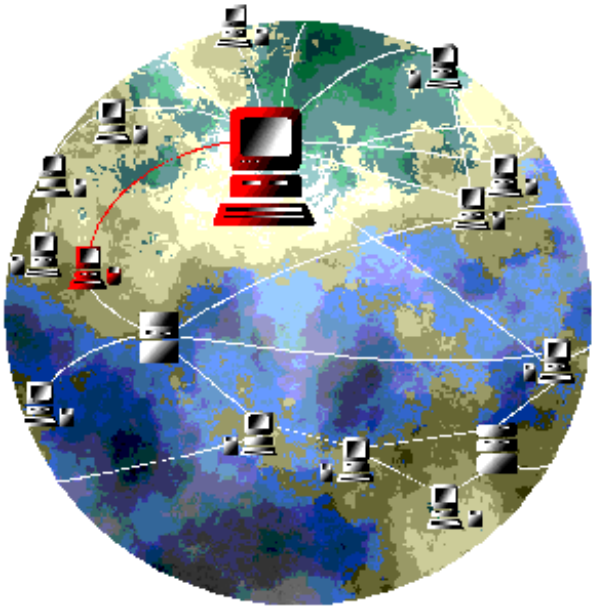
Web/SNMP Management Card

v1.x

User's Guide



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Version v1.0.1, December, 1998

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Contents

About This Guide 8
How to Register Your Management Card ... 8
This Guide's Purpose ... 8
This Guide's Structure ... 8
Associated Documents ... 9
This Guide's Conventions ... 10

Chapter 1:
What You Can Use to Manage a Management Card 11
Overview ... 11
Remote Management ... 11
Local Management ... 12

Chapter 2:
User-Interface Components 13
AP9606 Web/SNMP Management Card ... 13
Status LED ... 13
Link-RX/TX LED ... 13

Chapter 3:
How to Define Basic Configuration Requirements 14
Overview ... 14
How to Use a BOOTP Server ... 14
How to Use a Terminal ... 14
How to Use the Web/SNMP Management Card Wizard ... 14

Chapter 4:
How to Use a Management Card with PowerChute® plus 15
Overview ... 15
What PowerChute plus Can Do ... 15
What PowerChute plus Cannot Do ... 15
How to Connect with PowerChute plus ... 16

Chapter 5:
How to Use SNMP 17
Overview ... 17
How to Affect SNMP Access ... 17
How to Use MIB-II System OIDs ... 18
How to Use The PowerNet SNMP MIB ... 18
The PowerNet MIB and Network Communication ... 19
The PowerNet MIB OIDs ... 19
What PowerNet MIB OIDs Can Do ... 19
What PowerNet MIB OIDs Cannot Do ... 21
PowerNet MIB Traps ... 22

Chapter 6:
How to Use a PowerNet SNMP Manager 23
Overview ... 23
What PowerNet SNMP Manager Can Do ... 23
What PowerNet SNMP Manager Cannot Do ... 23

Chapter 7:
How to use the Web Interface 24
Overview ... 24
How Do I Access the Management Card Using a Web Browser? ... 24
What is Assistant Online? ... 25
What Purpose Do the User-Definable Links Serve? ... 25
Does the Management Card Have Local Help Pages? ... 25
How to Access the Web Interface ... 25
How to Log In ... 25
How to use the Web Interface ... 26
Device Status Summary Screen ... 26
The Smart-UPS Status Screen ... 27
The Measure-UPS Status Screen ... 28
The Network Screen ... 29
The System Screen ... 30
How to Manage a Smart-UPS or Matrix-UPS ... 31
The Smart-UPS Status Screen ... 31
The Smart-UPS Diagnostics Screen ... 33
How to Control a UPS ... 35
How to Configure a UPS ... 37
Configuration ... 38
Shutdown Parameters ... 39
General Settings ... 40
How to Manage a Symmetra Power Array ... 40
Detailed Status Screen ... 44
Diagnostics Screen ... 45
Symmetra Module Status ... 47
Symmetra Module Dump ... 49
How To Control a Symmetra Power Array ... 50
How To Configure a Symmetra Power Array ... 52
Configuration ... 53
Alarm Thresholds ... 53
Shutdown Parameters ... 54
General Settings ... 54
How to Manage a Measure-UPS ... 55
How to Monitor a Measure-UPS ... 55
Measure-UPS Menu Screen's Status Information ... 56
How to Configure a Measure-UPS ... 57
How To Define the Management Card's Basic Network Values ... 58
How To Control File Transfers ... 59
How To Use the Telnet/Web Menu ... 60
How to Use the SNMP Menu ... 61
How to Control SNMP Channel Access ... 62
How to Define Trap Receivers ... 62
How to Manage the Management Card's System (Internal) Operation ... 63

How to Control Access to the Control Console ... 63
How to Define System Identification Values ... 65
How to Set Date and Time Values ... 65
How to Manage File Transfers ... 66
How to Affect the Management Card's SNMP Agent ... 67
How To Define Links ... 68
How To View the Management Card's Identification Values ... 69

Chapter 8:
The AP9606 Management Card Control Console 70

Overview ... 70
Control Console Structure ... 70
How to Access the Control Console ... 71
How to Use Telnet with the Control Console ... 71
How to Use a Terminal with the Control Console ... 71
How to Log In ... 72
The Control Console's Main Screen ... 72
Management Card Information ... 73
How to use the Control Console Menu ... 73
Device Manager Menu ... 74
Network Menu ... 74
System Menu ... 75
How to Manage A UPS ... 75
How to Manage A Smart-UPS or Matrix-UPS ... 76
How to Monitor a Smart-UPS or Matrix-UPS ... 77
UPS Menu Screen Status Information ... 77
UPS Menu Status Options ... 78
How to Control a UPS ... 79
How to Configure a Smart-UPS or Matrix-UPS ... 81
Battery Screen ... 83
Line Transfer Screen ... 84
Shutdown Parameters Screen ... 85
General Screen ... 86
How to Manage A Symmetra Power Array ... 86
How to Monitor a Symmetra Power Array ... 87
Symmetra Screen Status Display ... 88
Detailed Status Screen ... 89
Scheduled Tests Screen ... 91
Module Diagnostics & Information Screen ... 92
Faults & Alarms Screen ... 95
How to Control a Symmetra Power Array ... 96
How to Configure a Symmetra Power Array ... 98
Utility Line Screen ... 99
Alarm Thresholds Screen ... 100
Shutdown Parameters Screen ... 101
General Screen ... 102
Reset UPS to Defaults Screen ... 102
How to Manage a Measure-UPS ... 103
How to Monitor a Measure-UPS ... 103
Measure-UPS Menu Screen's Status Information ... 103
Measure-UPS Menu Status Options ... 104
How to Configure a Measure-UPS ... 106

How to Manage the Management Card's Network Connection 108
How to Define the Management Card's Basic Network Values 109
How to Control File Transfers 110
TFTP Client 110
FTP Client 111
FTP Server 111
How to Use the Telnet Menu 112
How to Use the Web Menu 112
How to Use the SNMP Menu 113
How to Control SNMP Channel Access 115
How to Define Trap Receivers 115
How to Manage the Management Card's System (Internal) Operation 117
How to Determine Access to the Control Console 117
How to Define System Identification Values 118
How to Set Date and Time Values 119
How to Manage File Transfers 119
How to Control File Transfer Settings 120
How to Affect the Management Card's Operation 120
How to View the Management Card's Identification Values 121

Chapter 9:
File Transfers (Firmware and Configuration Files) 122

Overview 122
Upgrading the Management Card's Firmware 122
What is Firmware? 122
What are the Benefits of Upgrading the Firmware? 122
Where Do I Get the Latest Firmware? 122
How Much Does New Firmware Cost? 123
What Should I Know Before I Start the Firmware Upgrade? 123
How to Upgrade the Firmware 124
Upgrading Using the Web/SNMP Management Card Wizard 124
Upgrading Multiple Management Cards That are Available on the Network 124
Upgrading a Management Card That is Not Available on the Network. 124
Upgrading Using a Command Prompt FTP Client 125
Upgrading a Single Management Card That is Available on the Network 125
Upgrading Multiple Management Cards That are Available on the Network 127
Upgrading Using XMODEM 127
How Do I Know That the Firmware Upgrade Was Successful? 128
Updating the Management Card's Configuration Settings 129
What are the Management Card's Configuration Settings? 129
What is a Configuration File? 129
How Do I Create a Configuration File? 129
How Do I Transfer a Configuration File to a Management Card? 129
Updating the Configuration Settings using a BOOTP Bootup Filename 129
Updating the Configuration Settings of One or More Management Cards Using the Web/SNMP Management Card Wizard 130
Updating the Configuration Settings by Using an FTP Client 131
Updating the Configuration Settings by Initiating a TFTP Download 133
Updating the Configuration Settings by Initiating a FTP Download 134
How Do I Know That the Configuration File Transfer Was Successful? 135

Chapter 10:
Web/SNMP Management Card Wizard 136

Overview 136
What Are the System Requirements for Running the Wizard? 136
Where Can I Get an Updated Version of the Wizard? 136
What Management Card Settings Does the Wizard Allow Me to Configure? 136
Does the v1.0.1 Version of the Wizard Have Any Limitations? 136
How Do I Install the Wizard? 136
How Do I Run the Wizard? 136
How Can I Quickly Configure Only the Required Settings? 137
How Can I Pre-configure Multiple Management Cards Before They are Deployed? 137
How Can I Reconfigure Multiple Management Cards After They are Deployed? 137
How Can I Upgrade Firmware? 137
Using the Wizard to Configure Only the Required Settings 138
Using the Wizard to Pre-configure the Management Card Locally 140
Using the Wizard to Create a Configuration File for BOOTP 147
Using the Wizard to Reconfigure Deployed Management Cards 151
Using the Wizard to Create a Configuration File 158
Using the Wizard to Upgrade Firmware 162

Chapter 11:
Web/SNMP Management Card Security 165

Overview 165
Authentication versus Encryption 165
User Names, Passwords and Community Names 165
Port Assignments 165
MD5 Authentication 166

Chapter 12:
How to Correct Management Card Problems 167

Web/SNMP Management Card-Related Common Problems and Solutions 167
How to Correct Communication Lost Problems 168
APC Worldwide Product Support 169

Appendix A
Acronyms & Abbreviations 170

About This Guide

This introduction provides information which can help you use this guide to control the operation of your Management Card, its UPS and Measure-UPS (or SmartSlot Measure-UPS II). This includes descriptions of:

- How to Register Your Management Card
- This Guide's Purpose
- This Guide's Structure
- Associated Documents
- This Guide's Conventions

How to Register Your Management Card

Please fill out and return the enclosed warranty card. This card not only provides us with valuable feedback about how we can refine our products to serve your needs better, but it also enables us to notify you about important product updates and changes.

This Guide's Purpose

This guide describes how to use an AP9606 Web/SNMP Management Card v1.x to manage (monitor, control and configure) a UPS and a Measure-UPS (or a SmartSlot Measure-UPS II) via the web interface, SNMP and Telnet.

Note: The Management Card can connect a UPS without a Measure-UPS, a UPS which has a Measure-UPS, or a Measure-UPS without a UPS, to the network for management.

This Guide's Structure

In addition to this introduction, this guide has twelve chapters and an appendix to describing how to use the Web/SNMP Management Card:

- **Chapter 1: What You Can Use to Manage a Management Card**
  Provides an introduction to the applications you can use to manage a Management Card, its UPS and a Measure-UPS.

- **Chapter 2: User-Interface Components**
  Identifies the Management Card's light-emitting diodes (LEDs), and describes what these LEDs can tell you about the Management Card.

- **Chapter 3: How to Define Basic Configuration Requirements**
  Provides an overview of how you can use a BOOTP server, or a terminal, to define the network values a Management Card needs before it can run on the network.

- **Chapter 4: How to Use a Management Card with PowerChute *plus***
  Provides an overview of how you can use APC's PowerChute *plus* with your Management Card, including a brief description of using PowerChute *plus* for full, local management of a UPS and a Measure-UPS.

Note: You cannot use PowerChute *plus* to manage the Management Card's operation.

- **Chapter 5: How to Use SNMP**
  Describes how you can use an SNMP browser's **GET** (read) and **SET** (write) commands for full, remote (over the network) management of the Management Card, its UPS and a Measure-UPS.
- **Chapter 6: How to Use PowerNet SNMP Manager**
  Provides an overview of how you can use APC's PowerNet SNMP Manager for full, remote (over the network) management of the Management Card, its UPS and a Measure-UPS.
- **Chapter 7: Web Interface**
  Describes how you can manage an AP9606 Management Card, its UPS and a Measure-UPS using the Web Interface.
- **Chapter 8: The Management Card Control Console**
  Describes how you can manage an AP9606 Management Card, its UPS and a Measure-UPS using either Telnet for remote (over the network) management or a terminal, for local management.
- **Chapter 9: File Transfers**
  Describes the different options available for transferring files to the Management Card.
- **Chapter 10: Web/SNMP Management Card Wizard**
  Describes how to use the Wizard, a Windows application designed specifically for pre-configuration and reconfiguration of multiple Web/SNMP Management Cards.
- **Chapter 11: Security**
  Describes the different security options available, depending on the access interface used.
- **Chapter 12: How to Correct Management Card Problems**
  Describes how to correct problems which can occur with your Management Card. It also provides information on how to contact APC technical support anywhere in the world.
- **Appendix A: Acronyms and Abbreviations**
  Identifies the full terminology for acronyms and abbreviations used in this guide.

Associated Documents

Four other documents come with the Management Card, either in printer form, or as Portable Document Format (***.pdf**) files on the same disk which contains this user's guide:

- *Web/SNMP Management Card - Installation and Quick Start Guide* (printed, 990-6008A, **insguide.pdf** on CD-ROM)
  Describes how to physically install a Management Card, and connect it to your network.
- *PowerNet™ SNMP v3.0.2 MIB - Reference Guide* (**mibguide.pdf**, on CD-ROM)
  Describes the management information base (MIB) which a network management station (NMS) can use remotely to manage and control the Management Card, UPS and Measure-UPS.
- *Network Management Station (NMS) Reference Guide* (**nms.pdf**, on CD-ROM)
  Describes how to load and compile the PowerNet™ SNMP MIB at different NMS platforms.

- *Web/SNMP Management Card - Release Notes* (**relnotes.txt**, on CD-ROM)
  Identifies issues that apply directly to this v1.x version of the Management Card, and are not covered in any other document.

Refer to your UPS-specific user's guide or owner's manual for information about your UPS; refer to your NMS-specific documentation for information about your NMS.

This Guide's Conventions

This guide refers to the Management Card, and other various devices you can use with the Management Card and its UPS:

This Guide Uses	To Refer to
Management Card or Card	The AP9606 Web/SNMP Management Card
AP9600	The AP9600 SmartSlot Expansion Chassis
Measure-UPS	The standalone Measure-UPS or the SmartSlot Measure-UPS II
Server	Any server, workstation or other component which you can connect directly to your UPS
Network management station (NMS) or NMS	Any network component you can use to manage the Management Card.

Note: See APPENDIX A to identify the full terminology for any acronyms or abbreviation used in this guide.

Also, this guide uses the following conventions when referring to specific items within the text:

When the Following Appear in Text	This Guide Uses
A document name *(PowerNet SNMP Agent - MIB Reference Guide*)	*Italics*
- Menu names (**Console Control** menu) - File names (**powernet.mib**) - Management information base (MIB) object identifications (**upsAdvControl**) - Button names (**Connect**) - Dialog box names (**Connect** menu)	Boldface **Arial** font
- Menu options (`1- Device Manager`) - Display field names or values (`UPS Output:`) - Keyboard input (press `<Enter>`)	The `Courier New` font

Chapter 1:

What You Can Use to Manage a Management Card

This chapter provides an introduction to the applications you can use to manage a Management Card, its UPS and a Measure-UPS.

Overview

The Management Card provides the hardware and firmware needed to connect your APC UPS to a 10Mbps Ethernet network and use that network for remote (over the network) management of the Management Card, its UPS, and a Measure-UPS. The Management Card also allows you to use a terminal for local management.

Note: If PowerChute *plus* is installed on your system, you can use it to manage the UPS and a Measure-UPS locally. However, you cannot use PowerChute *plus* to manage the Management Card, or the Management Card's network operation. This user's guide mentions PowerChute *plus*, where appropriate, but does not describe how to use it. For that information, see your *PowerChute plus User's Guide*.

Remote Management

When a Management Card is running its SNMP agent on the network, you can use several methods to manage the Management Card, its UPS and a Measure-UPS:

You can use this	To Do this
An SNMP browser's **GET** and **SET** commands to access PowerNet SNMP management information base (MIB) object identifications (OIDs)	Use SNMP to manage a Management Card, its UPS and Measure-UPS (see CHAPTER 3).
APC's PowerNet SNMP Manager	Manage a Management Card, its UPS and Measure-UPS, without using an SNMP browser or the PowerNet SNMP MIB (see CHAPTER 5).
A Telnet console	Use a Management Card's Control Console to manage that Card, its UPS and Measure-UPS (seeCHAPTER 8).
A bootstrap protocol (BOOTP) server	Provide the basic network values a Management Card needs to run on the network (see CHAPTER 4).
FTP Client, TFTP Client, XMODEM or FTP Server	Download new firmware and configuration files.
Web Browser	Use a web browser to manage all aspects of the Adapter's operation and any connected UPS or Measure-UPS.

Local Management

You can connect a terminal (or terminal-emulator) to the Management Card, and use the Management Card's Control Console to manage the Management Card, its UPS and Measure-UPS. See CHAPTER 8 for information about HOW TO USE THE CONTROL CONSOLE.

Note: If the UPS connects to a server that uses APC's PowerChute *plus*, you can use PowerChute *plus* to manage the UPS and a Measure-UPS; you cannot use PowerChute *plus* to manage the Management Card in any way (see CHAPTER 4).

Chapter 2:

User-Interface Components

AP9606 Web/SNMP Management Card

The AP9606 has two status LEDs and a reset button. The reset button allows the user to reset the Management Card, typically when attempting to establish contact between a terminal (or terminal emulator) for Management Card configuration activity (as described in CHAPTER 3).

Status LED

This LED reports on the Management Card, the Management Card-to-UPS communication link, or the Management Card-to-SNMP network link, as follows:

- Off - The Management Card has no power.
- Solid green - The Management Card has valid network settings.
- Flashing green - The Management Card does not have valid network settings. See HOW TO DEFINE THE MANAGEMENT CARD'S BASIC NETWORK VALUES in CHAPTER 8.
- Flashing red slowly- The Management Card is making a BOOTP request.
- Solid red - The Management Card has detected a hardware failure.

Link-RX/TX LED

The Link-RX/TX LED reports on the following conditions:

- Off - The device(s) which connects the Management Card to the network, whether a router, hub or concentrator, is off or not operating correctly.
- Constant green - Management Card is connected to a functioning network.
- Flashing green - Management Card is receiving data packets from the network.

Chapter 3:
How to Define Basic Configuration Requirements

This chapter provides an overview of how you can use a BOOTP server, or a terminal, to define the network values a Management Card needs before it can run on the network.

Overview

A Management Card must have three network values defined before that Management Card can function (run its SNMP agent) on a network:

- The system IP address
- The IP address of the router or gateway for the Management Card's network segment
- The subnet mask for the Management Card's network segment

These values can be defined by using a BOOTP server, when BOOTP is enabled (the default condition), or by using the Web/SNMP Management Card Wizard or a terminal (or terminal-emulator), when BOOTP is not being used.

How to Use a BOOTP Server

The Management Card comes with BOOTP enabled. This allows a BOOTP server to provide the Management Card with the basic network values. If a bootup file is specified then the Management Card will attempt to get that file from an FTP or TFTP Server, which is on the same computer as the BOOTP Server. See Chapter 10, Web/SNMP Management Card Wizard, for information on how to create configuration files.

Note: See your BOOTP documentation for more information about using BOOTP.

How to Use a Terminal

If a BOOTP server is unavailable, you will need to use a terminal (or terminal-emulator) to access the Management Card's Control Console to disable BOOTP, and then define the basic network values that allow the Management Card to run on the network. See CHAPTER 8 for information about how to use the Control Console to define the Management Card's basic network values.

How to Use the Web/SNMP Management Card Wizard

If a BOOTP server is unavailable, you can use the Web/SNMP Management Card Wizard to define the basic network values that allow the Management Card to run on the network. See CHAPTER 10 for information about how to use the Wizard to define the Management Card's basic network values.

Chapter 4:
How to Use a Management Card with PowerChute® *plus*

How to Use a Management Card with PowerChute® *plus*

This chapter provides an overview of how you can use APC's PowerChute *plus* with your Management Card, including a brief description of using PowerChute *plus* for full, local management of a UPS and a Measure-UPS.

Note: For more information about APC's PowerChute *plus*, see your *PowerChute plus User's Guide*.

Overview

You use PowerChute *plus*, a graphical-user interface-based (GUI-based) UPS monitoring software application, with computer systems that require safe shutdown of applications during a power failure. Usually, PowerChute *plus* communicates with the UPS through a cable connection between the computer system and the UPS serial port. However, when the UPS is using a Management Card mounted in an AP9600, the AP9600 connects to the UPS serial port, and the computer system connects to the AP9600. In this case, the Management Card passes PowerChute *plus* communication through to the UPS without affecting the Management Card. This form of communicating is known as passthrough mode.

What PowerChute *plus* Can Do

PowerChute *plus* does not use the Management Card, nor does the Management Card use PowerChute *plus*. However, PowerChute *plus* does provide a graphical user interface (GUI) you can use to manage (monitor, control and configure) a UPS and a Measure-UPS (but not a Management Card) locally.

PowerChute *plus* provides for approximately the same level of UPS and Measure-UPS management that you can achieve when using SNMP, APC's PowerNet SNMP Manager application, or the Management Card's Control Console.

What PowerChute *plus* Cannot Do

PowerChute *plus* cannot manage the Management Card, or the Management Card's network connection: You can only manage a Management Card using SNMP, APC's PowerNet SNMP Manager application, the Management Card's Control Console or Web Interface; you can manage the Management Card's network connection only, using the Management Card's Control Console or Web Interface.

Note: You can manage the Management Card's trap receiver values using SNMP, PowerNet Manager, the Control Console or Web Interface. You can also use BOOTP to provide network communication values (see CHAPTER 3), and FTP Client, TFTP Client, XMODEM or FTP Server, to download firmware or configuration files. See THE SEPARATE DOWNLOAD.PDF FILE.

How to Connect with PowerChute *plus*

To install a Management Card with a UPS that connects with a computer system using PowerChute *plus*:

1) If PowerChute *plus* is not installed, see the PowerChute *plus* documentation for installation directions. During this installation:
   a) If the Management Card is already mounted in an AP9600 chassis, ensure that the AP9600 cable is disconnected from the UPS serial port.
   b) Use the black, smart-signalling cable (940-0024C) which came with the Management Card to connect the computer system to the UPS.

2) Once PowerChute *plus* is installed:
   a) Disconnect the PowerChute *plus* computer system-to-UPS cable from the UPS serial port. Do not disconnect this cable from the computer system. PowerChute *plus* should record the following message in its event log:

      Unable to Communicate with UPS

   b) Install the Management Card in the UPS SmartSlot, or, if the Management Card is going to use an AP9600:
      1) Install the Management Card in the AP9600.
      2) Connect the AP9600 cable to the UPS serial port.
   c) See CHAPTER 8 to configure the Management Card to run on the network.
   d) When you finish configuring the Management Card, connect the PowerChute *plus* cable to the UPS serial port (if the Management Card is installed in the UPS) or to the AP9600 serial port (if the Management Card is installed in this external chassis).

3) The installation is complete, and PowerChute *plus* should record this message in its event log:

   Communications established

Note: If this message does not appear, see HOW TO CORRECT COMMUNICATION LOST PROBLEMS in CHAPTER 12.

Chapter 5:

How to Use SNMP

This chapter describes how you can use an SNMP browser's **GET** (read) and **SET** (write) commands for full, remote (over the network) management of the Management Card, its UPS and a Measure-UPS.

Overview

The simple network management protocol (SNMP) provides a method of using a network to transfer data between two devices:

- Both devices use a management information base (MIB), and that MIB's object identifications (OIDs) as the shared language needed for the communication between the two devices. Two MIBs can be used with the Management Card:
  - MIB-II system OIDs
  - APC's PowerNet SNMP MIB

  Note: In addition to OIDs, the PowerNet MIB has a set of messages (called traps) it can send to up to four defined NMSs when certain events occur.

- One device, usually a network management station, uses the MIB's OIDs, through an SNMP browser's **GET** (read) and **SET** (write) commands, to monitor and control the other device.

How much management an NMS can actually perform at a Management Card depends on the MIB used by its SNMP browser, and on the level of SNMP access the Management Card allows for that NMS.

How to Affect SNMP Access

An NMS can manage a Management Card by using the Card's four SNMP access channels.. By default, a Management Card allows any NMS to use SNMP **GETs** and **SETs** to any one of the four channels, if:

- The Management Card's IP address, along with any alias desired, has been added to the appropriate network configuration files, or to the domain-name server, and a manageable object (icon) for the Management Card's UPS has been added to the appropriate network management map. See your operating system's documentation for more information about performing these functions.
- The NMS uses one of the Management Card's default community strings (passwords) for its **GET** (**public** and **public2**) and **SET** (**private** and **private2**) commands.

This default condition allows you to use SNMP to manage the Management Card as soon as it is running on the network, but provides no network security. Any NMS can use the PowerNet MIB OIDs to make changes to the Management Card's configuration, or to affect the operation of the Management Card's UPS.

Permission to modify the Management Card's SNMP access channels is granted or denied by using the Control Console.

Note: If you know the password, you can use a Telnet console to connect with the Management Card over the network, or a terminal to connect directly to the Management Card to make changes in the Management Card's Control Console or Web Interface. You cannot use SNMP, BOOTP, PowerNet Manager or PowerChute *plus* to change SNMP access values.

Use	To Do this
The **Network**->**SNMP**->`Settings`->`SNMP` option	Disable SNMP access completely.
The **Network**->**SNMP**->`Access Control 1` through `Access Control 4` options	Change the community string (password) used by an SNMP channel.
The **Network**->**SNMP**->`Access Control 1` through `Access Control 4` options	Allow only a defined NMS access to an SNMP channels.
The **Network**->**SNMP**->`Access Control 1` through `Access Control 4` options	Allow read and write access, read-only access, or disable an SNMP channel.

How to Use MIB-II System OIDs

An NMS does not need the PowerNet MIB to use the MIB-II system OIDs. If an NMS is allowed access to a Management Card (see the previous NMS SNMP ACCESS section), it can use its SNMP browser with MIB-II system name (**sysName**), system location (**sysLocation**) and system contact (**sysContact**) OIDs.

You cannot use the PowerNet MIB to access the MIB-II system OIDs, but you can use the Management Card's Control Console or a PowerNet SNMP Manager application to modify the MIB-II system OIDs.

How to Use The PowerNet SNMP MIB

If you want an NMS to use SNMP to access more than MIB-II system OIDs, then the PowerNet MIB must be installed and compiled at that NMS, even when a PowerNet SNMP Manager application is used. The PowerNet Manager does need the PowerNet MIB, but an SNMP browser does.

The PowerNet MIB and Network Communication

The PowerNet MIB provides for two different types of communications with an NMS:

- If an NMS allowed access to a Management Card (see the previous NMS SNMP ACCESS section), that NMS can use **GETs** and **SETs** to PowerNet MIB OIDs to manage a Management Card and its UPS.
- If an NMS is defined as a trap receiver, the PowerNet MIB allows that NMS to interpret traps (alert, alarm or informational messages) sent to that NMS by a Management Card.

Note: See the *Network Management Station (NMS) Reference Guide* (nms.pdf), and your NMS documentation, for information about how to load and compile the PowerNet MIB at your NMS.

The PowerNet MIB OIDs

The PowerNet MIB OIDs allow an NMS to use SNMP to monitor, control and configure most settings for a Management Card, its UPS and Measure-UPS. See Chapter 8 for information on the Control Console.

The rest of this discussion describes what you can and cannot do when using SNMP and the PowerNet MIB OIDs.

Note: For more information about the PowerNet MIB, its OIDs and traps, see the on-line version of the *PowerNet SNMP Agents - MIB Reference Guide* (mibguide.pdf) which came on a disk with your Management Card.

What PowerNet MIB OIDs Can Do

When you use an SNMP browser with the PowerNet MIB:

You Can	By Using
View and use APC management values: - See if BOOTP is enabled or not. - See how many trap receivers are defined - Modify trap receiver values. - Restart, continue or load a news SNMP Agent. - Define a tftp server's IP address	**apcmgmt** configuration (**mconfig**) and control (**mcontrol**) OIDs.
Monitor an attached Measure-UPS, including: - Viewing temperature and humidity values. - Modifying contact closure values.	**measureUPS** OIDs.
Transfer files - New firmware - Configuration files - Via FTP or TFTP Client	**mfiletransfer** OIDs

You Can	By Using
View UPS identification values: - UPS model - UPS name - Firmware revision - Date of manufacture - UPS serial number	**upsIdent** (read-only) basic (**upsBasicIdent**) and advanced (**upsAdvIdent**) OIDs.
View UPS battery values: - Battery status, temperature and capacity - Time on battery power and runtime remaining - Last replacement date - Number of battery packs and how many are bad	**upsBattery** (read-only) basic (**upsBasicBattery**) and advanced (**upsAdvBattery**) OIDs.
View input power (utility voltage) values: - Voltage phase, level and frequency - Maximum and minimum voltage sensed - Last cause for a transfer to battery	**upsInput** (read-only) basic (**upsBasicInput**) and advanced (**upsAdvInput**) OIDs.
View the current status of the UPS, and its output power values: - Voltage phase, level, current and frequency - UPS load	**upsOutput** (read-only) basic (**upsBasicOutput**) and advanced (**upsAdvOutput**) OIDs.
Use UPS configuration values to: - Select high and low transfer values. - Identify Volts/Amps values for the load equipment. - Select how the UPS alarm will work. - Select how long the UPS will run when a low-battery condition occurs. - Select power return capacity and return delay values. - Select how long the UPS remains on line after being told to shut down (shutdown delay). - Define the duration of a timed sleep by the UPS. - Reset the UPS EEPROM to its factory-default values. - Define a front-panel password. - Select how long before the UPS battery reaches exhaustion will the UPS wait before shutting down (low-battery duration). - Select the UPS output voltage. - Select the UPS sensitivity to input power noise.	**upsConfig** basic (**upsBasicConfig**) and advanced (**upsAdvConfig**) OIDs.

You Can	By Using
Use UPS control values to: - Turn the UPS on or off. - Put a UPS into sleep mode. - Reboot the UPS. - Put a UPS into bypass mode. - Simulate a power failure. - Test the UPS alarm.	**upsControl** basic (**upsBasicBattery**) and advanced (**upsAdvBattery**) OIDs.
Use UPS test values to: - Schedule UPS self-tests. - Cause the UPS to perform a self-test. - View the results of the last UPS self-test and runtime calibration. - Start and stop a runtime calibration.	**upsTest** basic (**upsBasicTest**) and advanced (**upsAdvTest**) OIDs.
Check on the current status of the Management Card's communication with the UPS.	**upsCommStatus**, a read-only OID.

What PowerNet MIB OIDs Cannot Do

The PowerNet MIB OIDs have the following limitations:

You cannot use the PowerNet MIB to Do this	You can only use
Define the network values a Management Card needs before it can run on the network: - The Management Card's IP address - The IP address of the network segment's router or gateway. - The network segment's subnet mask value	A BOOTP server (when BOOTP is enabled), or the Management Card's Control Console (when BOOTP is disabled). See CHAPTER 6 for information about how to use a BOOTP server; See CHAPTER 8 for information on how to use the Control Console.
Define any values for the Management Card's SNMP access channels: - Community strings (channel passwords) - Type of access (read or write) - NMS IP addresses	The Management Card's Control Console (see CHAPTER 8).
Enable or disable access to the Management Card by: - SNMP - Telnet - BOOTP - HTTP (Web Interface)	The Management Card's Control Console (see Chapter 8).

PowerNet MIB Traps

A Management Card can send alarm or informational messages, known as traps, to specifically defined NMSs. Most NMSs need to use the PowerNet MIB to interpret those traps.

Note: HP OpenView systems can use the Trap Definition File, which came on the disk with PowerNet MIB, to display intuitive messages.

The Management Card allows you to define up to four trap receivers. Each definition includes:

- The community string (password) used for traps (default is **public**).
- The IP address for each NMS defined as a trap receiver.
- Whether the Management Card is enabled or disabled to send traps to a defined NMS.

You can use SNMP, a PowerNet SNMP manager, or the Management Card's Control Console to define trap receivers.

To Change Trap Receiver Definitions	Use
Using The Management Card's Terminal Console	The **Trap Receiver 1** through **Trap Receiver 4** options in the Control Console's SNMP menu (see CHAPTER 8).
Using PowerNet MIB OIDs	The APC management **mconfigTrapReceiverTable** OIDs (see CHAPTER 5).
Using PowerNet SNMP Manager	The options in the SNMP Agent Parameters dialog box (see your *PowerNet SNMP Manager User's Guide*).
Using the Web Interface	The SNMP option under the Network menu on the left side of the screen (see CHAPTER 7).

Chapter 6:
How to Use a PowerNet SNMP Manager

This chapter provides an overview of how you can use APC's PowerNet SNMP Manager for remote (over the network) management of a Management Card, its UPS and a Measure-UPS. For more information about APC's PowerNet SNMP Manager, see your *PowerNet SNMP Manager User's Guide*.

Overview

PowerNet SNMP Manager provides graphs, display windows, dialog boxes and menus you can use to manage a Management Card, its UPS and a Measure-UPS through the Management Card's connection with the network.

Note: Currently, APC has PowerNet SNMP Manager applications which can operate with HP OpenView for Windows, SunNet Manager for Solaris, Novell ManageWise, and HP OpenView for UNIX (and other UNIX systems).

What PowerNet SNMP Manager Can Do

PowerNet Manager provides for virtually the same level of management that you can achieve when using SNMP or APC's PowerChute *plus* application.

What PowerNet SNMP Manager Cannot Do

Although PowerNet Manager can control some aspects of a Management Card's operation, it cannot manage the Management Card's network connection. You can only manage the Card's network connection using the Management Card's Control Console or Web Interface.

Note: You can also use BOOTP to provide network communication values (see CHAPTER 3), and FTP Client, TFTP Client, XMODEM or FTP Server, to download firmware or configuration files (see THE SEPARATE DOWNLOAD.PDF FILE).

Chapter 7:
How to use the Web Interface

This chapter provides details of how you can use your Internet Explorer or Netscape browser to manage your UPS or Measure-UPS.

Overview

The Management Card allows management of the UPS, Measure-UPS, and Management Card internal operation via an easy-to-use Web Interface. No software installation is required to access the Management Card's Web Interface, except for a standard web browser.

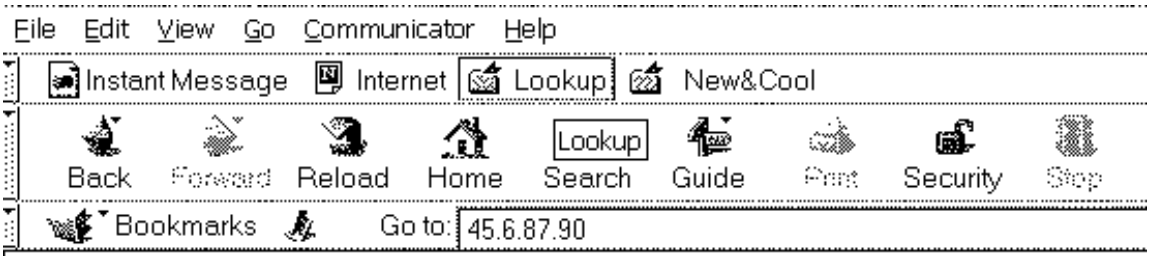
Supported Web Browsers

Internet Explorer 3.01 and later
Netscape 3.0 and later

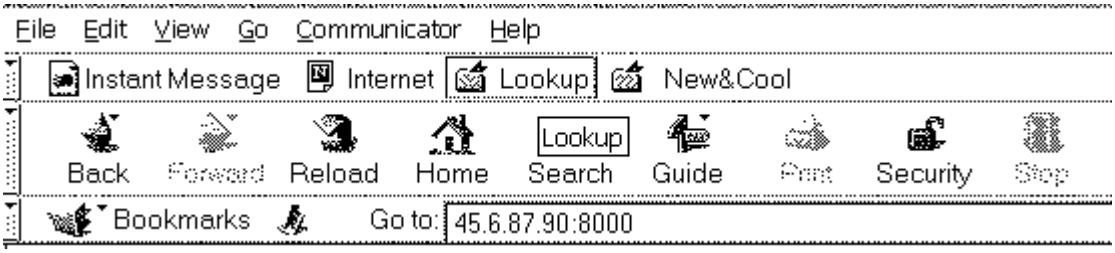
Some features of the Management Card's Web Interface (including data verification, Assistant Online, and MD5 authentication) require that JavaScript be enabled. Additionally, MD5 authentication requires that Java be enabled.

How Do I Access the Management Card Using a Web Browser?

At the URL line, enter the System IP address or DNS name (requires a DNS server entry for the Management Card) of the Management Card that you want to manage. Then press <ENTER>.



If the Management Card's Web Port is set to a value other than the default of 80, enter the System IP address followed by a colon and the configured Web Port value (in this example 8000).



What is Assistant Online?

Assistant Online brings APC Customer Service to the Web. When you click on the Assistant Online logo, the Management Card will transmit information about your UPS and Management Card to APC's Assistant Online server. The server will digest the information and tell you if a newer version of firmware is available, or if your UPS has a bad battery, and how to proceed. Assistant Online can also link you to extensive context-sensitive help. As new features are added to Assistant Online, all you need to do to take advantage of them is to click the logo.

What Purpose Do the User-Definable Links Serve?

The user-definable links at the bottom of the navigation frame allow you to link together your Management Cards, MasterSwitches, and other Web-enabled devices, allowing more integrated management via the Web interface.

Does the Management Card Have Local Help Pages?

Yes. The Management Card has its own internal help pages that you can access by selecting Help in the Navigation frame or by clicking the "?" at the end of select black title bars.

How to Access the Web Interface

Use any of the supported Web browsers to access the Web. In the URL Location field, type in `http://` followed by your Management Card's IP address. Press <Enter>.

For example: `http://170.241.17.51.`

How to Log In

When you enter your Management Card's IP address and press <Enter>, you will be prompted for a user name and password. When prompted:

1) Type your user name and press <Enter>.
2) Type your password and press <Enter> to access the Management Card's Web Interface main screen (see THE WEB INTERFACE'S MAIN SCREEN).

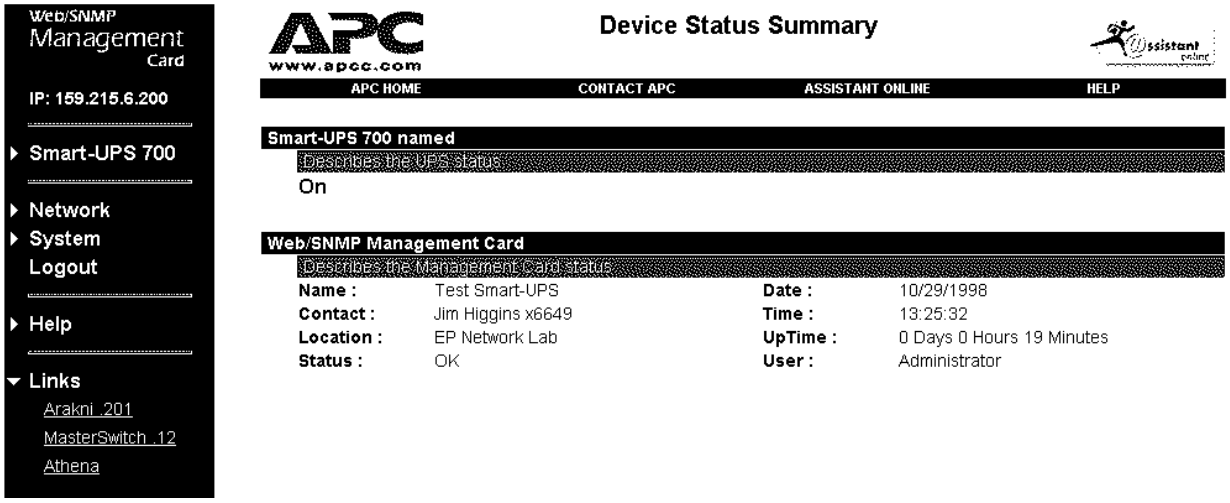
Note: Both use `apc`, all lowercase, for their default values. Use the Web Interface's System menu to change the user name, password or timeout values.

How to use the Web Interface

Once you have logged in, the Device Status Summary Screen appears. The column on the left side of the screen displays options that let you access detailed information about the Management Card, its UPS, Measure-UPS and Symmetra. To select a menu option, click on it. Detailed descriptions of each option are discussed later in this chapter.

Device Status Summary Screen

The Device Status Summary screen contains information about the Management Card, its UPS and Measure-UPS.

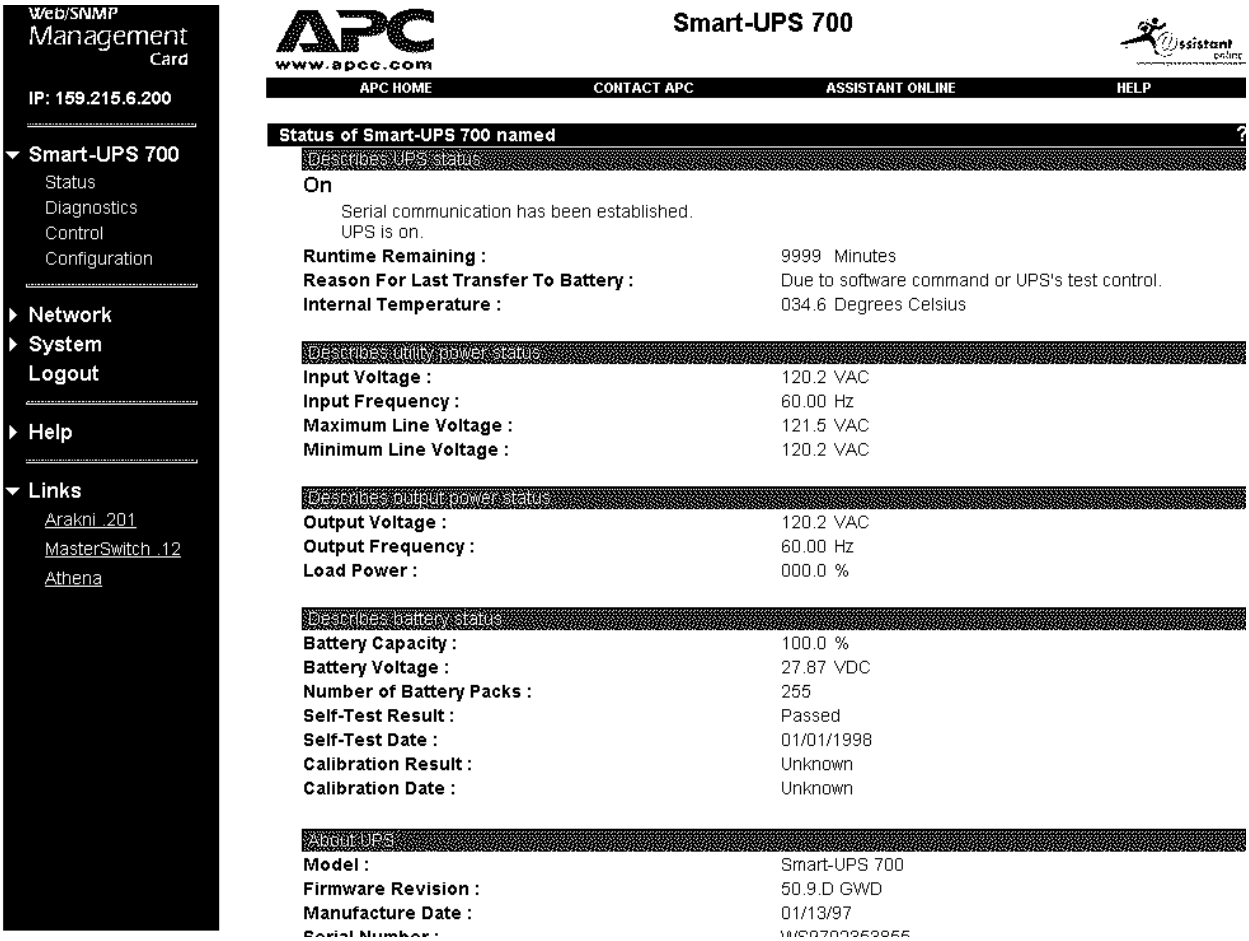


This Field	Describes
Smart-UPS	The name of the UPS and its status
Measure-UPS	The Measure-UPS status and whether or not any alarms exist
Web/SNMP Management Card	The Management Card status

Note: Use the UPS menu's Alarm Details option to get information about an existing alarm.

The Smart-UPS Status Screen

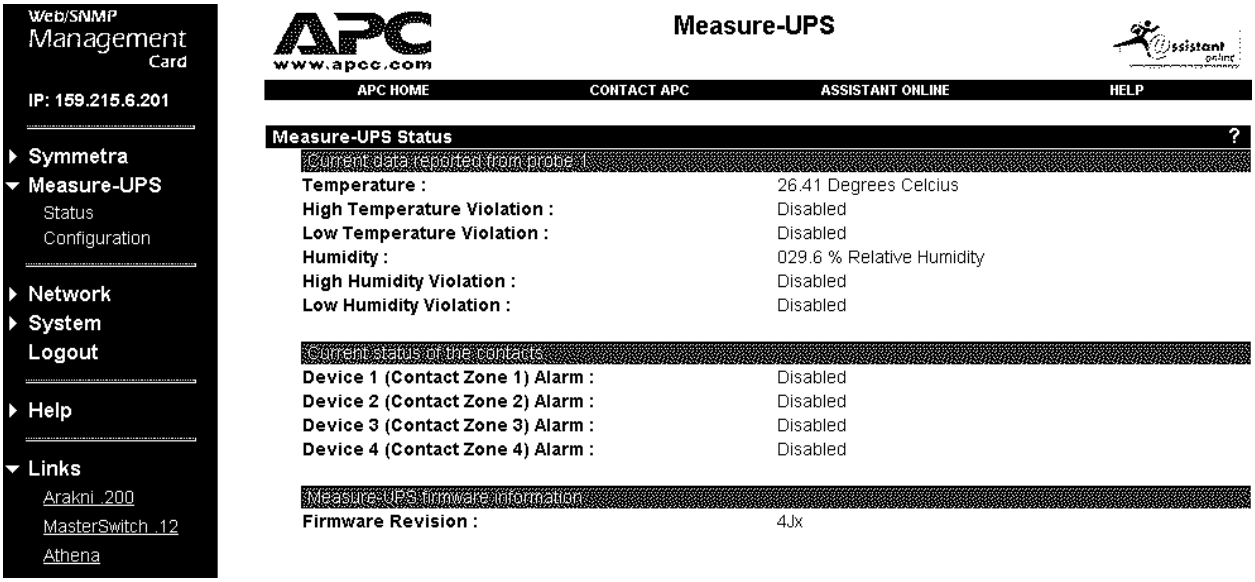
Selecting the **Web Interface**'s `Smart-UPS` option accesses a screen that shows Smart-UPS status information and allows you to select the Smart-UPS parameters you want to manage from the left-hand column.



For information about the Smart-UPS or Matrix-UPS screens, see How To Manage a Smart-UPS or Matrix-UPS.

