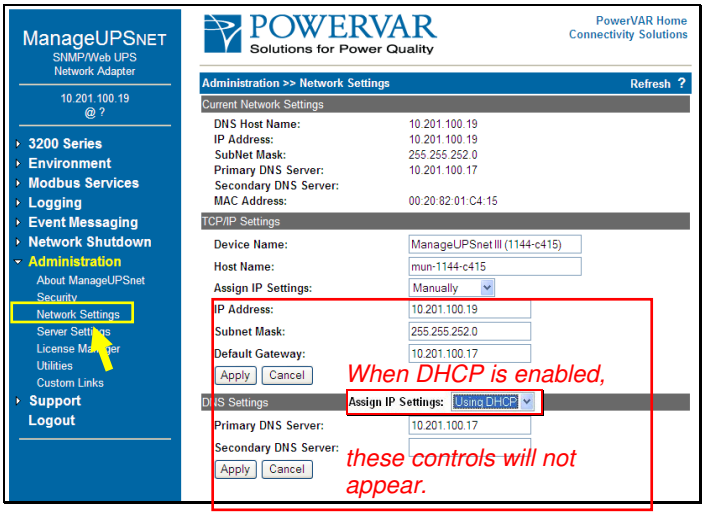
Configuration via WEB BROWSER

Enter the IP address or DNS name assigned to your adapter in the address bar of your web browser. Navigate to the **Network Settings** page in the **Administration** area.

```
http://<ip address>
http://<DNSname>
```

Once you enter new *TCP/IP Settings* in the browser view and press **[Apply]**, you will see a change warning message:

The new IP settings will take affect after you reboot the adapter. The *reboot* control is located in the *Utilities* menu.



After rebooting, you will need to open a new browser session with the adapter using its new IP address. You may want to configure Service, Administrative, or Device settings before rebooting.

Configuration via CONSOLE Menu

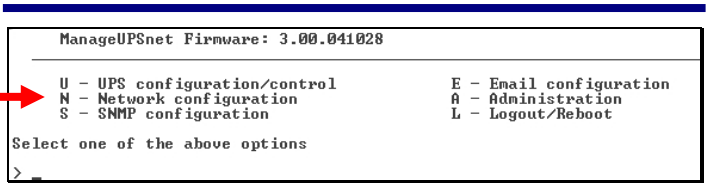
(For Telnet and Serial Configuration methods)

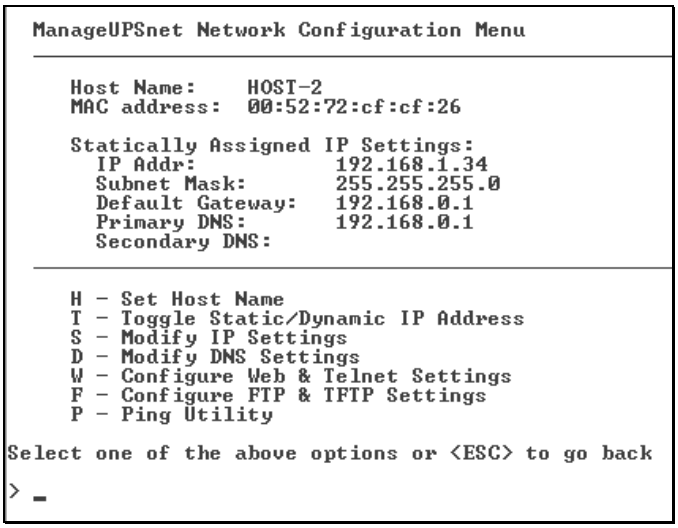
The **CONSOLE** utility is a text menu interface that is available via *Telnet* or via *serial port*.

The lower section of the MAIN menu (right) provides navigation to other menus.

If IP address is set to **STATIC**, active IP settings will appear in the top area of the **Network Configuration Menu**.

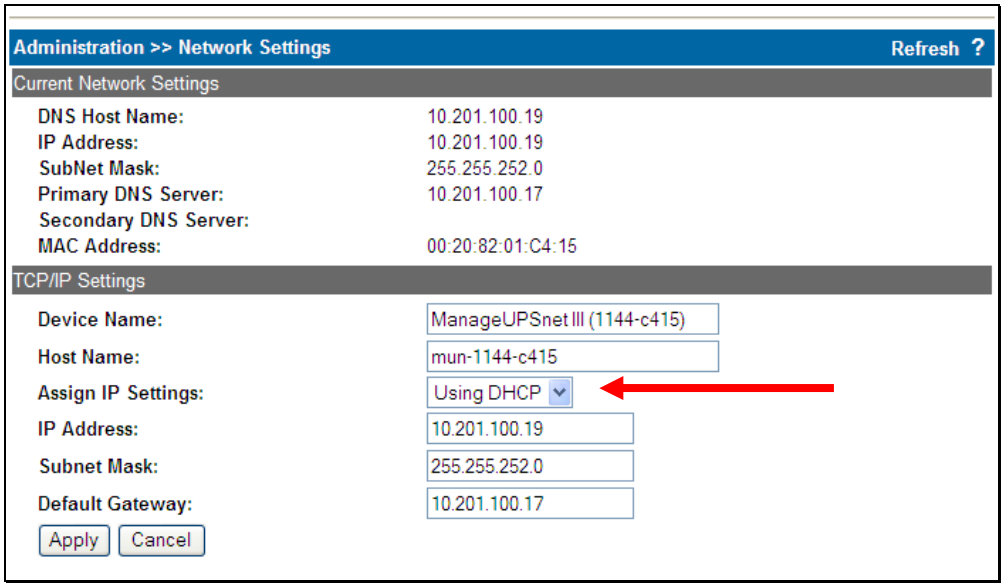
The active network settings of the adapter will remain active until you logout and reboot the adapter.





PING is a diagnostic utility used to verify that the adapter is able to route to specific network addresses of interest. **PING** is only available from the **CONSOLE** utility.

DHCP CLIENT AND NETWORK SETTINGS



DHCP CLIENT

ManageUPS ships with the DHCP client enabled. To disable the DHCP client and configure fixed IP settings, see the topic, *Assign IP Settings* on the next page.

What happens if ManageUPS is unable to obtain settings via DHCP?
If the client is unable to obtain an IP address from a DHCP server, ManageUPS will negotiate an IP address from the range reserved for *Local* networking (169.256.xxx.xxx). If an IP address becomes available later, ManageUPS will release the local address and use the IP address provided by the DHCP server.

NOTE: A self assigned link-local address will be reset every five minutes. This is a temporary address to be used for reaching the adapter via LAN to allow manual configuration of normal settings.

STATIC IP ADDRESS

Is a static IP address necessary?
Generally, it is considered good practice to assign a static IP address to server class devices -- but many network policies use dynamic address provisioning and automated network registration to simplify network administration.

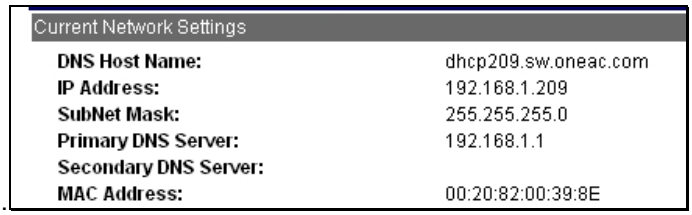
Generous lease periods allow a device that obtains a specific IP from a lease pool to continue to use the same IP unless the DHCP server's MAC table becomes corrupted, or the device is disconnected from the network for a period longer than the lease duration.

If you are using ManageUPS *primarily for email* event messaging, the email message body will contain a link to the card so you may reach it easily via browser.

If you are using ManageUPS as an *SNMP agent* or *UPS status server* for UPS monitoring software and you feel that that the DNS address resolution is not reliable assign a static IP to ManageUPS.

Current Network Settings

Display the currently active TCP/IP settings of the adapter



DNS Hostname

The DNS Hostname is retrieved from the DNS server on the network. If there is no DNS entry for ManageUPS in the DNS server, the current IP address of the adapter will be displayed in the DNS Host Name field.

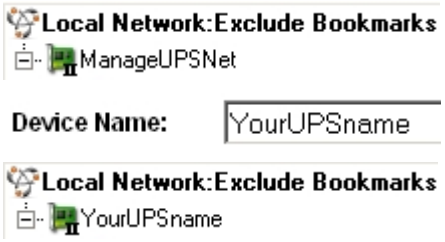
The MAC address is a unique hardware identifier that is set in the ManageUPS adapter at the factory.

TCP/IP Settings

When the DHCP client is enabled, The only settings you may control manually are Device and Host name.

Device Name

The name the adapter will publish for itself on the network. This name will appear as part of the adapter's icon in ManageUPS DCU navigation window whenever the icon is visible in the Local Network tree. The default value can be edited here and applied.



Host Name

If the DHCP server is configured to push the **DNS Host Name** to DHCP clients, the **DNS Host Name** will be presented here.

If the DHCP session does not include assignment of **DNS Host Name**, the entry will be the default value shown.

Changing the host name entry in ManageUPS TCP/IP settings **will not** affect the entry in the DNS server's directory.

NOTE: Handling of hostname via DHCP under DDNS: When the adapter boots with DHCP enabled, then the adapter will provide it's hostname in the DHCP request. By default this name is mun-1234-5678, where (1234-5678 is the unique hardware serial number). If the DHCP server is configured to pass hostname to a DDNS server, this hostname name will be added to the DNS server automatically.

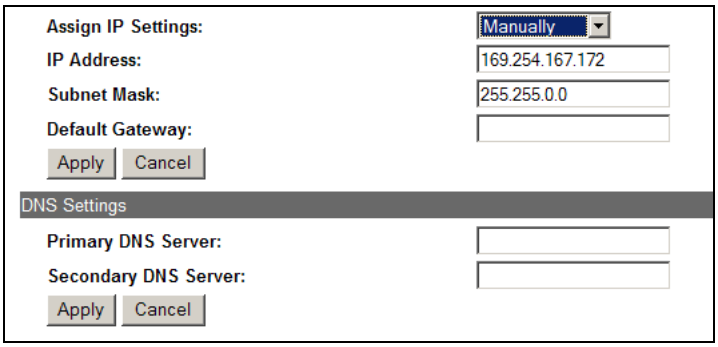
Host Name will be returned as SysName object in the SNMP system MIB (MIB-II)

Assign IP Settings

DHCP is the default configuration. Static or *fixed* is a configured option.

To switch to a fixed IP, select **Statically** in the dropdown box and press the **Apply** button. This will cause ManageUPS to present controls for entering the fixed IP settings. After you have entered the fixed settings, press **Apply** again. The settings will be saved -- but will not take effect until you reboot the adapter. After the card is rebooted, ManageUPS will deactivate the DHCP client and always use the fixed settings you enter.

TCP/IP Settings
-- MENU ITEMS FOR STATIC IP SETTINGS



IP Address Fixed IP address assigned to this adapter.

Subnet Mask: Subnet Mask of the network that the UPS unit is on.

Default Gateway: The local default gateway (IP address of the router).

DNS Settings

Primary DNS Server: IP address of the primary DNS server.

Secondary DNS Server: IP address of the secondary DNS server.

SECTION III:

SETTING SERVICE OPTIONS

Overview of Services

Logging Service

Pages 2-4

ManageUPS maintains event and data log files in a non-volatile memory. Log files can be *viewed* via the WEB interface — or downloaded for import and analysis via other utilities.

The default data log interval creates one entry every 10 minutes. This allows for approximately 26 days of history to be available for viewing. The log interval can be adjusted using the *Log Controls* menu.

The reference time source for log entry time stamps is a network timeserver (NTP server). Verify the IP address of a local NTP server in the *Date/Time Settings* menu.

Event Messaging Service

Pages 5-8

The messaging service sends messages on UPS status events via SNMP Trap, email or both.

For email alerts, set email recipients and the address of the SMTP server on your network that will deliver these emails.

Set up to ten destinations to receive *SNMP traps*.

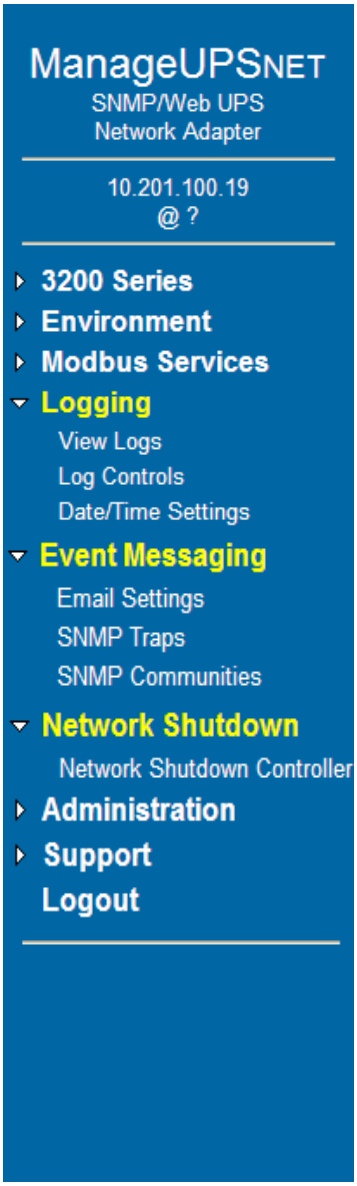
If you plan to use the full SNMP agent for GET or SET MIB objects, set SNMP access-rights using the *SNMP Communities* menu.

Network Shutdown Controller Service

Pages 9-10

ManageUPS will connect to network computers running MopNSA (Network Shutdown Agent) or RCCMD listener modules and call safe OS shutdown when AC power failures last longer than the specified delay periods.

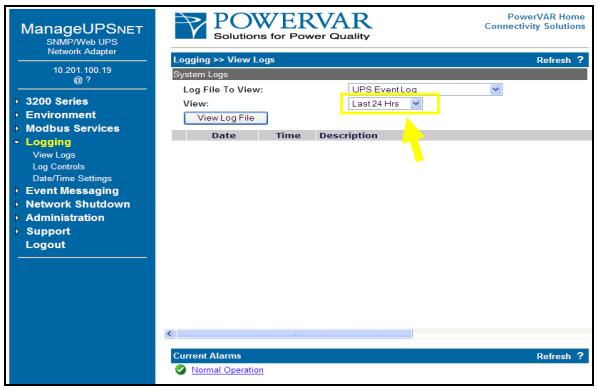
ManageUPS supports up to four delay groups for network shutdown.



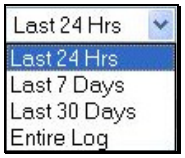
Logging Services

UPS Events Log

When you first access the *Log* viewing area, ManageUPS will load and display UPS events that have occurred in the last 24 hours.



If there are no events to display, the display area will be blank.



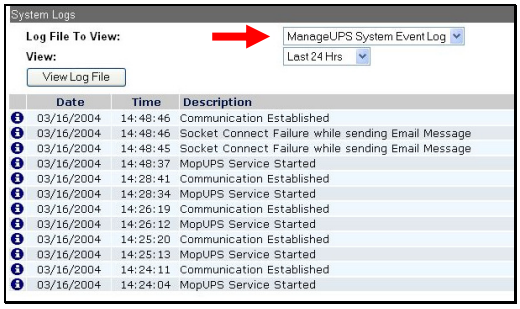
To view older history, select a time period from the dropdown box and press:

If an event is caused by a measured threshold such as input voltage, temperature or %load (as shown), the value of the relevant parameter will be included in the event log entry.

