

# **PowerNet Management Information Base (MIB)**

**Version 3.4.4**

**Reference Guide**

## **REFERENCE GUIDE: POWERNET® MANAGEMENT INFORMATION BASE (MIB), VERSION 3.4.4**

### **AMERICAN POWER CONVERSION CORPORATION - SOFTWARE LICENSE AGREEMENT**

This software license agreement (the "agreement") is a legal agreement between American Power Conversion Corporation as the "licensor" (hereafter referred to as APC) and you (hereafter referred to as the "customer") for the APC software accompanying this agreement.

By downloading, installing, loading, copying, or otherwise using the software, you represent that one of the following is true:

- You have been authorized to accept these terms on behalf of the customer (the entity on whose behalf you represent that you are authorized to act).
- You intend to be personally bound to the terms of this agreement as the customer.

If you accept these terms as a representative of an entity on whose behalf you are authorized to act, you may use the software only on behalf of such entity. If you intend to be personally bound, use of the software is limited to your personal use.

If you are not authorized to accept these terms on behalf of a company or other entity, and you do not intend to be personally bound, APC will not license the software.

Installation or use of the software in violation of the terms of this agreement is a violation of U.S. and international copyright laws and conventions.

If third-party software is provided with the APC software, that third-party software is not subject to the terms of this license agreement. The license agreement of that third-party software defines the responsibilities of the customer and licensor with regard to that software.

#### **1. GRANT OF LICENSE**

APC hereby agrees to grant and customer agrees to accept a non-exclusive and non-transferable license to use the software, subject to the terms and conditions of this agreement. The software is owned and copyrighted by American Power Conversion Corporation or its suppliers. As a customer, your license confers no ownership of or title to the software and does not constitute a sale of any right in the software. APC retains all proprietary rights and title to the software and any modifications.

The customer is not permitted to rent, lease, grant a security interest in, or otherwise transfer rights to the software, or remove or alter any trademark, logo, copyright or other proprietary notices, legends, symbols or labels in the software.

#### **2. RIGHT TO USE**

The software is licensed for use only by the number of users and/or on the number of servers or workstations described in this "Right to Use" section of this agreement or in any related invoice.

The customer may use this software in one of the following ways, whichever is applicable to this software:

- On a single file server powered by an APC UPS for serving any computer and related peripheral devices connected with that single file server
- On one or more computers powered by the same APC UPS
- To support a web server, which may be connected to a varying but unlimited number of workstations or computers on one or more networks.
- To support any licensed copy of the PowerNet Agent.

#### **3. RIGHT TO COPY**

The customer may make copies of the software for the following purposes only:

- The customer may make one copy of the software for archival or backup purposes.
- The customer may make additional copies of the software and documentation only when essential for the authorized and intended use of the software as described in this agreement and/or in the documentation accompanying the software.

Any and all copies, including any archival copy, must include the APC copyright notice and any other proprietary notices that are included with the licensed software, and are fully subject to the terms of this agreement.

The customer may not redistribute the software or make copies with the intent to redistribute.

#### **4. RESTRICTIONS**

The customer is not permitted to do any of the following:

- Reverse assemble, reverse compile, or otherwise attempt to create the source code from the software.
- Create derivative works of the software or any portion thereof.
- Localize or translate the software or its documentation, without the prior written consent of APC.
- Publish or provide any results of benchmark tests run on the software to a third party without the prior written consent of APC.

#### **5. DURATION AND TERMINATION OF THIS AGREEMENT**

This license shall continue so long as the customer uses the software in compliance with the agreement. If the customer breaches any of its obligations, this license shall terminate, and the customer agrees to destroy or return all copies of the software and all materials provided for or with the software upon notification and demand by APC. The customer can terminate the agreement at any time by destroying or returning to APC all copies of the software and documentation.

#### **6. LIMITED WARRANTY**

The APC limited warranty is for a period of ninety (90) days from the time the customer receives the software.

APC warrants during the limited warranty period that the software will function materially as described in the accompanying software user documentation and that any medium upon which the software is delivered will be free from defects in material and workmanship when given normal, proper and intended usage.

This warranty does not apply in any of the following circumstances:

- If the software is used on a machine or operating system other than the machines and versions of operating systems specified in the documentation.
- If the software is subjected to misuse, neglect, accident, or exposure to environmental conditions beyond those specified in the documentation.
- If a version of the software is used that does not include all updates available from APC.
- If the software has been modified.

APC does not warrant that use of the software will be uninterrupted or error free, nor that program errors will be corrected.

APC's sole responsibility and customer's sole remedy under this warranty is, at APC's option, to repair or replace all or any portions of the software, or to refund any license fee paid. This limited warranty is valid only if APC receives written notice within the ninety-day warranty period.

#### **7. LIMITATION OF WARRANTIES AND LIABILITY**

EXCEPT AS EXPRESSLY SET FORTH IN SECTION 6 HEREIN ENTITLED "LIMITED WARRANTY", (i) APC SHALL HAVE NO LIABILITY TO THE CUSTOMER OR ANY THIRD PARTY FOR THE SOFTWARE, INCLUDING ANY LIABILITY FOR NEGLIGENCE; (ii) APC MAKES AND THE CUSTOMER RECEIVES NO WARRANTIES, EXPRESS, IMPLIED, STATUTORY, OR IN ANY OTHER PROVISION OF THIS AGREEMENT OR ANY OTHER COMMUNICATION; AND (iii) APC SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE AND NON-INFRINGEMENT.

IN NO EVENT SHALL APC BE LIABLE TO THE CUSTOMER FOR ANY CONSEQUENTIAL, INDIRECT, SPECIAL, MULTIPLE OR INCIDENTAL DAMAGES, EVEN IF APC HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH POTENTIAL LOSS OR DAMAGE.

SOME STATES OR JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MIGHT NOT APPLY TO YOU. HOWEVER, TO THE FULL EXTENT PERMITTED BY APPLICABLE LAW, THE DURATION OF STATUTORILY REQUIRED WARRANTIES, IF ANY, SHALL BE LIMITED TO THE WARRANTY PERIOD OF 90 DAYS.

NO DEALER, AGENT, EMPLOYEE, OR CUSTOMER OF APC IS AUTHORIZED TO MAKE ANY MODIFICATIONS, EXTENSIONS, OR ADDITIONS TO THIS LIMITED WARRANTY. The cumulative liability of APC to the customer for all claims relating to the software shall not exceed the total amount of any and all license fees paid to APC by the customer for the software or, if no license fee was required, the replacement of the software.

## **8. NO WARRANTY UNDER HAZARDOUS, HIGH-RISK, OR LIFE-THREATENING CONDITIONS**

The software is not fault-tolerant and is not designed, manufactured or intended for use or resale as control equipment in hazardous environments requiring fail-safe performance, such as in the operation of nuclear facilities, aircraft navigation or communication systems, air traffic control, direct life support machines, or weapons systems, in which the failure of the software could lead directly to death, personal injury, or severe physical or environmental damage. Accordingly, APC and its suppliers specifically disclaim any express or implied warranty of fitness for such hazardous, high-risk, or life-threatening activities.

## **9. USE OF TECHNICAL INFORMATION RELATED TO CUSTOMER SUPPORT**

The customer agrees that APC may use technical information that the customer provides while receiving technical/customer support services. APC may use such information for its own business purposes, including product support and development, but agrees not to use such information in any form that might identify the customer.

## **10. TRANSFER RESTRICTIONS**

This agreement, the license granted hereunder, the software and any modifications thereto may not be assigned or in any way transferred without the prior written consent of APC.

## **11. LANGUAGE AND JURISDICTION OF THE AGREEMENT**

The original of this agreement has been written in English. The parties hereto waive any statute, law, or regulation that might provide an alternative law or forum or to have this agreement written in any language other than English. Any translation of this agreement to a language other than English is provided only for the convenience of the customer and is not the legally binding version of the agreement.

The terms of this agreement shall be construed in accordance with the substantive laws of the Commonwealth of Massachusetts, United States of America, without giving effect to the principles of conflict or choice of law of such commonwealth. APC and Customer exclude the United Nations Convention on Contracts for the International Sale of Goods from this agreement.

## **12. U.S. GOVERNMENT RESTRICTED RIGHTS LEGEND**

The software and documentation are "commercial items" as that term is defined in 48 C.F.R. 2.101 (October 1995) consisting of "commercial computer software" and "commercial computer software documentation" as such terms are used in 48 C.F.R. 227.7202-1, 227.7202-3 and 227.7202-4 (June 1995). If the customer is the U.S. Government or any agency or department thereof, the software and documentation are licensed only as a commercial item, and with only those rights as are granted to all other end users pursuant to the terms and conditions of this agreement. Licensor is American Power Conversion Corporation, P.O. Box 278, 132 Fairgrounds Rd., West Kingston, RI 02892, U.S.A.

## **13. EXPORT CONTROLS**

None of the software or underlying information or technology may be downloaded or otherwise exported or re-exported to any of the following:

- Into (or to a national or resident of) any country to which the U.S. has embargoed goods.
- To anyone on the U.S. Treasury Department's list of Specially Designated Nationals.
- To anyone on the U.S. Commerce Department's Table of Denial Orders.

By downloading or using the software, the customer agrees to the foregoing and represents and warrants that it is not located in, under the control of, or a national or resident of any such country or on any such list.

The customer is responsible for complying with any local laws in its jurisdiction that might impact its right to import, export or use the software, and represents that it has complied with any regulations or registration procedures required by applicable law to make this license enforceable.

---

### **AMERICAN POWER CONVERSION CORPORATION CORPORATE HEADQUARTERS:**

132 Fairgrounds Road  
P.O. Box 278  
West Kingston, RI 02892  
United States of America  
Telephone: 401-789-5735  
Toll Free (US and Canada): 800-800-4272

# Contents

## About This Guide 1

Guide Purpose .....	1
Guide Structure .....	1
Related Documents .....	2
Terms Used in This Guide .....	2

## Chapter 1: PowerNet MIB Structure 3

PowerNet MIB Traps .....	3
PowerNet MIB OIDs .....	3
SNMP Access Controls	4
SNMP Browser Structure	4
PowerNet MIB OIDs Structure	4
Tabled OIDs	5

## Chapter 2: How to Manage Agents and Management Cards 6

How to Monitor a PowerNet Agent .....	6
[powerNetSoftwareSystem]	7
[powerNetSoftwareConfig]	7
How to Manage the SNMP Agent at a Hardware Device .....	7
[mcontrol]	8
[mconfig]	8
[mtrapargs]	9
[mfiletransfer]	9
[mfiletransferStatus]	9
[mfiletransferConfig]	10
[mfiletransferControl]	10

## Chapter 3: How to Manage a UPS 11

How to Monitor a UPS .....	12
[upsIdent] UPS Identification OIDs	12
[upsBasicIdent]	12
[upsAdvIdent]	13
[upsBattery] UPS Battery OIDs	13
[upsBasicBattery]	13
[upsAdvBattery]	14
[upsComm] UPS Communication OID	14
[upsInput] UPS Input OIDs	14
[upsBasicInput]	14
[upsAdvInput]	15
[upsOutput] UPS Output OIDs	16
[upsBasicOutput]	16
[upsAdvOutput]	17

How to Control a UPS .....	17
[upsControl] OIDs 17	
[upsBasicControl] 17	
[upsAdvControl] 18	
How to Configure a UPS .....	20
[upsConfig] 20	
[upsBasicConfig] 20	
[upsAdvConfig] 21	
How to Test a UPS .....	23
[upsTest] 23	
[upsAdvTest] 23	
How to Use OIDs for 3-Phase UPS Models .....	25
[upsPhaseResetValues] 25	
[upsPhaseInput] 26	
[upsPhaseOutput] 27	

## **Chapter 4: How to Manage an Environmental Monitor 28**

External Environmental Monitor (em) OIDs .....	28
[emIdent] OID 28	
[emConfig] OIDs 29	
[emConfigProbes] OIDs 29	
[emConfigContacts] OIDs 30	
[emStatus] OIDs 30	
[emStatusCommStatus] OID 30	
[emStatusProbes] OIDs 31	
[emStatusContacts] OIDs 31	
Integrated Environmental Monitor (iem) OIDs (AP9618 or AP9619 Network Management Card Only) .....	32
[iemIdent] OID 32	
[iemConfig] OIDs 32	
[iemConfigProbes] OIDs 33	
[iemConfigContacts] OIDs 33	
[iemStatus] OIDs 34	
[iemStatusProbes] OIDs 34	
[iemStatusContacts] OIDs 35	
[iemStatusRelays] OIDs 35	
Measure-UPS (mUps) OIDs .....	35
[mUpsEnviron] Environment OIDs 36	
[mUpsContact] Contact OIDs 36	

## **Chapter 5: How to Manage a MasterSwitch Unit 37**

[sPDUIIdent] Identification OIDs .....	38
[sPDUMasterControl] Master Control OIDs .....	39
[sPDUMasterConfig] Master Configuration OIDs .....	40
[sPDUOutletControl] Outlet Control OIDs .....	41
[sPDUOutletConfig] Outlet Configuration OIDs .....	42

## Chapter 6: How to Manage a MasterSwitch VM Unit 43

[sPDUIdentVM] Identification OIDs . . . . .	44
[sPDUMasterControlVM] Master Control OIDs . . . . .	45
[sPDUMasterConfigVM] Master Configuration OIDs . . . . .	45
[sPDUMasterStatusVM] Master Status OIDs . . . . .	47
[sPDUOutletControlVM] Outlet Control OIDs . . . . .	48
[sPDUOutletConfigVM] Outlet Configuration OIDs . . . . .	49
[sPDUOutletStatusVM] Outlet Status OIDs . . . . .	50

## Chapter 7: How to Manage a MasterSwitch Plus Unit 51

[sPDUIdentMSP] Identification OIDs . . . . .	52
[sPDUMasterControlMSP] Master Control OIDs . . . . .	53
[sPDUMasterConfigMSP] Master Configuration OIDs . . . . .	54
[sPDUMasterStatusMSP] Master Status OIDs . . . . .	54
[sPDUOutletControlMSP] Outlet Control OIDs . . . . .	55
[sPDUOutletConfigMSPall] Outlet Configuration OIDs . . . . .	56
[sPDUOutConfigMSPgs] Outlet Configuration OIDs . . . . .	56
Example of a “Load-Shedding” Configuration 58	
[sPDUOutConfigMSPannun] Outlet Configuration OIDs . . . . .	60
[sPDUOutConfigMSPmups] Outlet Configuration OIDs . . . . .	61
[sPDUOutletStatusMSP] Outlet Status OIDs . . . . .	63

## Chapter 8: How to Manage an Automatic Transfer Switch 64

[atsIdent] Identification OIDs . . . . .	65
[atsCalibration] Calibration OIDs . . . . .	66
[atsControl] Control OIDs . . . . .	67
[atsConfig] Configuration OIDs . . . . .	67
[atsStatus] Status OIDs . . . . .	68
[atsStatusInput] Input OIDs . . . . .	70
[atsStatusOutput] Output OIDs . . . . .	72

## Chapter 9: PowerNet MIB Traps 74

Trap Severity Levels . . . . .	75
How To Define Trap Receivers . . . . .	75
PowerNet MIB Trap Definitions . . . . .	76
Symmetra UPS Subtraps . . . . .	85

# About This Guide

This introduction provides the following information to help you use this guide.

- [Guide Purpose](#)
- [Guide Structure](#)
- [Related Documents](#)
- [Terms Used in This Guide](#)

For assistance with this or any other APC product, contact [APC Worldwide Customer Support](#) as described at the end of this manual.

## Guide Purpose

This guide describes how to use the PowerNet management information base (MIB), version 3.4.4, to manage APC products that allow or enable using simple network management protocol (SNMP) for management:

- MIB version 3.4.4 management of a Management Card, UPS, and an Environmental Monitor
- MIB version 2.2-compatible management of a version 2.2 Agent, its UPS, and an Environmental Monitor
- MIB version 3.4.4 management of an APC MasterSwitch™ AC Power Controller, a MasterSwitch VM AC remote control PDU, or a MasterSwitch Plus AC remote control PDU
- MIB version 3.4.4 management of an APC Automatic Transfer Switch and its embedded Network Management Card.

## Guide Structure

This guide's chapters describe how to use the PowerNet MIB:

- [Chapter 1, PowerNet MIB Structure](#)  
Provides an overview of the PowerNet MIB, its Object Identifications (OIDs) and its traps (messages that alert a network management station [NMS] about specific conditions).
- [Chapter 2 through Chapter 8](#)  
Describe how to use PowerNet MIB OIDs to manage specific products:
  - [Chapter 2, How to Manage Agents and Management Cards](#)
  - [Chapter 3, How to Manage a UPS](#)
  - [Chapter 4, How to Manage an Environmental Monitor](#)
  - [Chapter 5, How to Manage a MasterSwitch Unit](#)
  - [Chapter 6, How to Manage a MasterSwitch VM Unit](#)
  - [Chapter 7, How to Manage a MasterSwitch Plus Unit](#)

- [Chapter 8, How to Manage an Automatic Transfer Switch](#)
- [Chapter 9, PowerNet MIB Traps](#)  
Describes the PowerNet MIB traps and how to define which NMSs can receive those traps.

## Related Documents

This guide describes how to use the PowerNet MIB only. For information about an APC product that you manage using the PowerNet MIB, see the user's guide or owner's manual for that product. See your network management system (NMS) documentation for information about your NMS.

## Terms Used in This Guide

Terms used in this guide have the following definitions:

Term Used in This Guide	Definition
<b>Management Card</b>	Unless otherwise stated, Management Card refers to any of the following devices: <ul style="list-style-type: none"><li>• Any PowerNet Adapter with model number AP9205, AP9605, or AP9603</li><li>• Any Web/SNMP Management Card</li><li>• Any Network Management Card</li></ul>
<b>PowerNet Agent, or Agent</b>	Any PowerNet Agent
<b>Environmental Monitor</b>	Unless otherwise stated, Environmental Monitor refers to any of the following devices: <ul style="list-style-type: none"><li>• Measure-UPS</li><li>• Measure-UPS II</li><li>• Environmental Monitoring Card</li><li>• Environmental Monitoring Device</li><li>• Integrated Environmental Monitor (AP9618 and AP9619 Network Management Cards only)</li></ul>
<b>MasterSwitch unit</b>	In <b>Chapter 5, How to Manage a MasterSwitch Unit</b> , MasterSwitch unit refers to model numbers AP9210(i), AP9211, and AP9212. In the rest of this guide, MasterSwitch unit is used collectively to refer to any MasterSwitch unit, MasterSwitch VM unit, or MasterSwitch Plus unit.
<b>Network management station or NMS</b>	Any network component capable of using the PowerNet MIB

# Chapter 1: PowerNet MIB Structure

This chapter categorizes the PowerNet MIB into its major OID and trap components as follows:

- [PowerNet MIB Traps](#)
- [PowerNet MIB OIDs](#)

## PowerNet MIB Traps

Any Management Card, PowerNet Agent, or MasterSwitch unit can send traps to an NMS when specific events occur. The NMS does not need the PowerNet MIB to receive the trap, but it does need the MIB to interpret the trap's meaning. Also, the trap receiver definitions that a particular device or Agent uses determines which NMSs can receive traps.

For more information on traps, see [Chapter 9, PowerNet MIB Traps](#).

## PowerNet MIB OIDs

The PowerNet MIB OIDs allow an NMS to use its SNMP browser to manage any of the following:

- A Management Card, its UPS and an Environmental Monitor
- A PowerNet Agent, its UPS and Environmental Monitor
- A MasterSwitch unit

However, the NMS can manage a device only if the SNMP access controls of that device allow the NMS to have SNMP access. (A PowerNet Agent, which has limited control over a UPS, does not use SNMP access controls.)