The Measure-UPS Status Screen

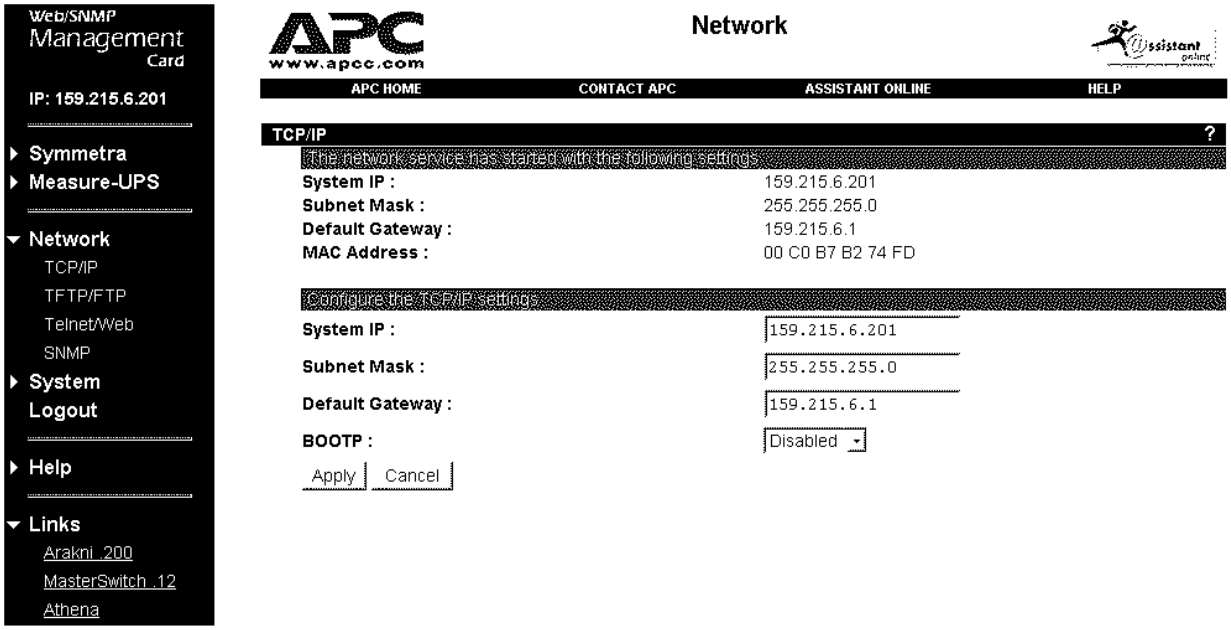
Selecting the **Web Interface**'s `Measure-UPS` option accesses a screen that shows Measure-UPS status information and, in the left-hand column, allows you to select the Measure-UPS parameters you want to manage.



For information about the Measure-UPS screens, see HOW TO MANAGE A MEASURE-UPS.

The Network Screen

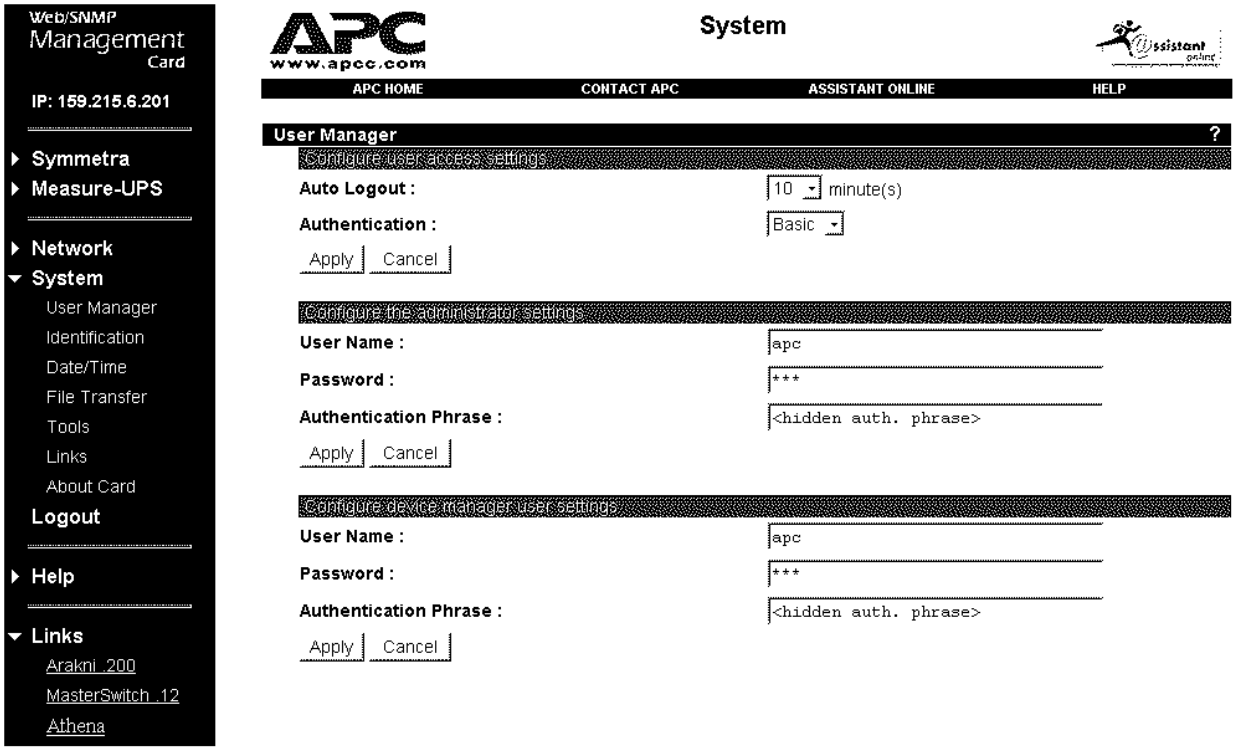
Selecting the **Web Interface**'s `Network` option accesses a screen that shows Network TCP/IP control and status information and, in the left-hand column, allows you to select the Network parameters you want to manage.



For information about the **Network** screens, see HOW TO DEFINE THE MANAGEMENT CARD'S BASIC NETWORK VALUES.

The System Screen

Selecting the **Web Interface**'s `System` option accesses a screen that shows User Manager control and status information and, in the left-hand column, allows you to select the System parameters you want to manage.

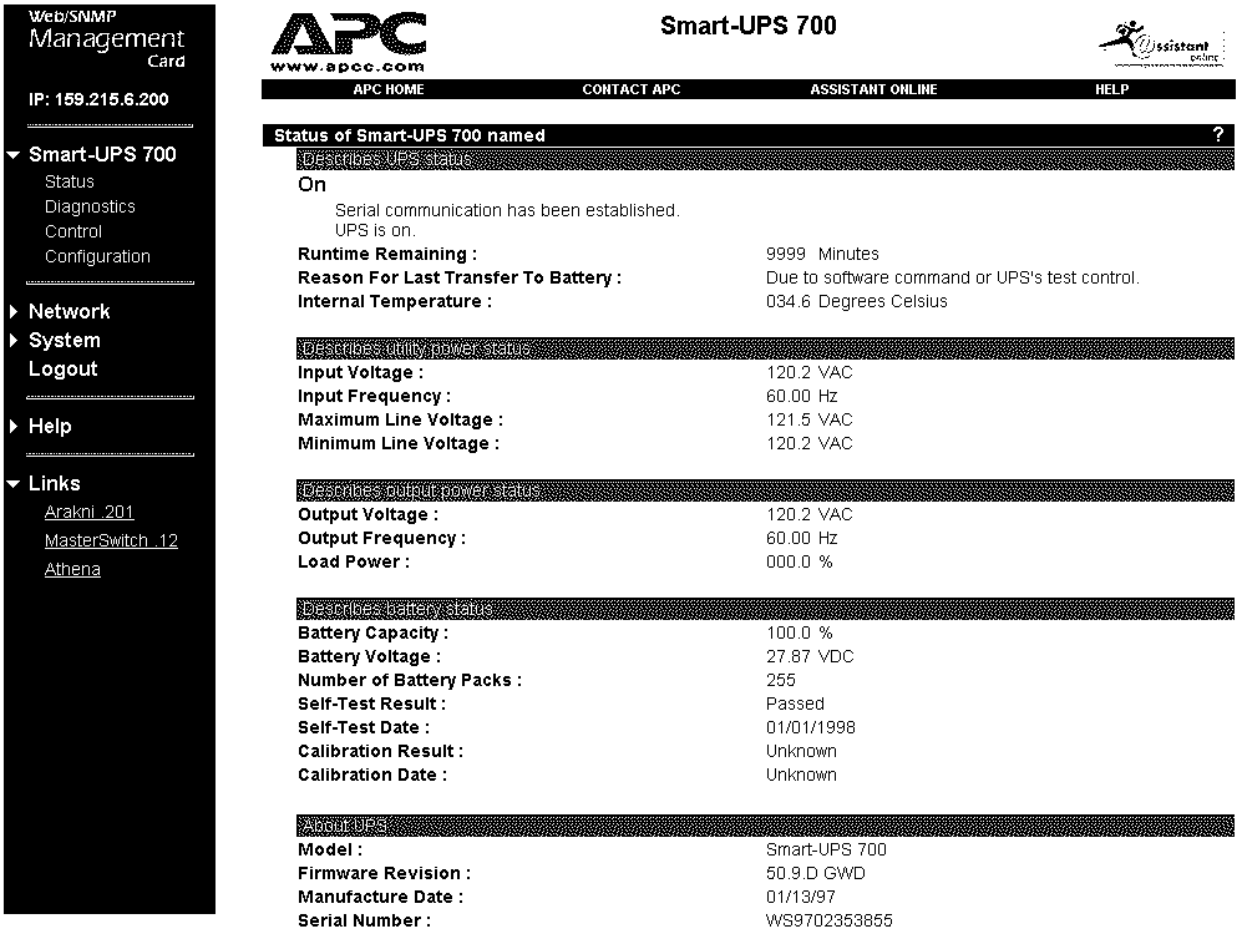


For information about the **System Screens**, see HOW TO MANAGE THE MANAGEMENT CARD'S SYSTEM (INTERNAL) OPERATION.

How to Manage a Smart-UPS or Matrix-UPS

When the UPS is a Smart-UPS or a Matrix-UPS and you select either of those options from the left-hand column, a screen appears (for a Smart-UPS 700, in the example below) showing UPS status information. Menu options in the left-hand column allow you to monitor (view operational parameters, identification parameters and alarm and operational status), control and configure a Smart-UPS or a Matrix-UPS.

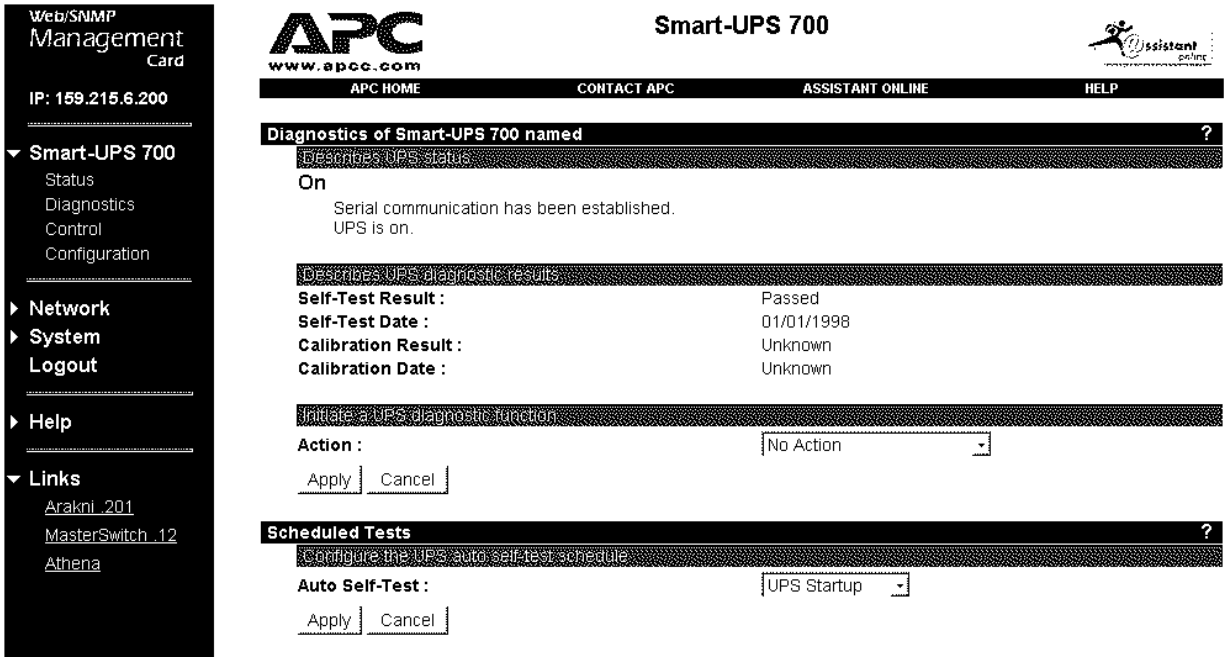
The Smart-UPS Status Screen



This Field	Describes
Describes UPS Status	
On or Off:	The UPS is "On" or "Off" and whether serial communications has been established.
Runtime Remaining:	How long the UPS can use battery power to support its load equipment before the UPS must shut down.
Reason For Last Transfer To Battery:	What caused the UPS to switch to battery most recently.
Internal Temperature:	The internal temperature of the UPS.
Describes Utility Power Status	
Input Voltage:	The input line (utility) voltage level.
Input Frequency:	The input line (utility) voltage's frequency, in Hertz (Hz, for cycles per second).
Maximum Line Voltage:	The maximum input voltage sensed by the UPS during the last minute of operation.
Minimum Line Voltage:	The minimum input voltage sensed by the UPS during the last minute of operation.
Describes Output Power Status	
Output Voltage:	The UPS output voltage level.
Output Frequency:	The output line voltage's frequency, in Hertz (Hz, for cycles per second).
Load Power:	The load placed on the UPS by the attached equipment , expressed as a percentage of the total UPS load capacity.
Describes Battery Status	
Battery Capacity:	How much battery capacity, as a percentage of full-capacity, the UPS has available.
Battery Voltage:	The UPS battery voltage level.
Number of Battery Packs:	How many battery packs the UPS has.
Self-Test Result:	The result of the last self-test.
Self-Test Date:	The date of the last self-test.
Calibration Result:	The result of the last runtime calibration.
Calibration Date:	The date of the last runtime calibration.
About UPS	The model, firmware revision, manufacture date and serial number of the UPS.

The Smart-UPS Diagnostics Screen

When you select `Diagnostics` from the Smart-UPS menu options in the left-hand column, the following screen appears:



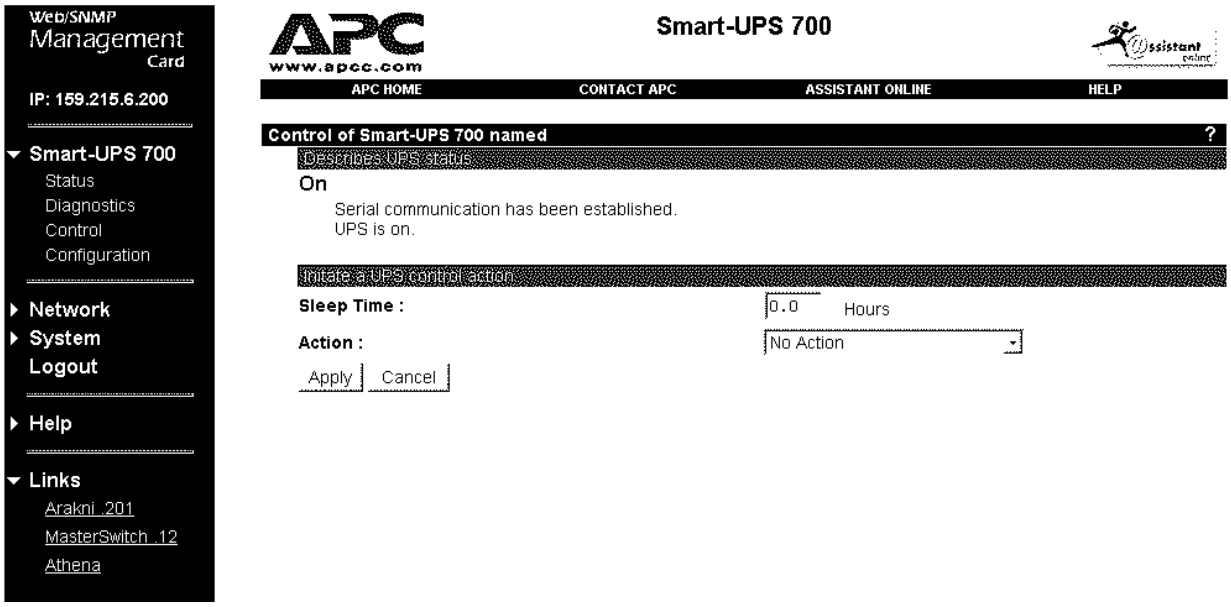
This Field	Describes
DESCRIBES UPS STATUS	
On or Off:	The UPS is "On" or "Off" and whether serial communication has been established.
DESCRIBES UPS DIAGNOSTICS RESULTS	
Self-Test Result:	The result of the last self-test.
Self-Test Date:	The date of the last self-test.
Calibration Result:	The result of the last runtime calibration.
Calibration Date:	The date of the last runtime calibration.

The following fields have options available on pull-down menus:

Use	To Select
INITIATE A UPS DIAGNOSTIC FUNCTION	
Action:	Available options (via pull-down menu) - No Action - UPS Self-Test - Simulate Power Failure - Start Runtime Calibration - Test UPS Alarm
CONFIGURE THE UPS AUTO SELF-TEST SCHEDULE	
Auto Self-Test:	Available options (via pull-down menu) - Every 7 Days - Every 14 Days - Never - UPS Start-up

How to Control a UPS

When you select `Control` from the Smart-UPS menu options in the left-hand column, the following screen appears:



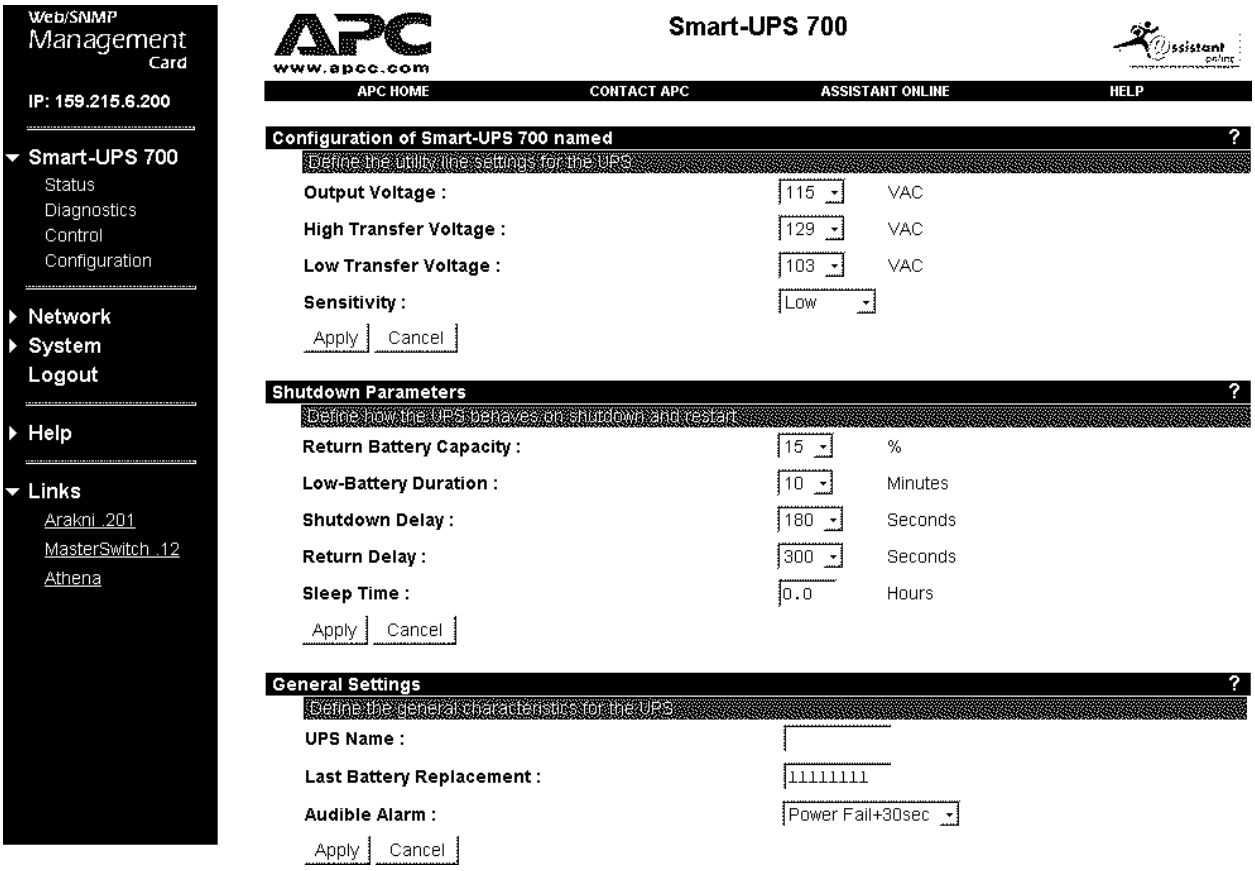
View	To
DESCRIBES UPS STATUS	
`On` or `Off`:	Display the status of the UPS. In this example, serial communication has been established and the UPS is `On`.
INITIATE A UPS CONTROL ACTION	
Sleep Time:	Define how long the UPS will sleep in response to either the `Put UPS to Sleep`, or `Put UPS to Sleep Gracefully` options in the `Control` screen menu. The time is defined in hours and in 6-minute (one tenth of an hour) increments.

The `Action` field lets you select from among the following options via a pull-down menu.

Use	To Do This
No Action	Do not initiate any action for the UPS.
Turn UPS On	To cause a UPS which was turned off to turn on again (supply power to its load equipment).
Turn UPS Off	Cause a UPS to turn off immediately (stop supplying power to its load equipment).
Turn UPS Off Gracefully	Signal all servers communicating with the UPS, that are using PowerChute *plus*, to shut down their operating systems. The UPS waits the amount of time defined by the `Low-Battery Duration` configuration value for servers to shut down before turning power off (see HOW TO CONFIGURE A SMART-UPS OR MATRIX-UPS).
Reboot UPS	Cause a UPS to turn off (stop supplying power to its load equipment) and then turn power back on after a specified delay.
Reboot UPS Gracefully	Signal all servers communicating with the UPS, that are using PowerChute *plus*, to shut down their operating systems. The UPS waits the amount of time defined by the `Low-Battery Duration` configuration value for servers to shut down before turning power off (see HOW TO CONFIGURE A SMART-UPS OR MATRIX-UPS).
Put UPS to Sleep	Turn the UPS off for a defined period of time.
Put UPS to Sleep Gracefully	The UPS waits the amount of time set as the `Shutdown Delay` configuration value for servers to shut down, then puts the UPS to sleep for the defined period of time set as the `Sleep Time` configuration value (see HOW TO CONFIGURE A SMART-UPS OR MATRIX-UPS).
Reset UPS to Defaults	Reset the UPS to the default values stored in the Management Card's EEPROM.

How to Configure a UPS

When you select `Configuration` from the Smart-UPS menu options in the left-hand column, the following screen appears:



Note: A UPS has many other operational parameters that can be modified using either SNMP (see CHAPTER 5), PowerChute *plus* (see CHAPTER 4) or PowerNet SNMP Manager (see CHAPTER 6).

Configuration

The first section of the Configuration screen lets you define the utility line settings for the UPS.

Use	To Do This
Output Voltage:	Define the nominal (basic voltage range) value for UPS output voltage level.
High Transfer Voltage:	Define the maximum voltage level the UPS tolerates before switching to battery power, if the UPS does not have SmartTrim to reduce the input voltage to a level it can use for its output power.
Low Transfer Voltage:	Define the minimum voltage level the UPS tolerates before switching to battery power, if the UPS does not have SmartBoost to reduce the input voltage to a level it can use for its output power.
Sensitivity:	Define how sensitive the UPS is to the input (utility) power's line noise.

Shutdown Parameters

This section lets you define how the UPS behaves during shutdown and restart. You define each of the following parameters by filling in values or accessing pull-down menus:

Use	To Do this
Return Battery Capacity (%):	Define the percentage of full capacity the UPS batteries must have available before the UPS can go back on line after a power failure shutdown occurs. *Note: The UPS must wait until the time defined by the* `Return Delay` *value expires before it can go back on-line.*
Low Battery Duration	Define how long (in minutes) the UPS can continue to run on-battery once a low-battery condition occurs. Also, this value defines how long the UPS will wait for servers to shut down in response to `Reboot UPS Gracefully`, `Turn Off UPS Gracefully`, and `Put UPS to Sleep Gracefully` commands (see HOW TO CONTROL A SMART-UPS OR MATRIX-UPS).
Shutdown Delay	Define how long the UPS waits (in seconds) after it receives a shutdown command, before it actually shuts down.
Return Delay	Define how long a UPS that has shut down due to a power failure will wait (in seconds) befpre ot gpes bacl pm ;ome, after the power failure ends. *Note: The UPS must also wait until the battery capacity equals the* `Return Battery Capacity` *value.*
Sleep Time	Define how long the UPS will sleep in response to using either the `Put UPS to Sleep` or `Put UPS to Sleep Gracefully` options in the Control screen menu. The time is defined in hours and in 6-minute (one-tenth of an hour) increments.

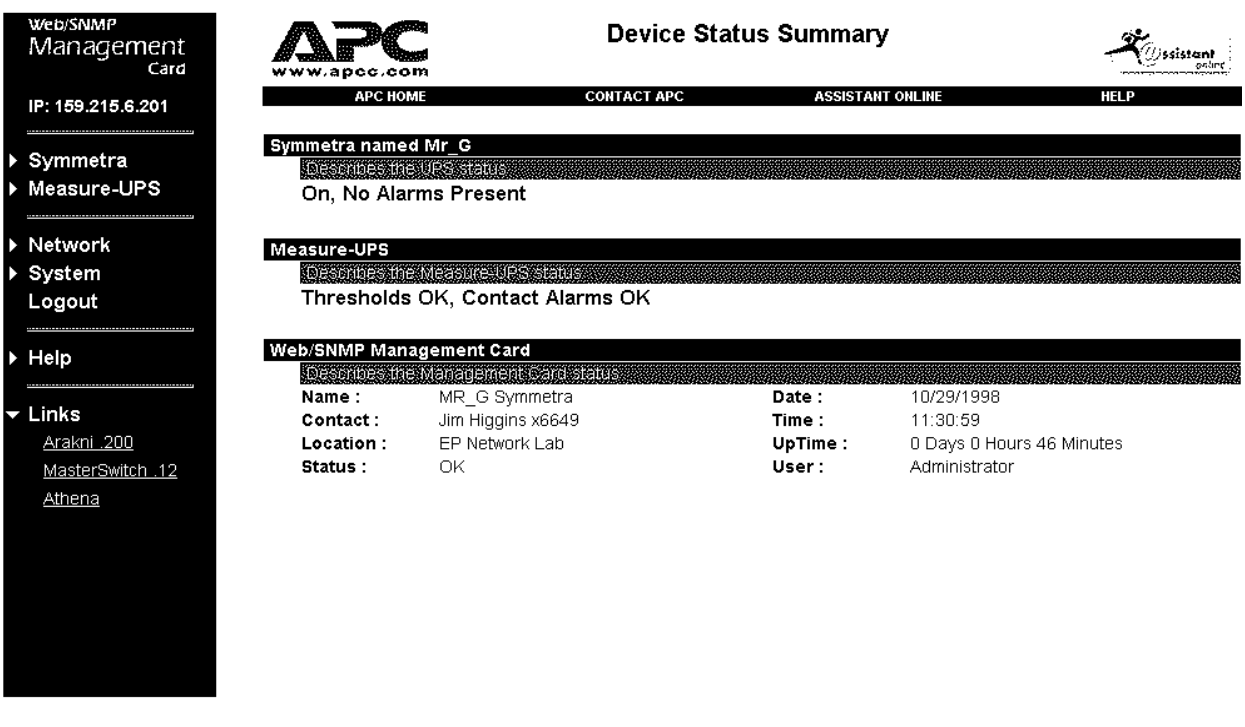
General Settings

The following section lets you define the general characteristics for the UPS:

Use	To Do This
UPS Name	Define the name used by the UPS.
Last Battery Replacement	Identify when the UPS battery was last replaced.
Audible Alarm	Define when the UPS will generate an audible alarm.

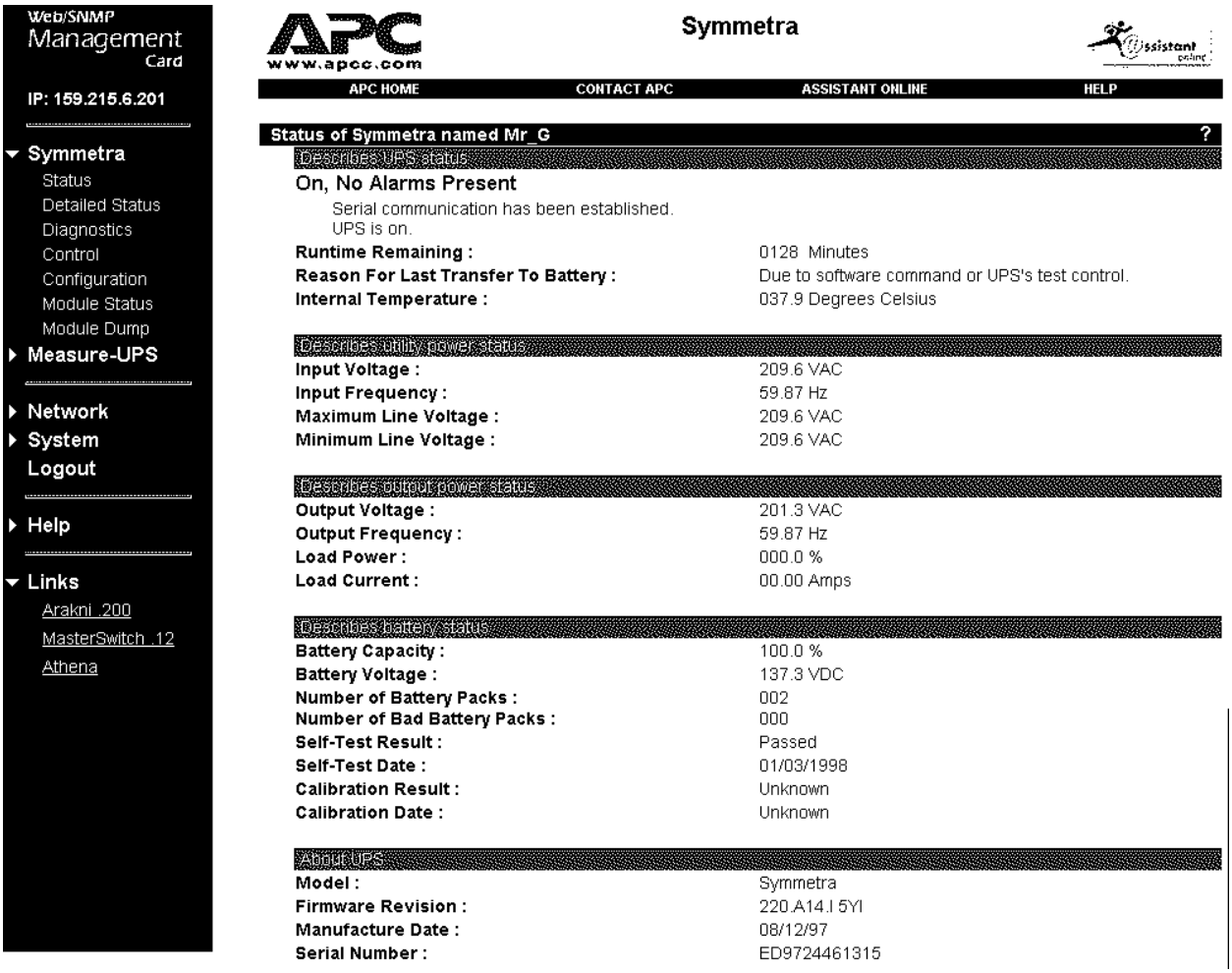
How to Manage a *Symmetra Power Array*

When the UPS is a *Symmetra Power Array*, the following screen appears when you first login.



Symmetra Power Array status information is displayed in the top half of this screen. Below that is status information for the Measure-UPS and Management Card.

By selecting the `Symmetra` option from the left-hand column, you access the following screen:



The menu options in the left-hand column allow you to monitor, control and configure the *Symmetra Power Array:*

- Status
- Detailed Status
- Diagnostics
- Control
- Configuration
- Module Status
- Module Dump

For more information about these menu options, see HOW TO MONITOR A SYMMETRA POWER ARRAY.

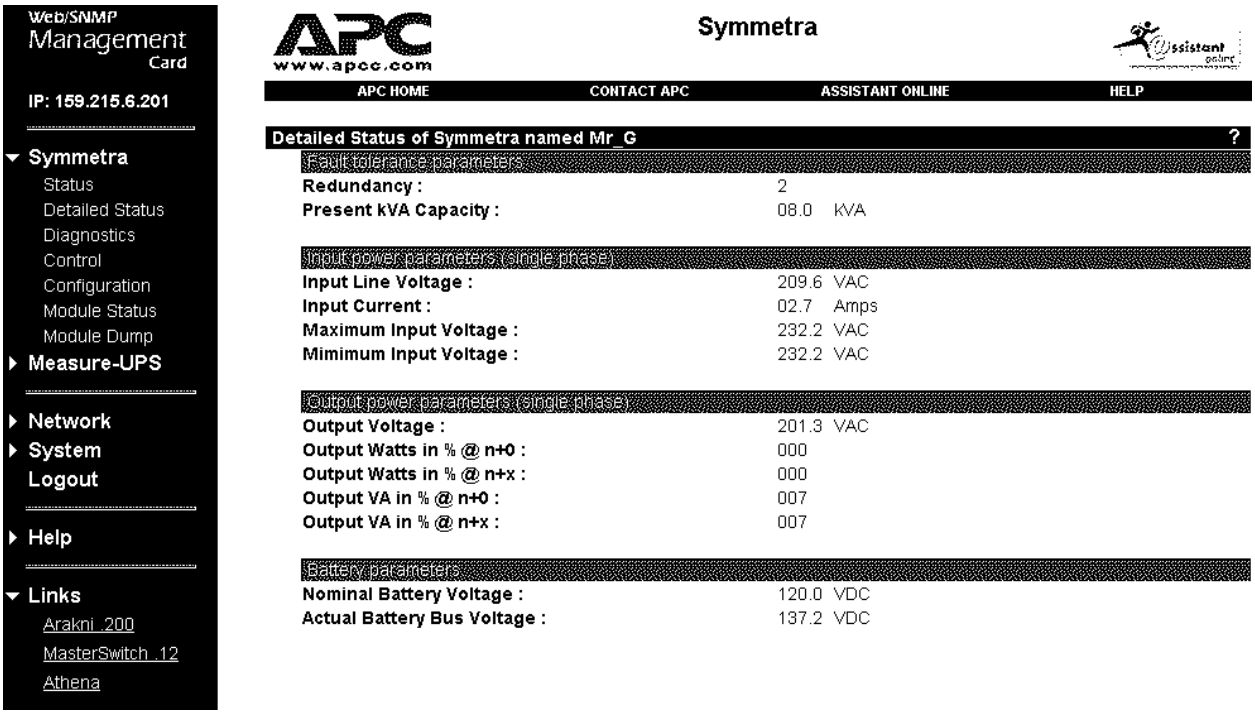
The status screen of the Symmetra Power Array shows the following information:

This Field	Describes
DESCRIBES UPS STATUS	
On or Off:	The *Symmetra Power Array* is "On" or "Off" and if serial communications has been established.
Runtime Remaining:	How long the *Symmetra Power Array* can use battery power to support its load equipment before it must shut down.
Reason For Last Transfer To Battery:	What caused the *Symmetra Power Array* to switch to battery power most recently.
Internal Temperature:	The internal temperature of the *Symmetra Power Array*.
DESCRIBES UTILITY POWER STATUS	
Input Voltage:	The input line (utility) voltage level.
Input Frequency:	The input line (utility) voltage's frequency, in Hertz (Hz, for cycles per second).
Maximum Line Voltage:	The maximum input voltage sensed by the *Symmetra Power Array* during the last minute of operation.
Minimum Line Voltage:	The minimum input voltage sensed by the *Symmetra Power Array* during the last minute of operation.
DESCRIBES OUTPUT POWER STATUS	
Output Voltage:	The *Symmetra Power Array* output voltage level.
Output Frequency:	The output line voltage's frequency, in Hertz (Hz, for cycles per second).
Load Power:	The load placed on the *Symmetra Power Array* by the attached equipment, expressed as a percentage of the total UPS load capacity.
Load Current:	The output voltage current (Amperage) being drawn (used) by the attached equipment.

This Field	Describes
DESCRIBES BATTERY STATUS	
Battery Capacity:	How much of the battery capacity, as a percentage of full-capacity, the *Symmetra Power Array* has available for running on battery.
Battery Voltage:	The *Symmetra Power Array* battery voltage level.
Number of Battery Packs:	How many battery packs the *Symmetra Power Array* has.
Number of Bad Battery Packs:	The number of faulty power modules.
Self-Test Result:	The result of the last self-test.
Self-Test Date:	The date of the last self-test.
Calibration Result:	The result of the last runtime calibration.
Calibration Date:	The date of the last runtime calibration.
ABOUT UPS	The model, firmware revision, manufacture date and serial number of the *Symmetra Power Array*.

Detailed Status Screen

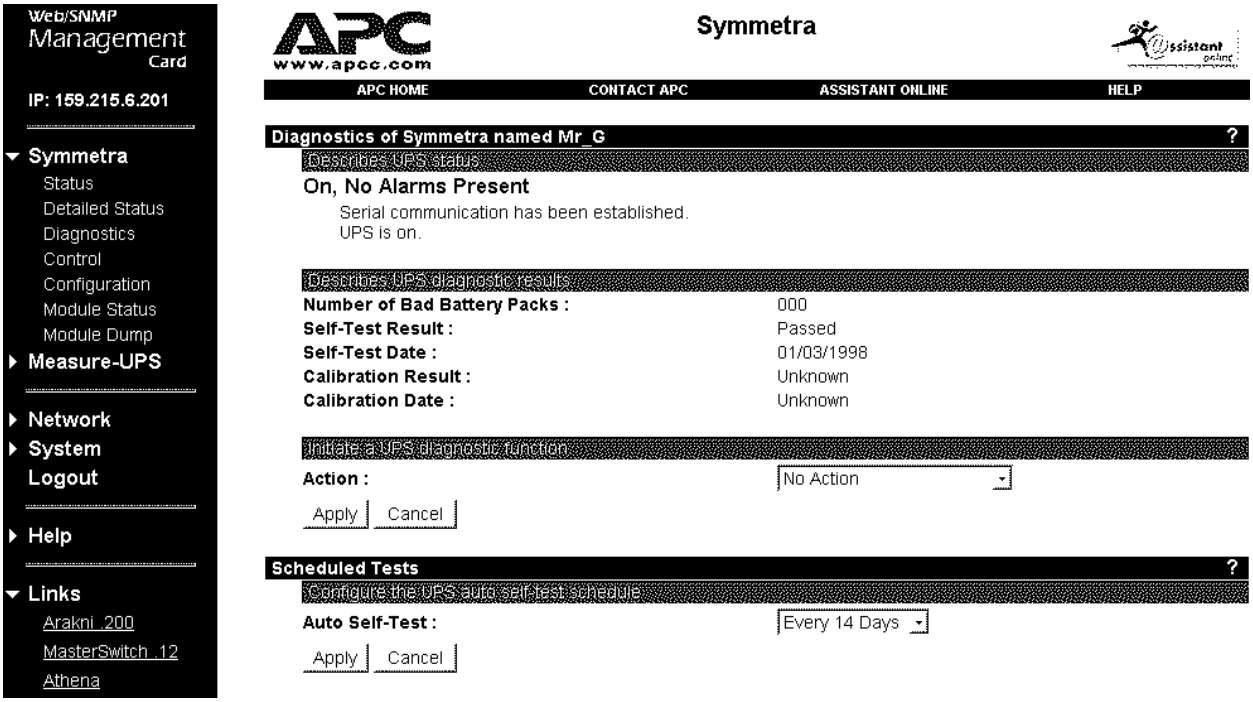
Selecting Detailed Status from the Symmetra menu options in the left-hand column accesses the following screen:



This Field	Identifies
Fault Tolerance Parameters	
Redundancy:	The number of Power Modules that can fail or be removed without causing the *Symmetra Power Array* to switch to bypass.
Present kVA Capacity:	The maximum kVA load of the Symmetra
Input Power Parameters (single phase)	
Input Line Voltage:	The input line (utility) voltage level.
Input Current:	The input line (utility) current.
Maximum Input Voltage:	The highest input voltage sensed during the last minute of operation.
Mininum Input Voltage:	The lowest input voltage sensed during the last minute of operation.
Battery Parameters	
Nominal Battery Voltage:	The nominal (basic voltage range) value for the UPS output voltage.
Actual Battery Bus Voltage:	The actual UPS battery voltage level.

Diagnostics Screen

Selecting the `Diagnostics` option from the Symmetra screen menu in the left-hand column accesses the following screen:



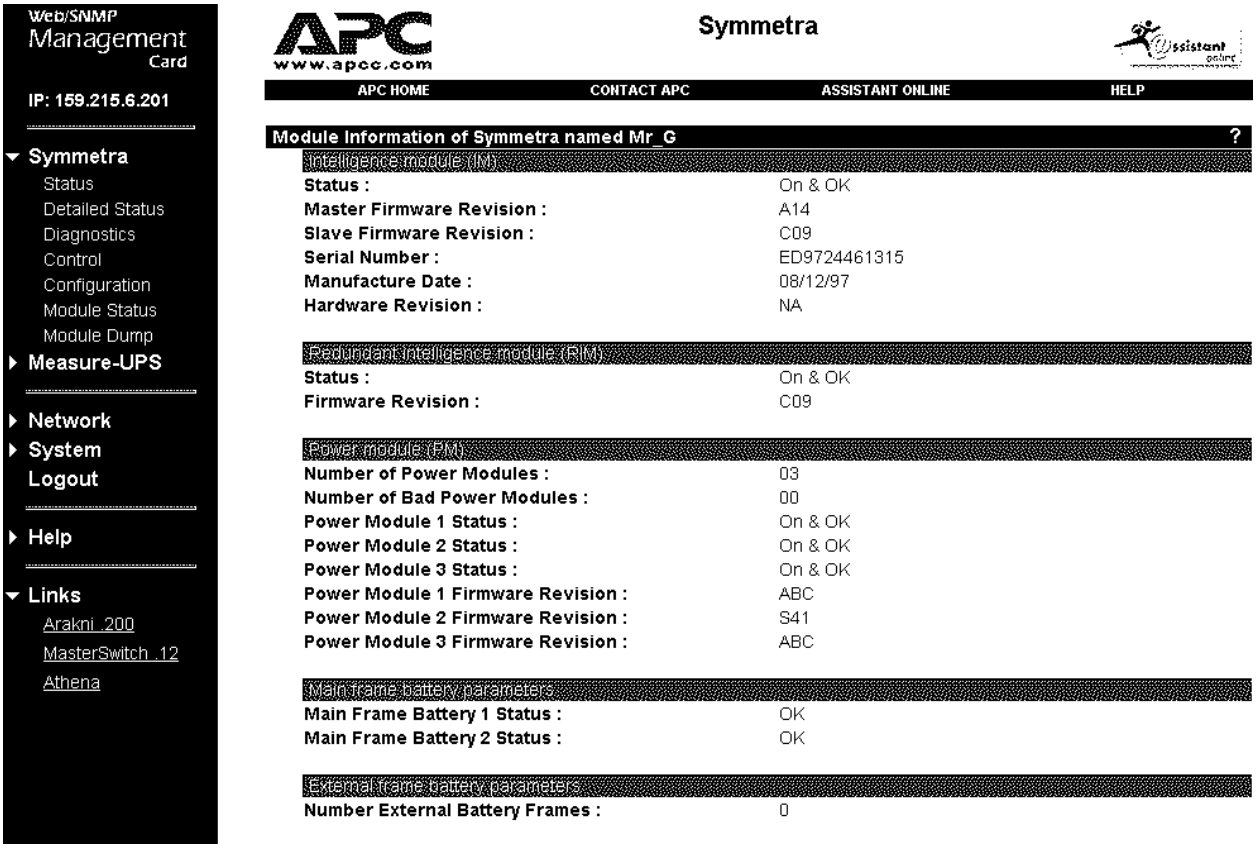
This Field	Describes
DESCRIBES UPS STATUS	
On or Off:	The UPS as "On" or "Off" and whether serial communication has been established.
DESCRIBES UPS DIAGNOSTICS RESULTS	
Self-Test Result:	The result of the last self-test.
Self-Test Date:	The date of the last self-test.
Calibration Result:	The result of the last runtime calibration.
Calibration Date:	The date of the last runtime calibration.

The following fields have options available on pull-down menus:

Use	To Select
INITIATE A UPS DIAGNOSTIC FUNCTION	
Action:	Available options (via pull-down menu) - No Action - UPS Self-Test - Simulate Power Failure - Start Runtime Calibration - Test UPS Alarm
CONFIGURE THE UPS AUTO SELF-TEST SCHEDULE	
Auto Self-Test:	Available options (via pull-down menu) - Every 7 Days - Every 14 Days - Never - UPS Start-up

Symmetra Module Status

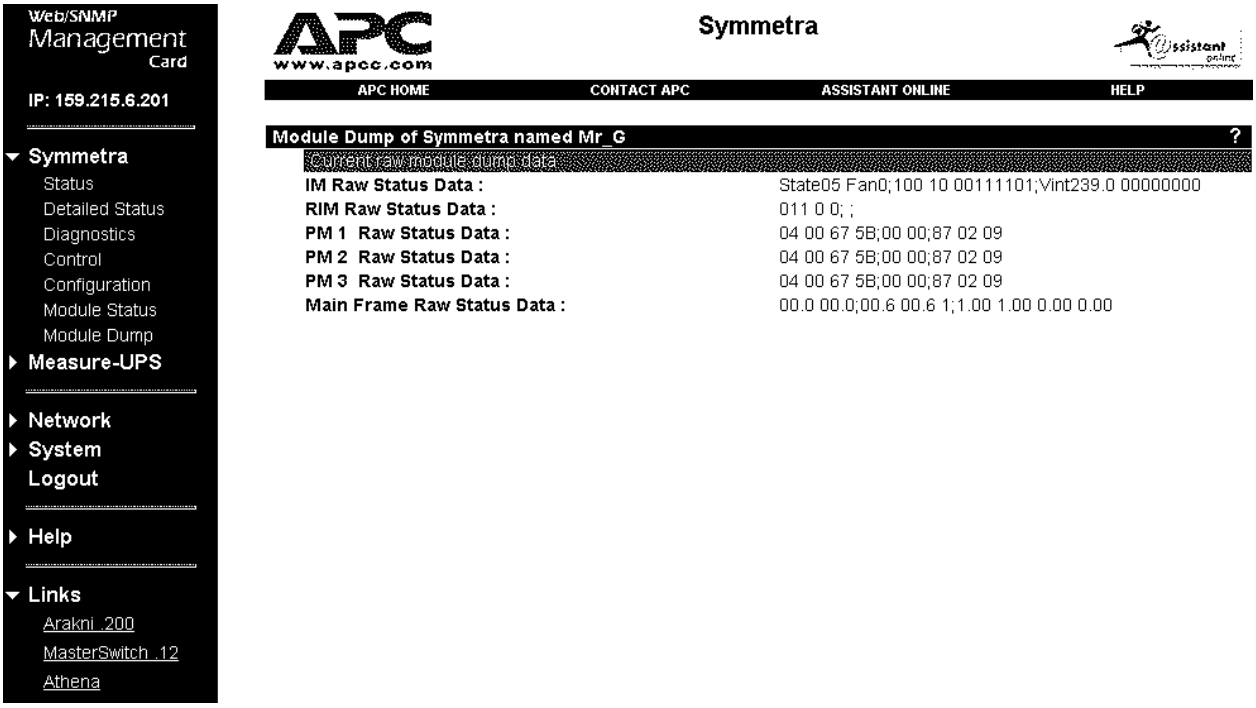
When you select `Module Status` from the Symmetra menu in the left-hand column, the following screen appears:



This Field	Identifies
INTELLIGENCE MODULE (IM)	
Status:	The status of the IM.
Master Firmware Revision:	The version number for the IM master firmware.
Slave Firmware Revision:	The version number for the IM slave firmware.
Serial Number:	The IM serial number.
Manufacture Date:	The date the IM was completed by the manufacturer.
Hardware Revision:	The version number for the IM hardware.
REDUNDANT INTELLIGENCE MODULE (RIM)	
Status:	The status of the RIM.
Firmware Revision:	The version number for the RIM firmware.
POWER MODULE (PM)	
Number of Power Modules:	How many power modules the *Symmetra Power Array* has.
Number of Bad Power Modules:	The number of faulty battery packs.
Power Module 1 Status:	The status of power module 1.
Power Module 2 Status:	The status of power module 2.
Power Module 3 Status:	The status of power module 3.
Power Module 1 Firmware Revision:	The version number for PM 1 firmware.
Power Module 2 Firmware Revision:	The version number for PM 2 firmware.
Power Module 3 Firmware Revision:	The version number for PM 3 firmware.
MAIN FRAME BATTERY PARAMETERS	
Main Frame Battery 1 Status:	The status of main frame battery 1.
Main Frame Battery 2 Status:	The status of main frame battery 2.
EXTERNAL FRAME BATTERY PARAMETERS	
Number External Battery Frames:	How many external battery frames the *Symmetra Power Array* has.