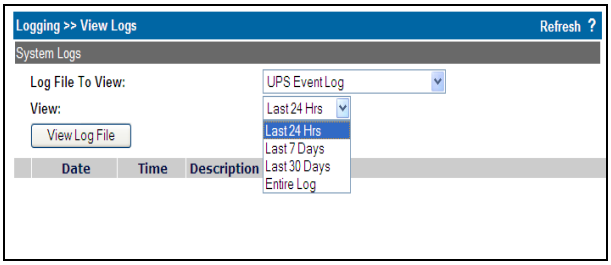
System Events Log

ManageUPS also logs informational records of background system activity.

If a Service fails to perform as expected, these records can sometimes aid in troubleshooting the cause of the problem.



Data Log



ManageUPS accumulates various measures reported by the UPS between log intervals and summarizes this information for each entry.

The following explains each of the fields contained in the data log.

Date	Time
01/01/2010	00:20:35

Date and Time the log entry was made is presented according to your time zone preference. The calendar and clock are synchronized to the network time server (See NETWORK TIME RESOURCE on page Section III Page 4).

VMin	VMax	Vin	VpMin	VpMax	VpAvg
228	233	230	228	233	230

Various measures of input voltage. *(See page Section V Page 4 for more information)*
VMin and **VMax** are long term extremes of voltage variations measured on the input side of the UPS.
Vin is the input voltage reported at the time the log entry was made.
VpMin, VpMax, and **VpAvg** are the minimum, maximum and average input voltage recorded during the period since the last log entry was made

Vout	Vbatt	Freq
230	1837	600

Vout is AC voltage reported on the UPS output.

Vbatt is DC voltage reported at the battery. Some UPS' report voltage at the string level. Other UPS' report voltage at the cell level. In the example shown, 1837 is interpreted as 183.7 VDC.

Freq is the frequency of AC voltage on the input of the UPS. 600 is interpreted as 60.0 Hz.

%Load	%LdpMin	%LdpMax	%LdpAvg
35	31	38	34

%Load is the UPS output load expressed as a % of UPS capacity as reported at the time the log entry is made.

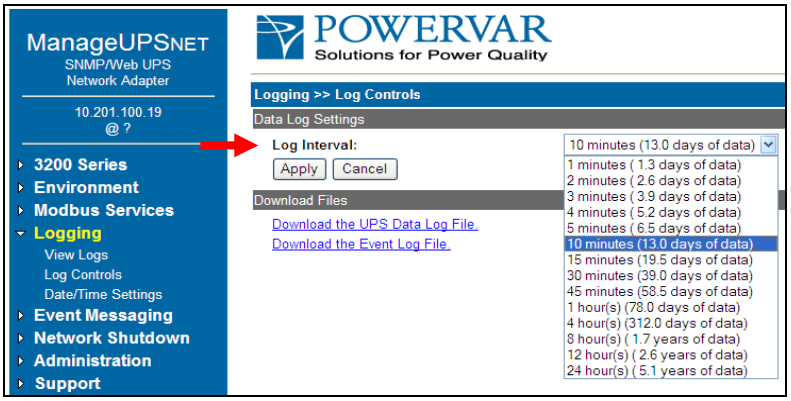
%LdpMin, %LdpMax, and **%LdpAvg** are the minimum, maximum and average % load statistics during the period since the last log entry was made.

Temp
28

Temp is the temperature (degrees C), reported by the UPS. Generally, the temperature reported reflects a temperature reading within the UPS cabinet - typically either in the inverter (power electronics) region or in the battery compartment.

Log Controls

Changing the *LOG INTERVAL* will change the amount of time ManageUPS waits before making entries in the data log file. Extending the duration between log entries allows ManageUPS



to archive a longer history of data measures. The default data log interval creates one entry for every 10 minute period. This allows for approximately 20-26 days of history to be available for viewing.

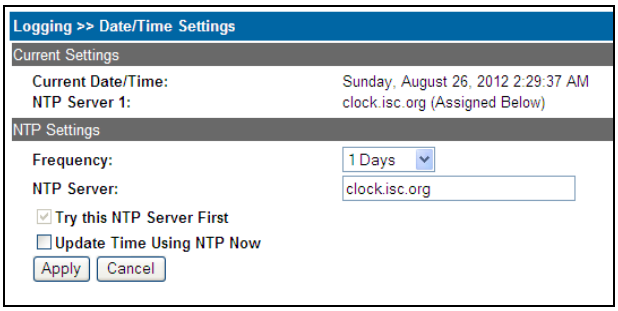
Links are provided to download the raw data and event log files in CSV format. The first record in the file will be a field header record.

Be aware that log entries are *stored* using the GMT time reference. Log entries are *displayed* in the WEB interface using your TIME ZONE preference (See "Time Zone" help in the *Date/Time Settings* dialog.) When you download a log file, the time stamps will be the GMT reference.

Network Time Resource

The default entry for the network time resource is an internet timeserver (requires internet access through NTP port 123).

The best practice is to use a local time server within your network. ManageUPS will accept a local NTP server from the DHCP server automatically if it is offered.



If the NTP Server 1 is an internet time server, ask your network administrator for the address of the timeserver(s) to connect to the network ManageUPS.

If no NTP server can be reached by ManageUPS it will start and reference the following:

"Midnight, 1 January 2000 GMT".

If this occurs, ManageUPS will retry to access the NTP server once every 5 minutes until a connection is established — unless NTP is "disabled" in the *FREQUENCY* control.

Frequency: How often ManageUPS will synchronize with the NTP Server.

Time Zone: Log entries are stored using GMT. The local time zone of the browser will be used when displaying data log entries in the WEB interface.

NTP Server: The NTP server to be used to obtain the time. This can be entered using the local DNS name or as an IP address.

Try this NTP Server First Use this control to identify the primary NTP server for ManageUPS to use.

Leave this control empty to identify 2nd and 3rd NTP servers.

Update Time Using NTP Now: Check the box **Update Time Using NTP Now** and press the **Apply** button to update the time immediately.

Event Messaging Services

The messaging service sends messages on UPS status events via SNMP Trap, email or both.

Email Settings

SMTP Server: The IP address or DNS hostname of the SMTP host server that the adapter will use when sending email messages in response to an event.

SMTP Settings

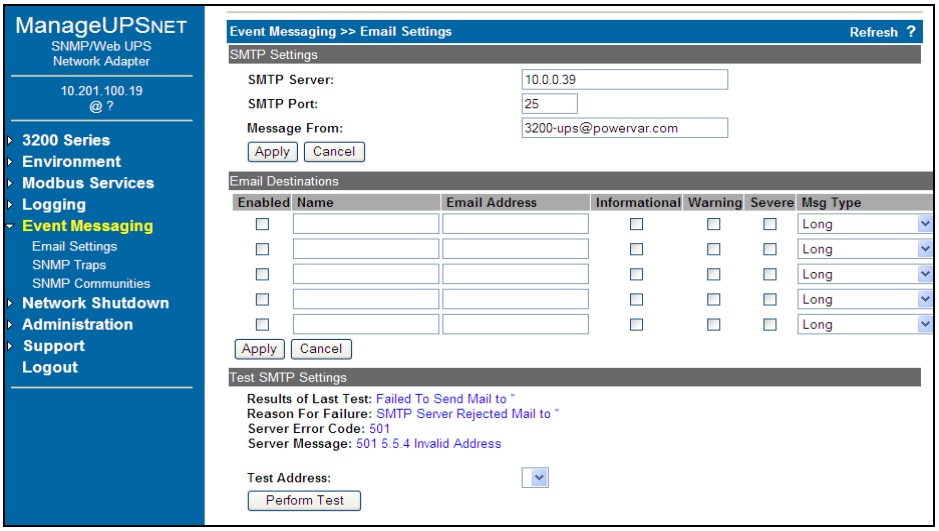
SMTP Port: The port that the SMTP server is listening on (usually 25).

Message From: The *from* email address that the UPS unit will use when sending email messages in response to an event. For example:

```
UPS1@Bld23.yourcompany.com
```

The **APPLY** buttons control only the entries in their form within the page. Press **APPLIES** to save changes before configuring email destinations.

Email Destinations



Enter the NAME and EMAIL ADDRESS of message recipient and determine which severity level should trigger email messages to this destination. (See *Appendix B - Alarm Detail* for more information on alarm interpretation).

For regular email recipients, use the LONG message type. Use SHORT or SHORT WITH NO SUBJECT to send emails preformatted for relay to GSM wireless devices via the provider's SMSC (Short Message Service Center). Most GSM providers offer email-to-SMS forwarding services

Press **APPLY** to save these settings

Email Test

To test email message delivery, select a destination email recipient and press **PERFORM TEST.**

When the test is complete the pass/fail result and failure diagnostics will be displayed in the TEST pane.

Samples of email message types

Long Message Type

```
From :ManageUPS27@Yournet.com
Sent: 5 April 2004
To:TestR1@yournet.com
Subject: Utility Power Fail
-------------------------------------------
The POWERVAR 3200 Series UPS @ YourLocation has the
following condition:

Module Utility Power Fail

----ManageUPSnet Information-----------------------------
Model:            ACTIVE
Serial Number:    0412-cf00
Host Name:        (none)
Contact           Your ContactName
Location:         YourLocation
Attached Devices: ""
URL:              http://192.168.1.2
------------------------------------------------------------
```

Short Message Type

```
From :ManageUPS27@Yournet.com
Sent: 5 April 2004
To:TestR1@yournet.com
Subject: Utility Power Fail
------------------------------------------------------------

Module Utility Power Fail
```

Short Message Type No Subject

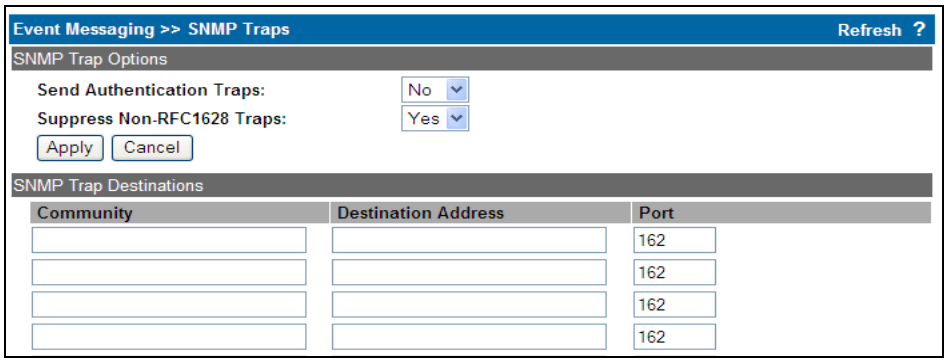
```
From :ManageUPS27@Yournet.com
Sent: 5 April 2004
To:TestR1@yournet.com
Subject:
------------------------------------------------------------

Module Utility Power Fail
```

SNMP Traps

The SNMP agent in ManageUPS conforms to the SNMP UPS MIB (RFC1628). The UPS MIB was originally circulated in SNMPv2 syntax.

An SNMP v1 translation of RFC1628 MIB file is included on the ManageUPS CD and available from

http://connectivity.powervar.com/products/manageups/



SNMP Trap Destinations

Send Authentication Traps: Enables or disables the agent to send SNMP authentication traps.

Suppress Non-RFC1628 Traps: Suppresses or enables the sending of alarms that are not included in the list of well-known-alarms defined in RFC1628. (See the subject *About SNMP UPS Alarm Table Entries* on the next page for more information)

Destination Address: The IP address of the trap receiver.

Community: The name (authentication string) of the SNMP trap receiver community

About SNMP UPS Traps

There are four traps defined in the standard UPS MIB (RFC1628):

Trap1: upsTrapOnBattery

DESCRIPTION: "The UPS is operating on battery power. This trap is persistent and is re-sent at one minute intervals until the UPS either turns off or is no longer running on battery."

Trap2: upsTrapTestCompleted NOTIFICATION-TYPE

DESCRIPTION: "This trap is sent upon completion of a UPS diagnostic test."

Trap3: upsTrapAlarmEntryAdded NOTIFICATION-TYPE

DESCRIPTION: "This trap is sent each time an alarm is inserted into to the alarm table. It is sent on the insertion of all alarms except for upsAlarmOnBattery and upsAlarmTestInProgress covered in Traps 1 and 2. “

Trap4: upsTrapAlarmEntryRemoved NOTIFICATION-TYPE

DESCRIPTION: "This trap is sent each time an alarm is removed from the alarm table. It is sent on the removal of all alarms except for upsAlarmTestInProgress."

About SNMP UPS Alarm Table Entries

WELL KNOWN ALARMS: (1-24)
Content sent in Traps 3 and 4 include a numeric identity (upsAlarmId) of the specific alarm that has been added or removed from the table. The MIB defines 24 specific upsWellKnownAlarms.

Value=1.3.6.1.2.1.33.1.6.3.x
Where; x is the alarm identification number of the specific alarm entry.

ADDITIONAL ALARMS: (25-31)
In addition to the 24 wellKnownAlarms defined in RFC1628, the adapter will also send additional alarms not defined in the MIB.

Additional alarms are suppressed by default. To enable these additional alarm entries, change the setting in the SNMP trap control dialog: **Suppress Non-RFC1628 Alarms.**

NOTE: For a complete list of UPS alarms reported by ManageUPS, including SNMP MIB OID, email severity code, and probable causes, see *Appendix B, Alarm Detail.*

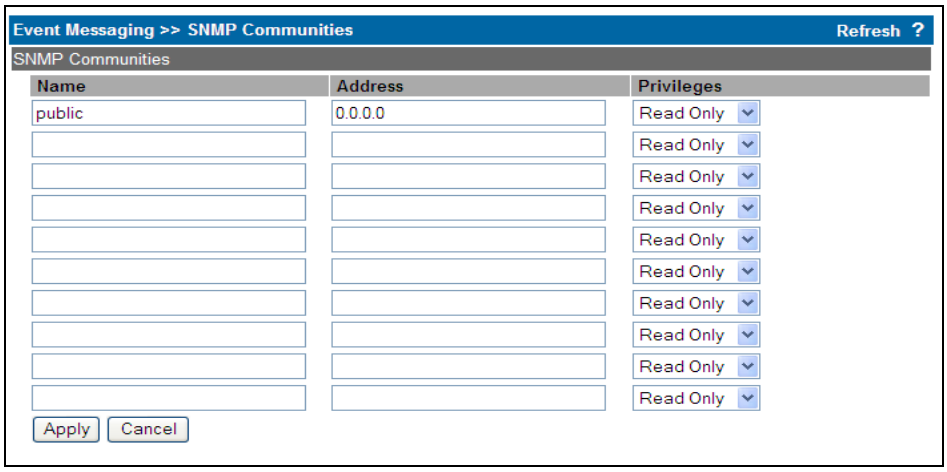
SNMP Communities

SNMP Communities is an authentication scheme that enables an intelligent network device to validate SNMP requests.

