Power Administrator ™ 800

User Manual

SYSTEMS ENHANCEMENT CORPORATION

PA-SE-26/02

10/1/96

Limited Warranty

Systems Enhancement Corporation (hereinafter "SE") warrants that each product sold by SE is free from defects in materials and workmanship under normal use. This warranty is applicable only to the initial end user (END USER), and is not transferable. The duration of this warranty is ninety (90) days from the date of the first retail sale or the date of delivery to the PURCHASER, whichever occurs first, subject to the following conditions.

If the PURCHASER discovers within the duration of this warranty a defect in material or workmanship, the PURCHASER must promptly notify SE in writing within the duration of the warranty. SE's obligation under this warranty is limited to the replacement or repair, subject to the conditions specified below, of such product returned intact to SE which shall appear to SE, upon inspection, to have been defective. Replacement or repair will be made at SE's Technical Support Center, 174 Chesterfield Industrial Boulevard, Chesterfield, MO. Such repair or replacement shall be at SE's expense. This warranty does not cover any taxes which may be due in connection with replacement or repair, nor any installation, removal, transportation or postage costs. These expenses will be paid by PURCHASER. If SE is unable to repair or replace the product to conform to this warranty after a reasonable number of attempts, SE will refund the purchase price to the purchaser or dealer through which the product was sold. Remedies under this warranty are expressly limited to those specified above.

TO THE EXTENT ALLOWED BY LAW, SE DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ON THIS PRODUCT IS LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY. TO THE EXTENT ALLOWED BY LAW, SE SHALL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS, INJURIES TO PROPERTY, LOSS OF USE OF THE PRODUCT OR ANY ASSOCIATED EQUIPMENT.

Some states do not allow limitations on how long an implied warranty lasts, so that the above limitation on duration of implied warranties may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. You are advised to consult applicable state laws.

No warranty is made with respect to other products sold by SE which do not bear the name Systems Enhancement Corporation, and no recommendation of such other product shall imply or constitute any warranty with respect to them. The warranty does not apply to products which have been abused, mishandled, modified, damaged, by Act of God or a source external to the product; repaired by others; or which have their serial numbers removed or altered.

Please register your unit by completing the Warranty Registration Card enclosed with your product. Should you need to make a claim, please contact your dealer or Systems Enhancement Corporation; giving the serial number, date of purchase and details of the fault.

Governing Law

This statement shall be construed, interpreted, and governed by the laws of the State of Missouri.

YOU ACKNOWLEDGE THAT YOU HAVE READ THIS AGREEMENT, UNDERSTAND IT AND AGREE TO BE BOUND BY ITS TERMS AND CONDITIONS. YOU FURTHER AGREE THAT THIS IS THE SOLE AGREEMENT BETWEEN US AND SUPERSEDES ANY PROPOSAL OR AGREEMENT ORAL OR WRITTEN BETWEEN US RELATING TO THE SUBJECT MATTER.

(Some states do not allow the exclusion or limitation of liability for consequential or incidental damages, so the above limitations may not apply to you.)

FCC Compliance

Power Administrator 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 instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.

CHANGES OR MODIFICATIONS TO THIS EQUIPMENT NOT EXPRESSLY APPROVED BY THE MANUFACTURER MAY VOID YOUR WARRANTY AND/OR AUTHORITY TO OPERATE THE EQUIPMENT.

Ratings: 115VAC 50/60Hz   11.5A Per Outlet (Not to Exceed 11.5A Total for All Outlets)

Warning: No User Serviceable Parts Inside. Opening the PA-800 will void the manufacturer warranty and could subject the operator to lethal voltages. Refer all units for repair to your reseller or Systems Enhancement Corporation.

Trademarks

Power Administrator is a trademark of Systems Enhancement Corporation.

IBM, IBM NetView/6000 are trademarks or registered trademarks of International Business Machines Corp.

Hewlett-Packard, HP, HP Open View are trademarks or registered trademarks of Hewlett-Packard Company.

Microsoft, MS, MS-DOS, XENIX are registered trademarks and Windows, Windows NT, LAN Manager, and Win32 are trademarks of Microsoft Corporation.

Novell and NetWare are registered trademarks, and NLM is a trademark of Novell, Inc.

Conventions Used In This Guide

This guide uses these conventions:

Bold italic print, as shown in this example, indicates field names, menu items, or values in the Power Administrator configuration menu.

Bold print, as shown in this example, indicates items that you must type exactly as they appear.

Italic print words or letters in braces { } indicate values that must be supplied by the user. For example: *{drive}*:**\setup**

Italic print words or letters in brackets < > indicate keys to press. If two keys are separated by a + plus symbol, then the first key should be pressed and held down while pressing the second key. For example: *<alt+enter>*.

Note: Important information set off from the text.

Warning: These messages alert you to specific procedures or practices; serious consequences may result including injury if you disregard them.

Table of Contents

IPR Page 7

TABLE OF FIGURES

Introduction

Congratulations on your purchase of the *Power Administrator™ 800* (PA-800). The PA-800 is a microprocessor-controlled receptacle management device for in-band and out-of-band control of AC power to remote equipment. The PA-800 provides flexible power management to critical equipment, such as hubs, routers, rack-mount servers, or other gear that require occasional power-down or power-up under remote control.

With the Windows '95/NT software provided, users may selectively apply power to devices connected to the PA-800 or schedule power-up and power-down sequences for automatic occurrence at a user-defined time or when triggered by an alarm input (such as a temperature or humidity alarm or a contact-closure input.)

Optional network and modem interfaces allow remote operation via dialup, telnet, or SNMP (Simple Network Management Protocol). See Section N for more discussion of network and modem support.

PA-800 Features
The PA-800 provides the following features. Note that not all configurations use all features.

Remote Monitoring
Monitors the input and output conditions for a connected UPS or other device.

Remote Contact Monitoring
Monitors two relay contact closures for user-definable events.

Six Integrated Receptacles
For powering six devices (11.5A maximum load).

Scalability
Up to sixteen PA-800 units may be connected via a single interface for control of up to 128 outlets.

Front Panel Interface
Allows manual operation via the face of the PA-800. May be disabled.

Integrated Load Meter

Provides load information on the front panel and via the software interface.

Optional Temperature/Humidity Input

Allows the PA-800 to provide environmental as well as power management to the rack.

Optional Network Interface

Ethernet (10BaseT or 10Base2) interface for SNMP or Telnet operation over TCP/IP.   Generate network traps at a central Network Management Station (NMS) when alarm conditions occur.

Optional Modem Interface

For dialup operations with a simple terminal-mode interface or protocol support.

Pager Support

Dialout on alarm to alert maintenance personnel.

Slave Shutdown Feature

The PA-800 can be configured to send shutdown indications to attached servers or other equipment prior to powering down the corresponding receptacle. This allows graceful operating system shutdown prior to power-off.

Enunciator Outputs

The PA-800 may be configured to send contact output indications to an enunciator panel to allow alarm conditions to be displayed for the operator.

Optional Remote Receptacles

The PA-800 supports two remote receptacles for switching remote contactors or relays.   Ideal for high-voltage and/or high-current loads. Remote receptacles are sold separately.

Package Contents

The PA-800 package as shipped contains the following items:

Standard Contents	Optional Components
PA-800 Unit	Telephone Interface Cable (Modem Units Only)
Window Software Disk (3.5")	MIB disk - 3.5" DOS format (SNMP capable units only)
RS-232 Interface cable	MIB disk - 3.5" Unix format (SNMP capable units only)
Power Cord (U.S. versions only)	
This User Manual	
Registration Card	
Packing Material	

PA-800 Front Panel

The following illustrations show the arrangement of the PA-800's front and rear panels. The front panel illustration points out the location of the manual override switches, power LED, and load meter.

Power Indication

Onboard Receptacle Control

Remote Receptacle Control

Load Meter
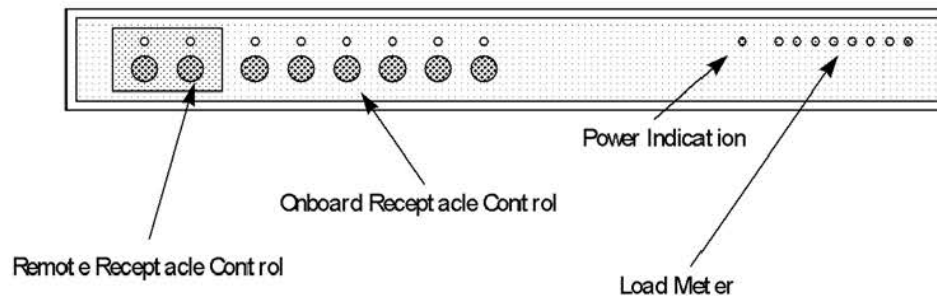
Figure 1 PA-800 Front Panel

Receptacle LEDs

The LEDs on the face of the PA-800 indicate output status of the unit. For Remote Receptacles and Onboard Receptacles the LED indicates that the associated receptacle is ON or OFF. For onboard receptacles, these outlets are on the reverse of the PA-800. Remote receptacles are connected to the R1 and R2 connectors on the reverse of the PA-800.

A slowly-flashing indicates that the receptacle is OFF with a power-on scheduled. A quickly-flashing LED indicates that the receptacle is ON with a power-off scheduled.

Receptacle Controls

Onboard and Remote Receptacles connected to the Power Administrator may be commanded on or off from the front panel by pressing and holding the associated switch on the PA-800. An audible beep will be heard. *Note that the front-panel may be disabled via the Configuration Applet.*

Power Indication

This LED indicates that power is present to the PA-800.

Load Meter

The load meter on the PA-800 indicates the output load connected to the unit. Each LED is approximately 12% of full-load. When the unit is overloaded, the rightmost (red) LED is illuminated. See the *Operation* section of this manual for a discussion of operation during overload.

The PA-800 Rear Panel

Figure 2 shows the layout of the PA-800 rear panel. See the *Connector Pinouts* section if you require information on how to wire a connector for operation with the PA-800.
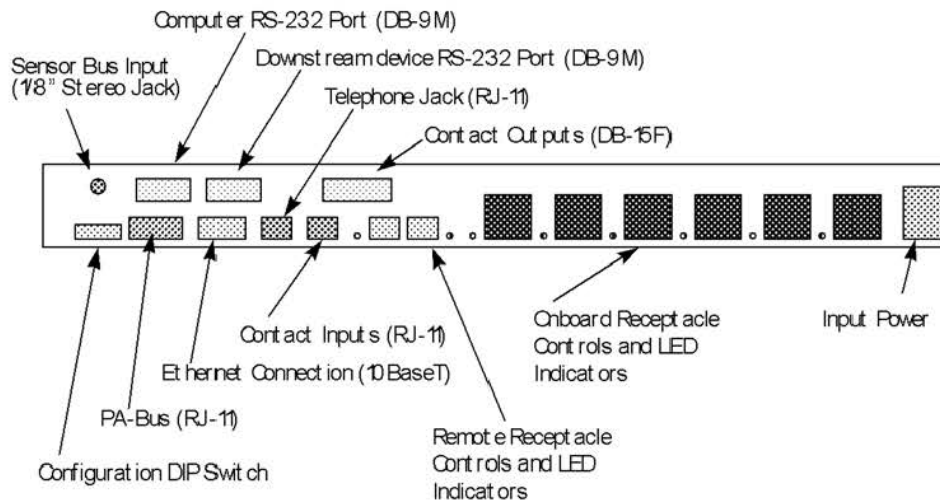
Figure 2 PA-800 Rear Panel

Power Interfaces

The PA-800 has a single input power connector and six (6) output receptacles. Each receptacle is rated for 11.5A load.