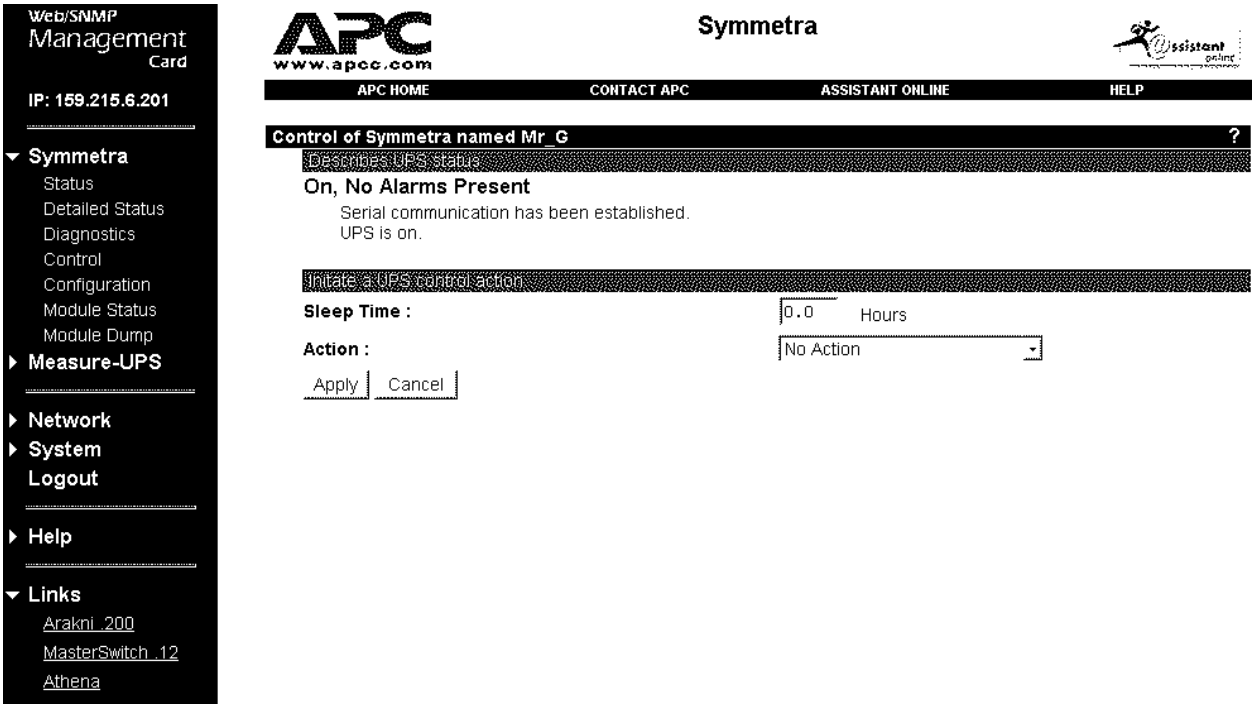
Symmetra Module Dump

You can access the following screen by selecting `Module Dump` from the Symmetra menu in the left-hand column. The information provided in this screen is used by APC engineers to trouble-shoot *Symmetra Power Array* hardware problems.



How To Control a *Symmetra Power Array*

When you select the Control option from the Symmetra menu in the left-hand column, you access the following screen:



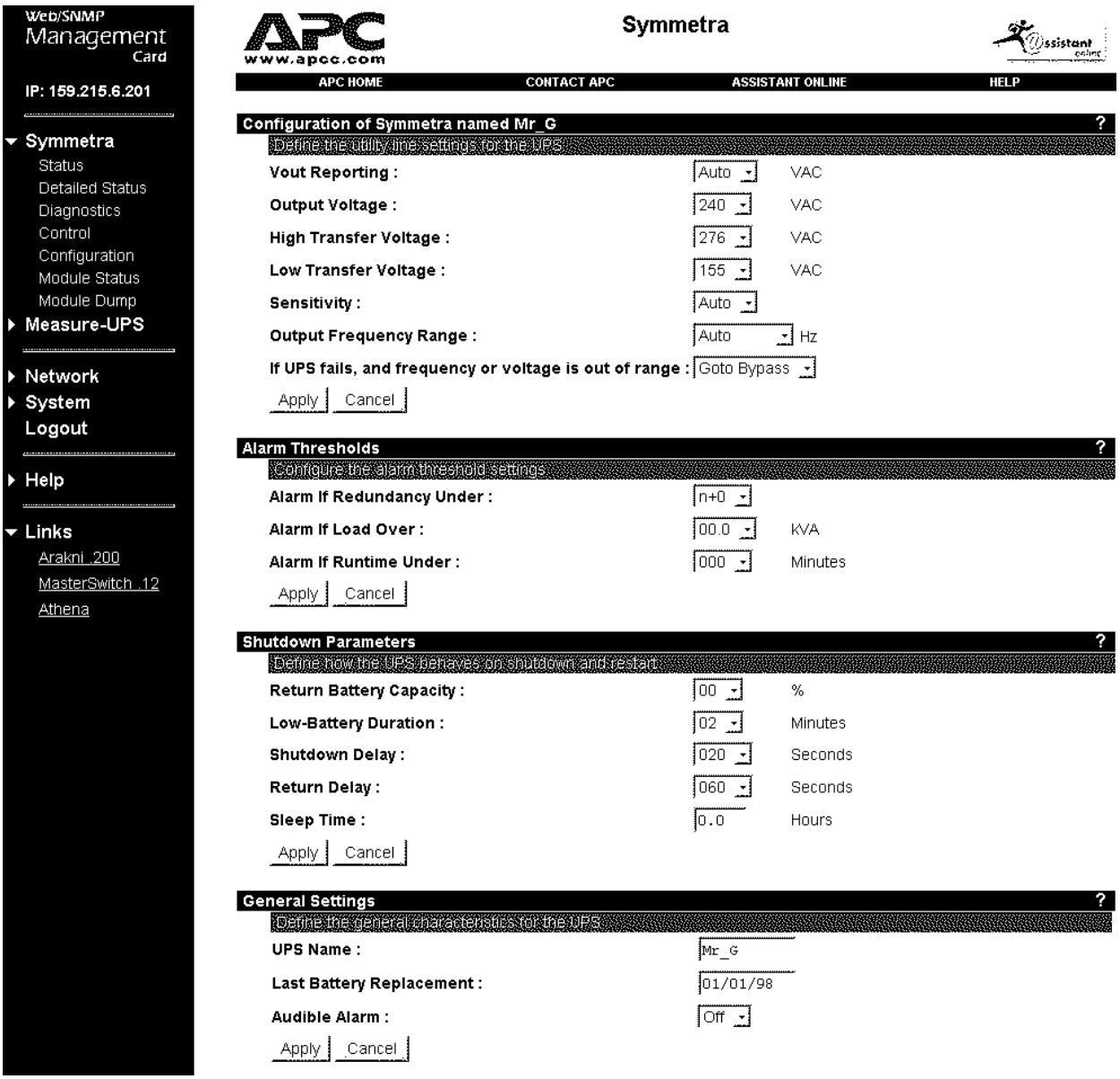
View	To
DESCRIBES UPS STATUS	
`On` or `Off`:	Display the status of the UPS. In this example, serial communication has been established and the UPS is `On`.
INITIATE A UPS CONTROL ACTION	
Sleep Time:	Define how long the UPS will sleep in response to either the `Put UPS to Sleep`, or `Put UPS to Sleep Gracefully` options in the `Control` screen menu. The time is defined in hours and in 6-minute (one tenth of an hour) increments.

The `Action` field lets you select from among the following options via a pull-down menu.

Use	To Do This
No Action	Initiate no action for the UPS.
Turn UPS On	Cause a UPS that was turned off to turn back on (supply power to its load equipment again).
Turn UPS Off	Cause a UPS to turn off immediately (stop supplying power to its load equipment).
Turn UPS Off Gracefully	Signal all servers communicating with the UPS, that are using PowerChute *plus*, to shut down their operating systems. The UPS waits the amount of time defined by the `Low-Battery Duration` configuration value for servers to shut down before turning power off (see HOW TO CONFIGURE A SMART-UPS OR MATRIX-UPS).
Reboot UPS	Cause a UPS to turn off (stop supplying power to its load equipment), and then turn power back on after a specified delay.
Reboot UPS Gracefully	Signal all servers communicating with the UPS, that are using PowerChute *plus*, to shut down their operating systems. The UPS waits the amount of time defined by the `Low-Battery Duration` configuration value for servers to shut down before turning power off (see HOW TO CONFIGURE A SMART-UPS OR MATRIX-UPS).
Put UPS to Sleep	Turn the UPS off for a defined period of time.
Put UPS to Sleep Gracefully	The UPS waits the amount of time defined by the `Shutdown Delay` configuration value, then puts the UPS to sleep for the period of time defined by the `Sleep Time` configuration value (see HOW TO CONFIGURE A SMART-UPS OR MATRIX-UPS)
Reset UPS to Defaults	Reset the UPS to the default values stored in the Management Card's EEPROM.
Put UPS in Bypass	Control the use of software bypass.

How To Configure a Symmetra Power Array

When you select the `Configuration` option from the Symmetra menu in the left-hand column, the following screen appears:



Configuration

The first section of the Configuration screen lets you define the utility line settings for the UPS.

Use	To Do This
Vout Reporting:	Define how the *Symmetra Power Array* scales its output voltage readings.
Output Voltage:	Define the nominal (basic voltage range) value for UPS output voltage level.
High Transfer Voltage:	Define the voltage level the UPS uses to determine when it should go on battery power, if the UPS does not have SmartTrim, or use SmartTrim to reduce the input voltage to a level the UPS can use for its output power.
Low Transfer Voltage:	Define the voltage level the UPS uses to determine when it should go on battery power, if the UPS does not have SmartBoost, or use SmartBoost to reduce the input voltage to a level the UPS can use for its output power.
Sensitivity:	Define how sensitive the UPS is to the input (utility) power's line noise.
Output Frequency Range:	Define the nominal value for the frequency of the *Symmetra Power Array* output frequency range.
If UPS fails, and frequency or voltage is out of range:	Define how the *Symmetra Power Array* will respond under the stated conditions.

Alarm Thresholds

This section lets you configure the alarm threshold settings. Each of the following parameters is accessed by pull-down menus.

Use	To Do this
Alarm if Redundancy Under:	Define the redundancy threshold. An alarm will occur if the redundancy value drops below this threshold.
Alarm if Load Over:	Define the load threshold. An alarm will occur if the load placed on the *Symmetra Power Array* by its attached equipment exceeds this threshold.
Alarm if Runtime Under:	Define the runtime available threshold. An alarm will occur if the amount of runtime (in minutes) available drops below this threshold.

Shutdown Parameters

This section lets you define how the UPS behaves on shutdown and restart. You define each of the following parameters by either filling in values or accessing pull-down menus.

Use	To Do this
Return Battery Capacity:	Define what percentage of full capacity the UPS batteries must have available before the UPS can go back on line once a power failure shutdown occurs. *Note: The UPS must wait until the time defined by the* `Return Delay` *value expires before it can go back on-line.*
Low Battery Duration	Define how long (in minutes) the UPS can continue to run on-battery once a low-battery condition occurs. Also, this value defines how long the UPS will wait for servers to shut down in response to `Reboot UPS Gracefully`, `Turn Off UPS Gracefully`, and `Put UPS to Sleep Gracefully` commands (see HOW TO CONTROL A SMART-UPS OR MATRIX-UPS).
Shutdown Delay	Define how long you want the UPS to wait (in seconds) after it is told to shut down, before the UPS actually shuts down.
Return Delay	Define how long a UPS that has shut down due to a power failure will wait (in seconds), after the power failure ends, before it goes back on line. *Note: The UPS must also wait until the battery capacity equals the* `Return Battery Capacity` *value.*
Sleep Time	Define how long the UPS will sleep in response to using either the `Put UPS to Sleep` or `Put UPS to Sleep Gracefully` options in the Control screen menu. The time is defined in hours and in 6-minute (one-tenth of an hour) increments.

General Settings

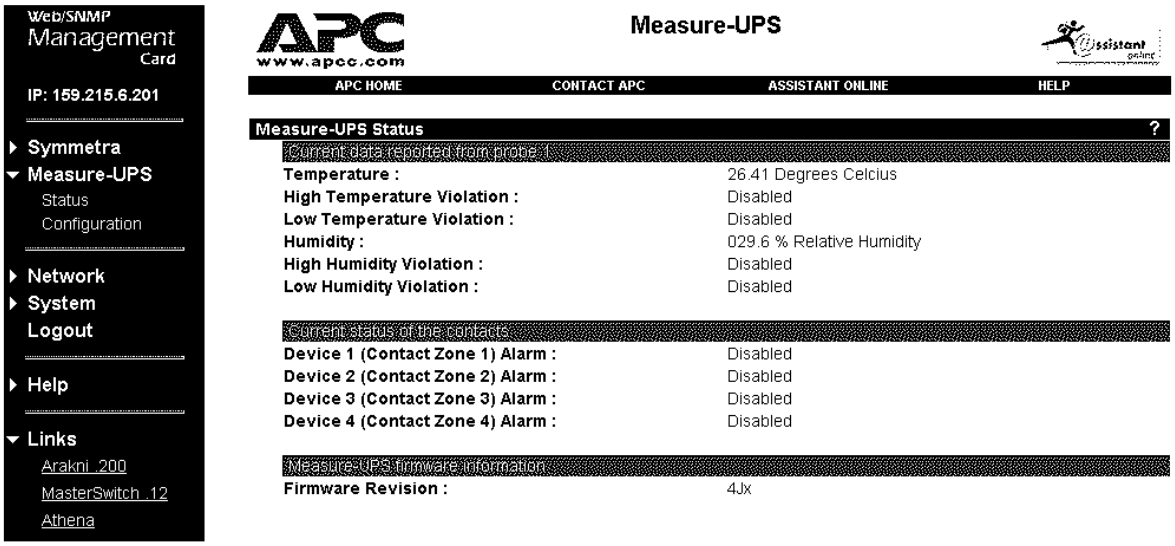
The following section lets you define the general characteristics for the UPS.

Use	To Do This
UPS Name	Define the name used by the UPS.
Last Battery Replacement	Identify when the UPS battery was last replaced.
Audible Alarm	Define when the UPS will generate an audible alarm.

How to Manage a Measure-UPS

When you select the `Measure-UPS` option from the menu on the left side of the main screen, you access the **Measure-UPS** menu screen. You can use this screen to:

- View information about the humidity, temperature and contact switch conditions (monitor the Measure-UPS).
- Define contact switch settings and probe trap thresholds (configure the Measure-UPS).



How to Monitor a Measure-UPS

The **Measure-UPS** menu screen provides information about the Measure-UPS, and menu options you can use to view more information about the Measure-UPS, temperature and humidity thresholds, and contacts.

Measure-UPS Menu Screen's Status Information

The **Measure-UPS** menu screen reports information about the temperature and humidity values sensed by two Measure-UPS probes.

This Field	Identifies
Temperature:	The temperature (in Celsius) sensed by the Measure-UPS probes.
High Temperature Violation:	Whether the high temperature threshold is disabled, or (when enabled) if the current temperature exceeds the threshold (Yes) or not (No).
Low Temperature Violation:	Whether the low temperature threshold is disabled, or (when enabled) if the current temperature exceeds the threshold (Yes) or not (No).
Humidity:	The relative humidity (as a percentage) sensed by the Measure-UPS probes.
High Humidity Violation:	Whether the high humidity threshold is disabled, or (when enabled) if the current humidity exceeds the threshold (Yes) or not (No).
Low Humidity Violation:	Whether the low humidity threshold is disabled, or (when enabled) if the current humidity exceeds the threshold (Yes) or not (No).

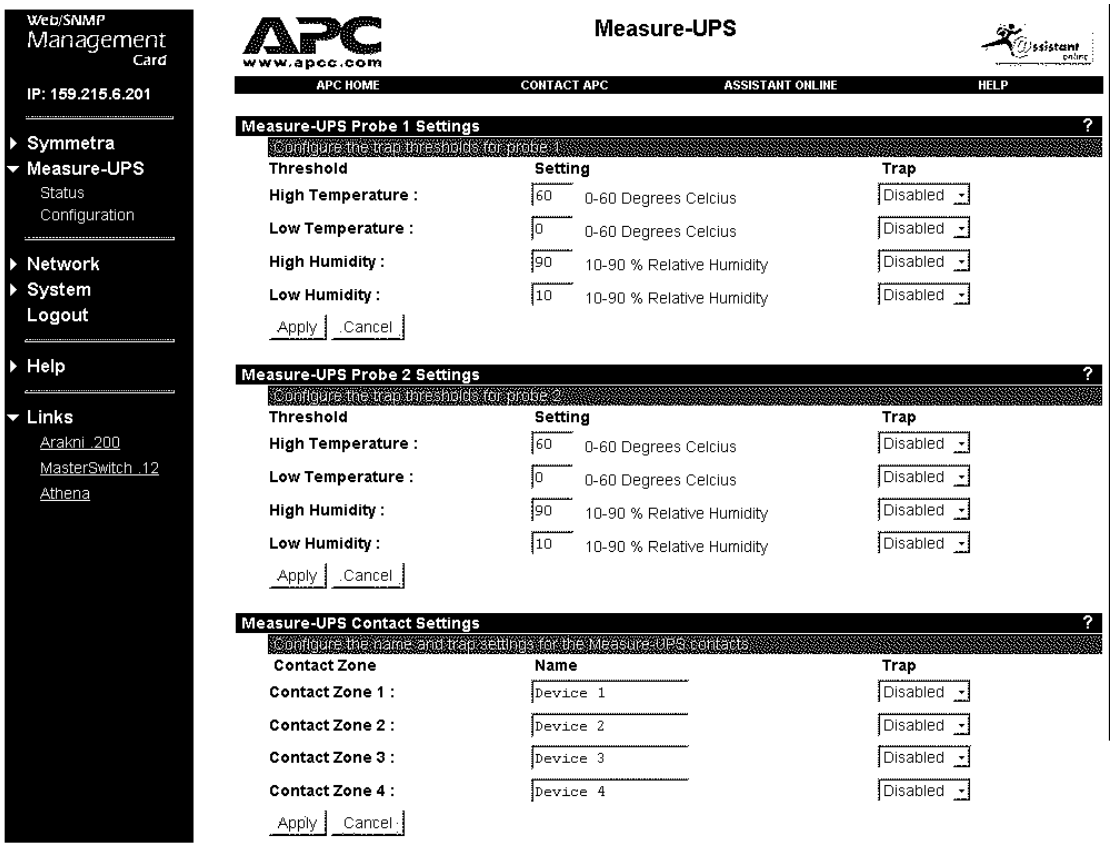
The Measure-UPS status screen also reports information about the status of the four contact switches.

This Field	Identifies
Device 1(Contact Zone 1) Alarm through Device 4 (Contact Zone 4) Alarm:	The contacts by number and name, and whether a contact alarm is Disabled or (when Enabled) if the contact senses an alarm condition (Yes) or not (No).

This screen also reports the Firmware Version of the Measure-UPS.

How to Configure a Measure-UPS

When you select the `Configuration` option from the Measure-UPS menu on the left side of the main screen, you access the **Measure-UPS** Configuration screen.



This screen lets you define the `Trap Thresholds for Probe 1` or `Trap Thresholds for Probe 2` settings. The screen provides two sets of identical options:

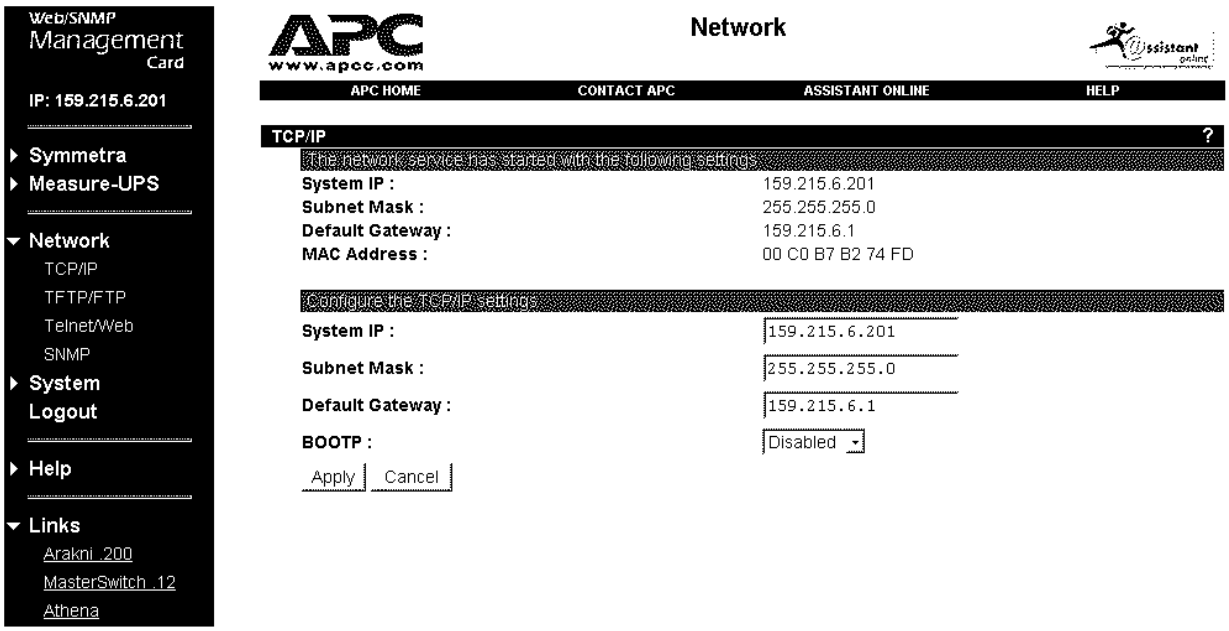
Use	To Do this
The `Trap Threshold` options	Define the high and low temperature (in Celsius), and relative humidy (as a percentage) thresholds the Measure-UPS will use to identify a trap condition.

You can also use this screen to configure the names and trap settings of the Measure-UPS Contacts.

Use	To Do this
`Contact 1 Name:` through `Contact 4 Name:`	Define a name for each contact, with each name having up to sixteen (16) characters.
`Contact Zone 1:` through `Contact Zone 4:`	Enable or disable the contacts.

How To Define the Management Card's Basic Network Values

Selecting the `Network` option from the menu on the left side of the screen accesses the TCP/IP screen:

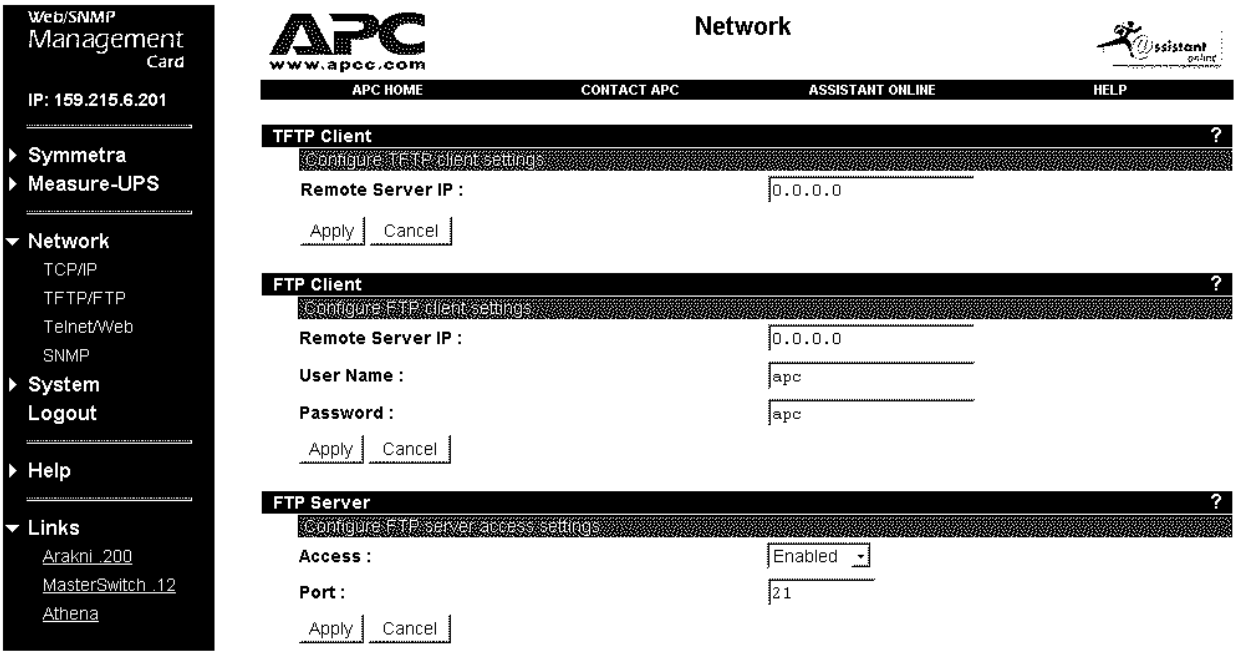


The first field of the TCP/IP screen shows the settings with which the network started. The `Configure the TCP/IP Settings` field allows you to enter values for the System IP, Subnet Mask and Default Gateway. It also lets you enable or disable BOOTP.

- With `BOOTP enabled` (the default), the address values shown in the menu screen come from a BOOTP server, and the menu contains only one option, which you use to disable BOOTP.
- With `BOOTP disabled`, you must use the menu's three address options (`Management Card IP`, `Subnet Mask` and `Default Gateway`) to define these required network values when you first install the Management Card or whenever you need to change these values.

How To Control File Transfers

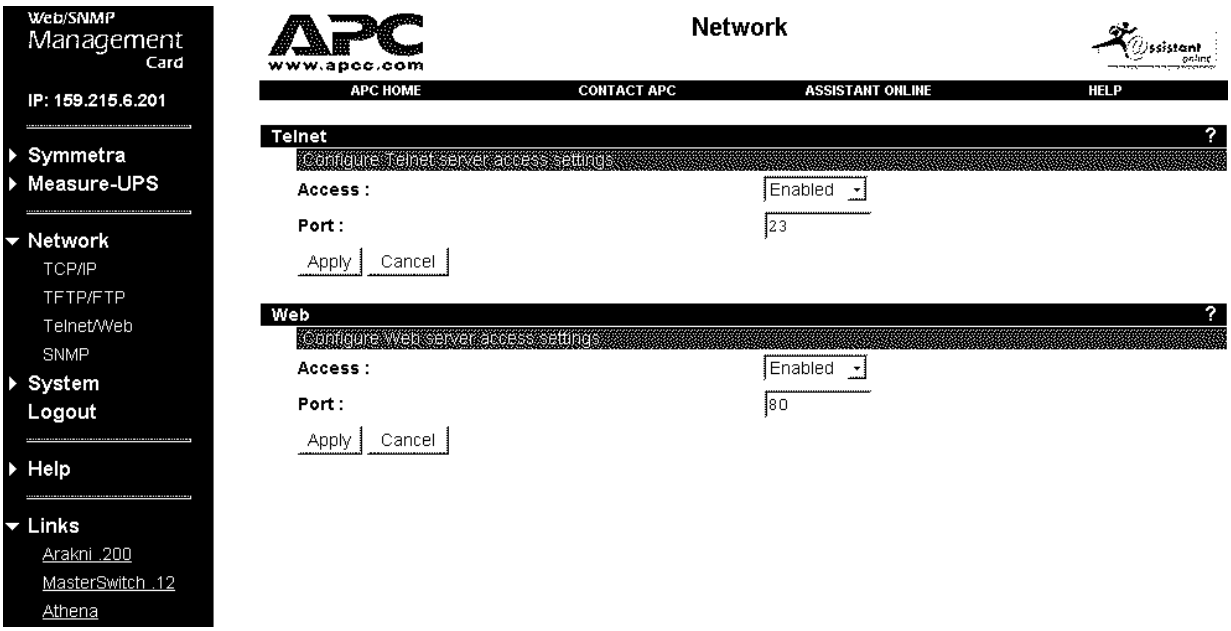
When you select the TFTP/FTP Client option from the Network menu on the left side of the screen, the following screen appears:



Use	To Do This
TFTP CLIENT	
Remote Server IP:	Define the remote server's IP address.
FTP CLIENT	
Remote Server IP:	Define the remote server's IP address.
User Name:	Define the user name.
Password:	Define the password.
FTP SERVER	
Access:	Enable or Disable FTP server access.
Port:	Define the port on which the FTP server for the Management Card resides (default port is 21).

How To Use the Telnet/Web Menu

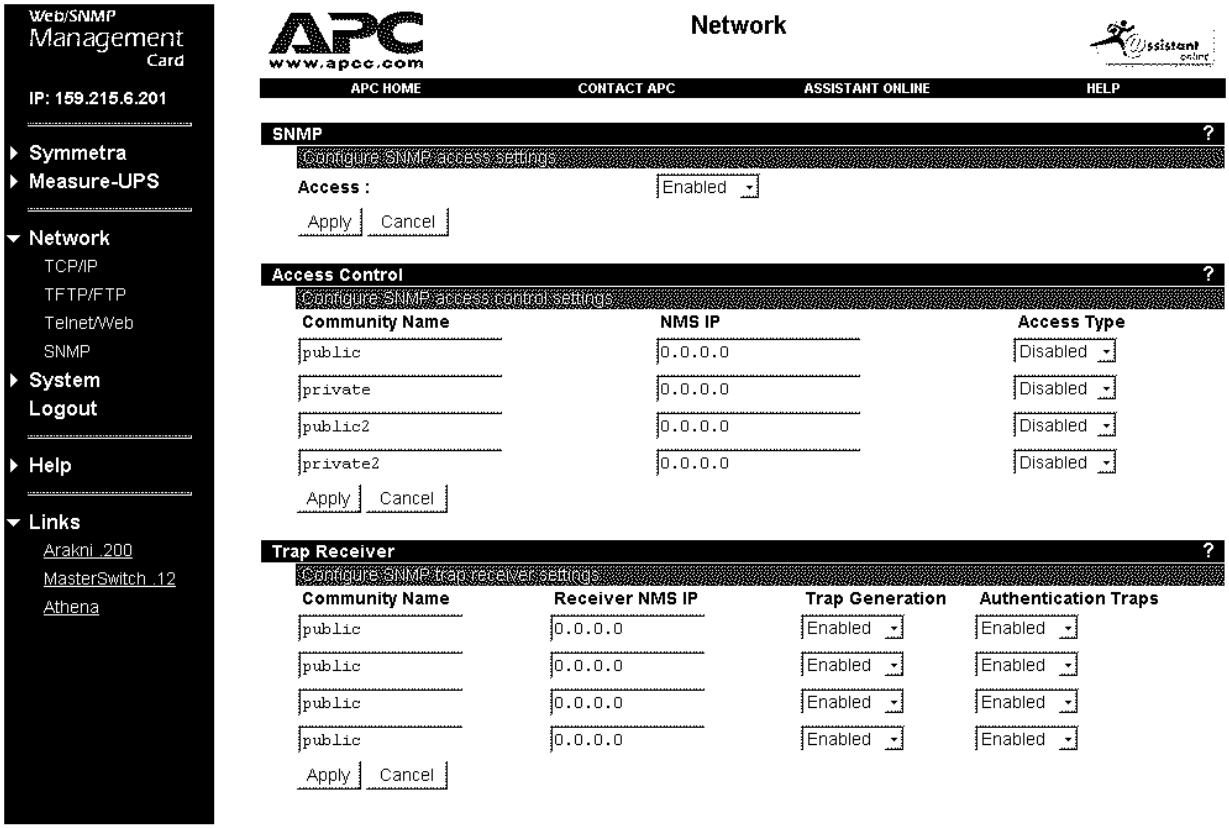
When you select the Telnet/Web option from the Network menu on the left side of the screen, the following screen appears:



Use	To Do This
TELNET	
Access:	Enable or Disable Telnet Access.
Port:	Define the port on which the Telnet server for the Management Card resides.
WEB	
Access:	Enable or Disable Web Access.
Port:	Define the port on which the Web server for the Management Card resides.

How to Use the SNMP Menu

When you select the **Network** menu's SNMP option, you access the **SNMP** screen:



Use	To Do this
Settings	Enable or disable SNMP access.
Access Control 1 through Access Control 4	Contol access to each of the four SNMP channels.
Trap Receiver 1 through Trap Receiver 4	Define which, of up to four NMSs, will be sent traps.

How to Control SNMP Channel Access

The **SNMP** menu's `Access Control field` lets you:

- Identify the current settings for all four SNMP channels.
- Change the values for a selected channel.

Use	To Do this
`1- Community Name:`	Define the password (up to 8 characters) the NMS (identifed by the NMS IP option) must use for SNMP access to the Management Card (with the allowed access defined by the Access Type option).
`2- NMS IP:`	Configure the channel to allow only one NMS (using a specific NMS IP address), or all NMSs (using 0.0.0.0 for the NMS IP value), to have access to the channel.
`3- Access Type:`	Define whether an NMS (identifed by the NMS IP option) can use **GETs** and **SETs** (Write), just **GETs** (Read), or cannot use **GETs** and **SETs** at all (Disabled).

How to Define Trap Receivers

The **SNMP** Trap Receiver options let you:

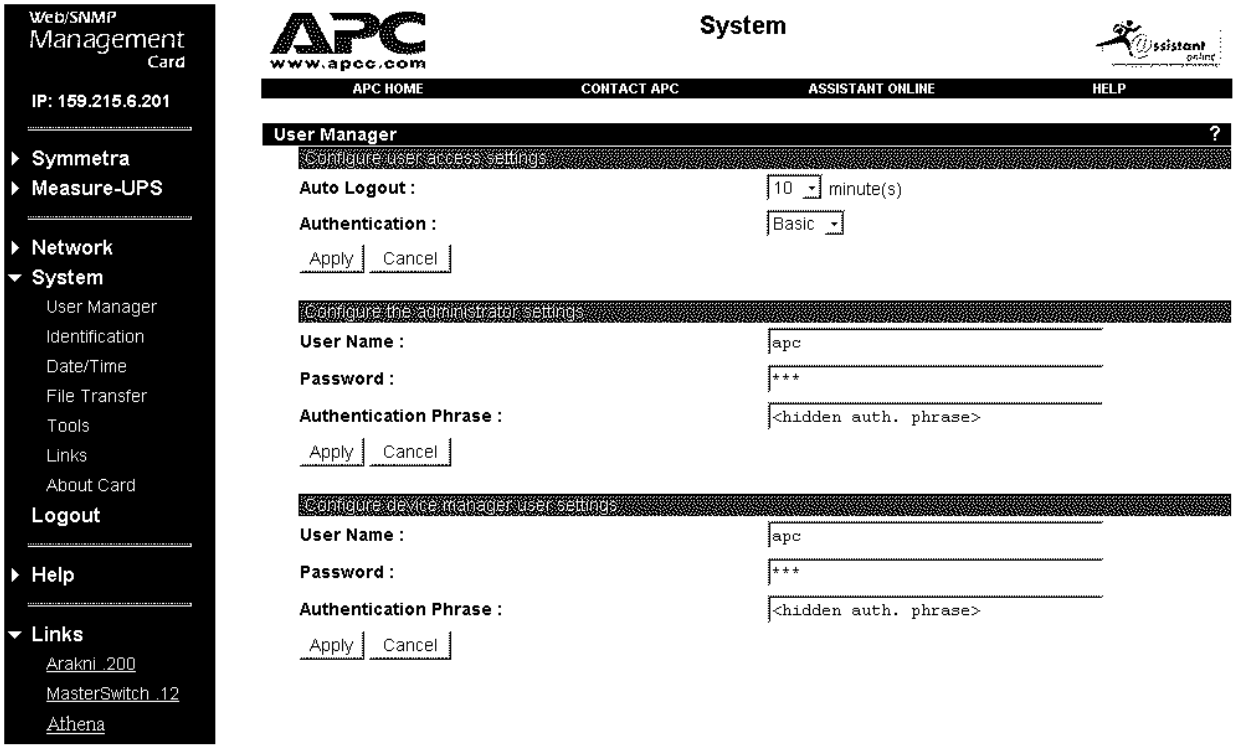
- Identify the current settings for all four trap receivers.
- Change the values for a selected trap receiver.

Use	To Do this
`1- Community Name:`	Define the password (up to 8 characters) the Management Card will use when it sends traps to the NMS identifed by the `Receiver NMS IP` option.
`2- Receiver NMS IP:`	Define the specific NMS (using its IP address) that you want to receive traps sent by the Management Card (`0.0.0.0` indicates no traps will be sent to any NMS for this `Trap Receiver` option).
`3- Trap Generation:`	Define whether (`Enabled`) or not (`Disabled`) the Management Card will send traps to the NMS identifed by the `Receiver NMS IP` option.
`4- Authentication Traps:`	Define whether (`Enabled`) or not (`Disabled`) the Management Card will send authentication traps to the NMS identifed by the `Receiver NMS IP` option.

How to Manage the Management Card's System (Internal) Operation

How to Control Access to the Control Console

Selecting the **System** option accesses the following screen:

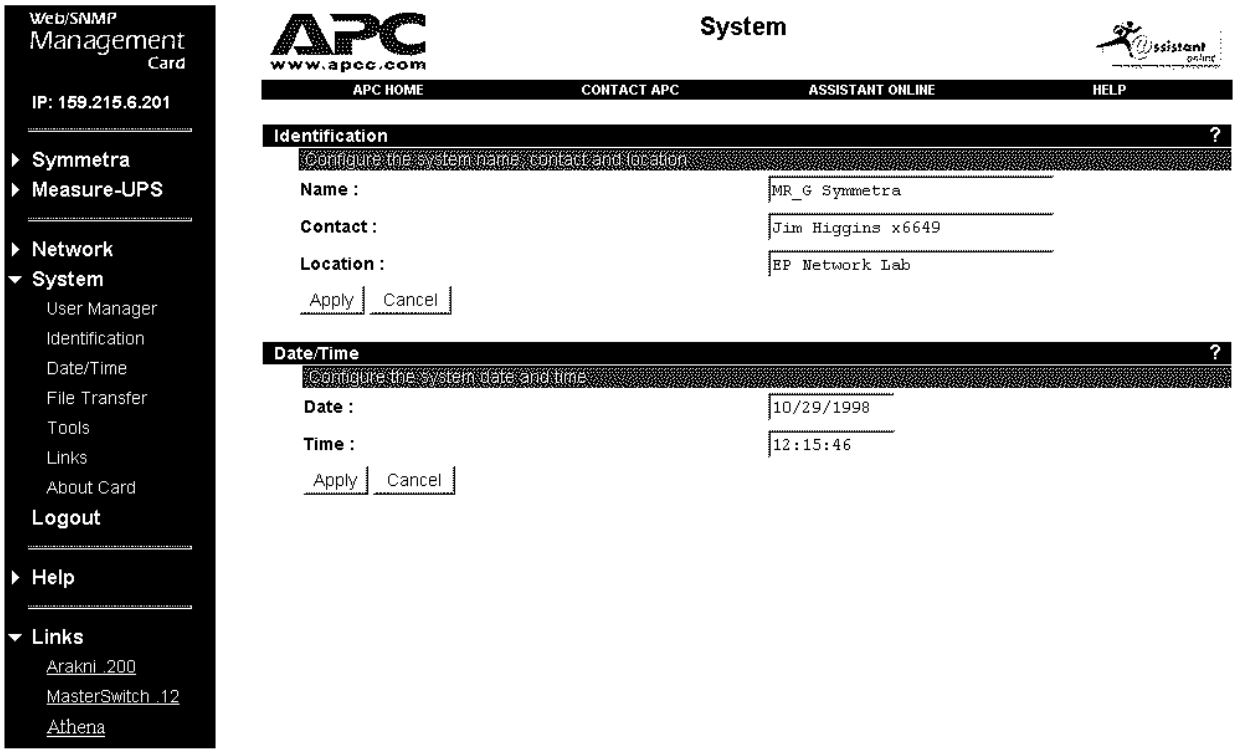


The User Manager screen lets you define the following parameters:

Use	To Do this
1- Administrator	Define the Administrator user name, password, and authentication phrase. The default Administrator user name is "apc". The default Administrator password is "apc". The default Administrator authentication phrase is "admin user phrase".
2- Device Manager User	Define the Device Manager User name, password, and authentication phrase. The default Device Manager User name is "device". The default Device Manager password is "apc". The default Device Manager authentication phrase is "device user phrase".
3- Auto Logout:	Choose the time, in minutes, it takes the system to automatically logout (default time is 3 minutes).
4- Authentication:	Basic causes the Web Interface to use HTTP 1.1 login; MD5 causes the Web Interface to use an MD5-based authenticated login. See Chapter 11 SECURITY for a detailed explanation.

How to Define System Identification Values

You use the **System** menu's `Identification` option to define the Management Card's system identification values. Each option shows its current value:



Use	To Do this
`1- Name:`	Define the system name used to identify the Management Card.
`2- Contact:`	Define the contact person for Management Card issues.
`3- Location:`	Identify the physical location of the management Card.

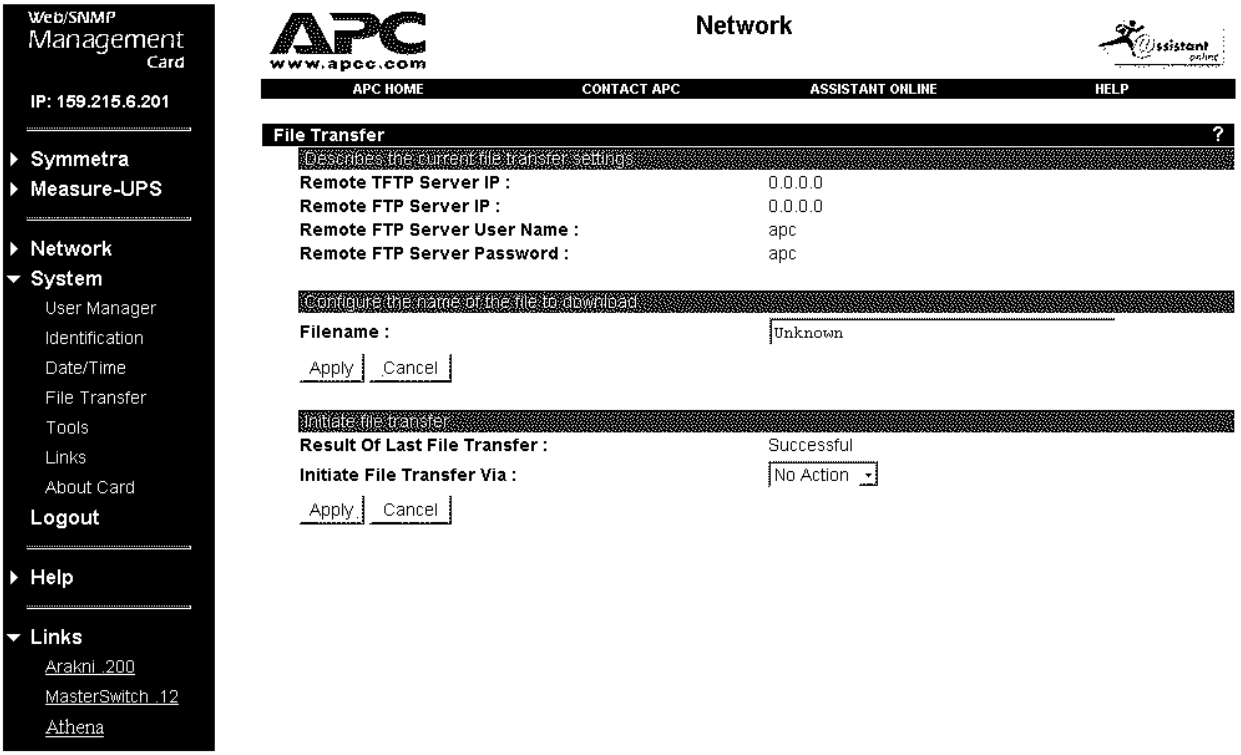
How to Set Date and Time Values

You use the **System** menu's `Date/Time` option to define the Management Card's system identification values.

Use	To Do This
`Date:`	Set the date for the system in dd / mm / yyyy format.
`Time:`	Set the time for the system in hh / mm / ss format.

How to Manage File Transfers

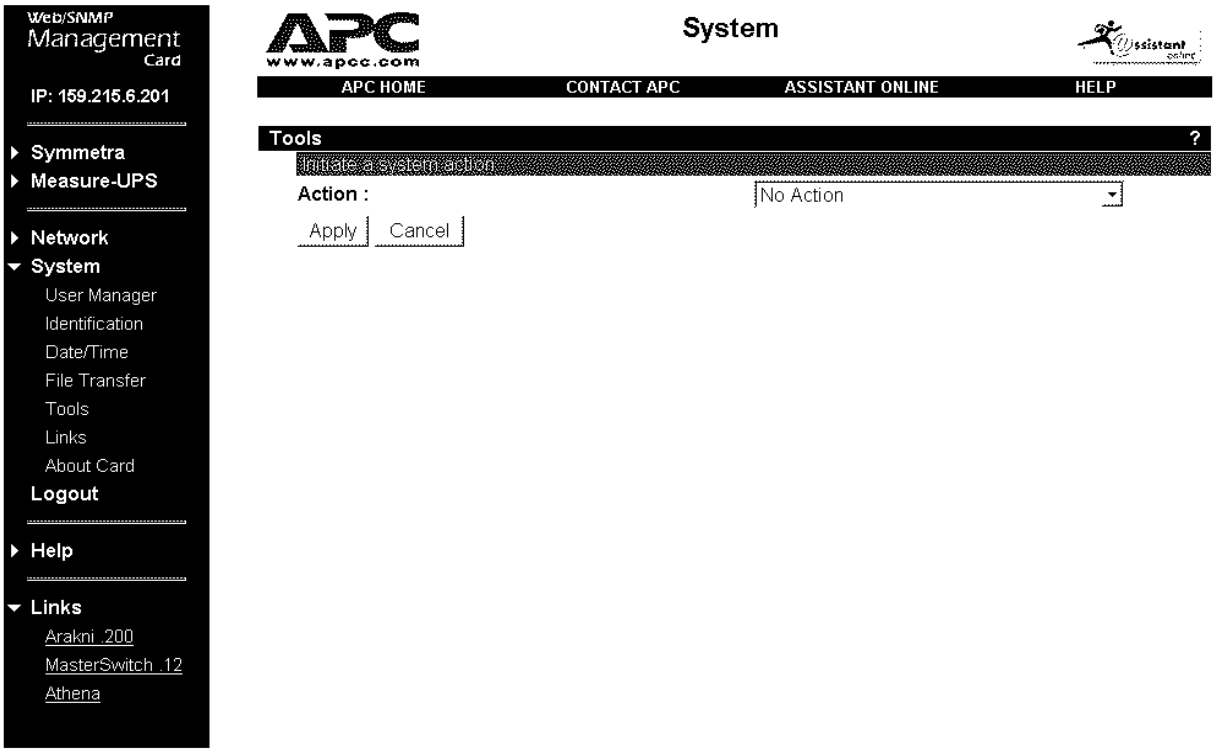
You use the **System** menu's `File Transfer` option to manage file transfers:



Use	To Do This
DESCRIBE THE CURRENT TRANSFER SETTINGS	
`Remote TFTP Server IP:`	Define the IP address of the remote TFTP server.
`Remote FTP Server IP:`	Define the IP address of the remote FTP server.
`Remote FTP ServerUser Name:`	Define the user name of the FTP server.
`Remote FTP Server Password:`	Define the password of the FTP server.
CONFIGURE THE NAME OF THE FILE TO DOWNLOAD	
`File Name:`	Enter the name of the file to be downloaded.
INITIATE THE TRANSFER	
`Result of LastFile Transfer:`	View the results of the last file transfer.
`Initiate File Transfer Via:`	Choose whether the file will be transferred via TFTP or FTP.