The following sections further explain how to use OIDs:

- [SNMP Access Controls](#)
- [SNMP Browser Structure](#)
- [PowerNet MIB OIDs Structure](#)
- [Tabled OIDs](#)

## SNMP Access Controls

A Management Card or MasterSwitch unit has a console programs that you can use to define specific SNMP access values for up to four SNMP channels.

Action	Result
Disable SNMP access completely	Prevent SNMP access by any NMS.
Use an NMS IP Address as a SNMP channel value	Limit channel access to only the defined NMS.
Define a non-default password for an SNMP channel	Limit channel access to an NMS that knows the password.
Select the type of access used by an SNMP channel	Allow an NMS to have write access, read access, or no access.

For more information on SNMP access controls, see the *User's Guide* for your Management Card.

## SNMP Browser Structure

The PowerNet MIB fits into a hierarchical structure within the SNMP browser's categories. For example, when you use an HP OpenView for Windows SNMP browser, PowerNet MIB OIDs fit into the browser's structure, as follows:

- **[iso]** (for International Standards Organization) at the top
- **[org]** (for organization) under **[iso]**
- **[dod]** (for Department of Defense) under **[org]**
- **[internet]** under **[dod]**
- **[private]** under **[internet]**
- **[enterprises]** under **[private]**
- **[apc]** (for American Power Conversion) under **[enterprises]**

## PowerNet MIB OIDs Structure

The PowerNet MIB OIDs also are categorized into a hierarchical structure, with **[apc]** at the top and individual OIDs under specific OID categories or within specific OID tables. (See **Tabled OIDs**.) For example, under **[apc]** there are two categories: **[products]**, which provides the OIDs that you use to manage specific products, and **[apcmgmt]**, which provides OIDs that you use to affect the operation of hardware-based SNMP agents (Management Cards and MasterSwitch units). For more information on how to use the **[apcmgmt]** OIDs, see **Chapter 2, How to Manage Agents and Management Cards**.

Under **[products]**, there are three categories, two of which (**[hardware]** and **[software]**) provide OIDs that you use to manage specific products.

<b>[hardware]</b>	<b>[software]</b>
<p>This category contains sub-categories for each type of hardware product that you can manage using PowerNet MIB OIDs. The following chapters describe how to use the OIDs in those sub-categories:</p> <ul style="list-style-type: none"> <li>• For <b>[ups]</b>, see <b>Chapter 3, How to Manage a UPS</b>.</li> <li>• For <b>[measureUps]</b>, see <b>Chapter 4, How to Manage an Environmental Monitor</b>.</li> <li>• For <b>[miniSNMP adapter]</b>, see <b>Chapter 2, How to Manage Agents and Management Cards</b>.</li> <li>• For <b>[masterswitch]</b>, see <b>Chapter 5, How to Manage a MasterSwitch Unit</b>.</li> <li>• For <b>[masterswitchVM]</b>, see <b>Chapter 6, How to Manage a MasterSwitch VM Unit</b>.</li> <li>• For <b>[masterswitchMSP]</b>, see <b>Chapter 7, How to Manage a MasterSwitch Plus Unit</b>.</li> </ul>	<p>This category includes read-only OIDs that you can use to monitor a software PowerNet Agent only (as described in <b>Chapter 2, How to Manage Agents and Management Cards</b>) and contains the one sub-category <b>[powerNetSubAgent]</b></p>

The third listing, **[system]**, does not provide OIDs that you can use for SNMP management. The read-only OIDs that this category contains identify models of UPSs, Environmental Monitors, and MasterSwitch units by unique numbers that other OIDs can reference. For example, the MIB-II system OIDs (listed under **[internet]**, **[mgmt]**, **[mib-2]**, and **[system]**) use a PowerNet MIB **[system]** OID number for the MIB-II's **[sysObjectID]** value.

## Tabled OIDs

For any PowerNet MIB OID category listed in the SNMP browser, you can access a list of the current values for all OIDs in that category and in all sub-categories below it in the hierarchy. For example, you can select **[apc]** to list the current values for all PowerNet MIB OIDs, or **[ups]** to list the current values for all PowerNet MIB UPS OIDs. However, OIDs grouped together in a table will not appear in such a list. You can access an OID table's values only by selecting that OID table in the SNMP browser. (An OID table appears enclosed in braces {}.) For example, to access the OIDs that define all four trap receivers for a device, select **{mconfigTrapReceiverTable}** in the SNMP browser.

For more information on how to define trap receivers, see **Chapter 9, PowerNet MIB Traps**.

# Chapter 2: How to Manage Agents and Management Cards

This chapter describes how to use PowerNet MIB OIDs to manage a Management Card, or to view software data for a PowerNet Agent. It also includes information on managing the SNMP agent of a MasterSwitch unit or Automatic Transfer Switch.

In the following cases, the network connection allows an NMS to use an SNMP browser and PowerNet MIB OIDs to manage the UPS, Environmental Monitor, MasterSwitch unit, or Automatic Transfer Switch.

- A Web/SNMP Management Card or Network Management Card enables Web-based or SNMP-based monitoring of a UPS, Environmental Monitor, MasterSwitch unit, or Automatic Transfer Switch (which has an embedded Network Management Card).
- A PowerNet Management Card allows SNMP-based monitoring of a UPS and Environmental Monitor.
- A PowerNet Agent indirectly connects a UPS and an Environmental Monitor to the network by communicating with a PowerChute *plus* application, which, in turn, communicates with the UPS and Environmental Monitor.

In addition to using SNMP to manage a device connected to the network by a Management Card or PowerNet Agent, the NMS can also use PowerNet MIB OIDs to manage any Management Card, Environmental Monitor, MasterSwitch unit, or Automatic Transfer Switch, or to monitor software values for the PowerNet Agent.

OIDs	Tasks
[powerNetSubAgent] read-only OIDs	View information about a PowerNet Agent. (See <a href="#">How to Monitor a PowerNet Agent.</a> )
[apcmgmt] OIDs	Manage the internal SNMP Agent at a hardware device. (See <a href="#">How to Manage the SNMP Agent at a Hardware Device.</a> )

## How to Monitor a PowerNet Agent

You can use [powerNetSubAgent] read-only OIDs to view information about a PowerNet Agent by performing the following steps:

1. Select [products] under [apc].
2. Select [software].
3. Select [powerNetSubAgent].

The SNMP browser lists two OID categories: [powerNetSoftwareSystem] and [powerNetSoftwareConfig].

## **[powerNetSoftwareSystem]**

The following table describes the **[powerNetSoftwareSystem]** OIDs.

OID	Information Provided
<b>powerNetSoftwareSystemDescription</b>	Information about an Agent, including its version number.
<b>powerNetSoftwareOid</b>	The technology that the Agent uses to implement the PowerNet MIB.
<b>powerNetSoftwareSystemUpTime</b>	The length of time that the Agent has been continuously running on the network.

## **[powerNetSoftwareConfig]**

The following table describes the **[powerNetSoftwareConfig]** OIDs.

OID	Information Reported
<b>powerNetSoftwareTableSize</b>	The number of distinct software modules that an Agent has.
<b>{powerNetSoftwareTable} {powerNetSoftwareEntry}   moduleNumber   moduleName   moduleVersion   moduleDate</b>	A tabled set of OIDs that define each module by these module characteristics: <ul style="list-style-type: none"><li>• Table row number</li><li>• Name</li><li>• Version number</li><li>• Installation date, in the format <i>mm-dd-yy</i></li></ul>

# **How to Manage the SNMP Agent at a Hardware Device**

When you select **[apcmgmt]** under **[apc]**, the SNMP browser lists four OID categories: **[mcontrol]**, **[mconfig]**, **[mtrapargs]**, and **[mfiletransfer]**. In these categories, you can use the OIDs documented in this guide to manage the SNMP Agent at a hardware device (ManagementCard, Environmental Monitor, MasterSwitch unit, or Automatic Transfer Switch).

## [mcontrol]

The following table describes the one OID in the **[mcontrol]** category. Value **(3)**, not documented, is obsolete.

OID	Values You Can SET
<b>mcontrolRestartAgent</b>	<b>restartCurrentAgent (1)</b> : Reboots the SNMP Agent. <b>continueCurrentAgent (2)</b> : Continues the Agent without rebooting. <b>restartWithoutAgent (4)</b> : Restarts the system without starting the Agent. The next time the system restarts, the Agent also restarts.

## [mconfig]

The following table describes the **[mconfig]** OIDs.

OID	Task
<b>mconfigBOOTPEnabled</b>	Identify the current BOOTP setting. A <b>GET</b> to this OID returns one of the following: <ul style="list-style-type: none"> <li>• <b>yes (1)</b>: Enable BOOTP. The hardware device will obtain its IP configuration parameters from a BOOTP server.</li> <li>• <b>no (2)</b>: Disable BOOTP. The hardware device will use the IP configuration parameters stored in its EPROM.</li> </ul>
<b>mconfigNumTrapReceivers</b>	Identify how many NMSs can receive traps from the Agent. A <b>GET</b> to this OID returns a value from 0 to 4.
<b>{mconfigTrapReceiverTable}</b> <b>{mconfigTrapReceiverEntry}</b> <b>trapIndex</b> <b>receiverAddr</b> <b>communityString</b> <b>severity</b> <b>acceptThisReceiver</b> <b>receiveTrapType</b>	Use this tabled set of OIDs to define up to four NMSs as trap receivers. See <a href="#">How To Define Trap Receivers in Chapter 9, PowerNet MIB Traps</a> for information on the OIDs in this table.
<b>mconfigClock</b>	Configure the date and time on a Web/SNMP Management Card, Network Management Card, or MasterSwitch unit. <ul style="list-style-type: none"> <li>• <b>mconfigClockDate</b> in <i>mm/dd/yyyy</i> format</li> <li>• <b>mconfigClockTime</b> in <i>hh:mm:ss am/pm</i> format</li> </ul>

See [How To Define Trap Receivers in Chapter 9, PowerNet MIB Traps](#) for information on how to define trap receivers.

## [mtrapargs]

The following table describes the [mtrapargs] OIDs, which enable APC traps to use a specific type of argument, which, in each case, may not be defined as part of the APC MIB.

OID	Argument That APC Traps Are Allowed to Use
mtrapsapargsInteger	An integer argument.
mtrapsapargsIpAddress	An IP address argument.
mtrapsapargsString	An octet string argument.
mtrapsapargsGauge	A Gauge argument.
mtrapsapargsTimeTicks	A TimeTicks argument.

## [mfiletransfer]

The [mfiletransfer] OIDs, which are supported only by a PowerNet Management Card, allow transfers of any type of file that the card can recognize. For more information, see the *User's Guide* for your PowerNet Management Card.

The OID categories under the [mfiletransfer] category are [mfiletransferStatus], [mfiletransferConfig], and [mfiletransferControl].

### [mfiletransferStatus]

The following table describes the one OID in the [mfiletransferStatus] category.

OID	Information Provided
mfiletransferStatusLastFileTransferResult	One of the following results of the last attempted file transfer: <b>lastFileTransferResultSuccessful (1)</b> <b>lastFileTransferResultNotAvailable (2):</b> If this value is returned, there have been no previous file transfers. <b>lastFileTransferResultFailureUnknown (3)</b> <b>lastFileTransferResultFailureServerInaccessible (4)</b> <b>lastFileTransferResultFailureServerAccessDenied (5)</b> <b>lastFileTransferResultFailureFileNotFound (6)</b> <b>lastFileTransferResultFailureFileTypeUnknown (7)</b> <b>lastFileTransferResultFailureFileCorrupted (8)</b>

## **[mfiletransferConfig]**

The following table describes the three sub-categories in the **[mfiletransferConfig]** category and the OIDs in each of those sub-categories.

OID Sub-category	OIDs in Each Sub-category
<b>[mfiletransferConfigSettings]</b>	<b>mfiletransferConfigSettingsFileName</b> : The name and path of the file to be transferred.
<b>[mfiletransferConfigTFTP]</b>	<b>mfiletransferConfigTFTPServerAddress</b> : The IP Address of the remote TFTP Server.
<b>[mfiletransferConfigFTP]</b>	<b>mfiletransferConfigFTPServerAddress</b> : The IP Address, in decimal notation, of the remote FTP Server involved in the file transfer. <b>mfiletransferConfigFTPServerUser</b> : The FTP Server User Name. <b>mfiletransferConfigFTPServerPassword</b> : The FTP Server Password.

## **[mfiletransferControl]**

The following table describes the one OID in the **[mfiletransferControl]** category.

OID	Task
<b>mfiletransferControlInitiateFileTransfer</b>	<b>doNotInitiateFileTransfer (1)</b> : Do nothing. <b>initiateFileTransferDownloadViaTFTP (2)</b> : Download file from the TFTP Server. <b>initiateFileTransferDownloadViaFTP (3)</b> : Download file from the FTP Server.

# Chapter 3: How to Manage a UPS

This chapter describes how to use PowerNet MIB OIDs to manage a UPS through its Management Card or its PowerNet Agent.

The PowerNet MIB OIDs that you can use to manage (monitor, configure, control and test) a UPS are in nine categories under the heading **[ups]**. To list the nine categories, perform the following steps:

1. Select **[products]** under **[apc]**.
2. Select **[hardware]**.
3. Select **[ups]**.

OID Categories	Tasks
<b>[upsIdent]</b> <b>[upsBattery]</b> <b>[upsInput]</b> <b>[upsOutput]</b> <b>[upsComm]</b>	View information about the UPS and its overall operation. (See <a href="#">How to Monitor a UPS</a> .)
<b>[upsConfig]</b>	Modify parameters that affect the overall operation of the UPS. (See <a href="#">How to Configure a UPS</a> .)
<b>[upsControl]</b>	Directly affect the current operation of the UPS. (See <a href="#">How to Control a UPS</a> .)
<b>[upsTest]</b>	Verify that the UPS can operate correctly during a power failure. (See <a href="#">How to Test a UPS</a> .)
<b>[upsPhase]</b>	Provide OIDs directly related to 3-phase UPS models. (See <a href="#">How to Use OIDs for 3-Phase UPS Models</a> .)

The following factors determine which OIDs in the **[ups]** categories can be used to manage a UPS:

- The manner in which the UPS connects to the network.
- For a PowerNet Agent, the type of signalling used for the connection between the Agent and the UPS: basic (simple-signalling) and advanced (smart-signalling).

Management Card	PowerNet Agent
You can use all OIDs listed under the <b>[ups]</b> category of the PowerNet MIB.	You cannot use the following: <ul style="list-style-type: none"><li>• Any <b>[ups]</b> OIDs not originally supported for PowerNet Agents in PowerNet MIB version 2.2.</li><li>• Smart-signalling (advanced) OIDs, if the Agent- to-UPS communication uses simple-signalling.</li></ul>

## How to Monitor a UPS

You use **GETs** (SNMP read commands) to PowerNet MIB OIDs to monitor (view information about) the UPS.

Most PowerNet MIB categories have OIDs that you can use to view information about the operation of the UPS. With few exceptions, these OIDs respond to **GETs**, but not to **SETs**: You can view (**GET**) information about UPS operation, but you cannot affect (**SET**) that operation.

OID Categories	Information Reported
[upsIdent]	The UPS identification parameters. See [upsIdent] UPS Identification OIDs.
[upsBattery]	The UPS battery status. See [upsBattery] UPS Battery OIDs.
[upsComm]	The UPS-to-SNMP agent communication link. See [upsComm] UPS Communication OID.
[upsInput]	The voltage input to the UPS. See [upsInput] UPS Input OIDs.
[upsOutput]	The voltage output by the UPS. See [upsOutput] UPS Output OIDs.

Not every PowerNet MIB OID responds to a **GET** with useful information. For example:

- A **GET** to any [upsControl] OID receives a response indicating that the UPS did not perform the related control action.
- A **GET** to [upsAdvControlFlashAndBeep] receives a **noFlashAndBeep (1)** response.
- A **GET** to [upsAdvControlRebootUps] receives a **noRebootUps (1)** response.

### [upsIdent] UPS Identification OIDs

The [upsIdent] category has five OIDs in two sub-categories, [upsBasicIdent] and [upsAdvIdent] that report UPS identification parameter values. Four read-only OIDs report values pre-set at the factory, and one OID reports the name used for the UPS, a name that you can define using a **SET**.

You can access all five OIDs through any Management Card or PowerNet Agent that connects to the UPS through a smart-signalling cable. For a PowerNet Agent that connects to the UPS through a simple-signalling cable, you can use only the two [upsBasicIdent] OIDs.

### [upsBasicIdent]

OID	Information Reported
upsBasicIdentModel	The UPS model name.
upsBasicIdentName	The 8-character name for the UPS. You can use a <b>SET</b> to change this value.

### **[upsAdvIdent]**

OID	Information Reported
<b>upsAdvIdentFirmwareRevision</b>	The UPS firmware version.
<b>upsAdvIdentDateOfManufacture</b>	The date on which the UPS completed the manufacturing process.
<b>upsAdvIdentSerialNumber</b>	The UPS serial number.

### **[upsBattery] UPS Battery OIDs**

The **[upsBattery]** category has nine OIDs in two sub-categories, **[upsBasicBattery]** and **[upsAdvBattery]** that provide UPS battery status information. Eight are read-only OIDs, and one OID reports when the battery was replaced last, a value that you can define by using a **SET**.

You can access all nine OIDs through any Management Card or through a PowerNet Agent that connects to the UPS through a smart-signalling cable. For a PowerNet Agent that connects to the UPS through a simple-signalling cable, you can use only the three **[upsBasicBattery]** OIDs.

### **[upsBasicBattery]**

OID	Information Reported
<b>upsBasicBatteryStatus</b>	<p>The current UPS battery status:</p> <ul style="list-style-type: none"> <li>• <b>unknown (1)</b>: The Management Card or PowerNet Agent cannot report the status.</li> <li>• <b>batteryNormal (2)</b>: Within normal operating parameters.</li> <li>• <b>batteryLow (3)</b>: Insufficient battery capacity to support the UPS equipment load.</li> </ul>
<b>upsBasicTimeOnBattery</b>	The amount of time since the UPS switched to battery power.
<b>upsBasicBatteryLastReplaceDate</b>	The date on which the battery was last replaced, a value you can change by using a <b>SET</b> . The format is <i>mm/dd/yy</i> or <i>mm/dd/yyyy</i> .

### **[upsAdvBattery]**

OID	Information Reported
<b>upsAdvBatteryCapacity</b>	The battery's remaining capacity as a percentage of full battery capacity.
<b>upsAdvBatteryTemperature</b>	The internal temperature of the UPS, in Celsius.
<b>upsAdvBatteryRunTimeRemaining</b>	How long the UPS battery can provide output voltage.
<b>upsAdvBatteryReplaceIndicator</b>	Whether a UPS battery needs replacement: <ul style="list-style-type: none"> <li>• <b>noBatteryNeedsReplacing (1)</b></li> <li>• <b>batteryNeedsReplacing (2)</b></li> </ul>
<b>upsAdvBatteryNumOfBattPacks</b>	The number of external battery packs a Matrix-UPS or Smart-UPS XL has.
<b>upsAdvBatteryNumOfBadBattPacks</b>	The number of defective external battery packs that a Matrix-UPS or Smart-UPS XL has.

### **[upsComm] UPS Communication OID**

This category has a single read-only OID that you can access through any Management Card but not through a PowerNet Agent.