Important: Total output load for the PA-800 is not to exceed 11.5A.

Configuration DIP Switch

Basic configuration of the PA-800 is via a DIP switch on the left side of the rear of the unit.

You must configure the DIP switch for correct operation.

IPR Page 16

Figure 3 shows the DIP switches and their meanings.

Figure 3 - DIP Switch

Rear Panel Electronic Interfaces

Electronic interfaces on the PA-800 include the following. Note that not all interfaces are used by every configuration.

Serial Port "1"

DB-9M connector for RS-232 communication with controlling computer.

Serial Port "2"

DB-9M connector for RS-232 communication with optionally attached UPS or other device.

"PABus" Port

Twin RJ-11 connectors to which all PA-800 units are attached.

Contact Input "IN" Port

RJ11 connector for input contact alarms.

Temperature/Humidity Bus "Sensor" Port

Stereo jack for connection of temperature and humidity sensor module. Sensor module is sold separately.

Remote Receptacle #1 "R1" Port

RJ11 jack for control of remote receptacle #1. Note that remote receptacle controls are located to the left of controls for onboard receptacles on the front of the PA-800.

Remote Receptacle #2 "R2" Port

RJ11 jack for control of remote receptacle #2.

Network Connection "10BaseT" Port

This is used for SNMP-capable units only. RJ45 connector for connection onto 10BaseT Ethernet networks.

Telephone "TEL" Jack

This is used for modem units only. Standard RJ12 telephone jack for connection to the end-user's telephone line.

Contacts "OUT" Port

DB15F connector provides contact outputs to initiate operating system shutdown on attached servers prior to power-off. This connector may be configured to drive an enunciator panel for indicating alarm status.

This section describes the installation of the PA-800 Unit #1.   For installation of Units #2 through #16, see *Installation of Units 2 to 16.*

DIP Switch Configuration

Before installing the PA-800, ensure that your DIP switch settings (on the reverse of the unit) are correct.   *Figure 3* shows the meaning of DIP switches.

The PA-800 will not communicate properly if the DIP switch is incorrectly configured.

Configure Address

For installation of Unit #1, ensure that DIP switches 1 to 4 are DOWN (corresponding to Unit #1).

Configure Baud Rates

DIP Switch #5 corresponds to serial port "1" (for connection to your PC). For 9600 baud operation, this DIP switch should be UP. For 2400 Baud operation, this DIP switch should be DOWN.

If using a downstream device is connected, DIP switch #7 indicates the baud rate for serial port "2". For 9600 baud operation, this DIP switch should be UP. For 2400 Baud operation, this DIP switch should be DOWN.

Termination Resistor

Ensure that DIP switch #8 is DOWN to indicate that Unit #1 is the first PA-800 in the chain.

Rack Mount Installation

To install the PA-800 in a 19" or 23" rack, ensure that the unit has been shipped with factory-installed rack-mount hardware. If not, see your reseller to upgrade the unit to a rack-mount configuration.

Please see the important notice on the following page for rack-mount installation.

IMPORTANT INFORMATION FOR RACK-MOUNT USERS

Please note the following important considerations for rack-mount operation of the PA-800:

- Do not exceed to Maximum Recommended Ambient of 120° Fahrenheit. Racks often achieve elevated temperatures relative to outside surroundings. Verify that worst-case temperatures will not exceed this 120° limit.

- Ensure that adequate airflow is maintained on sides and rear of the rack.

- Ensure that the rack in which the PA-800 is mounted has sufficient loading in its base to eliminate the possibility of the rack tipping.

- Do not use the PA-800 as a load-bearing shelf.

- Do not exceed the output load limit of 11.5A.

- Ensure that the rack and all equipment are properly grounded.

- Ensure that the rack environment has humidity of less than 90% non-condensing.

IPR Page 20

Standalone Installation

The PA-800 may also operate in a standalone (stackable) mode. Ensure that adequate ventilation space (at least 6") is provided on the sides of the unit.

Install   Communications Connectors

To communicate with the PA, you must install appropriate cables, depending upon your configuration.

RS-232 Connection

For direct communication with an attached PC or workstation, connect the serial cable shipped with your PA-800 to the DB-9M connector labeled *1* on the rear of the unit. Ensure that the baud rate setting for channel 1 is set (DIP switch #5) correctly (see *DIP Switch Configuration*, above*)*.

Downstream Device Connection

If you have an attached UPS or other device, connect is communication cable to the DB-9M connector labeled *2* on the rear of the unit. Ensure that the baud rate setting for channel 2 (DIP switch #7) matches that of the device (see *DIP Switch Configuration*, above*)*.

Ethernet Connections

If you have the optional LAN interface installed, plug a standard RJ-45 patch cable (10BaseT) into the connector labeled "10BaseT". The remaining end should be plugged into a 10BaseT hub or concentrator.

You must configure the network settings for the network interface card prior to network operation. See the *Network Operation* section of this manual for details.

Modem Connection

If you have the optional internal modem, plug the enclosed telephone patch cord into the "TEL" connector. The remaining end should be plugged into a standard telephone wall jack.

You must configure the settings for the modem prior to modem operation. See the *Modem Operation* section of this manual for details.

Contact Input Connections

Contact input connections vary from installation to installation. Consult *Connector Pinouts* for electrical definitions for wiring contact inputs to the PA-800.

Remote Receptacle Connections

If you have purchased remote receptacles, plug the control flat-cable into PA-800 remote control connectors labeled "R1" and "R2". Plug the power cable for the receptacle into a 120VAC outlet. *See instructions included with the remote receptacle unit for operation instructions.*

Contact Output Connections

Various configurations for output connectors are available based upon the user's requirements. See *Misc Settings* for the meanings of the configurations discussed below.

Enunciator Cable

For output to an enunciator panel, you must obtain SEC cable SE-XX-XXX. Plug the DB15-M cable end into the connector labeled "OUT" on the reverse of the PA-800. See *Connector Pinouts* for information on wiring to an enunciator panel.

Mirror Cables

To use the mirror capabilities, you must obtain SEC cable SE-XXX-XXX for Unix or SE-XXX-XXX for Windows and Novell installations. Plug the DB15-M cable end into the connector labeled "OUT" and the remaining ends into the servers you wish to have monitor the contact inputs to the PA-800. You must configure the shutdown software on the server as you would for the downstream UPS. See your shutdown software manual for details on cable type configuration.

Note: When using the Mirror feature, please ensure that automatic shutdown timers for Standard and High Priority (AC Fail and Low Battery) for a given receptacle exceed those specified by the shutdown software running on a server

attached to that receptacle. Failure to do so may result in power being removed from the server before graceful operating system shutdown is completed on that server.

Slave Shutdown Cables

To use the slave shutdown feature of the PA-800, you must obtain SEC cable SE-XXX-XXX for Unix or SE-XXX-XXX for Windows and Novell installations. Plug the DB15-M cable end into the connector labeled "OUT" and the remaining ends into the servers you wish to have monitor the contact inputs to the PA-800. You must configure the shutdown software on the server as you would for the downstream UPS. See your shutdown software manual for details on cable configuration.

Note: When using the Slave Shutdown feature, please ensure that all shutdown timers (automatic or manual) for a given receptacle exceed those specified by the shutdown software running on a server attached to that receptacle. Failure to do so may result in power being removed from the server before graceful operating system shutdown is completed on that server.

Power Connections

Plug devices you wish to control into the PA-800. Exceeding the load limitations of the PA-800 will result in the internal breaker tripping.

IMPORTANT NOTE: Each   integral   output receptacle (labeled "1" through "6" on the reverse of the PA-800) is rated for 11.5A load. Note that the maximum output for the entire unit is not to exceed 11.5A.

Plug the enclosed 15A 120VAC power cord into the jack labeled "INPUT".

IMPORTANT NOTE: YOU MUST USE THE ENCLOSED POWER CORD (OR ITS EQUIVALENT) WITH YOUR PA-800. FAILURE TO DO SO MAY RESULT A FIRE OR SHOCK HAZARD.

IPR Page 23

Installation of Additional Units

Up to sixteen PA-800 may be connected together to allow communications via a single control application or network connection. To do so, the PA-Bus is used. Unit #1 acts as a *gateway* in this scenario, directing requests to other units down the PA-Bus and directing responses to the requesting computer through the appropriate communications port.

Multiple unit installation requires special DIP switch settings and connection to the PA-Bus as detailed below.

DIP Switch Configuration

Configure Address

You must number your PA-800 units consecutively from 1 to 16. Thus, if you are adding a second PA-800 to your installation DIP switches 1 to 4 should correspond to **Unit 2** for the PA-800 you are adding to the chain. See *Figure 3* for DIP switches and their meaning.

Termination Resistor

Ensure that the rightmost DIP switch (#8) for the first and last PA-800 units in the chain is DOWN and that the rightmost DIP switch on all other PA-800 units is UP.

Connect to PA-Bus

If you are connecting the PA-800 to an existing unit, connect the PA-Bus expansion cable to the PA-Bus connector located on the last PA-800 in the chain. *Figure 4* shows how to connect more than 1 PA-800 together.

IPR Page 24

Figure 4 Connection of Additional PA-800 Units

IPR Page 25

PA-800 Operation

Power-Up Sequence

At power-up, the PA-800 will verify that non-volatile memory is intact and then turn outlets on in the order specified by the user. By default, the sequence is R1, followed one second later by R2, followed by onboard receptacle #1, #2 and so on.

Front Panel Interface

From the front panel, the user may manually power-up or power down receptacles on the PA-800 on demand. The configuration will be saved to memory for the next power up.

Note that computer receptacle settings take precedence over front-panel settings. Thus, if an outlet is commanded on or off under computer control, the user's settings will be overridden at power-up.

Communications

The Power Administrator supports multiple communications interfaces concurrently. This allows both in-band and out-of-band communications access with the unit.

Serial Port "1"

Modem Input

SNMP Support

Downstream Device on Serial Port "2"

Alarm Operation

The PA-800 can be configured to automatically schedule power off to outlets upon receipt of an alarm condition. Valid alarms are from the temperature and humidity sensor, overload, or contact inputs from the "IN" connector on the rear of the unit.

Low Priority Alarm

Low priority alarms are defined as any alarm except Contact Alarm #2 ("High Priority Alarm"). The operation of the PA-800 upon

receipt of an alarm is defined for each receptacle. See *Configuration Panel* section of this manual for discussion of how to enable load-shedding after receipt of an alarm.

High Priority Alarm

A user-defined override allows automatic, irrevocable load-shedding upon receipt of a high-priority alarm. A global, user-defined override time is used in lieu of the Low Priority Alarm time (which is specified for each output receptacle.

Auto Load Shed

If auto load-shedding is enabled, the PA-800 will shed load when the rightmost LED is illuminated.

Priority-based Load Shedding

Load shedding is accomplished by turning outlets off at two-second intervals (beginning with receptacle #6 down to #1) until the overload condition is cleared.