How to Affect the Management Card's SNMP Agent

You use the **System** menu's `Tools` option to affect the Management Card and its SNMP agent:

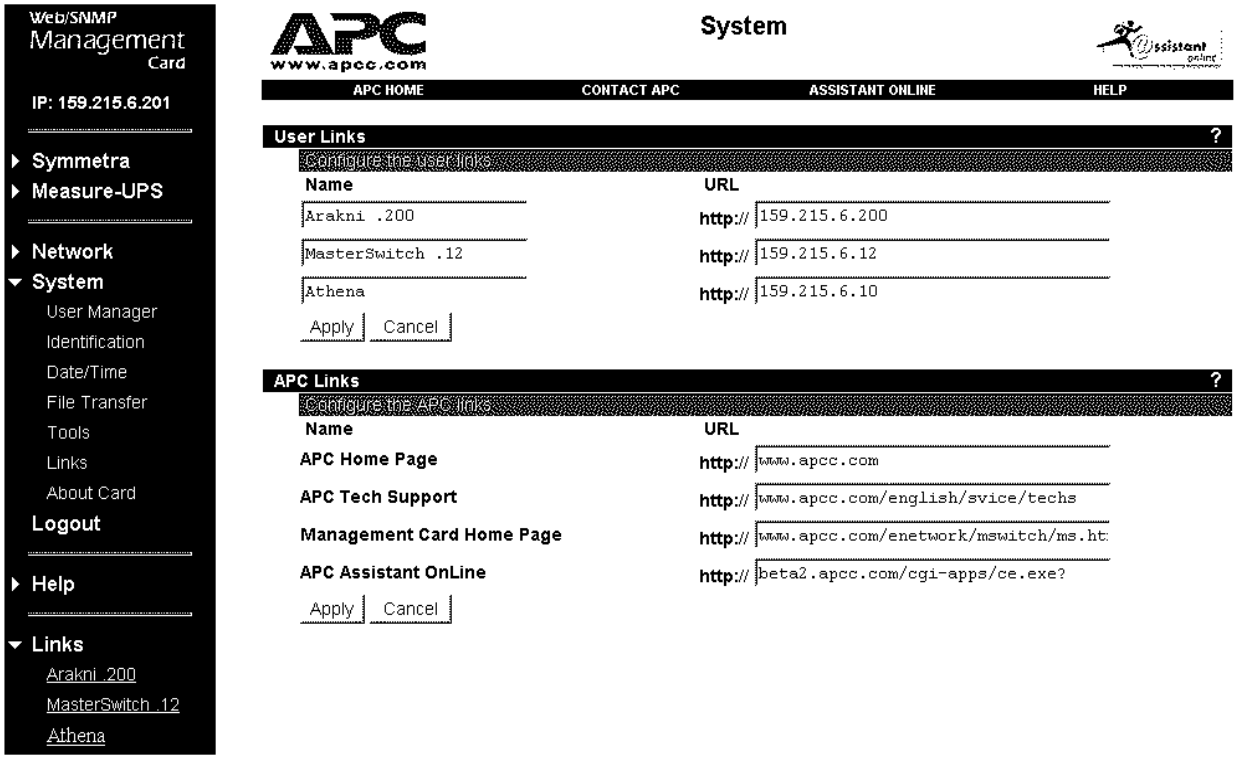


The following `Actions` are accessed via a pull-down menu:

Use	To Do This
`No Action`	Cause no action.
`Reboot Card`	Reinitialize the Management Card's operation.
`Reset Card to Defaults`	Change Control Console values back to the values currently stored in the Management Card's EEPROM.
`Reset Card to Defaults Except TCP/IP`	Change Control Console values back to the values currently stored in the Management Card's EEPROM, except for those values designated for TCP/IP.

How To Define Links

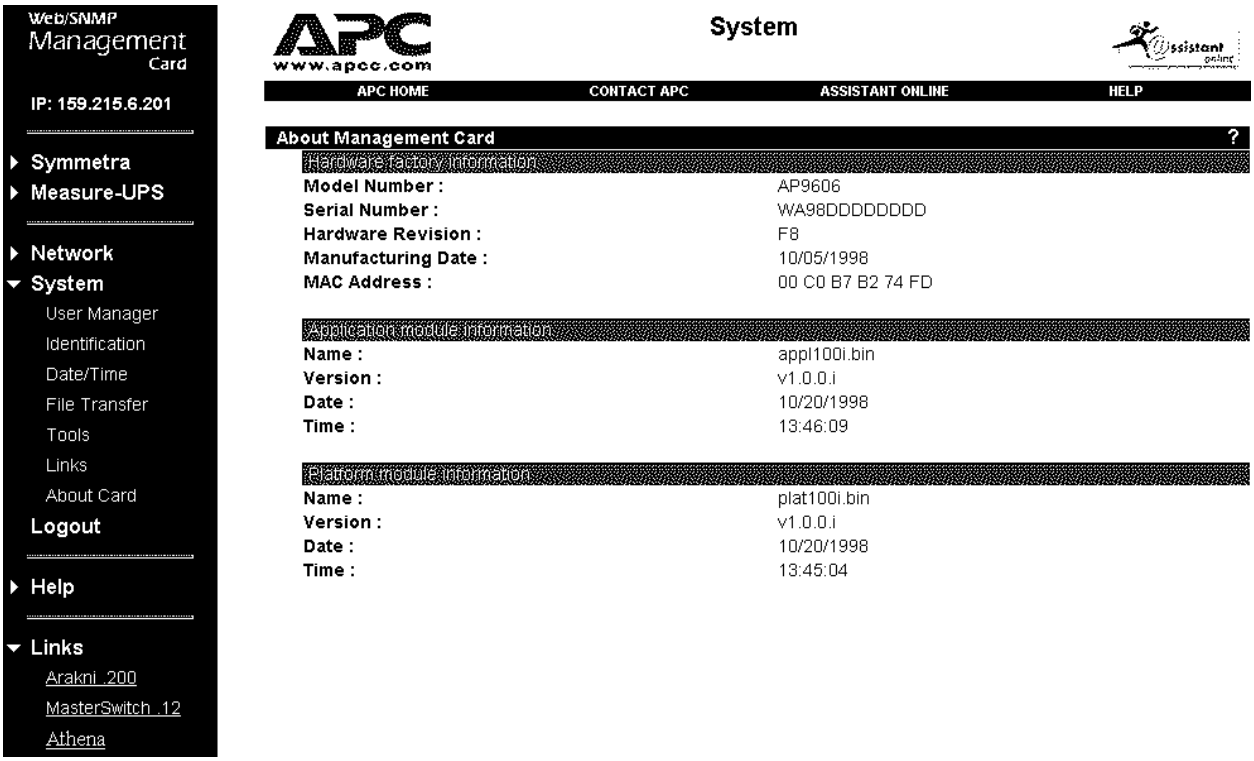
You use the **System** menu's `Links` option to define the links:



Use	To Do This
USER LINKS	
`Name:`	Define the name of up to three user links.
`URL:`	Define the URL of each user link.
APC LINKS	
`Name:`	View the names of the APC links.
`URL:`	Define the URL of each APC link.

How To View the Management Card's Identification Values

You use the **System** menu's `About Card` option to view Management Card identification values:



Chapter 8:
The AP9606 Management Card Control Console

This chapter describes how you can manage a UPS and a Measure-UPS using either Telnet, for remote (over the network) management or a terminal, for local management.

Overview

The Management Card's internal Control Console provides for comprehensive remote and local management of the Management Card, UPS, and Measure-UPS:

- You can use a Telnet console for remote management (access through the network).
- You can use a terminal (or emulator) for local management (access through the Management Card's serial port).

Control Console Structure

The Control Console uses a set of menus to manage the Management Card, its UPS and Measure-UPS:

- All menus list options by number and name. To use an option:

  1) Type the option's number.
  2) Press `<Enter>`.
  3) Follow any on-screen directions.

- Menus that allow you to configure any Management Card, UPS or Measure-UPS value will have an `Accept Changes` menu option. You must use the `Accept Changes` option, before you exit a menu, if you want to save the changes you made.

- While in a menu, you can also:

  - Press `<Enter>` to refresh that menu.
  - Press `<Esc>` to go back to the menu from which you accessed the current menu.
  - Type `?<Enter>` to access brief menu option descriptions (if the menu has help available).
  - Use `Ctrl-D` to toggle between UPS and Measure-UPS menus.
  - Use `Ctrl-C` to return to the main (Control Console) menu.

How to Access the Control Console

Though you can use Telnet or a terminal with the Control Console, whenever you log on, no one else will have access until you log out, or until the Control Console's timeout value expires.

How to Use Telnet with the Control Console

You can use Telnet, when enabled (the default), to access the Control Console:

1) Start the Telnet session. For example, on a Windows-based system, open the Telnet console by typing `telnet` at the DOS-prompt.
2) Select the **Remote System...** option from the **Connect** menu.

Note: If you previously used your Telnet console to connect with a Management Card, the Connect menu lists the Management Card's IP address. Select the IP address, instead of Remote System..., then see HOW TO LOG IN.

3) When the **Connect** dialog box appears:
   a) Verify that **Port** field defines `telnet`.
   b) Make sure the **Term Type** field defines `vt100`.
   c) Use the Management Card's IP address for the **Host Name**.
   d) Click **Connect** to access the Control Console.
   e) Log into the Control Console (see HOW TO LOG IN).

How to Use a Terminal with the Control Console

To use a dumb terminal (or a terminal-emulation application) to access the Control Console:

1) Use APC's smart-signalling cable (940-0024C) to connect the terminal port to the serial port at the UPS (if the Management Card mounts in the UPS) or at the AP9600 Smart Slot™ Expansion Chassis or AP9604 Smart Slot™ Triple Chassis (if the Management Card mounts in either of these chassis).
2) Ensure the terminal's port uses the following communication settings:

Data Bits: 8	Stop Bits: 1	Parity: None	Handshaking: None
Local Echo: Off	Baud Rate: 2400	Terminal Type: ANSI (VT100)	

   To change the communications settings when using HyperTerminal:
   a. Make the needed changes.
   b. Select **Disconnect** in the **Call** menu.
   c. Select **Connect** in the **Call** menu.

   You can now connect to the Management Card with the new communication settings in effect.
3) Press <Enter> and log into the Control Console (see HOW TO LOG IN).

How to Log In

Whether you use Telnet or a terminal, you log into the Control Console in the same way. When prompted:

1) Type your user name and press <Enter>.
2) Type your password and press <Enter> to access the Control Console's main screen (see THE CONTROL CONSOLE'S MAIN SCREEN).

Note: `apc`**, all lowercase, is used for the default values of both name and password. Use the Control Console's** User Manager -- Administrator **and** Device Manager User **menus to change the Control Console's name, password or timeout values.**

The Control Console's Main Screen

The main screen contains information about the Management Card, its UPS and Measure-UPS, and a **Control Console** menu.

```
American Power Conversion               Web/SNMP Management Card v1.0.0.f
www.apcc.com                            (c) Copyright 1998 All Rights Reserved
-------------------------------------------------------------------------------
Name      : Unknown                     Date    : 02/08/1998
Contact   : Unknown                     Time    : 09:08:33
Location  : Unknown                     Up Time : 2 Days 22 Hours 17 Minutes
Status    : P+ N+ A+                    User    : Administrator

Measure-UPS II : Thresholds OK, Contact Alarms OK
Smart-UPS 700 named UPS_IDEN : On

------- Control Console -----------------------------------------------------

     1- Device Manager
     2- Network
     3- System
     4- Logout

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Refresh Main Menu

> _
```

Management Card Information

The top two lines of the screen need no explanation. The next three lines provide identification values you can modify:

To Modify	Use
The Management Card's name (`Name:`), contact (`Contact:`) and location (`Location:`) fields. *Note: All use `Unknown` for their default value.*	- MIB II system OIDs (see CHAPTER 6) - PowerNet SNMP Manager (see CHAPTER 4) - Control Console's **System** Identification menu - Web Interface System page
The UPS name *Note: The default UPS name is `UPS_Iden`*	- PowerNet MIB (**upsBasicIdentName**) OID (see CHAPTER 6). - PowerNet SNMP Manager (see CHAPTER 4) - PowerChute *plus* (see CHAPTER 3) - Control Console UPS menu - Web Interface UPS menu

The UPS name field also provides basic status information about the UPS:

- The present status of the UPS (**On** in this example)
- Whether or not any alarms currently exist

Note: If an alarm exists, check the UPS menu's Detailed Status option to get information about the alarm.

How to use the Control Console Menu

This menu has an option you can use to log out of the Control Console (`4 - Logout`). It also has options which access additional console screens.

Use	To Manage
`1- Device Manager`	The Proxied UPS and Measure-UPS.
`2- Network`	How the Management Card operates on the Network.
`3- System`	System Passwords and File Transfer

Device Manager Menu

Selecting `Device Manager` from the **Control Console** menu accesses a menu that allows you to select the device you want to manage.

Note: The `1` option displays the model name of the UPS. In the example below, the UPS is a Smart-UPS 700, but could also be a Matrix-UPS or *Symmetra Power Array*.

```
------- Device Manager --------------------------------------------------------

     1- Smart-UPS 700
     2- Measure-UPS II

<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

> _
```

For information on the **Device Manager** menu options, see:

- How to Manage a Smart-UPS or Matrix-UPS
- How to Manage a *Symmetra Power Array*
- How to Manage a Measure-UPS

Network Menu

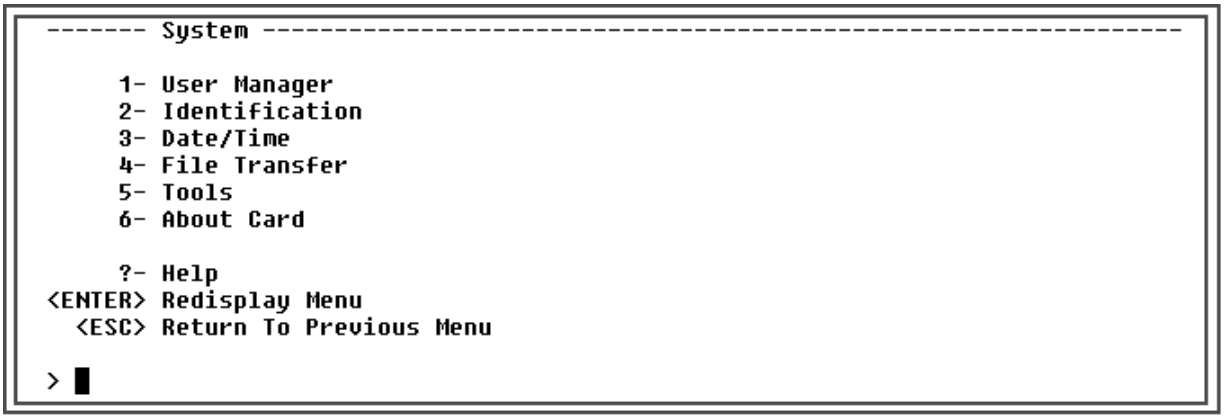
Selecting `Network` from the **Control Console** menu opens a menu that allows you to select other menus you can use to manage the Management Card's network operation.

```
------- Network ---------------------------------------------------------------

     1- TCP/IP
     2- Ping Utility

        File Transfer
        -------------
     3- TFTP Client
     4- FTP Client
     5- FTP Server

        Application Protocols
        ---------------------
     6- Telnet
     7- Web
     8- SNMP

<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

> _
```

For information about the **Network** menu, see How to Manage the Management Card's Network Connection.

System Menu

Selecting `System` from the **Control Console** menu accesses a menu with options you can use to manage the Management Card's system (internal) operation.



For information about the **System** menu, see HOW TO MANAGE THE MANAGEMENT CARD'S SYSTEM (INTERNAL) OPERATION.

How to Manage A UPS

When you select the 1 option in the **Device Manager** menu, you access a set of menus that allow you to do the following:

- View information about UPS operational parameters, identification parameters and alarm conditions (monitor UPS operation).
- Define how you want the UPS to operate, in general (configure UPS operational parameters).
- Control the UPS

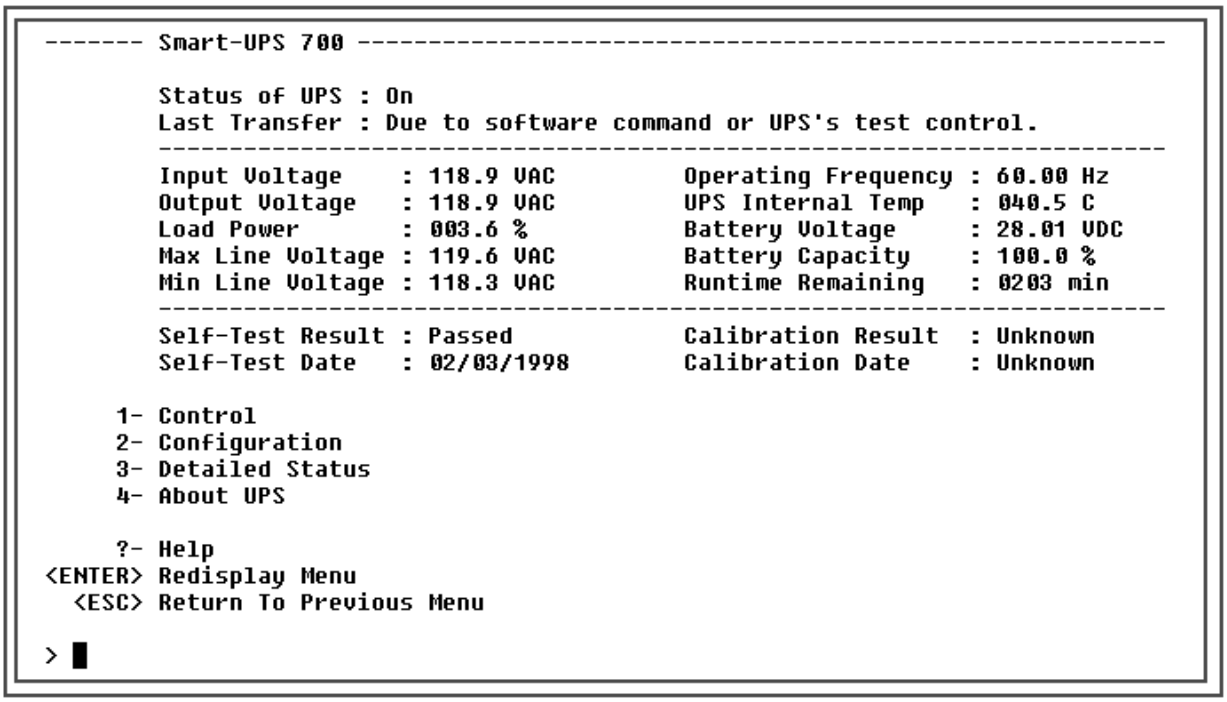
Two different sets of menus exist:

- One set for Smart-UPS and Matrix-UPS models
- One set for a *Symmetra Power Array*

For information on how to use the Smart-UPS and Matrix-UPS menus, see HOW TO MANAGE A SMART-UPS OR MATRIX-UPS; for information on how to use the *Symmetra Power Array* menus, see HOW TO MANAGE A *SYMMETRA POWER ARRAY*.

How to Manage A Smart-UPS or Matrix-UPS

When the UPS is a Smart-UPS or Matrix-UPS, and you select the `1` option in the **Device Manager** menu, a menu screen appears (for a Smart-UPS 700, in the example below) that allows you to monitor (view operational parameters, identification parameters, and alarm and operational status), control, and configure a Smart-UPS or Matrix-UPS.



How to Monitor a Smart-UPS or Matrix-UPS

The **Smart-UPS** or **Matrix-UPS** menu screen provides UPS status information, and two menu options that allow you to view alarm and operational status (option 3), or identification parameter values (option 4).

UPS Menu Screen Status Information

The **Smart-UPS** or **Matrix-UPS** menu screen displays UPS operational status, UPS input and output voltages, and UPS battery status.

This Field	Identifies
Status of UPS:	The current status of the UPS.
Last Transfer:	What most recenly caused the UPS to switch to battery.
Input Voltage:	The utility voltage level.
Output Voltage:	The UPS output voltage level.
Load Power:	The load the attached equipment is placing on the UPS, expressed as a percentage of the total UPS load capacity.
Max Line Voltage:	The maximum input voltage sensed by the UPS during the last minute of operation.
Min Line Voltage:	The minimum input voltage sensed by the UPS during the last minute of operation.
Operating Frequency:	The input line voltage's frequency, in Hertz.
UPS Internal Temperature:	The internal temperature of the UPS.
Battery Voltage:	The UPS battery voltage level.
Battery Capacity:	How much capacity, as a percentage of full-capacity, the UPS has available.
Runtime Remaining:	How long the UPS can support its load equipment before performing a shut down.
Self-Test Result:	The result of the last self-test.
Calibration Result:	The result of the last runtime calibration.

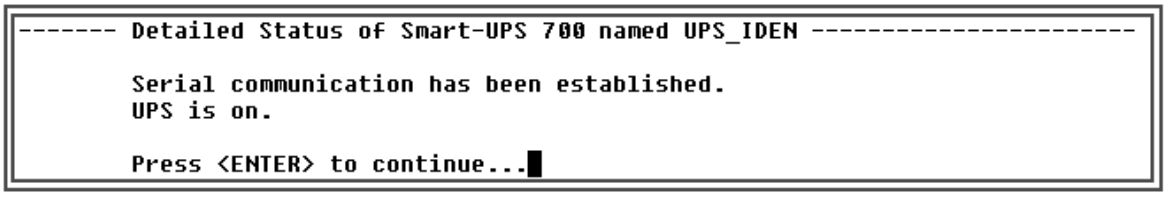
UPS Menu Status Options

The **UPS** menu provides two options you can use to view additional information about the UPS:

3- Detailed Status

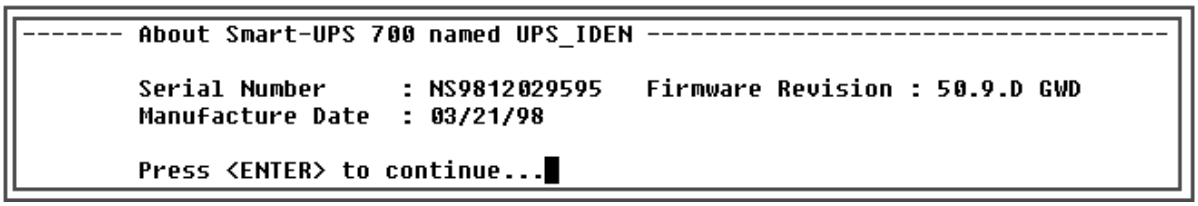
This option displays information which expands on the UPS status (Status of UPS field), reports on the status of the Management Card-to-UPS serial communication, and, when an alarm is present, reports that alarm. For the following example, the UPS is on-line, and no communications problem or alarm condition exists:

Note: When the UPS switches to battery, the Detailed Status screen shows the amount of time that has elapsed since the event.



4- About UPS

This option accesses UPS identification parameter values. For this Smart-UPS 700 example:



This Field	Identifies
Serial Number:	The serial number of the UPS.
Firmware Revision:	The version number for firmware used by the UPS.
Manufacture Date:	The date the UPS completed the manufacturing process.

How to Control a UPS

When you select the `Control` option in a **Smart-UPS** menu, you access the following **Control** menu screen:

Note: When you select the `Control` option in a Matrix-UPS menu, the Control screen menu has an additional option: `12- Put UPS in/Take UPS out of Bypass`**.**

```
------- Control ------------------------------------------------------------

        Status of UPS : On

     1- Turn UPS On
     2- Turn UPS Off
     3- Turn UPS Off Gracefully
     4- Reboot UPS
     5- Reboot UPS Gracefully
     6- Put UPS To Sleep
     7- Put UPS To Sleep Gracefully
     8- Simulate Power Failure
     9- UPS Self-Test
     10- Start/Stop Runtime Calibration
     11- Test UPS Alarm

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

>
```

Use	To Do this
`1- Turn UPS On`	Turn the UPS on.
`2- Turn UPS Off`	Cause a UPS to turn off immediately (stop supplying power to its load equipment).
`3- Turn UPS Off Gracefully`	Signal all servers communicating with the UPS, and which use PowerChute *plus*, to shut down their operating systems. The UPS waits the amount of time defined by the `Low-Battery Duration` configuration value for servers to shut down before turning power off (see HOW TO CONFIGURE A SMART-UPS OR MATRIX-UPS).
`4- Reboot UPS`	Cause a UPS to turn off and then turn power back on after a specified delay.

Use	To Do this
5- Reboot UPS Gracefully	Signal all servers using PowerChute *plus*, and communicating with the UPS, to shut down their operating systems. The UPS waits the amount of time defined by the Low-Battery Duration configuration value for servers to shut down before rebooting the load equipment (see How TO CONFIGURE A SMART-UPS OR MATRIX-UPS).
6- Put UPS to Sleep	Turns the UPS off for a defined period of time.
7- Put UPS to Sleep Gracefully	The UPS waits the amount of time defined by the Shutdown Delay configuration value for servers to shut down, then puts the UPS to sleep for the period of time defined by the Sleep Time configuration value (see HOW TO CONFIGURE A SMART-UPS OR MATRIX-UPS).
8- Simulate Power Failure	Test the ability of the UPS to respond to a power failure by simulating a power failure.
9- UPS Self-Test	Cause a UPS to perform a self-test.
10-Start/Stop Runtime Calibration	Start or stop a process which determines how long the UPS can support the attached equipment using battery power when a power failure occurs.
11-Test UPS Alarm	To verify the UPS alarm works properly.
12-Put UPS in/Take UPS out of Bypass	Control the use of software bypass. *Note: This menu option appears when the Management Card connects with a Matrix-UPS.*

How to Configure a Smart-UPS or Matrix-UPS

When you select the `Configuration` option in a **Smart-UPS** or **Matrix-UPS** menu, you access a **Configuration** menu screen that displays the current values for UPS parameters which you can change using five menu options.

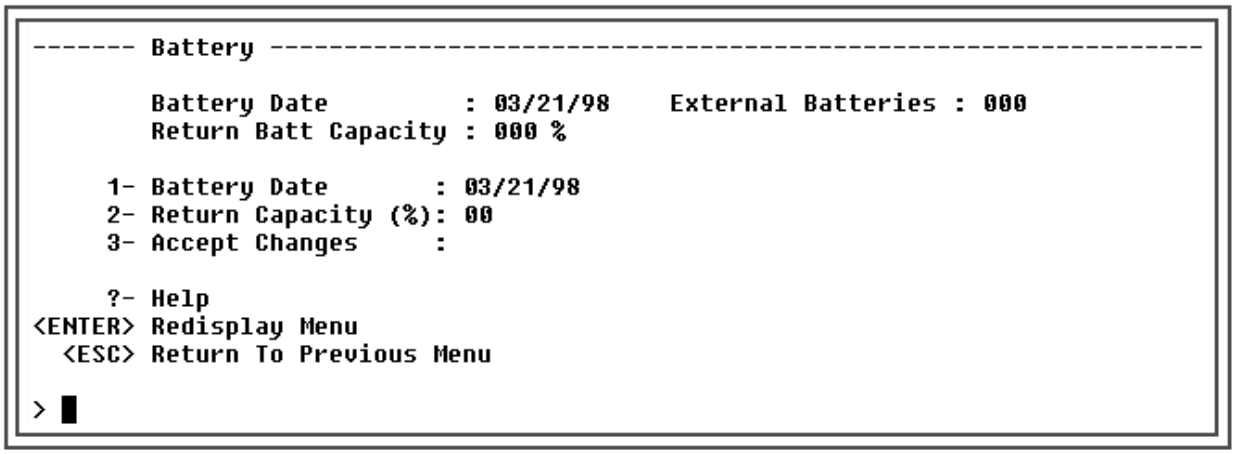
Note: A UPS has other operational parameters that can be modified using either SNMP (see CHAPTER 5), PowerChute *plus* (see CHAPTER 4) or PowerNet SNMP Manager (see CHAPTER 6).

```
------- Configuration ----------------------------------------------------

        UPS Name       : UPS_IDEN          Battery Date         : 03/21/98
        ------------------------------------------------------------------
        Output Voltage : 115 VAC           Shutdown Delay       : 020 sec
        High Transfer  : 132 VAC           Return Delay         : 000 sec
        Low Transfer   : 103 VAC           Low-Battery Duration : 002 min
        Sensitivity    : High              Sleep Time           : 0.0 hrs
        ------------------------------------------------------------------
        Auto Self-Test : Every 14 Days     External Batteries   : 000
        Audible Alarm  : Power Fail        Return Batt Capacity : 000 %

     1- Battery
     2- Line Transfer
     3- Shutdown Parameters
     4- General
     5- Reset UPS to Defaults

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

> _
```

Use	To Do this
1- Battery *Note: See the BATTERY SCREEN description for more information.*	Modify the Battery Date and Return Battery Capacity values. *Note: The Battery screen also lists the External Batteries value. However, you cannot modify this value: The External Batteries value only changes when an external battery pack is added to, or removed from, a Matrix-UPS or Smart-UPS XL.*
2- Line Transfer *Note: See the LINE TRANSFER SCREEN description for more information.*	Modify the following values: High Transfer Low Transfer Output Voltage Sensitivity
3- Shutdown Parameters *Note: See the SHUTDOWN PARAMETERS SCREEN description for more information.*	Modify the following values: Shutdown Delay Return Delay Low-Battery Duration Sleep Time
4- General *Note: See the GENERAL SCREEN description for more information.*	Modify the following values: UPS Name Self-Test Schedule Audible Alarm
5- Reset UPS to Defaults *Note: No other information is provided about this option.*	Reset all EEPROM-based UPS parameters to the values stored in the EEPROM at the factory.

Battery Screen

The `1- Battery` option in the **Configuration** screen menu accesses the following screen:

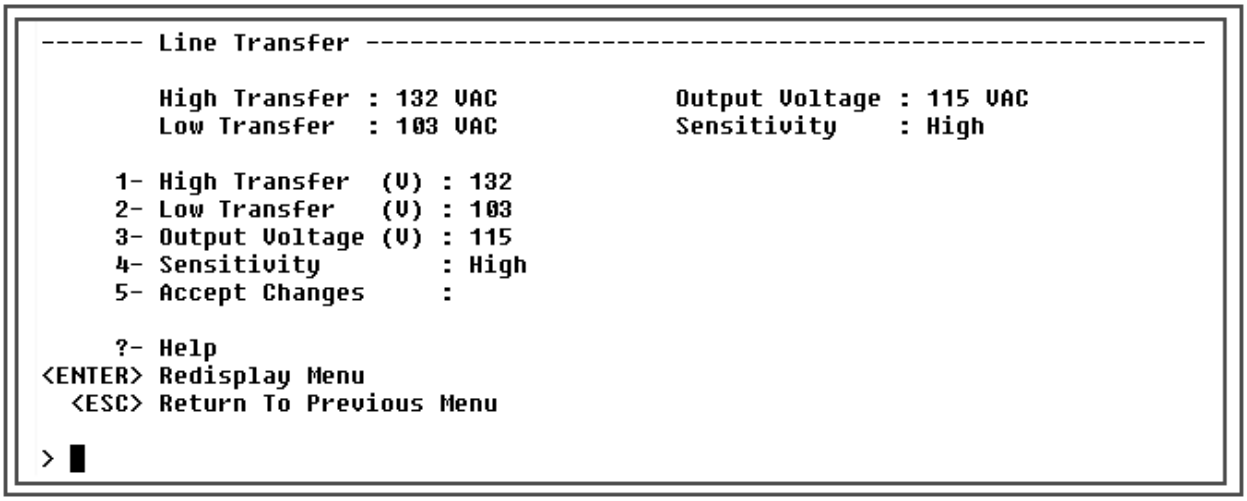


Note: You cannot change the `External Batteries` value. This value changes only when a Matrix-UPS or Smart-UPS XL senses that a battery pack has been added or removed.

Use	To Do this
`1- Battery Date:`	Identify when the UPS battery was last replaced.
`2- Return Battery Capacity (%):`	Define what percentage of full capacity the UPS batteries must have available before the UPS can go back on line once a power failure shutdown occurs. *Note: The UPS must must wait until the time defined by the `Return Delay` value expires before it can go back on-line.*

Line Transfer Screen

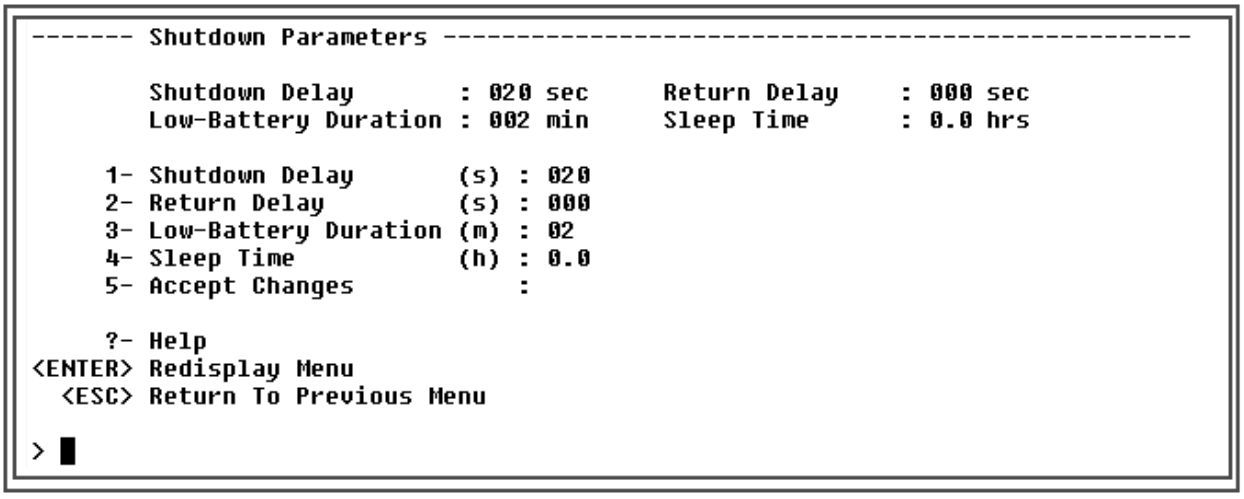
The `2- Line Transfer` option in the **Configuration** screen menu accesses the following screen:



Use	To Do this
`1- High Transfer:`	Define the voltage level the UPS uses to determine when it should switch to battery power, if the UPS does not have SmartTrim, or use SmartTrim to reduce the input voltage to a level the UPS can use for its output power.
`2- Low Transfer:`	Define the voltage level the UPS uses to determine when it should switch to battery power, if the UPS does not have SmartBoost, or use SmartBoost to increase the input voltage to a level the UPS can use for its output power.
`3- Output Voltage:`	Define the nominal (basic voltage range) value for UPS output voltage level.
`4- Sensitivity:`	Define UPS sensitivity to the input (utility) power's line noise.

Shutdown Parameters Screen

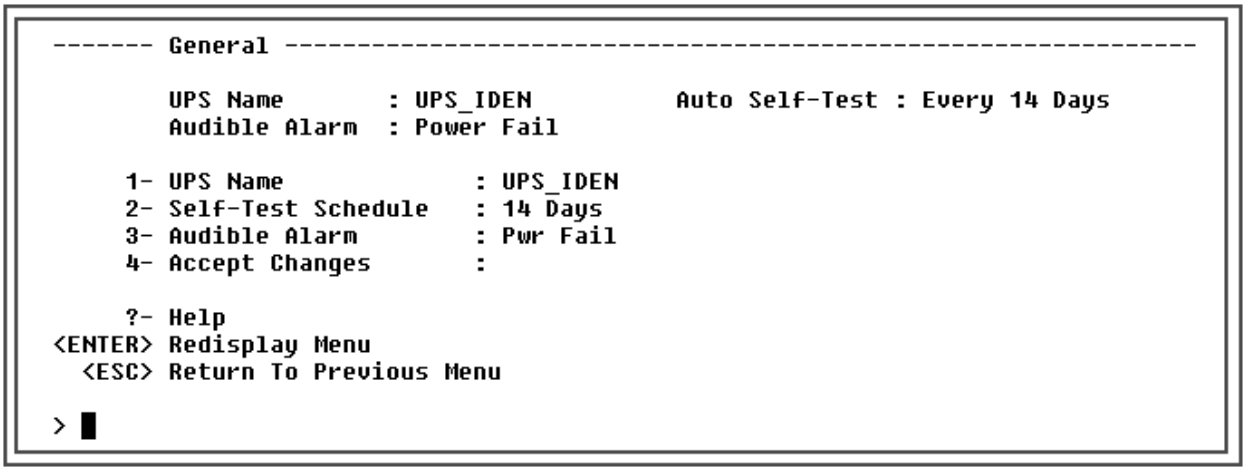
The `3- Shutdown Parameters` option in the **Configuration** screen menu displays the following screen:



Use	To Do this
`1- Shutdown Delay:`	Define, in seconds, how long the UPS waits before it actually shuts down.
`2- Return Delay:`	Define, in seconds, how long a UPS that has shut down due to a power failure waits, after the power failure ends, before it goes back on line. *Note: The UPS must also wait until the battery capacity equals the `Return Battery Capacity` value.*
`3- Low-Battery Duration:`	Define (in minutes) how long the UPS can continue to run on-battery once a low-battery condition occurs. Also, this value defines how long the UPS waits for servers to shut down in reponse to `Reboot UPS Gracefully`, `Turn Off UPS Gracefully`, and `Put UPS to Sleep Gracefully` commands (see HOW TO CONTROL A SMART-UPS OR MATRIX-UPS).
`4- Sleep Time:`	Define how long the UPS will sleep in response to the `Put UPS to Sleep` or `Put UPS to Sleep Gracefully` option in the **Command** screen Menu. The time is defined in hours and in 6-minute (one-tenth of an hour) increments.

General Screen

The `4- General` option in the **Configuration** screen menu accesses the following screen:



Use	To Do this
`1- UPS Name:`	Assign a name to the UPS.
`2- Self-Test Schedule:`	Define when the UPS will perform self-tests.
`3- Audible Alarm:`	Define when the UPS will generate an audible alarm.

How to Manage A *Symmetra Power Array*

When the UPS is a *Symmetra Power Array*, and you select the `1` option in the **Device Manager** menu, a **Symmetra** menu screen appears. This screen, shown below, has the following major elements:

- The screen displays *Symmetra Power Array* status information in the top half of the screen. For more information, see HOW TO MONITOR A *SYMMETRA POWER ARRAY*.
- Four menu options allow access to more status information about the *Symmetra Power Array*:

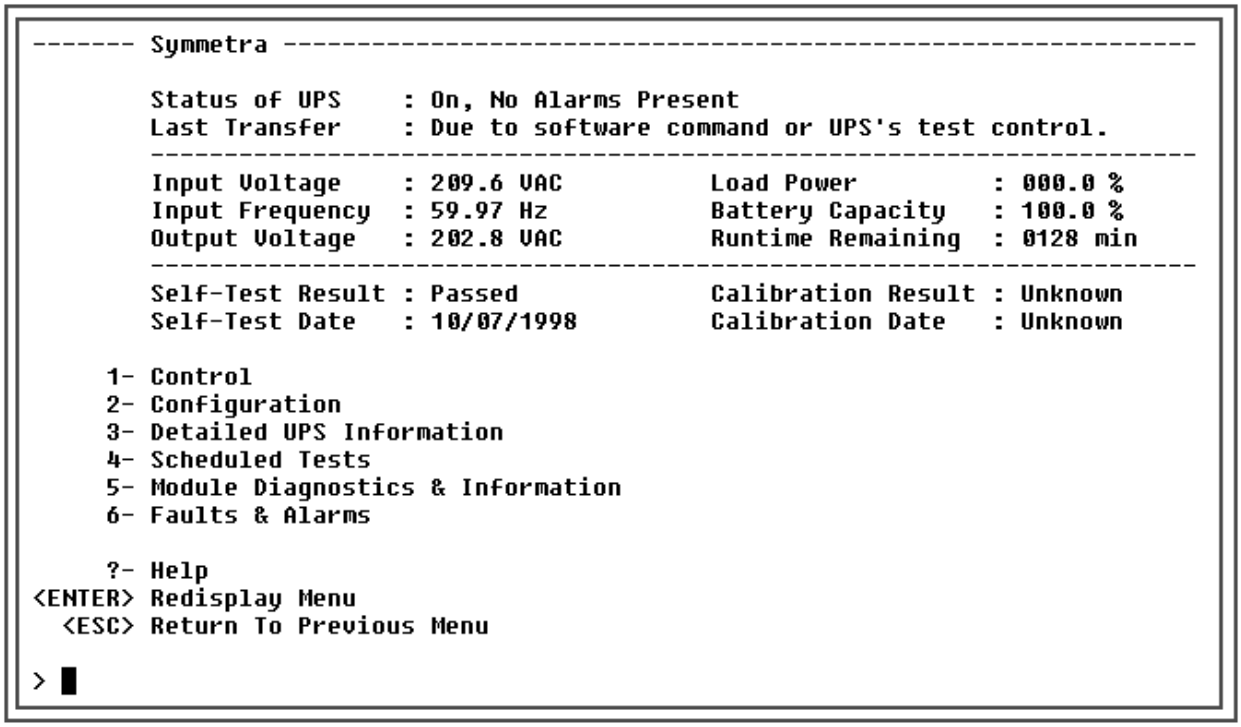
  `3- Detailed UPS Information`

  `4- Scheduled Tests`

  `5- Module Diagnostics & Information`

  `6- Faults & Alarms`

  For more information about the menu options listed above, see HOW TO MONITOR A *SYMMETRA POWER ARRAY*.
- The `1- Control` option accesses a set of screens you can use to control the operation of the *Symmetra Power Array*. For more information, see HOW TO CONTROL A *SYMMETRA POWER ARRAY*.
- The `2- Configuration` option accesses a set of screens you can use to modify how the *Symmetra Power Array* operates. For more information, see HOW TO CONFIGURE A *SYMMETRA POWER ARRAY*.



How to Monitor a *Symmetra Power Array*

The **Symmetra** menu screen provides a status display and four menu options that allow you to view additional information about the *Symmetra Power Array*. For information about the **Symmetra** screen status display, see SYMMETRA SCREEN STATUS DISPLAY; for information about the four menu options you can use to access additional status information, see the sections identified in the following list:

`3- Detailed UPS Information` (See DETAILED STATUS SCREEN.)

`4- Scheduled Tests` (See SCHEDULED TESTS SCREEN.)

`5- Module Diagnostics & Information` (See MODULE DIAGNOSTICS & INFORMATION SCREEN.)

`6- Faults & Alarms` (See FAULTS & ALARMS SCREEN.)

Symmetra Screen Status Display

The **Symmetra** screen reports the following information about the operational status, input and output voltages, battery status, self-test, and calibration results for the *Symmetra Power Array*:

This Field	Identifies
Status of UPS:	The current status of the UPS.
Last Transfer:	What most recenly caused the UPS to switch to battery.
Input Voltage:	The utility voltage level.
Input Frequency:	The input line (utility) voltage's frequency, in Hertz (Hz, for cycles per second).
Output Voltage:	The UPS output voltage level.
Load Power:	The load the attached equipment is placing on the UPS, expressed as a percentage of the total UPS load capacity.
Battery Capacity:	How much capacity, as a percentage of full-capacity, the UPS has available.
Runtime Remaining:	How long the UPS can support its load equipment before performing a shut down.
Self-Test Result:	The result of the last self-test.
Calibration Result:	The result of the last runtime calibration.

Detailed Status Screen

Selecting the `3- Detailed UPS Information` option in the **Symmetra** screen menu accesses the following screen, which expands on the `Status of UPS`: information provided in the **Symmetra** screen. In the following example, `Serial communication has been established. UPS is on.` The screen provides information on a wide range of other *Symmetra Power Array* status values.

Note: When the UPS switches to battery, the amount of time that has elapsed appears in the Detailed Status **screen.**

```
------- Detailed Status of Symmetra named Mr_G     -----------------------------

        IM Status         : On & OK           Internal Temperature  : 037.6 C
        RIM Status        : On & OK
        ------------------------------------------------------------------------
        Output Frequency  : 59.83 Hz          Maximum Line Voltage  : 209.6 VAC
        Load Current      : 00.00 Amps        Minimum Line Voltage  : 209.6 VAC
        ------------------------------------------------------------------------
        Power Modules     : 03                Redundancy            : n+2
        Number Bad        : 00                Alarm if Under        : n+0
        Load Capacity     : 08.0 kVA          Load @ n+0 Redundancy : 007 %
        Alarm if Over     : 00.0 kVA          Load @ n+0 Redundancy : 007 %
        ------------------------------------------------------------------------
        Ext Batt Frames   : 0                 Battery Capacity      : 100.0 %
        Batteries         : 002               Runtime Remaining     : 0128 min
        Number Bad        : 000               Alarm if Under        : 0000 min
        Voltage           : 137.3 VDC

        Serial communication has been established.
        UPS is on.

        Press <ENTER> to continue...
```

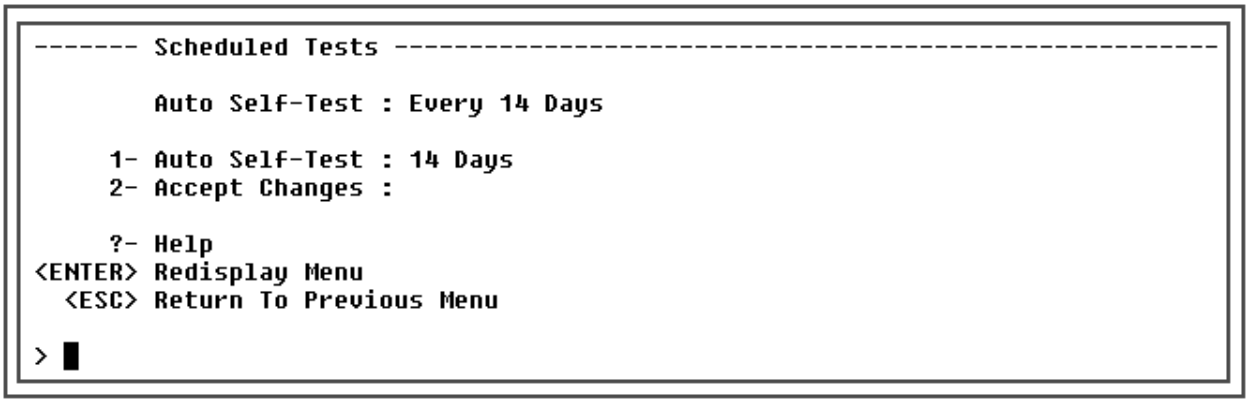
This Field	Identifies
`IM Status:`	The Intelligence Module (IM) is on and operational (OK).
`RIM Status:`	The Redundant Intelligence Module (RIM) is on and operational (OK).
`Internal Temperature:`	The internal temperature of the *Symmetra Power Array* (in Celcius).
`Output Frequency:`	The frequency of the voltage the*Symmetra Power Array* is providing to its attached equipment.
`Load Current:`	The output voltage current (Amperage) being used by the attached equipment.
`Maximum Line Voltage:`	The highest input voltage sensed during the previous minute of operation.

This Field	Identifies
Minimum Line Voltage:	The lowest input voltage sensed during the previous minute of operation.
Power Modules:	How many power modules the *Symmetra Power Array* has.
Number Bad: (listed under Power Modules)	The number of faulty power modules.
Load Capacity:	The maximum load capacity for the *Symmetra Power Array*, in kiloVolts per Amp (kVA).
Alarm if Over:	The load threshold, in kiloVolts per Amp (kVA). *Note: The Symmetra Power Array will generate an alarm if the attached equipment exceeds this threshold.*
Redundancy:	The number of Power Modules that can fail or be removed without causing the *Symmetra Power Array* to switch to bypass.
Alarm if Under: (listed under Redundancy)	The redundancy threshold for the *Symmetra Power Array*. *Note: The Symmetra Power Array will generate an alarm if the redundancy level falls below this value.*
Load @ n+0 Redundancy:	The percentage of the load relative to the total number of working Power Modules.
Load @ n+r Redundancy:	The percentage of the load relative to the total number of working Power Modules, minus the redundancy alarm level (0, 1, or 2). A value of 100% equals the redundancy alarm point.
Batteries:	The total number of battery packs used by the *Symmetra Power Array*.
Number Bad: (listed under Batteries)	The number of faulty battery packs.
Voltage:	The voltage that the *Symmetra Power Array* batteries can supply, in volts DC (VDC).

