

POWERWARE®  
9315

**Connect**UPS™  
A D A P T E R

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This book describes how to install and use the Powerware® 9315 ConnectUPS™ Adapter, part number 103001418 with Powerware 9315 UPS modules. Each procedure is outlined in a series of steps. These procedures are written primarily for network supervisors who are responsible for installing and configuring the ConnectUPS Adapter.

You should also be familiar with PC hardware and software and have a basic understanding of your network. The network should be set up and operating properly.

If you encounter problems while installing or configuring the adapter, call the **Help Desk** for assistance at one of the following numbers:

In the United States	<b>1-800-365-4892</b>
In Canada	<b>1-800-461-9166</b>
All other countries	<b>1-919-870-3149</b>

### Using This Manual

This manual uses these type conventions:

- *Italic type* represents variable information that you must replace with an actual value, or a directory or file name.
- **Screen type** represents information that appears on your screen.
- **Bold type** represents a command or option that you type or enter at a prompt.

Icon	Description
	Calls attention to information that is specific to SNMP operation. The ConnectUPS Adapter uses SNMP v.1.
	Information notes call attention to important features or instructions.
	Cautions alert you to system damage or loss of data.
[Keys]	Brackets are used when referring to a specific key such as [Return] or [Esc]

## Networking Terminology

A **Network** is a collection of workstations (for example, IBM-compatible personal computers) and other equipment (such as printers), connected for the purpose of exchanging information. Networks vary in size, some are within a single room, others span continents.

**Ethernet** is a type of local area network, referring to the technology used to pass information around the network.

**10Base-T** is the name given to the Ethernet protocol that runs over **Unshielded Twisted-Pair (UTP)** cable. The ConnectUPS Adapter uses an RJ-45 connector for connecting the network.

**Simple Network Management Protocol (SNMP)** is a protocol that controls how a management station gains information from a device. The ConnectUPS Adapter uses SNMP v.1. SNMP is composed of three areas:

- A set of rules that define how a management station can communicate with a device.
- A **Management Information Base (MIB)** that defines what information can be obtained from the device by the management station. Every SNMP-manageable device has a MIB, which is a list of information about it.
- Unsolicited messages called **Traps**, which work differently from the usual request/reply management communication. You can configure a device so that it generates a trap if a certain condition occurs, for example if the UPS goes on battery. The trap will be sent to the management station to inform it of the occurrence.

**Device** is a term that is used to refer to a piece of network equipment. Every device has a unique address that is used to identify it on the network.

**Internet Protocol (IP)** is a data communication protocol used to connect computers and data equipment into computer networks. It is used on a large international network called the Internet, which is composed of universities, government facilities, research institutions, and private companies.

## Verifying Installation Requirements

To install and use the adapter, you must have a Powerware 9315 UPS installed and operating. For use with a Powerware 9315, you must disable all handshaking (see your UPS operator's manual for more information) and the UPS must be configured for Binary Computer Mode (BCM) serial communications at 19200 baud.

The adapter is shipped with everything you need for installation and configuration, except for network cabling. Your package should include these items:

- One ConnectUPS Adapter (Part Number 103001418)
- One DB-25 to DB-25 serial cord
- One modem serial cord
- One PowerMIB 3.5" diskette
- One power supply
- This book

## For More Information

For further information on UPS module installation with the ConnectUPS Adapter, refer to the following:

<b>164200253</b>	<b><i>Powerware® 9315 30-80 kVA UPS Installation</i></b>
<b>164200292</b>	<b><i>Powerware® 9315 100-160 kVA UPS Installation</i></b>
<b>164201037</b>	<b><i>Powerware® 9315 200-300 kVA UPS Installation</i></b>
<b>164201118</b>	<b><i>Powerware® 9315 400-500 kVA UPS Installation</i></b>
<b>164201118</b>	<b><i>Powerware® 9315 500-750 kVA UPS Installation and Operation</i></b>
<b>164201150</b>	<b><i>Powerware® Plus Parallel Capacity/Redundant System Installation and Operation</i></b>

Provides installation instructions for the UPS or SBM cabinet, and optional components and accessories. Site preparation, planning for installation, and wiring and safety information are supplied. Detailed illustrations of cabinets and optional accessories, including dimensional and connection point drawings are provided.



In today's business environment, with computer networks becoming larger and more complex, a constant power supply is vital to the operation of your organization. Your computer system relies on the battery backup of an uninterruptible power supply (UPS) to prevent loss of data when the main power source fails.

The Powerware ConnectUPS Adapter provides network power management through UPS monitoring and control. The adapter is shipped with default settings that you can change to meet the needs of your organization. Figure 1 illustrates the ConnectUPS Adapter.

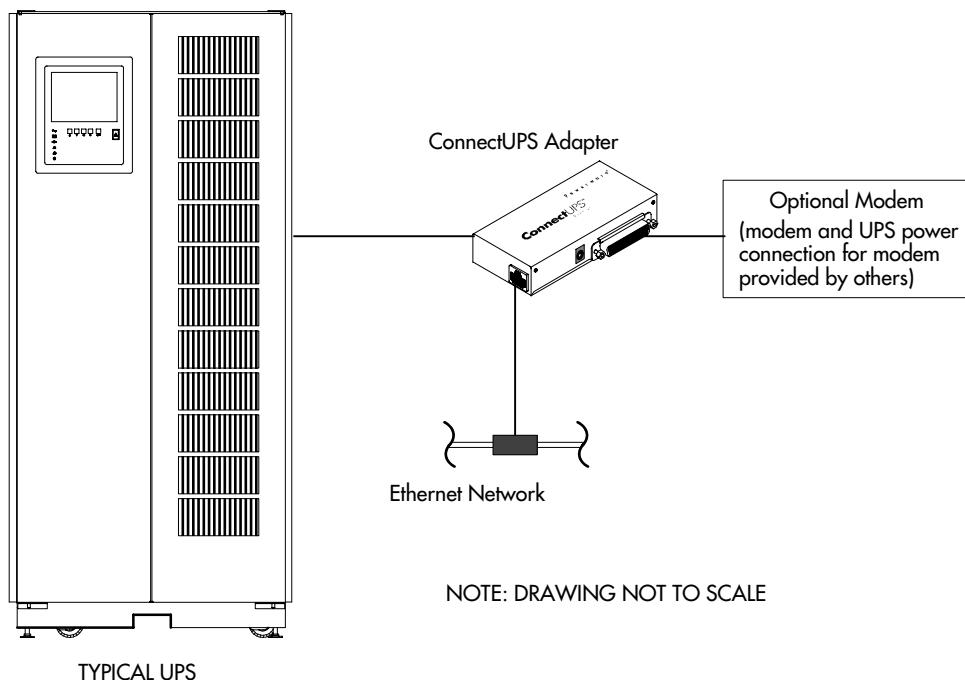


Figure 1. Powerware ConnectUPS Adapter

## Hardware Overview

The ConnectUPS Adapter is a single box that connects to a single UPS either directly via the RS-232 port, or optionally, via an RS-232 serial cable.

One twisted pair ConnectUPS: model is available. The twisted-pair model can connect to a twisted-pair Ethernet (10baseT) network using an RJ-45 connector.

The ConnectUPS Adapter is compatible with PowerVision® Power Management Software, providing remote communication between the PowerVision software and a UPS over an Ethernet network.

**SNMP** The adapter also contains a full SNMP agent that implements the proprietary PowerMIB and the Internet standard (RFC-1628) UPS MIB, as well as relevant portions of MIB II.

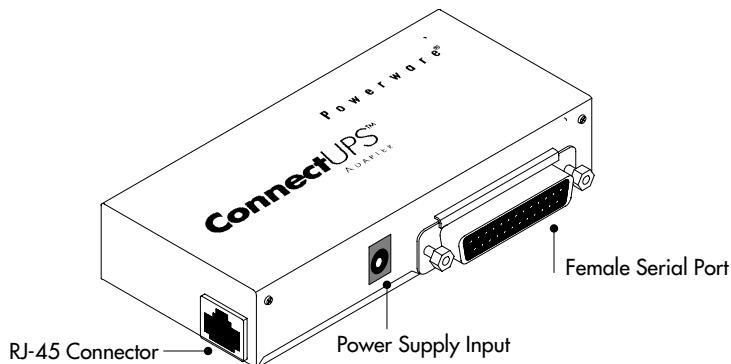


Figure 2. Twisted-Pair Model Connections

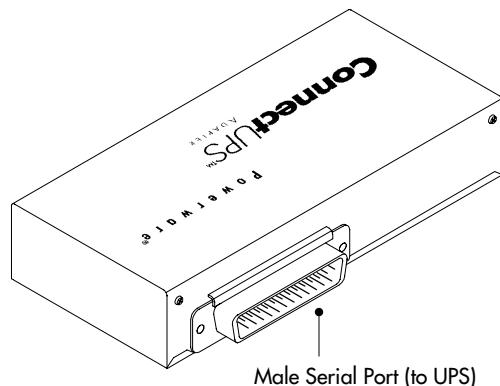


Figure 3. Rear View of the ConnectUPS Adapter

## **Configuring the Adapter Locally**

The adapter has a configuration program that you can access by connecting the adapter to a terminal or a computer with a terminal emulation program.

If you choose to configure your adapter locally, refer to Chapter 3, “Local Configuration” on page 9. After configuring the adapter, proceed to Chapter 4, “Adapter Installation” on page 25.

## **Configuring the Adapter Remotely**

You can configure the adapter using the bootstrap protocol (BOOTP) and the sample configuration file included in the adapter package. This method is useful if you have access to a BOOTP server.

If you choose to configure your adapter remotely, refer to Chapter 4, “Adapter Installation” on page 25. After installing the adapter refer to Chapter 5, “Remote Configuration” on page 27.



Use the following procedure to use the adapter's configuration program.

### Before You Start

You should contact your network administrator for the following adapter values: IP address, Netmask, and Default Gateway. Write these values down for future reference.

To use the configuration screens for the adapter, you need a terminal with an RS-232 serial port, or a PC with a terminal emulation program such as Windows Terminal® or PROCOMM®.

The serial line should be set to 9600 baud, No parity, 8 bits, and 1 stop bit. The configuration program always runs at these settings.

### Connecting the ConnectUPS Adapter

To connect the adapter to the terminal and start the configuration program:

- 1 Verify that the UPS is configured for Binary Computer Mode, 9600 baud, No parity, 8 bits, 1 stop bit, and all software and hardware handshaking is disabled.
- 2 Plug the male end of a serial cable into the female serial port on the front of the ConnectUPS Adapter (see Figure 4).

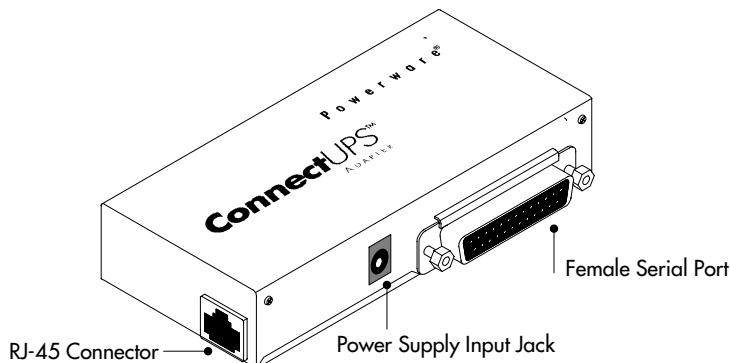


Figure 4. Twisted-Pair ConnectUPS Adapter

- 3 Plug the female end of the serial cable into the serial port on the back of the terminal.

**4** Press [Enter]. The Main Configuration screen appears (see Figure 5 on page 12).

If the Main Configuration screen does not appear, unplug the power supply cord from the adapter's power jack; repeat Step 13.

If you do not see the Main Configuration screen, check the following conditions:

- The communication settings of the terminal should be 9600 baud, No parity, 8 bits, and 1 stop bit.
- If the serial configuration is correct, check the cabling to be sure all connections are secure.
- Verify that your terminal program is on the correct communications port for the RS-232 connection.
- If the adapter was previously configured with an active modem, continue to the following section, "Exiting ASCII Computer Mode."
- Repeat Step 13 again. If the Main Configuration screen still does not appear, call the **Help Desk** for assistance (see page 1).

### **Exiting ASCII Computer Mode**

When the ConnectUPS Adapter has been configured to communicate with a modem, the adapter automatically enters ASCII computer mode (ACM). To view the Main Configuration screen, exit ACM by performing the following steps.

The following commands are case-sensitive and do not appear on the screen when typed:

- 1** Type EXITACM. A question mark (?) appears.
- 2** Type the ConnectUPS Adapter authorized password (see page 13). Press [Enter].
- 3** A percent sign (%) appears. Press [Enter].

The Main Configuration screen appears.

For remote configuration, you can dial into the ConnectUPS Adapter with a terminal emulator, such as "HyperTerminal" in Windows® 95. Use the same baud rate as previously used for the modem.

**NOTE** *Remote access is only available if the ConnectUPS command security level is configured for LV 1 - standard (see page 14).*

## Using the Configuration Screens

When you start the configuration program, the Main Configuration screen appears. (see Figure 5).

The Main Configuration screen displays the current configuration settings for your ConnectUPS Adapter. A list of command (CMD) options are available in the left column of the screen. Type **CF** and press [Enter] to redisplay the Main Configuration screen or to return to this screen from any subscreen.