OID	Information Reported
<b>upsCommStatus</b>	The status of the Management Card's SNMP agent-to-UPS communication link: <ul style="list-style-type: none"> <li>• <b>ok (1)</b></li> <li>• <b>noComm (2)</b></li> </ul>

### **[upsInput] UPS Input OIDs**

The **[upsInput]** category has six read-only OIDs in two sub-categories, **[upsBasicInput]** and **[upsAdvInput]**, that provide information about the UPS input (utility line) voltage.

You can access all six OIDs through any Management Card or through a PowerNet Agent that connects to the UPS through a smart-signalling cable. For a PowerNet Agent that connects to the UPS through a simple-signalling cable, you can use only the **upsBasicInputPhase** OID.

### **[upsBasicInput]**

OID	Information Reported
<b>upsBasicInputPhase</b>	The current AC input voltage phase.

## [upsAdvInput]

OID	Information Reported
<b>upsAdvInputLineVoltage</b>	The current input voltage in VAC.
<b>upsAdvInputMaxLineVoltage</b>	The maximum input voltage, in VAC, sensed by the UPS during the last minute.
<b>upsAdvInputMinLineVoltage</b>	The minimum input voltage, in VAC, sensed by the UPS during the last minute.
<b>upsAdvInputFrequency</b>	The current input voltage frequency in Hertz.
<b>upsAdvLineFailCause</b>	<p>The reason for the most recent transfer to battery.</p> <ul style="list-style-type: none"> <li>Any Management Card or smart-signalling PowerNet Agent can report the following: <ul style="list-style-type: none"> <li><b>noTransfer (1)</b>: No transfer has occurred.</li> <li><b>highLineVoltage (2)</b>: Voltage exceeded the high-transfer voltage value.</li> <li><b>brownout (3)</b>: For more than 5 seconds, the voltage level was between 40% of the UPS rated output voltage and the low-transfer voltage value.</li> <li><b>blackout (4)</b>: For more than 5 seconds, the voltage level was between 40% of the UPS rated output voltage and ground [0 volts].</li> <li><b>smallMomentarySag (5)</b>: A brownout existed for 5 seconds or less.</li> <li><b>deepMomentarySag (6)</b>: A blackout existed for 5 seconds or less.</li> <li><b>smallMomentarySpike (7)</b>: Less than 10 volts per cycle voltage increase.</li> <li><b>largeMomentarySpike (8)</b>: More than 10 volts per cycle voltage increase.</li> </ul> </li> <li>A Management Card can also report the occurrence of a UPS self-test, <b>self-test (9)</b>, and the rate of changes in the line voltage level, <b>rateOfVoltageChange (10)</b>.</li> </ul>

See [How to Configure a UPS](#) for information about the following values mentioned in the descriptions of **[upsAdvLineFailCause]** OID values in the preceding table:

- Rated output of the UPS
- The high-transfer voltage value
- The low-transfer voltage value

## [upsOutput] UPS Output OIDS

The [upsOutput] category has six read-only OIDs in two subcategories, [upsBasicOutput] and [upsAdvOutput], that provide information about the UPS output voltage.

You can access all six OIDs through any Management Card. A PowerNet Agent that connects to the UPS through a smart-signalling cable can use all the OIDs except **upsAdvOutputCurrent**. A PowerNet Agent that connects to the UPS through a simple-signalling cable can use only the two [upsBasicOutput] OIDs.

### [upsBasicOutput]

OID	Information Reported
<b>upsBasicOutputStatus</b>	<p>The current UPS operational status:</p> <ul style="list-style-type: none"> <li>• <b>unknown (1)</b>: The Management Card or PowerNet Agent cannot determine the state of the UPS.</li> <li>• <b>onLine (2)</b>: The UPS is using acceptable input voltage to provide output voltage.</li> <li>• <b>onBattery (3)</b>: The UPS is using battery power to provide output voltage.</li> <li>• <b>onSmartBoost (4)</b>: The UPS is using its AVR Boost feature with a low input voltage to provide sufficient output voltage without switching to battery operation.</li> <li>• <b>timedSleeping (5)</b>: The UPS is waiting a defined period of time before supplying output power to its supported equipment.</li> <li>• <b>softwareBypass (6)</b>: The Matrix-UPS or Symmetra UPS was placed into bypass mode using SNMP, PowerChute <i>plus</i> or PowerNet Manager.</li> <li>• <b>off (7)</b>: The UPS is turned off.</li> <li>• <b>rebooting (8)</b>: The UPS is resetting its supported equipment by turning off its output power and then turning it back on.</li> <li>• <b>switchedBypass (9)</b>: The Matrix-UPS or Symmetra UPS was placed into bypass mode using the switch at the UPS.</li> <li>• <b>hardwareFailureBypass (10)</b>: The Matrix-UPS or Symmetra UPS placed itself into bypass mode in response to a hardware problem.</li> <li>• <b>sleepingUntilPowerReturn (11)</b>: The UPS is waiting for input power to return to an acceptable level before it provides output power to its supported equipment.</li> <li>• <b>onSmartTrim (12)</b>: The UPS is using its AVR Trim feature with a high input voltage to provide output voltage without switching to battery operation.</li> </ul>
<b>upsBasicOutputPhase</b>	The current output phase.

### [upsAdvOutput]

OID	Information Reported
<b>upsAdvOutputVoltage</b>	The output voltage of the UPS in VAC.
<b>upsAdvOutputFrequency</b>	The output voltage frequency of the UPS in Hertz.
<b>upsAdvOutputLoad</b>	The equipment load placed on the UPS by its supported equipment as a percentage of rated load capacity.
<b>upsAdvOutputCurrent</b>	The output voltage current in Amperes

## How to Control a UPS

You can use **SETs** (SNMP write commands) to the **[upsControl]** OIDs to directly affect the current operation of the UPS

### [upsControl] OIDs

Which **[upsControl]** OIDs you can use depends on how the UPS connects to the network. The **[upsControl]** category has two subcategories

- **[upsBasicControl]** for simple-signalling connections.
- **[upsAdvControl]** for smart-signalling connections.

### [upsBasicControl]


The **[upsBasicControl]** category has one OID, which any Management Card or PowerNet Agent can use to put a UPS that is running on battery into “sleep mode.”

OID	Task
<b>upsBasicControlConserveBattery</b>	<p>Cause a UPS running on battery to turn off its outlets to conserve battery runtime and then wait in “sleep mode” until acceptable input power returns.</p> <ul style="list-style-type: none"><li>• <b>noTurnOffUps (1)</b>: The value always returned for a <b>GET</b>. Setting this value has no effect.</li><li>• <b>turnOffUpsToConserveBattery (2)</b>: The UPS, if running on battery, waits in “sleep mode” until acceptable input power returns. If the UPS is not on battery, a <b>badValue</b> error is returned.</li></ul>

## [upsAdvControl]

Management Cards and PowerNet Agents that use smart-signalling to connect with the UPS can use **SETs** to the OIDs in the [upsAdvControl] category, with the following exceptions:

- Three OIDs each have a value that you can use **only with a Management Card**.
  - The **upsAdvControlUpsOff** OID's value of **turnUpsOffGracefully (3)**.
  - The **upsAdvControlRebootUps** OID's value of **rebootUpsGracefully (3)**.
  - The **upsAdvControlUpsSleep** OID's value of **putUpsToSleepGracefully (3)**.

OID	Task (page 1 of 2)
<b>upsAdvControlUpsOff</b>	<p>Cause the UPS to turn off. How the UPS turns off depends on what <b>SET</b> value is used and how the UPS connects to the network:</p> <ul style="list-style-type: none"> <li>• <b>noTurnUpsOff (1)</b>: The value always returned for a <b>GET</b>. Setting this value has no effect.</li> <li>• <b>turnUpsOff (2)</b>: All Management Cards turn off the UPS immediately.</li> <li>• <b>turnUpsOffGracefully (3)</b>:               <ul style="list-style-type: none"> <li>- A PowerNet Agent performs an orderly shutdown of the UPS server, then turns off the UPS.</li> <li>- A Management Card turns off a UPS after the delay defined by <b>upsAdvConfigShutoffDelay</b>, a UPS configuration OID. (See <b>How to Configure a UPS</b>.)</li> </ul> </li> </ul> <p> <i>Note:</i> When you use the <b>upsAdvControlUpsOff</b> OID with a PowerNet Agent, you can turn on the UPS again only by using the UPS on/off switch. For all Management Cards, you can turn on the UPS again by using a <b>SET</b> value of <b>turnOnUPS (2)</b> for the <b>upsAdvControlTurnOnUPS</b> OID.</p>
<b>upsAdvControlRebootUps</b>	<p>Cause the UPS to reset its supported equipment by turning power off and then back on:</p> <ul style="list-style-type: none"> <li>• <b>noRebootUps (1)</b>: The value always returned for a <b>GET</b>. Setting this value has no effect.</li> <li>• <b>rebootUps (2)</b>: All Management Cards reboot the UPS immediately.</li> <li>• <b>rebootUpsGracefully (3)</b>: A Management Card reboots a UPS, using a delay before it turns off the UPS. The UPS uses the delay value defined by <b>upsAdvConfigShutoffDelay</b>, a UPS configuration OID. (See <b>How to Configure a UPS</b>.)</li> </ul>

OID	Task (page 2 of 2)
<b>upsAdvControlUpsSleep</b>	<p>Cause the UPS to turn off its outlets and wait in “sleep mode” for the period of time defined by <b>upsAdvConfigUpsSleepTime</b>, a UPS configuration OID. (See <a href="#">How to Configure a UPS</a>.)</p> <ul style="list-style-type: none"> <li>• <b>noPutUpsToSleep (1)</b>: The value always returned for a <b>GET</b>. Setting this value has no effect.</li> <li>• <b>putUpsToSleep (2)</b>: All Management Cards turn off UPS power immediately.</li> <li>• <b>putUpsToSleepGracefully (3)</b>: A Management Card turns off UPS power after a delay defined by <b>upsAdvConfigShutoffDelay</b>, a UPS configuration OID. (See <a href="#">How to Configure a UPS</a>.)</li> </ul>
<b>upsAdvControlSimulatePowerFail</b>	<p>Cause the UPS to test its ability to switch to battery operation as it would in a power failure:</p> <ul style="list-style-type: none"> <li>• <b>noSimulatePowerFailure (1)</b>: The value always returned for a <b>GET</b>. Setting this value has no effect.</li> <li>• <b>simulatePowerFailure (2)</b>: The UPS performs this test.</li> </ul>
<b>upsAdvControlFlashAndBeep</b>	<p>Cause the UPS to test its front panel lights (if any) and its audible alarm:</p> <ul style="list-style-type: none"> <li>• <b>noFlashAnd Beep (1)</b>: The value always returned for a <b>GET</b>. Setting this value has no effect.</li> <li>• <b>flashAndBeep (2)</b>: The UPS performs this test.</li> </ul>
<b>upsAdvControlTurnOnUPS</b>	<p>Cause a Management Card’s UPS to turn on:</p> <ul style="list-style-type: none"> <li>• <b>noTurnOnUPS (1)</b>: The value always returned for a <b>GET</b>. Setting this value has no effect.</li> <li>• <b>turnOnUPS (2)</b>: The UPS turns on, if that UPS was turned off using the <b>upsAdvControlUpsOff</b> OID.</li> </ul>
<b>upsAdvControlBypassSwitch</b>	<p>Switch a Matrix-UPS or Symmetra UPS to or from software bypass mode:</p> <ul style="list-style-type: none"> <li>• <b>noBypassSwitch (1)</b>: The value always returned for a <b>GET</b>. Setting this value has no effect.</li> <li>• <b>switchToBypass (2)</b>: The UPS switches to bypass mode.</li> <li>• <b>switchOutOfBypass (3)</b>: The UPS switches from bypass mode to normal operation.</li> </ul>

## How to Configure a UPS

You can use the OIDS in the **[upsConfig]** category to define how the UPS responds to specific operating conditions.

### **[upsConfig]**

Which **[upsConfig]** OIDs you can use depends on how the Management Card or PowerNet Agent connects to the UPS. The **[upsConfig]** category has two subcategories:

- **[upsBasicConfig]** for simple-signalling connections, which provide basic power management and protection but offer few additional configuration and monitoring options. (A Back-UPS supports only simple-signalling.)
- **[upsAdvConfig]** for smart-signalling connections, which provide full support for the advanced configuration and monitoring options available on all APC UPSs except Back-UPS.

### **[upsBasicConfig]**

The **[upsBasicConfig]** category has one read-only OID and a tabled set of OIDs that you can use to view or define information about the equipment supported by the UPS.

OID	Task
<b>upsBasicConfigNumDevices</b>	Identify the number of devices specified in the tabled set of OIDS <b>{upsBasicConfigDeviceTable}</b> , i.e. the number of devices plugged into the UPS.
<b>{upsBasicConfigDeviceTable}</b> <b>{upsBasicConfigDeviceEntry}</b> <b>deviceIndex</b> <b>deviceName</b> <b>vaRating</b> <b>acceptThisDevice</b>	<p>View or define information about the equipment supported by each UPS outlet:</p> <ul style="list-style-type: none"><li>• View read-only value that identifies the specific outlet.</li><li>• Define a 16-character name for the device at this outlet.</li><li>• Define the VA rating of the device this outlet supports</li></ul> <p>Add a device entry to the table or delete an existing device entry:</p> <ul style="list-style-type: none"><li>• <b>yes (1)</b>: Add an entry.</li><li>• <b>no (2)</b>: Delete an entry.</li></ul>

## [upsAdvConfig]

The OIDs in the [upsAdvConfig] category enable you to view or configure operating and shutdown parameters for a UPS connected in smart-signalling mode. A Management Card can use all the OIDs in this category. A PowerNet Agent can use all but four of the OIDs, as noted in the following table.

OID	Task (page 1 of 3)
<b>upsAdvConfigRatedOutputVoltage</b> <sup>1</sup>	Define the UPS nominal VAC output voltage. This value is read-only for most 120 VAC UPSs.
<b>upsAdvConfigHighTransferVolt</b> <sup>1</sup>	Define the input voltage at which the UPS will switch to its AVR Boost feature. If the UPS does not support AVR Boost, it switches to battery operation instead. (A Matrix-UPS, for example, does not support AVR Boost.)
<b>upsAdvConfigLowTransferVolt</b> <sup>2</sup>	Define the input voltage at which the UPS will switch to its AVR Trim feature. If the UPS does not support AVR Trim, it switches to battery operation instead. (A Matrix-UPS, for example, does not support AVR Trim.)
<b>upsAdvConfigAlarm</b>	Define when the UPS will generate an audible alarm for a line-fail condition: <ul style="list-style-type: none"> <li>• <b>timed (1)</b>: After the UPS switches to battery operation and waits the delay defined by the <b>upsAdvConfigAlarmTimer</b> OID.</li> <li>• <b>atLowBattery (2)</b>: When a low-battery condition occurs.</li> <li>• <b>never (3)</b>: No alarm occurs</li> </ul>
<b>upsAdvConfigAlarmTimer</b>	Define how long in seconds the UPS must wait after switching to battery operation before it can generate an alarm when <b>timed (1)</b> is the value for the <b>upsAdvConfigAlarm</b> OID. The only allowed values are 0 and 30. If you use any value of 1 second or more, the value is set to 30. If you use any value less than 1 second, the value is set to 0.
<b>upsAdvConfigMinReturnCapacity</b> <sup>2</sup>	Define the battery capacity (as a percentage of full capacity) required before the UPS can return from a low-battery shutdown.
<p><sup>1</sup> If a <b>SET</b> specifies an unsupported value, the UPS interprets the value as the next lower allowed value, as defined by the <b>apcUpsConfigFieldValueRange</b> OID in the tabled set of OIDs {<b>upsAdvConfigAllowedSetTable</b>}. If the value is less than the lowest allowable value, the lowest allowed value is used.</p> <p><sup>2</sup> If a <b>SET</b> specifies an unsupported value, the UPS interprets the value as the next higher allowed value, as defined by the <b>apcUpsConfigFieldValueRange</b> OID in the tabled set of OIDs {<b>upsAdvConfigAllowedSetTable</b>}. If the value is higher than the highest allowable value, the highest allowed value is used.</p>	

OID	Task (page 2 of 3)
<b>upsAdvConfigSensitivity</b>	<p>Define the sensitivity of the UPS to input line abnormalities or “noise.”</p> <ul style="list-style-type: none"> <li>• <b>auto (1)</b>: The only setting recognized by UPSs with automatic voltage regulators, e.g Matrix-UPS and Symmetra UPS.</li> <li>• <b>low (2)</b></li> <li>• <b>medium (3)</b></li> <li>• <b>high (4)</b></li> </ul>
<b>upsAdvConfigLowBatteryRunTime</b> <sup>2</sup>	Define when a low-battery condition will occur, based on how much battery runtime remains, in seconds.
<b>upsAdvConfigReturnDelay</b> <sup>2</sup>	Define the time in seconds that a UPS in sleep mode will wait after input power returns before turning on its power outlets. (In sleep mode, a UPS waits, with its power outlets turned off, for input power to return.)
<b>upsAdvConfigShutoffDelay</b> <sup>2</sup>	Define the delay time, in seconds, used for graceful turn-off, reboot, and sleep-control options. (See <b>How to Control a UPS</b> .) <b>Only Management Cards can use this OID.</b>
<b>upsAdvConfigUpsSleepTime</b>	Define how long the UPS will remain in timed sleep, specified as a multiple of 360 seconds (6 minutes). If a <b>SET</b> provides a value that is not a multiple of 360, the UPS rounds the value to the nearest multiple of 360, except that any value from 1 through 540 is rounded to 360. <b>Only Management Cards can use this OID.</b>
<b>upsAdvConfigSetEEPROMDefaults</b>	<p>Reset the UPS configuration values to the values set at the factory. <b>Only Management Cards can use this OID.</b></p> <ul style="list-style-type: none"> <li>• <b>noSetEEPROMDefaults (1)</b>: The value always returned by a <b>GET</b>. Setting this value has no effect.</li> <li>• <b>setEEPROMDefaults (2)</b>: Resets the values.</li> </ul>
<b>upsAdvConfigPassword</b>	Define the 4-byte password used for front-panel access to a Matrix-UPS or Symmetra UPS. <b>Only Management Cards can use this OID.</b>
<p><sup>1</sup> If a <b>SET</b> specifies an unsupported value, the UPS interprets the value as the next lower allowed value, as defined by the <b>apcUpsConfigFieldValueRange</b> OID in the tabled set of OIDs <b>{upsAdvConfigAllowedSetTable}</b>. If the value is less than the lowest allowable value, the lowest allowed value is used.</p> <p><sup>2</sup> If a <b>SET</b> specifies an unsupported value, the UPS interprets the value as the next higher allowed value, as defined by the <b>apcUpsConfigFieldValueRange</b> OID in the tabled set of OIDs <b>{upsAdvConfigAllowedSetTable}</b>. If the value is higher than the highest allowable value, the highest allowed value is used.</p>	

OID	Task (page 3 of 3)
<b>{upsAdvConfigAllowedSetTable}</b> <b>{apcUpsConfigEntry}</b> <b>apcUpsConfigFieldIndex</b> <b>apcUpsConfigFieldOID</b> <b>apcUpsConfigFieldValueRange</b>	Obtain the allowed values for all settable OIDs in the <b>[upsAdvConfig]</b> group. <ul style="list-style-type: none"> <li>• The index to an EEPROM field entry.</li> <li>• The OID of the current configurable value.</li> <li>• A comma-delimited list of allowed values for the OID</li> </ul>
<p><sup>1</sup> If a <b>SET</b> specifies an unsupported value, the UPS interprets the value as the next lower allowed value, as defined by the <b>apcUpsConfigFieldValueRange</b> OID in the tabled set of OIDs <b>{upsAdvConfigAllowedSetTable}</b>. If the value is less than the lowest allowable value, the lowest allowed value is used.</p> <p><sup>2</sup> If a <b>SET</b> specifies an unsupported value, the UPS interprets the value as the next higher allowed value, as defined by the <b>apcUpsConfigFieldValueRange</b> OID in the tabled set of OIDs <b>{upsAdvConfigAllowedSetTable}</b>. If the value is higher than the highest allowable value, the highest allowed value is used.</p>	

## How to Test a UPS

This section contains information on using OIDs to perform UPS self-tests and runtime calibrations.