This Field	Identifies
`Battery Capacity:`	The percentage of full battery capacity the *Symmetra Power Array* currently has available for supporting its attached equipment if a power failure occurs.
`Runtime Remaining:`	The amount of time the *Symmetra Power Array* can use battery power to keep its attached equipment powered during a power failure.
`Alarm if Under:` (listed under `Runtime Remaining`)	The minimum runtime the *Symmetra Power Array* can have available without generating an alarm.

Scheduled Tests Screen

Selecting the `4- Scheduled Tests` option in the **Symmetra** screen menu accesses the following screen that allows you to define how often you want the *Symmetra Power Array* to perform self-tests:



Module Diagnostics & Information Screen

Selecting the `5- Module Diagnostics & Information` option in the **Symmetra** screen menu accesses the following screen:

```
------- Module Diagnostics & Information --------------------------------------

     1- Intelligence Module
     2- Redundant Intelligence Module
     3- Power Modules
     4- Batteries
     5- Dump All Module Data

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

> _
```

This screen has menu options that allow you to access status information about different *Symmetra Power Array* components, as follows:

`1- Intelligence Module`

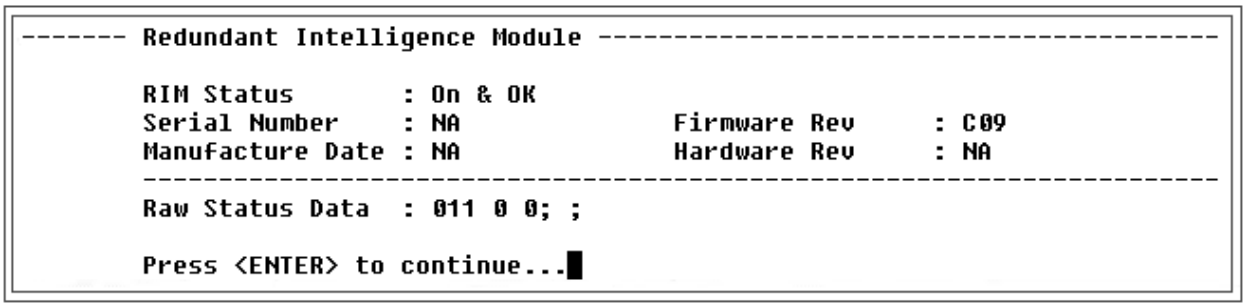
This option displays a screen that provides status information and identification parameters for the Intelligence Module used by the *Symmetra Power Array*:

```
------- Intelligence Module ----------------------------------------------------

        IM Status        : On & OK          Master Firmware Rev : A14
        Serial Number    : ED9724461315     Slave Firmware Rev  : C09
        Manufacture Date : 08/12/97         Hardware Rev        : NA
        ------------------------------------------------------------------------
        Raw Status Data  : State05 Fan0;100 10 00111101;Vint240.8 00000000

        Press <ENTER> to continue...
```

This Field	Identifies
IM Status:	The status of the Intelligence Module.
Serial Number:	The IM serial number.
Manufacture Date:	The date the IM was completed by the manufacturer.
Master Firmware Rev:	The version number for the IM master firmware.
Slave Firmware Rev:	The version number for the IM slave firmware.
Hardware Rev:	The version number for the IM hardware.
Raw Status Data:	Information used by APC Engineers to trouble-shoot *Symmetra Power Array* hardware problems.

2- Redundant Intelligence Module

This option accesses a screen that provides status and identification parameters information for the Redundant Intelligence Module (RIM) used by the *Symmetra Power Array*:



This Field	Identifies
RIM Status:	The status of the Redundant Intelligence Module.
Serial Number:	The RIM serial number.
Manufacture Date:	The date the RIM was completed by the manufacturer.
Firmware Rev:	The version number for the RIM firmware.
Hardware Rev:	The version number for the RIM hardware.
Raw Status Data:	Information used by APC Engineers to trouble-shoot *Symmetra Power Array* hardware problems.

3- Power Modules

This option accesses a screen that has menu options you can use to view status and identification parameters information for each Power Module (PM) used by the *Symmetra Power Array*:

```
------- Power Modules -------------------------------------------------------

     1- Power Module 1 : On & OK
     2- Power Module 2 : On & OK
     3- Power Module 3 : On & OK

<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

> _
```

Each option displays a screen that provides a single menu option (1- Flash LED) and the same status and identification parameter information, in the same format, for each Power Module (PM).

```
------- Power Module 1 -----------------------------------------------------

        PM Status         : On & OK
        Serial Number     : NA                Firmware Rev     : ABC
        Manufacture Date  : NA                Hardware Rev     : NA
        ------------------------------------------------------------------
        Raw Status Data   : 04 00 67 5B;00 00;87 02 09

     1- Flash LED

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

> _
```

The 1- Flash LED option will cause the Flash LED for the Power Module to blink on and off for several seconds.

This Field	Identifies
PM Status:	The status of the Power Module.
Serial Number:	The PM serial number.
Manufacture Date:	The date the PM completed the manufacturing process.
Firmware Rev:	The version number for the PM firmware.
Hardware Rev:	The version number for the PM hardware.
Raw Status Data:	Information used by APC Engineers to trouble-shoot *Symmetra Power Array* hardware problems.

4- Batteries

This option accesses a screen which provides Raw Status Data for the batteries, as a whole, and individual status reports for each *Symmetra Power Array* battery:

Note: The Raw Status Data **provides information used by APC Engineers to troubleshoot *Symmetra Power Array* problems.**

```
------- Main Frame -----------------------------------------------------------

        Raw Status Data   : 00.0  00.0;00.5  00.5  1;1.00 1.00 0.00 0.00
        -------------------------------------------------------------------
        Battery R2 Status : OK
        Battery R3 Status : OK

        Press <ENTER> to continue...
```

5- Dump All Module Data

This option displays the status information displayed for all of the other options.

Faults & Alarms Screen

Selecting the 6-Faults & Alarms option in the **Symmetra** screen menu accesses the following screen:

```
------- Faults & Alarms of Symmetra named Mr_G     ----------------------------

        No alarms to report.

        Press <ENTER> to continue...
```

How to Control a *Symmetra Power Array*

When you select the `1- Control` option in the **Symmetra** menu, the following **Control** menu screen is displayed:

```
------- Control ------------------------------------------------------------

        Status of UPS : On, No Alarms Present

     1- Turn UPS On
     2- Turn UPS Off
     3- Turn UPS Off Gracefully
     4- Reboot UPS
     5- Reboot UPS Gracefully
     6- Put UPS To Sleep
     7- Put UPS To Sleep Gracefully
     8- Simulate Power Failure
     9- UPS Self-Test
     10- Start/Stop Runtime Calibration
     11- Put UPS in/Return UPS from Bypass

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

> _
```

Use	To Do this
`1- Turn UPS On`	Turn the UPS on.
`2- Turn UPS Off`	Cause a UPS to turn off immediately (stop supplying power to its load equipment).
`3- Turn UPS Off Gracefully`	Signal all servers using PowerChute *plus* and communicating with the UPS, to shut down their operating systems. The UPS waits the amount of time defined by the `Low-Battery Duration` configuration value for servers to shut down before turning power off. See How to Configure a Symmetra Power Array.

Use	To Do this
4- Reboot UPS	Cause a UPS to turn off and then turn power back on after a specified delay.
5- Reboot UPS Gracefully	Signal all servers using PowerChute *plus* and communicating with the UPS to shut down their operating systems. The UPS waits the amount of time defined by the Low-Battery Duration configuration value for servers to shut down before rebooting the load equipmet. SeeHOW TO CONFIGURE A SYMMETRA POWER ARRAY.
6- Put UPS to Sleep	Turns the UPS off for a defined period of time.
7- Put UPS to Sleep Gracefully	The UPS waits the amount of time set as the Shutdown Delay value for servers to shut down, then puts the UPS to sleep for the period of time defined by the Sleep Time configuration value See HOW TO CONFIGURE A SYMMETRA POWER ARRAY.
8- Simulate Power Failure	Test the ability of the UPS to respond to a power failure by simulating a power failure.
9- UPS Self-Test	Cause a UPS to perform a self-test.
10-Start/Stop Runtime Calibration	Start or stop a process which determines how long the UPS can support the attached equipment using battery power when a power failure occurs.
11-Put UPS in/Return UPS from Bypass	Control the use of software bypass.

How to Configure a *Symmetra Power Array*

When you select the `2- Configuration` option in the **Symmetra** menu, you access a **Configuration** menu screen that displays the current values for UPS parameters that you can change using five menu options.

Note: A UPS has other operational parameters which can be modified using either SNMP (see CHAPTER 5), PowerChute *plus* (see CHAPTER 4) or PowerNet SNMP Manager (see CHAPTER 6).

```
------- Configuration ----------------------------------------------------

        Output Voltage    : 240 VAC       Alarm if Redundancy Under : n+0
        Vout Reporting    : Auto          Alarm if Runtime Under    : 000 min
        Output Freq Range : Auto          Alarm if Load Over        : Never
        ------------------------------------------------------------------
        If UPS fails, and frequency or voltage is out of range : Goto Bypass
        ------------------------------------------------------------------
        Shutdown Delay    : 020 sec       Low-Battery Duration      : 002 min
        Return Delay      : 060 sec       Sleep Time                : 0.0 hrs
        Auto Self-Test    : Every 14 Days Return Battery Capacity   : 000 %
        UPS Name          : Mr_G          Last Battery Replacement  : 01/01/97

     1- Utility Line
     2- Alarm Thresholds
     3- Shutdown Parameters
     4- General
     5- Reset UPS to Defaults

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

> _
```

Use	To Do this

`1- Utility Line`
 	
Note: See the UTILITY LINE SCREEN description for more information.
	Modify the following operational parameter values:
	
	`Output Voltage`
	`Vout Reporting`
	`Output Freq Range`
	`Freq/Volt Overload`

`2- Alarm Thresholds`
 	
Note: See the ALARM THRESHOLDS SCREEN description for more information.
	Modify the following values:
	
	`Alarm if Redundancy Under`
	`Alarm if Runtime Under`
	`Alarm if Load Over`

Use	To Do this
3- Shutdown Parameters *Note: See the SHUTDOWN PARAMETERS SCREEN description for more information.*	Modify the following values: Return Battery Capacity Low-Battery Duration Shutdown Delay Return Delay Sleep Time

4- General *Note: See the GENERAL SCREEN description for more information.*	Modify the following values: UPS Name Last Battery Replacement
5- Reset UPS to Defaults *Note: No other information is provided about this option.*	Reset all EEPROM-based UPS parameters to the values stored in the EEPROM at the factory.

Utility Line Screen

The 1- Utility Line option in the **Configuration** screen menu displays the following:

```
------- Utility Line ------------------------------------------------------

        If UPS fails, and frequency or voltage is out of range : Goto Bypass
        ------------------------------------------------------------------------
        Output Voltage : 240 VAC              Output Freq Range : Auto
        Vout Reporting : Auto

     1- Output Voltage     : 240
     2- Vout Reporting     : Auto
     3- Output Freq Range  : Auto
     4- Freq/Volt Overload : Goto Byp
     5- Accept Changes     :

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

> _
```

Use	To Do this
1- Output Voltage:	Define the nominal value for the *Symmetra Power Array* output voltage.
2- Vout Reporting:	Define how the Symmetra Power Array scales its output voltage readings.
3- Output Freq Range:	Define the nominal value for the frequency of the *Symmetra Power Array* output frequency range.
4- Freq/Volt Overload:	Define how the *Symmetra Power Array* will respond if it fails due to out-of-range frequency or voltage.

Alarm Thresholds Screen

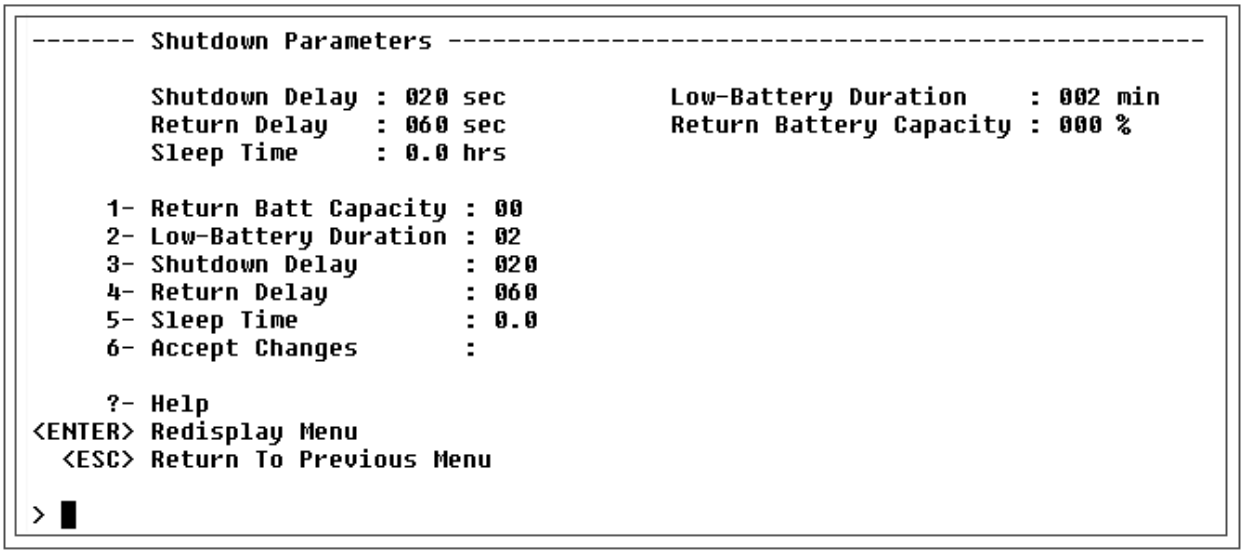
The 2- Alarm Thresholds option in the **Configuration** screen menu accesses the following screen:

```
------- Alarm Thresholds ------------------------------------------------------

        Alarm if Redundancy Under : n+0          Alarm if Load Over : Never
        Alarm if Runtime Under    : 000 min

     1- Alarm if Redundancy Under : 0
     2- Alarm if Runtime Under    : 000
     3- Alarm if Load Over        : Never
     4- Accept Changes            :

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

>
```

Use	To Do this
1- Alarm if Redundancy Under:	Define the redundancy threshold. An alarm will occur if the redundancy value drops below this threshold.
2- Alarm if Runtime Under:	Define the runtime available threshold. An alarm will occur if the amount of available runtime, expressed in minutes, drops below this threshold.
3- Alarm if Load Over:	Define the load threshold. An alarm will occur if the load placed on the *Symmetra Power Array* by its attached equipment exceeds this threshold.

Shutdown Parameters Screen

The 3- Shutdown Parameters option in the **Configuration** screen menu displays the following:

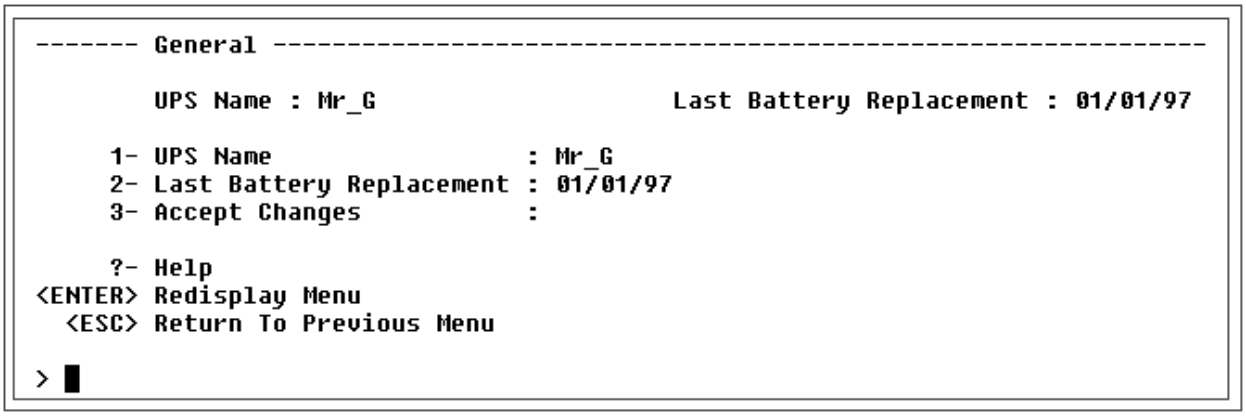


Use	To Do this
1- Return Battery Capacity:	Define the percentage of full battery capacity the *Symmetra Power Array* must have available before it can go back on line after being turned off. *Note: The UPS must also wait until the time set as the Return Delay value expires.*
2- Low-Battery Duration:	Define how long (in minutes) the *Symmetra Power Array* can continue to run on-battery once a low-battery condition occurs. Also, this value defines how long the UPS waits for servers to shut down in reponse to Reboot UPS Gracefully, Turn Off UPS Gracefully, and Put UPS to Sleep Gracefully commands. See HOW TO CONTROL A *SYMMETRA POWER ARRAY*.
3- Shutdown Delay:	Define how long, in seconds, the UPS waits after it receives the shutdown command, before the UPS actually shuts down.

Use	To Do this
4- Return Delay:	Define, in seconds, how long a UPS waits before going back on-line when power is restored. *Note: The UPS must also wait until the battery capacity equals the Return Battery Capacity value.*
5- Sleep Time:	Define how long the UPS will sleep in response to using either the Put UPS to Sleep or Put UPS to Sleep Gracefully options in the **Command** screen Menu. The time is defined in hours and in 6-minute (one-tenth of an hour) increments.

General Screen

The 4- General option in the **Configuration** screen menu accesses the following screen:



Use	To Do this
1- UPS Name:	Assign a name to the UPS.
2- Last Battery Replacement:	Identify the date of the last battery replacement for the *Symmetra Power Array*.

Reset UPS to Defaults Screen

The 5- Reset UPS to Defaults option in the **Configuration** screen menu displays a screen that lets you reset the UPS to its default settings.

How to Manage a Measure-UPS

The `Measure-UPS` option in the **Device Manager** menu opens the **Measure-UPS** menu screen. You can use this screen to:

- View information about the humidity, temperature and contact switch conditions. See How To Monitor the Measure-UPS.
- Set contact switch settings and probe trap thresholds. See How To Configure the Measure-UPS).

```
------- Measure-UPS II ------------------------------------------------------

        Probe 1 : 23.87 C, 030.4 %RH         Probe 2 : NA    C, NA    %RH
        ----------------------------         ----------------------------

        Current Status :
        Threshold Violation Present, Contact Alarms OK

     1- Trap Thresholds Probe 1
     2- Trap Thresholds Probe 2
     3- Contact Settings
     4- Threshold And Contact Details
     5- About Measure-UPS

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

> _
```

How to Monitor a Measure-UPS

The **Measure-UPS** menu screen provides information about the Measure-UPS, and displays the menu options you can use to view more information about the Measure-UPS, temperature and humidity thresholds, and contacts.

Measure-UPS Menu Screen's Status Information

The **Measure-UPS** menu screen reports information about the Measure-UPS operational status, and the temperature and humidity values sensed by two Measure-UPS probes.

This Field	Identifies
`Probe 1:` and `Probe 2:`	The temperature (in Celsius) and relative humidy (as a percentage) sensed by the Measure-UPS probes.
`Current Status:`	The current status of threshold and contact alarms.

Measure-UPS Menu Status Options

The **Measure-UPS** menu provides two options you can use to view additional information about the UPS:

4- Threshold and Contact Details

This option accesses information about current temperature and humidity thresholds and contact alarms:

```
------------------------------------------------------------------------
Threshold And Alarm Details

- Current Threshold Violations ----------------------------------
Probe 1 : 23.87 C, 030.4 %RH          Probe 2 : NA    C, NA    %RH
Description         Violation         Description         Violation
---------------------------           ---------------------------
Temperature                           Temperature
  High 60 C         Disabled            High 60 C         Disabled
  Low  0  C         Disabled            Low  0  C         Disabled
Humidity                              Humidity
  High 90 %RH       Disabled            High 90 %RH       Disabled
  Low  10 %RH       Disabled            Low  10 %RH       Disabled

- Current Contact Alarms ----------------------------------------
Description         Alarm             Description         Alarm
---------------------------           ---------------------------
Contact 1                             Contact 2
  Device 1          Disabled            Device 2          Disabled
Contact 3                             Contact 4
  Device 3          Disabled            Device 4          Disabled


Press <ENTER> to continue...
```

A Measure-UPS can have up to four contact switches and two probes enabled. Though both probes can perform the same measurements, what is displayed in the probe fields depends on how they are configured: Temperature, humidity or both temperature and humidity.

In the following example, the Measure-UPS has one temperature and humidity probe.

This Field	Identifies
Probe 1 : 23.87 C, 30.4 %RH	The current temperature (in Celsius) and relative humidity (as a percentage).
High 60°C Disabled	The high temperature threshold, 60°C in this example, and its status, enabled or disabled. When enabled, (Yes) or (No) is displayed to show whether the current temperature exceeds the threshold.
Low 0°C Disabled	The low temperature threshold, 0°C in this example, and its status, enabled or disabled. When enabled, (Yes) or (No) is displayed to show whether the current temperature exceeds the threshold.
High 90 %RH Disabled	The high humidity threshold, 90% in this example, and its status, enabled or disabled. When enabled, (Yes) or (No) is displayed to show whether the current humidity exceeds the threshold.
Low 10 %RH Disabled	The low humidity threshold, 10% in this example, and its status, enabled or disabled. When enabled, (Yes) or (No) is displayed to show whether the current humidity exceeds the threshold.
Contact 1 through Contact 4	The contacts by number and name (Device 1 through Device 4, the default names, in this example), and whether a contact alarm is Disabled, or (when Enabled) if the contact senses an alarm condition (Yes) or not (No).

5- About Measure-UPS

This option accesses a single value: The Firmware Version of the Measure-UPS.

How to Configure a Measure-UPS

The **Measure-UPS** menu has three options you can use to configure trap threshold and contact settings.

```
1- Trap Thresholds Probe 1
2- Trap Thresholds Probe 2
3- Contact Settings
```

You use the first two options to access the **Trap Thresholds Probe 1** or **Trap Thresholds Probe 2** menu screens. These menu screens provide two sets of identical options.

```
------- Trap Thresholds Probe 1 ------------------------------------------------

        Thresholds
        ----------
     1- High Temperature   (0-60 C) : 60
     2- Low Temperature    (0-60 C) : 0
     3- High Humidity   (10-90 %RH) : 90
     4- Low Humidity    (10-90 %RH) : 10

        Send Traps On
        -------------
     5- High Temperature            : Disabled
     6- Low Temperature             : Disabled
     7- High Humidity               : Disabled
     8- Low Humidity                : Disabled
     9- Accept Changes              :

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

> _
```

Use	To Do this
The `Threshold` options	Define the high and low temperature (in Celsius) and relative humidy (as a percentage) thresholds the Measure-UPS will use to identify a trap condition.
The `Send Traps On` options	Enable or disable sending traps for each threshold.

3- Contact Settings

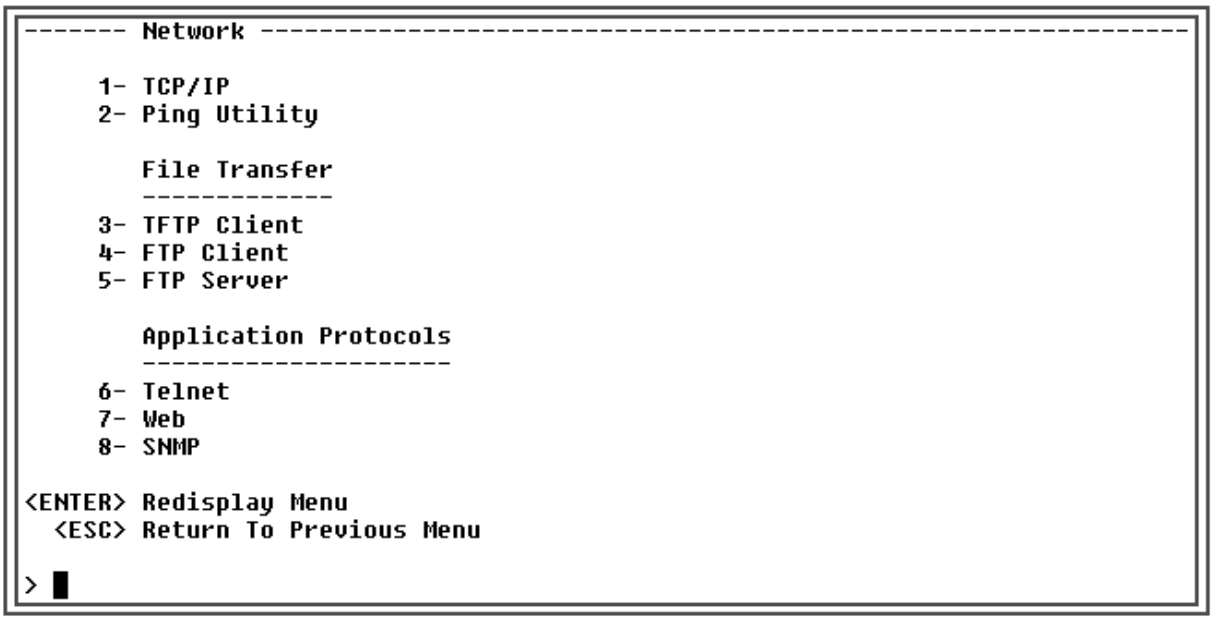
You use this option to access the **Contact Settings** menu screen, which identifies the current alarm condition for each contact, and provides two sets of options.

```
------- Contact Settings ------------------------------------------------------

        Description        Alarm            Description        Alarm
        ---------------------------         ---------------------------
        Contact 1                           Contact 2
          Device 1         Disabled           Device 2         Disabled
        Contact 3                           Contact 4
          Device 3         Disabled           Device 4         Disabled

     1- Contact 1 Name : Device 1
     2- Contact 2 Name : Device 2
     3- Contact 3 Name : Device 3
     4- Contact 4 Name : Device 4
     5- Contact Zone 1 : Disabled
     6- Contact Zone 2 : Disabled
     7- Contact Zone 3 : Disabled
     8- Contact Zone 4 : Disabled
     9- Accept Changes :

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

>
```

Use	To Do this
`Contact 1 Nam:` through `Contact 4 Name:`	Define a name for each contact, with each name having up to sixteen (16) characters.
`Contact Zone 1:` through `Contact Zone 4:`	Enable or disable the contacts.

How to Manage the Management Card's Network Connection

Selecting the **Control Console** menu's `Network` option displays a menu that allows you to select other menus you can use to manage the Management Card's network operation.



Use	To Do this
`1- TCP/IP`	Enable or disable a BOOTP server. With BOOTP `Disabled`, you must use this option to access menu options you use to define basic network values the Management Card needs to run on the network (see How to Define the Management Card's Basic Network Values).
`2- Ping Utility`	Use ping to test the Managment Card's ability to communicate over the network.
`3- TFTP Client`	Define the TFTP Client's IP address.
`4- FTP Client`	Define the FTP Client's IP address.
`5- FTP Server`	Define the FTP Server's IP address.
`6- Telnet`	Define the port on which the Telnet server for the Management Card resides. The default Telnet port is 23.

Use	To Do this
7- Web	Define the port on which the Web server for the Management Card resides. The default Web port is 80.
8-SNMP	Use the SNMP menu to define values for the Management Card's SNMP access controls, trap receivers and system identifications (see How to Use the SNMP Menu).

Note: Because `Ping Utility` **options are self-explanatory, this guide does not provide information on their use..**

How to Define the Management Card's Basic Network Values

When you select the **Network** menu's `TCP/IP` option, the **TCP/IP** menu's format depends on the `BOOTP` option setting:

- With `BOOTP: Enabled` (the default), the address values shown in the menu screen come from a BOOTP server, and the menu contains only one option, which you can use to disable BOOTP.

```
------- TCP/IP --------------------------------------------------------------

        The Network Service has started with the following settings :
        ------------------------------------------------------------------

        System IP       : 159.215.11.71
        Subnet Mask     : 255.255.255.0
        Default Gateway : 159.215.11.1
        MAC Address     : 00 C0 B7 F1 FF 55

     1- System IP       : 159.215.11.71
     2- Subnet Mask     : 255.255.255.0
     3- Default Gateway : 159.215.11.1
     4- BOOTP           : Enabled
     5- Accept Changes  :

<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu Without Accepting Changes

> _
```

- With `BOOTP: Disabled`, you must use the menu's three address options (`System IP`, `Subnet Mask` and `Default Gateway`) to define these required network values, when you first install the Management Card, or whenever you need to change these values.

```
------- TCP/IP --------------------------------------------------------------

        The Network Service has started with the following settings :
        ------------------------------------------------------------------

        System IP       : 159.215.11.71
        Subnet Mask     : 255.255.255.0
        Default Gateway : 159.215.11.1
        MAC Address     : 00 C0 B7 F1 FF 55

     1- System IP       : 159.215.11.71
     2- Subnet Mask     : 255.255.255.0
     3- Default Gateway : 159.215.11.1
     4- BOOTP           : Disabled
     5- Accept Changes  :

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

> _
```

How to Control File Transfers

TFTP Client

When you select the **Network** menu's `TFTP Client` option, you access a screen that lets you define the Remote Server's IP address.

```
------- TFTP Client ---------------------------------------------------------

        The result of the last file transfer is : Valid Code Image

     1- Remote Server IP : 0.0.0.0
     2- Accept Changes :

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

> _
```

FTP Client

When you select the **Network** menu's `FTP Client` option, you access the following screen:

```
------- FTP Client ----------------------------------------------------------

        The result of the last file transfer is : Valid Code Image

     1- Remote Server IP : 0.0.0.0
     2- User Name        : apc
     3- Password         : apc
     4- Accept Changes :

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

>
```

Use	To Do this
`1- Remote Server IP`	Define the Remote Server's IP address.
`2- User Name`	Define the User Name (up to 15 characters).
`3- Password`	Define the password (up to 15 characters).

FTP Server

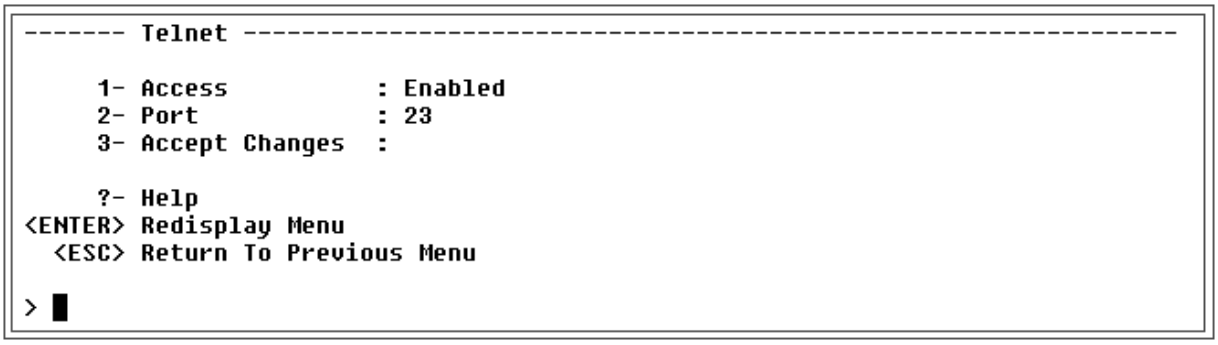
When you select the **Network** menu's `FTP Server` option, you access the following screen:

```
------- FTP Server ----------------------------------------------------------

        The result of the last file transfer is : Valid Code Image

     1- Access           : Enabled
     2- Port             : 21
     3- Accept Changes :

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

>
```

Use	To Do this
`1- Access`	Enable or Disable FTP server access.
`2- Port`	Define the port on which the FTP server for the Management Card resides (default port is 21).

How to Use the Telnet Menu

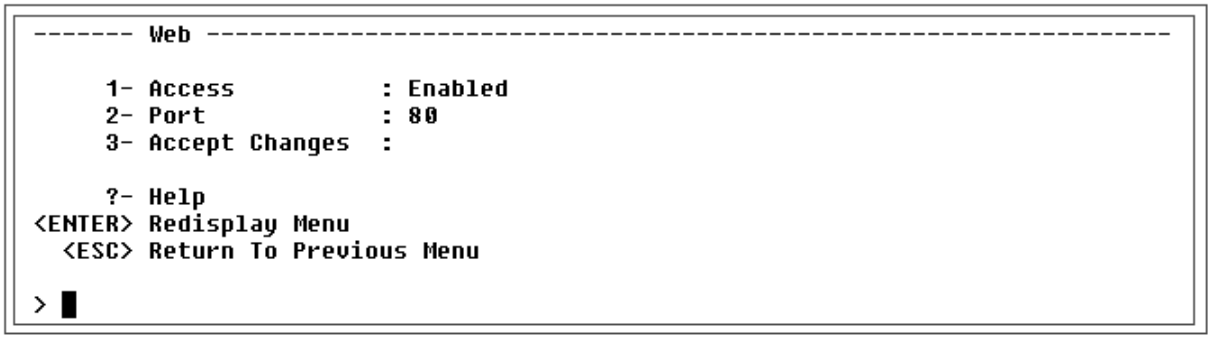
When you select the **Network** menu's `Telnet` option, you access the **Telnet** menu screen.



Use	To Do this
`1- Access`	Enable or Disable Telnet access.
`2- Port`	Define the port on which the Telnet server for the Management Card resides.

How to Use the Web Menu

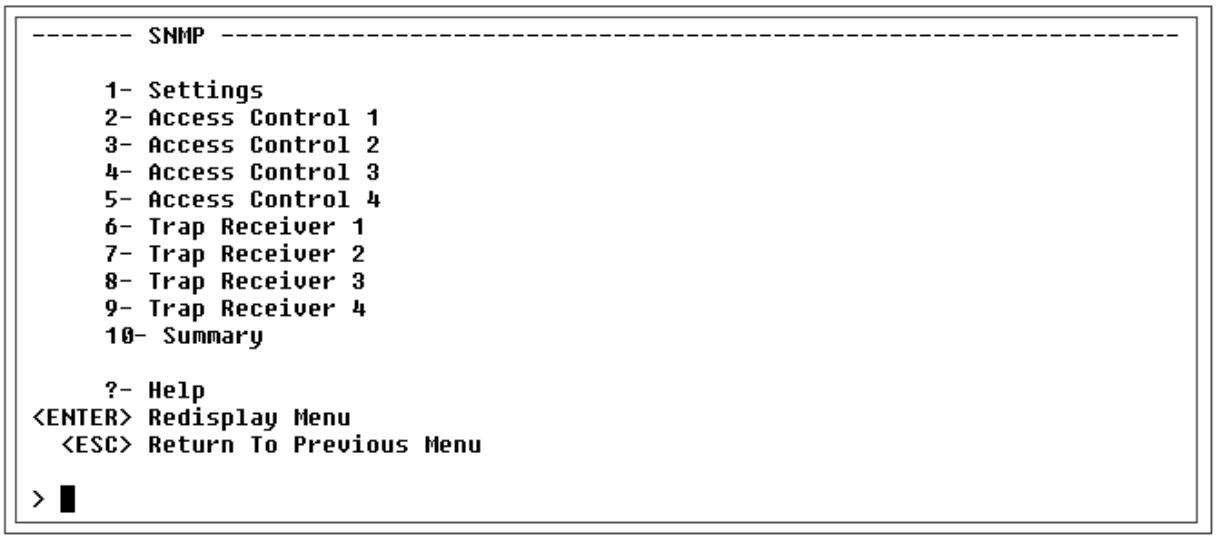
When you select the **Network** menu's `Web` option, you access the **Web** menu screen.



Use	To Do this
`1- Access`	Enable or Disable Web access.
`2- Port`	Define the port on which theWeb server for the Management Card resides.

How to Use the SNMP Menu

When you select the **Network** menu's SNMP option, you display the **SNMP** menu screen:



Use	To Do this
Settings	Enable or disable SNMP access.
Access Control 1 through Access Control 4	Contol access to each of the four SNMP channels.
Trap Receiver 1 through Trap Receiver 4	Define which, of up to four NMSs, will be sent traps.

Also, a `Summary` option allows you to view the current settings for all **SNMP** menu values.

```
-------------------------------------------------------------------------
SNMP Configuration Summary

sysName             : Unknown
sysLocation         : Unknown
sysContact          : Unknown

Access Control Summary
#  Community        Access      NMS IP
-------------------------------------------------------------------------
1  public           Read        0.0.0.0
2  private          Write       0.0.0.0
3  public2          Disabled    0.0.0.0
4  private2         Disabled    0.0.0.0

Trap Receiver Summary
#  Community        Generation  Authentication  Receiver NMS IP
-------------------------------------------------------------------------
1  public           Enabled     Enabled         0.0.0.0
2  public           Enabled     Enabled         0.0.0.0
3  public           Enabled     Enabled         0.0.0.0
4  public           Enabled     Enabled         0.0.0.0


Press <ENTER> to continue...
```

How to Control SNMP Channel Access

The **SNMP** menu's `Access Control 1` through `Access Control 4` options all access identical menu screens. Each screen:

- Identifies the current settings for all four SNMP channels.
- Provides menu options you can use to change the values for the selected channel.

```
------- Access Control 1 -----------------------------------------------------

        Access Control Summary
        #  Community        Access      NMS IP
        -------------------------------------------------------------------------
        1  public           Read        0.0.0.0
        2  private          Write       0.0.0.0
        3  public2          Disabled    0.0.0.0
        4  private2         Disabled    0.0.0.0

     1- Community      : public
     2- Access Type    : Read
     3- NMS IP         : 0.0.0.0
     4- Accept Changes :

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

> _
```

Use	To Do this
`1- Community:`	Define the password (up to 8 characters) the NMS (identifed by the `NMS IP` option) must use for SNMP access to the Management Card (with the allowed access defined by the `Access Type` option).
`2- Access Type:`	Define whether an NMS (identifed by the `NMS IP` option) can use **GETs** and **SETs** (`Write`), just **GETs** (`Read`), or cannot use **GETs** and **SETs** at all (Disabled).
`3- NMS IP:`	Configure the channel to allow only one NMS (using a specific `NMS IP` address), or all NMSs (using `0.0.0.0` for the `NMS IP` value), to have access to the channel.

How to Define Trap Receivers

The **SNMP** menu's `options, Trap Receiver 1` through `Trap Receiver 4`, display identical menu screens. Each screen:

- Identifies the current settings for all four trap receivers.
- Provides menu options you can use to change the values for a selected trap receiver.

```
------- Trap Receiver 1 ------------------------------------------------------

        Trap Receiver Summary
        #  Community        Generation  Authentication  Receiver NMS IP
        ------------------------------------------------------------------------
        1  public           Enabled     Enabled         0.0.0.0
        2  public           Enabled     Enabled         0.0.0.0
        3  public           Enabled     Enabled         0.0.0.0
        4  public           Enabled     Enabled         0.0.0.0

     1- Community Name      : public
     2- Trap Generation     : Enabled
     3- Authentication Traps: Enabled
     4- Receiver NMS IP     : 0.0.0.0
     5- Accept Changes      :

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

> _
```

Use	To Do this
1- Community Name:	Define the password (up to 8 characters) the Management Card will use when it sends traps to the NMS identifed by the Receiver NMS IP option.
2- Trap Generation:	Define whether (Enabled) or not (Disabled) the Management Card will send traps to the NMS identifed by the Receiver NMS IP option.
3- Authentication Traps:	Define whether (Enabled) or not (Disabled) the Management Card will send authentication traps to the NMS identifed by the Receiver NMS IP option.
4- Receiver NMS IP:	Define the specific NMS (using its IP address) that you want to receive traps sent by the Management Card (0.0.0.0 indicates no traps will be sent to any NMS for this Trap Receiver option).

How to Manage the Management Card's System (Internal) Operation

Selecting the **Control Console** menu's `System` option displays a menu that allows you to select other menus to manage the Management Card.

```
------- System ----------------------------------------------------------------

     1- User Manager
     2- Identification
     3- Date/Time
     4- File Transfer
     5- Tools
     6- About Card

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

> _
```

Use	To Do this
`1- User Manager`	Control access to the Control Console.
`2- Identification`	Define the name of the system, the system contact and location.
`3- Date/Time`	Set the date/time for the system
`4 - File Transfer`	Control file transfers
`5 - Tools`	Affect the Management Card's SNMP Agent.
`6 - About Card`	View Management Card identification values.

How to Determine Access to the Control Console

Use the **Management Card** menu's `User Manager` option to define the Control Console's Administrator and Device Manager User passwords, Auto Logout value, and to enable or disable Authentication.

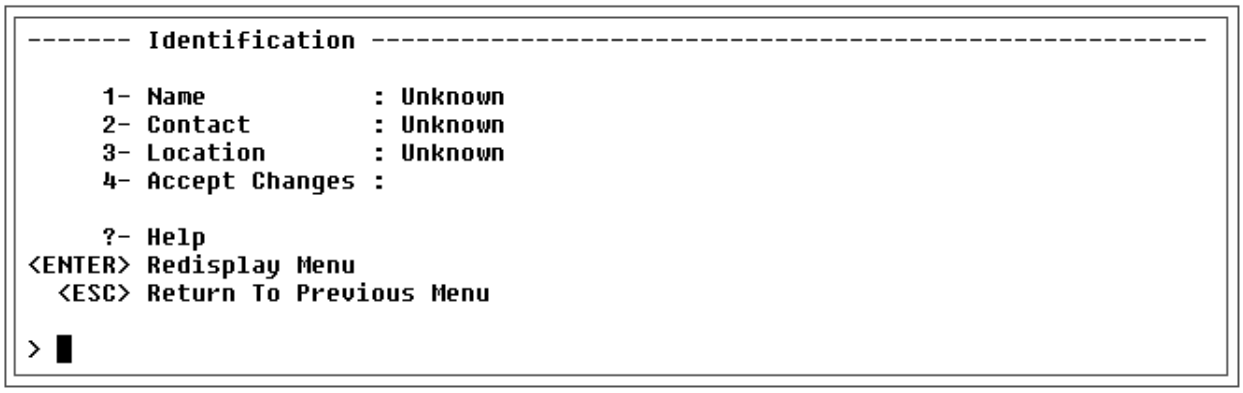
```
------- User Manager ----------------------------------------------------------

     1- Administrator
     2- Device Manager User
     3- Auto Logout        : 3 Minutes
     4- Authentication     : Disabled
     5- Accept Changes     :

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

> _
```

Use	To Do this
1- Administrator	Define the Administrator user name, password, and authentication phrase. The default Administrator user name is "apc". The default Administrator password is "apc". The default Administrator authentication phrase is "admin user phrase".
2- Device Manager User	Define the Device Manager User name, password, and authentication phrase. The default Device Manager User name is "device". The default Device Manager password is "apc". The default Device Manager authentication phrase is "device user phrase".
3- Auto Logout:	Choose the time (in minutes) it takes the system to automatically logout (default time is 3 minutes).
4- Authentication:	Basic causes the Web Interface to use HTTP 1.1 login; MD5 causes the Web Interface to use an MD5-based authenticated login. See Chapter 11 SECURITY for a detailed explanation.

How to Define System Identification Values

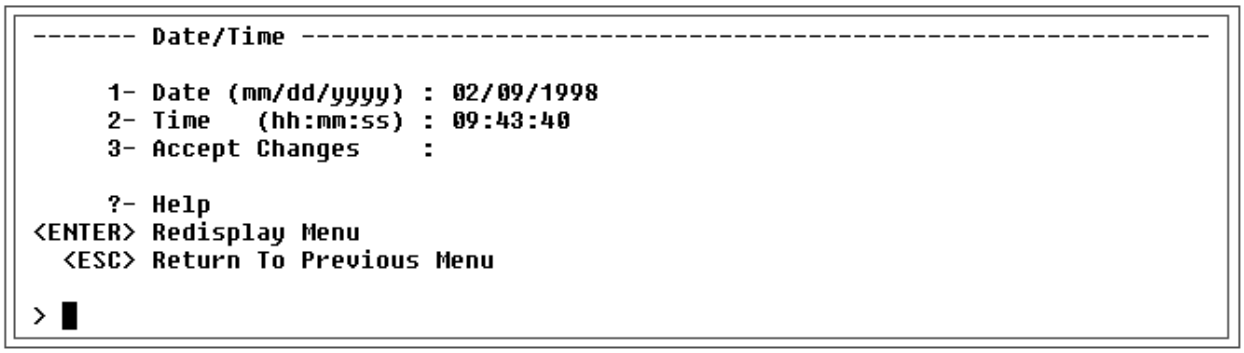
You use the **System** menu's Identification option to define the Management Card's system identification values. Each option identifies its current value.

Use	To Do this
1- Name:	Define the system name used to identify the Management Card.
2- Contact:	Define the contact person for Management Card issues.
3- Location:	Identify the physical location of the management Card.



How to Set Date and Time Values

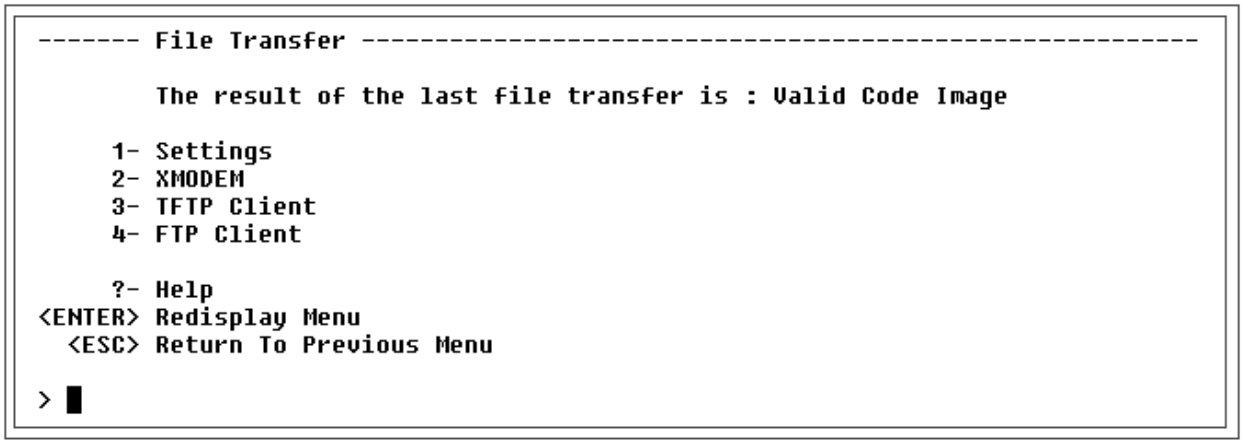
Use the **System** menu's `Date/Time` option to define the Management Card's date and time values.



Use	To Do this
`1- Date:`	Set the date for the system in dd / mm / yyyy format
`2- Time:`	Set the time for the system in hh / mm / ss format

How to Manage File Transfers

Use the **Management Card** menu's `File Transfer` option to control file transfers.