When you press [Enter] after a command, the adapter saves the new value; however, the adapter does not implement the change until you use the **SA** command to reboot the adapter. You can reboot from any screen. Use the following sequence for configuring the adapter and connecting to the network:

- 1** Configure the parameters on the Main Configuration screen. See “Changing the Configuration Fields” on page 12.
- 2** Optional: Use the **HS** command to access the Host Table Setup screen if you want to configure hosts to receive traps or modify the host table. Type **CF** and press [Enter] to return to the Main Configuration screen when complete. See “Host Table Setup Screen” on page 16.
- 3** Use the **MS** command to access the Modem Configuration screen for configuring or activating the adapter to communicate with a modem. When complete, use the **PS** command to enter the phone number parameters for modem configuration.

Type **CF** and press [Enter] to return to the Main Configuration screen when complete. See “Modem Configuration Screen” on page 18 and “Phone Number Screen” on page 20.

- 4** Optional: Connect the adapter to the network (see page 23).
- 5** Exit the configuration program (see page 23).

```
-----  
Powerware ConnectUPS (tm) Version 3.0 (08-08-97)  
CMD ----- Basic Setup -----  
IP IP address: . . . . . 90.1.23.45 MAC Address: 002085040092  
NM Netmask: . . . . . 255.255.128.0  
----- Network Setup ----- UPS Model: Powerware 9315  
GW Gateway: . . . . . 90.1.0.4.215  
BR BOOTP retries: . . . . . 0 Permanent Hosts Configured: 0  
PW Authorized Password: . . . MustB6  
LV Command Security Level . . Stnd Help: To change a parameter, type  
----- UPS Setup ----- the CMD and the new value  
Comm Settings: . . . . 9600/N/8/1 Examples: IP 128.1.2.3  
ID UPS Unit ID: . . Powerware UPS #10 Prs SC "Help Desk x101"  
----- SNMP Setup ----- For more help, enter the CMD alone  
CG Get Community name: public HS to show Host Table Setup  
CS Set Community name: private SA to Save Configuration  
CT Trap Community name: public CF to Redisplay this Screen  
SN sysName: my.domain.name MS to show Modem Configuration Screen  
SC sysContact: Help Desk x101  
SL sysLocation: 3rd Floor Wiring Closet, Rm 399  
AD AttcDevices: 3rd Floor Communication Rack:4 Hubs, 2 Routers, Modem  
%  
-----
```

Figure 5. Main Configuration Screen

### Changing the Configuration Fields

To change the value of a setup option, enter the two letter command followed by a space and the new value. For example, to change the IP address, type: IP *a.b.c.d*, where *a*, *b*, *c*, and *d* are numbers between 0 and 255.



**NOTE** *The new values do not appear until you press [Enter] on a blank command line to redisplay the screen.*

If you enter a command without a new value, the existing value for that option appears. If you enter an invalid value, the screen displays a range of valid values.

You can refresh the Main Configuration screen to show your changes by typing CF and pressing [Enter]. The configuration settings you can change are described in the following sections. Press [Enter] after each command to save the new setting and return to the configuration screen.

**SNMP** If you are using SNMP protocol, you should configure all of the setup options on the configuration screen. The ConnectUPS Adapter uses SNMP v.1.

**IP address (IP)**

Type IP followed by a space and the Internet protocol assigned to this adapter to change the IP address.

Use the format *a.b.c.d*, where *a*, *b*, *c*, and *d* are numbers between 0 and 255. If you type a number that is not in this range, an error message appears. If you do not know the IP address to use, contact your network administrator.

**Netmask (NM)**

Type NM followed by a space and the Netmask address to change the Netmask address.

Use the format *a.b.c.d*, where *a*, *b*, *c*, and *d* are numbers between 0 and 255. If you type a number that is not in this range, an error message appears. If the local network is partitioned into subnets, be sure to set this value to show that (for example, 255.255.0.0).

**Gateway (GW)**

To change the default gateway, type GW followed by a space and the default gateway. The default gateway is the default destination for all packets not addressed to the local network segment. This value must be set if you have routers in the network.

Use the format *a.b.c.d*, where *a*, *b*, *c*, and *d* are numbers between 0 and 255. If you type a number that is not in this range, an error message appears. Type GW 0.0.0.0 if there is not a primary gateway.

**BOOTP retries (BR)**

Type BR followed by a space and the number of times the adapter should request BOOTP configuration. You can specify any positive number up to 255 (the default is 30). If you set this field to 0, no BOOTP requests are made. To have the adapter request BOOTP configuration repeatedly until it receives a successful configuration, specify -1 in this field. Retries are sent at approximately two-minute intervals.



**NOTE** Be sure to set this field to 0 if the network does not have BOOTP. If you specify any other value, you have to wait while the adapter powers on and receives a successful BOOTP configuration (or completes the specified number of requests).

**Authorized Password (PW)**

To create a six-character password, type PW followed by a space and a password. The password is case-sensitive. You can type any character, but the first character cannot be a space. The default password is MustB6.



**NOTE** The password function cannot be disabled.

## Command Security Level (LV)

To change the command security level, type LV followed by a space and the corresponding level number. This command determines who receives data or sends commands.

There are three possible entries:

- 1 - The standard level allows anyone with the correct password or community name (for SNMP) to receive data or send commands. The standard level is the default. This is the only level that times out permanent entries in the ARP cache. This level also allows remote configuration via modem.
- 2 - The high-sets level restricts sets and commands to those hosts that appear in the host table; any SNMP manager with the correct get community name or any OnliNet Network user may request data.
- 3 - The high level is the most secure. Only those hosts who appear in the host table and use the correct password or community name can receive data or send commands.

## UPS Unit ID (ID)

To change the UPS Unit ID field, type ID followed by a space and the “*name of the UPS unit*” that you are currently configuring. The UPS unit name must be enclosed in quotes. You can enter up to 16 characters to identify the UPS unit. This information may be represented as the serial number on some UPS units.

### **Get Community name (CG)**

To change the community name, type CG followed by a space and the community name. This command changes the community name that the SNMP manager can use when performing a *get* operation, but not *set* operations.

Type up to 16 alphanumeric characters to specify the get community name. This field is case-sensitive and cannot contain blanks.



**NOTE** *The get community name should be different than the set community name to avoid conflicts with set operations.*

### **Set Community name (CS)**

Type CS followed by a space and the community name to change the community name the SNMP manager uses when performing *set* or *get* operations.

Type up to 16 alphanumeric characters to specify the set community name. This field is case-sensitive and cannot contain blanks.

**SNMP Trap Community name (CT)**

Type CT followed by a space and the community name to change the community name that is sent along with the traps to your network manager.

Type up to 16 alphanumeric characters to specify the trap community name. This field is case-sensitive and cannot contain blanks.

**SNMP sysName (SN)**

To change the system name field, type SN “*system name*”. The system name must be enclosed in quotes. Type the system name assigned by your system administrator (up to 63 alphanumeric characters).

The name you enter is used by network operators, and is not used for network addressing. (If you do not specify a system name here, you can do so using your SNMP software.)

**SNMP sysContact (SC)**

Type SC followed by a space and the “*system contact name*” to change this field. The system contact name must be enclosed in quotes.

Type up to 63 alphanumeric characters to identify someone to contact with questions about this device. For example, you can type a person's name, phone number, department, or physical location. (If you do not specify a system contact here, you can do so using your SNMP software.)

**SNMP sysLocation (SL)**

Type SL followed by a space and the “*system location name*” to change this field. The system location must be enclosed in quotes.

Type up to 63 alphanumeric characters to identify the location of the installed adapter.

**SNMP Attached Devices (AD)**

To list the protected equipment currently connected to the UPS, type AD “*device name*”. The attached devices must be enclosed in quotes.

Type up to 63 characters (for device names) to identify devices such as hubs, routers, and modems that are connected to the adapter.

## Host Table Setup Screen

The Host Table Setup screen allows you to add hosts permanently to the ConnectUPS Adapter's Host Table. The host table automatically adds hosts as nonpermanent entries when host communication is established with the adapter. This command is useful if you want to receive traps.

To access this screen from the Main Configuration screen, type HS and press [Enter]. The Host Table Setup screen appears (Figure 6).

```
-----
Host      IP          __Trap__  

Num      Address      Level  Type  

1        78.1.4.203    3      2  

2        78.1.5.31     3      2  

3        78.1.5.32     0      1  

4  

5  

6  

7  

8  

CMD: HIn (DEn) PIn   TLn   TTn   (n=Host Num 1-8; eg "TL2 1")  

Trap Levels: 0=None, 1=Critical, 2=Major, 3=All levels of traps sent  

Trap Types: 1=Stnd MIB, 2=Powerware MIB, 3=Stnd + msgs, 4=Powerware + msgs  

HIn adds a Permanent Host IP,          DEn removes a host entry  

PIn to "ping" host n (test connection),  SA to Save and Restart  

CF to show Configuration Information,   HS to Redisplay this Screen  

%
-----
```

**Figure 6. Host Table Setup Screen**

The Host Table Setup screen displays the host access list and the current setting for each host. The host number (Host Num) appears in the left column of the screen.

To change a value of a host field, type the two-letter command for a specific host number. For example, to change the IP address, type: **HIn a.b.c.d**, where *n* equals the host number and *a*, *b*, *c*, and *d* are numbers between 0 and 255.

The following settings can be changed in the Host Table Setup screen. When complete, type CF and press [Enter] to return to the Main Configuration screen. Press [Enter] after each command to save the new setting and return to the host access list.

**IP Address (HI)**

Type HI and the host number followed by a space and the Internet protocol address of the host.

Use the format *a.b.c.d*, where *a*, *b*, *c*, and *d* are numbers between 0 and 255. If you type a number that is not in this range, an error message appears.

**Delete Entry (DE)**

To remove a configured host, you can change its IP address to a new value, if one exists. Otherwise, use the Delete Entry command. To delete the entry, type DE and the host number and press [Enter]. Only eight hosts can be stored in the permanent memory.

**Ping (PI)**

The Ping option verifies the host's physical address. If you are connected to the network, you can use the Ping function to verify a host's address. Type PI and the host number and press [Enter] to send the command.

If the ping is successful, the adapter responds with the following message:

`received 5/5 packets (0% loss) from xx.xx.xx.xx`. If the ping is unsuccessful, the adapter displays an error message: `received 0/5 packets (100% loss) from xx.xx.xx.xx`. Any number greater than 0/5 is not an error.

**SNMP Trap Level (TL)**

To set the trap level, type TL and the host number followed by a space and the trap level. The possible values for the trap level are:

- 0 (None), hosts do not receive any traps
- 1 (Critical), hosts receive only severe traps
- 2 (Major), hosts receive severe and serious traps
- 3 (All), to receive all traps

The default setting for this field is 0 (None).

### Trap Type (TT)

To set the trap type, type TT and the host number followed by a space and the trap type. The ConnectUPS Adapter provides four possible trap types:

- 1 (Stnd MIB), hosts receive Standard UPS MIB-defined traps
- 2 (Powerware MIB), hosts receive PowerMIB-defined traps
- 3 (Stnd+msgs), hosts receive Standard UPS MIB traps plus additional information
- 4 (Powerware+msgs), hosts receive PowerMIB traps plus additional messages

The default setting for the ConnectUPS Adapter is 1 (Stnd MIB), but trap type 2 (Powerware MIB) is recommended since these traps are broken out by alarm type.

### Modem Configuration Screen

The Modem Configuration screen allows you to configure and activate the adapter to communicate with a modem. This feature is helpful if you want to be notified when a problem occurs or monitor the UPS status from an unattended computer using UPSdial.

To access this screen from the Main Configuration screen, type MS and press [Enter]. The Modem Configuration screen appears (Figure 7).

```
-----  
CMD ----- Modem Configuration -----  
MT Modem Type (1-7) . . . . . 1 = US Robotics -->Modem Type List:  
MA Modem Active (Y/N) . . . . . Yes 1 = US Robotics  
NR Number Rings (0-15). . . . . 3 2 = Hayes/Generic  
BD Baud rate (1200-9600). . . . . 9600 3 = Motorola  
MI Custom Modem Init. . . . . AT 4 = MultiTech  
----- Dialing Parameters -----  
PT Phone Type (Pulse/Tone). . . . Tone 6 = Practical Peripherals  
CA Enable Cancel Alarm (Y/N). . . Yes 7 = GVC  
CI Call Interval (0-255 min). . . 123 (eg, "MT 2" selects Hayes Modem Type)  
SU Status Interval (0-1524 min) . 60  
  
SA to Save Configuration and Restart  PS to show Phone numbers Screen  
CF to show Main Configuration Screen  For help, enter just CMD (eg, "BD")  
%
```

**Figure 7. Modem Configuration Screen**

The following commands can be used to configure the adapter for specific modem parameters. Press [Enter] after each command to save the new setting and return to the modem screen. After completing the modem settings, type PS and press [Enter] to configure the Phone Numbers screen.

**Modem Type (MT)**

Type MT followed by a space and the selection number for the specific modem type (1-7). For example, MT 3 selects a Motorola modem type. The ConnectUPS Adapter supports US Robotics, Hayes, Motorola, MultiTech, Boca, Practical Peripherals, and GVC. The default is Hayes. Enter 0 to indicate that no modem is selected; this automatically changes the Modem Active field to inactive (N).

**Modem Active (MA)**

To activate the modem feature, type MA followed by a space and Y (for Yes). To deactivate the modem feature, type MA N (for No). The default is inactive.

**Number of Rings (NR)**

Type NR followed by a space and the number of times the modem should ring before answering an outside call. You can specify between 0 and 15 rings. For network security, you can set this value to zero and the modem will never answer a call. The default value is 3 rings.

**Baud Rate (BD)**

Type BD followed by a space and the baud rate (1200, 2400, 4800, or 9600). The default is 9600 baud.