### [upsTest]

The **[upsTest]** category contains the **[upsAdvTest]** sub-category for use by smart-signalling Management Cards or PowerNet Agents. There are no OIDs in the **[upsTest]** category for performing self-tests and calibrations for UPSs connected in simple-signalling mode because simple-signalling does not support those functions.

### [upsAdvTest]

You can use the OIDs in the **[upsAdvTest]** sub-category to schedule or initiate UPS self-tests and runtime calibrations and to view the results of UPS self-tests.

The OIDs in this sub-category have the following limitations on their use:

- A Management Card can use all these OIDs except **upsAdvTestLastDiagnosticsDate**, which can be used only by a PowerNet Agent.
- A PowerNet Agent can use all these OIDs except **upsAdvTestRuntimeCalibration**, which can be used only by a Management Card

OID	Task
<b>upsAdvTestDiagnosticSchedule</b>	<p>Define the self-test schedule for the UPS:</p> <ul style="list-style-type: none"> <li>• <b>unknown (1)</b>: The Management Card or Agent cannot determine the setting.</li> <li>• <b>biweekly (2)</b>: Self-tests will occur bi-weekly.</li> <li>• <b>weekly (3)</b>: A self-test will occur once every week.</li> <li>• <b>atTurnOn (4)</b>: A self-test will occur whenever the UPS turns on.</li> <li>• <b>never (5)</b>: No self-test will be performed.</li> </ul>
<b>upsAdvTestDiagnostics</b>	<p>Cause the UPS to perform an immediate self-test.</p> <ul style="list-style-type: none"> <li>• <b>noTestDiagnostics (1)</b>: The value always returned by a <b>GET</b>. Setting this value has no effect.</li> <li>• <b>testDiagnostics (2)</b>: Perform the test.</li> </ul>
<b>upsAdvTestDiagnosticsResults</b>	<p>View the result of the last self-test:</p> <ul style="list-style-type: none"> <li>• <b>ok (1)</b>:</li> <li>• <b>failed (2)</b>:</li> <li>• <b>invalidTest (3)</b>:</li> <li>• <b>testInProgress (4)</b>:</li> </ul>
<b>upsAdvTestLastDiagnosticDate</b>	<p>View the date (in <i>dd/mm/yy</i> format) of the last UPS self-test. <b>Only smart-signalling PowerNet Agents use this OID.</b></p>
<b>upsAdvTestRuntimeCalibration</b>	<p>Control a runtime calibration:</p> <ul style="list-style-type: none"> <li>• <b>noPerformCalibration (1)</b>: The value always returned by a <b>GET</b>. Setting this value has no effect.</li> <li>• <b>performCalibration (2)</b>: Starts a runtime calibration, if the UPS battery is at 100% capacity. If the battery capacity is not at 100%, a <b>SET</b> of this value results in an <b>invalidCalibration</b> setting for the <b>upsAdvTestCalibrationResults</b> OID.</li> <li>• <b>cancelCurrentCalibration (3)</b>: Cancels a runtime calibration. <b>Only a Management Card can use this OID.</b></li> </ul>
<b>upsAdvTestCalibrationResults</b>	<p>View the result of the last runtime calibration:</p> <ul style="list-style-type: none"> <li>• <b>ok (1)</b>: The runtime calibration was successful.</li> <li>• <b>invalidCalibration (2)</b>: The last calibration requested did not take place because battery capacity was less than 100%.</li> <li>• <b>calibrationInProgress (3)</b>: A calibration is occurring now.</li> </ul>
<b>upsAdvTestCalibrationDate</b>	<p>View the date (in <i>dd/mm/yy</i> format) of the last runtime calibration. <b>Only smart-signalling PowerNet Agents use this OID.</b></p>

## How to Use OIDs for 3-Phase UPS Models

The **[upsPhase]** category has OIDs in three subcategories

- **[upsPhaseResetValues]**: Set of OIDs you use to reset the counters for the corresponding OID in the **[upsPhaseInput]** and **[upsPhaseOutput]** groups that report minimum and maximum values.
- **[upsPhaseInput]**: Set of OIDs you use to obtain information about the input phases.
- **[upsPhaseOutput]**: Set of OIDs you use to obtain information about the output phases.

To access the values of OIDs in a table, select the OID table in the SNMP browser. (An OID table appears enclosed in braces {}.) For example, to access the OIDs that provide information on all input phases for a device, select **{upsPhaseInputPhaseTable}** in the SNMP browser, and then select **[upsPhaseInputEntry]** to see each OID in the table.

### **[upsPhaseResetValues]**

Use an OID in the **[upsPhaseReset Values]** group to reset the counters for the corresponding OID in the **[upsPhaseInput]** and **[upsPhaseOutput]** groups that report minimum and maximum values.

OID	Task
<b>upsBasicControlConserveBattery</b> <b>upsPhaseInputMaxVoltage</b> <b>upsPhaseInputMinVoltage</b> <b>upsPhaseInputMaxCurrent</b> <b>upsPhaseInputMinCurrent</b> <b>upsPhaseInputMaxPower</b> <b>upsPhaseInputMinPower</b> <b>upsPhaseOutputMaxCurrent</b> <b>upsPhaseOutputMinCurrent</b> <b>upsPhaseOutputMaxLoad</b> <b>upsPhaseOutputMinLoad</b> <b>upsPhaseOutputMaxPercentLoad</b> <b>upsPhaseOutputMinPercentLoad</b> <b>upsPhaseOutputMaxPower</b> <b>upsPhaseOutputMinPower</b> <b>upsPhaseOutputMaxPercentPower</b> <b>upsPhaseOutputMinPercentPower</b>	Resets the counter for the corresponding OID in the <b>[upsPhaseInput]</b> and <b>[upsPhaseOutput]</b> groups. For example, to reset the counter for the OID in the <b>[upsPhaseInput]</b> category that reports the maximum input current ( <b>upsPhaseInputMaxCurrent</b> ), <b>SET</b> to the OID with that name in this <b>[upsPhaseResetValues]</b> category.

## [upsPhaseInput]

All of the OIDs in this category are read-only except for the **upsPhaseInputName** OID, a {upsPhaseInputEntry} in the {upsPhaseInputTable}.

OID	Task
<b>upsPhaseNumInputs</b> {upsPhaseInputTable} {upsPhaseInputEntry} upsPhaseInputTableIndex upsPhaseNumInputPhases upsPhaseInputVoltageOrientation upsPhaseInputFrequency upsPhaseInputType upsPhaseInputName	Use these read-only OIDs to obtain information about the number of input feeds to the UPS, and information about each of those feeds.
<b>(upsPhaseInputPhaseTable)</b> {upsPhaseInputPhaseEntry} upsPhaseInputPhaseTableIndex upsPhaseInputPhaseIndex upsPhaseInputVoltage upsPhaseInputMaxVoltage upsPhaseInputMinVoltage upsPhaseInputCurrent upsPhaseInputMaxCurrent upsPhaseInputMinCurrent upsPhaseInputPower upsPhaseInputMaxPower upsPhaseInputMinPower	Use the read-only OIDs to obtain the following information for each input phase: <ul style="list-style-type: none"> <li>• The input voltage, input current, and input power now.</li> <li>• The minimum and maximum value recorded for the input voltage, input current, and input power since the corresponding counters were reset by the OIDs in the <b>[upsPhaseResetValues]</b> group.</li> </ul> The number of entries in the table depends on the sum of the values reported for <b>upsPhaseNumInputPhases</b> in the {upsPhaseInputTable} described above.

## [upsPhaseOutput]

All of the OIDs in this category are read-only except for the **upsPhaseOutputName** OID, a {upsPhaseOutputEntry} in the {upsPhaseOutputTable}.

OID	Task
<b>upsPhaseNumOutputs</b> {upsPhaseOutputTable} {upsPhaseOutputEntry} upsPhaseOutputTableIndex upsPhaseNumOutputPhases upsPhaseOutputVoltageOrientation upsPhaseOutputFrequency upsPhaseOutputName	Use these read-only OIDs to obtain information about the number of output feeds to the UPS, and information about each of those feeds.
<b>(upsPhaseInputPhaseTable)</b> {upsPhaseInputPhaseEntry} upsPhaseInputPhaseTableIndex upsPhaseInputPhaseIndex upsPhaseInputVoltage upsPhaseInputMaxVoltage upsPhaseInputMinVoltage upsPhaseInputCurrent upsPhaseInputMaxCurrent upsPhaseInputMinCurrent upsPhaseInputPower upsPhaseInputMaxPower upsPhaseInputMinPower	Use the read-only OIDs to obtain the following information for each input phase: <ul style="list-style-type: none"> <li>• The output voltage, output current, output load and output power now.</li> <li>• The minimum and maximum value recorded for the output voltage, output current, output load and output power since the corresponding counters were reset by the OIDs in the <b>[upsPhaseResetValues]</b> group.</li> </ul> <p>The number of entries in the table depends on the sum of the values reported for <b>upsPhaseNumOutputPhases</b> in the {upsPhaseOutputTable} above.</p>

# Chapter 4: How to Manage an Environmental Monitor

This chapter describes how to use the following PowerNet MIB OIDs to manage (monitor, configure, and control) an Environmental Monitor through its Management Card or PowerNet Agent.

- **External Environmental Monitor (em) OIDs**
- **Integrated Environmental Monitor (iem) OIDs (AP9618 or AP9619 Network Management Card Only)**
- **Measure-UPS (mUps) OIDs**



*Note:*

*The external Environmental Monitor (em) OIDs expand on the management capabilities provided by the mUps OIDs. The mUps OIDs have been kept in the MIB for compatability with previous versions of the PowerNet MIB.*

## External Environmental Monitor (em) OIDs

Three categories of em OIDs provide for managing external Environmental Monitors.

- **[emIdent] OID**
- **[emConfig] OIDs**
- **[emStatus] OIDs**

To access these em OIDs in the PowerNet MIB, do the following:

1. Select **[products]** under **[apc]**.
2. Select **[hardware]**.
3. Select **[environmentalMonitor]**.
4. Select **[external]**.

### [emIdent] OID

A single **[emIdent]** OID, **emIdentFirmwareRevision**, identifies the firmware used by the Environmental Monitor.


## [emConfig] OIDs

Two sets of [emConfig] OIDs are available to configure an external Environmental Monitor:

- [emConfigProbes] OIDs
- [emConfigContacts] OIDs

### [emConfigProbes] OIDs

You use the following [emConfigProbes] OIDs to view and change values used by the temperature and humidity probes at an external Environmental Monitor.

OID	Task
<b>emConfigProbesNumProbes</b>	View how many probes are available (read-only).
<b>{emConfigProbesTable}</b> <b>{emConfigProbesEntry}</b> <b>emConfigProbeNumber</b>  <b>emConfigProbeName</b> <b>emConfigProbeHighTempThreshold</b> <b>emConfigProbeLowTempThreshold</b> <b>emConfigProbeTempUnits</b>	Access the set of OIDs for each probe and perform the following: <ul style="list-style-type: none"> <li>• View the number of the probe to which this set of OIDs applies (read-only).</li> <li>• Define a descriptive name for the probe.</li> <li>• Set the high-temperature threshold.</li> <li>• Set the low-temperature threshold.</li> <li>• View whether the probe uses <b>Celsius (1)</b> or <b>Fahrenheit (2)</b> temperature values (read-only).</li> </ul> <div style="margin-top: 10px;">  <p><i>Note:</i> The temperature unit is defined by a system preferences setting at the agent.</p> </div>
<b>emConfigProbeHighHumidThreshold</b> <b>emConfigProbeLowHumidThreshold</b>  <b>emConfigProbeHighTempEnable</b> <b>emConfigProbeLowTempEnable</b> <b>emConfigProbeHighHumidEnable</b> <b>emConfigProbeLowHumidEnable</b>	<ul style="list-style-type: none"> <li>• Set the high-humidity threshold.</li> <li>• Set the low-humidity threshold.</li> <li>• Enable or disable the following alarms:               <ul style="list-style-type: none"> <li>- High-temperature threshold alarm</li> <li>- Low-temperature threshold alarm</li> <li>- High-humidity threshold alarm</li> <li>- Low-humidity threshold alarm</li> </ul> </li> </ul>

## ***[emConfigContacts] OIDs***

You use the following **[emConfigContacts]** OIDs to view and change values used by the input contacts at an external Environmental Monitor.

OID	Task
<b>emConfigContactsNumContacts</b>	View how many contacts are available (read-only).
<b>{emConfigContactsTable} {emConfigContactsEntry} emConfigContactNumber  emConfigContactName emConfigContactEnable</b>	Access the set of OIDs for each input contact and perform the following: <ul style="list-style-type: none"><li>• Identify the contact to which this set of OIDs applies (read-only).</li><li>• Define a descriptive name for the contact.</li><li>• Enable or disable the contact alarm.</li></ul>

## ***[emStatus] OIDs***

Three types of **[emStatus]** read-only OIDs are available to view the status at an external Environmental Monitor:

- **[emStatusCommStatus] OID**
- **[emStatusProbes] OIDs**
- **[emStatusProbes] OIDs**


## ***[emStatusCommStatus] OID***

You use this read-only OID to view the status of the communication between the agent and the external Environmental Monitor.

Status	Description
<b>noComm (1)</b>	Communication has not been established.
<b>comm (2)</b>	Communication has been established.
<b>commLost (3)</b>	Communication was lost after it had been established.

## **[emStatusProbes] OIDs**

You use the following **[emStatusProbes]** read-only OIDs to view information about the temperature and humidity probes at an external Environmental Monitor.

OID	Information Reported
<b>emStatusProbesNumProbes</b>	The number of available probes
<b>{emStatusProbesTable}</b> <b>{emStatusProbesEntry}</b> <b>emStatusProbeNumber</b> <b>emStatusProbeName</b> <b>emStatusProbeStatus</b>  <b>emStatusProbeCurrentTemp</b> <b>emStatusProbeTempUnits</b>  <b>emStatusProbeCurrentHumid</b> <b>emStatusProbeHighTempViolation</b>  <b>emStatusProbeLowTempViolation</b>  <b>emStatusProbeHighHumidViolation</b>  <b>emStatusProbeLowHumidViolation</b>	Access the set of OIDs for each input contact and view the following information: <ul style="list-style-type: none"> <li>• The number of the probe</li> <li>• The name of the probe</li> <li>• The <b>disconnected (1)</b> or <b>connected (2)</b> status of the probe</li> <li>• The current temperature reading at the probe</li> <li>• Whether <b>Celsius (1)</b> or <b>Fahrenheit (2)</b> temperature values are used by the probe</li> </ul>  <p><i>Note:</i> The temperature unit is defined by a system preferences setting at the agent.</p> <ul style="list-style-type: none"> <li>• The current humidity reading at the probe</li> <li>• The <b>noViolation (1)</b>, <b>highTempViolation (2)</b>, or <b>disabled (3)</b> status of the high-temperature alarm</li> <li>• The <b>noViolation (1)</b>, <b>lowTempViolation (2)</b>, or <b>disabled (3)</b> status of the low-temperature alarm</li> <li>• The <b>noViolation (1)</b>, <b>highHumidViolation (2)</b>, or <b>disabled (3)</b> status of the high-humidity alarm</li> <li>• The <b>noViolation (1)</b>, <b>lowHumidViolation (2)</b>, or <b>disabled (3)</b> status of the low-humidity alarm</li> </ul>

## **[emStatusContacts] OIDs**

You use the following **[emStatusContacts]** read-only OIDs to view information about the input contacts at an external Environmental Monitor.

OID	Information Reported
<b>emStatusContactsNumContacts</b>	The number of available contacts
<b>{emStatusContactsTable}</b> <b>{emStatusContactsEntry}</b> <b>emStatusContactNumber</b> <b>emStatusContactName</b> <b>emStatusContactStatus</b>	Access the set of OIDs for each input contact and view the following information: <ul style="list-style-type: none"> <li>• The number of the contact</li> <li>• The name of the contact</li> <li>• The <b>noFault (1)</b>, <b>fault (2)</b>, or <b>disabled (3)</b> status of the contact alarm</li> </ul>

## Integrated Environmental Monitor (iem) OIDs (AP9618 or AP9619 Network Management Card Only)

Three categories of iem OIDs provide for managing the Integrated Environmental Monitor at an AP9618 or AP9619 Network Management Card.

- **[iemIdent] OID**
- **[iemConfig] OIDs**
- **[iemStatus] OIDs**



*Note:*

*The Integrated Environmental Monitor has one probe, two input contacts, and an output relay available.*

To access these iem OIDs in the PowerNet MIB, do the following:

1. Select **[products]** under **[apc]**.
2. Select **[hardware]**.
3. Select **[environmentalMonitor]**.
4. Select **[integrated]**.

### [iemIdent] OID

A single **[iemIdent]** OID, **iemIdentHardwareRevision**, identifies the hardware version for the Integrated Environmental Monitor.


### [iemConfig] OIDs

Two sets of **[iemConfig]** OIDs are available to configure an Integrated Environmental Monitor:

- **[iemConfigProbes] OIDs**
- **[iemConfigContacts] OIDs**

## [iemConfigProbes] OIDs

You use the following [iemConfigProbes] OIDs to view and change values used by the temperature and humidity probe at an Integrated Environmental Monitor.

OID	Task
<b>iemConfigProbesNumProbes</b>	View whether the single probe is available (read-only).
<b>{iemConfigProbesTable}</b> <b>{iemConfigProbesEntry}</b> <b>iemConfigProbeNumber</b> <b>iemConfigProbeName</b> <b>iemConfigProbeHighTempThreshold</b> <b>iemConfigProbeLowTempThreshold</b> <b>iemConfigProbeTempUnits</b>	Access the set of OIDs for the probe and perform the following: <ul style="list-style-type: none"> <li>• View the number of the probe (read only).</li> <li>• Define a descriptive name for the probe.</li> <li>• Set the high-temperature threshold.</li> <li>• Set the low-temperature threshold.</li> <li>• View whether the probe uses <b>Celsius (1)</b> or <b>Fahrenheit (2)</b> temperature values (read-only).</li> </ul> <div style="text-align: center;">  <p><i>Note:</i> The temperature unit is defined by a system preferences setting at the agent.</p> </div>
<b>iemConfigProbeHighHumidThreshold</b> <b>iemConfigProbeLowHumidThreshold</b>	<ul style="list-style-type: none"> <li>• Set the high-humidity threshold.</li> <li>• Set the low-humidity threshold.</li> </ul>
<b>iemConfigProbeHighTempEnable</b> <b>iemConfigProbeLowTempEnable</b> <b>iemConfigProbeHighHumidEnable</b> <b>iemConfigProbeLowHumidEnable</b>	<ul style="list-style-type: none"> <li>• Enable or disable the following alarms:               <ul style="list-style-type: none"> <li>- High-temperature threshold alarm</li> <li>- Low-temperature threshold alarm</li> <li>- High-humidity threshold alarm</li> <li>- Low-humidity threshold alarm</li> </ul> </li> </ul>

## [iemConfigContacts] OIDs

You use the following [iemConfigContacts] OIDs to view and change values used by the input contacts at an Integrated Environmental Monitor.