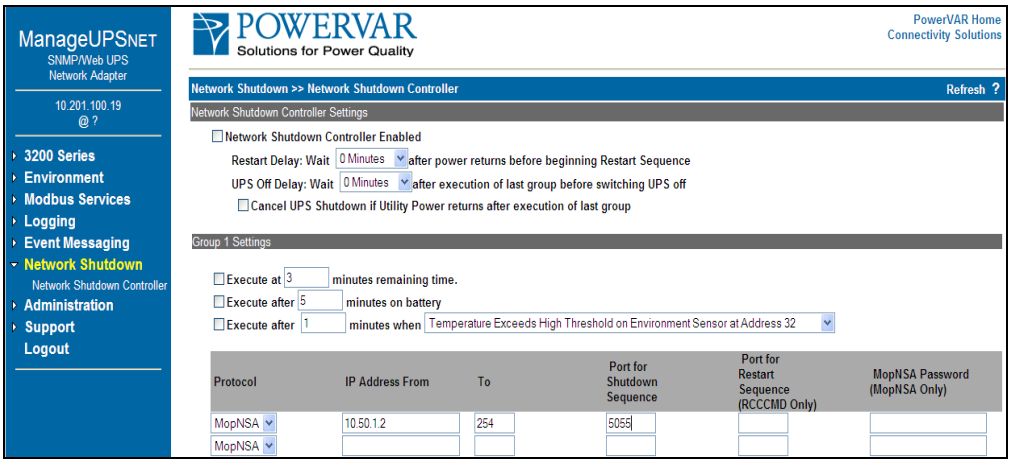
Name: The name of an SNMP access community (i.e. "public" or "private").
NOTE: Blank spaces are not accepted within the name string.

Address: The IP address of allowed stations (0.0.0.0 = any address).
A subnet range can be specified using the IP/MASK or IP/BITS syntax as shown below. If you are not familiar with this notation, open the **? HELP** dialog for examples of how this notation works.

Privileges: Enable **Read Only** or **Read/Write** access for individual communities.



Network Shutdown Control Services



Network Shutdown Controller Settings

Remote Shutdown Enabled: Check to enable the Remote Shutdown Function.

Restart Delay (applies to RCCMD only): The amount of time to wait after power has been restored to send the restart message to all IP addresses with a restart port greater than 0. This message will only be sent to those IP addresses that have received the Shutdown message.

UPS Off Delay (Available Only on UPS's with Shutdown Capabilities): The amount of time to wait after the last group is executed before shutting the UPS off.

Cancel UPS Shutdown if Utility Power Returns After Execution of Last Group

(Available Only on UPS's with Shutdown Capabilities)

If this option is checked, the UPS shutdown will be cancelled if power returns after the last group is executed but before the UPS is turned off.

If this option is NOT checked, the UPS will be shutdown regardless of the state of the input power. If power was restored prior to UPS shutdown, then the UPS will shut off and restart after a short delay.

Group Settings	**Execute at [N] minutes remaining time:**	Send Shutdown Messages to all IP Addresses in the Group if the UPS is running on battery power and the amount of remaining time is estimated to be [N] minutes.
	Execute after [N]:	Where N is the number of minutes on battery to wait.
	Protocol:	Select the protocol of the shutdown targets. If the shutdown target is running RCCMD listener module, select RCCMD. If the target is running MopUPS network shutdown agent (NSA), select **MopNSA**.
	IP Address From:	The IP address of the first computer in a range to receive *Remote Shutdown* signals. Formatted as `XXX.XXX.XXX.XXX`.
	IP Address To:	The fourth octet of the last computer in the range to receive Remote Shutdown messages. Must be a number greater than the fourth octet of the corresponding **IP Address From**, and must be less than 255.
	Port for Shutdown Sequence:	The TCP/IP port of the computers in this range that are listening for Remote Shutdown messages. The default port for MopUPS NSA is 5055.
	Port for Restart Sequence (RCCMD Only)	The TCP/IP port of the computers in this range that are listening for RCCMD restart messages.
	Password (MopNSA only)	The password entered on the target computer for access to the MopUPS service. ManageUPS must present the correct password to the shutdown target in order to be authenticated with rights to trigger shutdown of the target host operating system.

SECTION IV:

ADMINISTRATIVE SETTINGS

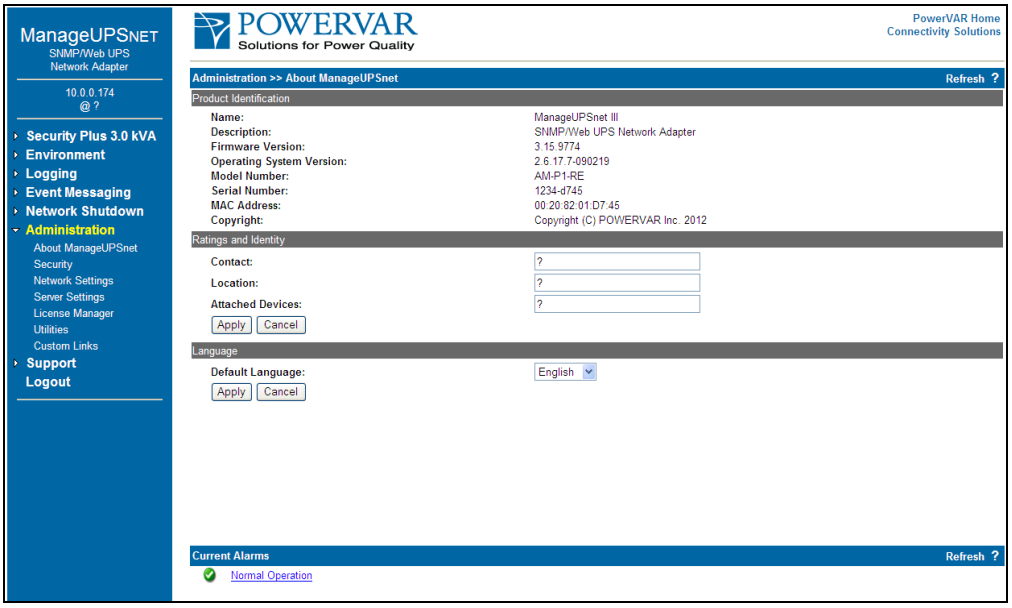
OVERVIEW OF ADMINISTRATION

The *Administration* area contains menus and utilities for setting identity information, network parameters (covered in Section II), security and firmware maintenance.

About ManageUPS

The *Product Identification* area contains information that is useful when contacting your vendor for technical support.

Ratings and Identity contains standard variables required in most SNMP applications.



PRODUCT IDENTIFICATION

Name :	Product Model Name.
Firmware Version:	Version of the ManageUPS *services* package that contains the device monitoring agent(s) along with related services and clients.
Operating System Version:	Version of the ManageUPS Operating System.
Model Number:	Adapter Model Number / Part Number.
Serial Number:	Adapter Serial Number is a 4 digit date code followed by the last 4 digits of the MAC ID.
MAC Address:	Adapter MAC Address

RATINGS AND IDENTITY

Contact:	The system Contact name for this UPS. (This value is returned as the `sysContact` object in SNMP MIB-II)
Location:	Location of the UPS. (This value is returned as the `sysLocation` object in SNMP MIB-II).
Attached Devices:	Brief description of devices attached to the UPS. (This value is returned as the `upsIdentAttachedDevices` object in the UPS MIB - RFC1628)

Security Settings

The security provided by ManageUPS is generally adequate for most applications that operate within a protected intranet environment.

However, you should be aware that **usernames, passwords and SNMP community names are transmitted over the network in plain text.**

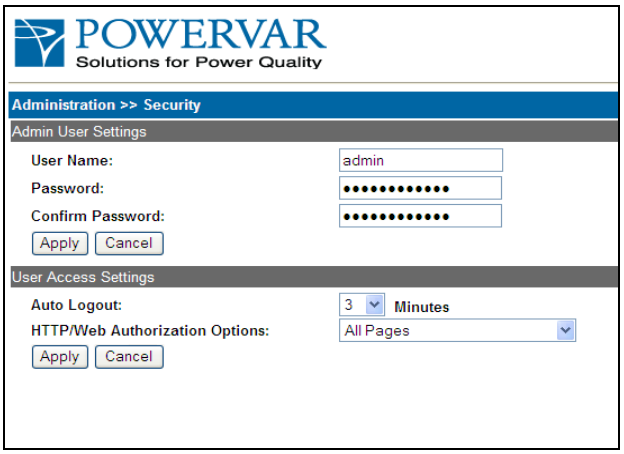
Authentication and User Access control options are explained below.

For further security, you may want to disable services that you are not using. You may also want to change the "well-known ports" assignments used for enabled services to "hide" these services from casual users on the network.
(See *Server Settings* on the following page for more information)

USER SETTINGS

UserName and password required for authentication when accessing the adapter via Web, Telnet, FTP or serial communication methods.

SNMP security is controlled using SNMP Communities. (See Messaging, SNMP Communities)



USER ACCESS SETTINGS

AUTO LOGOUT: This security feature will automatically log a user off of HTTP, Telnet or FTP when the session is idle for the specified amount of minutes.

HTTP/WEB AUTHORIZATION OPTIONS: The following options are available:

All Pages: Use this option if each page requires authentication.

Only Posts: This option allows anyone to view all pages (except the **Security** page) but requires authentication for posting information to the adapter (i.e. pressing the **Apply** button).

Disable All Authorization: Use this option to allow anyone to view or save information to the adapter without authentication. This is option is not recommended in most cases.

NOTE: ManageUPS allows three successive authentication attempts. If the username and password combination is not entered correctly after three attempts, the card will refuse further attempts and you will see the message:

HTTP/1.1 401

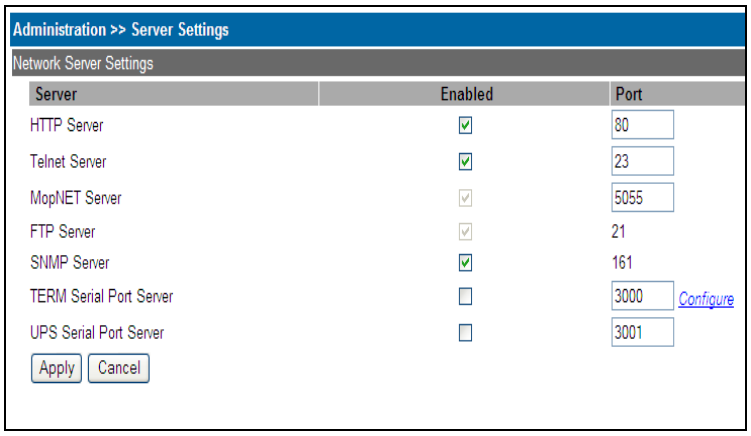
Unauthorized

You will need to restart your WEB, FTP or Telnet session to try again with the correct combination.

Server Settings

Settings of the network *servers* hosted by the adapter.

For greater security, use these controls to change port settings or disable any servers you are not using.



Server: Name of the server/service on the adapter.

Enable: Enables/Disables server.

If you disable the SNMP server -- all SNMP services will be disabled. The adapter will not accept "`SNMP get`" or "`SNMP set`" requests.

If you disable the http server, the adapter will no longer respond to browser access requests.

If you disable the telnet server, the adapter will no longer accept incoming connections via telnet.

Port: The default port settings for these servers are the "well-known" ports for a specific protocol. If an arbitrary port is used (between 5000 and 65535), you can effectively "hide" the server on the network. This provides an additional level of security since the port must be known by the user when attempting to connect to the server with client software.

(NOTE: If you change the port setting in a server, you will also need to use the new port setting when accessing the server with a client. For example, if you change the http server port to "8080" the syntax you use in your browser address bar would need to identify the non-standard port:

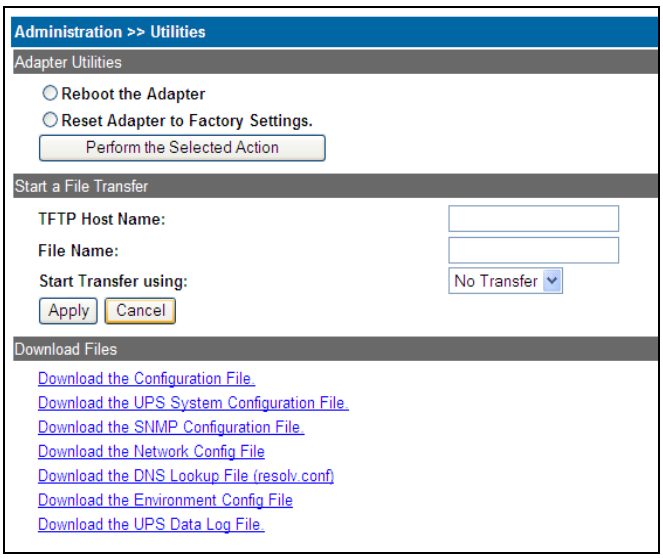
```
http://[manageupsDNSName]:8080
```

Changing ports can have unexpected consequences. Some ports have standard assignments for use with specific network services, and depending on your network security policies, some ports may be blocked at routers or firewalls. If you feel the need to change ports from the default values, you should consult with your network administrator.

The *FTP* and the *mopnet* servers cannot be disabled.

Utilities

The *Utilities* menu offers mechanisms for setting certain configuration parameters in the adapter and for managing various files in the adapter.



REBOOT / RESET UTILITIES

Reboot the Adapter:

This will cause the adapter to perform a reboot. This is required to force system changes such as a change to the IP Address to take effect. (See also, *Hardware Reset* -- below)

Reset the Adapter:

This will cause all settings on the adapter to be reset to their factory default values.

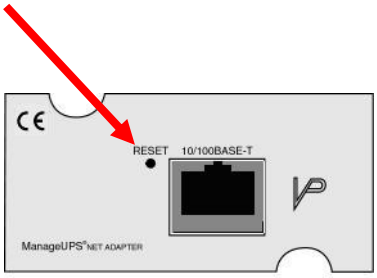
Note: This will reset all passwords and other user-specific settings. If you want to save some settings, download and save the configuration files before resetting the card. You may be able to edit the saved configuration files to upload specific settings you want to retain.

FILE TRANSFER / DOWNLOAD FILES

See Section IV, Pages 7-8.

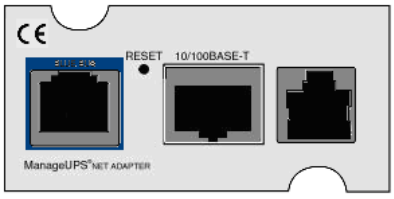
HARDWARE RESET

There is a hardware RESET switch on the front panel of the adapter within a recessed hole. Access the switch using a wire such as a small unwound paper clip.



1. If the RESET switch is depressed for less than three seconds, it provides the same function as *rebooting* the adapter.

2. If the RESET switch is depressed anywhere from three to ten seconds, the USERNAME and PASSWORD revert back to the factory default.



3. If the RESET switch is depressed for more than ten seconds, it reverts back to the factory defaults.

The RESET Switch can be reached through the access hole by using a paperclip or similar object.

Note: Resetting the adapter with the RESET switch will clear all volatile object values in the SNMP agent. This includes MIB-2 management objects:

`upsUpTime, snmpInPackets, upsInputLineBads, upsAlarmsPresent,`

etc.

If trap destinations (receivers) are configured, a `Cold Start` trap will be sent when hardware reset is initiated.

FILE MAINTENANCE

ManageUPS allows for firmware, configuration and graphics files to be uploaded to the card over the network via TFTP or FTP.

The *File Transfer* and *Downloads* utilities can be used to update adapter firmware or to simplify configuration of multiple adapters on your network.

KEY FILES

sys	`<firmware file>`	ManageUPS agent and services package.
	`<munosfile>`	ManageUPS OS kernel
conf	`snmp.conf`	Contains SNMP trap and community settings
	`Resolve.conf`	Contains the IP address of the DNS (name servers)
cfg	`System1.cfg`	Contains communication settings, device driver information and any user-entered UPS identity parameters held by the ManageUPS agent as a proxy for information not supplied by a particular UPS model.
	`Netconfig.cfg`	Contains network settings.
	`mopups.cfg`	Contains settings for network timeserver, email messaging, SNMP wellKnownAlarms, security, servers, remote server shutdown and logging.
	`Environment.cfg`	Contains the configuration settings of the environment sensor.