**Custom Modem Initialization (MI)**

To customize the modem initialization string, type MI “*string*”. The modem string must be enclosed in quotes. The custom string overrides the default (AT&F) and initializes the modem whenever the ConnectUPS Adapter is powered on or reset. For example, MI “ATL2” turns up the modem speaker volume.

**Phone Type (PT)**

Type PT followed by a space and T for a touch-tone phone or P for a pulse-dial phone. The default is tone.

**Cancel Alarm (CA)**

The cancel alarm feature allows you to call the modem to stop the repeated pages determined by the call interval. To enable the cancel alarm feature, type CA Y. If configured with Y, when the modem receives the incoming call, the adapter stops redialing the pager even if the alarm is still active. If a new alarm occurs, the adapter restarts the paging process. Type CA N to disable this feature. When set to N, the adapter does not allow alarms to be canceled, even if the modem answers your call.

**NOTE** *If the Number of Rings is set to 0, the cancel alarm feature is ignored because the modem does not answer any incoming calls (see “Number of Rings” above).*

### Call Interval (CI)

Type CI *n*, where *n* equals the number of minutes the adapter should wait before paging you again for the same alarm condition (0 to 255 minutes). For example, if you enter CI 5, the adapter notifies you every 5 minutes while the alarm is active. The default is 0 (you only receive the first page for an active alarm).

### Status Interval (SU)

The status interval is used for dialing computers only (see “Service” on page 22). The SU command configures the adapter to send status information to a computer with UPSdial within a specified time period. The value (0 to 1524) is in minutes and automatically rounds up to increments of 6 minutes. For example, SU 61 sends a status report to the computer every 66 minutes; SU 60 equals 60 minutes. The default is 0, which disables the status interval.

### Phone Number Screen

The Phone Number screen allows you to enter the phone number(s) that the modem should dial. The phone numbers can be to a pager or a computer with monitoring software, such as UPSdial.

To access this screen from the Modem Configuration screen, type PS and press [Enter]. The Phone Number screen appears (Figure 8).

```
----- Phone Numbers, Options, and IDs -----
CMD __ID Fields__
PD      0003914 . . . Pager Display value (Numeric Pagers)
PP      ,@ . . . Pager Dialing Pause (@ wait or,,, pauses)
AP      . . . AlphaPagerID (one or two PINs)
      __PPhone Number__ __Service__ __ALert__ __Net-Warn__ (Loss of Network)
PH1    No phone number . . . . .
PH2    No phone number . . . . .
PH3    No phone number . . . . .
PH4    No phone number . . . . .
PH5    No phone number . . . . .
PH6    No phone number . . . . .

Service values: 1=Computer, 2=Standard (Digital) Pager, 3=Alphanumeric Pager
Alert values: 1=Critical, 2=Major, 3=Minor, 4=Informational (All levels)
Net-Warn values: Y=yes, N=no
SA to Save Configuration and Restart   MS to show Modem Configuration Screen
CF to show Main Configuration Screen  For help, enter just CMD (eg, "BD")
%
```

Figure 8. Phone Number Screen

The following commands can be used to configure specific dialing parameters. Press [Enter] after each command to save the new setting and return to the Phone Number screen. After completing the phone number settings, type CF and press [Enter] to return to the Main Configuration screen.

### **Pager Display (PD)**

To set the message that appears on the pager, type **PD "xxxxxx"**, where x equals the numeric message. The message must be enclosed in quotes and usually identifies the ID of the UPS or adapter. Valid characters are 0 through 9 with a maximum length of 8 digits.

### **Pager Pause (PP)**

To adjust the time delay before the modem transmits the numeric message (alarm or status), type **PP "pause symbols"**. The pause symbols must be enclosed in quotes. A comma (,) represents a one second delay and the @ symbol signals the modem to wait for silence. For example: type **PP ",,@"** for the modem to wait two seconds and wait for silence before sending the alarm or status. The default is ",@" for a one second delay and silence.

### **Alphanumeric Pager ID (AP)**

An alphanumeric pager can have one or two different pagers at the same phone number. Type **AP "pager ID or PIN"** to identify the pager. The ID or PIN must be enclosed in quotes. Valid characters are 0 through 9 with a maximum length of 16 digits. If more than one ID is used, include both IDs (or PINs) in the same command separated by a space. For example: type **AP "5551212"** for one ID, or type **AP "5551212 5551234"** for two IDs.

### **Phone Numbers (PH)**

Use the **PH** command to enter the phone number(s) that the modem should dial. You can enter up to six different phone numbers. The numbers are dialed in sequential order.

Type **PHn "xxxxxx"**, where n equals the order sequence for the phone number (1-6) and x equals characters for the phone number. The phone number must be enclosed in quotes. You can type up to 15 characters including dialing commands, such as a comma (,) for pause and W for wait.

To delete a phone number from the list, enter a 0 for the phone number. For example, enter **PH1 0** to remove the first phone number entry.

## **Service (SV)**

The SV command is required and identifies the type of service the phone number dials. Type **SVn** followed by a space and the selection number for the service type, where *n* equals the phone number entry (1-6). The service types are:

- **1** for computer - If you specify computer, it is recommended that computer numbers are dialed last. When the modem connects to the computer, the adapter communicates with the monitoring software until the software ends the call.
- **2** for standard digital pager
- **3** for alphanumeric pager - only one entry in the phone list can be alphanumeric

For example, **SV3 2** defines a standard digital pager for the third phone number.

## **SNMP Alert (AL)**

The AL command sends an alert for alarms depending on the trap level. When the adapter receives an alarm with the specified trap level, the modem dials all phone numbers with the corresponding trap level.

Type **ALn** followed by a space and the selection number for the trap level, where *n* equals the phone number entry (1-6). The trap levels are:

- **0** (None), pagers/computers are not notified of any alarms
- **1** (Critical), to be notified of only severe alarms
- **2** (Major), to be notified of both severe and serious alarms
- **3** (Minor), to be notified of minor, serious, and severe alarms
- **4** (All), to be notified of all alarms, including informational alarms and when alarms clear

For example, **AL1 3** notifies the first phone number whenever there is a minor, serious, or severe alarm. The default is **0** (None).

## **Loss of Network (NW)**

Use the NW command to be notified when there is a loss of communication with the network. If the adapter loses communication with the network, the adapter signals the modem to dial all phone numbers configured with the network warning.

Type **NWn** followed by a space and Y (for Yes) or N (for No), where *n* equals the phone number entry (1-6). For example, **NW2 Y** configures the second phone number to be notified of a network communication loss. The default is **N** (No).

## Connecting to the Network

Connecting the adapter to a network is optional. If you plan to install the adapter on a network, perform the connections before exiting the configuration. Verify that you have the appropriate cables and connectors as described in “Verifying Installation Requirements” on page 3.

### Twisted-Pair Model

To connect a twisted-pair ConnectUPS to the network:

- 1** Plug a twisted-pair cable into the RJ-45 connector on the side of the adapter.
- 2** Plug the other end into an appropriate port on your twisted-pair hub.

## Exiting the Configuration Program

To activate the new configuration:

- 1** Type SA and press [Enter]. This command restarts the adapter with the new configuration changes. If the UPS is correctly configured, the Main Configuration screen automatically reports the correct UPS model.
- 2** The adapter is now configured. Disconnect the ConnectUPS Adapter from your terminal.
- 3** If you are using a modem, connect the modem’s serial cable to the adapter’s female serial port (where the terminal cable was connected).
- 4** See page 41 for details on installing the MIB.



To install the ConnectUPS Adapter on your network, check to be sure you have all the necessary hardware. You need access to the serial port of your UPS module or System Bypass Module (SBM) and the serial cable supplied with the ConnectUPS.

### Installing the Adapter to the UPS

To install the adapter on Powerware 9315 30–500 kVA UPS modules or SBM:

- 1** Open the UPS or SBM cabinet door, that provides access to the serial port.
- 2** Locate Communications Panel/Customer Interface Panel and Customer Convenience Outlet (refer to the applicable UPS or SBM Installation manual referenced in Chapter 1).
- 3** Loosen Communications Panel cover screw. Remove and retain cover.
- 4** Mount the ConnectUPS inside the UPS or SBM using the Location and Mounting Method information listed in the following table:

Model	Location	Mounting Method	Connection Method	Proceed to
9315 30–80 kVA	approximately 9.5 inches above convenience outlet	Supplied Velcro	DB-25 male to DB25 female serial cable (supplied)	Step 5
9315 100–160 kVA	approximately 2 inches above convenience outlet	Supplied Velcro	DB-25 male to DB25 female serial cable (supplied)	Step 5
9315 225–300 kVA	approximately 2 inches above convenience outlet	Supplied Velcro	DB-25 male to DB25 female serial cable (supplied)	Step 5
9315 300–500 kVA	approximately 7.5 inches to right of the convenience outlet and 2 inches up from the top of the base	Supplied Velcro	DB-25 male to DB25 female serial cable (supplied)	Step 5
9315 500–750 kVA	Customer Interface Panel	Direct to Customer Interface Panel Serial Connector (DB25)	Direct - No serial cable needed	Step 12
System Bypass Module	Customer Interface Panel	Direct to Customer Interface Panel Serial Connector (DB25)	Direct - No serial cable needed	Step 12

- 5** Cut (if not already cut to length) two strips of Velcro to the same length as the ConnectUPS.
- 6** Remove the protective backing from the Velcro strips and attach the strips to the rear surface of the ConnectUPS.
- 7** Cut (if not already cut to length) two mating strips of Velcro to the same length as the ConnectUPS.
- 8** Attach the mating Velcro strips to the Velcro strips on the ConnectUPS.
- 9** Remove the protective backing from the attached Velcro strips and install the ConnectUPS to the location listed in table on page 25.
- 10** Connect the female end of the supplied serial cable to the male serial port on the adapter (refer to Figure 3).
- 11** Connect the male end of the serial cable to the female serial port on the UPS. Place any extra serial cable behind the Communications Panel cover to prevent interference with cabinet doors. Proceed to step 13.
- 12** Plug the adapter's male serial port (Figure 3) into the serial port of the UPS communications panel. Tighten the screws on the adapter serial port to ensure a good connection.
- 13** Plug the power supply cord into the power supply input jack located on the side of the adapter. Plug the power supply into the 120V Customer Convenience Outlet on the UPS or SBM (refer to the applicable UPS or SBM Installation manual referenced in Chapter 1). Route power cord to prevent interference with cabinet doors.



**NOTE** *It is recommended that you plug the power supply into the UPS powered Convenience Outlet or a 120VAC critical load source.*

The bootstrap protocol (BOOTP) is a service that allows a network device to learn its IP address and configuration information through the network.

To use the BOOTP service, you must have a properly configured BOOTP server on your network. You must load the adapter configuration file (*BOOTP/xups*) onto the BOOTP server, modify and rename it for your configuration, and configure your BOOTP server to recognize the adapter.

If you want to configure your adapter through the network and do not have BOOTP, contact your system administrator for information about obtaining BOOTP.

BOOTP is available for several different operating systems. Each operating system displays the information in a slightly different format, but the information should be the same or very similar.

### Connecting to the Network

The ConnectUPS Adapter is connected to the network using the twisted-pair port on the adapter. Verify that you have the appropriate cables and connectors as described in “Verifying Installation Requirements” on page 3.

#### Twisted-Pair

To connect a twisted-pair ConnectUPS to the network:

- 1 Plug a twisted-pair cable into the RJ-45 connector on the side of the adapter.
- 2 Plug the other end into an appropriate port on your twisted-pair hub.
- 3 Verify that the UPS is configured for Binary Computer Mode, 9600 baud, No parity, 8 bits, 1 stop bit, and all software and hardware handshaking is disabled.
- 4 If you are using a modem, connect the modem’s serial cable to the adapter’s female serial port.

**NOTE** *The Powerware 9315 30-750 kVA UPS systems convenience outlet can not support the power requirements of a modem and a ConnectUPS Adapter.*

## Configuring the BOOTP File

Perform the following steps to load the adapter configuration file (BOOTP/xups) onto the BOOTP server and modify the file for configuration. You should know the hardware address of your adapter. Write this number down for future reference.

The hardware address can be found on the bottom of the adapter. The hardware address (in hexadecimal notation) is in this format: 002085 Xnnnnn

The first part of the hardware address (002085) is fixed. The second part (Xnnnnn) is the serial number of the adapter.



**NOTE** You must have root access to the BOOTP server to perform some of these steps; contact your network administrator for assistance.

- 1 Designate a home directory to hold the boot files. The home directory in the example on page 29 is */tftpboot*.  
Your server may already have a subdirectory named */tftpboot*.
- 2 Copy the *unix\_mib.tar* file from the PowerMIB diskette to the home directory on your BOOTP server.
- 3 To untar the file, type the following command and press [Return].  
`tar xvf unix_mib.tar ./bootp/xups`
- 4 Make a copy of the *xups* file and rename the file to *xups.hostname*, where *hostname* is the (domain) name of your adapter.

For example, the domain name shown on page 29 is *adap1.your.com*. The new file name would be *xups.adap1.your.com*.

- 5 Edit the *xups.hostname* file to set up the adapter's configuration for BOOTP retries, community names, permanent hosts and privileges, and security levels. See "Changing the Configuration Fields" on page 30 for information on modifying the settings in the *xups* file.
- 6 Verify that Public Read Access is enabled on the *xups* file so that the adapter can access the file for the TFTP process. For UNIX® systems, use the change mode command to enable read access for other users:  
`chmod o,+r filename`
- 7 Edit the *bootptab* file on your system to define the adapter's hardware address and to specify *xups* as the boot file for the adapter. You must also edit the *xups* file to configure the adapter for your computer system. Both

the *bootptab* file and the *xups* file can be edited using any text editor, such as vi.