OID	Task
<b>iemConfigContactsNumContacts</b>	View how many contacts are available (read-only).
<b>{iemConfigContactsTable}</b> <b>{iemConfigContactsEntry}</b> <b>iemConfigContactNumber</b>	Access the set of OIDs for each input contact and perform the following: <ul style="list-style-type: none"> <li>• Identify the contact to which this set of OIDs applies (read-only).</li> </ul>
<b>iemConfigContactName</b> <b>iemConfigContactEnable</b>	<ul style="list-style-type: none"> <li>• Define a descriptive name for the contact.</li> <li>• Enable or disable the contact alarm.</li> </ul>


## [iemStatus] OIDs

Three types of **[iemStatus]** read-only OIDs are available to view the status at an external Environmental Monitor:

- **[iemStatusProbes]** OIDs
- **[iemStatusContacts]** OIDs
- **[iemStatusRelays]** OIDs

### [iemStatusProbes] OIDs

You use the following **[iemStatusProbes]** read-only OIDs to view information about the temperature and humidity probes at an Integrated Environmental Monitor.

OID	Information Reported
<b>iemStatusProbesNumProbes</b>	The number of available probes
<b>{iemStatusProbesTable}</b> <b>{iemStatusProbesEntry}</b> <b>iemStatusProbeNumber</b> <b>iemStatusProbeName</b> <b>iemStatusProbeStatus</b>  <b>iemStatusProbeCurrentTemp</b> <b>iemStatusProbeTempUnits</b>   <b>iemStatusProbeCurrentHumid</b> <b>iemStatusProbeHighTempViolation</b>  <b>iemStatusProbeLowTempViolation</b>  <b>iemStatusProbeHighHumidViolation</b>  <b>iemStatusProbeLowHumidViolation</b>	<p>Access the set of OIDs for each input contact and view the following information:</p> <ul style="list-style-type: none"> <li>• The number of the probe</li> <li>• The name of the probe</li> <li>• The <b>disconnected (1)</b> or <b>connected (2)</b> status of the probe</li> <li>• The current temperature reading at the probe</li> <li>• Whether <b>Celsius (1)</b> or <b>Fahrenheit (2)</b> temperature values are used by the probe</li> </ul> <p> <i>Note:</i> The temperature unit used is defined by a system preferences setting at the agent.</p> <ul style="list-style-type: none"> <li>• The current humidity reading at the probe</li> <li>• The <b>noViolation (1)</b>, <b>highTempViolation (2)</b>, or <b>disabled (3)</b> status of the high-temperature alarm</li> <li>• The <b>noViolation (1)</b>, <b>lowTempViolation (2)</b>, or <b>disabled (3)</b> status of the low-temperature alarm</li> <li>• The <b>noViolation (1)</b>, <b>highHumidViolation (2)</b>, or <b>disabled (3)</b> status of the high-humidity alarm</li> <li>• The <b>noViolation (1)</b>, <b>lowHumidViolation (2)</b>, or <b>disabled (3)</b> status of the low-humidity alarm</li> </ul>

## **[iemStatusContacts] OIDs**

You use the following **[iemStatusContacts]** read-only OIDs to view information about the input contacts at an Integrated Environmental Monitor.

OID	Information Reported
<b>iemStatusContactsNumContacts</b>	The number of available contacts
<b>{iemStatusContactsTable}</b> <b>{iemStatusContactsEntry}</b> <b>iemStatusContactNumber</b> <b>iemStatusContactName</b> <b>iemStatusContactStatus</b>	Access the set of OIDs for each input contact and view the following information: <ul style="list-style-type: none"> <li>• The number of the contact</li> <li>• The name of the contact</li> <li>• The <b>noFault (1)</b>, <b>fault (2)</b>, or <b>disabled (3)</b> status</li> </ul>

## **[iemStatusRelays] OIDs**

You use the following **[iemStatusRelays]** read-only OIDs to view information about the output relay associated with the Integrated Environmental Monitor.

OID	Information Reported
<b>iemStatusRelaysNumRelays</b>	The number of available output relays
<b>{iemStatusRelaysTable}</b> <b>{iemStatusRelaysEntry}</b> <b>iemStatusRelayNumber</b> <b>iemStatusRelayName</b> <b>iemStatusRelaytStatus</b>	Access the set of OIDs for each output relay and view the following information: <ul style="list-style-type: none"> <li>• The number of the output relay</li> <li>• The name of the output relay</li> <li>• The <b>faultState (1)</b> or <b>normalState (2)</b> status</li> </ul>

# **Measure-UPS (mUps) OIDs**

Two categories of mUps OIDs provide for managing external Environmental Monitors through a Management Card or PowerNet Agent that uses a previous version of the PowerNet MIB.

- **[mUpsEnviron] Environment OIDs**
- **[mUpsContact] Contact OIDS**

To access these mUps OIDs in the PowerNet MIB, do the following:

1. Select **[products]** under **[apc]**.
2. Select **[hardware]**.
3. Select **[measureUps]**.

## [mUpsEnviron] Environment OIDs


An Environmental Monitor can monitor an environment's ambient temperature and relative humidity. You use two read-only [mUpsEnviron] OIDs to view those temperature and humidity values.

OID	Information Reported
<b>mUpsEnvironAmbientTemperature</b>	The ambient temperature, in Celsius or Fahrenheit, depending on the configuration, sensed by the Environmental Monitor.
<b>mUpsEnvironRelativeHumidity</b>	The relative humidity (as a percentage) sensed by the Environmental Monitor.

## [mUpsContact] Contact OIDS

An Environmental Monitor or Measure-UPS can have up to four input contacts in use. Each sensor provides an open contact condition and a closed contact condition.

You use the following [mUpsContact] OIDs to view and change input contact values for a an Environmental Monitor or Measure-UPS. However, with an Environmental Monitor you cannot use an OID to set or view the normal status of the contacts.

OID	Task
<b>mUpsContactNumContacts</b>	Determine how many input contacts the Environmental Monitor or Measure-UPS is using.
<b>{mUpsContactTable}</b> <b>{mUpsContactEntry}</b> <b>contactNumber</b> <b>normalState</b>  <b>description</b> <b>monitoringStatus</b>  <b>currentStatus</b>	<p>Access the set of OIDs for each input contact and perform the following:</p> <ul style="list-style-type: none"> <li>Identify the input contact to which this set of OIDs applies.</li> <li>Define the input contact's normal condition for a Measure-UPS: <b>open (2)</b> or <b>closed (3)</b>.</li> </ul> <p> <b>Caution:</b>  <i>An Environmental Monitor always report <b>unknown (1)</b> because the normal condition is not detectable via software.</i></p> <ul style="list-style-type: none"> <li>Define a brief description of the input contact's purpose.</li> <li>Define whether the Measure-UPS will monitor the input contact. <ul style="list-style-type: none"> <li><b>unknown (1)</b>: The monitoring status cannot be determined.</li> <li><b>enabled (2)</b>: The input contact will be monitored.</li> <li><b>disabled (3)</b>: The input contact will not be monitored.</li> </ul> </li> <li>Identify the current condition of the input contact: <b>unknown (1)</b>, <b>noFault (2)</b> or <b>fault (3)</b>.</li> </ul>

# Chapter 5: How to Manage a MasterSwitch Unit

This chapter describes how to use PowerNet MIB OIDs to manage a MasterSwitch unit, MasterSwitch VM unit, or MasterSwitch Plus unit. For information on how to manage the Agent that these units use, see **How to Manage the SNMP Agent at a Hardware Device in Chapter 2**.

To list the five OID categories that you use to manage a MasterSwitch unit, perform the following steps:

1. Select **[products]** under **[apc]**.
2. Select **[hardware]**.
3. Select **[masterswitch]**.

OID Categories	Tasks
<b>[sPDUIdent]</b>	Identify the MasterSwitch unit by its identification parameter values. See <b>[sPDUIdent] Identification OIDs</b> .
<b>[sPDUMasterControl]</b>	Directly affect the overall operation of the MasterSwitch unit. See <b>[sPDUMasterControl] Master Control OIDs</b> .
<b>[sPDUMasterConfig]</b>	Modify parameters that affect the overall operation of the MasterSwitch unit. See <b>[sPDUMasterConfig] Master Configuration OIDs</b> .
<b>[sPDUOutletControl]</b>	Directly affect the current operation of an outlet at a MasterSwitch unit. See <b>[sPDUOutletControl] Outlet Control OIDs</b> .
<b>[sPDUOutletConfig]</b>	Modify parameters that affect the operation of an outlet at a MasterSwitch unit. See <b>[sPDUOutletConfig] Outlet Configuration OIDs</b> .

## [sPDUIIdent] Identification OIDS

The [sPDUIIdent] category has five read-only OIDs that report MasterSwitch unit identification parameter values.




*Note:*

*MasterSwitch unit version 2.x identification parameters reflect the values of the Web/SNMP Management Card (AP9606)*

OID	Information Reported
sPDUIIdentHardwareRev	The MasterSwitch unit's hardware version
sPDUIIdentFirmwareRev	The MasterSwitch unit's firmware version
sPDUIIdentDateOfManufacture	The date on which the MasterSwitch unit completed the manufacturing process, in <i>mm/dd/yyyy</i> format
sPDUIIdentModelNumber	The MasterSwitch unit's model number
sPDUIIdentSerialNumber	The MasterSwitch unit's serial number



## [sPDUMasterControl] Master Control OIDs

The [sPDUMasterControl] category has two OIDs that respond to **GETs** with information about all eight outlets and a third OID that uses **SETs** to directly affect the operation of all outlets simultaneously.

OID	Task
sPDUMasterControlSwitch	<p>Affect the operation of all outlets.</p> <ul style="list-style-type: none"> <li>• <b>turnAllOnNow (1)</b>: Immediately turn on all outlets.</li> <li>• <b>turnAllOnSequence (2)</b>: Turn on all outlets by using the <b>sPDUOutletPowerOnTime</b> OID value for each outlet.</li> <li>• <b>turnAllOffNow (3)</b>: Immediately turn off all outlets.</li> <li>• <b>rebootAllNow (4)</b>: Immediately reboot all outlets by turning off power and then turning on power based on the master power's <b>sPDUMasterConfigReboot</b> configuration OID value.</li> <li>• <b>rebootAllSequence (5)</b>: <ul style="list-style-type: none"> <li>- For firmware version 2.x: Turn off all outlets as described for <b>turnAllOffSequence</b>, wait the delay time specified as <b>sPDUMasterConfigReboot</b>, and then turn on all outlets as described for <b>turnAllOnSequence</b>.</li> <li>- For firmware version 1.x: Reboot all outlets as described for <b>turnAllOnSequence</b>.</li> </ul> </li> <li>• <b>noCommand (6)</b>: The value returned for a <b>GET</b>.</li> <li>• <b>turnAllOffSequence (7)</b>: Turn off all outlets by using each outlet's <b>sPDUOutletPowerOffTime</b> configuration OID value.</li> </ul> <p> Note: The <b>turnAllOffSequence (7)</b> setting has no effect when used with firmware version 1.x.</p>
sPDUMasterState	Identify the <b>on</b> or <b>off</b> status of the eight outlets.
sPDUMasterPending	Identify whether any outlet has a command pending ( <b>yes</b> or <b>no</b> ).
<p>For information on [sPDUMasterConfigReboot] and [sPDUMasterConfigPowerOn], see [sPDUMasterConfig] Master Configuration OIDs; for information on [sPDUMasterConfigReboot] and [sPDUOutletPowerOnTime] OIDs, see [sPDUOutletConfig] Outlet Configuration OIDs.</p>	

## [sPDUMasterConfig] Master Configuration OIDs

The [sPDUMasterConfig] category has three OIDs that allow you to use SETs to define two overall operational values and a name for the MasterSwitch unit. If the MasterSwitch unit uses firmware version 2.x, the sPDUMasterConfigReboot OID is read-only.

OID	Task
sPDUMasterConfigPowerOn	<p>Define how long a delay will occur after power is applied to the MasterSwitch unit until it supplies power to the outlets.</p> <ul style="list-style-type: none"> <li>• <b>-1</b>: Never apply power automatically; you must turn on outlets manually.</li> <li>• <b>0</b>: Apply power immediately, with no delay.</li> <li>• <b>15</b>: 15-second delay.</li> <li>• <b>30</b>: 30-second delay.</li> <li>• <b>45</b>: 45-second delay.</li> <li>• <b>60</b>: 1-minute delay.</li> <li>• <b>120</b>: 2-minute delay.</li> <li>• <b>300</b>: 5-minute delay.</li> </ul>  <p><i>Note:</i> Each outlet's <b>sPDUOutletConfigPowerOn Time</b> configuration OID also affects the time it takes for an outlet to provide power. See <a href="#">[sPDUOutletConfig] Outlet Configuration OIDs</a>.</p>
sPDUMasterConfigReboot	<p>Define how long a delay after master power is turned off during a reboot sequence until master power is turned on again. This OID checks the delay that is set for each outlet and reports the longest of these delays. <b>This OID is read-only for firmware version 2.x.</b></p> <ul style="list-style-type: none"> <li>• <b>5</b>: 5-second delay.</li> <li>• <b>10</b>: 10-second delay.</li> <li>• <b>15</b>: 15-second delay.</li> <li>• <b>20</b>: 20-second delay.</li> <li>• <b>30</b>: 30-second delay.</li> <li>• <b>45</b>: 45-second delay.</li> <li>• <b>60</b>: 1-minute delay.</li> </ul>  <p><i>Note:</i> Each outlet's <b>sPDUOutletConfigPowerOnTime</b> configuration OID also affects the time it takes for an outlet to provide power. See <a href="#">[sPDUOutletConfig] Outlet Configuration OIDs</a>.</p>
sPDUMasterConfigPDUName	<p>Define a name (of up to 20 characters) for the MasterSwitch unit.</p>

## [sPDUOutletControl] Outlet Control OIDs

The [sPDUOutletControl] category has a read-only OID and a tabled set of OIDs.

OID	Task
sPDUOutletControlTableSize	Identify the number of MasterSwitch unit outlets (always 8)
{sPDUOutletControlTable} {sPDUOutletControlEntry} sPDUOutletControlIndex sPDUOutletPending  sPDUOutletCtl       sPDUOutletCtlName	<p>View and control each outlet individually:</p> <ul style="list-style-type: none"> <li>The outlet number (read-only).</li> <li>Identify whether the outlet has a command pending: <ul style="list-style-type: none"> <li><b>commandPending (1)</b>: A command is pending.</li> <li><b>noCommandPending (2)</b>: There is no pending command.</li> <li><b>commandPendingUnknown (3)</b>: This is an error condition. To clear the condition, shut down all devices powered by the MasterSwitch unit, and turn power off and then on to the MasterSwitch unit.</li> </ul> </li> <li>Affect the outlet's current operation. <ul style="list-style-type: none"> <li><b>outletOn (1)</b>: Turn on the outlet's power.</li> <li><b>outletOff (2)</b>: Turn off the outlet's power.</li> <li><b>outletReboot (3)</b>: Turn off and then turn on the outlet's power.</li> <li><b>outletUnknown (4)</b>: This is an error condition. Shut down all devices powered by the MasterSwitch unit, then turn power off and on to the MasterSwitch unit to clear the condition.</li> <li><b>outletOnWithDelay (5)</b>: <b>Not valid for firmware version 1.x.</b> Turn on the outlet's power after the delay specified as <b>sPDUOutletPowerOnTime</b>.</li> <li><b>outletOffWithDelay (6)</b>: <b>Not valid for firmware version 1.x.</b> Turn off the outlet's power after the delay specified as <b>sPDUOutletPowerOffTime</b>.</li> <li><b>outletRebootWithDelay (7)</b>: <b>Not valid for firmware version 1.x.</b> After the delay specified as <b>sPDUOutletPowerOffTime</b>, turn off the outlet's power, wait the time specified as <b>sPDUOutletRebootDuration</b>, and turn on the outlet's power.</li> </ul> </li> <li>Identify the outlet's name (20 characters or less) as defined by <b>sPDUOutletName</b>. See <a href="#">[sPDUOutletConfig] Outlet Configuration OIDs</a>.</li> </ul>

## [sPDUOutletConfig] Outlet Configuration OIDs

The **[sPDUOutletConfig]** category has a read-only OID and a tabled set of OIDs.

OID	Task
sPDUOutletConfigTableSize	Identify the number of MasterSwitch unit outlets (always 8).
{sPDUOutletConfigTable} {sPDUOutletConfigEntry} sPDUOutletConfigIndex sPDUOutletPowerOnTime  sPDUOutletName sPDUOutletPowerOffTime  sPDUOutletRebootDuration	View and configure each outlet individually. <ul style="list-style-type: none"> <li>The outlet number (read-only).</li> <li>Define how long the outlet will wait to provide output power after the MasterSwitch unit is turned on. <ul style="list-style-type: none"> <li>-1: Never start providing output power automatically.</li> <li>0: Begin providing output power immediately.</li> <li>15: 15-second delay</li> <li>30: 30-second delay</li> <li>45: 45-second delay</li> <li>60: 1-minute delay</li> <li>120: 2-minute delay</li> <li>300: 5-minute delay</li> </ul> </li> <li>Define a name of up to 20 characters for the outlet.</li> <li><b>Not valid for Firmware version 1.x.</b> Define the time that the outlet will wait after being commanded to turn off its output power until it does turn off its output power <ul style="list-style-type: none"> <li>-1: Never stop providing output power automatically</li> <li>0: Stop providing output power immediately.</li> <li>15: 15-second delay</li> <li>30: 30-second delay</li> <li>45: 45-second delay</li> <li>60: 1-minute delay</li> <li>120: 2-minute delay</li> <li>300: 5-minute delay</li> </ul> </li> <li><b>Not valid for Firmware version 1.x.</b> Define how long a delay will occur after power is turned off during a reboot sequence until power is turned on again. <ul style="list-style-type: none"> <li>5: 5-second delay</li> <li>10: 10-second delay</li> <li>15: 15-second delay</li> <li>20: 20-second delay</li> <li>30: 30-second delay</li> <li>45: 45-second delay</li> <li>60: 1-minute delay</li> </ul> </li> </ul>

# Chapter 6: How to Manage a MasterSwitch VM Unit

This chapter describes how to use PowerNet MIB OIDs to manage (monitor, configure, control and test) a MasterSwitch VM unit.

The MasterSwitch VM unit has its own SNMP agent that allows you to use SNMP to manage the MasterSwitch VM unit or any of its eight relay-controlled outlets. A maximum of four MasterSwitch VM units can be connected in a daisy chain and managed via SNMP. For more information on how to manage the SNMP agent, see **How to Manage the SNMP Agent at a Hardware Device in Chapter 2**.