The "sys" type files contain agent firmware and operating system files. If you register your product on the connectivity support web site, you will be notified by email if an update for either of these files is available for download.

The "cfg" type files store the results of user-specific settings entered during the configuration steps covered in Sections II and III.

To simplify configuration of multiple adapters on your network:

After you have configured the first adapter, download the MopUPS and/or SNMP configuration file(s) and save to a directory on your workstation hard drive. The files should be named as in the table above before uploading to the adapter.

There are settings you could make global throughout your adapter population, these *global settings* sections can be saved as a special subset of the configuration file. Rename the extension of partial "`.cfg`" files to "`.merge`".

When a "`.merge`" file is uploaded to the adapter, its contents are *merged* with the existing file of the same name. When a "`.cfg`" file is uploaded, it completely replaces the existing file.

You can use TFTP or FTP to upload these configuration files to other adapters on your network.

You can use ManageUPS DCU application (Windows) to simplify file maintenance activities. (See *Quick Start Guide* for more information on DCU and file maintenance)

USING TFTP

To use the WEB interface for TFTP uploads you will need access to the TFTP server on your network. Place the files to be uploaded onto the TFTP server. Enter the address and file name (path) in the controls offered in the ManageUPS WEB interface:

TFTP Host Name:

IP address or hostname of the TFTP server containing the file to be transferred.

File Name:

The name of the file to be transferred.

Start Transfer:

Select the method of transfer to be used. This must be set prior to clicking the **Apply** button.

USING FTP

Place the file you want to upload on a workstation.

Open a command prompt and change to the directory containing the file you want to upload.

Open an FTP session by typing:

`ftp [manageupsDNSname]` or `[manageupsIPaddress]`

You will be prompted for the username and password (*Default is* `admin, admin`).

If the file to be uploaded is a type `.cfg` or type `.merge` , simply enter:

`ftp> put mopups.cfg` *or* `put mopups.merge`

If the file to be uploaded is an agent or system update, then enter the word "bin" at the FTP prompt and press **Enter**.

```
ftp> bin
```

then enter the put file command:

`ftp> put <firmware file>` or `put <munosfile>`

DOWNLOADS

The *Download*s menu offers links to configuration and log files associated with this adapter. Select a link to start the download.

Custom Links

ManageUPS allows for four types of user-definable links that let you link from one ManageUPS adapter to a variety of other resources on your network.

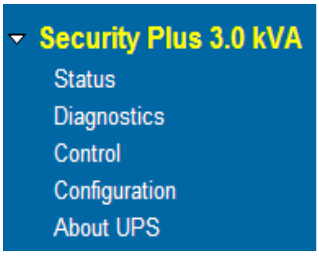
There is *help* available from the adapter web page if you need more information on custom links.

SECTION V:

DEVICE SETTINGS

OVERVIEW OF DEVICE SETTINGS

The Device menus provide a view of current status and access to dialogs for Diagnostics, Control and Configuration.



Status

Battery Status:

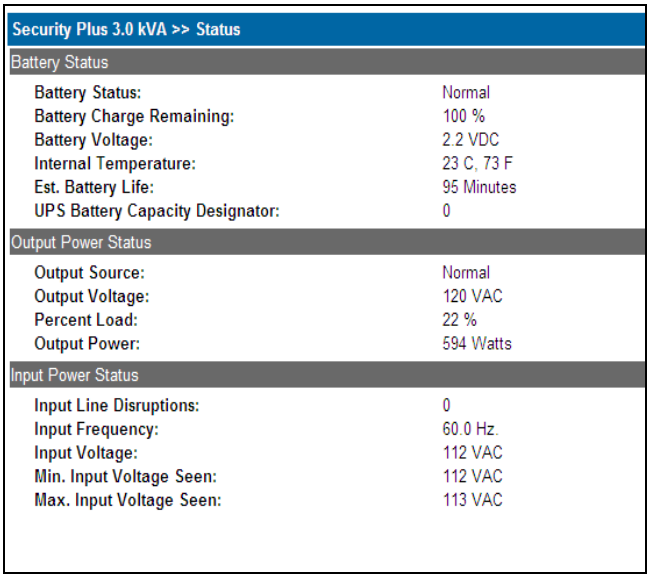
States are *Normal*, *Charging* or *Discharging*.

This value is returned as the object: `UpsBatteryStatus` in the UPS MIB - RFC1628.

Battery Charge Remaining:

Current percentage of the remaining total battery charge.

This value is returned as the object `upsBatteryChargeRemaining` in the UPS MIB - RFC1628.



Battery Voltage:

Voltage measured at the battery or charger output. This may be reported as "string" voltage or "cell" voltage depending on the UPS model. This value is returned as the `upsBatteryVoltage` object in the UPS MIB - RFC1628.

Internal Temperature:

The internal temperature reported by the UPS. This value is returned as the `upsBatteryTemperature` object in the UPS MIB - RFC1628.

Est. Battery Life:

Sometimes referred to as *Estimated Autonomy*. This is an estimate of the amount of time the UPS batteries can sustain the current load. This value is continuously recalculated based on the operating conditions of the UPS. When the UPS is on battery, this value may decrease faster than expected due to battery age and other variables that are difficult to model in the calculation algorhythm. This value is returned as the object; `upsBatteryEstimatedMinutesRemaining` in the UPS MIB - RFC1628.

Battery Capacity Designator:

Typically the number of battery packs attached to the UPS. (NOT A MIB OBJECT).

View the special help link for this parameter on the UPS Configuration page.

UPS Up Time:

The amount of time since the UPS was last started. (This value is returned as the sysUpTime object in MIB-2).

Output Voltage

The measured UPS output voltage.

Output Source:

The source of the UPS output power. Under normal conditions this will be Utility. The source may also be reported as Battery or Bypass.

Percent Load:

The percentage of the UPS capacity currently being supplied by the UPS.

Output Watts:

The measured UPS output power in Watts.

Input Line Disruptions:

The number of times the UPS has been on inverter due to input voltage being out of tolerance.

Input Frequency:

The frequency measured on the UPS AC input.

Input Voltage:

The voltage measured at UPS AC input.

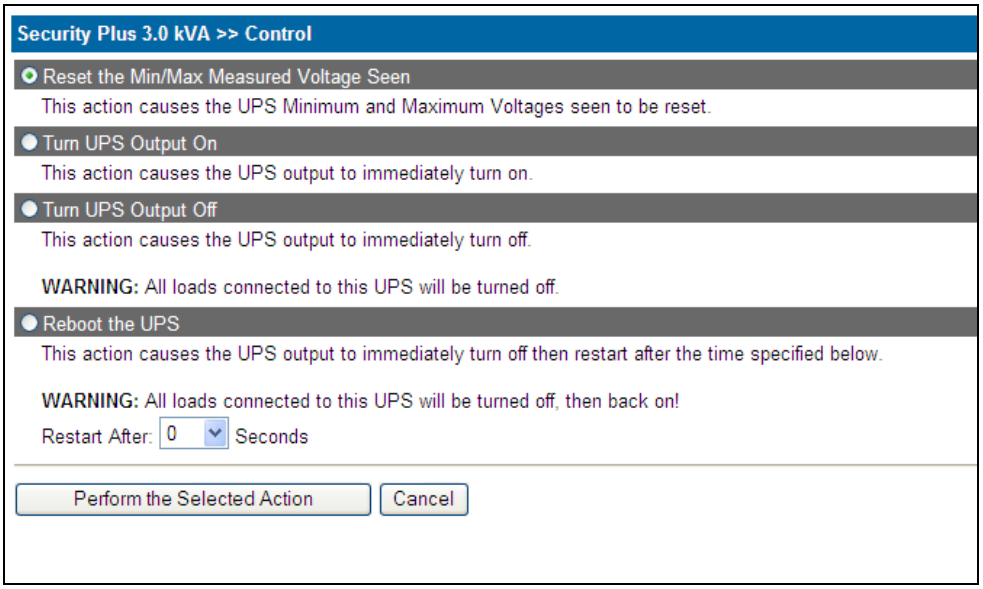
Min. Input Voltage Seen:

The lowest input voltage detected by the UPS since last reset.
(See Also *UPS Control* to reset the stored minimum input voltage to the current input voltage).

Max. Input Voltage Seen:

The highest input voltage detected by the UPS since last reset. (See Also *UPS Control* to reset the stored maximum input voltage to the current input voltage).

Diagnostics



Your UPS may not support all the test options listed above.

Your UPS may need to recharge its batteries after a battery test is complete. Your UPS may refuse to initiate a battery test if the battery is recovering from a previous test or if some other condition exists that would invalidate the results.

Select a test by choosing the corresponding radio button. To start the test, click the button: "Perform Selected Diagnostic Function".

Tests not shown in the screen picture above are described below.

Battery Impedance Test:

The Impedance test performs a qualitative analysis of the condition of the battery. This test runs at regular intervals. The impedance test returns one of three results; *Passed*, *Battery is significantly degraded*, or *The battery is defective and must be replaced as soon as possible.*

Deep Battery (Autonomy) Calibration:

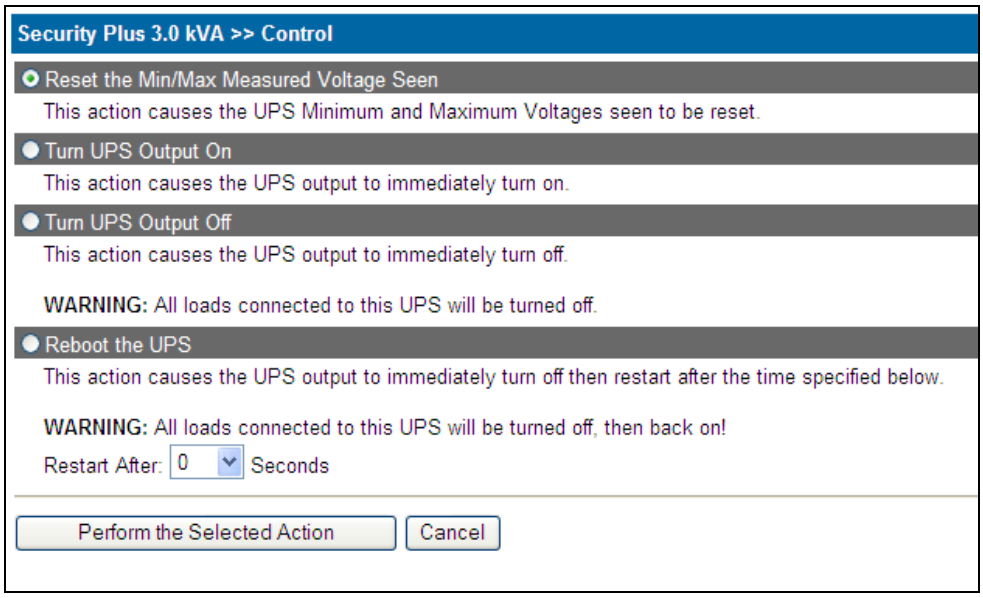
This test performs a deep battery discharge, putting the UPS on battery until a "Low Battery" condition occurs.

WARNING: This will leave the batteries in a "tired" state so they will be unable to support the load for the expected amount of time if AC input power should fail before the batteries are fully recharged!

Front Display Test:

This test is used to test the lights and display on the UPS front panel.

Control



Select one of the control actions by choosing the corresponding radio button. Click the "Perform Selected Action" button to start the action.

NOTE: Your UPS may not support all of the options listed in this help dialog.

Reset the Min/Max Measured Voltage Seen:

A record of the Minimum and Maximum input line voltages are stored in your UPS, or in the ManageUPS UPS agent

Mute the Audible Alarm:

This action mutes the audible alarm for the duration of the current event. It does not disable the alarm. If you want to silence the audible alarm for future events, navigate to the *UPS Configuration* menu. The control for the audible alarm is in the *General Settings* dialog area.

Reboot the UPS:

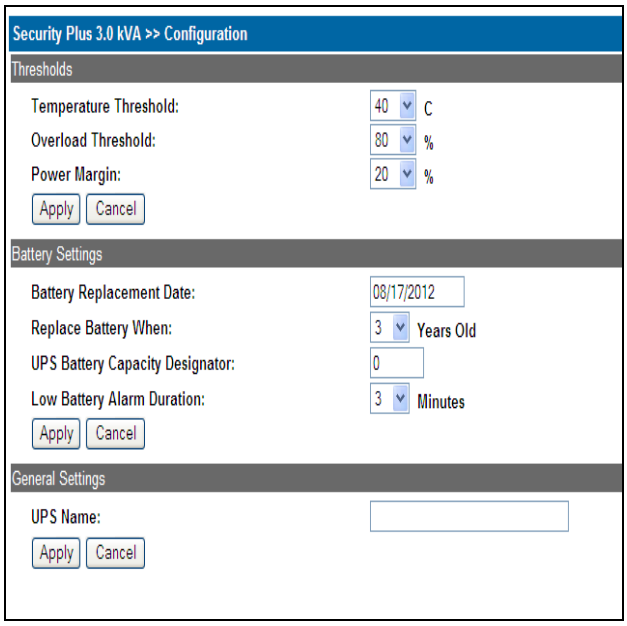
This action causes the UPS output to immediately turn off and then restart after the time specified.

WARNING: When you initiate the reboot control, **all loads connected to this UPS will lose power and will turn back on when the UPS output is re-energized.**

Make sure this is what you want to do before you initiate this control!

NOTE: This command is not active on 3-phase UPS.

Configuration



NOTE: Your UPS may not support all the configuration options listed in this document.

Temperature Threshold:

The maximum internal UPS temperature allowed before triggering a *UPS over temperature* alarm.

Overload Threshold:

The maximum percent load allowed before triggering a UPS overload alarm.

Power Margin:

The maximum percent load allowed before triggering a Power Margin Exceeded.

Low/High Transfer Point: (Stand-by & Line Interactive)

The transfer points determine the range of acceptable output voltage values. If the input line voltage drops below the lower transfer point or rises above the upper transfer point, the UPS takes corrective action either by using the booster or switching to battery power.

The proper setting of transfer points depends on the voltage tolerance of the devices connected to the UPS. Setting the transfer points closer together will cause the UPS to provide a more tightly controlled voltage, but may also cause the UPS to switch to battery power more frequently, depending on the quality of your AC line power. The factory default values are sufficient for most applications.

Battery Replacement Date:

The date on which the UPS was first commissioned or when the battery was last replaced.

This value will be set automatically the first time ManageUPS boots up and retrieves a valid date from a network time (NTP) server. The assumption is that the ManageUPS is installed at about the same time the UPS is first installed and commissioned.

It is up to the user to set this date to a more accurate commissioning date and to maintain the date when batteries are replaced in the future.

Replace Battery When:

Counts elapsed time from the value in the *Battery Replacement Date* field.

Low Battery Alarm Duration:

Triggers the UPS Low Battery alarm when estimated minutes remaining -- as computed by the UPS, or limited by the *Authorized Autonomy* setting -- reaches this value.

Authorized Autonomy:

Triggers the UPS Low Battery alarm when the estimated minutes remaining value computed by the UPS reaches this value. (see *Estimated Battery Life* on the *UPS Status* page).

This is the value a UPS administrator *authorizes* the UPS to use. Some UPS administrators set this value at 60% of specified available autonomy to reserve some charge (40%) in the batteries to be used in case a second power fail condition occurs before the batteries have been recharged after the first outage.

Learned Autonomy:

The estimated autonomy available in a fully charged battery after the deep battery calibration test has been completed (See UPS Diagnostics). *Learned Autonomy* will initialize at a value set at the UPS factory representing the specified capacity of the UPS batteries when new.