When you open *bootptab*, you may see license or copyright information at the top. As you scroll down, you may see a legend defining the abbreviations used in the configuration information. These abbreviations vary depending on the type of operating system you have. The following sample legend is for the AIX® operating system:

- ht** - Hardware type (Ethernet)
- ha** - Hardware address of the device
- ip** - Internet protocol (IP) address
- sm** - Subnet mask (verify with your network administrator)
- gw** - Gateway (the IP address of the default gateway)
- hn** - Host name (may be left blank)
- tc** - Template host (defines this entry as similar)
- hd** - Home directory (the location of the boot file)
- bf** - Boot file (the name of the boot and/or configuration file for the device)

The *bootptab* file usually lists global default configuration settings first. Below the global settings, you can add configuration settings specific to the adapter. This is an example *bootptab* file for IBM AIX:

```
global.default:\
  ht=ethernet:\
  ha=002085532750:\      # just any address
  ip=128.1.1.2:\          # just any IP
  sm=255.255.0.0:\\
  gw=128.1.1.1

adap1.your.com:\          # hostname of the adapter
  ha=002085040001:\\
  ip=128.1.2.3:\\
  hd=/tftpboot:
  #bf=xups:--may work better if you don't #include "bf="
```



**NOTE** Verify that your BOOTP server uses the “vendor magic cookie value” of 99.130.83.99, as per RFC-951.

**8** Check your BOOTP server description to see that the proper file name responds to the adapter's BOOTP request.

The adapter sets the boot file field to *xups* as a generic boot file name in its BOOTP request. The combination of this *xups* name request and the **hd** and **bf** entries in *bootptab* determines the boot file name to be sent in the BOOTP response from your server. Consult your server documentation for more information.

For example, the sample AIX bootserver shown above would return a boot file name of either */tftpboot/xups.adap1* or a file name of */tftpboot/xups* if that file did not exist or if the public read access was disabled.



**NOTE** *If you have a router between the BOOTP server and your adapter, verify that it is configured to forward BOOTP broadcasts from your adapter.*

**9** After you edit *xups* to configure the adapter for your system, save the file and exit from the text editor. Make a backup copy of the new configuration file before powering on the adapter.

**10** Start or restart your BOOTP server so that it reads the updated *bootptab* file. Some BOOTP servers time out if no requests are received within a certain period of time.

The adapter begins normal operation when it receives a correct BOOTP response (if BOOTP retries = any value other than 0) or when it completes the number of requests equal to the number of BOOTP retries.

If the adapter does not begin normal operation, you can view error messages on a terminal connected to the ConnectUPS Adapter or on the debug screen of your BOOTP server.

**11** Continue to "Installing the MIB" on page 41.

## Changing the Configuration Fields

The following file is a sample *xups* file. The PowerMIB diskette contains a copy of this file.

```
# File XUPS -- Version 2.02 for Powerware Ethernet, Network,
# and ConnectUPS Adapters (c)
# Copyright 1993-98, Powerware Corporation
# Last revised: mm/dd/yy by Your Name

# Configuration file for Powerware' Network Adapters
# received via TFTP after BOOTP response gives fully qualified file name
# Not all of the configuration items apply to each type of adapter;
# consult your manual; extra items will be ignored by the adapter.
```

```

### note -- any characters following a '#' character are comments

# The adapter's IP, Netmask, and default Gateway are set via the
# BOOTP header, and generally not in this file (unless you need to
# change your current IP address to a new one via BOOTP)
# Put a '#' before the gateway statement if you have no gateway.
#my addr      128.1.2.3 # my IP address
#my netmask   255.255.0.0 # network portion of my IP address
#my gateway   128.1.1.1  # IP address of our gateway to other systems

### The number of times to try BOOTP configuration before
### using standard (or default) configuration.
bootp retries 30

### Setup strings for SNMP
### The SYS group values define the SNMP MIB II
### 'sys' group fields.
sys Name      "my.domain.name"
sys Contact   "Who to call, and their extension/pager number"
sys Location  "Where this adapter can be found"

### Community name used for all traps
### The trap community field defines the community name with
### which trap messages will be sent.
trap community all "public"

### This item is the severity level of errors needed to cause a
### warning beep on the speaker. A 0 means beeps are disabled,
### a 1 means only severe errors will beep the speaker, 2 means
### severe and serious errors will beep, and 3 means all errors beep.
### This only applies to the Powerware Network Adapter
audible traplevel 3

### Command Security Level determines who can get data and send commands
### Level 1=Stnd: Anyone with password/comm name can get or send;
### 2= High Set: Must be Perm host to send commands; anyone can get data
### 3= High: Must be Perm host to get data or send commands
cmdSecure level 1

### This item is the number of UPS serial ports
### installed on this adapter.
#comport all 2      # For Powerware Network Adapter
comport all 1      # For ConnectUPS, Powerware Ethernet Adapter

###.....Serial Port Information.....
### Unit ID message is 16 characters maximum,
### getname and setname are the SNMP community name required for
### doing SETS or GETS of MIB data for that port.
### Set and get names must be unique, and different for each serial port
### The "id____" values define the UPS MIB 'upsIdent' group fields
comport baud    1 9600      # port baud rate
comport id      1 "NetUPS"   # ID field is 16 characters
comport getname 1 "public1"  # Community name for "gets"
comport setname 1 "private1" # Community name for "sets"
#comport passwd 1 "Secret"   # Not secure to set it via TFTP !
comport idName 1 "Put text for upsIdentName here"
comport idAtDev 1 "upsIdentAttachedDevices: File Server, Monitor, CD-ROM"

```

```
### .....Network Host Table Information .....
### The 'Num' item is a number used to reference this host later when
### specifying the authorizations for the hosts; the 'Name' item is a
### text name to identify the host, but is not used for addressing.
###      Num   IP Address/Value      Name
Host addr      1      128.0.0.1      Network.manager
Host permanent 1      Y
Host traptype  1      3      # Recommend 3 or 4 for PW Network Adapter

### .....Host Authorization by Port Number Information .....
### The desired traplevel to be received from each port is given.
###      Num   Port1  Port2  (etc)
Host traplevel 1      3      # 3

### .....Modem Configuration Information.....
### If you purchased an adapter with the modem option, you can configure and
### activate the adapter to communicate with a modem. This feature is helpful
### if you want to be notified when a problem occurs or monitor the UPS status
### from an unattended computer using UPSdial.

### This command activates (Y) or deactivates (N) the modem feature.
modem enable N

### Select the specific modem type: 1-US Robotics, 2-Hayes, 3-Motorola,
4-MultiTech, 5-Boca, 6-Practical Peripherals, or 7-GVC.
modem type 2

### Select the modem connection baud rate (1200, 2400, 4800, or 9600).
modem baud 9600

### Enter the number of times the modem should ring before answering an
### outside call (0 to 15 rings). Use 0 for network security so that the
### modem never answers an incoming call.
modem rings 3

### This command allows you to call in and halt the repeated transmission of
### pages for an active alarm.
modem cancel y      # n the call is not answered and the page repeats.

### Set the number of minutes (0-255) for the adapter to redial the page for
### the same alarm condition.
modem redial 5      # redials every 5 minutes

### If the modem dials a computer and sends status information (ie., UPSdial),
### use this command to specify the time interval (0 to 1524 minutes). The
### adapter automatically rounds up the numeric interval to increments of
### 6 minutes. For example, modem status 61 automatically sends status
### information every 66 minutes.
modem status 0      # 0 disables

### This command specifies a custom string to configure the modem and
### overrides the default initialization string (AT&F).
modem init "ATL3"  # sets the volume to high

### .....Phone Number Configuration Information.....
### The following commands are used for configuring specific dialing
### parameters. Up to 6 phone numbers can be configured.

### Use this command to set the message that appears on the pager's LCD. The
### message usually identifies the ID of the UPS or adapter. Valid characters
### are 0 to 9 with a maximum of 8 characters.
modem idName "1234911"
```

```

### This command adjusts the time delay before the modem transmits
the numeric
### message (alarm or status). Use , for a 1-second delay; use
@ to wait for a
### silence.
modem pause ",@"
      #waits for 1 second and then for silence

### This command identifies the alphanumeric pager. Valid characters are
### 0 to 9, maximum length of 16 digits. If more than one ID is used, include
### both IDs (or PINs) in the same command separated by a space (for example,
### modem id "5551212" for one ID, or modem id "5551212 5551234" for two IDs).
modem id "pager ID or PIN"

### Enter the phone numbers that the modem should dial (up to 6 numbers);
### dialed in sequential order. After each command, type N V where N is the
### order sequence for the phone number and V is the value for each parameter.
# Phone numbers can have 15 valid characters including dialing commands
# (ie., W for wait or , for pause).
# Modem service is required and identifies the type of service the modem dials:
# 1-computer, 2-digital pager, or 3-alphanumeric pager. Put computer numbers
# last in sequential order; only one alphanumeric pager allowed.
# Modem level is for sending alerts when the adapter receives a specified
# trap level (modem dials all numbers with the corresponding trap level).
# Trap levels: 0-none, 1-critical (only severe), 2-major
# (only severe and serious), 3-minor (severe, serious, and minor), or 4-all.
# Modem warn dials all specified phone numbers when there is a loss of network.
# Type Y for yes or N for no.

# command N V
modem phone 1 "9,5551234"
modem service 1 2
modem level 1 1
modem warn 1 y

#modem phone 2 "9,5556789"
#modem service 2 2
#modem level 2 0
#modem warn 2 n

#modem phone 3 "9,5554321"
#modem service 3 1
#modem level 3 4
#modem warn 3 y

```

Not all of the settings in the *xups* configuration file apply to the ConnectUPS Adapter. The following sections describe the fields you can edit in the *xups* file to configure the adapter for your system.



**NOTE** Be careful not to remove the double quotes around variable-length fields (such as community name, system contact, system location, modem init, and modem phone). The quotes are delimiters indicating the beginning and end of a field. Removing them may cause the adapter to be configured incorrectly.

### Number of attempts for BOOTP before using default information

Specify the number of times the adapter should request BOOTP configuration. You can specify any positive number up to 255 (the default is 30). If you set this field to 0, no BOOTP requests are made. To have the adapter request BOOTP configuration repeatedly until it receives a successful configuration, specify -1 in this field. Retries are sent at approximately two-minute intervals.



**NOTE** If you configure the adapter using the configuration program rather than BOOTP, be sure to set this field to 0. If you specify any other value, you have to wait while the adapter powers on and receives a successful BOOTP configuration (or completes the specified number of requests).

#### sys Name

Type the system name assigned by your system administrator (up to 63 alphanumeric characters). The name you type is used by network operators, and is not used for network addressing.

#### sys Contact

Type up to 63 alphanumeric characters to identify someone to contact with questions about the adapter or its operation.

#### sys Location

Type up to 63 alphanumeric characters to identify the location of the installed adapter.

#### Community name for all traps

Type up to 16 alphanumeric characters to specify the community name the SNMP manager uses for sending all traps.

#### cmdSecure level

Type 1, 2, or 3 to set the command security level. This command determines who receives data or sends commands. There are three possible entries:

- 1 - The standard level allows anyone with the correct password or community name (for SNMP) to receive data or send commands. This is the only level that times out permanent entries in the ARP cache. This level also allows remote configuration via modem.
- 2 - The high-sets level restricts sets and commands to those hosts that appear in the host table; any SNMP manager with the correct get community name or any Network user may request data.
- 3 - The high level is the most secure. Only those hosts who appear in the host table and use the correct password or community name can receive data or send commands.

**comport baud**

Type the port baud rate. It is recommended to set this value to 9600 baud.

**comport id**

Type the name of the UPS unit that you are currently configuring. You can enter up to 16 characters to identify the UPS unit. This information may be represented as the serial number on some UPS units.

**SNMP ➔ comport getname (Community name for "gets")**

Type up to 16 alphanumeric characters to specify the get community name.

**SNMP ➔ comport setname (Community name for "sets")**

Type up to 16 alphanumeric characters to specify the set community name.

**comport idName**

Type a description to identify the UPS. You can type up to 16 alphanumeric characters in this field.

**comport idAtDev**

To list devices that are currently connected to the adapter, type the device name. You can type up to 63 characters (for device names) to identify devices such as hubs, routers, and modems that are connected to the adapter.

**Num**

This field is used for host commands. You must specify a specific host number with each host command. Type a single digit (1-8) to specify the number of the host.

**Host addr (IP address)**

Type the Internet protocol address assigned to this adapter. Use the format *a.b.c.d*, where *a*, *b*, *c*, and *d* are numbers between 0 and 255. If you do not know the IP address, contact your network administrator.

**Host permanent**

To enter a host into permanent memory type Y (for Yes) or N (for No).

### **Host traptype**

To set the trap type, type the trap type number. The ConnectUPS Adapter provides four possible trap types:

- **1** (Stnd MIB), hosts receive Standard UPS MIB-defined traps
- **2** (Powerware MIB), hosts receive PowerMIB-defined traps (recommended)
- **3** (Stnd+msgs), hosts receive Standard UPS MIB traps plus additional information
- **4** (Powerware+msgs), hosts receive PowerMIB traps plus additional messages

### **Host traplevel**

To set the trap level, type the trap level number. The possible values for the trap level are:

- **0** (None), hosts do not receive any traps
- **1** (Critical), hosts receive only severe traps
- **2** (Major), hosts receive severe and serious traps
- **3** (All), to receive all traps

### **modem enable**

To activate the modem feature, type **Y** (for Yes). To deactivate the modem feature, type **N** (for No). The default is inactive.

### **modem type**

Type the selection number for the specific modem type (1-7). For example, **modem type 3** selects a Motorola modem type. The ConnectUPS Adapter supports US Robotics, Hayes, Motorola, MultiTech, Boca, Practical Peripherals, and GVC. Enter 0 to indicate that no modem is selected; this automatically changes the modem enable field to inactive (N).