If load-shedding is disabled, the PA-800 will not shed load. The output breaker will likely trip in this event.

Internal Breaker Operation

The PA-800 has an internal breaker that automatically resets after a few minutes. Please note that the PA-800 will attempt to restart output loads after a breaker trip up to a user-defined limit within a user-defined time interval. After this, the PA-800 will require manual restart (either through the computer or manually from the front panel.

For example, if the user has specified three trips in five minutes, the PA-800 will attempt to restart twice within a five minute window. If the breaker trips a third time, the PA-800 will not restart the outputs.

IPR Page 28

Configuration Applet

Distribution Media

The PA-800 Control Applet is shipped on two 3.5" floppy diskettes. To install, insert Disk 1 into your floppy drive. There are two recommended methods of installation as listed below.

Installation Method 1

From the **Start** Menu, select **Settings ...Control Panel.** In the Control Panel, select **Add/Remove Programs.** Select the **Install** button to install the PA-800 Control Applet.

Follow the instructions in the installation procedure.

Installation Method 2

Alternatively, selecting **SETUP** under the **Run...** option in the start menu will install the application.

Cable Installation

Ensure that the enclosed RS-232 cable is plugged into an available COM port on your PC and into the connector labeled "1" on the rear of the PA-800. Apply power to the PA-800.

Software Activation

To activate the program, select the **PA-800 Control Applet** icon under **Programs...** in the **Start** Menu.

IPR Page 29

Comm Settings

The Comm Setup Index Tab allows baud and COM port selection.
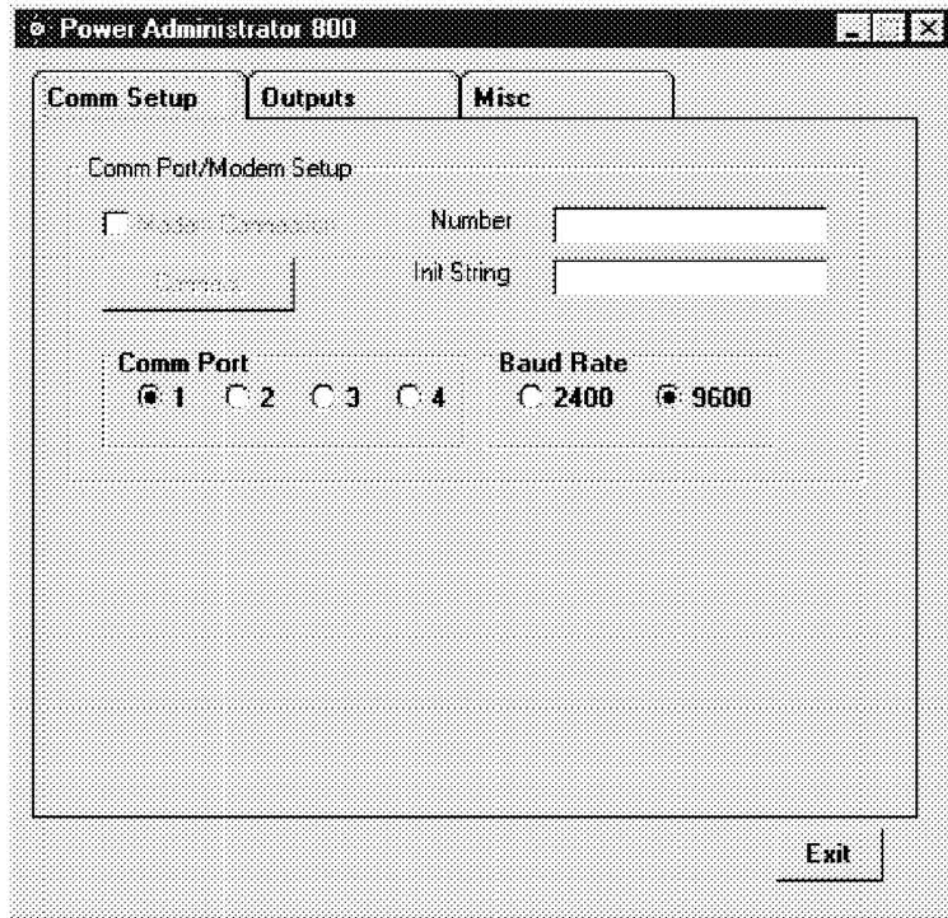
Comm Port

Select the COM port to which the PA-800 RS-232 cable is connected.

Baud Rate

This selection must match the setting for Port 1 of the PA-800. For 2400 baud operation, DIP switch #5 should be DOWN. For 9600 baud operation, DIP switch #5 should be UP.

Modem Operation

For operation with a Hayes® compatible modem, select the **Modem Connection** checkbox and enter the appropriate telephone number and modem initialization string. Pressing **Connect** will then dial the modem and establish a connection with your remote PA-800.

IPR Page 30

Output Panel

The **Output** index tab show the general status of the PA-800 outputs and allows on-demand power switching as well as configuration of receptacle names and other information. Pressing the color-coded control buttons on the left of the panel will turn the associated output on or off depending upon its current state.
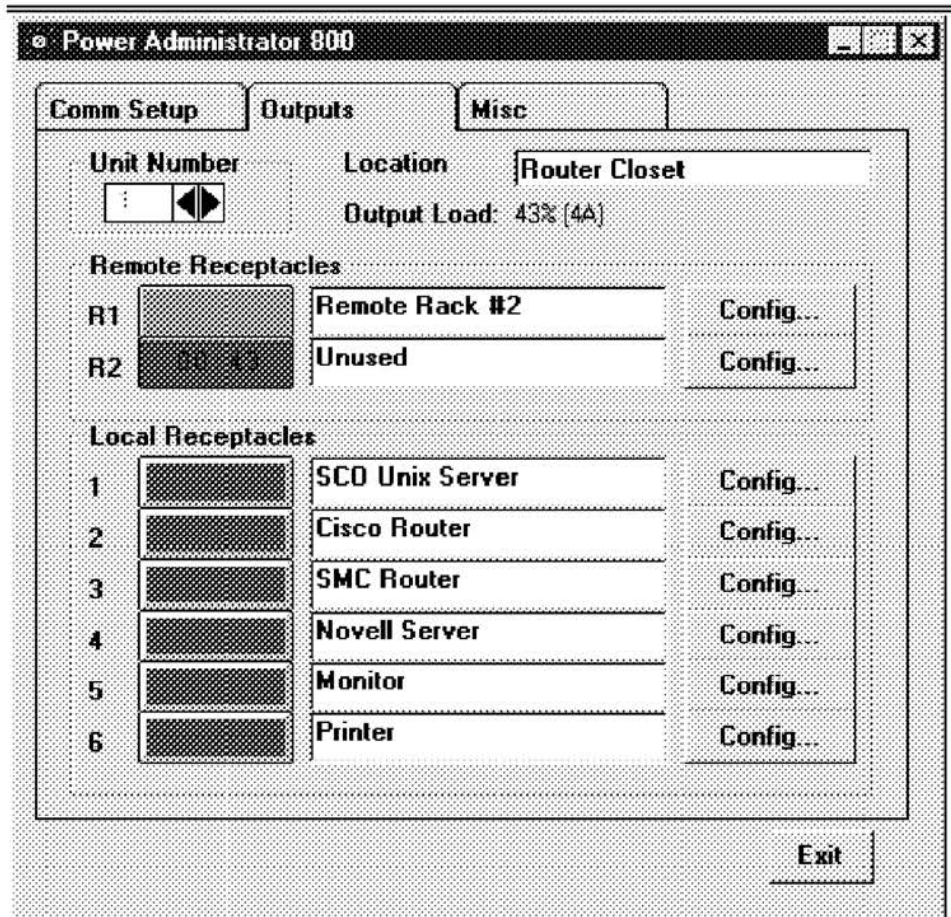
Unit Number

For installations with more that one PA-800 installed, selection of units is accomplished by clicking on this control. In single PA-800 installations, this number should not be changed.

Location

This field allows the user to uniquely identify the PA-800 by location. Maximum field length is 24 characters.

Output Load

This field displays the output load connected to the PA-800 in percent and Amperes. *This does not include loads on any attached remote receptacles.*

Configuration Dialog

Each receptacle's characteristics may be set by selecting the **Config...** button next to the receptacle name. The following panel appears:

Receptacle Name

The name of the device attached to the receptacle.

Schedule Power On {Off}

If you wish to schedule a power on or power off, simply enter the delay in seconds here. After "OK" is selected, the PA-800 will automatically perform the action after the delay specified. Note that the corresponding LED on the face and rear of the PA-800 will flash quickly if powering off and slowly if powering on.

Note that if you have a server attached to the receptacle you are powering off (using the *Slave Shutdown* feature of the PA-800), you must ensure that adequate time is provided for graceful operating system shutdown.

Wakeup State:

Specify whether you wish the receptacle to power up automatically when the PA-800 is powered on. A time delay may be specified to allow devices to startup in a user-defined sequence. *This wakeup time is also used at power-up after a breaker trip.*

Alarm Actions:

To configure the receptacle's actions upon alarm receipt, choose the *Alarm Actions* button.

Note that if you have a server attached to the receptacle you are powering off (using the *Mirror* feature of the PA-800), you must ensure that adequate time is provided for graceful operating system shutdown.

Alarm Actions Dialog
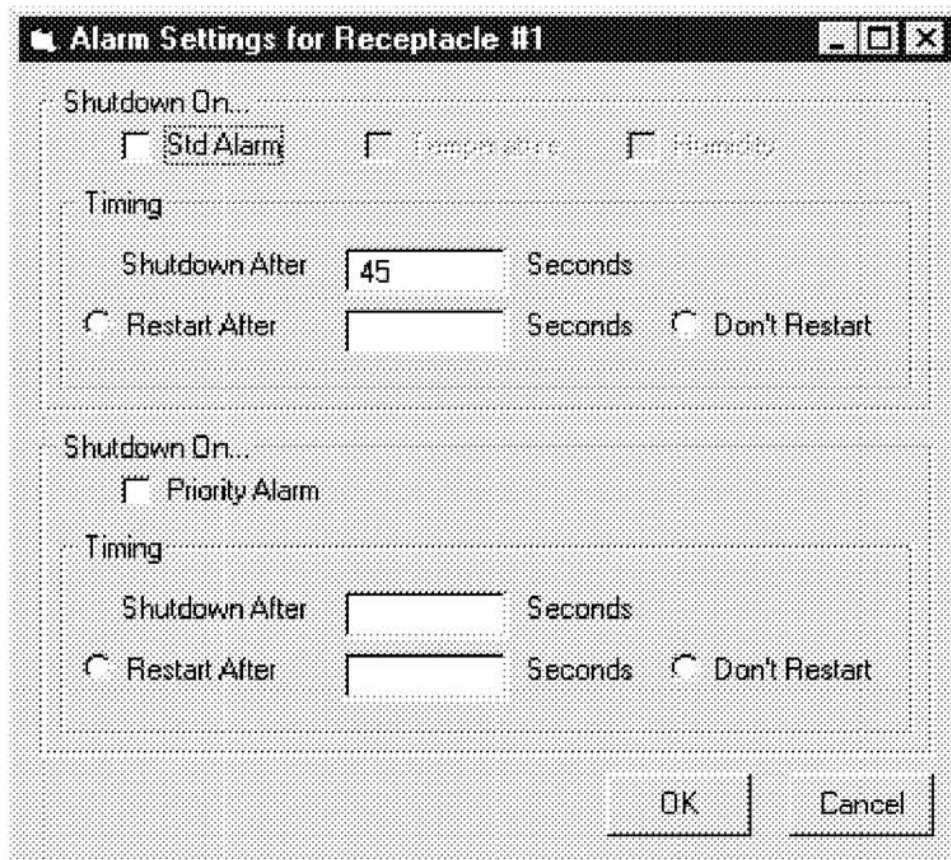
Shutdown On…

The first *Shutdown On…* group allows the user to specify if the receptacle is to shutdown upon receipt of an alarm condition. These alarms are the *Standard Alarm* (contact input #1), *temperature*, *or humidity*. Thresholds for these alarms are defined in the *Misc Settings* panel.