Available Autonomy:

The lesser value of *Authorized* or *Learned*.

Shutdown Type:

This setting controls the behavior of the UPS when a shutdown command is received from monitoring software.

If *"Whole UPS"* is selected, the UPS output and internal electronics are turned off. In this state, the UPS will not be able to communicate with monitoring software until the UPS is restarted.

If "*Output Only*" is selected, the UPS output is turned off but the UPS internal electronics remain

Auto Restart:

This setting controls the conditions under which UPS output is restarted after the UPS has been shut down.

If "*AC Return*" is selected, UPS output is automatically restarted when AC line power is restored.

If "*Manual Return*" is selected, UPS output must be restarted manually, either by turning the UPS power switch off, and then on, or by issuing a command on the serial port of the UPS.

UPS Name:

The name of this UPS. (This value will be returned as `upsIdentName` object in the SNMP UPS MIB - RFC1628).

Audible Alarm:

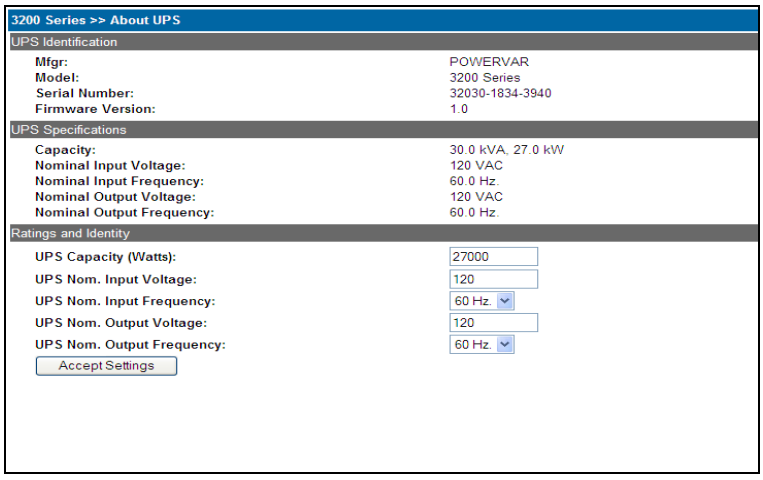
Controls audible alarms that the UPS may initiate during tests or alarm conditions. You can use this control to silence audible alarms that might sound when a UPS test is initiated. (The control is the `upsConfigAudibleStatus` object in SNMP UPS MIB - RFC1628).

Auto Stop:

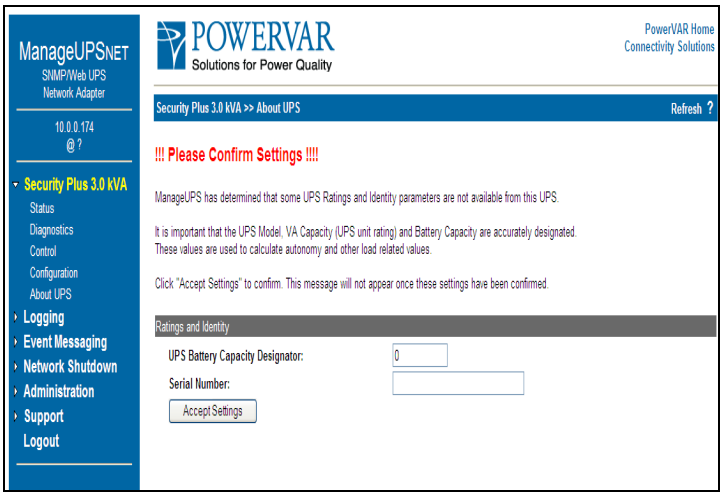
Sets the AutoStop control in some UPS' that cause the UPS to turn off after some time with no measurable load present.

About UPS

This dialog area displays identity and nominal ratings of the UPS.



For UPS' that do not communicate identity and nominal ratings information, the form controls in the *Ratings and Identity* area allow the user to set this information in the ManageUPS adapter manually.



The first time the web interface is accessed, ManageUPS may prompt you to confirm the UPS' identity and ratings information that the UPS does not communicate to ManageUPS.

.

Model:

The model number of the UPS unit.

Serial Number:

The serial number of the UPS unit.

Firmware Version:

The version number of the firmware in the UPS.

Capacity:

The maximum power output of the UPS. Capacity is measured in VA and Watts. The VA measurement is the maximum power available to drive devices with switched-mode power supplies such as computers. The Watts measurement is the maximum power available to drive resistive loads such as lighting or devices with motors.

Nominal Input Voltage:

The line voltage that the UPS is designed to operate with.

Nominal Input Frequency:

The line frequency that the UPS is designed to operate with.

Nominal Output Voltage:

The nominal output voltage supplied by the UPS.

Nominal Output Frequency:

The nominal frequency that supplied by the UPS.

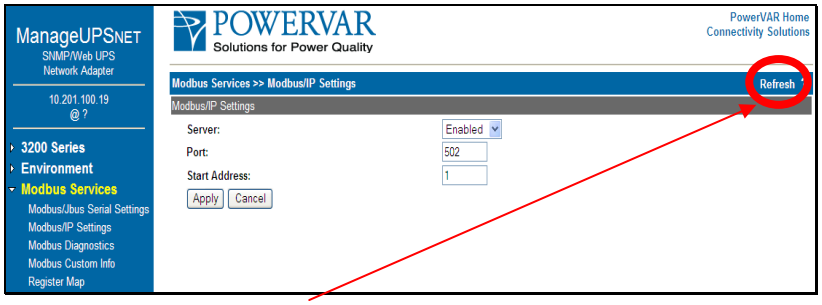
SECTION VI:

CONFIGURING MODBUS SERVICES P-SERIES ONLY

Modbus TCPIP Communications

ManageUPS Net Adapter P-Series supports both IP and Serial type Modbus communications.

The default Modbus IP settings are shown in the WEB form below.

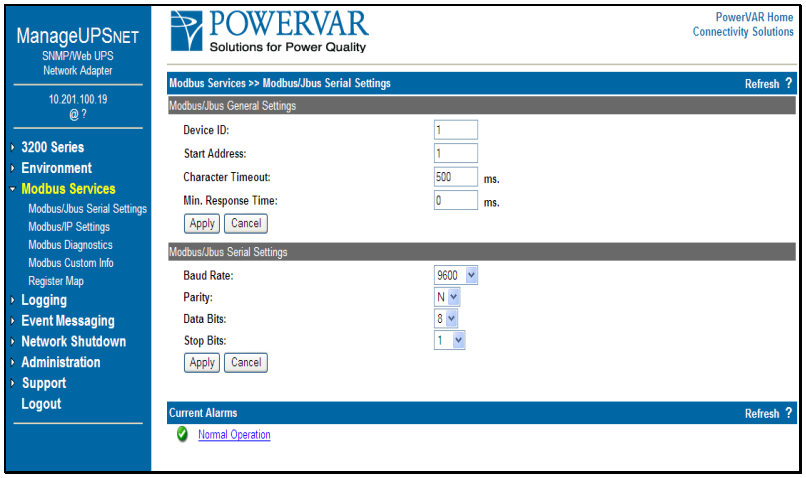


Refer to the on-screen "help" **"?"** files available from the WEB interface in the *Administration, Network Settings* portion of the WEB menu.

The Modbus Register map text file can be downloaded from the adapter. A "print" formatted register map document is included in this document as Appendix E.

Modbus (Jbus) Serial Communications RS485 2-wire (Half Duplex)

The default physical serial communication mode for ManageUPS Net Adapter P-Series is RS485, 2-wire (half duplex) configuration (settings shown below)

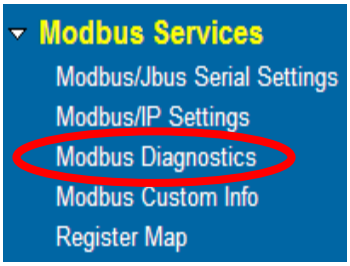


Use the WEB interface (above) to change address and device ID setting to meet your requirements. Modbus Diagnostics opens a page to assist in diagnosing packets to and from the adapter on serial networks.

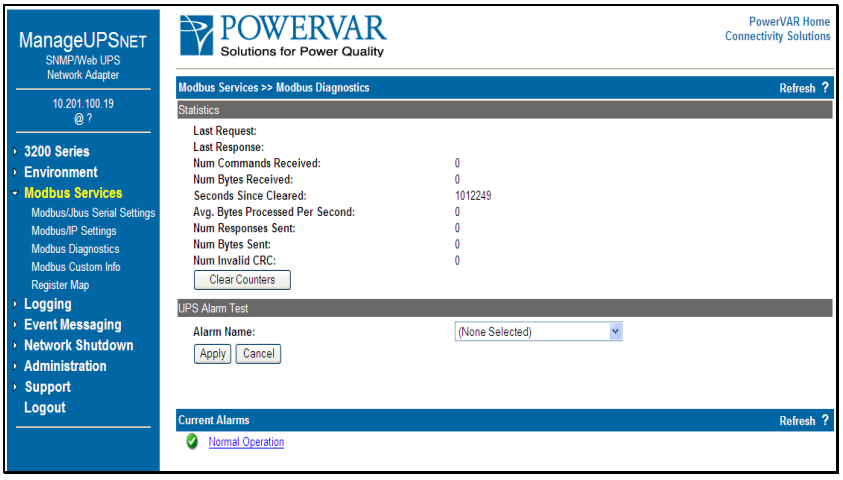
NOTE: To configure the adapter to use one of the other serial communications modes, you will need to change the jumper settings on the adapter hardware. (See Section VI, Page 4)

Troubleshooting Communications on Serial Networks

The link on the Serial Settings dialog (previous page) will open a diagnostics dialog in the WEB interface to help troubleshoot or verify serial communications with the building monitoring system.

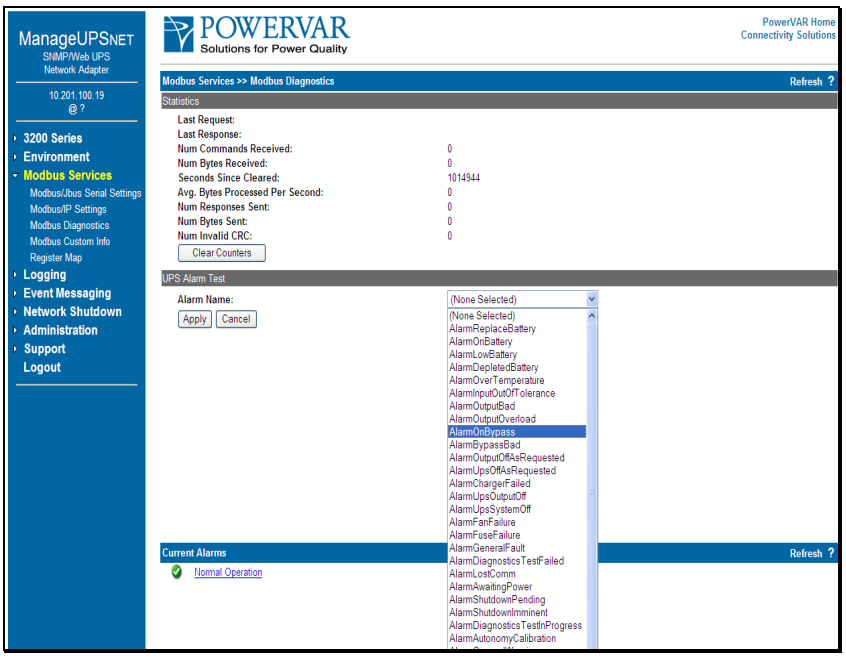


The screen below will report the activity seen by the adapter on the serial network.



The UPS Alarm Test will cause the MODBUS RTU server to simulate alarm conditions. Select the condition of interest and press "**Apply**" to activate the simulated alarm. Verify that the alarm is interpreted correctly at the BMS.

Make sure to select *"None Selected"* and press **Apply** to clear the alarm when finished with installation testing.



Physical RS485 Network Connection

Use the RJ11 to Screw Terminal adapter cable provided.

Connect 16AWG (or smaller) conductors from your RS485 network cable as shown below:

Ground is Pin 1

D+ is connected to Pin 2 and Pin 4

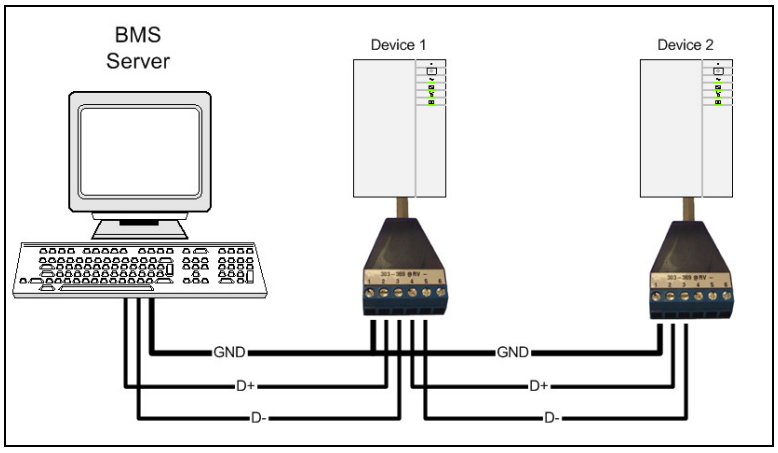
D- is connected to Pin 3 and Pin 5

Pins 4 and 5 are also used in full duplex mode.

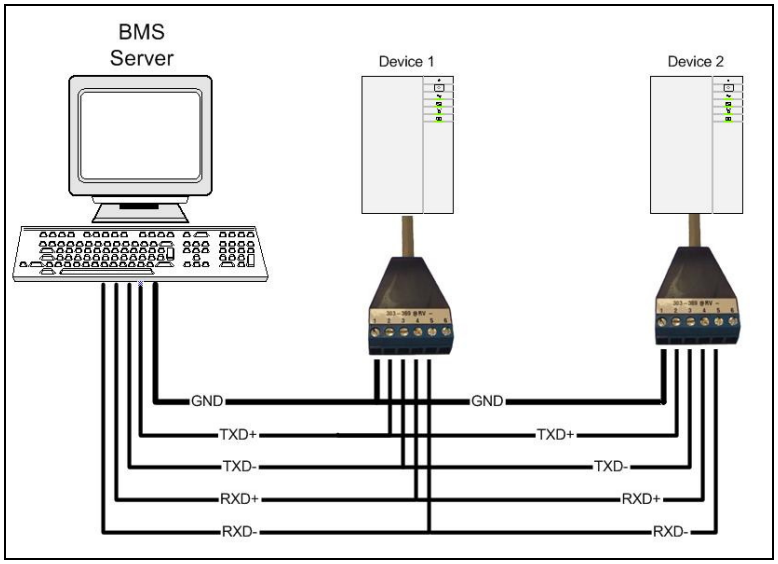
Pin 6 is not used

In half Duplex mode Pin(s) 2 & 4 and Pin(s) 3 & 5 are electrically connected to aid in the wiring of multiple devices on the Modbus network. When the ManageUPS Net Adapter P-Series is configured for full Duplex Pin(s) 4 & 5 are reassigned to RXD+ & RXD- respectively.