### **modem baud**

To set the baud rate for the modem connection, type the baud rate after this command (1200, 2400, 4800, or 9600).

### **modem rings**

Type the number of times the modem should ring before answering an outside call. You can specify between 0 and 15 rings. For network security, you can set this value to zero and the modem will never answer a call.

### **modem cancel**

The cancel alarm feature allows you to call the modem to stop the repeated pages determined by the call interval. To enable the cancel alarm feature, type Y. If configured with Y, when the modem receives the incoming call, the adapter stops redialing the pager even if the alarm is still active. If a new alarm occurs, the adapter restarts the paging process. Type N to disable this feature. When set to N, the adapter does not allow alarms to be canceled, even if the modem answers your call.



**NOTE** *If the number of modem rings is set to 0, the cancel alarm feature is ignored because the modem does not answer any incoming calls (see “modem rings” above).*

### **modem redial**

Use the modem redial command to set the number of minutes the adapter should wait before paging you again for the same alarm condition (0 to 255 minutes). For example, if you enter **modem redial 5**, the adapter notifies you every 5 minutes while the alarm is active.

### **modem status**

The status interval is used for dialing computers only (see “modem service” on page 38). The **modem status** command configures the adapter to send status information to a computer with UPSdial within a specified time period. The value (0 to 1524) is in minutes and automatically rounds up to increments of 6 minutes. For example, **modem status 61** sends a status report to the computer every 66 minutes.

### **modem init**

To customize the modem initialization string, type the “*string*” after the command. The custom string overrides the default (AT&F) and initializes the modem whenever the ConnectUPS Adapter is powered on or reset.

### **modem idName**

To set the message that appears on the pager, type “xxxxxx”, where x equals the numeric message. The message usually identifies the ID of the UPS or adapter. Valid characters are 0 through 9 with a maximum length of 8 digits.

### **modem pause**

To adjust the time delay before the modem transmits the numeric message (alarm or status), type “*pause symbols*”. A comma (,) represents a one second delay and the @ symbol signals the modem to wait for silence. For example: **modem pause “,,@”** waits two seconds and waits for silence before sending the alarm or status.

### **modem id**

An alphanumeric pager can have one or two different pagers at the same phone number. Use **modem id “*pager ID or PIN*”** to identify the pager. Valid characters are 0 through 9 with a maximum length of 16 digits. If more than one ID is used, include both IDs (or PINs) in the same command separated by a space. For example: type **modem id “5551212”** for one ID, or **modem id “5551212 5551234”** for two IDs.

### **modem phone**

Use the **modem phone** command to enter the phone number(s) that the modem should dial. You can enter up to six different phone numbers. The numbers are dialed in sequential order.

Type **n “xxxxxxxx”**, where **n** equals the order sequence for the phone number (1-6) and **x** equals characters for the phone number. You can type up to 15 characters including dialing commands, such as a comma (,) for pause and W for wait.

To add phone numbers to the list, enter the command and number on a new line. To remove a phone number from the list, delete the line.

### **modem service**

The **modem service** command is required and identifies the type of service the phone number dials. Type **n x**, where **n** equals the phone number entry (1-6) and **x** equals the selection number for the service type. The service types are:

- 1 for computer - If you specify computer, it is recommended that computer numbers are dialed last. When the modem connects to the computer, the adapter communicates with the monitoring software until the software ends the call.
- 2 for standard digital pager
- 3 for alphanumeric pager - only one entry in the phone list can be alphanumeric

For example, **modem service 3 2** defines a standard digital pager for the third phone number.

**SNMP ➤ modem level**

Type the trap level number to set the adapter to send alerts. When the adapter receives an alarm with the specified trap level, the modem dials all phone numbers with the corresponding trap level.

Type **n x** where **n** equals the phone number entry (1-6) and **x** equals the selection number for the trap level. The trap levels are:

- **0** (None), pagers/computers are not notified of any alarms
- **1** (Critical), to be notified of only severe alarms
- **2** (Major), to be notified of both severe and serious alarms
- **3** (Minor), to be notified of minor, serious, and severe alarms
- **4** (All), to be notified of all alarms, including informational alarms and when alarms clear

For example, **modem level 1 3** notifies the first phone number whenever there is a minor, serious, or severe alarm.

**modem warn**

Use the **modem warn** command to be notified when there is a loss of communication with the network. If the adapter loses communication with the network, the adapter signals the modem to dial all phone numbers configured with the network warning.

Type **n** followed by a space and **Y** (for Yes) or **N** (for No), where **n** equals the phone number entry (1-6). For example, **modem warn 2 Y** configures the second phone number to be notified of a network communication loss.

After you edit **xups** to configure the adapter for your system, save the file and exit from the text editor. Make a backup copy of the new configuration file before powering on the adapter.



You can install the UPS PowerMIB and the Standard UPS MIB on any general network manager, including:

- HP OpenView™ for HP-UX®
- HP OpenView for Windows
- NetView® for AIX
- Novell® NetWare Management System™
- SNMPc™ Network Manager
- SunNet Manager™ for Solaris™
- SunNet Manager for SunOS™

Check the information on the PowerMIB diskette for information on network managers not listed here.



**NOTE** *Some network management packages are “element” managers (for example, hubs or routers), and cannot accept new MIBs.*

The PowerMIB diskette is in MS-DOS® format. If you are using a UNIX operating system that cannot read MS-DOS-formatted files, contact the **Help Desk** (see page 1) for copies of UNIX-formatted files.

### Selecting MIB Files

The PowerMIB diskette contains a variety of UPS MIB files. To install the MIB files, decide which files to load based on your preferences and the Network Management Software you are using. Refer to the *read\_me.txt* file on the PowerMIB diskette for current installation instructions.

You can use the Internet Standard UPS MIB, as described in RFC-1628, or the proprietary PowerMIB. If you have enough disk space on your management station, it is recommended to load both MIBs. The following table lists the advantages of both MIBs.

Standard UPS MIB	PowerMIB
Works with UPS SNMP agents from many vendors	Downward compatible with existing Network adapters
Includes some objects not found in PowerMIB:	Includes some objects not found in Standard MIB:
upsIdentName	xupsAlarmNumEvents
upsIdentAttachedDevices	xupsAlarmEventID
upsBatteryStatus	xupsAlarmEventDateAndTime
upsSecondsOnBattery	xupsAlarmEventKind
upsOutputSource	xupsAlarmEventDescr
upsConfigInputFreq	xupsBatteryAbmStatus
upsConfigOutputVA	xupsEnvironmentGroup
upsConfigLowBattTime	xupsControlToBypassDelay
upsConfigAudibleStatus	xupsConfigDateAndTime
	xupsMaxTrapLevel
	xupsSendTrapType
Enhances the Test and Control groups	More trap types and trap descriptions Simpler battery test procedure

To select the appropriate MIB file, locate the operating system you use and load the MIB file that corresponds to the operating system.

### Choosing a Standard UPS MIB File

If you are using Novell's NetWare Management System 2.0 on HP OpenView for Windows, you should load the MIB file located in the appropriate subdirectory. The traps in the Novell NMS file are annotated for NMS. You should also copy the `\NVL_NMS\UPS_*.PRF` file to include all MIB browsing profiles with Novell NMS.

If you are not using one of these managers, you should load the `STDUPSV1.MIB` file. Only SNMP version 1 is currently supported in this file. The `RFC1628.TXT` file located in the `RFC` subdirectory has the SNMP version 2 format.

**NOTE** *If you are using a UNIX platform, you need the `STDUPSV1.MIB` file from the `unix_mib.tar` file on the PowerMIB diskette. This eliminates unwanted carriage return symbols in the MIB file.*

### Choosing a PowerMIB File

If you are using Novell NMS on HP OpenView for Windows, then you should load the MIB file from the appropriate subdirectory. You should also copy all MIB browsing profiles in the `\NVL_NMS\XUPS*.PRF` file for Novell NMS.

If you are not using one of these managers, you should load the `EXIDE.MIB` file.



**NOTE** If you are using a UNIX platform, you need the Powerware MIB file from the *unix\_mib.tar* file on the PowerMIB diskette. This eliminates unwanted carriage return symbols in the MIB file.

### Installing the MIB files

After selecting the proper MIB file(s) for installation, use the following installation procedures for your network management software. Everywhere *filename.mib* appears in the instructions, substitute the correct MIB file name that you selected in the preceding section.

#### HP OpenView for HP-UX

- 1** Log in as the root user.
- 2** The PowerMIB diskette should be write-protected to prevent an accidental overwrite of the original files.
- 3** Insert the PowerMIB diskette into the floppy drive.
- 4** Create a directory to untar the MIB files and change to that directory.
- 5** Copy the *unix\_mib.tar* file to the new directory.
- 6** To expand the directory structure, type the following command and press [Return]: `tar xvf unix_mib.tar ./ov_hpux`
- 7** Change to the *ov\_hpux* subdirectory by typing the following command and press [Return]: `cd ov_hpux`
- 8** To run the script to install the MIBs and traps, type the following command and press [Return]: `./xups_ins`
- 9** The installation is complete.

#### HP OpenView for Windows

To install the MIB on a workstation with HP OpenView for the Windows operating system, use the following procedure.

- 1** The PowerMIB diskette should be write-protected to prevent an accidental overwrite of the original files.
- 2** Insert the PowerMIB diskette into the floppy drive.
- 3** Open File Manager, click on the **drive A** icon, and click on the *ov\_win* subdirectory. Select both MIB files.

- 4** From the File menu, select the Copy option. When the pop-up window appears, type the following command in the To field: `c:\ov\mibs`
- 5** Click on the OK pushbutton to close the window.
- 6** Verify the `exide_ov.mib` and `stdupsv1.mib` files are loaded into the HP `ov\mibs` directory.
- 7** Click on the HP OpenView icon to start HP OpenView.
- 8** Select the Control panel.
- 9** Select the SNMP Manager option.
- 10** Select the Manage DataBase option to display the SNMP Manager window.
- 11** Press the Select pushbutton to add the `rfc1213.mib` file.  
Select the `rfc1213.mib` file in the `ov\mib` directory and click on the OK pushbutton. The SNMP Manager window reappears.
- 12** Press the Select pushbutton to add the `stdupsv1.mib` file.  
Select the `stdupsv1.mib` file and click on the OK pushbutton. The SNMP Manager window reappears.
- 13** Press the Select pushbutton to add the `exide_ov.mib` file.  
Select the `exide_ov.mib` file and click on the OK pushbutton. The SNMP Manager window reappears.
- 14** Press the Add pushbutton to add the selected file to the database. Wait approximately three to four minutes for the file to load. If the file loads successfully, this message appears: `Files successfully added to database`
- 15** Close the MIB windows.

## NetView for AIX

To install the MIB on a workstation with NetView for AIX, perform the following procedure.

- 1** Log in as the root user.
- 2** The PowerMIB diskette should be write-protected to prevent an accidental overwrite of the original files.
- 3** Insert the PowerMIB diskette into the floppy drive.
- 4** Create a directory to untar the MIB files and change to that directory.
- 5** Copy the *unix\_mib.tar* file by typing the following command and press [Return]: **dosread unix\_mib.tar unix\_mib.tar**
- 6** To expand the directory structure, type the following command and press [Return]: **tar xvf unix\_mib.tar ./netview**
- 7** Change to the *netview* subdirectory by typing the following command and press [Return]: **cd netview**
- 8** To run the script to install the MIBs and traps, type the following command and press [Return]: **./xups\_ins**
- 9** From NetView, select Options from the menu bar.
- 10** Then select Load/Unload MIBs: SNMP... from the pull-down.
- 11** Click on the Load pushbutton and select *filename.mib* from the list of files.
- 12** Click on the Close pushbutton to exit.

## Novell NetWare Management System

To install the MIB on the Novell NetWare Management System, use the following procedure.

- 1** The PowerMIB diskette should be write-protected to prevent an accidental overwrite of the original files.
- 2** Insert the PowerMIB diskette into the floppy drive.
- 3** Change to the *current* subdirectory by typing the following command and press [Enter]: **cd \nms\snmpmibs\current**
- 4** To copy the *filename.mib* file from the floppy, type the following command at the prompt: **copy a:\NVL\_NMS\filename.mib**

- 5** Change to the *allmibs* subdirectory by typing the following command and press [Enter]: `cd \nms\snmpmibs\allmibs`
- 6** Copy the *filename.mib* file from the floppy. Repeat Step 4.
- 7** In the NMS window, select Tools from the menu bar, and then select the SNMP MIB Compiler option.
- 8** Click on the Compile pushbutton.
- 9** Select Exit when the compile function completes.

The *read\_me.txt* file on the PowerMIB diskette contains instructions for copying sample profile files for selected MIBs.

### **SNMPc Network Manager**

To install the MIB on the SNMPc Network Manager workstation (with the Windows operating system), use the following procedure.

- 1** The PowerMIB diskette should be write-protected to prevent an accidental overwrite of the original files.
- 2** Insert the PowerMIB diskette into the floppy drive.
- 3** Open File Manager, click on the **drive A** icon, and select the *filename.mib* file.
- 4** From the File menu, select the Copy option. When the pop-up screen appears, type the following command in the To field: `c:\snmpc\mibfiles`
- 5** Click on the OK pushbutton to close the window.
- 6** Open Network Manager.
- 7** If you are running SNMPc version 3.2 or lower, access the *names.txt* file. Edit the file to add the *filename.mib* (insert on a new line after the *standard.mib*).
- 8** Select the SNMPc icon.
- 9** From the Config menu, select the Compile MIB... option.