The second *Shutdown On…* group allows the user to indicate if the receptacle is to shutdown upon receipt of a high priority alarm.

Shutdown After…

Enter the number of seconds to wait after receipt of alarm before powering off the receptacle.

Restart After…

Enter the number of seconds to wait after the alarm condition clears before powering the receptacle back on. *Please note that if the receptacle is off when the alarm condition is asserted, it will not be powered back on when the alarm condition is cleared regardless of the user's settings.*

Uninterrupted

If you wish, you may configure the receptacle to always continue its power-off sequence upon receipt of an alarm. This means that even if the alarm condition is cleared before the power-down takes place, the receptacle will continue its countdown and power-off when scheduled. If this option is not selected and the priority alarm is cleared before the timer expires, the countdown is canceled and the receptacle remains on.

Misc Settings

General configuration information is set by selecting the *Misc* index tab.
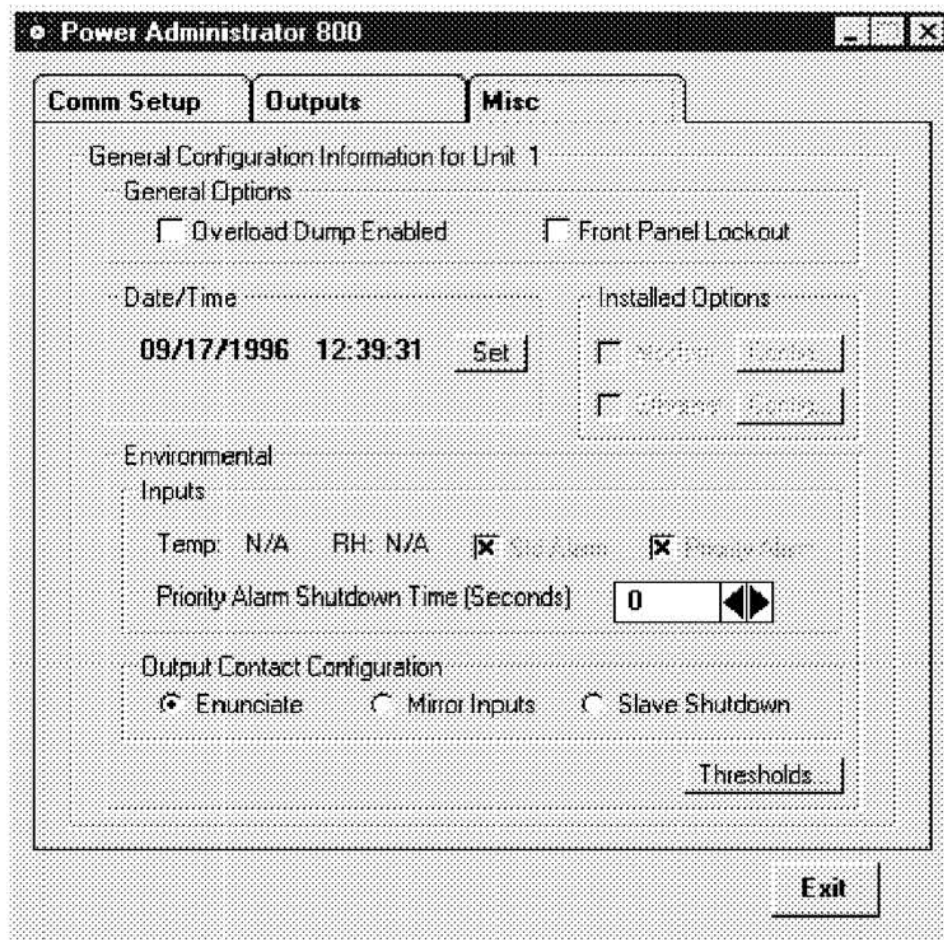
Installed Options

You may configure the internal modem or Ethernet card if they are installed by selecting the appropriate button.

Date/Time

The PA-800 has an internal time clock. To set it (according to your PC time clock) press **SET.**

Output Contact Configuration

The PA-800 has eight output contacts that may be configured to operate one of three ways (see *Connector Pinouts* for the DB15-F pin definition)

Enunciate

IPR Page 35

If you wish the contact outputs to indicate the alarm state of the PA-800 for an enunciator panel, select *Enunciate.* The outputs will be configured to *CLOSE* upon the following alarms:

Contact #	Definition
1	Standard Alarm
2	Temperature Alarm
3	Humidity Alarm
4	Priority Alarm
5..8	Not Used

Mirror Inputs

In this mode, the eight contacts are configured as four sets of two, each set exactly mirroring the state of the PA-800 input contacts. This "MultiMon" functionality allows four servers to monitor the contacts of a single UPS, for example.

Note that when using the *Mirror* feature of the PA-800, you must ensure that all automatic shutdown times (as setup in the *Alarm Actions*) provide adequate time for graceful operating system shutdown as specified by the shutdown software running on the attached server. Manually cycling power on a receptacle to which a server is attached in this configuration should only be used if the attached server is locked up.

Output definitions for are as follows:

Contact #	Definition
1	Input Contact #1
2	Input Contact #2
3	Input Contact #1
4	Input Contact #2
5	Input Contact #1
6	Input Contact #2
7	Input Contact #1
8	Input Contact #2

Slave Shutdown

In this mode, each contact will be closed if power-off is scheduled on the respective receptacle (or if the receptacle is off). This allows attached equipment (usually a Windows NT, Novell, or Unix file server) to complete a graceful shutdown prior to having power removed.

Note that when using the *Slave Shutdown* feature of the PA-800, you must ensure that all automatic and manual shutdown times (as setup in the *Alarm Actions* and *Configuration* Dialogs) provide adequate time for graceful operating system shutdown as specified by the shutdown software running on the attached server.

Thresholds Dialog

The Thresholds dialog allows the operator to specify how the PA-800 handles various alarm conditions.
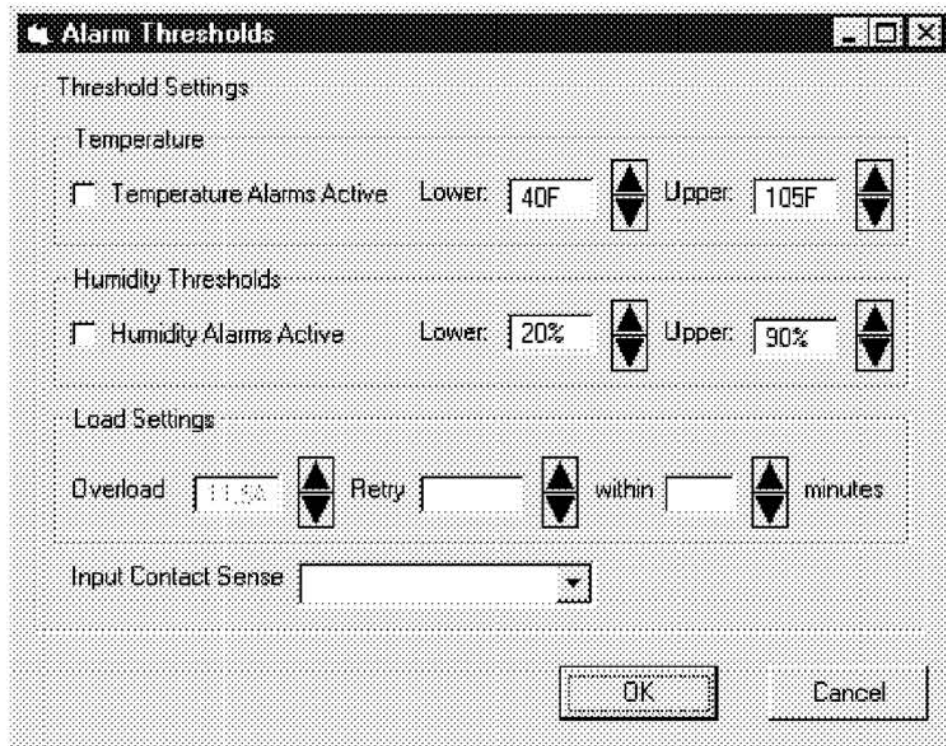
Temperature and Humidity

If the optional temperature/humidity module is connected to the PA-800, the user will have the option to select temperature and humidity alarm monitoring and specify a ranges outside of which alarms are generated. Note that each receptacle may be configured to honor or ignore these alarm indications.

Overload

If the user wishes to shed load at thresholds lower than the maximum for the unit (11.5A), this value may be specified here. *Retry* and *Within* allow the user to specify how many times to attempt to restart the PA-800 outputs after a breaker trip.

Note that if the specified number of retries is unsuccessful, outputs will remain off and manual intervention is required.

IPR Page 38

Input Contact Sense

The two contact closure inputs on the PA-800 monitor an attached device or switch. Specify normally open **(N/O)** or normally closed **(N/C)** as specified by the device or switch manufacturer. The checkboxes at left will indicate the current state of alarm. See *Connector Pinouts* for how to connect sensors to the PA-800.

Operator Intervention

If you wish alarms generated by contact inputs to be acknowledged by an operator prior to being cleared, select the contact sense entry with *"Operator Cleared"* in its description. Otherwise, select the entry that matches the contact sense of the attached device that does not contain *"Operator Cleared"* in its description. In this case the associated alarm is cleared when the device stops sending the alarm indication.

Terminal Mode Operation

Connector Pinouts

Convention Used

PA-800 Connector pinouts for all connectors. All views are from the outside of the PA looking in.