To list the seven categories of PowerNet MIB OIDs that you use to manage a MasterSwitch VM unit, perform the following steps:

1. Select [\[products\]](#) under [\[apc\]](#).
2. Select [\[hardware\]](#).
3. Select [\[masterSwitchVM\]](#).

OID Categories	Tasks
<a href="#">[sPDUIdentVM]</a>	Identify the MasterSwitch VM unit by its identification parameter values. See <a href="#">[sPDUIdentVM] Identification OIDs</a> .
<a href="#">[sPDUMasterControlVM]</a>	Directly affect the overall operation of the MasterSwitch VM unit. See <a href="#">[sPDUMasterControlVM] Master Control OIDs</a> .
<a href="#">[sPDUMasterConfigVM]</a>	Modify parameters that affect the overall operation of the MasterSwitch VM unit. See <a href="#">[sPDUMasterConfigVM] Master Configuration OIDs</a> .
<a href="#">[sPDUMasterStatusVM]</a>	Identify the status of MasterSwitch VM unit. See <a href="#">[sPDUMasterStatusVM] Master Status OIDs</a> .
<a href="#">[sPDUOutletControlVM]</a>	Directly affect the operation of an outlet at a MasterSwitch VM unit. See <a href="#">[sPDUOutletControlVM] Outlet Control OIDs</a> .
<a href="#">[sPDUOutletConfigVM]</a>	Modify parameters that affect the operation of an outlet at a MasterSwitch VM unit. See <a href="#">[sPDUOutletConfigVM] Outlet Configuration OIDs</a> .
<a href="#">[sPDUOutletStatusVM]</a>	Identify the status of the outlets of the MasterSwitch VM unit. See <a href="#">[sPDUOutletStatusVM] Outlet Status OIDs</a> .

## [sPDUIdentVM] Identification OIDs

The [sPDUIdentVM] category has a read-only OID and a tabled set of read-only OIDs that return values for MasterSwitch VM unit's identification parameters.



*Note:*

*The last five OIDs in the following table are set at the factory.*

OID	Information Reported
sPUIdentVMTableSize	The number of MasterSwitch VM units.
{sPDUIdentVMTable} {sPDUIdentVMEntry} sPDUIdentVMIndex sPDUIdentNameVM  sPDUIdentHardwareRevVM sPDUIdentFirmwareRevVM sPDUIdentDateofManufactureVM  sPDUIdentModelNumberVM sPDUIdentSerialNumberVM	View the following information about a specified MasterSwitch VM unit. <ul style="list-style-type: none"> <li>• The index to the MasterSwitch VM unit's entry.</li> <li>• The name of the MasterSwitch VM unit. (You use the <a href="#">sPDUMasterConfigVMName</a> OID to define this name.)</li> <li>• The MasterSwitch VM unit's hardware version.</li> <li>• The MasterSwitch VM unit's firmware version.</li> <li>• The date on which the MasterSwitch VM unit completed the manufacturing process, in <i>mm/dd/yyyy</i> format.</li> <li>• The MasterSwitch VM unit's model number.</li> <li>• The MasterSwitch VM unit's serial number.</li> </ul>

## [sPDUMasterControlVM] Master Control OIDs

The [sPDUMasterControlVM] category has a read-only OID and a tabled set of OIDs that provide information on the MasterSwitch VM unit and commands to control it.

OID	Task
sPDUMasterControlVMTableSize	The number of MasterSwitch VM units.
{sPDUMasterControlVMTable} {sPDUMasterControlVMEntry} sPDUMasterControlVMIndex sPDUMasterControlVMName  sPDUMasterControlVMCommand	View and control a specified MasterSwitch VM unit. <ul style="list-style-type: none"> <li>The index to the MasterSwitch VM unit's entry (read-only).</li> <li>The name for the MasterSwitch VM unit (read-only). (You use the <a href="#">sPDUMasterConfigVMName</a> OID to define this name.)</li> <li>Affect the current outlet state. <ul style="list-style-type: none"> <li><b>noCommandAllVM (1)</b>: The value returned by an SNMP <b>GET</b> of this OID.</li> <li><b>immediateAllOnVM (2)</b>: Turn on all outlets immediately.</li> <li><b>immediateAllOffVM (3)</b>: Turn off all outlets immediately.</li> <li><b>immediateAllRebootVM (4)</b>: Reboot all outlets immediately.</li> <li><b>delayedAllOnVM (5)</b>: Turn on all outlets as defined by the value of the <a href="#">sPDUOutletConfigVMPowerOnTime</a> OID for each outlet.</li> <li><b>delayedAllOffVM (6)</b>: Turn off all outlets as defined by the value of the <a href="#">sPDUOutletConfigVMPowerOffTime</a> OID for each outlet.</li> <li><b>sequencedAllRebootVM (7)</b>: Perform the command <b>immediateAllOffVM</b>, wait the time specified for the <a href="#">sPDUMasterStatusVMRebootDuration</a> OID, then perform the command <b>delayedAllOnVM</b>.</li> <li><b>delayedAllRebootVM (8)</b>: Perform the command <b>immediateAllOffVM</b>, then cause each outlet to wait the time specified by its <a href="#">sPDUOutletConfigVMRebootDuration</a> OID before it provides power.</li> <li><b>delayedSequenceAllRebootVM (9)</b>: Perform the command <b>delayedAllOffVM</b>; when all outlets are off, wait the time specified by the <a href="#">sPDUMasterStatusVMRebootDuration</a> OID, then perform the command <b>delayedAllOnVM</b>.</li> <li><b>cancelAllPendingCommandsVM (10)</b>: Cancel all pending commands on the MasterSwitch VM unit.</li> <li><b>audioAlarmMute (11)</b>: Disable the audible alarm for the duration of the current overload condition. The alarm will be activated for subsequent overload alarm conditions.</li> </ul> </li> </ul>

## [sPDUMasterConfigVM] Master Configuration OIDs

The [sPDUMasterConfigVM] category has a read-only OID and a tabled set of OIDs that provide commands to configure the MasterSwitch VM unit.

OID	Task
sPDUMasterConfigVMTableSize	The number of MasterSwitch VM units.
{sPDUMasterConfigVMTable} {sPDUMasterConfigVMEEntry} sPDUMasterConfigVMIndex sPDUMasterConfigVMName  sPDUMasterConfigVMColdstartDelay          sPDUMasterConfigVMAudioAlarmActivated       sPDUMasterConfigVMHighLoadWarningThreshold   sPDUMasterConfigVMLowLoadWarningThreshold    sPDUMasterConfigVMOverloadRestriction	View and configure a specified MasterSwitch VM unit.  <ul style="list-style-type: none"> <li>The index to the MasterSwitch VM unit's entry (read-only).</li> <li>Define a name (up to 23 characters) for the MasterSwitch VM unit.</li> <li>Define the delay that will occur from the time that power is applied to the MasterSwitch VM unit until it supplies power to its outlets:           <ul style="list-style-type: none"> <li>-1: Never start providing output power automatically.</li> <li>0: Begin providing output power immediately.</li> <li>15: 15-second delay</li> <li>20: 20-second delay</li> <li>30: 30-second delay</li> <li>45: 45-second delay</li> <li>60: 1-minute delay</li> <li>120: 2-minute delay</li> <li>300: 5-minute delay</li> </ul> </li> <li>Define the following by using a SET:           <ul style="list-style-type: none"> <li>audioAlarmActiveNever (1): Disable the audio alarm.</li> <li>audioAlarmActiveOnOverload (2): Cause the audio alarm to sound when an overload condition occurs.</li> <li>audioAlarmActiveOnOverloadImminent (3): Cause the audio alarm to sound when the load on the MasterSwitch VM unit exceeds the high load warning threshold, as defined by the sPDUMasterConfigVMHighLoadWarningThreshold OID.</li> </ul> </li> <li>Define the threshold that indicates when the power consumption of the load is approaching an overload condition. The value is specified as a percentage of a full load.</li> <li>Define the threshold that indicates when the power consumption of the load is approaching a low-consumption condition. The value is specified as a percentage of a full load.</li> <li>Control the behavior of the MasterSwitch VM unit when an overload condition is imminent and a request has been made to turn on additional outlets.           <ul style="list-style-type: none"> <li>alwaysAllowTurnOn (1): Always allow the outlets to turn on.</li> <li>restrictOnWarning (2): Do not allow outlets to turn on if the OID value specified for the High Load Warning Threshold is exceeded.</li> <li>restrictOnOverload (3): Do not allow outlets to turn on if the MasterSwitch VM unit is in an overload condition</li> </ul> </li> </ul>

## [sPDUMasterStatusVM] Master Status OIDs

The [sPDUMasterStatusVM] category has a read-only OID and a tabled set of read-only OIDs that provide information on the status of the MasterSwitch VM unit.

OID	Information Reported
<b>sPDUMasterStatusVMTableSize</b>	The number of MasterSwitch VM units.
<b>{sPDUMasterStatusVMTable}</b> <b>{sPDUMasterStatusVMEntry}</b> <b>sPDUMasterStatusVMIndex</b> <b>sPDUMasterStatusVMName</b>  <b>sPDUMasterStatusVMCommandPending</b>   <b>sPDUMasterStatusVMOverloadCondition</b>   <b>sPDUMasterStatusVMLowLoadCondition</b>   <b>sPDUMasterStatusVMCurrentLoad</b>  <b>sPDUMasterStatusVMMaxLoad</b>  <b>sPDUMasterStatusVMOutletCount</b> <b>sPDUMasterStatusVMRebootDuration</b>	<p>Information about the status of a specified MasterSwitch VM unit.</p> <ul style="list-style-type: none"> <li>• The index to the MasterSwitch VM unit's entry (read-only).</li> <li>• The name of the MasterSwitch VM unit (read-only). (You use the <b>sPDUMasterConfigVMName</b> OID to define this name.)</li> <li>• One of the following: <ul style="list-style-type: none"> <li>- <b>commandPendingMasterTrueVM (1)</b> if the MasterSwitch VM unit has a pending command on any of its outlets.</li> <li>- <b>commandPendingMasterFalseVM (2)</b> if there are no pending commands.</li> </ul> </li> <li>• One of the following: <ul style="list-style-type: none"> <li>- <b>overloadConditionTrueVM (1)</b> if the <b>sPDUMasterConfigVMHighLoadWarningThreshold</b> OID is violated.</li> <li>- <b>overloadConditionFalseVM (2)</b> if the <b>sPDUMasterConfigVMHighLoadWarningThreshold</b> OID is not violated.</li> </ul> </li> <li>• One of the following: <ul style="list-style-type: none"> <li>- <b>lowLoadConditionTrueVM (1)</b> if the <b>sPDUMasterConfigVMLowLoadWarningThreshold</b> OID is violated.</li> <li>- <b>lowLoadConditionFalseVM (2)</b> if the <b>sPDUMasterConfigVMLowLoadWarningThreshold</b> OID is not violated.</li> </ul> </li> <li>• The total power being used by the attached equipment as a percentage of full load.</li> <li>• The total power, in Amperes, that the MasterSwitch VM unit can provide.</li> <li>• The number of controllable outlets for the MasterSwitch VM unit.</li> <li>• The largest <b>sPDUOutletConfigVMRebootDuration</b> OID time for the MasterSwitch VM unit</li> </ul>

## [sPDUOutletControlVM] Outlet Control OIDs

The [sPDUOutletControlVM] category has a tabled set of OIDs that provide information on MasterSwitch VM unit's outlets and provide commands to control individual outlets.

OID	Task
<b>{sPDUOutletControlVMTable}</b> <b>{sPDUOutletControlVMEntry}</b> <b>sPDUOutletControlVMIndex</b> <b>sPDUOutletControlVMName</b>  <b>sPDUOutletControlVMOutletIndex</b> <b>sPDUOutletControlVMOutletName</b>  <b>sPDUOutletControlVMOutletCommand</b>	<p>Control a specified outlet. (The <b>sPDUMasterStatusVMOutletCount</b> OID identifies the number of table entries.)</p> <ul style="list-style-type: none"> <li>The index to the MasterSwitch VM unit's entry (read-only).</li> <li>The name of the MasterSwitch VM unit (read-only). (You use the <b>sPDUMasterConfigVMName</b> OID to define this name.)</li> <li>The outlet number (read-only).</li> <li>The name of the outlet (read-only). (You use the <b>sPDUOutletConfigVMOutletName</b> OID to define this name.)</li> </ul> <p>Obtain the outlet state by using a <b>GET</b>:</p> <ul style="list-style-type: none"> <li><b>immediateOnVM (1)</b> if the outlet is on.</li> <li><b>immediateOffVM (2)</b> if the outlet is off.</li> </ul> <p>Perform any of the following by using a <b>GET</b>.</p> <ul style="list-style-type: none"> <li><b>immediateOnVM (1)</b>: Immediately turn on outlet.</li> <li><b>immediateOffVM (2)</b>: Immediately turn off the outlet.</li> <li><b>immediateRebootVM (3)</b>: immediately reboot the outlet.</li> <li><b>delayedOnVM (4)</b>: Turn on the outlet after the time specified by the <b>sPDUOutletConfigVMPowerOnTime</b> OID.</li> <li><b>delayedOffVM (5)</b>: Turn off the outlet after the time specified by the <b>sPDUOutletConfigVMPowerOffTime</b> OID.</li> <li><b>delayedRebootVM (6)</b>: Perform the command <b>delayedOffVM</b>, wait the time specified by the <b>sPDUOutletConfigVMRebootDuration</b> OID, and then perform the command <b>immediateOnVM</b>.</li> <li><b>cancelPendingCommandVM (7)</b>: Cancel any pending command to the outlet.</li> </ul>

## [sPDUOutletConfigVM] Outlet Configuration OIDs

The [sPDUOutletConfigVM] category has a tabled set of OIDs that provide information on outlets at the MasterSwitch VM unit and allow you to configure outlet values.

OID	Task
<p>{sPDUOutletConfigVMTable} {sPDUOutletConfigVMEntry} sPDUOutletConfigVMIndex sPDUOutletConfigVMName</p> <p>sPDUOutletConfigVMOutletIndex sPDUOutletConfigVMOutletName sPDUOutletConfigVMPowerOnTime</p> <p>sPDUOutletConfigVMPowerOffTime</p> <p>sPDUOutletConfigVMRebootDuration</p>	<p>Configure a specified outlet. (The <b>sPDUMasterStatusVMOutletCount</b> OID identifies the number of table entries.)</p> <ul style="list-style-type: none"> <li>The index to the MasterSwitch VM unit's entry (read-only).</li> <li>The name of the MasterSwitch VM unit (read-only). (You use the <b>sPDUMasterConfigVMName</b> OID to define this name.)</li> <li>The outlet number (read-only).</li> <li>Define the name (up to 23 characters) of the outlet.</li> <li>Define how long the outlet will delay providing power when the MasterSwitch VM unit turns on or after a command that requires a turn-on delay is issued: <ul style="list-style-type: none"> <li>-1: Never start providing output power automatically.</li> <li>0: Begin providing output power immediately.</li> <li>15: 15-second delay</li> <li>20: 20-second delay</li> <li>30: 30-second delay</li> <li>45: 45-second delay</li> <li>60: 1-minute delay</li> <li>120: 2-minute delay</li> <li>300: 5-minute delay</li> </ul> </li> <li>Define how long the outlet will delay turning off power when the MasterSwitch VM unit turns off or after a command that requires a turn-off delay is issued: <ul style="list-style-type: none"> <li>-1: Never start providing output power automatically.</li> <li>0: Stop providing output power immediately.</li> <li>15: 15-second delay</li> <li>20: 20-second delay</li> <li>30: 30-second delay</li> <li>45: 45-second delay</li> <li>60: 1-minute delay</li> <li>120: 2-minute delay</li> <li>300: 5-minute delay</li> </ul> </li> <li>Define the time the outlet will wait during a reboot sequence after turning off its power until it turns its power on again. <ul style="list-style-type: none"> <li>5: 5-second delay</li> <li>10: 10-second delay</li> <li>15: 15-second delay</li> <li>20: 20-second delay</li> <li>30: 30-second delay</li> <li>45: 45-second delay</li> <li>60: 1-minute delay</li> </ul> </li> </ul>

## [sPDUOutletStatusVM] Outlet Status OIDs

The [sPDUOutletStatusVM] category has a tabled set of OIDs that provide information on the status of the outlets for a MasterSwitch VM unit.

OID	Information Provided
<b>{sPDUOutletStatusVMTable}</b> <b>{sPDUOutletStatusVMEntry}</b>  <b>sPDUOutletStatusVMIndex</b> <b>sPDUOutletStatusVMName</b>  <b>sPDUOutletStatusVMOutletIndex</b> <b>sPDUOutletStatusVMOutletName</b>  <b>sPDUOutletStatusVMOutletState</b>  <b>sPDUOutletStatusVMCommandPending</b>	<p>View the status of a specified outlet. (The <b>sPDUOutletStatusVMOutletCount</b> OID identifies the number of table entries.)</p> <ul style="list-style-type: none"> <li>• Index to the MasterSwitch VM unit's entry (read only).</li> <li>• The name of the MasterSwitch VM unit (read-only). (You use the <b>sPDUOutletStatusVMName</b> OID to define this name.)</li> <li>• The outlet number (read only).</li> <li>• The name of the outlet (read-only). (You use the <b>sPDUOutletStatusVMOutletName</b> OID to define this name.)</li> <li>• One of the following: <ul style="list-style-type: none"> <li>- <b>outletStatusOnVM (1)</b> if the outlet is on</li> <li>- <b>outletStatusOffVM (2)</b> if the outlet is off</li> </ul> </li> <li>• One of the following: <ul style="list-style-type: none"> <li>- <b>outletStatusVMCommandPending (1)</b> if a command is pending on the outlet.</li> <li>- <b>outletStatusVMNoCommandPending (2)</b> if no command is pending on the outlet.</li> </ul> </li> </ul>

# Chapter 7: How to Manage a MasterSwitch Plus Unit

This chapter describes how to use PowerNet MIB OIDs to manage (monitor, configure, control and test) a MasterSwitch Plus unit. The MasterSwitch Plus unit has its own SNMP agent that allows you to use SNMP to manage the MasterSwitch Plus unit or any of its eight relay-controlled outlets. A maximum of four MasterSwitch Plus units can be connected in a daisy chain and managed via SNMP. For more information on how to manage the SNMP agent, see **How to Manage the SNMP Agent at a Hardware Device in Chapter 2**.

To list the seven categories of PowerNet MIB OIDs that you use to manage a MasterSwitch Plus unit, perform the following steps:

1. Select [\[products\]](#) under [\[apc\]](#).
2. Select [\[hardware\]](#).
3. Select [\[masterSwitchMSP\]](#).

OID Categories	Tasks
<a href="#">[sPDUIdentMSP]</a>	Identify the MasterSwitch Plus unit by its identification parameter values. See <a href="#">[sPDUIdentMSP] Identification OIDs</a> .
<a href="#">[sPDUMasterControlMSP]</a>	Directly affect the overall operation of the MasterSwitch Plus unit. See <a href="#">[sPDUMasterControlMSP] Master Control OIDs</a> .
<a href="#">[sPDUMasterConfigMSP]</a>	Modify parameters that affect the overall operation of the MasterSwitch Plus unit. See <a href="#">[sPDUMasterConfigMSP] Master Configuration OIDs</a> .
<a href="#">[sPDUMasterStatusMSP]</a>	View the status of MasterSwitch Plus unit. See <a href="#">[sPDUMasterStatusMSP] Master Status OIDs</a> .
<a href="#">[sPDUOutletControlMSP]</a>	Directly affect the operation of an outlet at a MasterSwitch Plus unit. See <a href="#">[sPDUOutletControlMSP] Outlet Control OIDs</a> .
<a href="#">[sPDUOutletConfigMSPall]</a>	Modify parameters that affect how an outlet at a MasterSwitch Plus unit operates. See <a href="#">[sPDUOutletConfigMSPall] Outlet Configuration OIDs</a> .
<a href="#">[sPDUOutConfigMSPgs]</a>	Configure individual outlets in relation to Graceful Shutdown mode. See <a href="#">[sPDUOutConfigMSPgs] Outlet Configuration OIDs</a> .
<a href="#">[sPDUOutletConfigMSPannun]</a>	Configure individual outlets in relation to Annunciator mode. See <a href="#">[sPDUOutConfigMSPannun] Outlet Configuration OIDs</a> .
<a href="#">[sPDUOutletConfigMSPmups]</a>	Configure individual outlets to turn off in response to the state of the alarm conditions of the Environmental Monitor or to ignore those alarm conditions. See <a href="#">[sPDUOutConfigMSPmups] Outlet Configuration OIDs</a> .
<a href="#">[sPDUOutletStatusMSP]</a>	View the status of the outlets of the MasterSwitch Plus unit. See <a href="#">[sPDUOutletStatusMSP] Outlet Status OIDs</a> .