**NOTE** *The Compile function could take longer than 30 minutes.*

If you are running SNMPc version 3.3, load the desired MIBs.

- 10** Close the MIB windows.

The *\snmpc\snmpc\_rd.me* file contains information for sample configurations.

## SunNet Manager for Solaris

To install the MIB on the SunNet Manager station, use the following procedure.

- 1 Log in as the root user.
- 2 The PowerMIB diskette should be write-protected to prevent an accidental overwrite of the original files.
- 3 Insert the PowerMIB diskette into the floppy drive.
- 4 Search for **na.snmp.schemas** in the */opt/SUNWconn/snm/snm.conf* file by typing the following command and press [Return]:  

```
grep na.snmp.schemas /opt/SUNWconn/snm/snm.conf
```

The system responds with output similar to this:

```
na . snmp . schemas /opt/SUNWconn/snm/agents
```

- 5 If you performed a default installation of SunNet manager, then the *agents* subdirectory is located in */opt/SUNWconn/snm*. Change to that directory by typing: `cd /opt/SUNWconn/snm/agents`



**NOTE** *If you performed a custom installation, then execute these commands in the specific directory where SunNet Manager was installed.*

- 6 Use File Manager or the `cp` command to copy the *unix\_mib.tar* file from the floppy.
- 7 To expand the directory structure, type the following command and press [Return]: `tar xvf unix_mib.tar ./filename.mib`



**NOTE** *If you want to list the contents of the tar file, then use the `tar tf unix_mib.tar` command.*

- 8 Create *filename.mib.oid*, *filename.mib.schema*, and *filename.mib.traps* by typing: `/opt/SUNWconn/snm/bin/mib2schema filename.mib`
- 9 Run the build command by typing: `/opt/SUNWconn/snm/bin/build_oid`
- 10 Search for **na.snmp-trap.default-trapfile** in the */opt/SUNWconn/snm/snm.conf* file by typing the following command and press [Return]:  

```
grep na.snmp-trap.default-trapfile /opt/SUNWconn/snm/snm.conf
```

The system responds with output similar to this:

```
na . snmp - trap . default - trapfile /var / opt / snm / snmp . traps
```

**11** If you performed a default installation, then the *snmp.traps* file is located in */var/opt/snm*. Append the *filename.mib.traps* to the *snmp.traps* file by typing the following command and press [Return]:

```
cat filename.mib.traps >> /var/opt/snm/snmp.traps
```

Appending the file enables the SNM to decode traps.



**NOTE** *If the traps have already been appended, delete the old traps using a text editor such as vi or textedit.*

### **SunNet Manager for SunOS**

To install the MIB on the SunNet Manager station, use the following procedure.

- 1** Log in as the root user.
- 2** The PowerMIB diskette should be write-protected to prevent an accidental overwrite of the original files.
- 3** Insert the PowerMIB diskette into the floppy drive.
- 4** Search for **na.snmp.schemas** in the */usr/snm/snm.conf* file by typing the following command and press [Return]:

```
grep na.snmp.schemas /usr/snm/snm.conf
```

The system responds with output similar to this:

```
na.snmp.schemas /usr/snm/agents
```

- 5** If you performed a default installation of SunNet Manager, then the *agents* subdirectory is located in */usr/snm*. Change to that directory by typing:  
`cd /usr/snm/agents`



**NOTE** *If you performed a custom installation, then you need to execute these commands in the specific directory where SunNet Manager was installed.*

- 6** Use File Manager or some other method to copy the *unix\_mib.tar* file from the floppy.
- 7** To expand the directory structure, type the following command and press [Return]: `tar xvf unix_mib.tar ./filename.mib`



**NOTE** *If you want to list the contents of the tar file, then use the tar tf unix\_mib.tar command.*

- 8** Create *filename.mib.oid*, *filename.mib.schema*, and *filename.mib.traps* by typing: `/usr/snm/bin/mib2schema filename.mib`

- 9 Run the build command by typing: `/usr/snm/bin/build_oid`
- 10 Search for **na.snmp-trap.default-trapfile** in the `/usr/snm/snm.conf` file by typing the following command and press [Return]:  
`grep na.snmp-trap.default-trapfile /usr/snm/snm.conf`  
The system responds with output similar to this:  
`na.snmp-trap.default-trapfile /var/adm/snm/snmp.traps`
- 11 If you performed a default installation, then the `snmp.traps` file is located in `/var/adm/snm`. Append the `filename.mib.traps` to the `snmp.traps` file by typing the following command and press [Return]:  
`cat filename.mib.traps >> /var/adm/snm/snmp.traps`  
Appending the file enables the SNM to decode traps.



**NOTE** *If the traps have already been appended, delete the old traps using a text editor such as vi or textedit.*



Problem	Possible Cause	Corrective Action
ConnectUPS does not respond to SNMP get requests, but does respond to pings.	<p>The UPS is not connected.</p> <p>Wrong community name being used. The get community name that was set during the adapter configuration does not match the one being used by your network management system (NMS) for get requests.</p>	<p>See the next problem.</p> <p>To verify that the community name is mismatched, connect a terminal to the adapter (see Chapter 3, “Local Configuration” on page 9).</p> <p>If the <b>authentication failed, SNMP source: xx.xx.xx.xx:yy</b> message appears (where xx.xx.xx.xx is the IP address of your NMS) every time your NMS does an SNMP get request, then correct the get community name used by the NMS. Note that community names are case-sensitive, and non-alphanumeric characters (such as spaces) are included in the count. Please refer to your NMS user’s guide for more information on configuring community names.</p>
ConnectUPS does not respond to some UPS object get requests, but responds to others.	<p>The UPS is not communicating with the adapter.</p> <p>A particular UPS data object is not implemented on this UPS.</p>	<p>Check all connections between the UPS and adapter and verify the connections are secure. If an extension cable is used between the UPS and adapter, verify that pins 2, 3, and 7 are connected straight through (as per the drawing on page 72).</p> <p>Get <b>upsIdentModel</b> or <b>xupsIdentModel</b> from your NMS. If it responds with the UPS model, then the UPS is communicating properly. No UPS model reports all of the MIB items.</p>
	A Powerware 9315 UPS is not configured properly for communication. (The 9315 UPS is automatically configured.)	Verify that the communication setup for the 9315 UPS is configured for Binary Computer Mode, 19200 baud rate, 8 bits, No parity, 1 stop bit, and all software and hardware handshaking is disabled.

Problem	Possible Cause	Corrective Action
BOOTP does not work.	The ConnectUPS Adapter's physical address or other configuration item is not correctly entered in the hardware address (ha) field of <i>bootptab</i> file on the BOOTP server.	<p>Connect a terminal to the adapter (see page 9). When the adapter sends a BOOTP request, the following message appears on the terminal:</p> <pre>bootp: made BOOTP request (num retries = xx).</pre> <p>If any BOOTP response is received, the adapter prints <code>Got a BOOTP response</code> and then immediately prints the response contents. The response can be checked to see if the correct values were received. A network analysis tool can be used to monitor the sequence and contents of BOOTP requests and responses.</p>
BOOTP server not configured properly.		<p>If no response is received, check the <i>bootptab</i> file on your BOOTP server and verify that the standard "magic cookie value" of 99.130.83.99 is used by your BOOTP server.</p>
BOOTP not received correctly when using the adapter's IP address.		<p>Configure the adapter's IP address to 0.0.0.0 (not defined) and save the configuration to reboot the ConnectUPS.</p>
Using the same community name for SNMP gets and sets; gets work, but sets do not.	The same community name is used for both gets and sets.	<p>Confirm the get community name and set community name are different. You can use the set community name for doing both gets and sets.</p> <p>If you want to use just one community name (such as public) for gets and sets, then configure the adapter's get community name to some value you are not using (such as unused) and configure its set community name to the desired value (public).</p>
There are UPS alarms, as indicated by a non-zero <i>upsAlarmsPresent</i> , but the NMS shows an empty <i>upsAlarmTable</i> .	Some NMSs, such as Novell's NMS 2.0, cannot get the sparsely populated <i>upsAlarmTable</i> reliably.	<p>Try accessing the PowerMIB's <i>xupsAlarmTable</i>.</p>

Problem	Possible Cause	Corrective Action
The BOOTP request succeeds, but the follow-on TFTP request for the xups configuration file fails.	TFTP server not running, or the ConnectUPS Adapter is not authorized by the server for TFTP.	Use a network analysis tool to determine which part of the TFTP process is not working correctly.
	Incorrect configuration file name or path given by BOOTP server.	Connect a terminal to the adapter and examine the data dump of the BOOTP response, particularly, what appears for the Boot file name.
	Adapter configured incorrectly after BOOTP response.	Compare the adapter configuration screen before and after the BOOTP packet is received. Note any configuration items that have changed; for instance, if the BOOTP packet contains an incorrect netmask, the adapter sends the TFTP request to the Default Gateway instead of to the BOOTP and TFTP server. Correct errors in the <i>bootptab</i> file.
For SNMP, setting the <i>upsShutdownAfterDelay</i> control object while the UPS is on battery does not result in the UPS shutting down.	The NMS is not enabled for the Majority Function in the adapter's host table.	See previous problem and solutions.
	Bad cable connection.	Verify cable connections at ConnectUPS and at the concentrator.
	Incorrect ring speed configured in adapter.	Verify the proper ring speed with the network administrator, and configure the ConnectUPS for that speed.



The appendix contains MIB definitions, MIB II interface support, related Internet reference documentation, and ConnectUPS pin assignments.

## PowerMIB Definitions

The PowerMIB consists of three main sections:

- UPS Control Objects
- Alarm and Trap Objects
- UPS Status Objects

With the UPS Control Objects, a network manager can remotely control the UPS by SNMP set commands, performing such tasks as shutting down or turning on the UPS.

The Alarm and Trap Objects alert the SNMP management station to the condition of the UPS and of significant conditions such as Shutdown Imminent.

The UPS Status Objects allow the network manager to check or graph the condition of the UPS and its environment such as monitoring input voltage and output load.

The objects described are for version 2.11 of the PowerMIB; later versions may add objects, which will be described in the PowerMIB itself.

### PowerMIB UPS Control Objects

These objects are used to control the UPS and are managed by SNMP set commands. For example, to get the UPS to turn off in 125 seconds, set *xupsControlOutputOffDelay* to 125. When *xupsControlOutputOffDelay* is read back, it indicates the seconds remaining before shutdown.

#### UPS Control Objects

##### *xupsControlOutputOffDelay*

Turns the UPS off after the specified delay (in seconds).

##### *xupsControlOutputOnDelay*

Turns the UPS on after the specified delay (in seconds).

##### *xupsControlOutputOffTrapDelay*

Sends an *xupsControlOff* trap the specified number of seconds before shutdown (UPS Off).

##### *xupsControlToBypassDelay*

Puts the UPS on Bypass after the specified delay (in seconds).

UPS Control Objects
<b>xupsTestBattery</b> Initiates a 30 second battery test.
<b>xupsEnvAmbientLower&amp;UpperLimit</b> The Lower Limit of the ambient temperature (before xupsAmbientTempBad alarm). The Upper Limit of the ambient temperature (before xupsAmbientTempBad alarm).
<b>xupsTestBatteryStatus</b> Indicates whether the battery test passed, failed, has not been run, or is not supported in this UPS.
<b>xupsConfigDateAndTime</b> Sets or reads the date and time in the UPS with an internal clock.

## PowerMIB Alarm and Trap Objects

The Alarm and the Alarm Event History MIB objects are listed in the following table. The Alarm Event History is a log of significant events that is stored by the UPS in nonvolatile memory; not all UPSs implement this log.

Alarm and Trap Objects
<b>xupsAlarms</b> The number of active alarms in the alarm table.
<b>xupsAlarmEntry</b> Each entry consists of <i>xupsAlarmID</i> , <i>xupsAlarmDescr</i> , <i>xupsAlarmTime</i> .
<b>xupsAlarmID</b> The alarm number (same as its trap number).
<b>xupsAlarmDescr</b> The MIB object identifier number for this alarm.
<b>xupsAlarmTime</b> The <i>sysUpTime</i> when this alarm occurred.
<b>xupsAlarmNumEvents</b> The number of entries in the alarm event table (up to 200).
<b>xupsAlarmEventEntry</b> Each entry consists of <i>xupsAlarmEventID</i> , <i>xupsAlarmEventDateAndTime</i> , <i>xupsAlarmEventKind</i> , <i>xupsAlarmEventDescr</i> .
<b>xupsAlarmEventID</b> The index number of this entry.
<b>xupsAlarmEventDateAndTime</b> The date and time when this event occurred.