Wiring Diagrams



Half Duplex Wiring Diagram

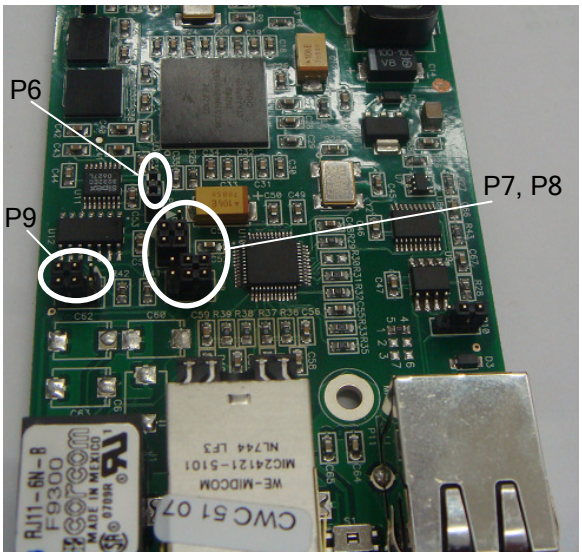


Full Duplex Wiring Diagram

Configuration for other Serial Communications network

To configure the adapter to use one of the other serial communications modes change the jumper settings on the adapter hardware.

Physical **jumper** locations are shown in the photo below.



Set **jumper** positions according to the table below:

Configuration	P6	P7	P8	P9	
	RS232 or RS422/485	RS232 or RS422/485	Full or Half Duplex	Termination In or Out	
RS-232	RS-232	RS-232	N/A	N/A	
RS422	RS422/485	RS422/485	Full	In	
RS485 Half Duplex	RS422/485	RS422/485	Half	In	Out
RS485 Full Duplex	RS422/485	RS422/485	Full	In	Out

PIN Definitions for Other Communication Mode

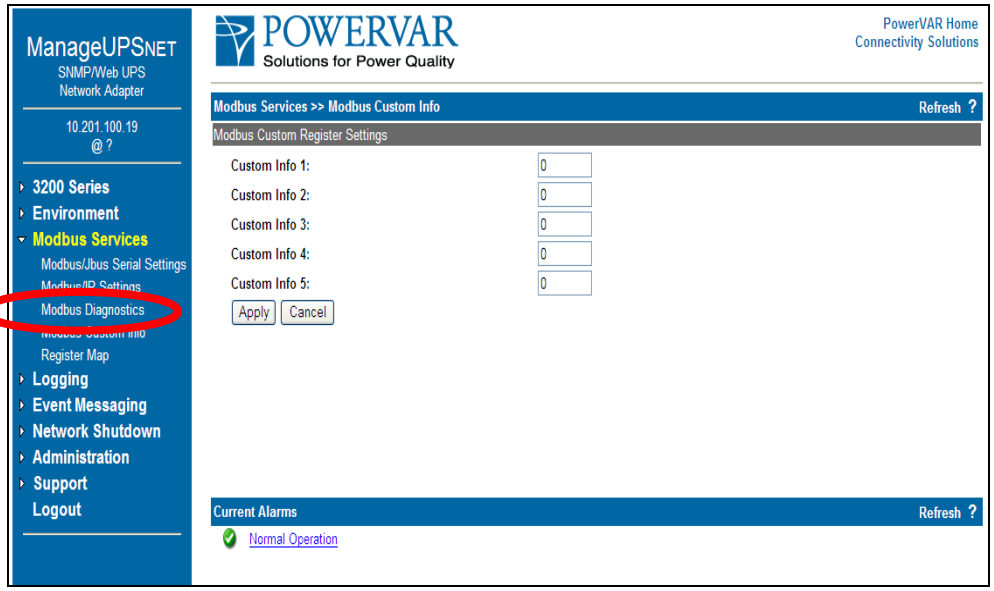
RJ 11		RS485 Half Duplex	RS485/422 Full Duplex	RS232
Pin	Color	Signal	Signal	Signal
1	Blue	GND	GND	GND
2	Yellow	D+	TXD+	TXD
3	Green	D-	TXD-	RXD
4	Red	D+	RXD+	
5	Black	D-	RXD-	
6	White			

MODBUS Register Map

The MODBUS Register MAP includes identity, measures, and status information obtained from the UPS by the ManageUPS adapter.

Some addresses are reserved as space for entering custom identification objects. This information will be retained in the adapter flash memory system, and presented in specific register addresses.

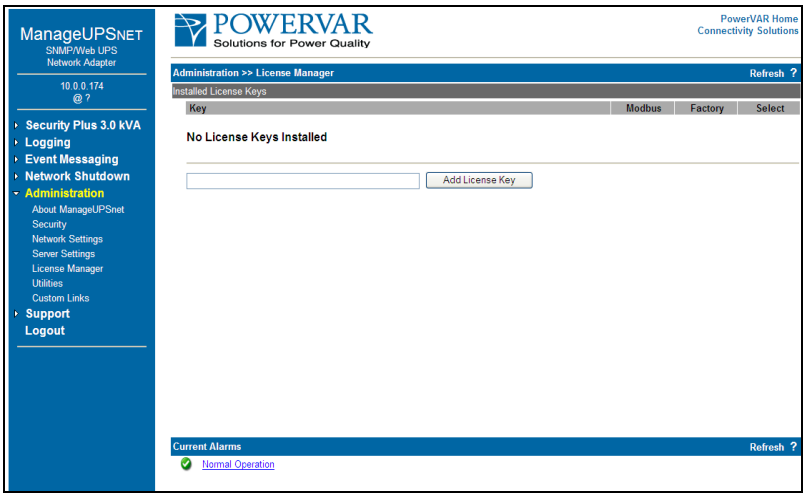
Set this custom information using the WEB interface shown below.



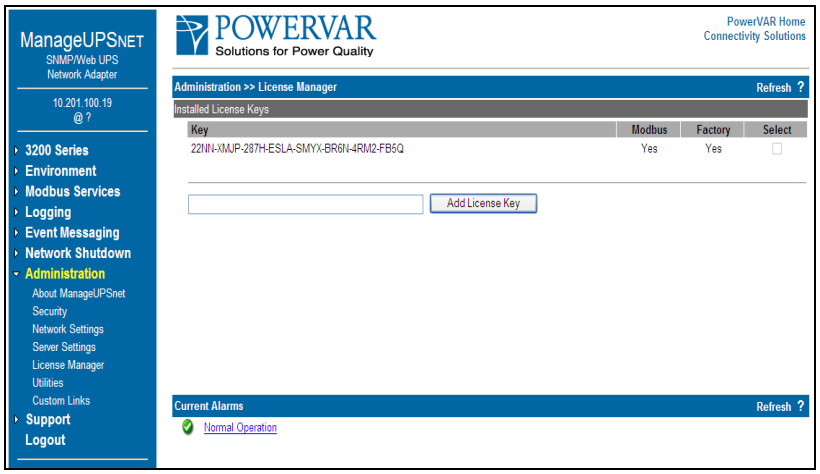
The complete MODBUS register map is listed in Appendix E.

License Manager

A License is needed to activate the Modbus feature on the ManageUPS Net Adapter P-Series. The license can be submitted in two ways. The first is in the factory where it is programmed prior to shipping. The second, by the customer through the HTML interface. It can be found in Administration >> License Manager.



Insert the provided license key and press the **Add License Key** button. Notice the Modbus Services feature in not available in the screen above.



The Modbus Services link will become available after the license key is accepted. Referring to the image above; the Modbus column indicates if the license key is supporting Modbus. The Factory column indicates if the license was submitted in the factory. To remove the license check the **Select** button and press the **Remove Selected Keys** button.

Refer to the on-screen "help" **"?"** files available from the WEB interface in the *Administration, License Manager* portion of the WEB menu.

Troubleshooting

There is a troubleshooting utility on the adapter that is accessible from the WEB interface. Use this utility to view what the adapter is receiving and sending on the RS485 network connection. (See page 2 of Section VI).

SECTION VII:

Configuring the ENVIRONMENT SENSOR P-Series Only

ManageUPS Net Adapter P-Series Environment Sensor

Kit Components

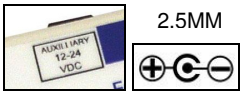
Environment Sensor

Adhesive Backed Velcro Strip

Blue Bus Cable 3m (15')

ManageUPS with Blue Bus port

Hardware Specifications

Environment Sensor	**Input power**	Single sensor powered from Blue Bus @ 7-24Vdc, < 0.36 watts Multiple sensors may require an auxiliary power supply. (Refer to Appendix *C: Compatibility Table for ManageUPS Blue Bus Accessories*) Auxiliary power input accepts 12-24Vdc unregulated. Connector is 2.5mm center pin. Outer barrel is positive, inner post is negative. 
	Temperature	Measurement range 0 – 75 degC Accuracy +/- 1 degC between 10 and 50 degC
	Relative Humidity	Measurement range 1-99% RH Accuracy +/- 2% between 10 and 90 %RH
	Input Contacts	Accepts input from up to three (3) Form C dry contacts
	Output Relay	1 relay contact, rated 1A @ 30V (normally open or normally closed)
	Conformance	Emissions: EMC Directive 89/336/EEC as amended by 92/31/EEC and 93/68/EEC EN 55022: 19948+ A1:2000 + A2:2003 EN 50091-2: 1995 EN 61000-3-2:2000 EN 61000-3-3:1995 +A1:2001 Immunity: EMC Directive 89/336/EEC as amended by 92/31/EEC and 93/68/EEC EN 55022: 19948+ A1:2000 + A2:2003 EN 50091-2: 1995 EN 61000-4-2:1995 +A1:1998 + A2:2002 (IEC 1000-4-2) EN 61000-4-3:2002 (IEC 10000-4-3) EN 61000-4-4:1995 +A1:2001 + A2:2001 (IEC 1000-4-4) EN 61000-4-5:1995 +A1:2001 (IEC 1000-4-5) EN 61000-4-6:1996 +A1:2001 (IEC 1000-4-6) EN 61000-4-8:1993 +A1:2001 (IEC 1000-4-8) EN 61000-4-11:1994 +A1:2001 (IEC 1000-4-11)
Blue Bus	**Cable**	CAT5 STP with RF filter at ManageUPS connection point. (filtered cable not required for connections between sensors).

Configuring the Environment Sensor

Hardware Installation

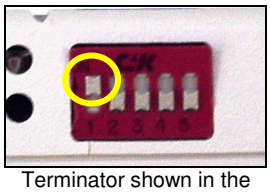
Single Sensor

1. Install the ManageUPS Net Adapter P-Series in your UPS.
2. Choose a location to mount the environment sensor within 3m (15') of your UPS.
3. Use the adhesive-backed *Velcro Strip* to attach the Sensor to the mounting location.
4. Connect the Blue Bus cable between the Blue Bus port in the ManageUPS Net Adapter P-Series and a Blue Bus port on the sensor. (Connect the filtered end of the cable to the ManageUPS Net Adapter P-Series.)

Multiple Sensors

1. Install the first sensor as described above – making sure to connect the Blue Bus cable from the ManageUPS Net Adapter P-Series to the IN port on the first sensor.

2. Connect a Cat5 STP cable between the Blue Bus OUT port on the first sensor and IN port on the second sensor.
3. Set the Terminator (switch #1) on the first sensor in the DOWN position. Set the terminator in the last sensor in the UP position

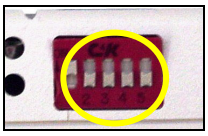


Terminator shown in the UP position.

4. Set the address (switches #2 - #5) of the each additional sensor to be unique – different from the 1st sensor and different from any other sensor on the bus.

Address Switch Translation Table	
32 = 0000	40 = 1000
33 = 0001	41 = 1001
34 = 0010	42 = 1010
35 = 0011	43 = 1011
36 = 0100	44 = 1100
37 = 0101	45 = 1101
38 = 0110	46 = 1110
39 = 0111	47 = 1111

Address combination (switches #2-5) in the "all down" position is 0000.



This combination will set the value "32" as the "address" in the ENVIRONMENT SENSOR.MIB

On the Environment Status web page:

NOTE for Multiple Sensors:
There is a logical limit of 16 addresses available on the BLUE BUS.

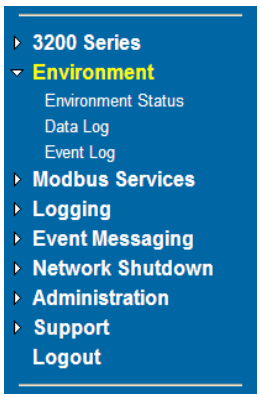
However, the number of sensors that can be added to the bus without adding supplemental power is limited by the power available in the UPS communications accessory slot.

If you need more sensors than your UPS can power, add supplemental power to any sensor on the bus. Supplemental power will drive that sensor and any sensors down stream from the sensor connected to auxiliary power.

Refer to *Appendix C: Compatibility Table for ManageUPS Blue Bus Accessories* to verify the limits for your UPS.

Configuring the Environment Sensor

BROWSER INTERFACE:



The "Environment" menu provides a view of current status and quick links to Environment Logs.

Environment Logs can also be reached from the dropdown list on "Logging" menu.

OVERVIEW OF DEVICE SETTINGS

Configuration menus are accessed from the link on the *Environment Status* page.

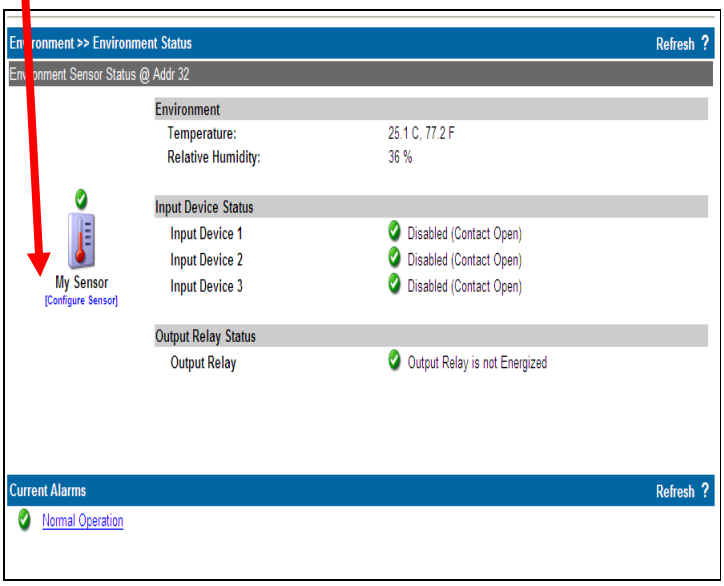
Status View Environment:

Measures of *Temperature* and *Relative Humidity* are displayed.

These values are returned as MIB objects in the *Environment Sensor MIB.*

Input / Output Device Status

The current state and defined alarm condition are displayed for each input and output relay contact.

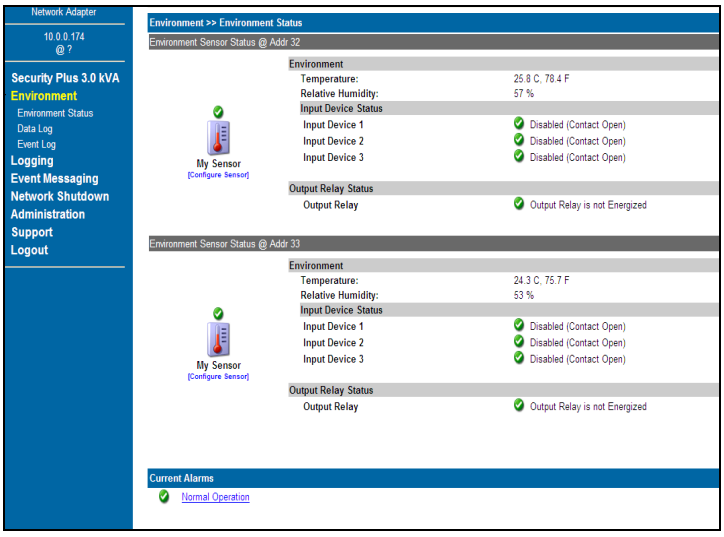


The states of these switches are also returned as MIB objects in the *Environment Sensor MIB.*

Status View Multiple Sensors

If multiple sensors are connected to the bus each sensor will have its own section in the status page.