Electronic Interfaces

Expansion RJ12 Connectors ("PA-Bus")

```
PA Bus J1/J2 are in parallel (either one may be used)
  1234
+------+
| |||| |
|      |
+-+  +-+
  +--+
1, 4       shield (not needed for shorter runs)
2    RS485 A (noninverting drive/receive)
3    RS485 B (inverting drive/receive)
```

1/8" Stereo Jack ("Sensor")

```
Sensor 1/8" stereo jack

Tip +5VDC

Ring       I/O data
Sleeve     Ground
```

LAN RJ45 Connector ("10BaseT")
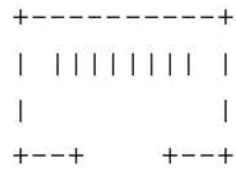
```
   12345678

+---------+
|  ||||||||  |
|              |
+--+      +--+

   +----+
1   TX+
2   TX-
3   RX+
4   N.C.
5   N.C.
6   RX-
7   N.C.
8   N.C.
```

Telephone RJ11 Connector ("TEL")
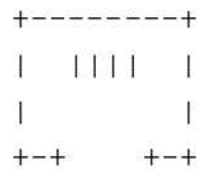
```
   1234

+--------+
|  ||||  |
|          |
+-+    +-+

  +----+
1   N.C.
2   Tip
3   Ring
4   N.C.
```

Contact In Handset Connector ("IN")
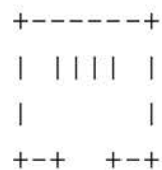
```
   1234

+------+
| |||| |
|        |
+-+  +-+

  +--+
1,3 Ground
2   Low Battery (CC1)
4   AC Fail (CC0)
```

IPR Page 42

Handset Connectors ("R1" and "R2")

```
 1234
+------+
| |||| |
|      |
+-+  +-+
  +--+
1,2 Drive -
3,4 V+ (12VDC Nominal)
```

RS-232 DB9-M Connectors ("1" and "2")

```
 1 2 3 4 5
+-----------+
\o o o o o /
 \o o o o /
  +------+
  6 7 8 9
1   N.C.
2   RXD (input to PA)
3   TXD (output from PA)
4   DTR (output from PA)
5   GND
6   DSR (input to PA)
7   RTS (output from PA)
8   CTS (input to PA)
9   RI  (input to PA)
```

Contact Out DB15F Connector ("Out")

```
8 7 6 5 4 3 2 1

+---------------+

\o o o o o o o o/

 \o o o o o o o/

  +----------+

  1 1 1 1 1 1 9

  5 4 3 2 1 0
```
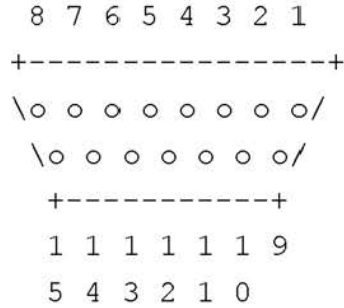
1   Emitter 1   (emitters are generally grounded at other end)

2   Collector 1 (collectors are generally pulled up at other end and read)

3   Emitter 2

4   Collector 2

5   Emitter 3

6   Collector 3

7   Emitter 4

8   Collector 4

9   Emitter 5

10   Collector 5

11   Emitter 6

12   Collector 6

13   Collector 7

14   Collector 8

15   Emitter 7,8

Power Receptacles

All output receptacles are UL recognized, rated to 11.5A output.

Power Output Receptacles

```
   1
+----------+
| --       |
|       (| | 3
| ---      |
+----------+
```

```
    2
```
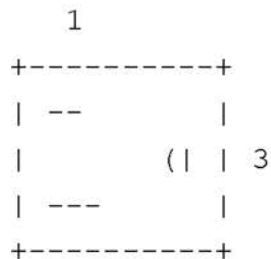
```
1    L (AC "HOT")
2    N (Neutral)
3    Ground (earth, all grounds in this system make to
earth)
```

Power Input Receptacle

```
    1
+------+
| <>   |
|      |
|    <>| 3
|      |
| <>   |
+------+
    2
```
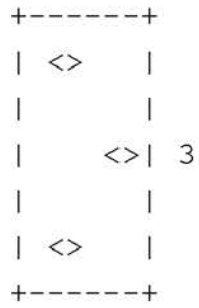
```
1    L (AC "HOT")
2    N (Neutral)
3    Ground (earth,  all  grounds  in  this  system
connected to earth)
```

Ethernet Option Card

The Ethernet Option Card hardware adapter runs an embedded Simple Network Management Protocol (SNMP) software agent. This agent responds to SNMP GETS and SETS and, also, forwards traps to designated recipients when critical conditions occur to the UPS—such as going on battery backup.

The Ethernet Option Card features:

- **Compact Size**—A small unit that takes less space on your work area. Dimensions are 4¾"x3½"(12 x 8½ cm).

- **One Serial Port**—A DIP switch changes the adapter's single serial port to a configuration port for installation or to a communication port for normal operations.

- **Remote monitoring**—Monitors utility power and low battery status for one UPS from a remote workstation (NMS).

- **Remote Control**—Turns the UPS inverter off when the NMS sends the proper command.

- **NMSs To Receive UPS Alarms**—These traps (unsolicited messages) inform you about the power condition of your UPS.

- **Works with all major NMSs on EtherNet**—Ethernet Option Card works with the most widely used Network Management Systems: HP Open View, Novell NMS, Sun NetManager, IBM NetView, and many more.

Internal Ethernet Adapter

The optional Internal Ethernet Card (IEC) provides the ability to communicate with the Power Administrator over 10BaseT Ethernet networks using the standard *Simple Network Management Protocol (SNMP)* and *telnet*.

The

Ethernet Option Card Package Contents

The components of your package are:

• Ethernet Option Card Unit
• Two 3.5" Diskettes
• Power Supply
• Ethernet Option Card Manual
• Configuration Cable labeled NSP-CFG-01A
• UPS Interface cable
• Worksheet included in the *Manual*

The Ethernet Option Card Unit

Figures 2 and 3 show the Ethernet Option Card's panels and top. The network connection panel illustrates the following:

Error! Cannot read or display file.

Figure 5 Ethernet Option Card Network Connection Panel

Network connection ports—Ethernet Option Card provides a BNC connector for 10Base-2 connection and a UTP (RJ-45) connector for 10Base-T networks.

Power connection port–Ethernet Option Card provides a connector for a 5VDC power supply.

The following illustration shows the serial port and the DIP switch. The serial port serves two purposes—adapter configuration and UPS communication.

Error! Cannot read or display file.

Figure 6 Ethernet Option Card Serial Port Panel

Status LEDs
The LED indicators inform you of network activity, which is the green LNK light, and the UPS status, which is the red ERR light.

DIP Switches
Use the DIP switch to configure with a dumb terminal or to communicate with the UPS for status monitoring.

Serial Port
The Ethernet Option Card uses this port for configuration during installation or for communications during normal operations.

Two 3.5" Diskettes
Your package contains two 3.5" MIB diskettes—one in DOS format and one in TAR format. These diskettes contain the UPS MIB file. Copy the MIB file to the appropriate `NMS MIB` directory for the UPS connected to your Ethernet Option Card.

The DOS disk also contains a copy of the programmed image file and the downloaded `.exe` program. See the *Upload Firmware* section for further explanation of these files.

Configuration Cable
Your package contains a cable labeled NSP-CFG-01A, female-to-female. Use this cable to connect the Ethernet Option Card serial port and a dumb terminal or PC for configuration. When you configure the Ethernet Option Card, be sure to set the DIP switch to the proper setting. Any dumb terminal or terminal emulation package, such as Microsoft Windows' Terminal will work fine.

WARNING: If you are using a power supply other than the one supplied with the Ethernet Option Card, be sure that the polarity of the new power supply is correct. If the polarity of

---

the new power supply is incorrect, you may run the risk of damaging the adapter.

Power Supply

The two types of power supplies offered are:

Power Supply Type	Input	Output
Wall Cube	120 VAC, 60 Hz	5 VDC, 1 amp
Universal	230 VAC, 50 Hz	5 VDC, 1 amp

IPR Page 49

UPS Interface Cable

The manufactureecific interface cable connects the UPS to the Ethernet Option Card unit. The table below defines the basic UPS device port configuration:

1	Battery	Not connected
2	Connected	Set to Voltage High (+12V)
3	o Voltage Low (-12 V)	Power Fail
4	ter Shutoff	Not connected
5	ınd	

IPR Page 50

System Requirements

Ethernet Option Card requires a terminal for configuration and a network connection with an NMS for operation. The following is a description of all required components and a list of the most widely used NMSs.

- The components of your standard Ethernet Option Card package

- Connection to an EtherNet network

- An SNMP-based management station

   Some NMSs that support the Ethernet Option Card are:

   > HP OpenView for UNIX
   >
   > HP OpenView for Microsoft Windows
   >
   > Novell NMS
   >
   > SunConnect SunNet Manager
   >
   > IBM NetView/6000

- A dumb terminal or a PC with an emulation package to configure the Ethernet Option Card SNMP Agent

- An RS232 communication port on your PC or terminal

- A UPS—any UPS type

   You can interface <u>any</u> contact closure UPS with Ethernet Option Card if you have the manufacture's specific cable supplied with your kit.

- Network identification values for the Ethernet Option Card:

   > IP Address
   >
   > Net Mask
   >
   > IP Addresses for the NMS
   >
   > Definitions of Communities
   >
   > IP Address of the Gateway/Router

Ethernet Configuration

This section describes the installation of the Ethernet Option Card adapter when you connect it to the UPS and the network. (Refer to the *Configuration* section for network communications' setup.) For configuration, connect the Ethernet Option Card temporarily to a PC with a terminal emulation package or to a dumb terminal. The following steps guide you in connecting the Ethernet Option Card to the network and UPS.

1. Install the UPS.
2. Adjust the DIP switches on the Ethernet Option Card for Configuration. Switch 1 is ON when down; switch 2 is OFF when up.
3. Temporarily, connect the Ethernet Option Card adapter to a dumb terminal or to a PC with the terminal emulation package.

   a) Using the configuration cable, connect the end of the cabled labeled "CPU/ NSP-CFG-01A" into a dedicated RS-232 serial port on the configuration PC.

   b) Connect the other end into the Ethernet Option Card's serial port.

4. Configure the communications settings.

   a) Use the following settings to configure the dumb terminal or PC.

Baud rate →	9600	Flow Control Xon/XOFF	
Data bits →	8	Handshaking →	**None**
Stop bit →	1	Terminal Type:→	**ANSI (VT100)**
Parity →	**None**	Local Echo →	**Off**

   b) A Windows's communication screen with the typical Ethernet Option Card setting:
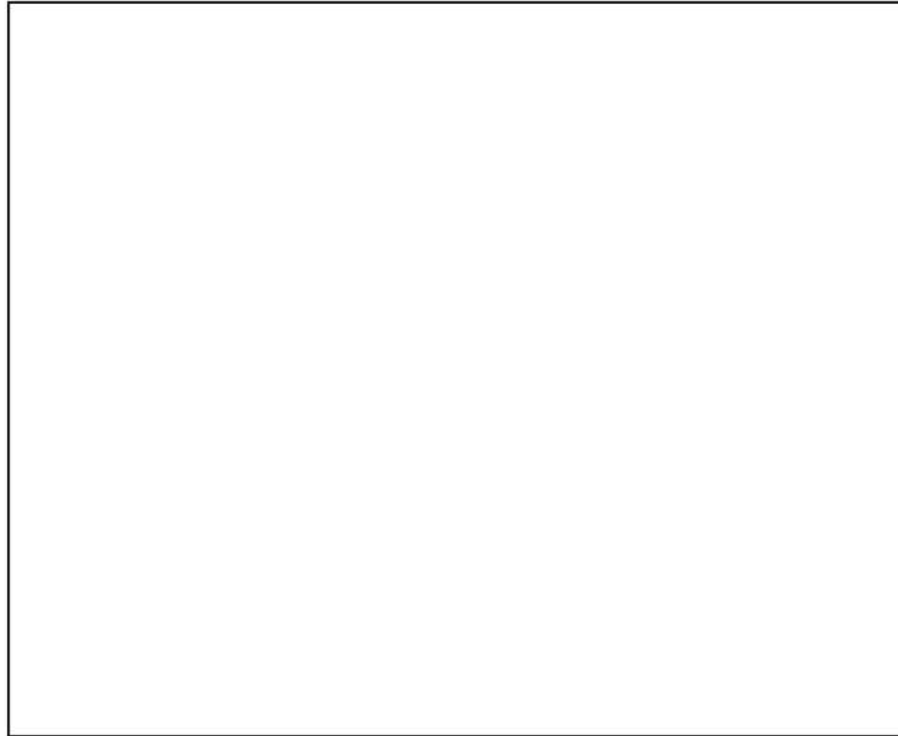
Figure 7 Communication Screen (Windows)

5. Press **OK** if you have the Windows Communications screen or accept your communication settings in the terminal emulation package. The terminal is now configured to communicate with the Ethernet Option Card adapter.