Alarm and Trap Objects	
Alarm and Trap Names	Trap Level
<b>xupsAlarmEventKind</b> Indicates whether this event was an alarm occurring or being cleared.	
<b>xupsAlarmEventDescr</b> The MIB object identifier number for this alarm event (there are over 192 distinct events that may be indicated by this value).	
<b>xupsMaxTrapLevel</b> The level of severity of traps that are sent to the requesting host.	
<b>xupsSendTrapType</b> The type of traps that are sent to the requesting host.	
The alarms and traps that are defined by the PowerMIB are listed in the following table. The number in parenthesis following the alarm/trap name represents the alarm and trap number. The <i>xupsControlOff</i> and <i>xupsControlOn</i> names exist only as traps, not alarms.	
<b>xupsControlOff (1)</b> The UPS output power to turn off in a number of seconds equal to <i>xupsControlOutputOffTrapDelay</i> .	Critical
<b>xupsControlOn (2)</b> The UPS output power turns on in a number of seconds equal to <i>xupsControlOutputOnTrapDelay</i> .	Informational
<b>xupsOnBattery (3)</b> The UPS is operating from battery power.	Major
<b>xupsLowBattery (4)</b> The UPS is operating from battery power, and there are only 2 minutes or less of run time available.	Critical
<b>xupsUtilityPowerRestored (5)</b> Input power has been restored after running on battery.	Informational
<b>xupsReturnFromLowBattery (6)</b> The UPS has recovered from a low battery condition.	Informational
<b>xupsOutputOverload (7)</b> The UPS has sensed that output current exceeds the rated value.	Major
<b>xupsInternalFailure (8)</b> Some component of the UPS (rectifier, inverter, control panel) has failed.	Major

Alarm and Trap Names	Trap Level
<b>xupsBatteryDischarged (9)</b> The battery is fully depleted; there is no battery backup protection available in the event of an input power failure.	Critical
<b>xupsInverterFailure (10)</b> The UPS inverter is unavailable due to a failure in its circuitry.	Critical
<b>xupsOnBypass (11)</b> The UPS is operating from bypass power.	Major
<b>xupsBypassNotAvailable (12)</b> The UPS bypass power is not available or out of tolerance.	Minor
<b>xupsOutputOff (13)</b> The UPS output is turned off.	Critical
<b>xupsInputFailure (14)</b> The input power is out of tolerance in voltage, frequency, or phase rotation.	Minor
<b>xupsBuildingAlarm (15)</b> One of the defined building alarms has occurred.	Major
<b>xupsShutdownImminent (16)</b> The UPS turns off the output power in less than 5 seconds.	Critical
<b>xupsOnInverter (17)</b> The UPS is supplying output power through its inverter (normal operation).	Informational
<b>xupsBreakerOpen (20)</b> One of the UPS breakers or contactors has been opened.	Critical
<b>xupsAlarmEntryAdded (21)</b> An alarm not defined in the xups Well Known Alarms has been added to the Alarm Table.	Major
<b>xupsAlarmEntryRemoved (22)</b> An alarm not defined in the xups Well Known Alarms has been removed from the Alarm Table.	Informational
<b>xupsAlarmBatteryBad (23)</b> One or more batteries needs replacing.	Major
<b>xupsOutputOffAsRequested (24)</b> The UPS has shutdown as requested (i.e., the output is off).	Informational
<b>xupsDiagnosticTestFailed (25)</b> The result of the last diagnostic test indicates a failure.	Minor

Alarm and Trap Names	Trap Level
<b>xupsCommunicationsLost (26)</b> A problem has been encountered in the communications between the agent and the UPS.	Major
<b>xupsUpsShutdownPending (27)</b> An xupsControlOutputOffDelay countdown is underway.	Major
<b>xupsAlarmTestInProgress (28)</b> A test is in progress, as initiated and indicated by the Battery Test Group.	Informational
<b>xupsAmbientTempBad (29)</b> The Ambient Temperature is outside of its lower/upper limits.	Major

## PowerMIB UPS Status Objects

The MIB objects that supply monitoring and status information about the UPS are detailed below. These objects were chosen to be similar to the industry-standard UPS MIB objects. Some of the groups implement tables of values, where the measured values for each phase constitute one entry in the table.



**NOTE** Not every UPS model implements all the objects listed below. For example, the Bypass objects are only supported by larger UPSs with a separate bypass feed.

UPS Status Objects
<b>xupsIdentManufacturer</b> The UPS manufacturer name (for example, Fiskars Power Systems).
<b>xupsIdentModel</b> The UPS model (for example, 9315).
<b>xupsIdentSoftwareVersion</b> The firmware revision level(s) of the UPS microcontrollers.
<b>xupsBatTimeRemaining</b> Battery run time in seconds before UPS turns off due to low battery.
<b>xupsBatVoltage</b> Measured battery voltage.
<b>xupsBatCurrent</b> Measured battery current (discharge is positive).
<b>xupsBatCapacity</b> Percent of battery charge.
<b>xupsBatteryAbmStatus</b> Gives the status of the Advanced Battery Management.

UPS Status Objects
<b><i>xupsInputFrequency</i></b> The utility line frequency in tenths of Hz.
<b><i>xupsInputLineBads</i></b> The number of times the input was out of tolerance in voltage or frequency.
<b><i>xupsInputNumPhases</i></b> The number of phases in the input.
<b><i>xUpsInputEntry</i></b> Each entry consists of <i>xupsInputPhase</i> , <i>xupsInputVoltage</i> , <i>xupsInputCurrent</i> , <i>xupsInputWatts</i> .
<b><i>xupsInputPhase</i></b> The number of the phase. Serves as an index for the table.
<b><i>xupsInputVoltage</i></b> The measured input Root Mean Squared (RMS) voltage.
<b><i>xupsInputCurrent</i></b> The measured input current in amps.
<b><i>xupsInputWatts</i></b> The measured input real power in watts.
<b><i>xupsOutputLoad</i></b> The UPS output load in percent of rated capacity.
<b><i>xupsOutputFrequency</i></b> The output frequency in tenths of Hz.
<b><i>xupsOutputNumPhases</i></b> The number of phases in the output.
<b><i>xUpsOutputEntry</i></b> Each entry consists of <i>xupsOutputPhase</i> , <i>xupsOutputVoltage</i> , <i>xupsOutputCurrent</i> , <i>xupsOutputWatts</i> .
<b><i>xupsOutputPhase</i></b> The number of the phase. Serves as an index for the table.
<b><i>xupsOutputVoltage</i></b> The measured output RMS voltage.
<b><i>xupsOutputCurrent</i></b> The measured output current in amps.
<b><i>xupsOutputWatts</i></b> The measured output real power in watts.
<b><i>xupsBypassFrequency</i></b> The bypass frequency in tenths of Hz.

UPS Status Objects
<b><i>xupsBypassNumPhases</i></b> The number of phases in the bypass.
<b><i>xUpsBypassEntry</i></b> Each entry consists of <i>xupsBypassPhase</i> , <i>xupsBypassVoltage</i> .
<b><i>xupsBypassPhase</i></b> The number of the phase. Serves as an index for the table.
<b><i>xupsBypassVoltage</i></b> The measured bypass RMS voltage.
<b><i>xupsConfigOutputVoltage</i></b> The nominal UPS output voltage per phase.
<b><i>xupsEnvAmbientTemp</i></b> The reading of the ambient temperature in the vicinity of the UPS.
<b><i>xupsConfigInputVoltage</i></b> The nominal UPS input voltage per phase.
<b><i>xupsConfigOutputWatts</i></b> The nominal UPS available real power output in watts.
<b><i>xupsConfigOutputFreq</i></b> The nominal output frequency in tenths of Hz.

## Standard UPS MIB

The Standard UPS MIB is compatible with UPS SNMP agents from several vendors and contains some objects not found in the PowerMIB.

### UPS Control Objects

The following table lists the UPS Control objects for the Standard UPS MIB.

UPS Control Objects
<b><i>upsTestId</i></b> The test as named by an OBJECT IDENTIFIER which allows a standard mechanism for the initiation of tests.
<b><i>upsTestSpinLock</i></b> A spin lock on the test subsystem.
<b><i>upsTestResultsSummary</i></b> The results of the current or last UPS diagnostics test performed.

UPS Control Objects
<b><i>upsTestResultsDetail</i></b> Additional information about <i>upsTestResultsSummary</i> .
<b><i>upsTestStartTime</i></b> The value of <i>sysUpTime</i> at the time the test in progress was initiated; or if no test is in progress, the time the previous test was initiated.
<b><i>upsTestElapsedTime</i></b> The amount of time (in TimeTicks) since the test in progress was initiated; or if no test is in progress, the time the previous test took to complete.
<b><i>upsShutdownType</i></b> Determines the nature of the action to be taken at the time when the countdown of the <i>upsShutdownAfterDelay</i> and <i>upsRebootWithDuration</i> objects reaches zero.
<b><i>upsShutdownAfterDelay</i></b> Shuts down either the UPS output voltage or the UPS system.
<b><i>upsStartupAfterDelay</i></b> Starts the output after the indicated number of seconds, including starting the UPS, if necessary.
<b><i>upsRebootWithDuration</i></b> Immediately shuts down either the UPS output voltage or the UPS system.
<b><i>upsAutoRestart</i></b> Causes the UPS system to restart after a shutdown if the shutdown occurred during a power loss as a result of either a <i>upsShutdownAfterDelay</i> or an internal battery depleted condition.
<b>Alarm and Trap Objects</b> The Alarm and Trap MIB objects are listed in the following table.
Alarm and Trap Objects
<b><i>upsAlarmsPresent</i></b> The present number of active alarm conditions.
<b><i>upsAlarmId</i></b> A unique identifier for an alarm condition.
<b><i>upsAlarmDescr</i></b> A reference to an alarm description object.
<b><i>upsAlarmTime</i></b> The value of <i>sysUpTime</i> when the alarm condition was detected.
<b><i>upsTrapOnBattery</i></b> The UPS is operating on battery power.
<b><i>upsTrapTestCompleted</i></b> This trap is sent upon completion of a UPS diagnostic test.

Alarm and Trap Objects
<b><i>upsTrapAlarmEntryAdded</i></b>
This trap is sent each time an alarm is inserted into the alarm table.
<b><i>upsTrapAlarmEntryRemoved</i></b>
This trap is sent each time an alarm is removed from the alarm table.
<b>Common Alarms for Standard UPS MIB</b>
The following table is a list of the well-known alarms for Standard UPS MIBs.
Well-Known Alarms for Standard UPS MIB
<b><i>upsAlarmBatteryBad</i></b>
One or more batteries have been determined to require replacement.
<b><i>upsAlarmOnBattery</i></b>
The UPS is drawing power from the batteries.
<b><i>upsAlarmLowBattery</i></b>
The remaining battery runtime is less than or equal to <i>upsConfigLowBattTime</i> .
<b><i>upsAlarmDepletedBattery</i></b>
The UPS is unable to sustain the present load when and if the utility power is lost.
<b><i>upsAlarmTempBad</i></b>
A temperature is out of tolerance.
<b><i>upsAlarmInputBad</i></b>
An input condition is out of tolerance.
<b><i>upsAlarmOutputBad</i></b>
An output condition other than <i>OutputOverload</i> is out of tolerance.
<b><i>upsAlarmOutputOverload</i></b>
The output load exceeds the UPS output capacity.
<b><i>upsAlarmOnBypass</i></b>
The Bypass is presently engaged on the UPS.
<b><i>upsAlarmBypassBad</i></b>
The Bypass is out of tolerance.
<b><i>upsAlarmOutputOffAsRequested</i></b>
The UPS has shut down as requested.
<b><i>upsAlarmUpsOffAsRequested</i></b>
The entire UPS has shut down as commanded.
<b><i>upsAlarmChargerFailed</i></b>
An uncorrected problem has been detected within the UPS charger subsystem.

Well-Known Alarms for Standard UPS MIB	
<b><i>upsAlarmUpsOutputOff</i></b>	The output of the UPS is in the off state.
<b><i>upsalarmUpsSystemOff</i></b>	The UPS system is in the off state.
<b><i>upsAlarmFanFailure</i></b>	The failure of one or more fans in the UPS has been detected.
<b><i>upsAlarmFuseFailure</i></b>	The failure of one or more fuses has been detected.
<b><i>upsAlarmGeneralFault</i></b>	A general fault in the UPS has been detected.
<b><i>upsAlarmDiagnosticTestFailed</i></b>	The result of the last diagnostic test indicates a failure.
<b><i>upsAlarmCommunicationsLost</i></b>	A problem has been encountered in the communications between the agent and the UPS.
<b><i>upsAlarmAwaitingPower</i></b>	The UPS output is off and the UPS is awaiting the return of input power.
<b><i>upsAlarmShutdownPending</i></b>	A <i>upsShutdownAfterDelay</i> countdown is underway.
<b><i>upsAlarmShutdownImminent</i></b>	The UPS turns off power to the load in less than 5 seconds (this may be either a timed shutdown or a low battery shutdown).
<b><i>upsAlarmTestInProgress</i></b>	A test is in progress, as initiated and indicated by the Test Group.

## UPS Status Objects

The MIB objects that supply monitoring and status information about the UPS are detailed below. Some of the groups implement tables of values, where the measured values for each phase constitute one entry in the table.

UPS Status Objects	
<b><i>upsIdentManufacturer</i></b>	The UPS manufacturer name (for example, Fiskars Power Systems).
<b><i>upsIdentModel</i></b>	The UPS model (for example, 9315).
<b><i>upsIdentUPSSoftwareVersion</i></b>	The UPS firmware/software versions.

UPS Status Objects
<b>upsIdentAgentSoftwareVersion</b> The UPS agent software version.
<b>upsIdentName</b> String identifying the UPS.
<b>upsIdentAttachedDevices</b> String identifying the devices attached to the output of the UPS.
<b>upsBatteryStatus</b> The indication of the capacity remaining in the UPS batteries.
<b>upsSecondsOnBattery</b> Elapsed time since the UPS last switched to battery power, or the time since the network management subsystem was last restarted, whichever is less.
<b>upsEstimatedMinutesRemaining</b> Estimate of the time to battery charge depletion under present load conditions.
<b>upsEstimatedChargeRemaining</b> Estimate of the battery charge remaining expressed as a percent of full charge.
<b>upsBatteryVoltage</b> The magnitude of the present battery voltage.
<b>upsBatteryCurrent</b> The present battery current.
<b>upsBatteryTemperature</b> Ambient temperature at or near the UPS battery casing.
<b>upsInputLineBads</b> The number of times the input voltage entered an out-of-tolerance condition as defined by the manufacturer.
<b>upsInputNumLines</b> The number of input lines used in this device.
<b>upsInputLineIndex</b> The input line identifier (for example, phase).
<b>upsInputFrequency</b> The present input frequency.
<b>upsInputVoltage</b> The magnitude of the present input voltage.
<b>upsInputCurrent</b> The magnitude of the present input current.