Press the *Configure Sensor* link to open a page that will allow you to tailor the name of the sensor, thresholds for alarms and names and alarm state to associate with the various input devices.



Configuring the Environment Sensor

Configure Sensor Settings

The *configure sensors* page displays the current status at the top page and provides three sections for configuring:

- Environment Sensor Settings
- Input Device Settings
- Output Device Settings

Use the scroll bar at right to reveal the sections at the lower part of the page.

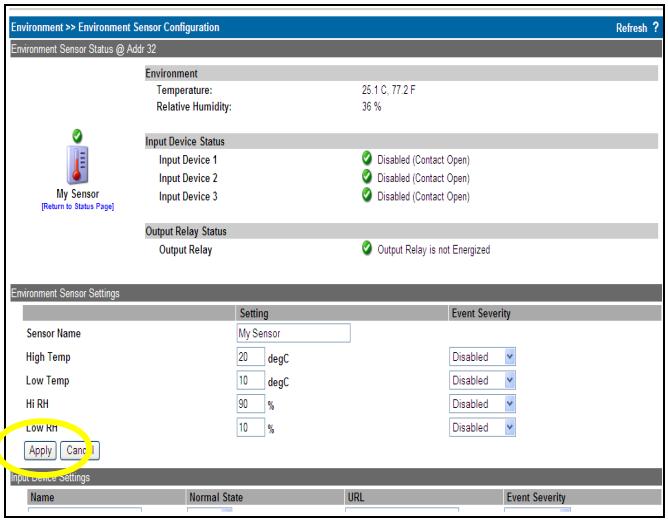
The APPLY button in each section enters the settings for that section.

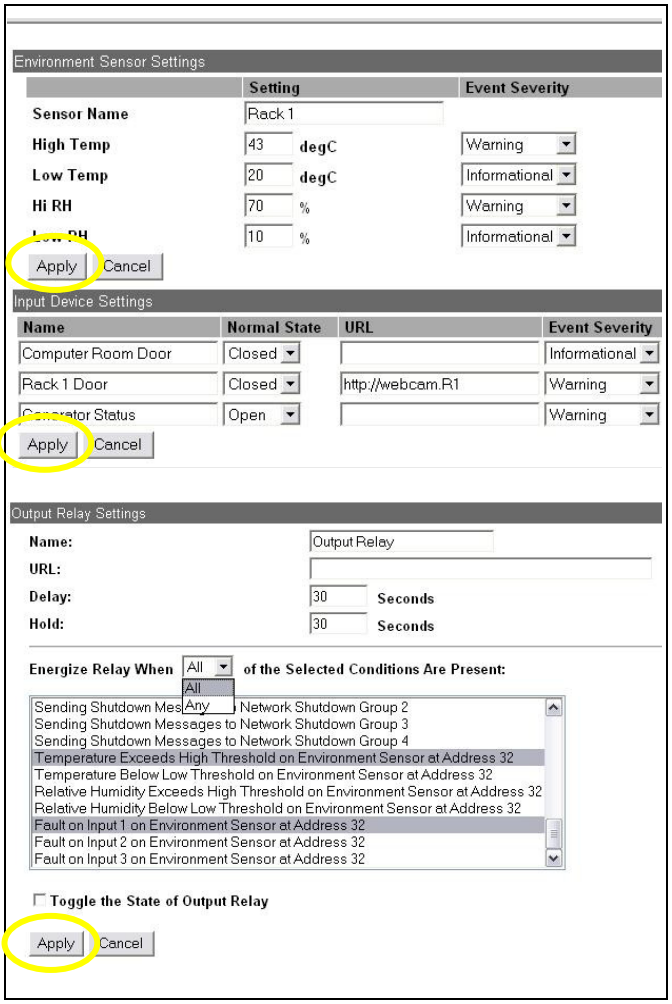
You should configure one section at a time pressing the APPLY button before configuring the next section.

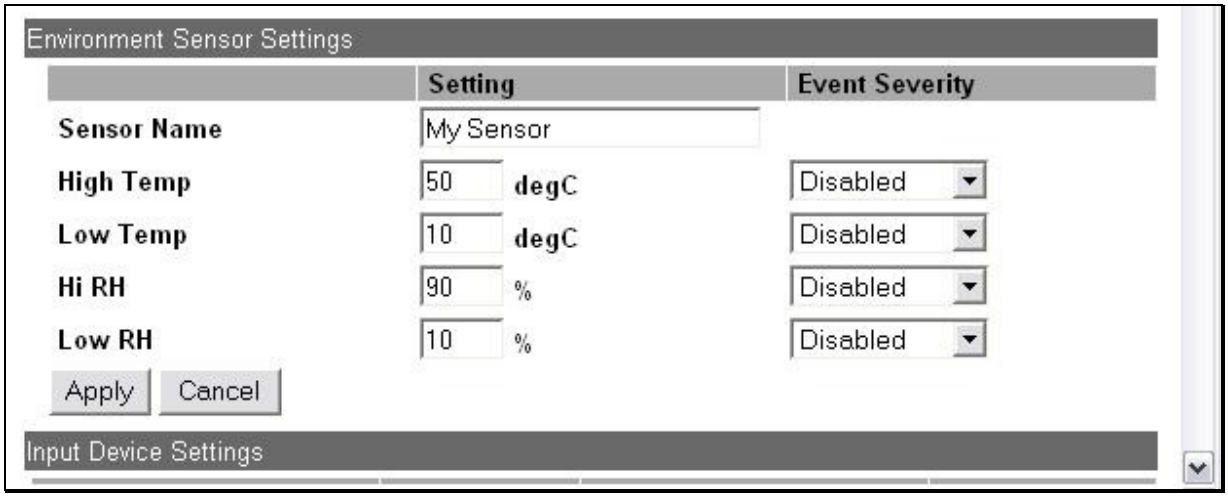
Configuration options are explained in the on screen ?HELP utility.

A copy of the online help entries are included on the following pages.

NOTE: The control for *Toggle the State of the Output* relay does not permanently override an event that drives the relay. If the relay is energized by an event, and you toggle the relay off using the *Toggle* control, the output relay will re-energize within 10 seconds if the event remains active.







Environment Sensor Settings – Help Detail Entries

Event Severity

The severity level of each of the conditions described above is determined using the ***Event Severity*** setting. If this setting is ***Disabled*** then no condition will be generated and the status will always be ***Normal***.

Sensor Name:

A user configurable name given to the sensor. (This value is the `name` object in the Environment Sensor MIB)

High Temp:

The temperature at which the high temperature condition is generated for this sensor. (This value is the `tempHiThreshold` object in the Environment Sensor MIB)

Low Temp:

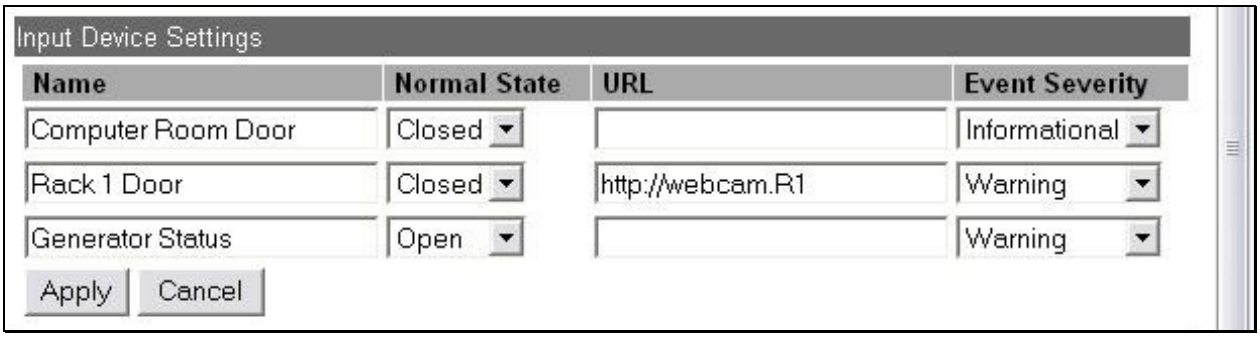
The temperature at which the low temperature condition is generated for this sensor. (This value is the `tempLoThreshold` object in the Environment Sensor MIB)

High RH:

The relative humidity at which the high relative humidity condition is generated for this sensor. (This value is the `humidityHiThreshold` object in the Environment Sensor MIB)

Low RH:

The relative humidity at which the low relative humidity condition is generated for this sensor. (This value is the `humidityLoThreshold` object in the Environment Sensor MIB)



Input Device Settings – Help Detail Entries

Name (1-3):

A user configurable name given to the input device. (These values are the `inputName1, inputName2, inputName3` objects in the Environment Sensor MIB)

Normal State (1-3)

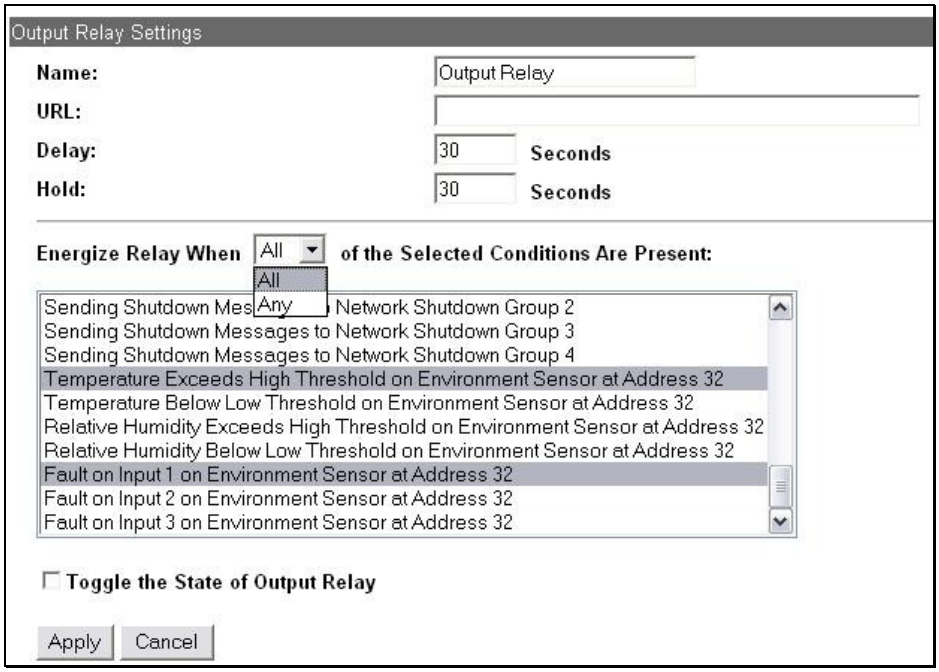
The normal state of the input contact. When the input contact is not in this state the input fault condition is generated. (These values are the `inputNormalState1, inputNormalState2, inputNormalState3` objects in the Environment Sensor MIB)

URL (1-3)

A URL associated with this device. Must be in the format `'http://hostname'`. When this value is set the input name becomes a link on the environment status page. (These values are the `inputUrl1, inputUrl2,` inputUrl3 objects in the Environment Sensor MIB)

Event Severity (1-3)

This setting determines the severity level of a fault condition on the input. If this setting is ***Disabled*** then no condition will be generated and the status will always be ***Normal***. (These values are the `inputFaultSeverity1, inputFaultSeverity2, inputFaultSeverity3` objects in the Environment Sensor MIB)



Output Relay Settings – Help Detail Entries

Name:

A user configurable name given to the output relay. (These values are the `ouputName` objects in the Environment Sensor MIB)

URL:

A URL associated with this device. Must be in the format `'http://hostname'`. When this value is set the output name becomes a link on the environment status page. (These values are the `outputUrl` objects in the Environment Sensor MIB)

Delay:

This setting determines the number of seconds the ***Energize Relay When*** conditions must be present before the relay is energized.

Hold:

The number of seconds the relay will be held in the energized state after the ***Delay*** time has expired. If the ***Energize Relay When*** conditions are corrected before this time is up the relay will de-energize.

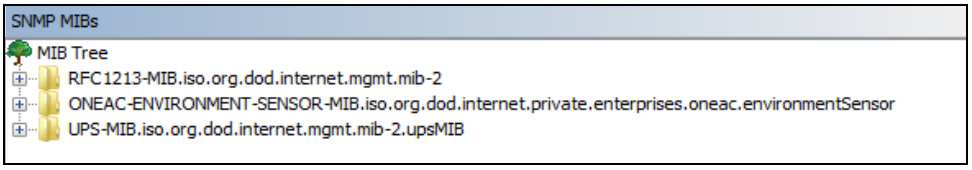
An entry of '0' in this field will cause the relay to remain energized for as long as the event condition(s) that trigger the relay remain active.

Energize Relay When:

Configure the relay to energize when any or all of the selected conditions are present. Multiple conditions can be selected using the `Ctrl` key and clicking on entries in the list box. If no conditions are selected the output relay is disabled.

ENVIRONMENT SENSOR MIB

ManageUPS Net Adapter P-Series with Environment Sensor option supports three SNMP MIBs:



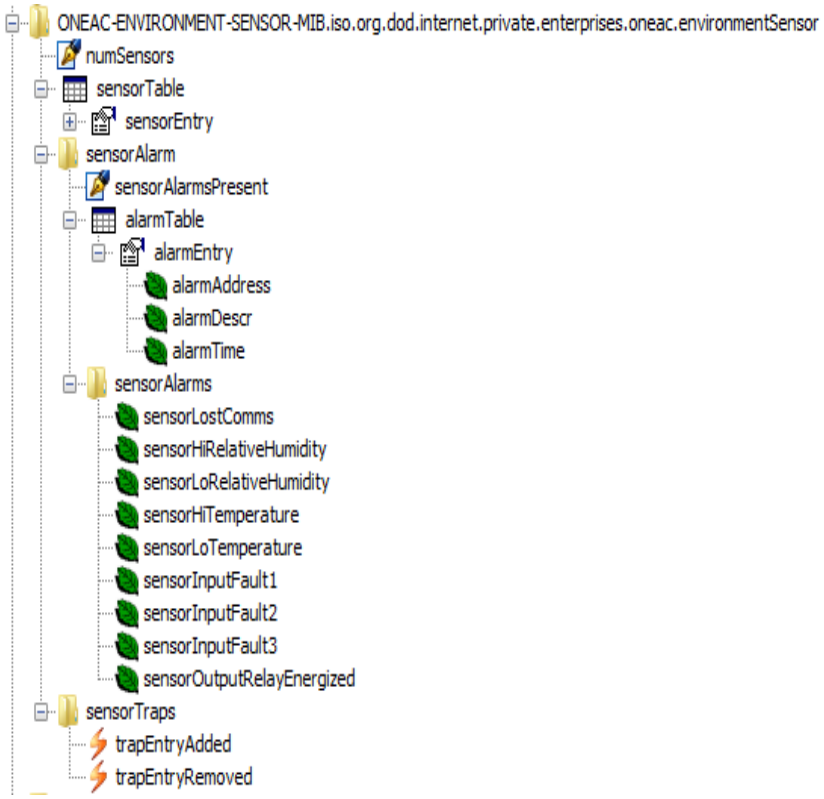
The UPS MIB is an SNMPv1 translation of RFC1628 (1.3.6.1.2.1.33)

The environment sensor MIB is a private enterprise MIB.