6. Connect the power supply with the 5VDC connector to the Ethernet Option Card adapter's power input. Connect the other end of the power supply with a standard plug into the UPS. Approximately five seconds after you supply power, the adapter displays the introductory screen on your terminal. Press <enter> to get to the main menu.

7. You are now ready to configure the Ethernet Option Card adapter. Refer to the *Configuration* section for a detailed discussion.

8. Turn DIP switch 1 on the Ethernet Option Card from the **DOWN** (ON) position to the **UP** (OFF) position.

9. Disconnect the configuration cable from the Ethernet Option Card adapter and the dumb terminal or PC. Store this cable for future use.

10. Disconnect the Ethernet Option Card adapter from the PC or terminal and from the power supply.

11. DIP switch 1 is still set to **OFF** (UP) position.

12. Place the Ethernet Option Card close enough to the UPS it is monitoring so the UPS interface cable can connect to the Ethernet Option Card's serial port and the UPS's serial port.

13. Connect the Ethernet Option Card to the Ethernet cable—either UTP or BNC.

14. Re-insert the power jack into the Ethernet Option Card*'s* power connection.

Verify The Ethernet Option Card Operation

15. After you complete all configuration settings and connect the Ethernet Option Card to the network, *check the LINK status*.

LED Status After Power Up

A.   Momentarily, green and red LEDs do not light.

B.   Green LED pulses randomly showing network activity.

C.   After five to ten seconds from power up, the red LED flashes rapidly; this indicates that Ethernet Option Card is determining which UPS model is connected to your system. This takes from few seconds.

D.   After Ethernet Option Card determines the UPS mode, the red LED light turns off.

E.   The red LED pulses once for every UPS communication failure it detects.

F.   If the LED detects three failures in a row, the red LED turns on and stays on solidly.

G.   If the LED receives one good UPS message, it turns off the red LED light.

II.   PING the Ethernet Option Card. Issue a PING command from the NMS (Network Management Station).

A.   If you do not get a response, check the Ethernet Option Card's network connection and IP address.

III.   Test the adapter with an NMS. Perform a *"get"* and a *"set."*

A.   If the get or set commands fail, check the Ethernet Option Card access controls. The manager must have read permission to execute a ***get*** command successfully and read/write permission to execute a ***set*** command successfully.

(See *Configuring the NMS* section for a detailed discussion.)

Your Ethernet Option Card SNMP adapter is now installed and completely functional.

Configuration

You have previously installed the UPS, and you are ready to configure the Ethernet Option Card to work on your network. Ethernet Option Card is temporarily connected to a PC with a terminal emulation package or to a dumb terminal.

NOTE: Refer to the *Installation* section for the proper setting of the hardware adapter prior to configuring the device.

Press any key to display the *Main Menu*. From this menu you can select to enter the IP address, Gateway address, and MIB system group; you can set the access controls of SNMP communities; set traps, display settings; reset the settings to default values; save the new values and exit the program, and upgrade Firmware (See caution in the *Upgrade Firmware* section); and exit without saving.
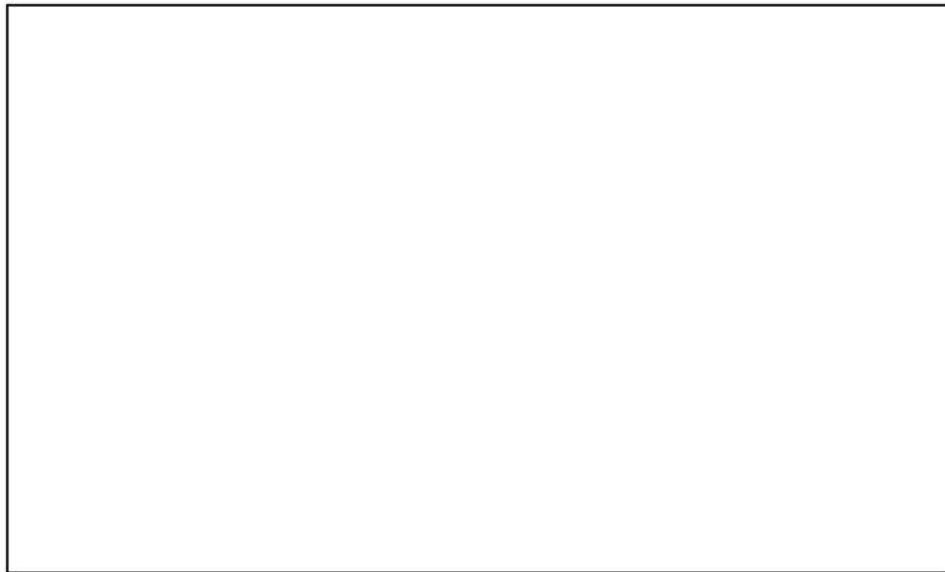
Figure 8 Main Menu

To select any option on the *Main Menu*, enter the number of the option you want at the Choose a Number=> prompt. The program displays the desired screen.

Set IP And Gateway Addresses And MIB System Group

To set the IP address, Gateway address, MIB system group, and other system configurations, type 1 at the prompt. The following screen displays:

Figure 9 IP Address for the Ethernet Option Card and More

NOTE: The minimum requirement to operate Ethernet Option Card is to set the IP address.

To enter values, enter the number of the option, type a *<space>*, and enter the name. Press *<enter>*. Your new value displays next to the field heading on the top of the screen.

If you want to return to the *Main Menu*, press **0** (zero) and press *<enter>*.

For more information on IP addresses and net masks, see the <u>Reference</u> section of the *Appendix* in this manual.

The following table contains the values with their MASK_BIT_COUNT:

.255.255.0		.255.255.240
.255.255.128		.255.255.248
.255.255.192		.255.255.252
.255.255.224		.255.255.254

To assign the IP address of Ethernet Option Card, the gateway, and the network, type at the prompt:

1, *<space>*, the IP address of the Ethernet Option Card, *<space>*, **0** to **7**, *<space>*, the IP address of the gateway.

The Gateway IP Address is optional; the program generates the Network IP address.

To assign the system contact name, type **2** and enter the name of the person to contact about the Ethernet Option Card:

To assign the UPS name, type **3** and enter name of the UPS:

To assign the UPS location, type **4** and enter the location name:

The top of the screen displays your new values:

Record the definitions on your Worksheet for reference. To return to the Main Menu, type 0 and press *<enter>*.

Set Access Controls

To set access controls of SNMP communities from the Main Menu, type **2** at the Choose a Number => prompt. The following screen displays a column of four Manager IP addresses with their access permission, the commands, and an example to guide you. Use this screen to specify which managers have access to the Ethernet Option Card agent, the community names, and what type of access the IP managers have–read only or read and write.
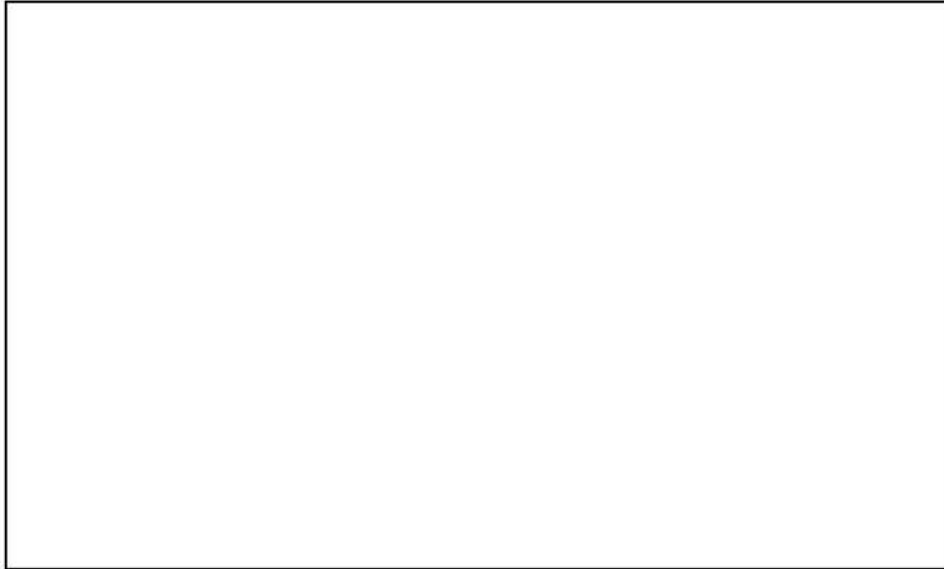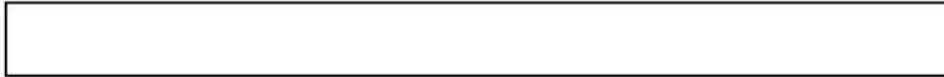
Figure 10　Access Controls

To set an access control, at the prompt type:

Set, *<space>*, enter the number of the column from **1** through **4**, *<space>*, enter the IP address, *<space>*, name of the community string, *<space>*, and access code—**r** for read only or **w** for read and write. Press *<enter>*. For example:

The new values display on the top of the screen:

To clear access controls of any manager IP address, type **clear**, *<space>*, and the desired list number at the prompt. Press *<enter>*.

The top of the screen reflects your changes:

To return to the Main Menu, type **0** and press *<enter>*.