## [sPDUIdentMSP] Identification OIDs

The [sPDUIdentMSP] category has a read-only OID and a tabled set of read-only OIDs that return values for MasterSwitch Plus unit identification parameters.



*Note:*

*The last five OIDs in the following table are set at the factory.*

OID	Information Reported
<b>sPUIdentMSPTableSize</b>	The number of MasterSwitch Plus units.
<b>{sPDUIdentMSPTable}</b> <b>{sPDUIdentMSPEntry}</b> <b>sPDUIdentMSPIndex</b> <b>sPDUIdentNameMSP</b>  <b>sPDUIdentHardwareRevMSP</b> <b>sPDUIdentFirmwareRevMSP</b> <b>sPDUIdentDateOfManufactureMSP</b>  <b>sPDUIdentModelNumberMSP</b> <b>sPDUIdentSerialNumberMSP</b>	View the following information about a specified MasterSwitch Plus unit. <ul style="list-style-type: none"> <li>• The index to the MasterSwitch Plus unit's entry.</li> <li>• The name of the MasterSwitch Plus unit (read only) (You use the <b>sPDUMasterConfigMSPName</b> OID to define this name).</li> <li>• The MasterSwitch Plus unit's hardware version.</li> <li>• The MasterSwitch Plus unit's firmware version.</li> <li>• The date on which the MasterSwitch Plus unit completed the manufacturing process, in <i>mm/dd/yyyy</i> format.</li> <li>• The MasterSwitch Plus unit's model number.</li> <li>• The MasterSwitch Plus unit's serial number.</li> </ul>

## [sPDUMasterControlMSP] Master Control OIDs

The [sPDUMasterControlMSP] category has a read-only OID and a tabled set of OIDs that provide information on the MasterSwitch Plus unit and commands to control it.

OID	Task
sPDUMasterControlMSPTableSize	The number of MasterSwitch Plus units.
{sPDUMasterControlMSPTable} {sPDUMasterControlMSPEntry} sPDUMasterControlMSPIndex sPDUMasterControlMSPName  sPDUMasterControlMSPCommand	View and control a specified MasterSwitch Plus unit. <ul style="list-style-type: none"> <li>The index to the MasterSwitch Plus unit's entry (read only).</li> <li>The name of the MasterSwitch Plus unit (read only) (You use the <a href="#">sPDUMasterConfigMSPName</a> OID to define this name).</li> <li>Affect the current outlet state. <ul style="list-style-type: none"> <li><b>noCommandAllMSP (1)</b>: The value returned by an SNMP <b>GET</b> of this OID.</li> <li><b>immediateAllOnMSP (2)</b>: Turn on all outlets immediately.</li> <li><b>sequencedAllOnMSP (3)</b>: Turn on all outlets as defined by the <a href="#">sPDUOutletConfigMSPgsPowerOnDelay</a> OID for each outlet.</li> <li><b>immediateAllOffMSP (4)</b>: Turn off all outlets immediately.</li> <li><b>gracefulAllRebootMSP (5)</b>: After the device running PowerChute <i>plus</i> confirms shutdown, reboot all outlets as defined by the time value of the <a href="#">sPDUOutletConfigMSPgsRebootDuration</a> OID for each outlet.</li> <li><b>immediateAllRebootMSP (6)</b>: Reboot all outlets immediately.</li> <li><b>gracefulAllShutdownMSP (7)</b>: After the device running PowerChute <i>plus</i> confirms shutdown, shut down all outlets as defined by the time value of the <a href="#">sPDUOutletConfigMSPgsPowerOffDelay</a> OID for each outlet. Turn each outlet back on after waiting for two consecutive delay periods: <ul style="list-style-type: none"> <li>The time defined by the value of the OID <a href="#">sPDUOutletConfigMSPgsRestartDelay</a> for the outlet</li> <li>The time defined by the value of the OID <a href="#">sPDUOutletConfigMSPgsPowerOnDelay</a> for the outlet.</li> </ul> </li> <li><b>overrideAllBatCapThreshMSP (8)</b>: Ignore the battery capacity threshold, and turn on each outlet after the delay defined by the <a href="#">sPDUOutletConfigMSPgsPowerOnDelay</a> OID for that outlet.</li> <li><b>cancelAllPendingCommandsMSP (9)</b>: Cancel all pending commands on the MasterSwitch Plus unit.</li> <li><b>restoreFactoryDefaultsMSP (10)</b>: Reset the settings for the MasterSwitch Plus unit to the defaults originally set at the factory.</li> </ul> </li> </ul>

## [sPDUMasterConfigMSP] Master Configuration OIDs

The [sPDUMasterConfigMSP] category has a read-only OID and a tabled set of OIDs that provide commands to configure the MasterSwitch Plus unit.

OID	Task
sPDUMasterConfigMSPTableSize	The number of MasterSwitch Plus units.
{sPDUMasterConfigMSPTable} {sPDUMasterConfigMSPEntry} sPDUMasterConfigMSPIndex sPDUMasterConfigMSPName  sPDUMasterConfigMSPPowerOnTimeDelay    sPDUMasterConfigMSPManualButton	View and configure a specified MasterSwitch Plus unit. <ul style="list-style-type: none"> <li>• The index to the MasterSwitch Plus unit's entry ( read-only).</li> <li>• Define a name (up to 23 characters) for the MasterSwitch Plus unit.</li> <li>• Define the delay that will occur from the time that power is applied to the MasterSwitch Plus unit until the it supplies basic master power to its outlets:               <ul style="list-style-type: none"> <li>- <b>0</b>: Begin providing output power immediately.</li> <li>- <b>1</b> through <b>9999</b> seconds (2 hours, 46 minutes, 39 seconds): Provide output power after the specified delay.</li> </ul> </li> <li>• Disable (<b>manualButtonDisabled (1)</b>) or enable <b>manualButtonEnabled (2)</b> the manual button on the MasterSwitch Plus unit.</li> </ul>

## [sPDUMasterStatusMSP] Master Status OIDs

The [sPDUMasterStatusMSP] category has one read-only OID and a tabled set of read-only OIDs that provide information on the status of the MasterSwitch Plus unit.

OID	Information Reported
sPDUMasterStatusMSPTableSize	The number of MasterSwitch Plus units.
{sPDUMasterStatusMSPTable} {sPDUMasterStatusMSPEntry} sPDUMasterStatusMSPIndex sPDUMasterStatusMSPName  sPDUMasterStatusMSPOutletCount	View identification information about a specified MasterSwitch Plus unit. <ul style="list-style-type: none"> <li>• The index to the MasterSwitch Plus unit's entry (read only).</li> <li>• The name of the MasterSwitch Plus unit (read only) (You use the <b>sPDUMasterConfigMSPName</b> OID to define this name).</li> <li>• The number of MasterSwitch Plus outlets.</li> </ul>

## [sPDUOutletControlMSP] Outlet Control OIDs

The [sPDUOutletControlMSP] category has a tabled set of OIDs that provide information on the outlets at a MasterSwitch Plus unit and provide commands to control individual outlets.

OID	Task
<p>{sPDUOutletControlMSPTable} {sPDUOutletControlMSPEntry}</p> <p>sPDUOutletControlMSPIndex sPDUOutletControlMSPName</p> <p>sPDUOutletControlMSPOutletIndex sPDUOutletControlMSPOutletName</p> <p>sPDUOutletControlMSPOutletCommand</p>	<p>Control a specified outlet. (The <b>sPDUMasterStatusMSPOutletCount</b> OID identifies the number of table entries.)</p> <ul style="list-style-type: none"> <li>The index to the MasterSwitch Plus unit's entry (read only).</li> <li>The name of the MasterSwitch Plus unit (read only) (You use the <b>sPDUMasterConfigMSPName</b> OID to define this name).</li> <li>The outlet number (read only).</li> <li>The name of the MasterSwitch Plus unit (read only) (You use the <b>sPDUOutletConfigMSPallOutletName</b> OID to define this name).</li> </ul> <p>Use a <b>GET</b> to obtain the outlet state.</p> <ul style="list-style-type: none"> <li><b>immediateOnMSP (1)</b> if the outlet is on.</li> <li><b>immediateOffMSP (3)</b> if the outlet is off.</li> </ul> <p>Use a <b>SET</b> to perform any of the following.</p> <ul style="list-style-type: none"> <li><b>immediateOnMSP (1)</b>: Immediately turn on the outlet.</li> <li><b>delayedOnMSP (2)</b>: Turn on the outlet after the time specified by the <b>sPDUOutletConfigMSPgsPowerOnDelay</b> OID.</li> <li><b>immediateOffMSP (3)</b>: Immediately turn off the outlet.</li> <li><b>gracefulRebootMSP (4)</b>: Cause the outlet to wait for device confirmation (if applicable), then turn off after the time specified by the <b>sPDUOutletConfigMSPgsPowerOffDelay</b> OID, and then turn on after the time specified by the <b>sPDUOutletConfigMSPgsRebootDuration</b> OID</li> <li><b>immediateRebootMSP (5)</b>: Immediately reboot the outlet.</li> <li><b>gracefulShutdownMSP (6)</b>: Cause the outlet to wait for device confirmation (if applicable), then turn off after the time specified by the <b>sPDUOutletConfigMSPgsPowerOffDelay</b> OID. The outlet will turn on again after waiting both the time specified by the <b>sPDUOutletConfigMSPgsRestartDelay</b> OID and the time specified by the <b>sPDUOutletConfigMSPgsPowerOnDelay</b> OID</li> <li><b>overrideBatCapThreshMSP (7)</b>: Cause the outlet to ignore the battery capacity threshold and turn on after the time specified by the <b>sPDUOutletConfigMSPgsPowerOnDelay</b> OID.</li> <li><b>cancelPendingCommandMSP (8)</b>: Cancel any pending command on the outlet.</li> </ul>

## [sPDUOutletConfigMSPall] Outlet Configuration OIDs

The [sPDUOutletConfigMSPall] category contains a tabled set of OIDs that provide information on the outlets at a MasterSwitch Plus unit and allow you to configure values for individual outlets.

OID	Task
<p>{sPDUOutletConfigMSPallTable} {sPDUOutletConfigMSPallEntry}</p> <p>sPDUOutletConfigMSPallIndex sPDUOutletConfigMSPallName</p> <p>sPDUOutletConfigMSPallOutletIndex sPDUOutletConfigMSPallOutletName sPDUOutletConfigMSPallOutletCtrlMode</p>	<p>Configure individual MasterSwitch Plus outlets. (The sPDUMasterStatusMSPOutletCount OID identifies the number of table entries.)</p> <ul style="list-style-type: none"> <li>The index to the MasterSwitch Plus unit's entry (read only).</li> <li>The name of the MasterSwitch Plus unit (read only) (You use the sPDUMasterConfigMSPName OID to define this name).</li> <li>The outlet number (read only)</li> <li>Define the name (up to 23 characters) of the outlet.</li> <li>Use a SET to do one of the following: <ul style="list-style-type: none"> <li><b>modeGracefulShutdown (1)</b>: Put this outlet into Graceful Shutdown control mode. See [sPDUOutConfigMSPgs] Outlet Configuration OIDs for options you can set for this mode.</li> <li><b>modeAnnunciator (2)</b>: Put this outlet in Annunciator control mode.</li> </ul> </li> </ul>

## [sPDUOutConfigMSPgs] Outlet Configuration OIDs

The [sPDUOutletConfigMSPgs] category has a tabled set of OIDs that provide commands to configure individual outlets in relation to Graceful Shutdown mode.

OID	Task
<p><b>{sPDUOutletConfigMSPgsTable}</b>  <b>{sPDUOutletConfigMSPgsEntry}</b>  <b>sPDUOutletConfigMSPgsIndex</b>  <b>sPDUOutletConfigMSPgsName</b></p> <p><b>sPDUOutletConfigMSPgsOutletIndex</b>  <b>sPDUOutletConfigMSPgsOutletName</b></p> <p><b>sPDUOutletConfigMSPgsOutletCtrlMode</b></p> <p><b>sPDUOutletConfigMSPgsDeviceConfirm</b></p> <p><b>sPDUOutletConfigMSPgsLowBattWarning</b></p> <p><b>sPDUOutletConfigMSPgsLowBattMult</b></p> <p><b>sPDUOutletConfigMSPgsRestartDelay</b></p> <p><b>sPDUOutletConfigMSPgsPowerOnDelay</b></p> <p><b>sPDUOutletConfigMSPgsPowerOffDelay</b></p> <p><b>sPDUOutletConfigMSPgsBattCapThresh</b></p> <p><b>sPDUOutletConfigMSPgsRebootDuration</b></p>	<p>View and configure a specified outlet for Graceful Shutdown mode. (The OID <b>sPDUMasterStatusMSPOutletCount</b> identifies the number of table entries.)</p> <ul style="list-style-type: none"> <li>• The index to the MasterSwitch Plus unit's entry (read only).</li> <li>• The name of the MasterSwitch Plus unit (read only). (You use the <b>sPDUMasterConfigMSPName</b> OID to define this name).</li> <li>• The outlet number (read only)</li> <li>• The name of the outlet (read only). (You use the <b>sPDUOutletConfigMSPallOutletName</b> OID to define this name).</li> <li>• The control mode of the outlet, as defined by the <b>sPDUOutletConfigMSPallOutletCtrlMode</b> OID: <ul style="list-style-type: none"> <li>- <b>modeGracefulShutdown: (1)</b>: In Graceful Shutdown Control Mode.</li> <li>- <b>modeAnnunciator (2)</b>: In Annunciator Mode.</li> </ul> </li> <li>• Define whether the outlet waits for shutdown confirmation before turning off. <ul style="list-style-type: none"> <li>- <b>deviceConfirmNo (1)</b>: Do not wait for confirmation.</li> <li>- <b>deviceConfirmYes (2)</b>: Wait for confirmation.</li> </ul> </li> <li>• Define how long this outlet will wait before beginning its turn-off sequence after the UPS switches to battery operation. <ul style="list-style-type: none"> <li>- <b>-2</b>: Do not turn off the outlet.</li> <li>- <b>-1</b>: Begin the turn-off sequence based on remaining runtime.</li> <li>- <b>0</b>: Begin the turn-off sequence at low battery warning.</li> <li>- <b>1 to 9999</b> intervals of 6 seconds each. Begin the turn-off sequence after the specified number of intervals (e.g. <b>5994</b> = 1 hour, 39 minutes, 54 seconds).</li> </ul> </li> <li>• Define a multiplier value for this outlet that enables "load shedding," i.e. as UPS battery runtime decreases, outlets turn off in stages, so that power is maintained to your most important equipment for as long as possible. <ul style="list-style-type: none"> <li>- <b>1 to 7</b>: Unless the <b>sPDUOutletConfigMSPgsLowBattWarning</b> OID is <b>-2</b>, turn off this outlet when the remaining UPS battery runtime is less than this value multiplied by the low battery warning time received from the UPS. See <b>Example of a "Load-Shedding" Configuration</b> (next page).</li> <li>- When the <b>sPDUOutletConfigMSPgsLowBattWarning</b> OID is set to <b>-2</b>, any value specified for this OID is ignored.</li> </ul> </li> <li>• Define how long the outlet will wait between turning off and turning on after graceful shutdown. <ul style="list-style-type: none"> <li>- <b>-1</b>: The outlet never turns on after a graceful shutdown.</li> <li>- <b>0 to 9999</b> intervals of 6 minutes each. Begin the outlet's turn-on sequence after the specified number of intervals (e.g. <b>9999</b> = 999 hours, 54 minutes).</li> </ul> </li> <li>• Define the number of seconds the outlet will wait before turning on after the UPS returns to online operation. <ul style="list-style-type: none"> <li>- <b>-1</b>: Never turn on the outlet after the UPS returns to online operation.</li> <li>- <b>0 to 9999</b> seconds (0 seconds to 2 hours, 46 minutes, 39 seconds).</li> </ul> </li> <li>• Define the number of seconds the outlet will wait after the server shuts down until the outlet begins its turn-off sequence. Allowed values are <b>0 to 9999</b>.</li> <li>• Define the percentage of full battery capacity needed before the outlet is allowed to turn on.</li> <li>• Define the number of seconds the outlet will wait after the it turns off until it turns on during a reboot. Allowed values are <b>0 to 9999</b>.</li> </ul>

## Example of a “Load-Shedding” Configuration

You can configure the eight outlets of the MasterSwitch Plus unit to turn off in up to seven stages during a power outage so that devices attached to those outlets shut down in an ordered sequence based on the importance you assign to them. Such “load shedding” allows you to extend UPS runtime to more important equipment by eliminating less significant equipment in stages from the UPS load as a power outage continues to reduce available battery runtime.

In the following table, which shows a sample load-shedding configuration, the following OID values are referenced:

- **Low Battery Warning** is the value of the **sPDUOutletConfigMSPgsLowBattWarning** OID.
- **Low Battery Multiplier** is the value of the **sPDUOutletConfigMSPgsLowBattMult** OID.

UPS Parameters			MasterSwitch Plus Unit Parameters			
Low Battery Signal Time	Runtime Remaining	UPS State	Outlet	Low Battery Warning	Low Battery Multiplier	Low Battery Multiplier x the Low Battery Signal Time of the UPS
25 minutes	60 minutes	On battery	1	60 six-second intervals (60 x 6 seconds = 6 minutes)	7	7 x 25 = 175 minutes
			2	60 six-second intervals (60 x 6 seconds = 6 minutes)	6	6 x 25 = 150 minutes
			3	120 six-second intervals (120 x 6 seconds = 12 minutes)	2	2 x 25 = 50 minutes
			4	70 six-second intervals (70 x 6 seconds = 7 minutes)	2	2 x 25 = 50 minutes
			5	-1: (Turn off the outlet based on runtime remaining.)	3	3 x 25 = 75 minutes
			6	-1: (Turn off the outlet based on runtime remaining.)	2	2 x 25 = 50 minutes
			7	-1: (Turn off the outlet based on runtime remaining.)	1	1 x 25 = 25 minutes
			8	-2: (Do not turn off the outlet.)	3	3 x 25 = 75 minutes

If the UPS's **Low Battery Signal Time** is set to **25** minutes, and the UPS switches to battery operation with **60** minutes of **Runtime Remaining**, the outlets will turn off as follows:

- Outlet 1 will begin its turn-off sequence immediately, without waiting the 6-minute **Low Battery Warning**, because the **Runtime Remaining** of 60 minutes is already less than 175 minutes (**Low Battery Multiplier x the Low Battery Signal Time of the UPS**).
- Outlet 2 will begin its turn-off sequence immediately, without waiting the 6-minute **Low Battery Warning**, because the **Runtime Remaining** of 60 minutes is already less than 150 minutes (**Low Battery Multiplier x the Low Battery Signal Time of the UPS**).
- Outlet 3 will begin its turn-off sequence after 10 minutes, when the **Runtime Remaining** is depleted to less 50 minutes (**Low Battery Multiplier x the Low Battery Signal Time of the UPS**). The full 12-minute **Low Battery Warning** will not yet have expired.
- Outlet 4 will begin its turn-off sequence when the 7-minute **Low Battery Warning** expires, instead of waiting until after 10 minutes when the **Runtime Remaining** would be depleted to less than 50 minutes (**Low Battery Multiplier x the Low Battery Signal Time of the UPS**).
- Outlet 5 will begin its turn-off sequence immediately because the 60-minute **Runtime Remaining** is already less than 75 minutes (**Low Battery Multiplier x the Low Battery Signal Time of the UPS**).
- Outlet 6 will begin its turn-off sequence after 10 minutes, when the **Runtime Remaining** is depleted to less than 50 minutes (**Low Battery Multiplier x the Low Battery Signal Time of the UPS**).
- Outlet 7 will begin its turn-off sequence after 35 minutes, when the **Runtime Remaining** is depleted to less than 25 minutes (**Low Battery Multiplier x the Low Battery Signal Time of the UPS**).
- Outlet 8 will not begin a turn-off sequence because the value defined for the **Low Battery Warning** indicates that the outlet should never turn off. The 75 minutes calculated as **Low Battery Multiplier x the Low Battery Signal Time of the UPS** is ignored.