Use	To Do this
`1- Settings`	Define the file name.
`2- XMODEM`	Perform the transfer serially via XMODEM (not available via Telnet).
`3- TFTP Client`	Perform file transfer via TFTP
`4- FTP Client`	Perform file transfer via FTP

How to Control File Transfer Settings

You use the **File Transfer** menu's `1- Settings` option to define the name of the file to be transferred. The name of the file to be transferred may include path information.

```
------- Settings ------------------------------------------------------------

        The result of the last file transfer is : Valid Code Image

     1- Filename       : Unknown
     2- Accept Changes :

     ?- Help
 <ENTER> Redisplay Menu
   <ESC> Return To Previous Menu

 > _
```

How to Affect the Management Card's Operation

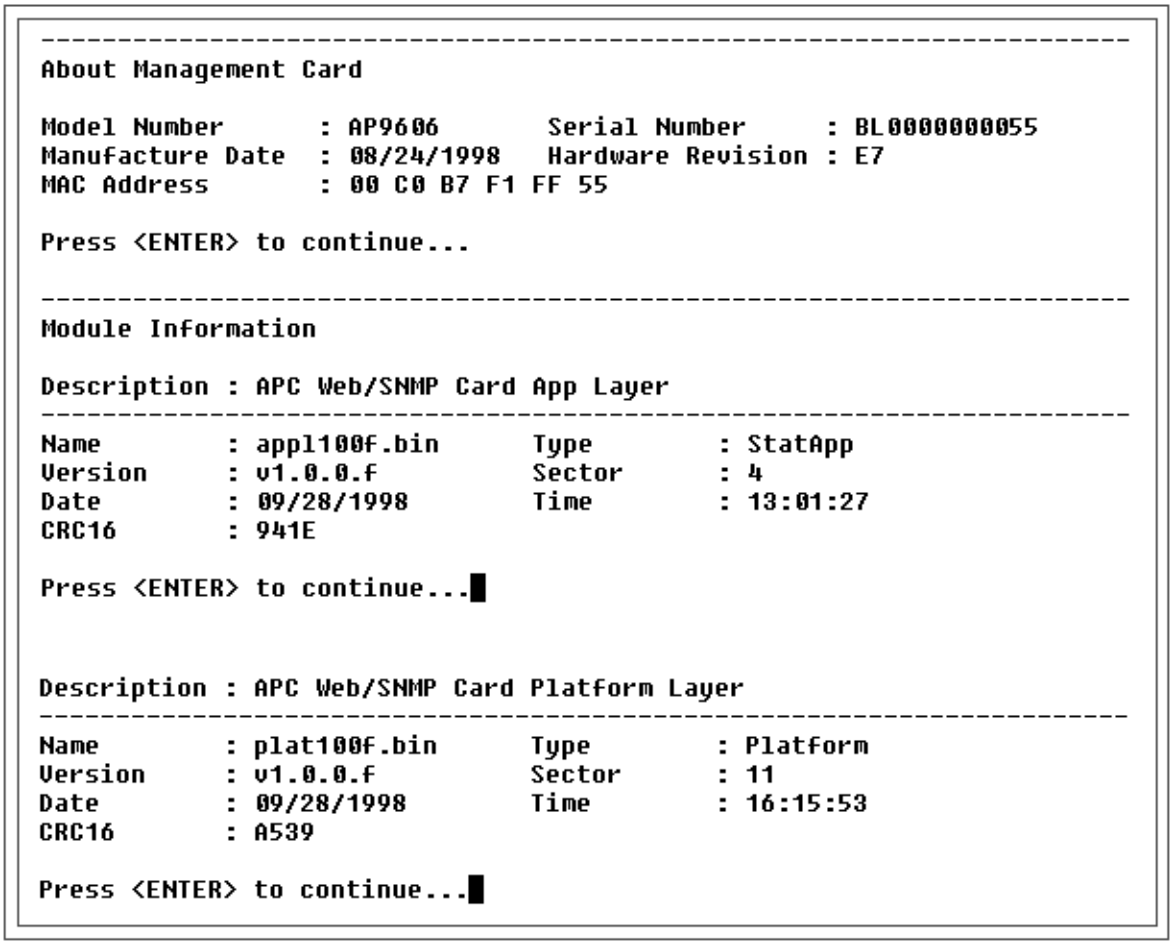
You use the **Management Card** menu's `Tools` option to affect the Managment Card and its SNMP agent.

```
------- Tools ---------------------------------------------------------------

     1- Reboot Card
     2- Reset Card To Defaults
     3- Reset Card to Defaults Except TCP/IP

     ?- Help
<ENTER> Redisplay Menu
  <ESC> Return To Previous Menu

> _
```

Use	To Do This
`1- Reboot Card`	Reinitialize the Management Card's operation.
`2- Reset Card to Defaults`	Change Control Console values to the values currently stored in the Management Card's EEPROM.
`3- Reset Card to Defaults Except TCP/IP`	Change Control Console values to the values currently stored in the Management Card's EEPROM, except for the values designated for TCP/IP.

How to View the Management Card's Identification Values

Use the **Management Card** menu's `About Management Card` option to view Management Card identification values.



Chapter 9:

File Transfers (Firmware and Configuration Files)

Overview

The Management Card automatically recognizes two types of binary files: firmware and configuration. Both types of files contain a header and one or more CRCs (Cyclical Redundancy Checks) to ensure that the data contained in the files is not corrupted before or during the transfer operation.

When new firmware is transmitted to the Management Card, the program code is updated and new features become available. When a configuration file is transmitted to the Management Card, the configuration settings are updated accordingly. If any other type of file is transmitted to the Management Card it will be ignored.

There are several ways to transfer firmware and configuration files to the Management Card. The following sections describe the different options available for transferring files to the Management Card: **Upgrading the Management Card's Firmware** and **Updating the Management Card's Configuration Settings**.

Upgrading the Management Card's Firmware

What is Firmware?

Broadly defined, firmware is highly specialized, reliable software that runs on non-PC type computers. It is the firmware that allows the Management Card to perform useful work, like managing UPSs.

What are the Benefits of Upgrading the Firmware?

Upgrading the firmware on the Management Card has several benefits. First, new firmware will have the latest bug fixes and performance improvements. Second, any new features that have been added will become available for immediate use. Third, keeping the firmware versions consistent across your network simplifies the management task, since all of the Management Cards will support the same features in the same manner.

Where Do I Get the Latest Firmware?

To get the latest firmware contact APC Technical Support. The firmware upgrade consists of two files: the platform module and the application module. The platform module contains the OS and network stack. The application module provides the Management Card with several user interfaces and the ability to speak to UPSs and other accessories.

How Much Does New Firmware Cost?

Depending on the type of upgrade, there may be a charge. Contact APC Technical Support for details.

What Should I Know Before I Start the Firmware Upgrade?

Before you start a firmware upgrade, it is important that you understand some basic terminology, as well as the steps required. Once you do, it should take less than one minute to upgrade the firmware on a Management Card.

A firmware upgrade consists of two files; one of the files is the platform module, and the other is the application module.

The platform module contains the OS and network stack. The platform module file name has the following format:

```
plat101.bin

plat indicates that this is a platform module.
101 indicates that the version is v1.0.1.
bin indicates that this is a binary file.
```

The application module provides the Management Card with several user interfaces and the ability to communicate with UPSs and other accessories. The application module file name will have the following format:

```
appl101.bin

appl indicates that this is an application module.
101 indicates that the version is v1.0.1.
bin indicates that this is a binary file.
```

The platform module must be transmitted to the Management Card first. Once the new platform module has been successfully transferred, the application module must be transmitted to the Management Card. Refer to the section, HOW TO UPGRADE THE FIRMWARE, for detailed instructions on how to transfer both modules to the Management Card.

How to Upgrade the Firmware

There are several methods to upgrade the Management Card's firmware. These methods are listed in order of simplicity.

Upgrading Using the Web/SNMP Management Card Wizard

Upgrading Multiple Management Cards That are Available on the Network

See the *Using the Wizard to Upgrade Frimware* in *Chapter 10 Web/SNMP Management Card Wizard* for detailed instructions.

Upgrading a Management Card That is Not Available on the Network.

If the Management Card is not available on the network and you prefer to upgrade the firmware locally via XMODEM, refer to the section, UPGRADING USING XMODEM.

Upgrading Using a Command Prompt FTP Client

Upgrading a Single Management Card That is Available on the Network

1. To perform an upgrade with this method, the Management Card must have been previously configured with a System IP, Subnet Mask, and Default Gateway and attached to the network. In addition, FTP Server must be enabled.
2. Open an MS-DOS command prompt window on a PC that is connected to the network. Change to the directory that contains the firmware upgrade files. The commands that need to be entered are shown in **bold**.

```
C:\>cd\apc
C:\apc>dir

 Volume in drive C has no label
 Volume Serial Number is 405F-1BD2
 Directory of C:\apc

.              <DIR>        10-08-98  4:59p .
..             <DIR>        10-08-98  4:59p ..
PLAT101 BIN       327,680  10-08-98  1:02p plat101.bin
APPL101 BIN       458,752  10-07-98  4:39p appl101.bin
         2 file(s)        786,432 bytes
         2 dir(s)     763,691,008 bytes free

C:\apc>
```

3. Open an FTP client session.

```
C:\apc> ftp
ftp>
```

4. Connect to the Management Card.
   a. If the Management Card's FTP Server Port is 21, the default, use the following command:

```
ftp> open 150.250.6.10
```

   b. If you have changed the Management Card's default FTP Server Port to a value other than 21, then use the following command:

```
ftp> open 150.250.6.10 21000
```

5. Log in using the Administrator User Name and Password. Your passwords may be different than the defaults, "apc" and "apc". Typically, the password will appear on the screen as ***.

```
Connected to 150.250.6.10.
220- APC FTP server ready.
220
User (150.250.6.10:(none)):apc
331 User name okay, need password.
Password:apc
230 User logged in, proceed.
ftp>
```

6. Upgrade the platform first. (The platform module is the file with the *plat* prefix.)

```
ftp> bin
200 Command okay.
ftp>
ftp> put plat101.bin
200 Command okay.
150 Opening data connection for plat101.bin
250 Requested file action okay, completed. Management Card
Rebooting....
327680 bytes sent in 5.99 seconds (54.70 Kbytes/sec)
ftp>
```

7. Close the FTP client session.

```
ftp>quit
C:\apc>
```

8. Wait about 20 seconds.
9. Repeat Steps 3 - 8 for the application module. In Step 6, use the application module file name (the one with the *appl* prefix) in place of the platform module file name.

Upgrading Multiple Management Cards That are Available on the Network

To upgrade multiple management cards using an FTP client, write a script which automatically performs the steps in the previous section.

Upgrading Using XMODEM

1. Connect serially to the Management Card.
   a. Connect the Management Card to an available serial port on the host computer using the supplied cable (PN: 940-0024C).
   b. If PowerChute is running, stop that service.
   c. Open a terminal session. Configure the terminal session to 2400bps, no parity, 8 data bits, 1 stop bit, and no flow control. If you are using HyperTerminal select `Call->Disconnect` and then `Call->Connect` to apply the changes to the serial port.
   d. Press the `<Enter>` key several times, until a User Name prompt appears. If you do not see the prompt, make sure that you have the proper cable and that the communication settings are correct.
2. Log into the Management Card.
   a. Enter the Administrator User Name and Password. The default for both is "apc". If you have changed the Administrator User Name and Password, use the new settings. The main Control Console menu will appear.
3. Start an XMODEM transfer.
   a. Select option `3 - System`.
   b. Select option `4 - File Transfer`.
   c. Select option `2 - XMODEM`.
   d. Enter "`YES`" at the prompt to continue with the transfer.
4. Select the appropriate baud rate. The higher the baud rate, the faster the firmware upgrades.
5. Change the terminal program's baud rate to match the one you selected in step 4. If you are using HyperTerminal select `Call->Disconnect` and then `Call->Connect` to apply changes made to the serial port. Press `<ENTER>` to continue.
6. From the terminal program's menu, select the binary platform file (the file with the *plat* prefix) to transfer via XMODEM-CRC.
7. After the XMODEM transfer is complete set the baud rate back to 2400. The Management Card will automatically reboot itself.

Note : Never remove the Management Card before it completes the reboot cycle or the card will be damaged. The reboot cycle is complete when the status LED turns off, then turns solid green or slowly flashes red after 20 seconds.

---

8. Repeat Steps 1 - 7 to install the application module. In Step 6, substitute the application module file name (the one with the *appl* prefix) for the platform module file name.

How Do I Know That the Firmware Upgrade Was Successful?

You can verify that the firmware upgrade was successful by looking at the Last Transfer Result message. This message is available in the Control Console and Web interface in the `System->File Transfer` menu and via SNMP using the `mfiletransferStatusLastTransferResult` OID.

Listed below are the possible Last Transfer Result codes.

Code	Description
Successful	The file transfer was successful.
Result not available	There are no recorded file transfers.
Failure unknown	The last file transfer failed for an unknown reason.
Server inaccessible	The TFTP or FTP server could not be found on the network.
Server access denied	The TFTP or FTP server denied access.
File not found	The TFTP or FTP server could not locate the requested file.
File type unknown	The file was downloaded but the contents were not recognized.
File corrupt	The file was downloaded but at least one CRC was bad.

Additionally, you can verify that the expected versions of the newly upgraded platform and application modules are displayed in the Web interface and Control Console `System->About Card` menu and via SNMP using the MIB II `sysDescr` OID.

Updating the Management Card's Configuration Settings

What are the Management Card's Configuration Settings?

The Management Card stores its configuration settings internally. These include TCP/IP, TFTP, FTP, Web, Measure-UPS, password, and system settings. Configuration settings do **not** include UPS settings.

There are several ways to edit the Management Card's configuration settings. One method is to log into either the Web interface or Control Console serially, or via Telnet. Any setting that can be edited can be changed in these interfaces. Another method is to perform Sets via SNMP. Only settings which have OIDs in the MIB defined as read-write can be edited.

What is a Configuration File?

A configuration file provides another way to alter the settings of a Management Card. A configuration file is a binary-encoded file that includes a header, multiple CRCs, and configuration data, and is not editable in a text editor, since such changes would cause the CRCs to be incorrect.

After transferring a configuration file to the Management Card, the Card will assume all of the new settings specified in the configuration file. A configuration file will have a *cfg* extension.

How Do I Create a Configuration File?

Configuration files can be created with the Web/SNMP Management Card Wizard. The Wizard operates under Windows 95, Windows 98, and NT 4.0. See *Chapter 10 Web/SNMP Management Card Wizard* for details on how to create a configuration file.

How Do I Transfer a Configuration File to a Management Card?

There are several ways to transfer a configuration file to a Management Card.

1. Specify the configuration file as the Bootup Filename in a BOOTP response.
2. Use the Web/SNMP Management Card Wizard (included on CD-ROM) to transfer the configuration file to one or more Management Cards.
3. Upload the configuration file to the Management Card using FTP.
4. Initiate a TFTP or FTP download of a configuration file via Web, Control Console, or SNMP.

Updating the Configuration Settings using a BOOTP Bootup Filename

1. Create a binary configuration file (.cfg extension). See *Chapter 10 Web/SNMP Management Card Wizard* for details.

2.. In the BOOTPTAB file of your BOOTP server, specify the Management Card's System IP, Subnet Mask, and Default Gateway. Specify the configuration file as the Bootup Filename. The Bootup Filename must be less than 33 characters, and may contain path information.

3. Install or reboot the Management Card, to initiate a BOOTP request. You can reboot the Management Card in the Control Console or Web Interface, under the `System->Tools` menu, or SNMP via the `mcontrolRestartAgent` OID. Alternatively, if you have physical access to the Management Card you may reboot it by pressing the white Reset button on the faceplate.

4. When the Management Card receives the BOOTP response it will assume the System IP, Subnet Mask, and Default Gateway. The Management Card will also automatically recognize that a configuration file has been specified in the Bootup Filename and will attempt to download that file.

   First, the Management Card will make a TFTP request for the Bootup Filename from the same IP address which supplied the BOOTP response. If a TFTP server is present on that computer, and the configuration file is in the appropriate directory then the Management Card will download the configuration file and assume all of the specified settings.

   If the TFTP request fails, the Management Card will make an FTP request for the Bootup Filename from the same computer that supplied the BOOTP response. The FTP request will use the FTP Client User Name and Password, previously configured in the Management Card, to log in to the FTP server. If the FTP server is present and the configuration file is in the appropriate directory, the Management Card will download the configuration file and assume all of that file's specified settings.

5. You can see whether the file transfer was successful by looking at the Web interface or Control Console `System->File Transfer` menu or SNMP via the `mfiletransferStatusLastTransferResult` OID.

Updating the Configuration Settings of One or More Management Cards Using the Web/SNMP Management Card Wizard

Note : Please Refer to Chapter 10 Web/SNMP Management Card Wizard for a detailed description of how to update the configuration settings of one or more Management Cards. The following steps describe only the general process of updating the configuration settings and do not address many of the available options.

1. Install (if necessary) and run the Web/SNMP Management Card Wizard (included on CD-ROM). Details about installing the Wizard are in Chapter 10 Web/SNMP Management Card Wizard.

2. If you have a previously saved *csv* file, load it, changing any settings as needed. Otherwise you can create new settings and save them.

3. Click `Finish`. Select the settings you want to transmit to the Management Card. Click `Next >` to continue.

4. You can view, print, and save your new settings. When finished click `Next >` to continue.

5. Choose the Network (via FTP) and click `Next >` to continue.

6. If you have previously saved a list of Management Card IP addresses, load that list now. Otherwise enter the IP addresses of the Management Cards to which you want to send the configuration settings. Enter the FTP Server Port, Administrator User Name and Password of the Management Cards to which you are transmitting the settings. Now you can save the new IP address list. Click `Next >` to continue.

7. Click `Apply` to transmit the configuration settings to all of the specified Management Cards. A window containing the download results that can be saved, printed, or cleared will be displayed.

Updating the Configuration Settings by Using an FTP Client

1. Create a configuration file by using the Web/SNMP Management Card Wizard (included on CD-ROM). See Chapter 10 Web/SNMP Management Card Wizard for Details.

2. Open an MS-DOS command prompt window on a PC that is connected to the network. Change to the directory containing the configuration file. The commands that need to be entered are shown in **bold**.

```
C:\>cd\apc
C:\apc>dir

 Volume in drive C has no label
 Volume Serial Number is 405F-1BD2
 Directory of C:\apc

.              <DIR>        10-08-98  4:59p .
..             <DIR>        10-08-98  4:59p ..
MYCONFIG CFG            146 10-08-98  1:02p myconfig.cfg
         1 file(s)            146 bytes
         2 dir(s)     763,691,008 bytes free

C:\apc>
```

3. Open an FTP client session.

```
C:\apc> ftp
ftp>
```

4. Connect to the Management Card.

   a. If the Management Card's FTP Server Port is 21, the default, use the following command:

```
ftp> open 150.250.6.10
```

   b. If you have changed the Management Card's default FTP Server Port to a value other than 21, use the following command:

```
ftp> open 150.250.6.10 21000
```

5. Log in using the Administrator User Name and Password. Your passwords may be different than the defaults of "apc", and typically will appear on the screen as ***.

```
Connected to 150.250.6.10.
220- APC FTP server ready.
220
User (150.250.6.10:(none)):apc
331 User name okay, need password.
Password:apc
230 User logged in, proceed.
ftp>
```

6. Upload the configuration file, identified by a *cfg* extension.

```
   ftp> bin
   200 Command okay.
   ftp>ftp> put myconfig.cfg
200 Command okay.
150 Opening data connection for myconfig.cfg
250 Requested file action okay, completed. Management Card
Rebooting....
146 bytes sent in 0.00 seconds (146000.00 Kbytes/sec)
ftp>
```

7. Close the FTP client session.

```
ftp>quit
C:\apc>
```

8. You can verify that the file transfer was successful by looking at the Web interface or Control Console `System->File Transfer` menu or SNMP via the `mfiletransferStatusLastTransferResult` OID.

Updating the Configuration Settings by Initiating a TFTP Download

1. Create a configuration file by using the Web/SNMP Management Card Wizard (included on CD-ROM). See Chapter 10 Web/SNMP Management Card Wizard for Details.
2. Configure the TFTP Remote Server IP to the address of the computer that is running the TFTP server.
   a. Web Interface

      Log in to the Web interface as the administrator, then access the `Network->TFTP/FTP` page. Configure the TFTP Client Remote Server IP to the address of the TFTP server.

   b. Control Console

      Log in to the Control Console as the administrator, then access the `Network->TFTP Client` menu. Configure the Remote Server IP to the address of the TFTP server.

   c. SNMP

      Set the `mfiletransferConfigTFTPServerAddress` OID to the address of the TFTP server.
3. Set the name of the configuration file.
   a. Web Interface

      Access the `System->File Transfer` page. Set the Filename to the name of the configuration file you want to download. The Filename may include path information if desired.

   b. Control Console

      Access the `System->File Transfer->Settings` menu. Set the Filename to the name of the configuration file you want to download. The Filename can include path information.

   c. SNMP

      Set the `mfiletransferConfigSettingsFilename` to the name of the configuration file you want to download. The Filename can include path information.
4. Initiate the TFTP download.
   a. Web Interface

      Access the `System->File Transfer` page. Select TFTP from the `Initiate File Transfer Via` drop down box. Click `Apply` to initiate the download.

   b. Control Console

      Access the `System->File Transfer->TFTP Client` menu. Enter "YES" to initiate the download.

   c. SNMP

      Set the `mfiletransferControlInitiateFileTransfer` OID to `initiatefFileTransferDownloadViaTFTP`.
5. You can see if the file transfer was successful by checking the Web interface or Control Console `System->File Transfer` menu or SNMP via the `mfiletransferStatusLastTransferResult` OID.

Updating the Configuration Settings by Initiating a FTP Download

1. Create a configuration file by using the Web/SNMP Management Card Wizard (included on CD-ROM). See Chapter 10 Web/SNMP Management Card Wizard for Details.
2. Configure the FTP Remote Server IP, User Name and Password.
   a. Web Interface

      Log in to the Web interface as the administrator, then access the `Network->TFTP/FTP` page. Configure the FTP Client Remote Server IP, User Name and Password to the address, user name and password of the FTP server.

   b. Control Console

      Log in to the Control Console as the administrator, then access the `Network->FTP Client` menu. Configure the Remote Server IP, User Name and Password to the address, user name and password of the FTP server.

   c. SNMP

      Set the `mfiletransferConfigFTPServerAddress`, `mfiletransferConfigFTPServerUser`, and `mfiletransferConfigFTPServerPassword` OIDs to the address, user name and password of the FTP server.
3. Set the name of the configuration file.
   a. Web Interface

      Access the `System->File Transfer` page. Set the Filename to the name of the configuration file you want to download. The Filename can include path information.

   b. Control Console

      Access the `System->File Transfer->Settings` menu. Set the Filename to the name of the configuration file you want to download. The Filename can include path information.

   c. SNMP

      Set the `mfiletransferConfigSettingsFilename` to the name of the configuration file you want to download. The Filename can include path information.

4. Initiate the FTP download.

   a. Web Interface

      Access the `System->File Transfer` page, then select FTP from the `Initiate File Transfer Via` drop down box. Click Apply to initiate the download.

   b. Control Console

      Access the `System->File Transfer->FTP Client` menu. Enter "YES" to initiate the download.

   c. SNMP

      Set the `mfiletransferControlInitiateFileTransfer` OID to `initiatefFileTransferDownloadViaFTP`.

5. You can see if the file transfer was successful by checking the Web interface or Control Console `System->File Transfer` menu or at SNMP via the `mfiletransferStatusLastTransferResult` OID.

How Do I Know That the Configuration File Transfer Was Successful?

You can verify that the configuration file transfer was successful by looking at the `Last Transfer Result` message. This message is available in the Control Console and Web interface in the `System->File Transfer` menu and via SNMP using the `mfiletransferStatusLastTransferResult` OID.

Listed below are the possible Last Transfer Result codes

Code	Description
Successful	The file transfer was successful.
Result not available	There are no recorded file transfers.
Failure unknown	The last file transfer failed for an unknown reason.
Server inaccessible	The TFTP or FTP server could not be found on the network.
Server access denied	The TFTP or FTP server denied access.
File not found	The TFTP or FTP server could not locate the requested file.
File type unknown	The file was downloaded but the contents were not recognized.
File corrupt	The file was downloaded but at least one CRC was bad.

Chapter 10:

Web/SNMP Management Card Wizard

Overview

The Web/SNMP Management Card Wizard, hereafter referred to as the Wizard, is a Windows application designed specifically to pre-configure, reconfigure, and upgrade multiple Web/SNMP Management Cards.

What Are the System Requirements for Running the Wizard?

The Wizard will run on Windows 95, Windows 98, and Windows NT 4.0 Intel-based workstations.

Where Can I Get an Updated Version of the Wizard?

Updated versions of the Wizard will be available as a free download from ftp:\\apccorp.apcc.com\apc\ts_public\Management Card\Wizard. Login as anonymous and supply your e-mail address. Updated Wizard software will be distributed without cost. However, access to some of the new features may require an upgrade to the Management Card's firmware for which there may be a charge. For details on how to upgrade the Management Card's firmware, see CHAPTER 9 FILE TRANSFERS.

What Management Card Settings Does the Wizard Allow Me to Configure?

Using the Wizard, all of the Management Card's settings, except URL names and links, can be configured locally (via the serial port) or remotely (over the network via FTP).

Does the v1.0.1 Version of the Wizard Have Any Limitations?

The main limitation of the Wizard is that you cannot configure any UPS settings either locally (via the serial port) or remotely (over the network via FTP).

How Do I Install the Wizard?

If you have enabled autorun for your CD-ROM drive the installation program will start automatically when the Utility CD is inserted. Otherwise run the `setup.exe` installation program found in the Wizard directory, then follow the on-screen instructions.

How Do I Run the Wizard?

During installation, a shortcut link is created in the Start menu. Use this link to launch the Wizard application.

How Can I Quickly Configure Only the Required Settings?

You can quickly configure only the required settings using the Wizard. See *Using the Wizard to Configure Only the Required Settings* for instructions.

How Can I Pre-configure Multiple Management Cards Before They are Deployed?

How you pre-configure multiple Management Cards before they are deployed depends on your organization's deployment strategy. The following describes the different ways to proceed:

1. Using the Wizard, you can pre-configure all of the Management Card's settings, or just the TCP/IP settings, locally (via the serial port) and then deploy them. See *Using the Wizard to Pre-configure the Management Card Locally* for instructions.
2. Deploy your Management Cards without any pre-configuration and let a BOOTP server assign the TCP/IP settings (System IP, Subnet Mask, and Default Gateway). Use the Wizard to reconfigure any of the Management Card's settings remotely (over the Network via FTP). See *How Can I Reconfigure Multiple Management Cards After They are Deployed?* for details.
3. Deploy your Management Cards without any pre-configuration and let a BOOTP server assign the TCP/IP settings (System IP, Subnet Mask, and Default Gateway) *and* specify a configuration file (.cfg extension). The Management Card will assume all settings specified in the configuration file. Configuration files are created using the Wizard. See *Using the Wizard to Create a Configuration File for BOOTP* for instructions.

How Can I Reconfigure Multiple Management Cards After They are Deployed?

How you reconfigure multiple Management Cards after they are deployed depends on your organization's preferences. The following describes the different ways to proceed.

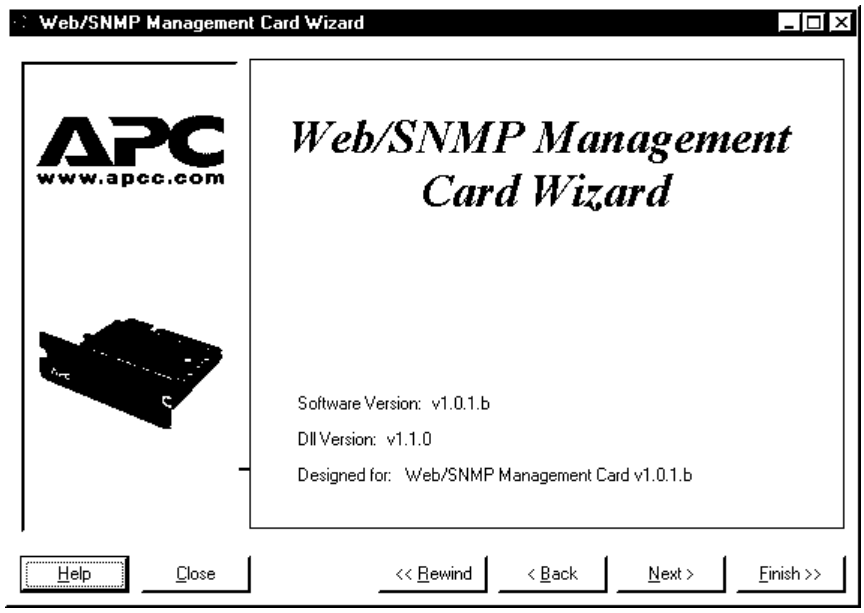
1. Use the Wizard to reconfigure any of the Management Card's settings remotely (over the network via FTP). See *Using the Wizard to Reconfigure Deployed Management Cards* for instructions.
2. Create a configuration file (.cfg extension) with the Wizard, then transmit it to the Management Card. See *Using the Wizard to Create a Configuration File* for instructions.

How Can I Upgrade Firmware?

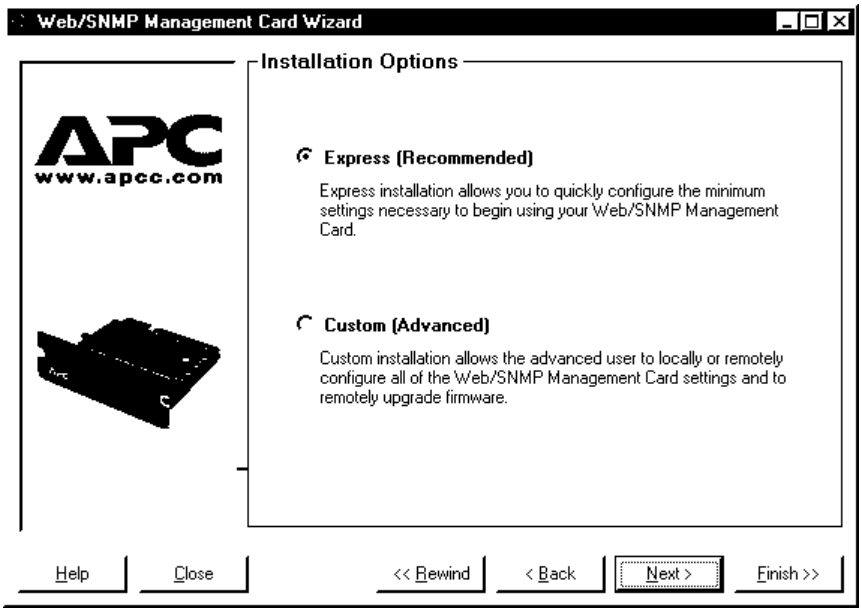
You can easiily upgrade the firmware of many Management Cards simultaneously using the Wizard. See *Using the Wizard to Upgrade Firmware* for instructions.

Using the Wizard to Configure Only the Required Settings

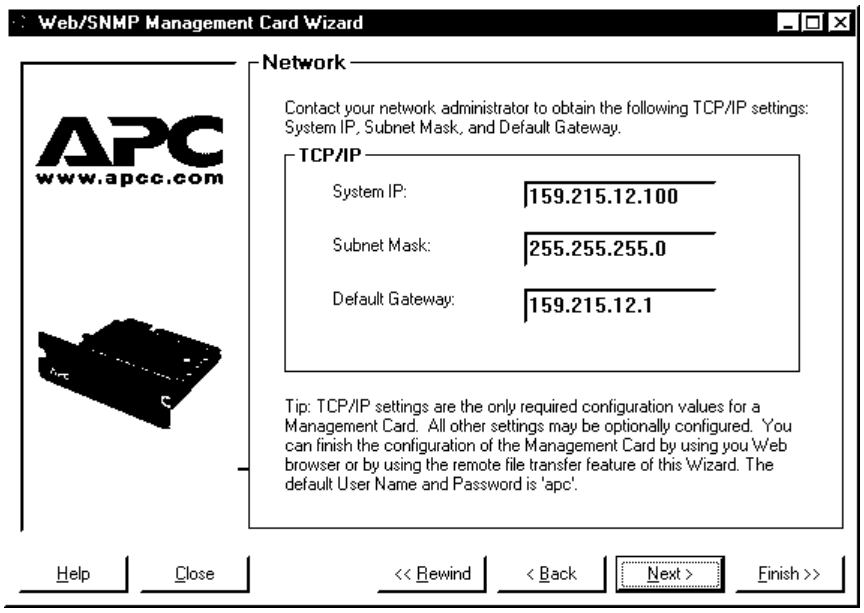
1. Use the link in the Start menu to launch the Wizard application.
2. The main screen displays the software version of the Wizard. Click Next > to continue.



3. Select the `Express (Recommended)` option. `Click Next > to continue.`

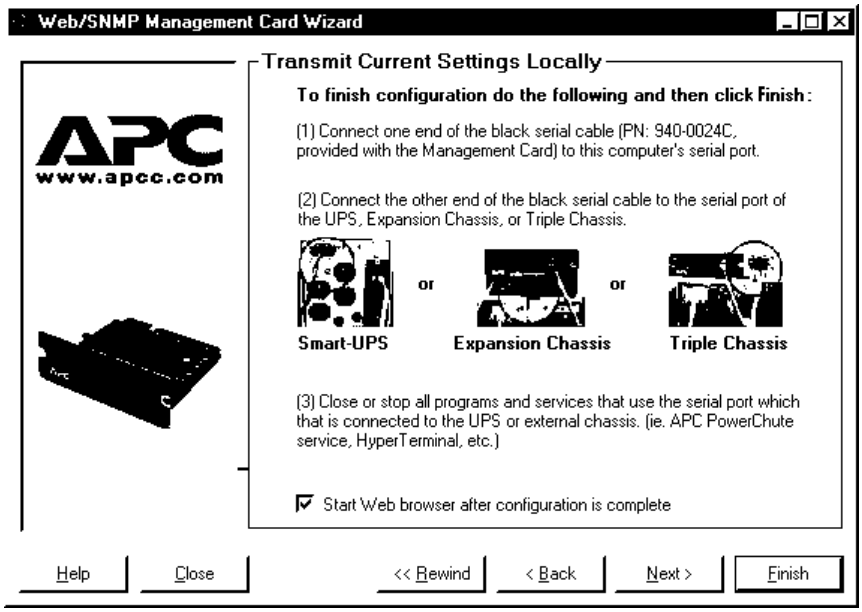


4. At a minimum, you must configure the TCP/IP settings (System IP, Subnet Mask, Default Gateway). Please contact your network administrator to obtain valid TCP/IP settings. As long as the Management Card's TCP/IP settings are configured before deployment, the Management Card can be reconfigured remotely at a later time.



5. Follow the on-screen instructions. For detailed instructions on how to install the Management Card, see the Web/SNMP Management Card Installation Guide (insguide.pdf on the CD-ROM).

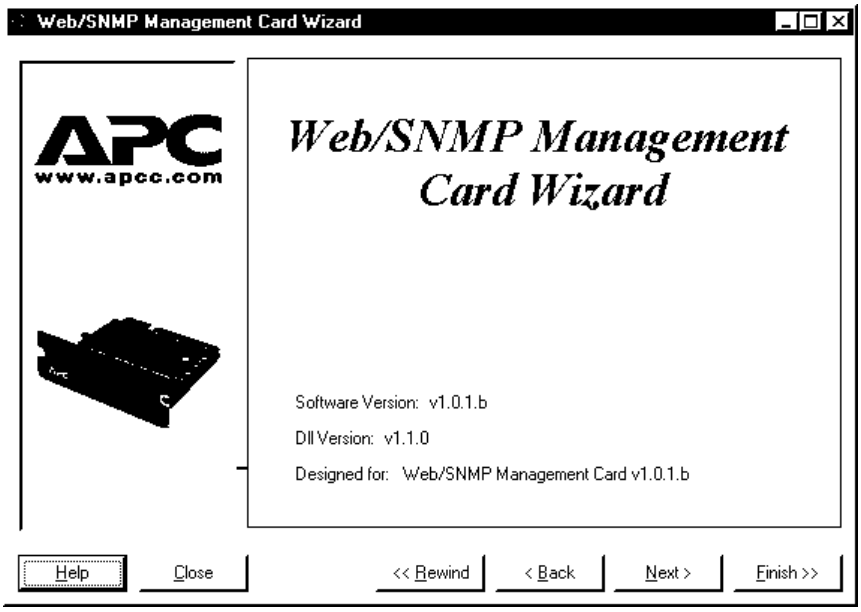
Click Finish to transmit the new settings to the Management Card. You will be prompted when the transmission is complete or if there was a communications failure.



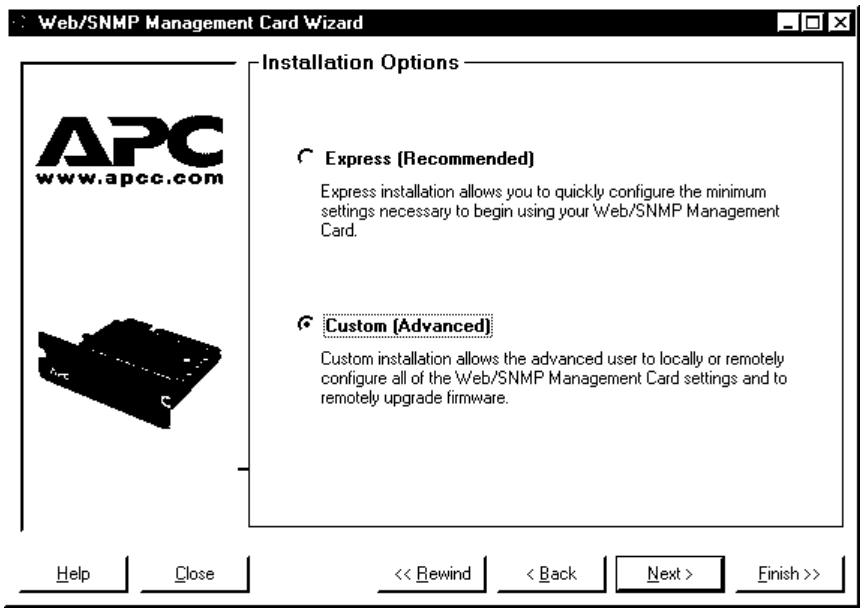
Using the Wizard to Pre-configure the Management Card Locally

1. Use the link in the Start menu to launch the Wizard application.

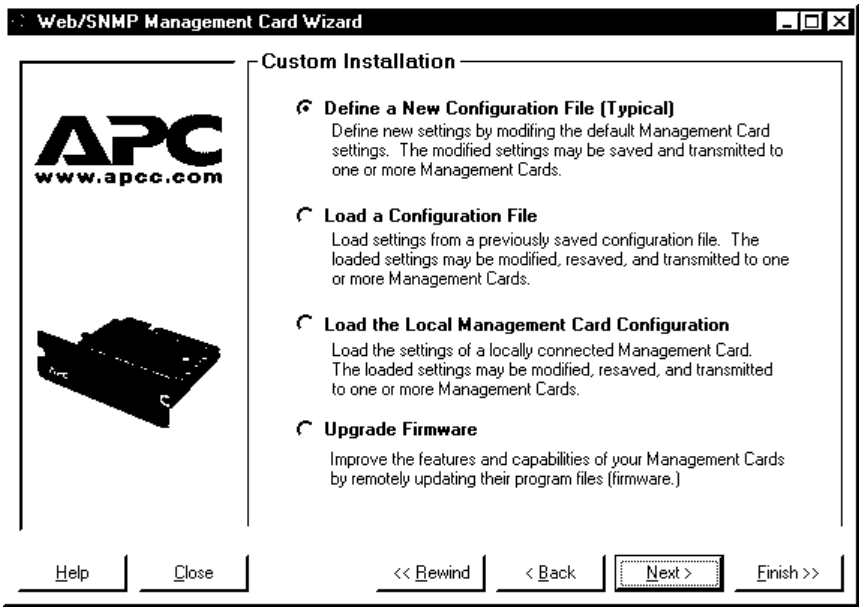
2. The main screen displays the software version of the Wizard. Click Next > to continue.



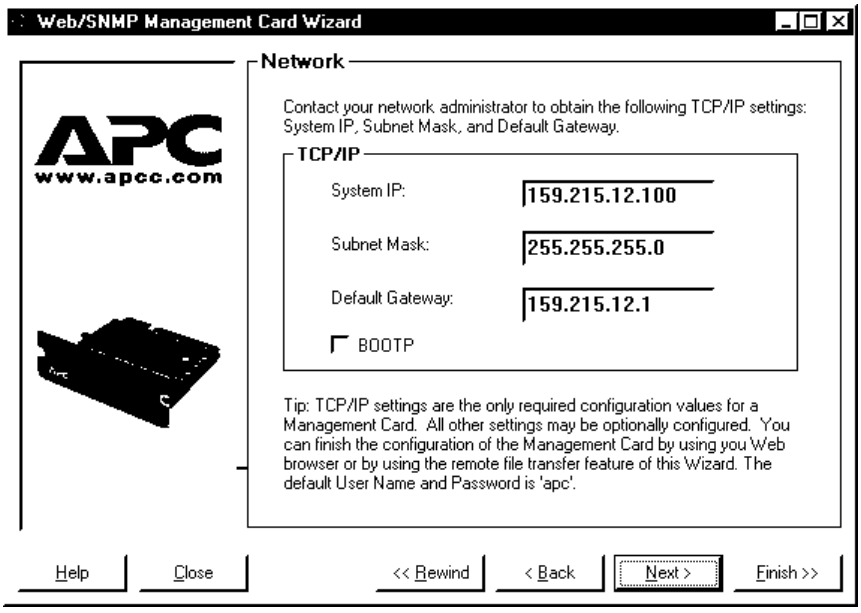
3. Select the `Custom (Advanced)` option. `Click Next > to continue.`



4. Select the `Define a New Configuration File (Typical)` option. `Click Next > to continue.`



5. At a minimum, you must configure the TCP/IP settings (System IP, Subnet Mask, Default Gateway, and BOOTP). As long as the Management Card's TCP/IP settings are configured before deployment, the Management Card can be reconfigured remotely at a later time.

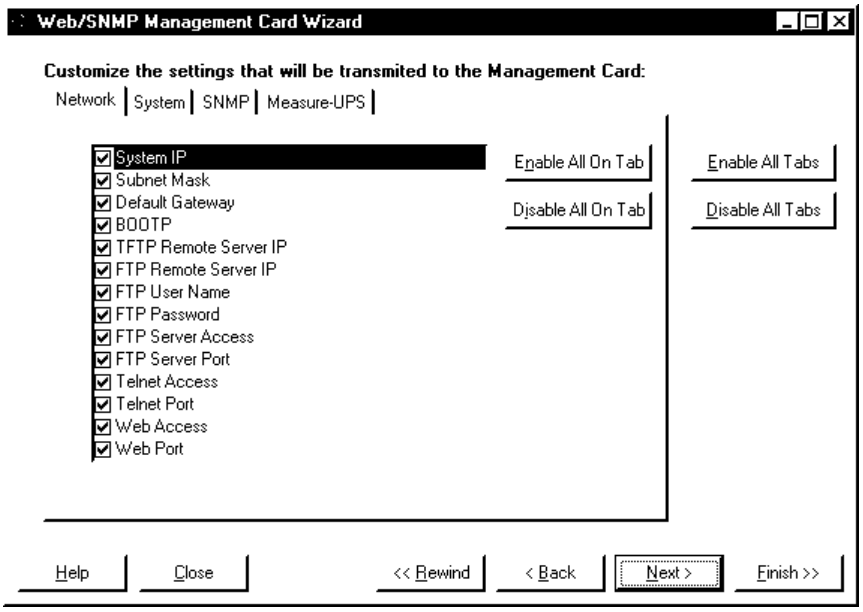


Note: If you intend to use the Management Card Wizard to reconfigure Management Cards after deployment then do NOT disable FTP Server Access.

Click Next > to continue through the Management Card's various settings. Any settings that you do not want to configure should be left alone.

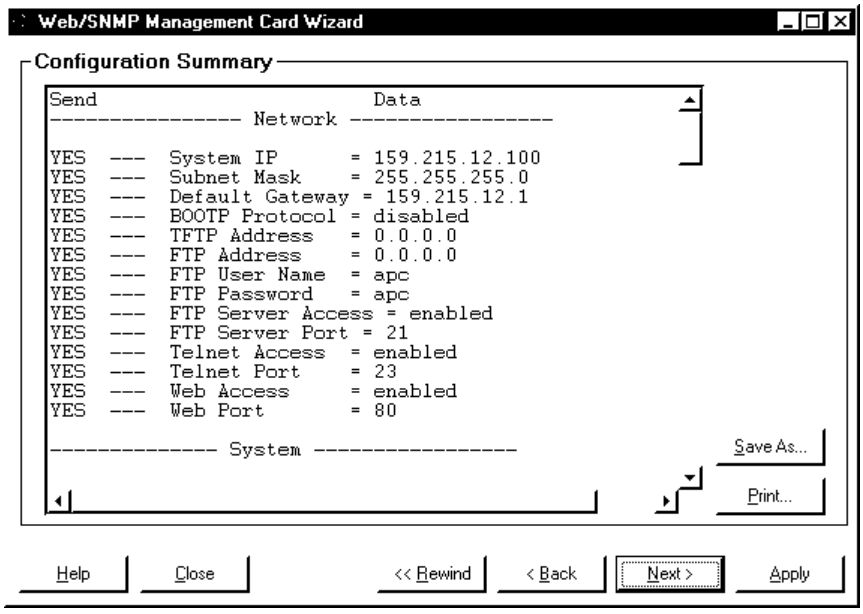
6. When you reach the `Customize the settings that will be transmitted to the Management Card` screen, choose which settings to transmit to the Management Card. You should choose to transmit the TCP/IP settings (System IP, Subnet Mask, Default Gateway, and BOOTP), and only the options you wish to configure. This reduces the amount of time required to transmit the settings to the Management Card.

   Click Next > to continue.



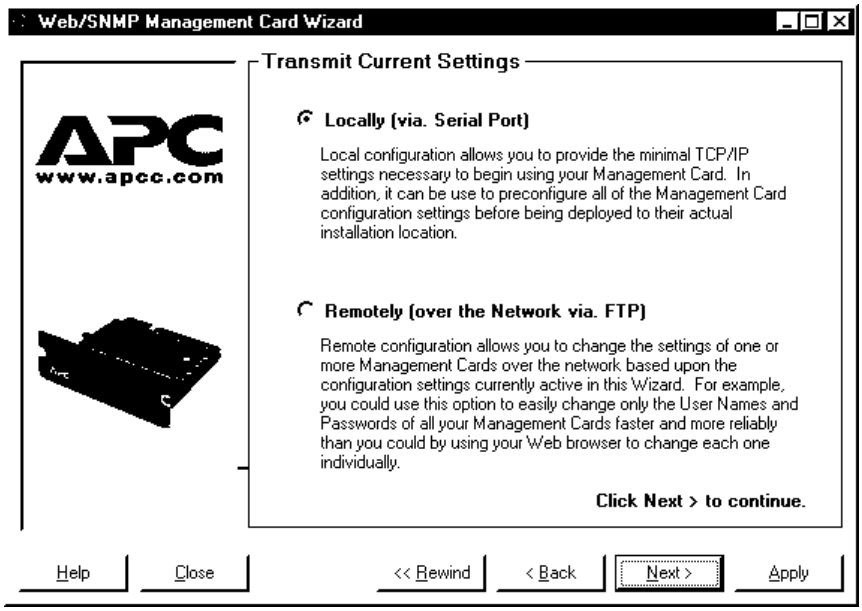
7. The Configuration Summary screen will be displayed. You can now verify the selections you have made, and Save and Print the summary text box by clicking the appropriate buttons. If you save these settings, you can load them into the Wizard at a later time.

   Click Next > to continue.



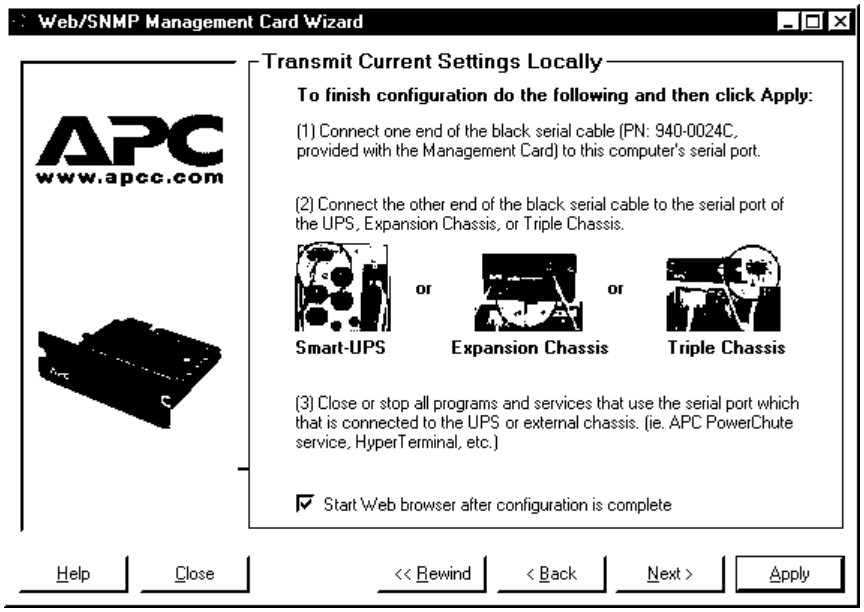
8. Select the Locally (via serial port) option.