UPS Status Objects	
<b><i>upsInputTruePower</i></b>	The magnitude of the present input true RMS power.
<b><i>upsOutputSource</i></b>	The present source of output power.
<b><i>upsOutputFrequency</i></b>	The present output frequency.
<b><i>upsOutputNumLines</i></b>	The number of output lines used in this device.
<b><i>upsOutputLineIndex</i></b>	The output line identifier.
<b><i>upsOutputVoltage</i></b>	The present output voltage.
<b><i>upsOutputCurrent</i></b>	The present output current.
<b><i>upsOutputPower</i></b>	The present output true power.
<b><i>upsOutputPercentLoad</i></b>	Percentage of the UPS power capacity presently used on this output line.
<b><i>upsBypassFrequency</i></b>	Present bypass frequency.
<b><i>upsBypassNumLines</i></b>	The number of bypass lines used in this device.
<b><i>upsBypassLineIndex</i></b>	The bypass line identifier.
<b><i>upsBypassVoltage</i></b>	The present bypass voltage.
<b><i>upsConfigInputVoltage</i></b>	The magnitude of the nominal input voltage.
<b><i>upsConfigInputFreq</i></b>	The nominal input frequency.
<b><i>upsConfigOutputVoltage</i></b>	The magnitude of the nominal output voltage.
<b><i>upsConfigOutputFreq</i></b>	The nominal output frequency.

UPS Status Objects
<b><i>upsConfigOutputVA</i></b> The magnitude of the nominal volt-amperes rating.
<b><i>upsConfigOutputPower</i></b> The magnitude of the nominal true power rating.
<b><i>upsConfigLowBattTime</i></b> The value of <i>upsEstimatedMinutesRemaining</i> at which a low battery condition is declared.
<b><i>upsConfigAudibleStatus</i></b> The requested state of the audible alarm.

## MIB II Interface Group Support

The ConnectUPS Adapter can control communications via the MIB II Interface Group using the following interfaces:

- The first interface (*ifIndex* = 1) is the Network Interface.
- The second interface (*ifIndex* = 2) is the Serial Interface connected to the UPS.

## Rebooting the ConnectUPS Adapter

By setting *ifAdminStatus.1* to *down*, you can reset the ConnectUPS Adapter just as though it had a power-on reset. If the ConnectUPS Adapter is configured to send traps to your management station, it should receive the *coldStart* trap from the ConnectUPS Adapter within 10 to 60 seconds.

## Monitoring and Controlling Serial Ports

By setting *ifAdminStatus.2* to *down*, the ConnectUPS Adapter is forced to stop communicating on the associated serial port. Resetting the *ifAdminStatus* object to *up* allows the communications to restart.

If a ConnectUPS Adapter has not established communication with a UPS on a given serial port, that port's *ifOperStatus* is *down*, and *ifSpeed* identifies the baud rate the ConnectUPS Adapter is currently using to attempt the communications.

Other interface objects count events for the serial ports; some of the error counters are:

- ifInUnknownProtocols* - unrecognized commands
- ifInErrors* - bad data received (usually due to noise on the serial line)
- ifInDiscards* - received data that couldn't be processed
- ifOutErrors* - UPS timeouts (times UPS did not respond)
- ifOutDiscards* - had a request that could not be sent to the UPS

### **Authentication Failure Traps**

authFail traps can be disabled for a management station if that station sets *snmpEnableAuthenTraps* to *disable*. If you would like to learn the source of the authFail traps, look at the string for *xupsTrapMessage*, included in the authFail trap message, which gives the IP address of the source.

### **Related Internet Documentation**

For more information about the Internet suite of protocols, you can consult the Request for Comments (RFC) document series. RFCs are research notes that are available in both printed and electronic form. RFCs are not standardized, but some are updated periodically to reflect new or changing information.

Printed copies of RFCs are available for a fee from the DDN Network Information Center:

Address:	<b>DDN Network Information Center</b> <b>14200 Park Meadow Drive</b> <b>Suite 200</b> <b>Chantilly, VA USA 22021</b>
Telephone:	<b>1-800-365-3642</b> <b>1-703-802-4535</b>
E-mail address:	<b>nic@nic.ddn.mil</b>

Other sites also maintain copies of RFCs. This list may change, but some of these Internet addresses include:

**ftp://nis.nsf.net**  
**ftp://internic.net**  
**ftp://venera.isi.edu**  
**ftp://wuarchive.wustl.edu**  
**ftp://nisc.jvnc.net**  
**ftp://src.doc.ic.ac.uk**

The tables on the following pages list the major RFCs you may want to request for reference.

These are key administrative RFCs:

RFC	Name	Status
1009	Gateway Requirements	Required
1122	Host Requirements - Communications	Required
1123	Host Requirements - Applications	Required
1340	Assigned Numbers	Required
1410	IAB Official Protocol Standards	Required

These RFCs pertain to the core of the Internet suite of protocols:

RFC	Name	Status
791	Internet Protocol	Required
792	Internet Control Message Protocol	Required
919	Broadcast Datagrams	Required
922	Broadcast Datagrams with Subnets	Required
950	Subnet Extension	Required
768	User Datagram Protocol	Recommended
1034	Domain Name System Concepts and Facilities	Recommended
1035	Domain Name System Implementation and Specification	Recommended
1350	TFTP Protocol (revision 2)	Elective

These RFCs pertain to transmission of the IP over various media:

RFC	Name	Standard
826	Address Resolution Protocol	Full
894	Ethernet Networks	Full
951	Bootstrap Protocol (BOOTP)	
1497	BOOTP Vendor Information Extensions	
1542	Clarifications and Extensions of the Bootstrap Protocol (BOOTP)	

These RFCs define the original Internet-standard network management framework:

RFC	Name	Status
1155	Structure of Management Information	Recommended
1157	Simple Network Management Protocol	Recommended
1212	Concise MIB Definitions	Recommended
1213	Management Information Base II	Recommended

These RFCs define MIB modules for particular environments:

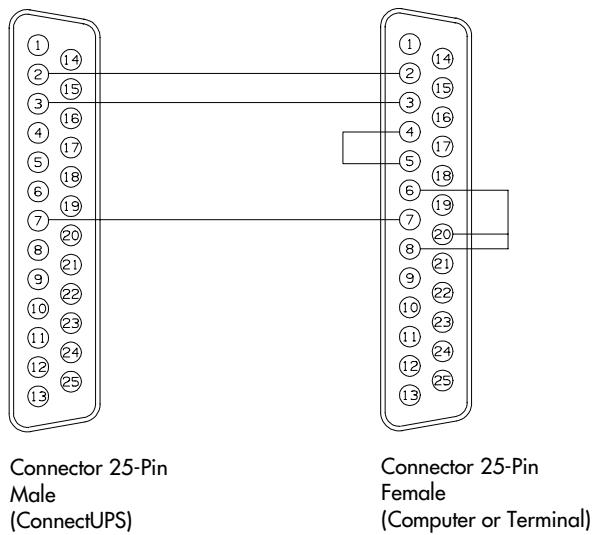
RFC	Name	Standard
1129	Extensions to the generic-interface MIB	Proposed
1239	Reassignment of Experimental MIBs to Standard MIBs	Proposed
1628	UPS MIB	Proposed

These are miscellaneous informational RFCs:

RFC	Name	Status
1215	A Convention for Defining Traps for Use with the SNMP	Informational
1270	SNMP Communication Services	Informational

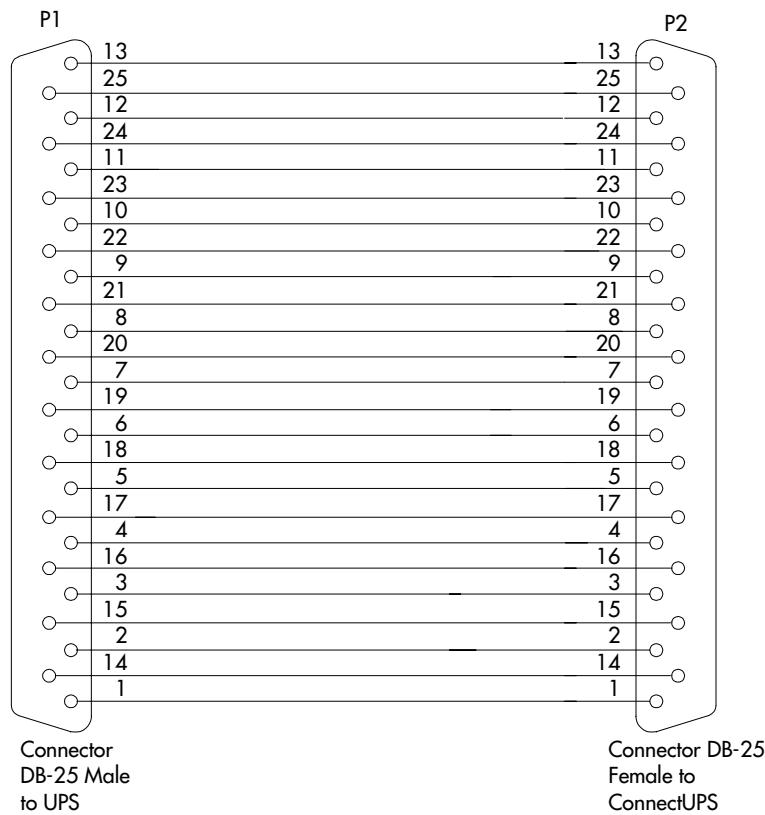
## Pin Assignments

The following pin-out is for the DB-25 to DB-25 serial cord used for configuring the ConnectUPS:



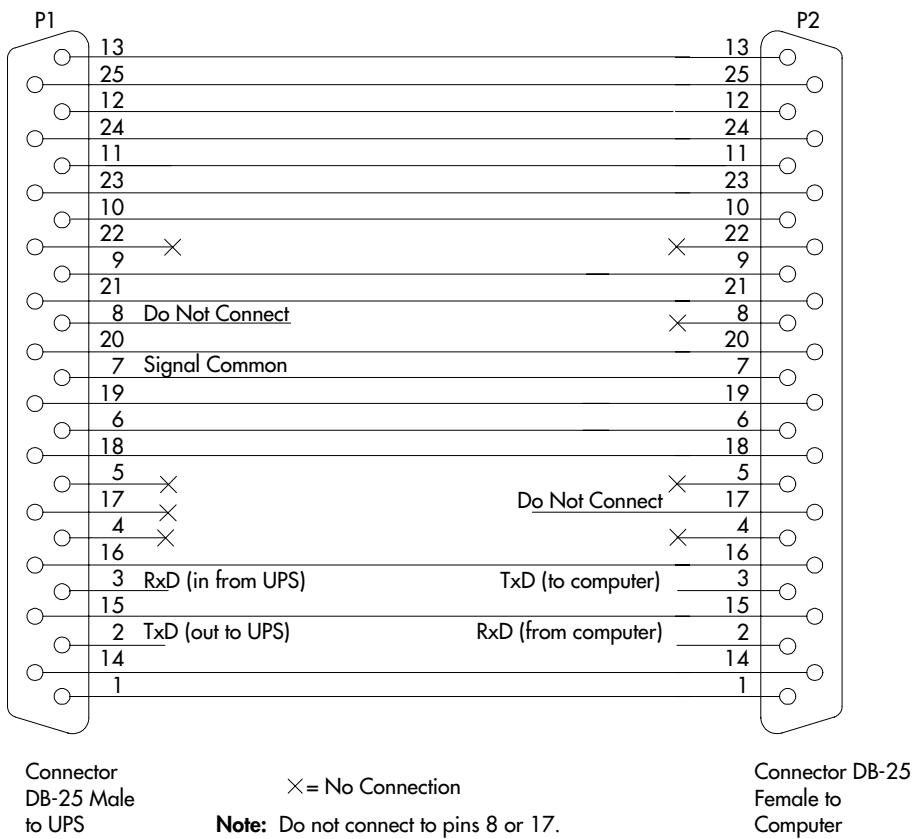
**Figure 9. Cable Pin Drawing**

The following pin-out is for an optional serial extension cable from the ConnectUPS Adapter to the UPS:



**Figure 10. ConnectUPS to UPS Extension Cable Pin-Out**

The following pin-out shows the signals passed through the ConnectUPS Adapter from the UPS:



**Figure 11. ConnectUPS Pin-Out Drawing**



## FCC Statement

The ConnectUPS configurations vary. Some configurations may or may not be classified by the Federal Communications Commission (FCC). If your ConnectUPS unit is classified by these standards, the corresponding information applies:

### Class A

**NOTE** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. Operation of this equipment in a residential area is likely to cause interference in which case the user will be required to correct the interference at his own expense.

## European EMC Statement

Some configurations are classified under EN50091-2 as "Class-A UPS for Unrestricted Sales Distribution." For these configurations, the following applies:

**WARNING** This is a Class A-UPS Product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take additional measures.

## EC Declaration of Conformity

Units that are labeled with a CE mark comply with the following EU directives:

73/23/EEC      Council Directive on equipment designed for use within certain voltage limits.  
93/68/EEC      Amending Directive 73/23/EEC.  
89/336/EEC      Council Directive relating to electromagnetic compatibility.

The EC Declaration of Conformity is available upon request for products with a CE mark. For copies of the EC Declaration of Conformity, contact:

Exide Electronics SA, MPL House  
Attn: General Manager  
Prescott Road  
Poyle Colnbrook  
Berkshire, England SL3 0BE  
Phone: 44.1753.686200  
Fax: 44.1753.686827