Set Trap Receivers

Use this screen to determine which IP managers receive traps (messages) from your Ethernet Option Card. This screen permits you to send traps about your UPS to four IP addresses (managers). Also, you may determine the severity levels to assign to a particular manager. To access the trap setting screen, type **3** from the Main Menu. The following screen displays:
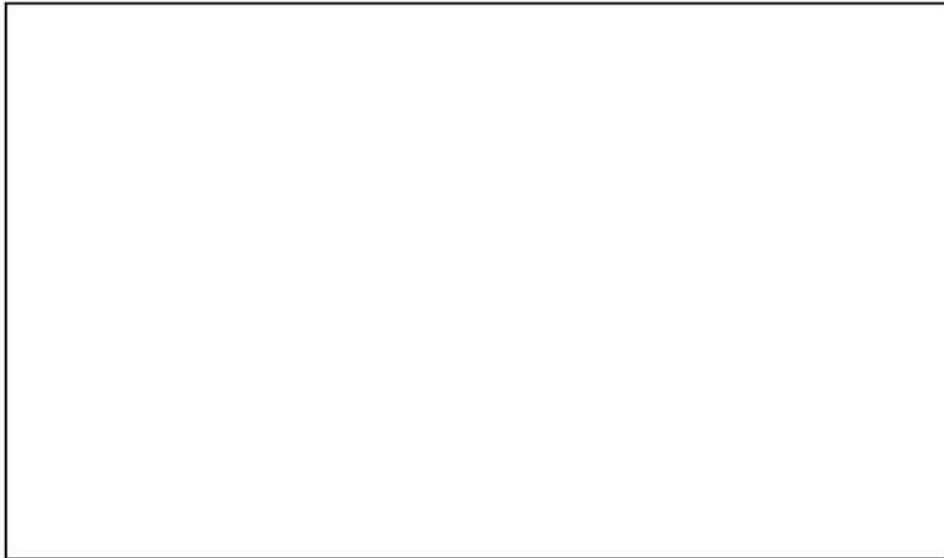
Figure 11 Trap Receivers

To set traps, at the prompt type:

Set, *<space>*, enter the number of the column from **1** through **4**, *<space>*, enter the IP address, <space>, severity code–1,2, or 3, and name of the community string. Press *<enter>*. The severity level codes for messages are:

- **1** Informational

- **2** Warning

- **3** Severe

The trap receiver receives all assigned severity level messages and the ones rated above. If you assign severity code 2, the manager receives warning and severe levels.

A set trap example.

```


```

The top of the screen reflects your changes:

```



```

To remove a trap receiver from the list, type **clear**, *<space>*, and the desired list number at the prompt. Press *<enter>*.

```

```

The top of the screen reflects your changes:

```



```

To return to the Main Menu, type **0** at the prompt and press *<enter>*.

Additional Setup Screen

Ethernet Option Card does not use this option at this time. If you select No. 4, the screen first displays a blank screen followed by the Main Menu.

Display Settings

This screen displays all of Ethernet Option Card's current settings. To access this screen, type **5** at the prompt from the Main Menu. The current settings display:
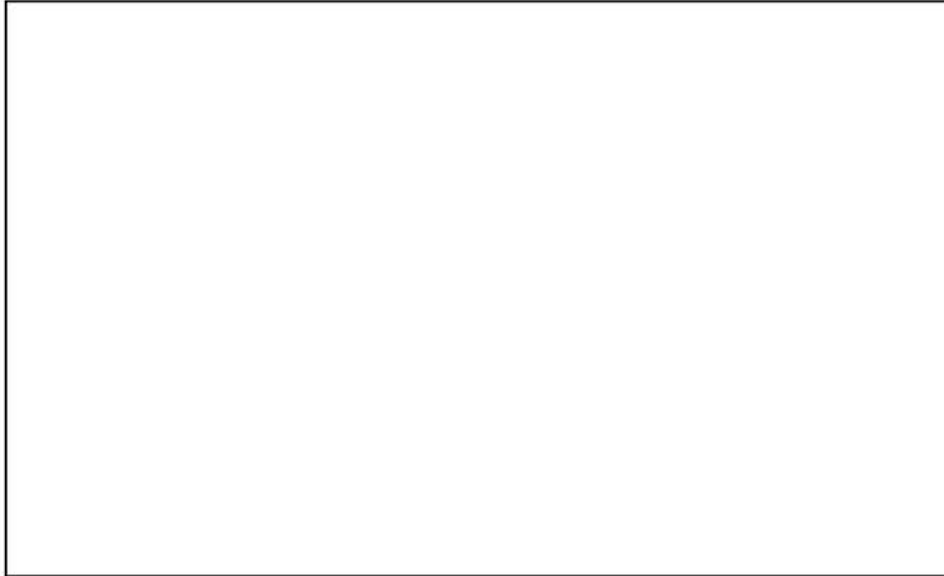
Figure 12 Display All Current Settings

The settings are the following fields:

- Local, Ethernet Option Card's, Address and serial number (physical address)

- Gateway and Network address

- System Contact Name (Your system administrator's or a contact's name)

- System Name

- Location (location of your UPS and Ethernet Option Card)

- List of the current communities with their access control code

- List of the current trap receivers with their severity level codes

Reset Configuration to Default

If you press <6>, the program resets all fields to default. To display the results, press <5> for Display Settings. Most fields have no values.
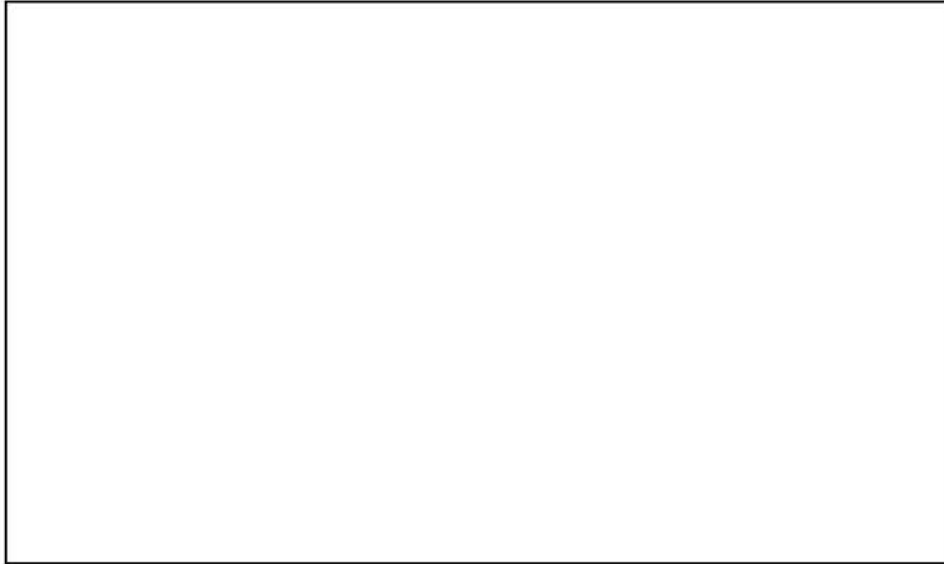
Figure 13 Reset Values To Default

To Save and Exit

If you are satisfied with your configurations, save them and exit. To save, press <7>. The screen displays the following message:
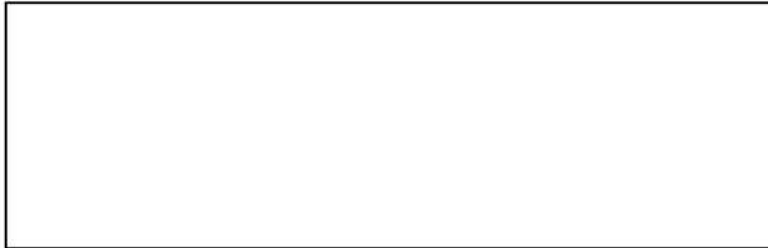
Figure 14 Save and Exit Messages For Configuration

This messages informs or directs you.

1. The Setup program has ended.

2. Turn off the DIP switch (switch 1 UP).

3. Disconnect the power supply from the Ethernet Option Card.

4. Re-connect the power supply to the Ethernet Option Card.

Upload Firmware

CAUTION: The firmware upload has already been accomplished at the factory. Before you proceed with this option, you must contact our technical support team for assistance.

This option supports upgrades to the firmware program when they become available. Should an upgrade be available, call our technical support team for assistance with the upgrade.

If you inadvertently use this option, your system suspends (locks). To restart, unplug the power supply from the Ethernet Option Card, and re-connect the power supply to the Ethernet Option Card.

Exit Without Saving

This options lets you quit the program without saving any of your configuration settings. To exit, type **0** (zero).

Configuring the NMS

To complete the Ethernet Option Card installation and configuration process, you must compile the necessary MIBs to configure the NMS.

Any NMS with a MIB compiler can manage the Ethernet Option Card adapter. For instructions on how to compile MIBs for the most popular NMSs—Novell's NetWare Management Station, Hewlett-Packard's OpenView Network Node Manager, and SunConnect's SunNet Manager; see the corresponding heading below.

General Network Management Stations

Follow these general procedures to configure an NMS:

- Compile the device MIBs.
- Add the Ethernet Option Card object to the *Management Map*.
- Ping the Ethernet Option Card.

HP OpenView Network Node Manager for HP-UX

Compile the Device MIB

I.   Copy the UPS MIB file from the TAR formatted diskette into the subdirectory /usr/OV/snmp_mibs.

II.   From the main menu, select *Options*

III.   Load/Unload *MIBs: SNMP...*

IV.   Select *Load*.

V.   Select the MIB file copied earlier.

VI.   Select *OK*.

Add the Ethernet Option Card Object to the Management Map

I.   Select the submap then *Edit: Add Object*.

II.   Select the group computer.

III.   With the middle (or opposite) mouse button, drag the generic symbol subclass device to the submap.

IV.   Enter a name for the object in the Selection and Label fields of the *Add Object* box.

V.   Highlight *IP Map* from *Object Attributes* group.

IPR Page 65

VI.   Select Set Object Attributes button.
VII.   Enter Host name and IP address of Ethernet Option Card adapter.
VIII.   Enter **OK**.
IX.   Enter **OK** at *Add Object* menu.
X.   Enter **OK** at *Add Object:palette*.

Poll the Device OIDs

I.   From the main menu, select **Monitor: MIB** values then **Browse MIB: SNMP**.
II.   Move around the MIBs to view the UPS device information.

Set the Device OIDs

From the main menu, select **Monitor: MIB** values then **Browse MIB: SNMP**.

I.   Select a MIB variable you want to alter; click on it.
II.   Enter the new value then click on **Set**.
III.   Click on **Start Query** to view the changes.

Ping the Ethernet Option Card

I.   Change active Window to **Shell**.
II.   Type ping <IP address> and press <enter>.

Novell's NetWare Management Station v.2.0

Compile the Device MIB

I.   Copy the UPS MIB file from the DOS formatted diskette into the subdirectory
         `\nms\snmpmibs\current`.
II.   From the main menu, select **Tools** then SNMP MIB Compiler.
III.   From the *SNMP MIB Compiler* box, select Compile.

Add the Ethernet Option Card Object to the Management Map

The NMS will discover the Ethernet Option Card and add it to the Management map during its discovery pass.

Poll the Device OIDs

I.   From the main menu, select **Tools** then the *SNMP MIB Browser*.

II.   From the *SNMP MIB Browser* box, select the IP protocol and then enter the IP Address.

      A.   select the profile **to read**.

      B.   select **OK**.

Set the Device OIDs

I.   From the main menu, select **Tools** then *SNMP MIB Browser*.

II.   From the *SNMP MIB Browser* box, select **Add**.

III.   From the *SNMP Profile Editor* box,

      A.   assign the profile a name, a community, and a poll interval.

      B.   select the OID groups from the Group Choice then select Add to transfer them to the Group Selection(s).

      C.   Save the profile.

Ping the Ethernet Option Card

I.   From the main menu, first select **Fault**, second **Test Connectivity**, and third **Once**.

II.   From the *Test Connectivity* box,

      A.   type in the IP address.

      B.   select **Test**.

SunConnect SunNet Manager

Compile the Device MIB

1. Copy the UPS MIB file from the TAR formatted diskette into the subdirectory specified by `na.snmp.schemas` keyword in `$SNMHOME/snm.conf`.