   Click Next > to continue.



9. Follow the on-screen instructions. For detailed instructions on how to install the Management Card, see the Web/SNMP Management Card Installation Guide (insguide.pdf on the CD-ROM).

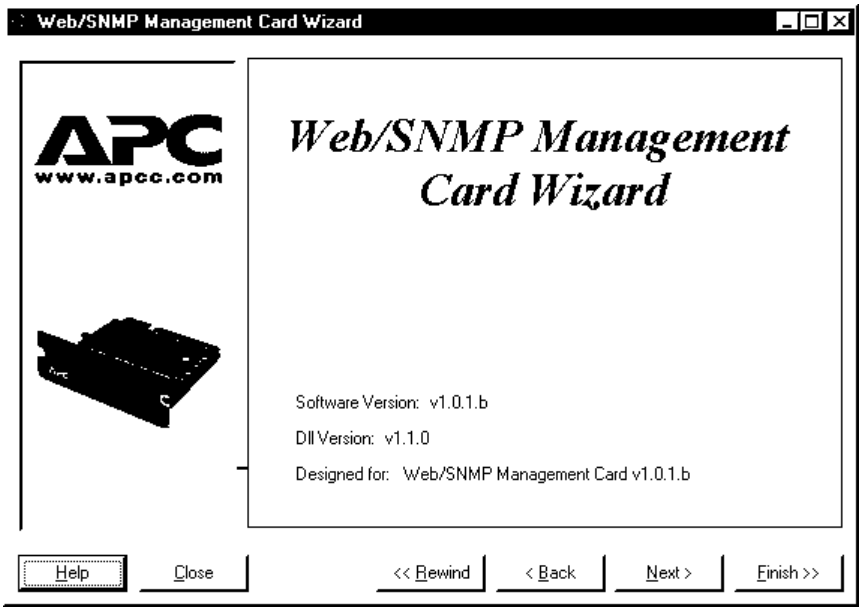
   Click Apply to transmit the new settings to the Management Card. You will be prompted when the transmission is complete or if there was a communications failure.



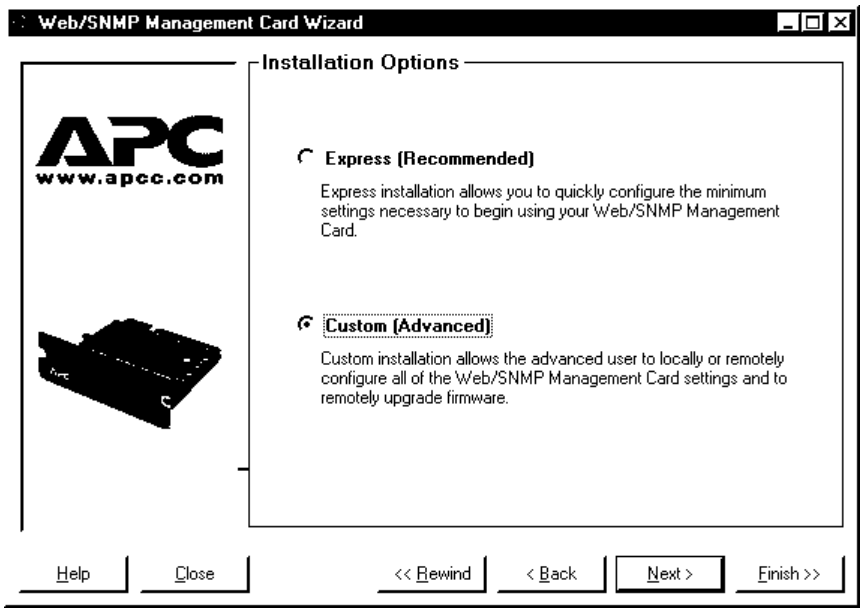
10. Click the Rewind button. Define the TCP/IP settings for the next Management Card that you want to configure.

Using the Wizard to Create a Configuration File for BOOTP

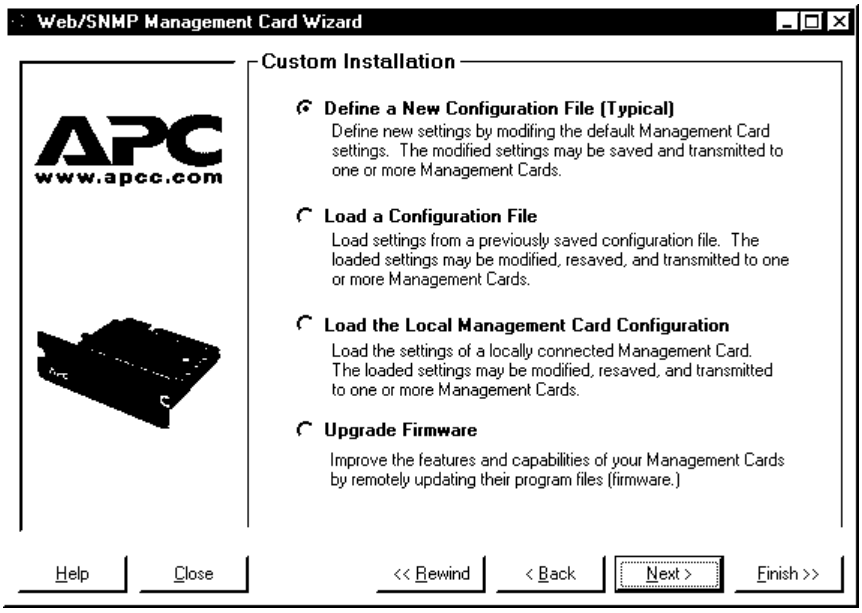
1. Use the link in the Start menu to launch the Wizard application.
2. The main screen displays the software version of the Wizard.
3. Click Next > to continue.



4. Select the `Custom (Advanced)` option. `Click Next > to continue.`



5. Select the `Define a New Configuration File (Typical)` option. `Click Next > to continue.`



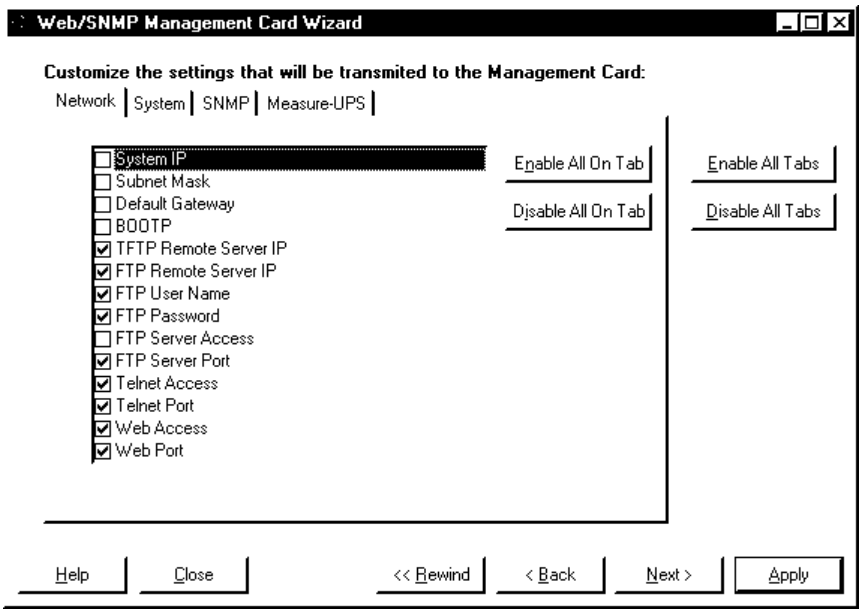
6. Generally, when using a configuration file in conjunction with BOOTP, the configuration file will contain only settings that are generic across multiple Management Cards.

Note: If you intend to use the Management Card Wizard to reconfigure Management Cards after they are deployed, then do NOT disable FTP Server Access.

Click Next > to continue through the Management Card's various settings. Any settings that you do not want to configure should be left alone.

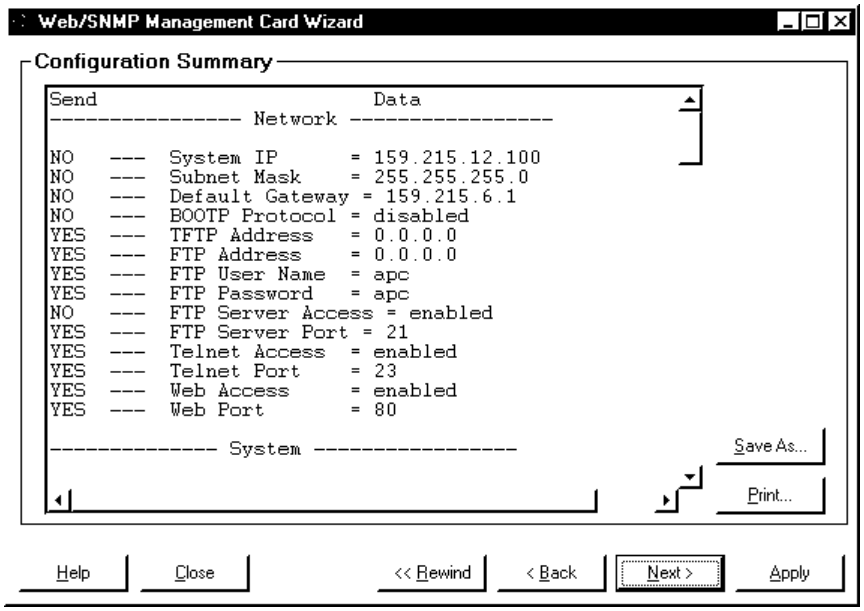
7. When you reach the *Customize the settings that will be transmitted to the Management Card* screen, choose the settings you want to transmit to the Management Card. At a minimum, you should **deselect** the TCP/IP settings (System IP, Subnet Mask, Default Gateway, and BOOTP) since those settings are specified by the BOOTP server. It is also recommened that FTP Server Access be deselected.

Click Next > to continue.



8. The Configuration Summary screen will be displayed. You can now verify the selections you have made, and Print the summary text box by clicking the appropriate button.

   Save your settings. Saving automatically produces two files. One of the files is a text-editable configuration file (.csv extension) that can be reloaded into the Wizard, the other is a ***binary*** configuration file (.cfg extension). The binary configuration file contains only the settings that were selected in the *Customize the settings that will be transmitted to the Management Card* screen



9. In the BOOTPTAB file of your BOOTP server, specify the Management Card's System IP, Subnet Mask, and Default Gateway. Specify the ***binary*** configuration file(.cfg extension) that was saved in the previous step as the Bootup Filename, which may be up to 32 characters in length and may contain path information.

10. Install or reboot the Management Card to make a BOOTP request. You can reboot the Management Card in the Control Console or Web Interface using the System->Tools menu, or in SNMP via the mcontrolRestartAgent OID. Alternatively, if you have physical access to the Management Card itself, you can reboot it by pressing the white Reset button on the faceplate.

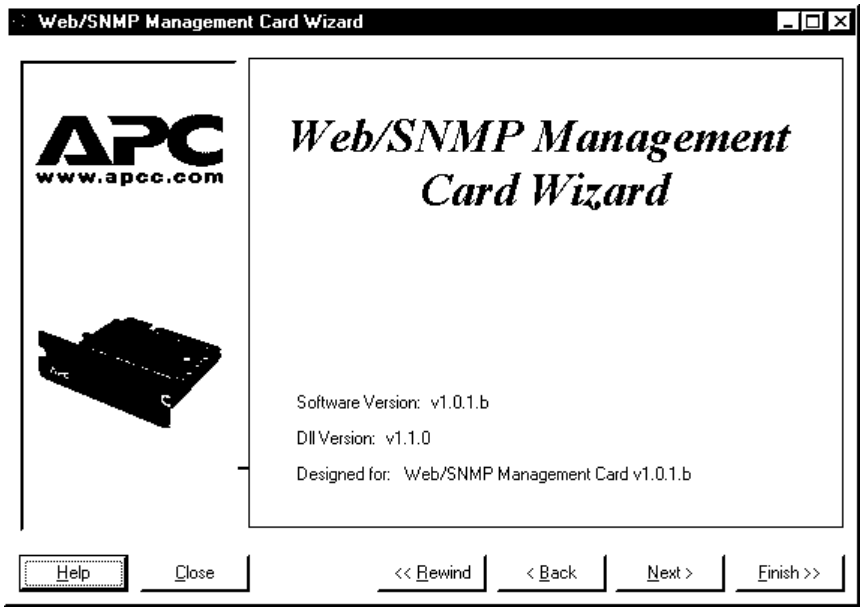
11. When the Management Card receives the BOOTP response, it will assume the System IP, Subnet Mask, and Default Gateway. The Management Card will also automatically recognize that a configuration file has been specified in the Bootup Filename and it will attempt to download that file.

    The Management Card will first make a TFTP request for the Bootup Filename from the same IP address that supplied the BOOTP response. If a TFTP server is present on that computer, and the configuration file is in the appropriate directory then the Management Card will download the configuration file and assume all of the specified settings.

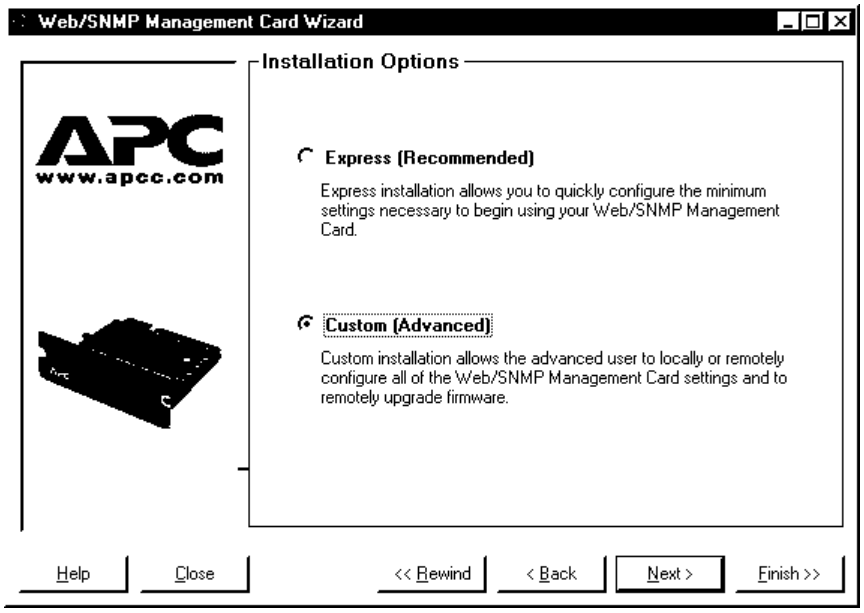
    If the TFTP request fails then the Management Card will make an FTP request for the Bootup Filename from the same computer which supplied the BOOTP response. The FTP request will use the FTP Client User Name and Password (defaults for both are apc) previously configured in the Management Card to login to the FTP server. If the FTP server is present and the configuration file is in the appropriate directory then the Management Card will download the configuration file and assume all of the specified settings.

Using the Wizard to Reconfigure Deployed Management Cards

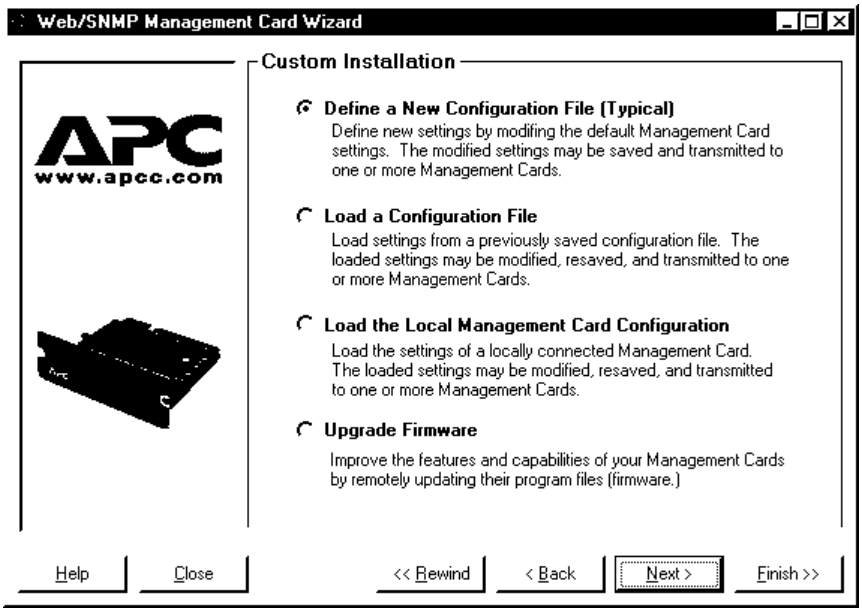
1. Use the link in the Start menu to launch the Wizard application.
2. The main screen displays the software version of the Wizard. Click Next > to continue.



3. Select the Custom (Advanced) option. Click Next > to continue.



4. Select the Define a New Configuration File (Typical) option. Click Next > to continue.

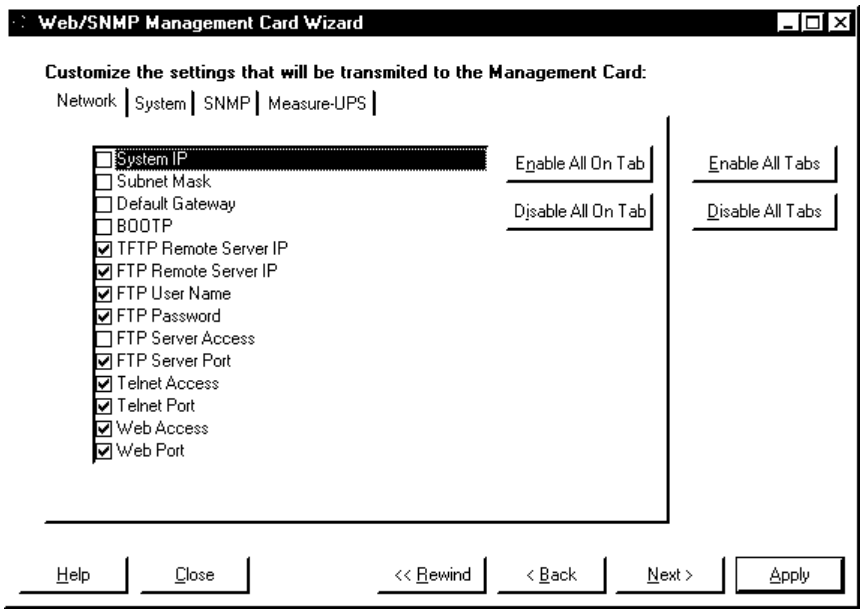


5. Click Next > to continue through the Management Card's various settings. Any settings that you do not want to reconfigure can be left alone.

Note: If you intend to use the Management Card Wizard to reconfigure Management Cards after deployment then do NOT disable FTP Server Access.

6. When you reach the *Customize the settings that will be transmitted to the Management Card* screen, select the settings you want to transmit to the deployed Management Cards. Typically, the TCP/IP (System IP, Subnet Mask, Default Gateway, and BOOTP) and FTP Server Access settings are not transmitted, so deselect them now. Finish selecting the options you want to reconfigure.

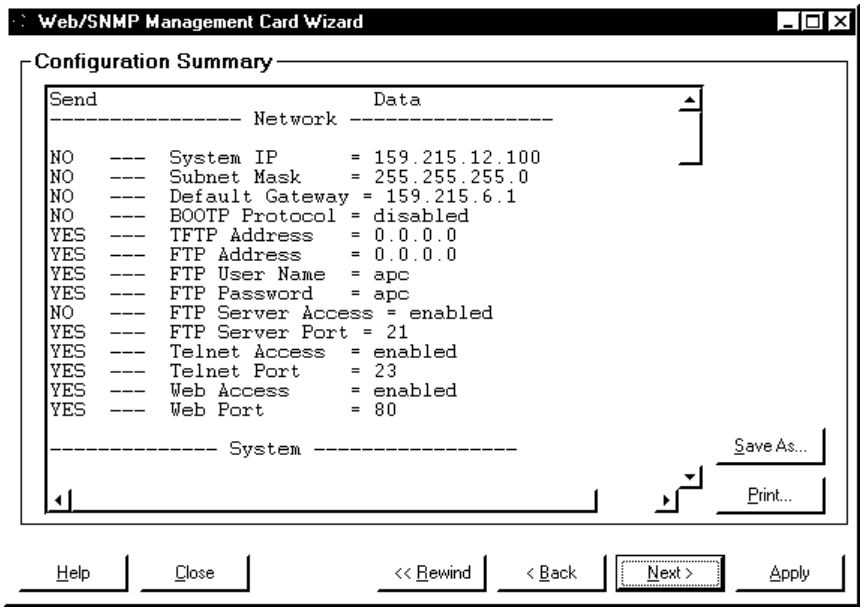
   Click Next > to continue.



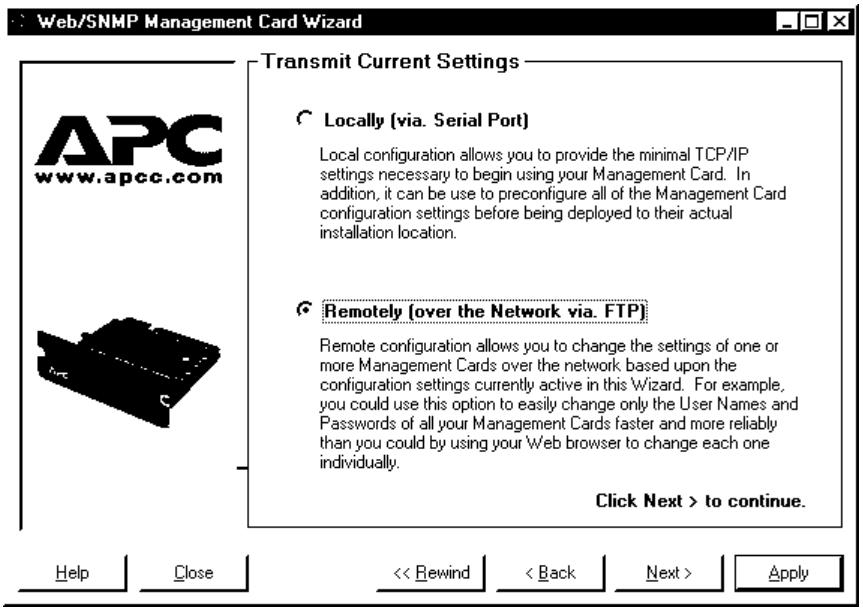
7. The Configuration Summary screen will be displayed. At this point, you can verify the selections you have made, and Save and Print the summary text box by clicking the appropriate buttons. If you save these settings, you can load them into the Wizard at a later time.

Note: Make sure that you have selected ONLY the settings that you want to reconfigure. You can inadvertently overwrite the deployed Management Card settings if you have not properly deselected the settings that you do NOT want to reconfigure. All settings that have a YES in the Send column of the Configuration Summary screen will be transmitted.

Click Next > to continue.



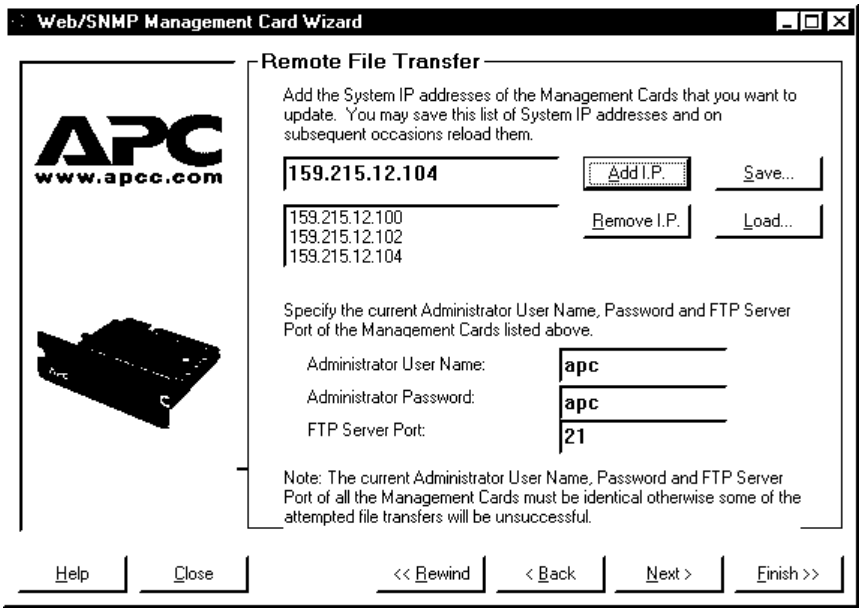
8. Select the Remotely (over network via FTP Server) option, then click Next > to continue.



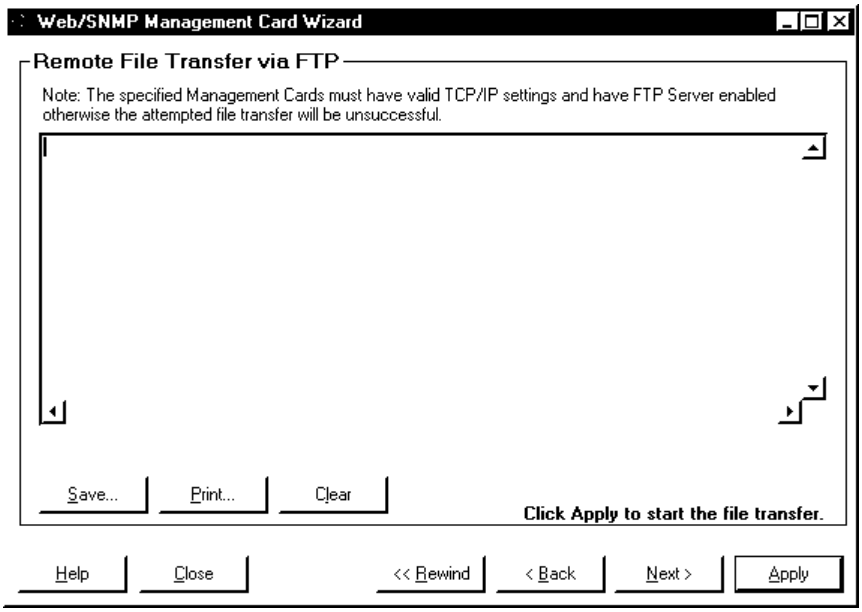
9. Add the IP addresses of the Management Cards that you want to reconfigure. If the deployed Management Cards have different settings for the Administrator User Name, Password, and FTP Server Port then change the values in the wizard to reflect those values.

   If you have previously saved a list of Management Card IP addresses then you can load them by clicking the Load… button.

   Click Next > to continue.

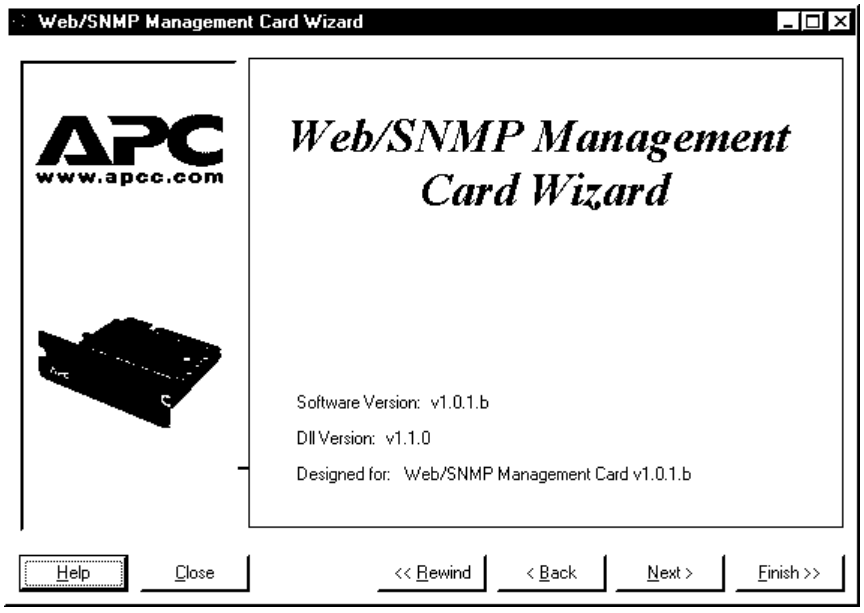


10. Click Apply to transmit the new settings to all of the Management Cards specified in the previous screen. After transmitting the settings to all of the Management Cards, a transmission log will be available. The log can be saved, printed, or cleared by clicking the appropriate button.

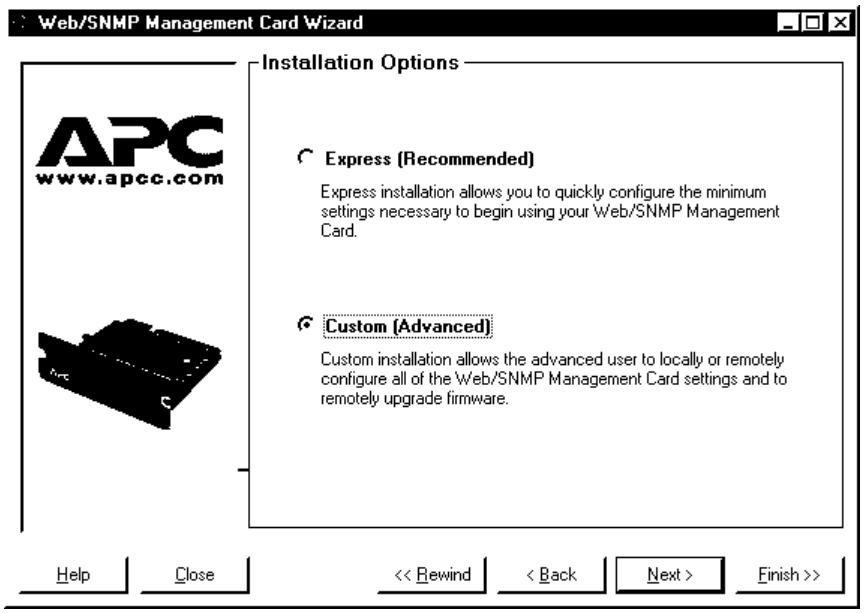


Using the Wizard to Create a Configuration File

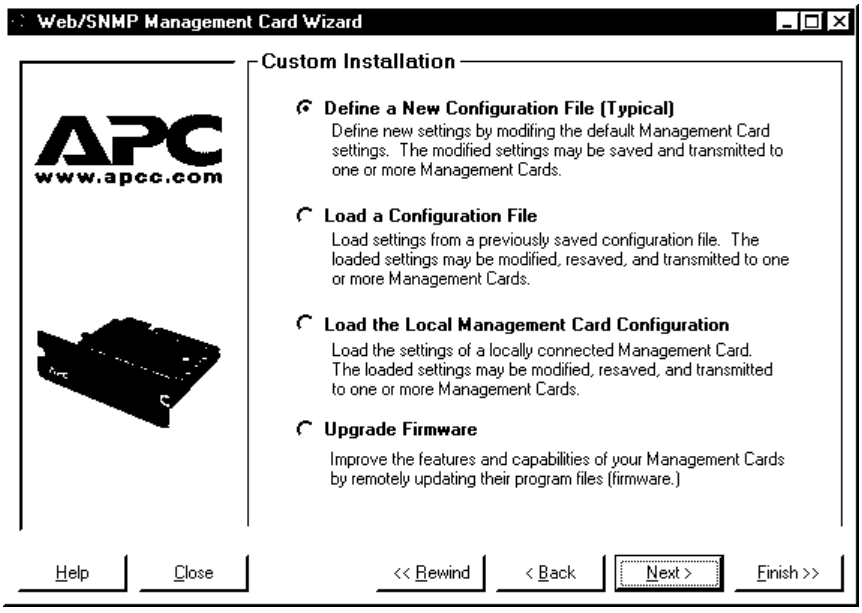
1. Use the link in the Start menu to launch the Wizard application.
2. The main screen displays the software version of the Wizard.
3. Click Next > to continue.



4. Select the `Custom (Advanced)` option. `Click Next > to continue.`



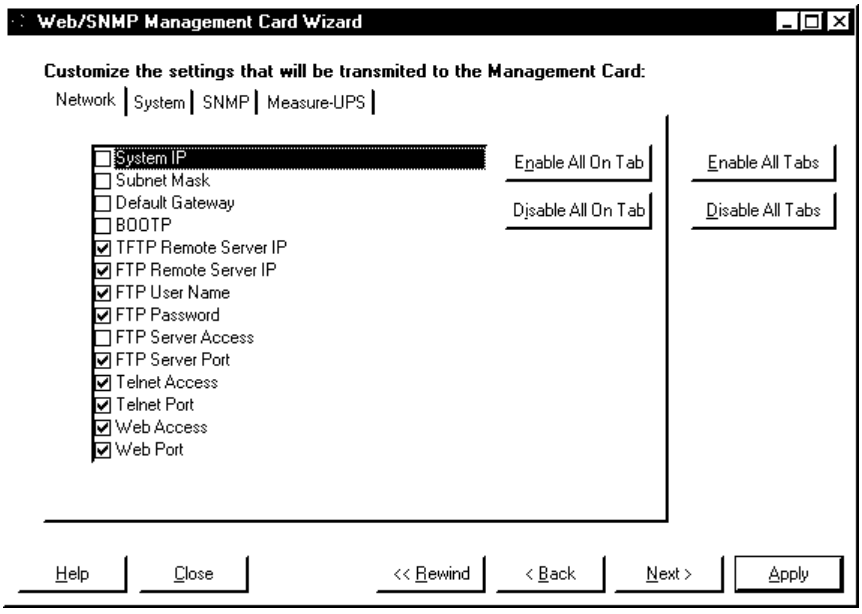
5. Select the `Define a New Configuration File (Typical)` option. `Click Next > to continue.`



6. Click Next > to continue through the Management Card's settings, ignoring any settings that you do not want to reconfigure.

Note: If you intend to use the Management Card Wizard to reconfigure Management Cards after deployment then do NOT disable FTP Server Access.

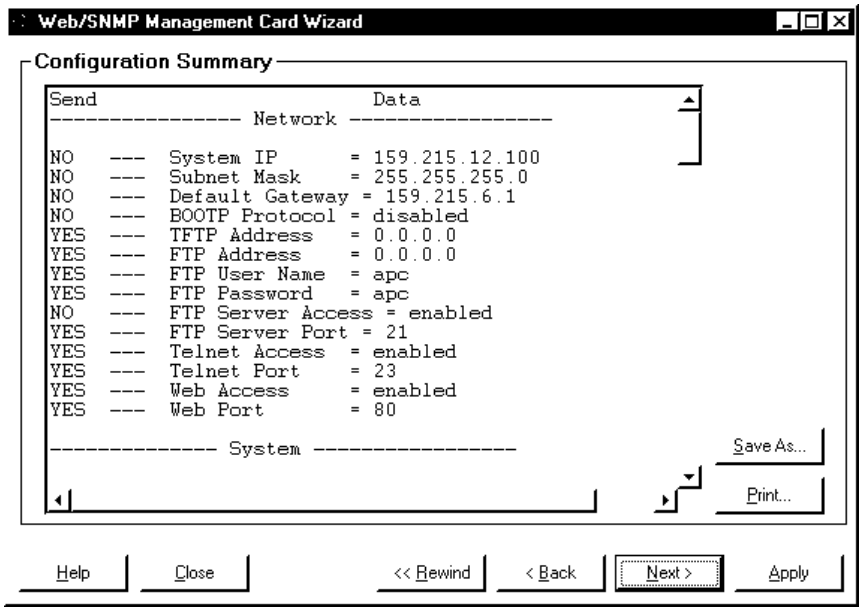
7. When you reach the *Customize the settings that will be transmitted to the Management Card* screen, choose which settings you want to transmit to the deployed Management Cards. Typically, the TCP/IP (System IP, Subnet Mask, Default Gateway, and BOOTP) and FTP Server Access settings are not transmitted, so deselect them now. Finish selecting only the options you want to reconfigure, then click Next > to continue.



8. The Configuration Summary screen will be displayed. At this point, you can verify the selections you have made, and Print the summary text box by clicking the appropriate button.

Note: Make sure that you have selected ONLY the settings that you want to reconfigure. You can inadvertently overwrite the deployed Management Card settings if you have not properly deselected the settings that you do NOT want to reconfigure. All settings that have a YES in the Send column of the Configuration Summary screen will be transmitted.

Save your settings, which will automatically produce two files. One of the files is a text-editable configuration file (.csv extension) that can be reloaded into the Wizard, the other is a ***binary*** configuration file (.cfg extension) that contains only the settings chosen in the *Customize the settings that will be transmitted to the Management Card* screen.



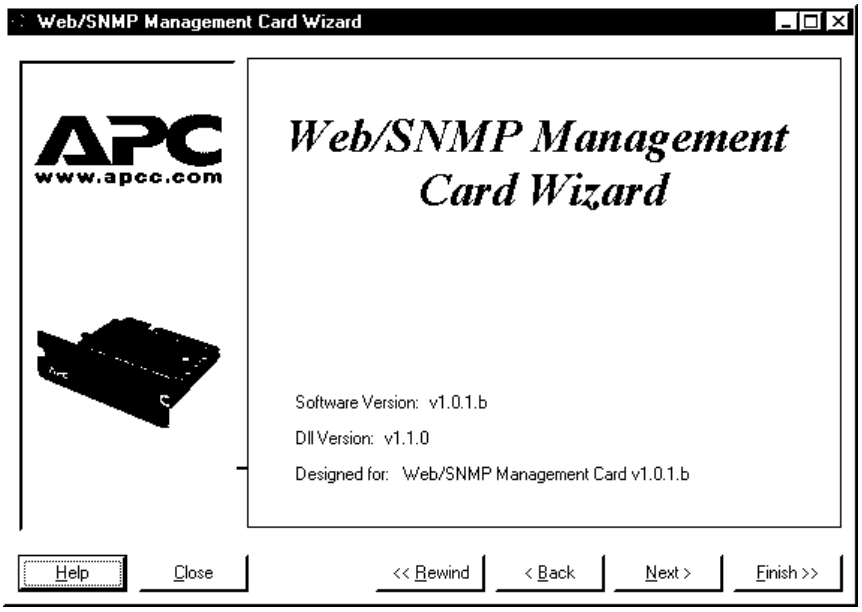
9. Transmit the ***binary*** configuration file (.cfg extension) to the Management Card. See *Chapter 9 File Transfers* for detailed explanations of the various file transfer options available.

Using the Wizard to Upgrade Firmware

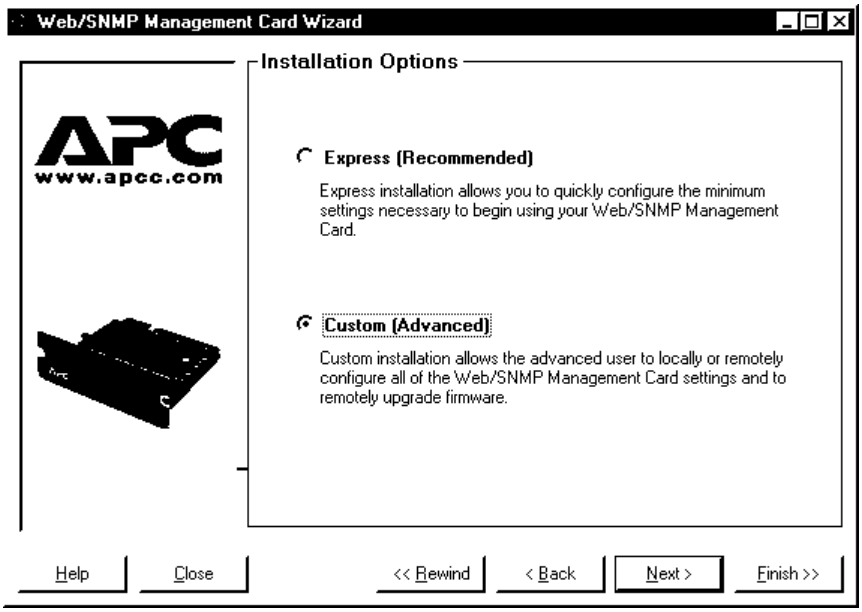
1. Make sure that the Management Cards that you want to upgrade have had their TCP/IP settings configured and that they are connected to the network.

1. Use the link in the Start menu to launch the Wizard application.

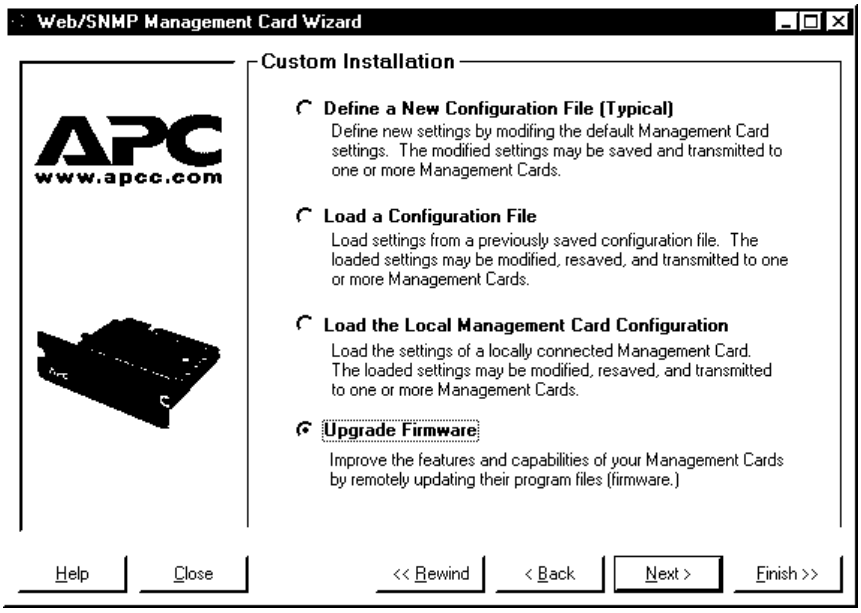
2. The main screen displays the software version of the Wizard. Click Next > to continue.



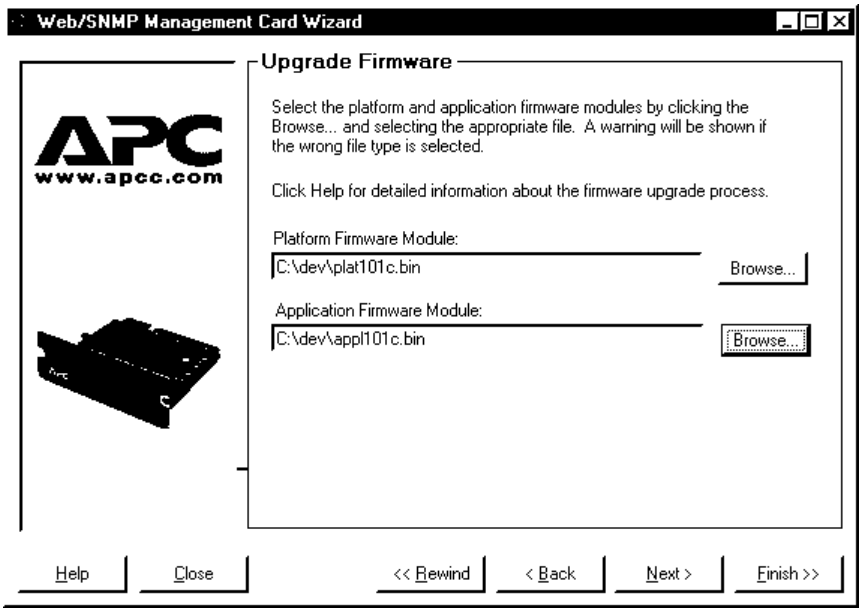
3. Select the `Custom (Advanced)` option. `Click Next > to continue.`



4. Select the `Upgrade Firmware` option. `Click Next > to continue.`



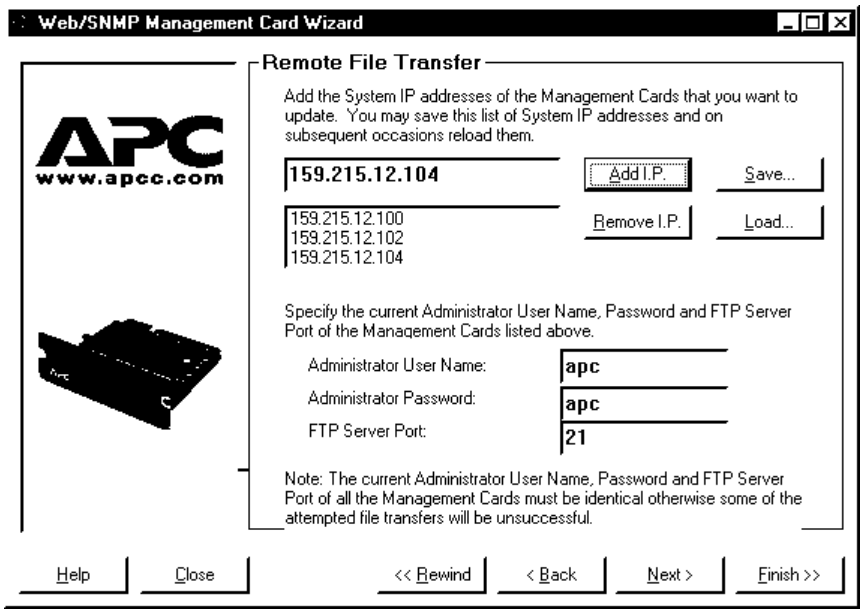
5. Press the Browse buttons for both the Platform and Application Firmware Modules. Select the appropriate file. If the wrong file type is selected a warning will be displayed. See **Chapter 9 File Transfers (Firmware and Configuration)** for details about how to obtain new firmware modules from APC.



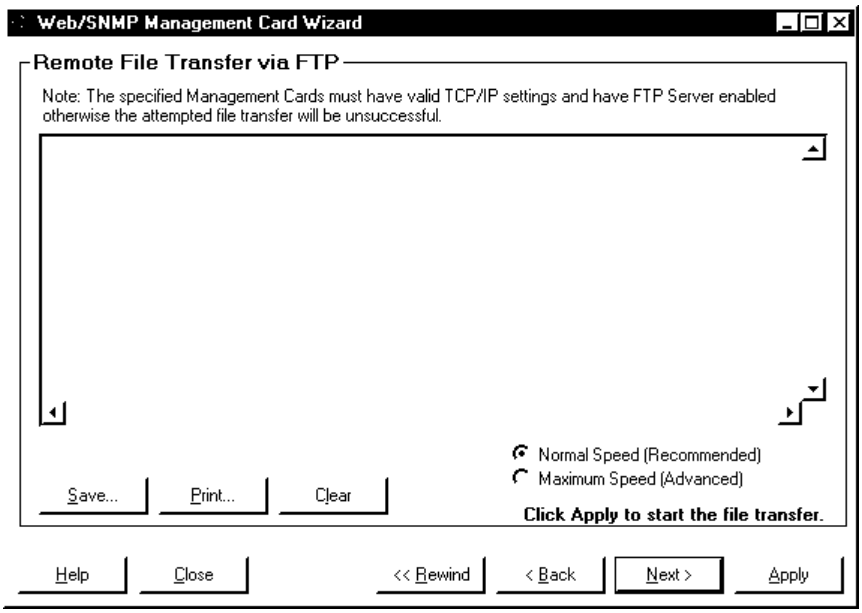
6. Add the IP addresses of the Management Cards that you want to upgrade. If the deployed Management Cards have different settings for the Administrator User Name, Password, and FTP Server Port then change the values in the wizard to reflect those values.

   If you have previously saved a list of Management Card IP addresses then you can load them by clicking the Load… button.

   Click Next > to continue.



7. Click Apply to transmit the new firmware to all of the Management Cards specified in the previous screen. After transmitting the firmware to all of the Management Cards, a transmission log will be available. The log can be saved, printed, or cleared by clicking the appropriate button.



Chapter 11:

Web/SNMP Management Card Security

Overview

The Web/SNMP Management Card provides several different security options, depending on the access interface used. Each of these individual elements is described below, and a summary table is given for each interface. In general, the security aspects of the Management Card should provide a reasonable level of access and authentication control. As a network device that passes information across the network, though, it is subject to the same exposure as other devices on the network. Protecting intranet networks that are connected to external networks (the Internet) with devices such as firewalls, is also an extremely important element in security.