(1.3.6.1.4.1.574.10)

The sensor MIB is organized in tables of object values, alarms and traps.

Each entry shown on the WEB interface is represented as an object in the sensorTable sensorEntries.



The table on the next page illustrates how the MIB handles entries for *single sensor* and *multiple sensor* configurations.

NOTE: Screen shots were prepared with iReasoning, Inc.'s MIB Browser v2.5.1

Example of environment Sensor MIB sensorTable sensorEntries

Single Sensor		Two Sensors	
Object Name	Object Value	Object Name	Object Value
numSensors.0	1	numSensors.0	2
name.1	Rack 1	name.1	Rack 1
		name.2	My Sensor
status.1	Warning	status.1	warning
		status.2	Normal
address.1	32	Address.1	32
		Address.2	40
temperature.1	21	temperature.1	22
		temperature.2	21
tempStatus.1	Normal	tempStatus.1	Normal
		tempStatus.2	Normal
tempHiSeverity.1	Warning	tempHiSeverity.1	warning
		tempHiSeverity.2	disabled
tempLoSeverity.1	informational	tempLoSeverity.1	informational
		tempLoSeverity.2	disabled
tempHiThreshold.1	43	tempHiThreshold.1	43
		tempHiThreshold.2	50
tempLoThreshold.1	20	tempLoThreshold.1	20
		tempLoThreshold.2	10
humidity.1	32	humidity.1	32
		humidity.2	32

Listing above is a partial listing to illustrate the construction of the MIB.

View the full list of MIB objects with your MIB browser utility.

ASCII Terminal

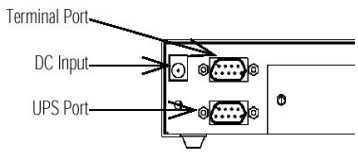
You will need an ASCII terminal or terminal emulation program on your PC workstation.

HyperTerminal is a standard terminal emulation program offered with Windows. See *Terminal Settings* on the following page for instructions on how to set up Hyper Terminal to work with ManageUPS.

Serial Connection

Connect a serial port on your PC to the ManageUPS serial configuration port as described in the *Supplemental Installation Note* appropriate for your UPS.

The ManageUPS serial configuration port will be either the UPS communications port on *internal* adapters or the DB9 port marked TERM on *external* adapters.



Location of serial ports on external adapter.

Open a Terminal Session

If your terminal settings are correct, you should see the following dialog in your terminal window after you power up ManageUPS (Entries are case sensitive)

Type: `CONSOLE` and press `[ENTER]`

Type: `admin` for both username and password

```
ManageUPSnet III - SNMP/Web UPS Network Adapter
Copyright (C) POWERVAR Inc. 2012


User Name :
```

```
User Name :  admin
Password  :  ******
ManageUPSnet III - SNMP/Web UPS Network Adapter
Copyright (C) POWERVAR Inc. 2012
```

```
ManageUPSnet III Console                Firmware Version: 3.15.9774
-------------------------------------------------------------------------------
   Battery status: Normal                Battery Charge: 100 %
   Output source:  Normal                UPS Load:       19 %
   Cur Alarms: Normal Operation
-------------------------------------------------------------------------------
   UPS Name:    Security Plus            IP Address:   10.0.0.174
   UPS Model:   Security Plus  3.0 kVA   MAC Address:  00:20:82:01:D7:45
   UPS S/N:     1234567890               UPS Firmware:

   Location:         ?
   Contact:          ?
   Attached Devices: ?


-------------------------------------------------------------------------------

   U - UPS configuration/control           E - Email configuration
   N - Network configuration               A - Administration
   S - SNMP configuration                  L - Logout/Reboot

Select one of the above options

>
```

General Terminal Settings

BPS = 1200, 2400 or 9600
(Depends on UPS model family.)

Other settings are standard for all:
Data Bits = 8
Parity = None
Stop Bits = 1

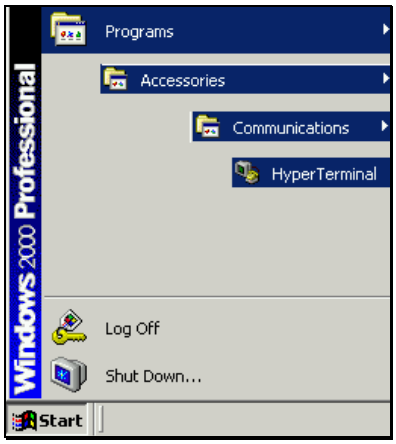
Flow Control = None

ASCII Setup:
Send line ends with line feeds

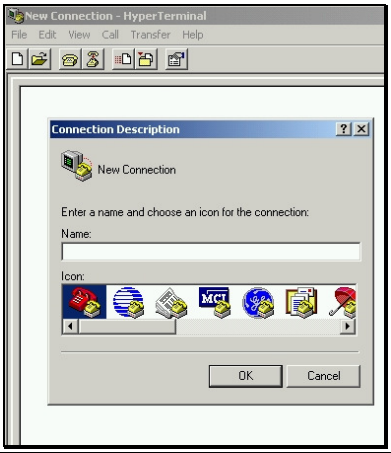
Echo = Off

Configuring Hyper Terminal

1

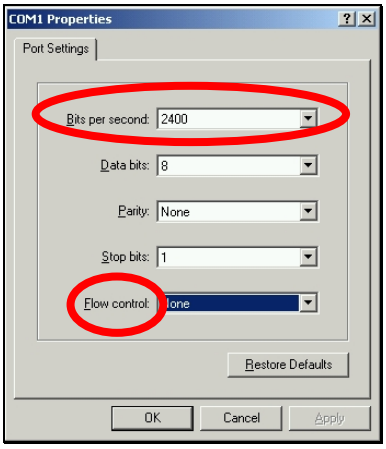


2

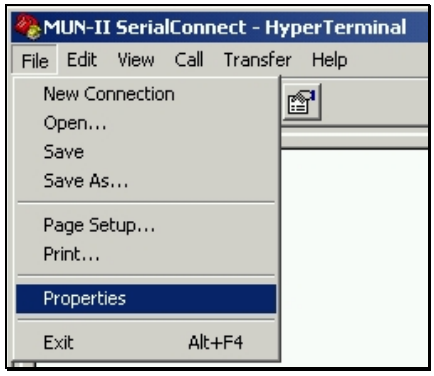


3

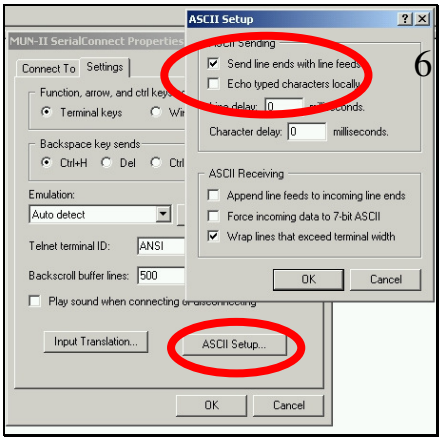
4



5



6



SNMP Alarm ID	SNMP MIB OID Ref:	Log Entry & Condition Email Subject	Probable Cause
6	UpsAlarmInputBad	SNMP Trap only	Input power is out of limits or not present.
7	UpsAlarmOutputBad		An output condition is out of tolerance.

SEVERE! Condition Codes

1	UpsAlarmBatteryBad	Module Battery Needs Replacing	UPS Battery needs replacing.
4	UpsAlarmDepletedBattery	Module Depleted Battery	Run time is just about zero.
5	UpsAlarmTempBad	Module Temperature Limit was Exceeded	Temperature near the battery is too hot.
8	UpsAlarmOutputOverload	Module Output Overload	Output load power is > 100% of rated capacity.
10	UpsAlarmBypassBad	Module Bypass Bad	The bypass is out of tolerance.
13	UpsAlarmChargerFailed	Module Charger Failed	Battery charger has failed or its fuse has blown.
16	UpsAlarmFanFailure	Module Fan Failure	Fan failure detected.
17	UpsAlarmFuseFailure	Module Fuse Failure	Input circuit breaker is open or charger fuse has blown.
18	UpsAlarmGeneralFault	Module Requires Servicing	A UPS fault was detected that is not specifically identified in the UPS protocol or defined in the standard MIB.
19	UpsAlarmDiagnosticTestFailed	Module Diagnostics Failed	A user initiated test has failed.
20	UpsAlarmCommunicationsLost	Module Lost Communications	Adapter has Lost Serial Communications with the UPS.
26*	UpsAlarmBackfeedRelayFailure	Module Backfeed Relay Failure	Backfeed Relay Failure Detected.
27*	UpsAlarmBatteryFuseBlown	Module Battery Fuse Blown	Battery Fuse failure detected.
29*	UpsAlarmBatteryDegraded	Module Battery Degraded	The UPS detects that the Battery may need to be replaced soon.
no trap		Module Lost Communications While On Battery	Adapter has Lost Serial Communications with the UPS after the UPS reported an On Battery condition.
		System Load Exceeds Power Margin	The load reported by the UPS exceeds the user specified power margin.

SNMP Alarm ID	SNMP MIB OID Ref:	Log Entry & Condition Email Subject	Probable Cause
Warning! Condition Codes			
2	UpsAlarmOnBattery	Module On Battery	UPS is running on battery power.
3	UpsAlarmLowBattery	Module Low Battery Condition	Run time left is less than configured low battery alarm value.
9	UpsAlarmOnBypass	Module On Bypass	The bypass is engaged by the UPS.
31	UpsAlarmGeneral Warning	Module General Warning	The UPS is indicating an unspecified fault condition.
no trap		Module Running On Booster	The UPS is correcting a low input line condition without using battery reserves.
Informational Condition Codes			
11	UpsAlarmOutputOff AsRequested	Output Off As Requested	Ups Output Has been Turned off via UPS Com port command.
12	UpsAlarmUpsOff AsRequested	Module Off As Requested	Ups Has been Turned off via UPS Com port command.
14	UpsAlarmUpsOutputOff	Module Output Is Off	Confirmation that the UPS output is off, but the UPS control logic is still operating. This trap can only be sent if the adapter is powered from a source other than UPS output.
15	UpsAlarmUpsSystemOff	Module System Is Off	UPS output and control logic is off. Will likely never be seen.
21	UpsAlarmAwaitingPower	Module Awaiting Power	UPS output is off and the UPS is waiting for input power to be restored.
22	UpsAlarmShutdown Pending	Shutdown Pending On Module	A UPS shutdown timer has begun counting -- typically means UPS monitoring software has requested UPS output to be turned off after a delay period.
23	UpsAlarmShutdown Imminent	Shutdown Imminent On Module	Output shutdown will occur in approximately 5 seconds.
24	UpsAlarmTestIn Progress	Module Diagnostics Test in Progress	A user requested UPS test has begun.
25	UpsAlarmBattery Charging	Module Battery Charging	The UPS Battery is recovering from a recent discharge.
28	UpsAlarmSystemRestart Pending	System Restart Pending	The UPS is counting a user specified restart delay after AC input returns.
30	UpsAlarmAutonomy Calibration	Module Autonomy Calibration	The UPS is discharging the battery and calibrating its run time (autonomy) estimates.

System Log Entries

	LogEntry & Condition Email Subject	Probable Cause
Warning	Failed To Synchronize System Clock With NTP Server	The adapter could not reach the identified NTP server
Informational	Communication Established	The adapter established Communications with the UPS
	MopUPS Service Started	The Adapter's device monitoring service has started successfully
	MopNSA remote shutdown: failed to authenticate to <IP address>:<port>	Network Shutdown Controller - Return Codes for MopUPS NSA
	MopNSA remote shutdown: failed to connect to <IP address>:<port>	
	MopNSA remote shutdown: succeeded to shutdown <IP address>.	
	RCCMD : failed to connect to <IP address> on port <port>	Network Shutdown Controller - return Codes for RCCMD
	RCCMD : successfully sent message to <IP address> on port <port>.	

Number of Environment Sensors that can be powered by ManageUPS Blue Bus without *auxiliary power* supplied to the sensor.

Note: Please contact your local distributor if your UPS is not listed here.

POWERVAR Brand UPS Models

UPS Family	*ManageUPS Net Adapter Card*	*ManageUPS Net w/External Chassis*
3200 Series	*5*	*8*
Security Plus		

ONEAC Brand UPS Models

UPS Family		*ManageUPS Net Adapter*	*ManageUPS Net Adapter w/ External Chassis*
ONe +		*NA*	*8*
Sinergy A	*(120V)*	*3*	
Sinergy E	*6kVA*	*0*	
	10-20kVA	*2*	
Sinergy II		*5*	
ON v96 .6 – 2.2 kVA		*3*	
ON v96 3-5kVA		*3*	
ON UM .7-2kVA		*5*	

** Value assumes ManageUPS is the only accessory in the multi-slot. If a LIFE modem or other accessory is also installed in the multi-slot accessory bay, subtract 3. Contact the factory for further details on compatibility with other accessories.*

Specifications and Features			ManageUPS
			P-Series
Hardware	Base	Network Interface	10/100 Base-T Ethernet — Ethernet Class 1 (DIX) packet format 802.3u Compliant – Compatible w/FastEthernet full/half duplex
		Main Processor	Motorola MCF5208 32 bit uController with integrated 10/100 Mbps Ethernet media access controller (MAC)
		Ethernet Controller	
		Memory	16MB RAM, 4MB Flash memory
		Power	90ma @ 12 VDC @ 44/88 MHz
		Serial Interface	Two RS232 asynchronous serial ports
		Regulatory	Complies with FCC Class A emission CE emission and susceptibility requirements
	P-Series	*Blue Bus*	Microchip 2515 CAN Controller
		Modbus	RJ11 port offers RS232, RS422, RS485 Half and Full Duplex Options
Features	SNMP	Agent	SNMP UPS Agent conforms with SNMPv1 RFCs. UCD-SNMPd from Berkley OpenSource (BSD) Library (see Open Source aknowledgements in POWERVAR-Connectivity-License statement under COLLECTIVE WORK, THIRD PARTY MODULES and OPEN SOURCE ISSUES)
		MIB Support	RFC1213 (MIB-II) is supported. SNMPv1 compatible UPS Agent supports a SNMPv1 translation of RFC1628 Meets the requirements of the upsFullCompliance module defined in RFC1628
	OTHER	Automatic Network Configuration	DHCP client (RFC2131 & 2136-DDNS) and Apple Zero-Configuration networking BONJOUR™ multicast (mDNS) service.
		Network Access	SNMP, HTTP, Telnet, FTP, Mopnet
		Network Update	Firmware, OS and Configuration update via FTP, TFTP.
		Fault messaging	via SNMP Trap and/or email
		Serial Port Sharing	Pass-through serial router allows ManageUPSnet to share a single UPS communications port with other accessories such as a local diagnostics terminal, PC with UPS software or external modem for remote diagnostics
		Network Shutdown	Client/Server: Mopnet UPS status server with password authentication: Supports integration with MopUPS UPS monitoring software.
			Network Shutdown Controller: Issues shutdown commandsvia network to RCCMD and MopNSA shutdown agents.
		Logging	UPS Data and Event log with WEB-based log viewing utilty.
		Network Configuration Utility	ManageUPS configuration utility enables automatic discovery, configuration guidance and inventory management from a Win2000/XP workstation.
		MODBUS Services	MODBUS services available via AUX Serial communication port or 10/100 Ethernet port.