2. Execute `mib2schema` on the MIBs. This creates respective `*.mib.oid` and `*.mib.schema` and `*.mib.traps` files.

3. In the **SNM console window**, select **File|Load**.

4. Select **Management Database**.

5. Click on `*.mib schema`, where *= the name of each MIB copied in step 1 and select **Load**.

IPR Page 67

6. Start a new shell window; change to the subdirectory `$SNMHOME/agent` and execute ***build_oid***. This creates an oid database using all compiled MIBs.

7. Append `*.mib.traps` to the file specified by `na.snmp-trap.default` keyword in `$SNMHOME/snm.conf`.

Add the Ethernet Option Card Object to the Management Map

I.   Enter the submap where the managed device will be placed.

II.   Select ***Edit***, ***Create***, ***Component***, ***lanbox*** with the right (opposite) mouse button. Select ***Create***.

III.   The ***Properties*** box displays.

IV.   Enter the Ethernet Option Card 's name as it appears in `etc/hosts` or in the name server.

V.   Enter the **SNMP WrCommunity**.

VI.   Select the desired MIBs.

VII.   Choose a color for the device.

VIII.   Select ***Apply***. This adds the device to the submap.

IX.   Create a managed device view with the following steps:

    A.   Select the relevant submap .

    B.   Select ***Edit***, ***Create***, ***View***, subnet with the right (opposite) mouse button.

    C.   Select ***Create*** and press *<enter>*.

    D.   Enter the view name.

    E.   Copy and paste the glyph into the managed device view.

Poll the Device OIDs

I.   Select the device glyph with the right mouse button.

II.   Select **Quick Dum**, ***-MIB** then one of the MIB groups. A window appears displaying a snapshot of the group.

IPR Page 68

Set the device OIDs

I.   Select the device glyph with the right mouse button.

II.   Select **Set Request**, ***-MIB**, {*OID name*}.

III.   When the **Set Tool** application displays,

        A.   Click on **Get** to receive the current values.

        B.   Select a new value by clicking on **New Value** then by clicking **Set**.

        C.   Click on **Get** again to view the changes.

Ping the Ethernet Option Card

I.   Change active Window to Shell.

II.   Type ping <IP address> and press <enter>.

Appendix

This appendix has three sections: *Reference*, *Glossary*, and *Troubleshooting*.

Reference

This section discusses Communities, IP Addresses, Sub net masking, and routers/gateways.

Communities

A community is a string of printable ASCII characters that identifies a user group with the same access privileges. For example, a common community name is "public."

For security purposes, the SNMP agent validates requests before responding. The agent can be configured so that only trap managers that are members of a community can send requests and receive responses from a particular community. This prevents unauthorized managers from viewing or changing the configuration of a device.

IP Addresses

Every device on an internetwork must be assigned a unique IP (Internet Protocol) address. An IP address is a 32-bit value comprised of a network ID and a host ID. The network ID identifies the logical network to which a particular device belongs. The host ID identifies the particular device within the logical network. IP addresses distinguish devices on an internetwork from one another so that IP packets are properly transmitted.

IP addresses appear in dotted decimal (rather than in binary) notation. Dotted decimal notation divides the 32-bit value into four 8-bit groups, or octets, and separates each octet with a period. For example, 199.217.132.1 is an IP address in dotted decimal notation.

To accommodate networks of different sizes, the IP address has three divisions—Classes A for large, B for medium, and C for small. The difference among the network classes is the number of octets reserved for the network ID and the number of octets reserved for the host ID.

Class	Value of First Octet	Network ID	Host ID	Number of Hosts

A	1-126	first octet	last three octets	16,387,064
B	128-191	first two octets	last two octets	64,516
C	192-223	first three octets	last octet	254

Any value between 0 and 255 is valid as a host ID octet except for those values the InterNIC reserves for other purposes.

Value	Purpose
0, 255	Subnet masking
127	Loopback testing and interprocess communication on local devices
224-254	IGMP multicast and other special protocols

Subnetting and Subnet Masks

Subnetting divides a network address into subnetwork addresses to accommodate more than one physical network on a logical network.

For example: A Class B company has 100 LANs (Local Area Networks) with 100 to 200 nodes on each LAN. To classify the nodes by its LANs on one main network, this company segments the network address into 100 subnetwork addresses. (If the Class B network address is 150.1.x.x, the address can be segmented further from 150.1.1.x through 150.1.100.x.)

A subnet mask is a 32-bit value that distinguishes the network ID from the host ID for different subnetworks on the same logical network. Like IP addresses, subnet masks consist of four octets in dotted decimal notation. You can use subnet masks to route and filter the transmission of IP packets among your subnetworks. The value "255" is assigned to octets that belong to the network ID, and the value "0" is assigned to octets that belong to the host ID.

For the example above, if you want all the devices on the subnetworks to receive each other's IP packets, set the subnet mask to 255.255.0.0. If you want the devices on a single subnetwork only to receive IP packets from other devices on its own subnetwork, set the subnet mask to 255.255.255.0 for the devices on that subnetwork.

Subnet Mask	Routing and Filtering
0.0.0.0	IP packets are transmitted to all devices.
255.0.0.0	IP packets are only transmitted to devices whose IP address's first octet matches the sender's IP address's first octet.
255.255.0.0	IP packets are only transmitted to devices whose IP address's first two octets match the sender's IP address's first two octets.
255.255.255.0	IP packets are only transmitted to devices whose IP address's first three octets match the sender's IP address's first three octets.

Gateways

Gateway, also referred to as a router, is any computer with two or more network adapters connecting to different physical networks. Gateways allow for transmission of IP packets among networks on an internetwork.

SNMP Glossary

The Glossary section defines the terms used in the Ethernet Option Card-MP environment.

Agent	Implemented SNMP applications in network elements (hosts). Agents perform the network management's functions as requested by the network administrator from an NMS.
Dry Closure Input	Non-powered contact type inputs—switch, relay contact, open-collector.
Dry Closure Output	Form C dry-contact outputs which are common, normally open, or normally closed.
EtherNet	Local Area Network technology, originally developed by the Xerox Corporation, can link up to 1,024 nodes in a bus network. EtherNet provides raw data transfer in a rate of 10 megabits/sec. with actual throughputs in 2 to 3 megabits/sec. using a baseband (single-channel) communication technique. EtherNet uses carrier sense multiple access collision detection (CSMA/CD) that prevents network failures when two devices attempt to access the network at the same time. LAN hardware manufactures use EtherNet protocol; their products may not be compatible.
Gateway	A computer that attaches to a number of networks and routes packets between them. The packets can be different protocols at the higher levels.
IP	*Internet Protocol*—The TCP/IP standard protocol defines the IP datagram as the unit of information passed across a network.
IP Address	*Internet Protocol Address*—A 32-bit address assigned to hosts participating in a TCP/IP network. The IP address consists of network and host portions. It is assigned to an interconnection of a host to a physical network.
MAC	*Medium Access Control*—The network layer between the physical and the datalink layers. Specifically, the physical (hardware) address exists in this layer.
MIB	*Management Information Base*—The database, i.e., set of variables maintained by a gateway running SNMP.
NC	*Normally Closed* —Refers to a contact switch that is normally closed.
NIC	*Network Interface Controller*—The hardware interface to the physical connection to the network.
NMS	*Network Management Station*

IPR Page 74

NO	*Normally Open*—Refers to a contact switch that is normally open.
OID	*Object Identifier*—The variables defined in a MIB.
Personality	The current device specific software uploaded to the Ethernet Option Card.
Router	A computer that manages traffic between different network segments or different network topologies. It directs the destination IP address. The network media can be different, but the higher level protocols must be the same.
RS-232	A specification for serial communication between data communication equipment and computers.
SNMP	*Simple Network Management Protocol*—A standard protocol used to monitor IP hosts, networks, and gateways. SNMP defines a set of simple operations that can be performed on the OIDs of the MIBs managed by the monitored Agents. It employs the UDP/IP transport layer to move its object between the Agents and the NMS.
Sub-Agent	A software module that manages specific MIB sub-groups for an Agent. They communicate with the Agent using a SMUX (multiplexer).
TCP/IP	*Transmission Control Protocol/Internet Protocol*—A protocol suite used by more than 15 million users with a UNIX association and widely used to link computers of different kinds.
TES	*Terminal Emulation Software*—Communications program to transform a personal computer into a terminal for the purpose of data communications.
TFTP Server	*Trivial File Transfer Protocol Server*—A host to provide services according to TFTP; a TCP/IP standard protocol for file transfer with minimal capability and overhead depending on UDP for its datagram delivery service.
UDP/IP	*User Datagram Protocol/Internet Protocol*—A TCP/IP standard protocol. It enables transfer of information between applications running on different host. It is referred to as an unreliable, connectionless datagram delivery service.
UPS	*Uninterruptible Power Supply*—A device that supplies power to your system with rechargeable batteries if there is an AC power failure.

IPR Page 75

SNMP/Telnet Troubleshooting

Problem: The TES (Terminal Emulation Software) does not display anything.

Solution: ***Make sure the Dip switch is set correctly. Switch 1 is ON when DOWN and Switch 2 is UP.*** This applies only when you power up.

Make sure the TES's communication parameters are correct. They should be 9600 baud rate, no parity, 8-data bits, and 1 stop bit.

Make sure the ends of the NSP-CFG-01A cable are plugged into their respective ports.

The ends of the cable indicate which belongs to the CPU and which belongs to the Ethernet Option Card.

The end of the hooded cable nearest the label belongs to the CPU, and the end farthest away belongs to the Ethernet Option Card.

PROBLEM: **The NMS cannot ping the Ethernet Option Card.**

Solution: ***Make sure the network connection to the Ethernet Option Card is good.***

Solution: ***Make sure the cable is in good condition.***

Solution: ***Make sure to set the Community String [Set Access Controls, Type 2, Set 1 through 4]. Follow these steps:***

Name the community with any lowercase name. (A UPS monitors a designated community.)

Solution   ***Make sure to set the Manager Table. Set Access Controls, Type 3, Set 1 through 4]. Follow these steps:***

Define the Manager IP Address, Community string, and Access Permission together.

The trap manager's community should be the same number as the number of the community it monitors.

The trap manager's status is set to Accept *YES* to enable sending traps or to Accept to *No* to disable.

IPR Page 76

Troubleshooting

Problem: She no workie.

Solution: ***Here's the answer***

Getting Techical Support

Before calling for help, please complete the following form:

Installation Site:

Company Name:_____

Address:_____

City:_____State:_____ZIP code:_____

Installation Site Contact:

Full Name:_____

Phone Number:_____Fax Number:_____

If you are a consultant,

Consultant Name:_____

Phone Number:_____Fax Number:_____

Computer System:

Operating System and version:_____

System Manufacturer:_____

System Model Number:_____

NMS name and version number:_____

UPS (if any):

Manufacturer:_____

Model Name/Number:_____

Type of Port Connector (#pins, male or female.):   _____

IPR Page 78

What are the symptoms?

_____

_____

_____

_____

☎ *Technical Support* ☎

Have the information listed above ready. You can reach us by calling:

US & World: (314) 532-2855

by fax at (314) 532-2037

or by E-mail at: support@sechq.com

Europe: +44 1600 716400

or by fax at +44 1600 772026

IPR Page 79