Authentication versus Encryption

The Management Card does not currently use any type of encryption. This means that all the data and communication between the Management Card and any of the client interfaces, such as Telnet and the web server, is "readable" by capturing the network traffic going to and from the Management Card. For almost all applications this should not be a problem since sensitive data is not being transferred. The card does provide basic authentication via user names and passwords to control access as well as IP address verification. While these basic access modes are sufficient for most environments, the Management Card can also provide a greater level of security by enabling MD5 authentication for the web interface. For information on using MD5 see MD5 AUTHENTICATION.

User Names, Passwords and Community Names

The Administrator and Device Manager User user names and passwords are for logging into the Control Console and web interfaces. All user names, passwords and community names, for SNMP, are transferred over the network as plain-text. This means that someone capable of monitoring the network traffic can determine the user names and passwords required to access the Management Card. Any similar device with Telnet server, web server, or SNMPv1 agent will have the same constraints due to the limitations in the protocols themselves.

Port Assignments

It is possible to define the TCP ports that the Telnet, FTP and web servers utilize. These are initially set at the standard "well known port" for the particular protocol. To enable users to hide the interfaces, one can use arbitrary ports from 5000-65535. Once an interface uses a non-standard port, it is required to specify the port when using a client interface, such as a web browser. Hiding the servers provides a level of security in obscurity. In a sense, the non-standard ports are extra passwords.

MD5 Authentication

The web interface option for MD5 authentication enables a higher level of access security than provided by the basic http authentication scheme. The MD5 scheme is very similar to the the CHAP and PAP remote access protocols. When enabled, the web server will request a user name and a *password phrase* (distinct from the passwords). As opposed to the basic scheme, the user name and password phrase are not transmitted over the network. The small Java login applet combines the user name, password phrase and session-unique challenge number and calculates an MD5 hash number. This number is then returned to the server so that it can verify that the user has the correct login information. By passing back only the hash number, the login information is not revealed. In addition to the login authentication, each form post for configuration or control operations is also authenticated with a unique challenge and hash response. The scheme does not involve any encryption, so pages are transmitted in their plain-text form. In addition, after the authentication login, subsequent page access is restricted by IP address and a hidden session cookie. Since the MD5 authentication scheme is available only for the web interface, it is important to disable the less secure interfaces including Telnet, FTP and SNMP. For SNMP, it is possible to disable write access only so that read and trap facilities are still available.

The MD5 authentication scheme provides a much higher level of security than the plain-text type access methods. Sophisticated attackes are, however, almost impossible to prevent. Well-configured firewalls are an essential element in an overall security scheme.

Each of the interfaces and access methods is described below.

Interface	Security Access	Notes
Serial Control Console	- User name & password	Always enabled.
Telnet Control Console	- User name & password - Selectable server port - Server Enable/Disable	The user name and password are transmitted plain-text.
SNMP	- Community Name - NMS IP filters - Agent Enable/Disable - Four access communities with read/write/disable capability	IP filters only allow access from designated IP addresses.
FTP Server	- User name & password - Selectable server port - Server Enable/Disable	Administrator access only.
Web Server	- User name & password - Selectable server port - Server Enable/Disable - MD5 Authentication option	In basic HTTP authentication. mode, the user name and password are transmitted base-64 encoded (no encryption). In MD5, authentication mode uses user name and password phrase.

Chapter 12:

How to Correct Management Card Problems

This chapter describes how to correct problems that can occur with your Management Card. If you cannot isolate and correct a problem using this chapter, see the TECHNICAL SUPPORT section.

Web/SNMP Management Card-Related Common Problems and Solutions

Problem	Solution
Unable to ping the Management Card	Is the Management Card's Status LED green, indicating it is up and running its SNMP agent on the network? If yes, try to ping another node on the same network segment as the Management Card. If that fails, it is not a Management Card problem. If the Status LED is not green, or if the ping test succeeds, perform the following checks: - Verify that the Management Card is properly seated in the UPS or X-chassis. - Verify all network connections. - Verify IP addresses of the Management Card and the NMS, and make sure both are on the same network or sub-network. - Verify the default gateway (or router) IP address if the NMS is on a different physical network (or subnet) than the Management Card. - Verify the number of subnet bits for the Management Card's subnet mask.
Unable to perform a **GET**	- Verify the read (**GET**) community name. - Use the Management Card's Control Console to ensure that the NMS has access to the Management Card (see CHAPTER 8).
Unable to perform a **SET**	- Verify the read/write (**SET**) community name. - Use the Management Card's Control Console to ensure that the NMS has write (**SET**) access to the Management Card (see CHAPTER 8).
Unable to receive traps at the management station	- Query the PowerNet™ MIB **mconfigTrapReceiverTable** OID to see if the NMS IP address is listed correctly, and the community name defined for the NMS matches the community name in the table. If not, use **SETs** to the **mconfigTrapReceiverTable** OIDs, or the Management Card's Control Console to correct the trap receiver definition problem (see CHAPTER 8).
Traps received at NMS are not identified	- See your NMS-specific documentation to verify the traps are properly integrated in the NMS's alarm/trap database.
Frequent Comm Lost messages from PowerChute *plus* when using the passthrough feature	- See this chapter's separate section on CORRECTING COMMUNICATION LOST PROBLEMS.

Problem	Solution
Terminal program reports that it cannot allocate the comm port when you try to configure the Management Card	- You must shutdown PowerChute *plus* before you can use a terminal to configure the Management Card.
Can't browse the Web Interface	- Verify that HTTP access is enabled. - Verify that you can ping the adapter. - Verify that you are using either Internet Explorer 3.01 or above, or Netscape 3.0 or above.

How to Correct Communication Lost Problems

Unable to Communicate with UPS conditions can be reported by PowerChute *plus*. If this problem occurs after PowerChute *plus* and the Management Card have been installed together on a UPS:

1) If PowerChute *plus* cannot communicate with the UPS at all:
   a) Ensure that the cable between the computer and the UPS (or the AP9600) is securely connected at both ends.
   b) Ensure that the UPS (or AP9600) serial port is connected to the same computer port used to connect the computer to the UPS when PowerChute *plus* was installed.
   c) Ensure that the black, smart-signalling cable (940-0024C) which came with the Management Card is being used for the connection between the computer and the UPS (or AP9600).
   d) If steps a) through c) do not find the problem, reset the Management Card.
   e) If the problem persists, disconnect (or remove) the Management Card from the UPS and restart PowerChute *plus*.
   f) If the problem persists, see your PowerChute *plus* documentation to remove and then reinstall PowerChute *plus*. If the problem continues, contact Technical Support.
   g) If step e) cleared the problem, reinstall the Management Card. If the problem returns, contact Technical Support.
2) If **Unable to Communicate with UPS** is an intermittent problem, an interrupt request (IRQ) conflict could be the cause. To eliminate the IRQ conflict, disconnect (or remove) the Management Card from the UPS and restart PowerChute *plus*:
   a) If the problem persists, see your PowerChute *plus* documentation to remove, and then reinstall, PowerChute *plus*. If the problem continues, contact Technical Support.
   b) If PowerChute *plus* works without the Management Card:
      1. Stop PowerChute *plus*.
      2. Use an ASCII text editor to edit the **[ups]** section of the PowerChute *plus* initialization file (**pwrchute.ini** or **powerchute.ini**, depending on the PowerChute *plus* operating system):
         - Add **TimeoutFactor=40** parameter to the file.
         - Add **UpsPollInterval=6** to the file (default value is **4**).

         Note: See your *PowerChute plus User's Guide* for information on how to edit the pwrchute.ini **file.**

      3. Restart PowerChute *plus*.
      4. If the problem persists, contact Technical Support.

APC Worldwide Product Support

If you have any questions concerning this or other APC products, contact the technical support center for your area. APC technical support is provided at no charge.

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Appendix A

Acronyms & Abbreviations

APC	American Power Conversion
BOOTP	bootstrap protocol
Comm	communication
EEPROM	electrically erasable programmable read-only memory
FTP	file transfer protocol
HP	Hewlett Packard Corporation
HTTP	Hypertext Transport Protocol
IP	Internet Protocol
LED	light emitting diode
MIB	management information base
NMS	network management system
OID	object identification
RMA	returned material authorization
SNMP	simple network management protocol
TCP/IP	Transport Control Protocol/Internet Protocol
TFTP	trivial file transfer protocol
UPS	uninterruptible power supply

Index

A

About Management Card Screen 121
Access
  Changing values 18
  Channels 17, 62, 115
    Controlling 62, 115
    SNMP, Defining access to 61–62, 113
    SNMP screen 115
    SNMP, Using to define 109, 113
  FTP Server, enable or disable 111
  SNMP channel, Allowing to 18
Action
  Initiate
    Simulate Power Failure 34
    Start Runtime Calibration 34
    Test UPS Alarm 34
    UPS Self-Test 34
  Put UPS to Sleep 36
  Put UPS to Sleep Gracefully 36
  Reboot UPS 36
  Reboot UPS Gracefully 36
  Reset UPS to Defaults 36
  Turn UPS Off Gracefully 36
  Turn UPS On/Off 36
Administrator settings, defining 64, 118
Alarms
  Defining Thresholds 53, 98, 100
    Alarm if Load Over 53, 90, 100
    Alarm if Redundancy Under 53, 90, 100
    Alarm if Runtime Over 53
    Alarm if Runtime Under 100
    Alarm if Under 91
  Displaying information about 26, 73
  Faults and 87, 95
  Measure-UPS contacts, Viewing 56, 104
  Measure-UPS details, Viewing 104
  Testing UPS 34, 46, 80
  UPS, Audible 40, 54, 86
AP9606 Web/SNMP Management Card. *See* Management Card
apcmgmt 19
application module
  and Firmware upgrade 122, 123
    User Interface 122
  File Name format 123
Assistant Online 25
Authentication 64, 118, 165
  IP address verification 165
  MD5 165, 166
  Password 165
  Traps 62
  User Name 165
Auto Logout 64, 117–118, 118
Auto Self-Test
  Configure 34

B

Battery
  Actual Bus Voltage Status Field 44
  Capacity Status Field 20, 32, 43, 77, 83, 88, 91
  Configuring UPS Values 82
  External Frame Parameters 48
  Low Duration 101
  Main Frame Parameters 48
  Nominal Voltage status field 44
  Number of Bad Battery Packs Status Field 33, 43, 90
  Number of Battery Packs Status Field 32, 43, 90
  Replacement date 40, 54, 83, 102
  Return Capacity 101
  Screen, Symmetra 95
  Screen, UPS 83
  UPS Menu 83
  Viewing UPS values 20
  Voltage status field 32, 43, 77
BOOTP 139, 142, 143, 149, 150, 153, 160, 170
  and Configuration File transfer 129
    Using the Wizard 147
  Bootup Filename 129–130, 150, 151
  Enabled or Disabled 109, 110
  Network Communication, Using to Provide 15, 109
  Network Values, Using to Define 14
  Providing network values using 11
  Request 130, 150
  Response 130, 151
  TCP/IP, Using to enable or disable 58, 108
  Using a terminal instead of 14
  Verifying if enabled 19
Bootstrap protocol 170. *See also* BOOTP
Bypass
  Put UPS in/out 80, 97

C

Calibration Test
  Date Status Field 32, 33, 43, 45
  Result Status Field 32, 33, 43, 45, 88
cfg file 137, 150, 161
Channel Access, SNMP 115
Communication
  Established 16
  PowerChute plus and Management Card 15
  Settings for using a terminal 71
  Settings for using Telnet 71

Troubleshooting 167–168
Using BOOTP to provide network 15
Communications Lost problems
Troubleshooting 168
Community Name 165
Defining 61–62
Community strings
Changing 18
NMS and 17
Concentrator 13
Configuration
Files 122, 137
Creating for BOOTP 147–151
Creating using the Wizard 158
Defined 129
How to create 129
Management Card, Updating 135
Verifying update 135
Files, Transferring to a Management Card 129–135
Using a BOOTP Bootup Filename 129–130
Management Card
How to Update 129
Settings 129
FTP 129
Measure-UPS 129
Password 129
Pre-Configuring for Management Card 137
Pre-Configuring the Management Card Locally 138, 140–146, 162
Reconfiguring Deployed Management Cards 151–157
Reconfiguring for Management Card 137
System 129
TCP/IP 129
TFTP 129
Updating by initiating FTP Download 134–135
Updating by initiating TFTP Download 133
Updating using FTP Client 131–132
Updating using the Wizard 130
Web 129
Summary Screen 144
Configuring
Client name 14
Management Card
Defining Requirements 14
Measure-UPS 57, 106
UPS 37, 81, 98
Configuration Menu 81
Configuration Screen 37, 81
Connect dialog box 71
Connecting PowerChute plus 16
Contact
Defining name 57, 105, 107
Defining system 65
Settings 104, 105, 107
Configuring Closures 19
Measure-UPS, Defining Switches for 55, 103
Measure-UPS, Disabling and Enabling for 105, 107
Measure-UPS, Viewing 56, 104
Control Console
Accessing the 63, 71, 117
Accessing via Telnet 71
Basic Network Values 109
Battery Menu 83
Battery Screen 83
Configuration Menu 81
Configuration Screen 81
Control Menu 79
Control Screen 79
Date/Time screen 119
Device Manager Menu 74, 76
File Transfer screen 119
File Transfer Settings screen 120
File Transfer values
FTP Client 119
Settings 119
TFTP Client 119
XMODEM 119
File Transfers 122
General Menu 86
General Screen 86
How to Use 73
Line Transfer Menu 84
Line Transfer Screen 84
Logging on to the 72
Logging Out 73
Main screen 72
Management Card
Accessing 14
Managing 70
Managing Locally 70
Managing Remotely 70, 117
Network Connection, Using to Manage 108
Measure-UPS
Using to Manage 103
Menu Options, using 70
Network Menu 74
Security Access 166
Shutdown Menu 85
Shutdown Screen 85
Structure of the 70
System Identification Values
Contact 118
Date 119
Location 118
Name 118
Time 119
System Menu 75, 117
System Screen 117
Tools Menu 120
Reboot Card 120
Reset Card to Defaults 120
Reset Card to Defaults Except TCP/IP 120
Tools Screen 120
UPS, Managing 76
UPS Status Menu 77, 78
About UPS 78

User Manager
Administrator 118
Authentication 118
Auto Logout 118
Device Manager User 118
Screen 117
Using a Terminal with the 71
CRC (Cyclical Redundancy Check) 122
csv file 130, 150, 161
Current Password 117–118
Cyclical Redundancy Check (CRC) 122

D

Data packets 13
Date and Time values 65, 119
Default Gateway
125, 130, 139, 142, 143, 149, 150, 153, 160. *See also* Gateway
Defining 58
Detailed Information
Symmetra 87
Detailed Status
Viewing UPS 78
Symmetra 89
Device Manager Menu 64, 74, 76
Device Manager User 118, 165
DNS Name 24
Downloading
New code 15, 23

E

EEPROM 170
Changing Control Console values 67
Resetting to factory-defaults 20, 82
Encryption 165
External Frame Battery Parameters 48

F

File Name 66, 120
File Transfers
Controlling 59, 66, 110
Initiate File Transfer Via 66
Result of Last File Transfer 66
FTP Client 119
Screen 66, 119
Settings 119, 120
Settings Screen 120
TFTP Client 119
To Management Card 122, 129–135
XMODEM 119
Firmware
Defined 122
Files 122
Management Card, Updating 122
application module 122, 123
application module file name format 123
Before Starting, What to Know 123
How To 124–128
Last Transfer Result codes 128
platform module 122, 123
platform module file name format 123
Updating using Command Prompt FTP Client 125
Multiple Management Cards on the Network 127
Single Management Card on the Network 125–126
Updating using the Wizard 124
Management Card not available on the Network 124
Using Multiple Management Cards from the Network 124
Updating using XMODEM 127
Verifying update 128
Firmware revision, Viewing 20, 78, 93, 94
Frequency/Voltage Overload 100
FTP
Configuration Files 129
Configuration Settings 129
Remote Server IP, Defining 66
Remote Server Password, Defining 66
Remote Server User Name, Defining 66
Request 151
FTP Client 59, 108, 111
Command Prompt, Updating Firmware Using 125
Multiple Management Cards on the Network 127
Single Management Card on the Network 125–126
Updating the Configuration Settings using 131–132
FTP Download
Using to update Configuration Settings 134–135
FTP Server 108, 111, 125, 155
Access 111
Port 111, 156, 164
Security Access 166

G

Gateway
Defining Values for Management Card 14. *See also* Default Gateway
General Parameters, UPS 82
General Settings
Menu 86, 99
Screen 86
GET commands
Defining NMS's use of 62, 115
Management Card, Using to Manage a 17
Measure-UPS, Using to Manage a 17
NMS and 19
Troubleshooting 167
UPS, Using to Manage a 17
Graceful
Put UPS to Sleep 80, 97
Reboot 80, 97
UPS turn off 79, 96
Green LED indicator 13

H

Hardware revision, Viewing 93, 94
Hardware, Status LED 13
Help 25. *See* Assistant Online; Web Interface: Help
Hub 13

Humidity
Monitoring Measure-UPS values 19, 105
Viewing Measure-UPS values 56, 104

I

Identification, System 117, 121
Input Current
Status Field 44
Input Frequency
Status Field 32, 42, 88
Input power, Viewing values 20
Input Voltage 77, 88
Status Field 32, 42, 44
Intelligence Module (IM) 48, 89, 92
Status 93
Internal Temperature Status Field 32, 42, 89
IP address
Defining Management Card's 58
Defining TFTP server's 108
Management Card, Defining Values for 14
Management Card's Access Channels and 17
verification 165

L

Last calibration status field 77, 88
Last Self-Test status field 77, 88
Last Transfer 77, 88
Result Codes 128, 135
LEDs
Link-RX/TX 13
Status 13
Line Transfer
and UPS 82
Menu 84
Screen 84
Line Voltage
Maximum, Status Field 32, 42, 89
Minimum, Status Field 32, 42, 90
Links, Defining 68
Screen 68
Load Capacity 90
Load Current
Status Field 42, 89
Load equipment
Turning UPS on and off 36, 79, 96
Load Power 77, 88
and Power Modules 90
Status Field 32, 42
Local Management of the Management Card 70, 140
Location
Defining system 65
Modifying Management Card's 73
System 18
Log in 71
To the Control Console 72
Log Out
Of the Control Console 73
Low Battery Duration, Setting 54, 85, 101

M

Main Frame Battery Parameters 48
Management Card
About 121
Access channels 17
BOOTP
Enable or Disable 58, 108, 109, 110
Changing the contact fields 73
Changing the location of the 73
Changing the name of the 73
Command Prompt FTP Client
Upgrading Firmware using 125
Configuration Files
Last Transfer Result Codes 135
Using Wizard to Create 158
Using Wizard to Create for BOOTP 147–151
Verifying 135
Configuration Settings
Pre-configuring 137
Pre-configuring Locally 138, 140–146, 162
Reconfiguring 137
Reconfiguring deployed 151–157
Configuration Settings, updating
Using FTP Client 131–132
Using FTP Download 134–135
Using TFTP Download 133
Using the Wizard 130, 136
Configuration, updating
How to 129
Using BOOTP Bootup Filename 129–130
Connecting with PowerChute plus 16
Control Console
Accessing 14, 63, 71
Accessing via a Terminal 71
Accessing via Telnet 71
Control Menu Menu 79
Control Screen 79
Device Manager Menu 74, 76
How to Use 73
Logging In 72
Main Screen 72
Managing a UPS 76
Managing the System 117
Network Menu 74, 108
Network Screen 108
System Menu 75
Tools Screen 120
UPS Status Menu 77, 78
Using menu options 70
Control Console Structure 70

Defining basic network values 14, 109
Defining IP address 109
Defining system identification values 63, 65
About Card 117
Contact 65
Date 65
Date/Time 117
File Transfer 117, 119, 120
Identification 117
Location 65
Name 65
Time 65
Tools 117
User Manager 117, 118
Defining trap receivers 22, 115
Downloading new code 15
File Transfers 122
File Transfers, Controlling 59, 66, 110
FTP Client 119
Settings 119, 120
TFTP Client 119
XMODEM 119
Firmware, updating 122
application module 122, 123
Before Starting, What to Know 123
How to 124–128
Last Transfer Result Codes 128
platform module 122, 123
Using Command Prompt FTP Client 125
Using the Wizard 124
Using XMODEM 127
Verifying 128–129
FTP Client 108, 111
Password 111
Remote Server IP 111
Upgrading Configuration Settings using 131–132
User Name 111
FTP Download
Upgrading the Configuration Settings 134–135
FTP Server 108, 111
Access 111
Port 111
Identification Values, Viewing 65, 69, 121
Information about, Viewing 73
Limitations of PowerChute plus with 15
Links, Defining 68
Local Management 70
Managing 11
Network Connection 108
Remotely 70
Remotely with SNMP Agent 11
Trap Receiver Values 15
Using Telnet 70
with Control Console 70, 117
Ping Utility
Using to test communication 108
Resetting 168
Screens
About Card 69
File Transfer 66
Identification 65
Links 68
Network 58
SNMP Menu 113
SNMP Summary 114
System 63, 117
TCP/IP, BOOTP Disabled 110
TCP/IP, BOOTP Enabled 109
Telnet/Web 60, 112
Tools 67
User Manager 117
Security 165
Authentication 165
SET commands
Using to manage 17
SNMP Agent, Affecting 67
Reboot Card 67, 120
Reset Card to Defaults 67, 120
Reset Card to Defaults Except TCP/IP 67, 120
SNMP Settings 113
System Identification Values
Contact 118
Date 119
Location 118
Name 118
Time 119
System Identification Values, Viewing 65
TCP/IP Settings, configure 58
Default Gateway 58
Subnet Mask 58
Telnet access
Disabling or enabling 60, 112
Telnet Port, defining 108, 112
TFTP Client 108, 110
TFTP Download
Upgrading the Configuration Settings 133
Troubleshooting 167
User Manager Settings
Administrator 64, 118
Authentication 64, 118
Auto Logout 64, 118
Device Manager User 64, 118
Web access
Disabling or enabling 60, 112
Web Port, defining 109, 112
Wizard 136
Configuration Summary Screen 144
Defined 136
Installing 136
Running 136
System Requirements 136
Upgrading Configuration Settings using 130, 136
Upgrading Firmware using 124

XMODEM
Upgrading Firmware using 127
Management Information Base. *See* MIB
Manufacture date, Viewing 20, 78, 93
Matrix-UPS, managing 76
Max Line Voltage 44, 77
mconfig 19
mconfig TrapReceiverTable 167
mcontrol 19
MD5
Authentication 166
Measure-UPS 19
Configuring 55, 57, 103, 106, 129
Contacts 57, 104, 105, 107
Trap Thresholds 106
Control Console, Using to manage 103
Firmware Version 56, 105
GET commands, Using to manage 17
Managing locally with PowerChute plus 15
Monitoring 19, 55, 103
High Humidity 105
High Humidity Violation 56
High Temperature 105
High Temperature Violation 56
Humidity 56
Low Humidity 105
Low Humidity Violation 56
Low Temperature 105
Low Temperature Violation 56
Probes 103, 105
Temperature 56
Screens
Configuration 57
Contact Settings 107
Main 55, 103
Status 55
Threshold and Alarm Details 104
Trap Thresholds 106
SET commands, Using to manage 17
Status Information 56
Contact Settings 56
Trap Thresholds
Defining 57
Send Traps On option 106
Viewing alarm and threshold details 104
Web Interface, using to manage 55
Media Access Control. *See* MAC
Menus
Control Console, Using 70
Refreshing 70
SNMP, Using 61–62, 113
Telnet, Using 112
Messages
Communications established 16
Unable to Communicate with UPS 16, 168
MIB 170
MIB-II System OIDs 129
sysDescr 128
Using 18
Min Line Voltage 44, 77
Model, Viewing UPS 20
Module Diagnostics and Information 87, 92
Module Dump 95

N

Name
Changing the UPS 40, 54, 86
Contact, Defining 65
Defining system 65
Location, Defining 65
UPS, Viewing 20
Network
BOOTP Server, Using to Define Values 14
BOOTP, Using to Provide Communication values 15
Communication and the PowerNet MIB 19
Link-RX/TX LED 13
Management Card, Defining Values for 14
Managing a Management Card's connection 108
Menu 74, 108
Security 17
Stack
and Firmware upgrade 122, 123
Telnet Menu, Using 112
Telnet, Using to Manage a Management Card 70
New Password 117–118
New User Name 117–118
NMS 170
Access channels 17
Community strings and 17
Configuring access to the channel 62, 115
GET and SET commands and 19
GET and SET commands, Defining use of 62, 115
IP, Defining 61–62
PowerNet communication with 19
Receiver IP, Defining 61–62
SNMP Access
Defining IP for 115
Defining Password for 62
SNMP Channel, Allowing Access to 18
Trap Receiver, Defined as 19, 61
Traps
Defining for 61, 113
Defining Receipt 62, 115–116
Troubleshooting 167

O

Object Identifications. *See* MIB-II System OIDs; OIDs
OIDs 129, 130, 170
sysDescr 128
OIDs, PowerNet MIB 19–21
Operating frequency status field 77, 88
Operating System
and Firmware upgrade 122, 123
Options, Using Control Console 70
Output Frequency
Status Screen 32, 42, 89
Output Frequency Range

Define 53, 100
Output Voltage 53, 77, 88
Status Screen 32, 42
Output voltage
Nominal setting parameter 84, 100

P

passthrough mode 15
Password 165
Configuration Settings 129
Control Console, Defining access to 117–118
Front-panel, Defining 20
FTP Client 111
Traps, Defining for Management Card to send 62
Password phrase 166
Ping utility
Troubleshooting 167
Using to test communication 108
platform module
and Firmware upgrade 122, 123
Network Stack 122, 123
Operating System 122, 123
file name format 123
PM Status 94
Power failure
Shutdown delay and 20, 37
Simulate 34, 46, 97
Testing UPS's ability to respond to 80, 97
Power Module (PM) 48, 90, 94
Number Bad 90
PowerChute plus
Connecting 16
Management Card 15
Limitations of with 15
Measure-UPS, Using to Manage 11
Restarting 168
Troubleshooting 167
UPS, Using to Manage 15
PowerNet MIB
Network communication and 19
Traps, Using to Interpret 22
PowerNet MIB OIDs 19–21
Capabilities of 19
Limitations of 21
PowerNet SNMP Manager 23
Present kVA Capacity 44
Probes
Monitoring with Measure-UPS 103, 105
Put UPS to Sleep 80, 97
Put UPS to Sleep gracefully 80, 97

R

Raw Status Data 93, 94, 95
Reason for Last Transfer to Battery Status Field 32, 42
Reboot Card 67
Reboot UPS 79, 97
Gracefully 80, 97
Receiver NMS IP 62, 115–116
Red Status LED indicator 13
Redundancy 44, 90
Redundant Intelligence Module (RIM) 48, 89, 93
Registering Your Product 8–10
Remote Management of the Management Card 70
Remote Server IP 111
Reset Card to Defaults 13, 67
Reset Card to Defaults Except TCP/IP 67
Reset UPS to Defaults 82, 99, 102
Return Battery Capacity 54, 101
Return delay, Setting 54, 85, 102
RIM Status 93
RMA 170
Router, Defining values for Management Card 14
Runtime
Calibration
Starting/Stopping 34, 46, 80, 97
Remaining status field 32, 42, 77, 88, 91

S

Scheduled Tests 87, 91
Security, Management Card 165
and FTP Server 166
and Serial Control Console 166
and SNMP 166
and Telnet Control Console 166
and Web Server 166
Authentication 165
MD5 166
Community Name 165
Password 165
Port Assignments 165
FTP server 165
Telnet server 165
Web server 165
SNMP Agent 165
Telnet Server 165
User Name 165
Web Server 165
Self-test
Causing a UPS to perform a 34, 46, 80, 97
Date Status Field 32, 33, 43, 45
Results Status Field 32, 33, 43, 45, 88
Scheduling UPS 86
Sensitivity 53, 84
Serial Number
Intelligence Module, Viewing 93
RIM, Viewing 93
UPS, Viewing 20, 78
Serial port
Communication settings for terminal 71
Selecting 145
SET commands
Defining NMS's use of 62, 115
Management Card, Using to Manage 17, 129
NMS and 19
Troubleshooting 167
Shutdown Delay
Setting 20, 54, 101

UPS 85
Shutdown Parameters 82, 99, 101
Menu 85, 101
Screen 85, 101
Simple Network Management Protocol. *See* SNMP
Sleep Time 35, 54, 85, 102
Smart-UPS, managing 76
SNMP 170
Access Channels, Defining values for 109, 113
Access Control
Access Type 115
Community Name 61–62, 115
Enable or Disable 61
NMS IP 61–62, 115
Channel Access Screen 115
Channels, Controlling access to 61–62, 113, 115
Disabling or enabling access 18, 61
Menu Screen 113
Security Access 166
Summary Screen 114
System IDs, Defining Values for 109
Trap Receivers
Defining values for 61, 109, 113, 115
Screen 116
Trap Receivers, Defining
Authentication Traps 61–62, 116
Community Name 61–62, 116
Receiver NMS IP 61–62, 116
Trap Generation 61–62, 116
Using 17, 61–62, 113
SNMP Agent 165
Managing the Management Card with 11, 67
Restarting, continuing, or loading a new 19
Status
Options in the UPS menu
77, 84, 85, 86, 88, 99, 100, 101, 102
Viewing
Battery 20, 95
Current UPS 20
Detailed UPS 78, 89
Status fields 77, 83, 84, 85, 86, 88, 99, 100, 101, 102
Status Indicators 13
Status LED 13
Status of UPS 77, 88
Subnet Mask
125, 130, 139, 142, 143, 149, 150, 153, 160
Defining Values 14, 58
Symmetra Power Array
Actions
Put UPS in Bypass 51, 97
Put UPS to Sleep 51, 97
Put UPS to Sleep Gracefully 51, 97
Reboot UPS 51, 97
Reboot UPS Gracefully 51, 97
Reset UPS to Defaults 51, 99, 102
Runtime Calibration 97
Simulate Power Failure 97
Turn UPS Off Gracefully 51, 96
Turn UPS On/Off 51, 96
UPS Self-Test 97
Alarm Thresholds
Defining 53, 90, 98, 100
Configuring 52, 86, 98
General Settings 54, 99
Shutdown Parameters 54, 99, 101
Utility Line Settings 53, 98
Controlling 50, 86, 96
Detailed Status 44, 87
Diagnostics 45
Faults and Alarms 87, 95
Managing 40, 86
Module Diagnostics & Information 87, 92
Module Dump 49, 95
Module Status 47
Monitoring 87
Scheduled Tests 87, 91
Screens
Alarm Thresholds 100
Batteries 95
Configuration 52, 98
Control 50, 96
Detailed Status 44, 89
Device Status Summary 40
Diagnostics 45
General 102
Intelligence Module (IM) 92
Main 40, 87
Module Diagnostics & Information 92
Module Dump 49
Module Status 47
Power Module 94
Redundant Intelligence Module (IM) 93
Reset UPS to Defaults 102
Scheduled Tests 91
Shutdown Parameters 101
Status 41
Utility Line 99
Status Fields 88
About UPS 43
Action 46
Actual Battery Bus Voltage 44
Alarm if Load Over 53, 90, 100
Alarm if Redundancy Under 53, 90, 100
Alarm if Runtime Over 53
Alarm if Under 91, 100
Audible Alarm 54
Auto Self-Test 46
Batteries 90
Battery Capacity 43, 88, 91
Battery Voltage 43
Calibration Date 43, 45
Calibration Result 43, 45, 88
External Frame Battery Parameters 48
Firmware Revision 93, 94
Frequency/Voltage Overload 100
Hardware Revision 93, 94

High Transfer Voltage 53
If UPS Fails 53
Input Current 44
Input Frequency 42, 88
Input Voltage 42, 44, 88
Intelligence Module (IM) 48, 89, 93
Internal Temperature 42, 89
Last Battery Replacement 54, 102
Last Transfer 88
Load Capacity 90
Load Current 42, 89
Load Power 42, 88
Load Power and Redundancy 90
Low Battery Duration 54, 101
Low Transfer Voltage 53
Main Frame Battery Parameters 48
Manufacture Date, IM 93
Manufacture Date, RIM 93
Maximum Line Voltage 42, 44, 89
Minimum Line Voltage 42, 44, 90
Nominal Battery Voltage 44
Number of Bad Battery Packs 43, 90
Number of Battery Packs 43
On/Off 50
Output Frequency 42, 53, 89, 100
Output Voltage 42, 53, 88, 100
Power Module (PM) 48, 90, 94
Power Module (PM), Number bad 90
Present kVA Capacity 44
Raw Status Data 93, 94, 95
Reason for Last Transfer to Battery 42
Redundancy 44, 90
Redundant Intelligence Module (RIM) 48, 89, 93
Return Battery Capacity 54, 101
Return Delay 54, 102
Runtime Remaining 42, 88, 91
Self-Test Date 43, 45
Self-Test Result 43, 45, 88
Sensitivity 53
Serial Number, IM 93
Serial Number, RIM 93
Shutdown Delay 54, 101
Sleep Time 50, 54, 102
Status of UPS 88
UPS Name 54, 102
Voltage 90
Vout Reporting 53, 100
Status Information 86
System
Configuration Settings 129
Contact 18
Date and Time
Defining 65
Screen 119
File Transfer Screen 119
Identification Values, Defining 63, 65, 117, 118
About Card 117
Contact 65, 118
Date 65, 117, 119
File Transfer 117
Location 65, 118
Name 18, 65, 118
Time 65, 117, 119
Tools 117
User Manager 117
Using SNMP to 109
IP 125, 130, 139, 142, 143, 149, 150, 153, 160
Location 18
Menu 75, 117
Screen, Identification 65, 118

T

TCP/IP 170
BOOTP server and 108, 109
Configuration Settings
129, 139, 142, 143, 149, 153, 160
Port assignments 165
Telnet
Communications Settings for 71
Control Console 70
Accessing 71
Accessing via a Terminal 71
Accessing via Telnet 71
Battery Menu 83
Battery Screen 83
Configuration Menu 81
Configuration Screen 81
Control Menu 79
Control Screen 79
Device Manager Menu 74, 76
General Menu 86
General Screen 86
How to Use 73
Line Transfer Menu 84
Line Transfer Screen 84
Logging In 72
Logging Out 73
Main Screen 72
Managing a UPS 76
Network Menu 74, 108
Network Screen 108
Shutdown Menu 85
Shutdown Screen 85
Structure 70
System Menu 75, 117
UPS Status Menu 77, 78
Using menu options 70
Disabling or enabling access 60, 112
Management Card
Managing Locally using 70
Managing Remotely using 70
Managing using 11

- Measure-UPS
  - Configuring 106
  - Managing 103
  - Monitoring 103
- Measure-UPS Screens
  - Contact Settings 107
  - Main 103
  - Threshold and Alarm Details 104
  - Trap Thresholds 106
- Menu
  - Screen 112
  - Using 112
- Port, defining 60, 108, 112
- Server 165
- Symmetra
  - Configuring 86, 98
  - Configuring Shutdown Parameters 101
  - Controlling 86
  - Faults & Alarms 87, 95
  - Intelligence Modules 92
  - Managing 86
  - Module Diagnostics & Information 87
  - Monitoring 87
  - Power Modules 94
  - Redundant Intelligence Module 93
  - Scheduled Tests 87
  - Status Information 86, 87, 88
- Symmetra Screens
  - Alarm Thresholds 100
  - Configuration 98
  - Control 96
  - General 102
  - Main 87, 95
  - Reset UPS to Defaults 102
  - Shutdown Parameters 101
  - Utility LIne 99
- Using to Manage UPS and Measure-UPS 70

Telnet/Web Screen 60

Temperature
- Defining high and low for Measure-UPS 105
- Viewing battery 20
- Viewing Measure-UPS values 19, 56, 104

Terminal
- Communication settings for 71
- Managing a Management Card using a 70
- Using to define network values 14
- Using with the Control Console 71

Terminal-emulator. *See* Terminal

Testing
- Communications 108
- Serial port 19

TFTP 170
- Code, Downloading New 11
- Configuration Files, Transferring 129
- Configuration Settings 129
- Remote Server IP, Defining 66
- Request 151
- Server's IP Address, Using to Define 108
- TFTP Client 59, 110
- TFTP Download
  - Using to update Configuration Settings 133
- TFTP server
  - Address, changing 19
  - Address, Identifying 19

Threshold
- Probing trap 103
- Viewing Measure-UPS 104

Time
- Set Date and Time Values 65

Tools 120

Transfers
- Selecting high and low 20, 53, 84

Traps
- Disabling or enabling sending for each threshold 106
- Generation 62, 115–116
- Management Card Password, Defining 62
- PowerNet MIB, Using to interpret 22
- Receivers
  - Defining 22, 62–64, 115–121
  - Modifying Values 19
  - NMS Defined as 19, 113
  - Using SNMP to Define Values 61–62, 109, 113
  - Viewing defined 19
- SNMP, Defining 115–116
- Thresholds
  - Defining 57, 106
  - Probing 55, 103
- Troubleshooting 167

Trivial File Transfer Protocol. *See* TFTP

Troubleshooting
- Communication 167
- Communication lost problems 168
- GET and SET performance 167
- Pinging the Management Card 167
- PowerChute plus 167
- Traps, not received 167
- Unable to Communicate with UPS 168
- Unidentified traps 167
- Web Interface, can't browse 168

U

Unable to Communicate with UPS 16, 168

Upgrades
- Configuration
  - How To 129
- Configuration Files
  - Last Transfer Result Codes 135
- Configuration Settings
  - Using FTP Client 131–132
  - Using FTP Download 134–135
  - Using TFTP Download 133
  - Using the Wizard 130
  - Verifying 135

Firmware
Before Starting, What to Know 123
How To 124–128
Last Transfer Result Codes 128
Verifying 128
Firmware, Using Command Prompt FTP Client 125
Multiple Management Cards on the Network 127
Single Management Card on the Network 125–126
Firmware, Using the Wizard 124
and Management Card not available on the Network 124
and Multiple Management Cards from the Network 124
Firmware, Using XMODEM 127
UPS
About, Status Field 32, 43, 78
Battery Menu 83
Battery Capacity 83
Battery Date 83
Battery Screen 83
Battery Values, Viewing 20
Configuring 20, 37, 52, 75, 81, 98
Audible Alarm 86
Battery Values 82
Configuration Menu 81
Configuration Screen 37, 81
General Parameters 82
High Transfer Voltage 38, 53, 84
Line Transfer 82
Low Transfer Voltage 38, 53, 84
Output Frequency Range 53
Output Voltage 38, 53, 84
Reset to Defaults 82
Sensitivity 38, 53, 84
Controlling 35, 79, 96
Alarm, Testing 80
Put UPS in Bypass 51
Put UPS in/out of Bypass 80
Reboot UPS 36, 51, 79
Reboot UPS Gracefully 36, 51, 80
Reset UPS to Defaults 36, 51
Runtime Calibration, Start/Stop 80
Self-Test 80
Simulate Power Failure 80
Sleep Gracefully, Put UPS to 36, 51, 80
Sleep, Put UPS to 36, 51, 80
Sleep Time 35, 50
Firmware Revision, viewing 78
General Menu 86
General Screen 86
General Settings 40, 54
Audible Alarm 40, 54
Last Battery Replacement 40, 54
UPS Name 40, 54
Graceful Turn Off 36, 51, 79, 96
Identification Values, Viewing 20
Information About, Viewing 75
Line Transfer Menu 84
Line Transfer Screen 84
Managing 15, 31, 75, 76, 86
Manufacture Date, viewing 78
Name parameter 73, 86, 102
Self-Test 86
Serial Number, viewing 78
SET Commands, Using to manage 17
Shutdown Menu 85
Shutdown Parameters 39, 54, 82
Low Battery Duration 39, 54, 85
Return Battery Capacity 39, 54
Return Delay 39, 54, 85
Shutdown Delay 39, 54, 85
Sleep Time 39, 54, 85
Shutdown Screen 85
Status Menu 77
About UPS 78
Battery Capacity 77
Battery Voltage 77
Calibration Results 77
Detailed Status 78
Input Voltage 77
Last Transfer 77
Load Power 77
Max Line Voltage 77
Min Line Voltage 77
Operating Frequency 77
Output Voltage 77
Runtime Remaining 77
Self-Test Results 77
Status of UPS 77
UPS Internal Temperature 77
Status Screens
Device Summary 26
Diagnostics 33
Matrix-UPS 31
Measure-UPS 28
Network 29
Smart-UPS 27, 31
System 30
Turning on and off 21, 36, 50, 51, 79
Unable to Communicate with 168
Utility Line Settings 38
upsAdvBattery 20
upsAdvConfig 20
upsAdvControl 21
upsAdvident 20
upsAdvInput 20
upsAdvOutput 20
upsAdvTest 21
upsBasicBattery 20
upsBasicConfig 20
upsBasicControl 21
upsBasicIdent 20
upsBasicInput 20
upsBasicOutput 20
upsBasicTest 21
upsCommStatus 21
upsConfig 20

upsControl 21
upsIdent 20
upsInput 20
upsOutput 20
upsTest 21
User Interface
  and application module 122
User Manager
  Management Card Parameters 64, 117, 117–118
    Administrator values, defining 64, 118
    Authentication 64, 118
    Auto Logout 64, 118
    Device Manager User values 64, 118
  Screen 117
User Name 165, 166
  FTP Client 111
Utility Line Settings 53, 98
Utility voltage. *See* Input power

V

Values
  APC Management 19
  Battery 20
  BOOTP, Providing network with 11
  Input Power 20
  Management Card, Defining basic network 14, 63
  Management Card's Identification 63, 65, 121
  Measure-UPS 19
  System Identification, Defining 65
  Trap Receiver, Managing 15
  UPS 20
  UPS menu screen's status information
    77, 84, 85, 86, 88, 99, 100, 101, 102
Voltage status field 77, 88, 90
Vout Reporting 53, 100

W

Web Configuration Settings 129
Web Interface
  Accessing the Management Card Using 24, 25
  Action Fields
    Put UPS in Bypass 51
    Put UPS to Sleep 36, 51
    Put UPS to Sleep Gracefully 36, 51
    Reboot UPS 36, 51
    Reboot UPS Gracefully 36, 51
    Reset UPS to Defaults 36, 51
    Turn UPS Off Gracefully 36, 51
    Turn UPS On/Off 36, 51
  Help 25
  Logging In 25
  Management Card
    BOOTP, enable or disable 58
    Contact, Defining 65
    Control Console, Accessing 63
    Date, Defining 65
    Default Gateway 58
    File Transfers, Controlling 59, 66
    Identification Values, View 69
    Links, Defining 68
    Location, Defining 65
    Name, Defining 65
    SNMP Agent 67
    Subnet Mask 58
    System Identification Values, Defining 63
    TCP/IP Settings 58
    Telnet, Configuring 60
    Time, Defining 65
    Web, Configuring 60
Management Card APC Links
  Name, Viewing 68
  URL, Defining 68
Management Card Screens
  About Card 69
  File Transfer 66
  Identification 65
  Links 68
  Network 58
  System 63
  Telnet/Web 60
  Tools 67
Management Card User Links
  Name, Defining 68
  URL, Defining 68
Measure-UPS
  Configuring 57
  Contact Settings, viewing 56
  Contact Switches, viewing 57
  Contacts, naming 57
  Firmware Version 56
  Managing 55
  Status Information 56
  Trap Thresholds, Defining 57
Measure-UPS Fields
  High Humidity Violation 56
  High Temperature Violation 56
  Humidity 56
  Low Humidity Violation 56
  Low Temperature Violation 56
  Temperature 56
Measure-UPS Screens
  Configuration 57
  Main 55
  Status 55
Menu Screen 112
  Access 112
  Port 112
SNMP Access
  Enable or Disable 61
SNMP Access Control 62
  Community Name 61–62
  Enable or Disable 61
  NMS IP 61–62
SNMP Trap Receiver

- Authentication Traps 61–62
- Community Name 61–62
- Receiver NMS IP 61–62
- Trap Generation 61–62

Status Screens
- Diagnostics 33
- Matrix-UPS 31
- Network 29
- Smart-UPS 31
- System 30

Supported Web Browsers 24

Symmetra Power Array
- Alarm Thresholds, Defining 53
- Configuring 52
- Controlling 50
- Detailed Status 44
- Diagnostics 45
- General Settings, Defining 54
- Managing 40
- Module Dump 49
- Module Status 47
- Shutdown Parameters 54

Symmetra Power Array Fields
- About UPS 43
- Action 46
- Actual Battery Bus Voltage 44
- Alarm if Load Over 53
- Alarm if Redundancy Under 53
- Alarm if Runtime Under 53
- Audible Alarm 54
- Auto Self-Test 46
- Battery Capacity 43
- Battery Voltage 43
- Calibration Date 43, 45
- Calibration Result 43, 45
- External Frame Battery Parameters 48
- High Transfer Voltage 53
- If UPS Fails 53
- Input Current 44
- Input Frequency 42
- Input Voltage 42, 44
- Intelligence Module (IM) Status 48
- Internal Temperature 42
- Last Battery Replacement 54
- Load Current 42
- Load Power 42
- Low Battery Duration 54
- Low Transfer Voltage 53
- Main Frame Battery Parameters 48
- Maximum Line Voltage 42, 44
- Minimum Line Voltage 42, 44
- Nominal Battery Voltage 44
- Number of Bad Battery Packs 43
- Number of Battery Packs 43
- On/Off Status 50
- Output Frequency 42, 53
- Output Voltage 42, 53
- Power Module (PM) Status 48
- Present kVA Capacity 44
- Reason for Last Transfer to Battery 42
- Redundancy 44
- Redundant Intelligence Module (RIM) Status 48
- Return Battery Capacity 54
- Return Delay 54
- Runtime Remaining 42
- Self-Test Date 43, 45
- Self-Test Result 43, 45
- Sensitivity 53
- Shutdown Delay 54
- Sleep Time 50, 54
- UPS Name 54
- Utility Line Settings 53
- Vout Reporting 53

Symmetra Power Array Screens
- Configuration 52
- Control 50
- Detailed Status 44
- Device Status Summary 40
- Diagnostics 45
- Main 40
- Module Dump 49
- Module Status 47
- Status 41

UPS
- Configuration Screen 37
- Configuring 37

UPS General Settings 40
- Audible Alarm 40
- Last Battery Replacement 40
- UPS Name 40

UPS Shutdown Parameters
- Return Battery Capacity 39
- Return Delay 39
- Shutdown Delay 39
- Sleep Time 39

UPS Status Fields
- About UPS 32
- Action 34
- Auto Self-Test 34
- Battery Capacity 32
- Battery Voltage 32
- Calibration Date 32, 33
- Calibration Result 32, 33
- High Transfer Voltage 38
- Input Frequency 32
- Input Voltage 32
- Internal Temperature 32
- Load Power 32
- Low Transfer Voltage 38
- Maximum Line Voltage 32
- Minimum Line Voltage 32
- Number of Bad Battery Packs 33
- Number of Battery Packs 32
- Output Frequency 32
- Output Voltage 32, 38
- Reason for Last Transfer to Battery 32

Runtime Remaining 32
Self-Test Date 32, 33
Self-Test Result 32, 33
Sensitivity 38
UPS Status Screens
Device Summary 26
Measure-UPS 28
Smart-UPS 27
User-Definable Links 25
Web Port 24, 109
Web Server 165
Security Access 166
Wizard, Web/SNMP Management Card 136
Configuration File, Creating 158
Configuration File, Creating for BOOTP 147–151
Defined 136
Installing 136
Pre-Configuring for Multiple Management Cards 137
Pre-Configuring the Management Card Locally 138, 140–146, 162
Reconfiguring Deployed Management Cards 151–157
Reconfiguring for Multiple Management Cards 137
Running 136
Screens
Configuration Summary 144, 154
Configure FTP Transfer 156
Main 138, 140, 147, 158, 162
Network 142
Select Which Settings to Transmit 143, 149, 153, 160
Settings
138, 139, 141, 148, 152, 159, 162, 163, 164
Transmit Current Settings 145, 155
System Requirements 136
Transferring Configuration Files using 129
Upgrading Configuration Settings using 130, 136
Upgrading Firmware using 124
Management Card not available on the Network 124
Multiple Management Cards from the Network 124

X

XMODEM
Downloading New Code 11
Updating Firmware using 127