## [sPDUOutConfigMSPannun] Outlet Configuration OIDS

The [sPDUOutConfigMSPannun] category has a has a tabled set of OIDS to configure individual outlets in Annunciator mode.

OID	Task
<p>{sPDUOutletConfigMSPannunTable} {sPDUOutletConfigMSPannunEntry}</p> <p>sPDUOutletConfigMSPannunIndex sPDUOutletConfigMSPannunName</p> <p>sPDUOutletConfigMSPannunOutletIndex sPDUOutletConfigMSPannunOutletName</p> <p>sPDUOutletConfigMSPannunOutletCtrlMode</p> <p>sPDUOutletConfigMSPannunInitialState</p> <p>sPDUOutletConfigMSPannunAlarmActionDly</p>	<p>View and configure individual outlets in Annunciator Mode. The OID <b>sPDUMasterStatusMSPOutletCount</b> contains the number of entries in this table.</p> <ul style="list-style-type: none"> <li>The index to the MasterSwitch Plus unit's entry (read only).</li> <li>The name of the MasterSwitch Plus unit (read only). (You use the <b>sPDUMasterConfigMSPName</b> OID to define this name).</li> <li>The outlet number (read only)</li> <li>The name of the outlet (read only). (You use the <b>sPDUOutletConfigMSPallOutletName</b> OID to define this name).</li> <li>The control mode of the outlet, as defined by the OID <b>sPDUOutletConfigMSPallOutletCtrlMode</b>: <ul style="list-style-type: none"> <li><b>modeGracefulShutdown: (1)</b>: The outlet is in Graceful Shutdown control mode.</li> <li><b>modeAnnunciator (2)</b>: The outlet is in Annunciator control mode.</li> </ul> </li> <li>Define the initial (default) state of the outlet: <ul style="list-style-type: none"> <li><b>initialStateOff (1)</b>: The outlet defaults to off when in the non-alarmed condition.</li> <li><b>initialStateOn (2)</b>: The outlet defaults to on when in the non-alarmed condition.</li> </ul> </li> <li>Define the time in seconds that an alarm from an Environmental Monitor must continue before it causes an alarm condition. Allowed values are <b>0</b> to <b>9999</b> seconds (2 hours, 46 minutes, 38 seconds) If the alarm is disabled for the outlet, as described in [sPDUOutConfigMSPmups] Outlet Configuration OIDS, this OID's value is ignored.</li> </ul>

## **[sPDUOutConfigMSPmups] Outlet Configuration OIDs**

The **[sPDUOutConfigMSPmups]** category has a has a tabled set of OIDs to configure individual outlets to begin their turn-off sequence in response to alarm conditions from the Environmental Monitor or to ignore those alarm conditions.

OID	Task
<b>{sPDUOutletConfigMSPmupsTable}</b> <b>{sPDUOutletConfigMSPmupsEntry}</b>  <b>sPDUOutletConfigMSPmupsIndex</b> <b>sPDUOutletConfigMSPmupsName</b>  <b>sPDUOutletConfigMSPmupsOutletIndex</b> <b>sPDUOutletConfigMSPmupsOutletName</b>  <b>sPDUOutletConfigMSPmupsZone1</b> <b>sPDUOutletConfigMSPmupsZone2</b> <b>sPDUOutletConfigMSPmupsZone3</b> <b>sPDUOutletConfigMSPmupsZone4</b>  <b>sPDUOutletConfigMSPmupsP1LowHum</b>  <b>sPDUOutletConfigMSPmupsP1HiHum</b>  <b>sPDUOutletConfigMSPmupsP1LowTemp</b>  <b>sPDUOutletConfigMSPmupsP1HiTemp</b>  <b>sPDUOutletConfigMSPmupsP2LowHum</b>  <b>sPDUOutletConfigMSPmupsP2HiHum</b>  <b>sPDUOutletConfigMSPmupsP2LowTemp</b>  <b>sPDUOutletConfigMSPmupsP2HiTemp</b>	<p>View and configuration a specified outlet. (The <b>sPDUMasterStatusMSPOutletCount</b> OID identifies the number of table entries.)</p> <ul style="list-style-type: none"> <li>The index to the MasterSwitch Plus unit's entry (read only).</li> <li>The name of the MasterSwitch Plus unit (read only). (You use the <b>sPDUMasterConfigMSPName</b> OID to define this name).</li> <li>The outlet number (read only)</li> <li>The name of the outlet (read only). (You use the <b>sPDUOutletConfigMSPallOutletName</b> OID to define this name).</li> <li>For this outlet, enable or disable any of the alarms for zone 1, 2, 3, or 4 that the Environmental Monitor is monitoring. <ul style="list-style-type: none"> <li><b>disableAlarm (1)</b>: Disable the alarm for the zone number in the OID name, e.g. to disable the alarm for zone 3, set this value for the OID <b>sPDUOutletConfigMSPmupsZone3</b>.</li> <li><b>enableAlarm (2)</b>: Enable the alarm for the zone number in the OID name.</li> </ul> </li> <li>Enable or disable the Probe 1 low humidity alarm for the outlet. <ul style="list-style-type: none"> <li><b>disableAlarm (1)</b>: Disable the alarm.</li> <li><b>enableAlarm (2)</b>: Enable the alarm.</li> </ul> </li> <li>Enable or disable the Probe 1 high humidity alarm for the outlet. <ul style="list-style-type: none"> <li><b>disableAlarm (1)</b>: Disable the alarm.</li> <li><b>enableAlarm (2)</b>: Enable the alarm.</li> </ul> </li> <li>Enable or disable the Probe 1 low temperature alarm for the outlet. <ul style="list-style-type: none"> <li><b>disableAlarm (1)</b>: Disable the alarm.</li> <li><b>enableAlarm (2)</b>: Enable the alarm.</li> </ul> </li> <li>Enable or disable the Probe 1 high temperature alarm for the outlet. <ul style="list-style-type: none"> <li><b>disableAlarm (1)</b>: Disable the alarm.</li> <li><b>enableAlarm (2)</b>: Enable the alarm.</li> </ul> </li> <li>For this outlet, enable or disable the Probe 2 low humidity alarm. <ul style="list-style-type: none"> <li><b>disableAlarm (1)</b>: Disable the alarm.</li> <li><b>enableAlarm (2)</b>: Enable the alarm.</li> </ul> </li> <li>Enable or disable the Probe 2 high humidity alarm for the outlet. <ul style="list-style-type: none"> <li><b>disableAlarm (1)</b>: Disable the alarm.</li> <li><b>enableAlarm (2)</b>: Enable the alarm.</li> </ul> </li> <li>Enable or disable the Probe 2 low temperature alarm for the outlet. <ul style="list-style-type: none"> <li><b>disableAlarm (1)</b>: Disable the alarm.</li> <li><b>enableAlarm (2)</b>: Enable the alarm.</li> </ul> </li> <li>Enable or disable the Probe 2 high temperature alarm for the outlet. <ul style="list-style-type: none"> <li><b>disableAlarm (1)</b>: Disable the alarm.</li> <li><b>enableAlarm (2)</b>: Enable the alarm.</li> </ul> </li> </ul>

## [sPDUOutletStatusMSP] Outlet Status OIDs

The [sPDUOutletStatusMSP] category has a tabled set of OIDs that provides information on the status of the outlets for MasterSwitch Plus unit.

OID	Information Provided
<b>{sPDUOutletStatusMSPTable}</b> <b>{sPDUOutletStatusMSPEntry}</b>  <b>sPDUOutletStatusMSPIndex</b> <b>sPDUOutletStatusMSPName</b>  <b>sPDUOutletStatusMSPOutletIndex</b> <b>sPDUOutletStatusMSPOutletName</b>  <b>sPDUOutletStatusMSPOutletState</b>  <b>sPDUOutletStatusMSPCommandPending</b>  <b>sPDUOutletStatusMSPOutletCtrlMode</b>	<p>View status information for a specified outlet. (The <b>sPDUMasterStatusMSPOutletCount</b> OID identifies the number of table entries.)</p> <ul style="list-style-type: none"> <li>• The index to the MasterSwitch Plus unit's entry (read only).</li> <li>• The name of the MasterSwitch Plus unit (read only). (You use the <b>sPDUMasterConfigMSPName</b> OID to define this name).</li> <li>• The outlet number (read only)</li> <li>• The name of the outlet (read only). (You use the <b>sPDUOutletConfigMSPallOutletName</b> OID to define this name).</li> <li>• One of the following: <ul style="list-style-type: none"> <li>- <b>outletStatusOnMSP (1)</b> if the outlet is on</li> <li>- <b>outletStatusOffMSP (2)</b> if the outlet is off</li> </ul> </li> <li>• One of the following: <ul style="list-style-type: none"> <li>- <b>outletStatusMSPCommandPending (1)</b> if a command is pending on the outlet.</li> <li>- <b>outletStatusMSPNoCommandPending (2)</b> if no command is pending on the outlet.</li> </ul> </li> <li>• The control mode of the outlet, as defined by the OID <b>sPDUOutletConfigMSPallOutletCtrlMode</b>: <ul style="list-style-type: none"> <li>- <b>modeGracefulShutdown: (1)</b>: In Graceful Shutdown control mode, the outlet turns off after a server supported by the UPS has completed a graceful shutdown.</li> <li>- <b>modeAnnunciator (2)</b>: In Annunciator control mode, the outlet turns off in response to an environmental alarm from an Environmental Monitor and turns on when the cause is resolved.</li> </ul> </li> </ul>

# Chapter 8: How to Manage an Automatic Transfer Switch

This chapter describes how to use PowerNet MIB OIDs to manage (monitor, configure, control and test) an Automatic Transfer Switch. The Automatic Transfer Switch also has an embedded Network Management Card. To manage that management card, see **Chapter 2, How to Manage Agents and Management Cards**.

To list the seven categories of PowerNet MIB OIDs that you use to manage an Automatic Transfer Switch, perform the following steps:

1. Select [\[products\]](#) under [\[apc\]](#).
2. Select [\[hardware\]](#).
3. Select [\[automaticTransferSwitch\]](#).

OID Categories	Tasks
<a href="#">[atsIdent]</a>	Identify the Automatic Transfer Switch by its identification parameter values. See <a href="#">[atsIdent] Identification OIDs</a> .
<a href="#">[atsCalibration]</a>	View information about the Automatic Transfer Switch's input and output lines, their phases, and their calibration factors. See <a href="#">[atsCalibration] Calibration OIDs</a> .
<a href="#">[atsControl]</a>	Directly affect the overall operation of the Automatic Transfer Switch. See <a href="#">[atsControl] Control OIDs</a> .
<a href="#">[atsConfig]</a>	Modify parameters that affect the overall operation of the Automatic Transfer Switch. See <a href="#">[atsConfig] Configuration OIDs</a> .
<a href="#">[atsStatus]</a>	View the status of the Automatic Transfer Switch, and reset the recording of minimum and maximum values that occurred for various operational parameters. See <a href="#">[atsStatus] Status OIDs</a> .
<a href="#">[atsStatusinput]</a>	View the status of the input feeds of the Automatic Transfer Switch and their phases, including, for each phase, information on voltage, current, and power. Also view or change the configured name for each input feed. See <a href="#">[atsStatusInput] Input OIDs</a> .
<a href="#">[atsStatusOutput]</a>	View the status of the output feeds of the Automatic Transfer Switch and their phases, including, for each phase, information on voltage, current, power, load, and percentage of load capacity being used. See <a href="#">[atsStatusOutput] Output OIDs</a> .

## [atsIdent] Identification OIDs

The [atsIdent] category has eight read-only OIDs that return values for Automatic Transfer Switch identification parameters.



*Note:*

*The first six OIDs in the following table are set at the factory.*

OID	Information Reported
<b>atsIdentHardwareRev</b>	The hardware version of the Automatic Transfer Switch.
<b>atsIdentFirmwareRev</b>	The firmware version of the Automatic Transfer Switch.
<b>atsIdentFirmwareDate</b>	The date of release for this Automatic Transfer Switch firmware version.
<b>atsIdentDateOfManufacture</b>	The date on which the Automatic Transfer Switch unit completed the manufacturing process, in <i>mm/dd/yyyy</i> format.
<b>atsIdentModelNumber</b>	The model number of the Automatic Transfer Switch.
<b>atsIdentSerialNumber</b>	The serial number of the Automatic Transfer Switch.
<b>atsIdentNominalLineVoltage</b>	The RMS utility voltage in volts.
<b>atsIdentNominalLineFrequency</b>	The utility power frequency in Hz.

## [atsCalibration] Calibration OIDs

The [atsCalibration] category has five read-only OIDs and three tabled sets of read-only OIDs that return values related to the Automatic Transfer Switch's input lines and output lines, including information on their phases and calibration factors. The OIDs also identify the number, type, and calibration factors of power supplies supported.

OID	Information Reported
<b>atsCalibrationNumInputs</b>	The number of input lines to this device.
<b>atsCalibrationNumInputPhases</b>	The number of phases per input line for this device.
<b>{atsCalibrationInputTable}</b> <b>{atsCalibrationInputPhaseEntry}</b> <b>atsCalibrationInputTableIndex</b> <b>atsCalibrationInputPhaseTableIndex</b> <b>atsLineVoltageCalibrationFactor</b>	A tabled set of OIDs providing the following information for each phase of an input line: <ul style="list-style-type: none"> <li>• The input identifier.</li> <li>• The input phase identifier.</li> <li>• The Line Voltage Calibration factor (set at the factory).</li> </ul>
<b>atsCalibrationPowerSupplyVoltages</b>	The number of power supply voltages that this device supports, which defines the number of rows in <b>atsCalibrationPowerSupplyVoltageTable</b> (one entry per supported voltage: 24V, 12V and 5V).
<b>{atsCalibrationPowerSupplyVoltageTable}</b> <b>{atsCalibrationPowerSupplyVoltageEntry}</b> <b>atsCalibrationPowerSupplyVoltageTableIndex</b>  <b>atsCalibrationPowerSupplyVoltage</b>  <b>atsPowerSupplyVoltageCalibrationFactor</b>	A tabled set of OIDs providing the following information for each power supply voltage supported by this device: <ul style="list-style-type: none"> <li>• The power supply voltage identifier: <b>24 V (1)</b>, <b>12 V (2)</b>, or <b>5 V (3)</b>.</li> <li>• A description of the power supply voltage: <b>powerSupply24V (1)</b>, <b>powerSupply12V (2)</b>, or <b>powerSupply (3)</b>.</li> <li>• The Line Voltage Calibration factor (set at the factory).</li> </ul>
<b>atsCalibrationNumOutputs</b>	The number of output lines from this device. This number defines the number of rows in <b>atsCalibrationOutputTable</b> .
<b>atsCalibrationNumOutputPhases</b>	The number of output phases used in this device.
<b>{atsCalibrationOutputTable}</b> <b>{atsCalibrationOutputEntry}</b> <b>atsCalibrationOutputTableIndex</b> <b>atsCalibrationOutputPhasesTableIndex</b>  <b>atsOutputCurrentCalibrationFactor</b>	A tabled set of OIDs providing the following information for each output line: <ul style="list-style-type: none"> <li>• The output identifier.</li> <li>• Description of each calibration factor for each output phase used in this device and one for neutral: <b>phase 1 (1)</b>, <b>phase 2 (2)</b>, <b>phase 3 (3)</b>, and <b>neutral (4)</b>.</li> <li>• The output current calibration factor measured in Amps.</li> </ul>

## [atsControl] Control OIDs

The [atsControl] category has two read-write OIDs that provide commands to control the resetting of the Automatic Transfer Switch and the clearing of all its alarms.

OID	Task
<b>atsControlResetATS</b>	Setting this variable determines whether the Automatic Transfer Switch performs a reset when power is applied. <b>none (1)</b> : Does not perform a reset. <b>reset (2)</b> : Performs a power-on reset.
<b>atsControlClearAllAlarms</b>	Setting this variable determines whether all alarms in the Automatic Transfer Switch are cleared. <b>none (1)</b> : Does not clear alarms. <b>clear (2)</b> : Clears all alarms.

## [atsConfig] Configuration OIDs

The [atsConfig] category has seven read-write OIDs that provide commands to configure the Automatic Transfer Switch.

OID	Task
<b>atsConfigProductName</b>	A character string that names the Automatic Transfer Switch.
<b>atsConfigPreferredSource</b>	The preferred source of power when both sources are functioning properly: <b>source A (1)</b> , <b>source B (2)</b> , or <b>none (3)</b>
<b>atsConfigFrontPanelLockout</b>	Determines whether you can set source preference from the Automatic Transfer Switch's front panel: <b>disableFrontPanel (1)</b> : Disables the capability to set source preference for the Automatic Transfer Switch from its Front Panel. To re-enable this capability, you must use the serial interface of the Automatic Transfer Switch. <b>enableFrontPanel (2)</b> : Allows setting source preference for the Automatic Transfer Switch from its Front Panel.
<b>atsConfigVoltageSensitivity</b>	Defines the sensitivity of the Automatic Transfer Switch to changes in voltage: <b>high (1)</b> : Provides the best protection <b>low (2)</b> : Allows the Automatic Transfer Switch to tolerate frequent small line voltage changes.
<b>atsConfigTransferVoltageRange</b>	Defines the range of acceptable voltage from a power source: <b>wide (1)</b> , <b>medium (2)</b> , or <b>narrow (3)</b> . If the voltage from the selected input source is not within this range, the Automatic Transfer Switch switches to the alternate power source.
<b>atsConfigCurrentLimit</b>	The threshold (in Amps) at which an Over Current Alarm is generated.
<b>atsConfigResetValues</b>	Resets the configuration of the Automatic Transfer Switch to its default values. <b>do not reset (1)</b> or <b>reset (2)</b> .

## [atsStatus] Status OIDs

The [atsStatus] category has six read-only OIDs that report the status of Automatic Transfer Switch components and operation and one read-write OID that you can use to restart the recording of minimum and maximum values that occurred for various operational parameters of the Automatic Transfer Switch.

OID	Information Reported
<b>atsStatusCommStatus</b>	The current communication status of the Automatic Transfer Switch: <b>atsNeverDiscovered (1)</b> , <b>atsCommEstablished (2)</b> , or <b>atsCommLost (3)</b> .
<b>atsStatusSelectedSource</b>	The current source of power to the Automatic Transfer Switch: <b>source A (1)</b> or <b>source B (2)</b> .
<b>atsStatusRedundancyState</b>	The Automatic Transfer Switch's current state of redundancy: <ul style="list-style-type: none"> <li>• <b>atsRedundancyLost (1)</b>: The Automatic Transfer Switch cannot switch to the alternate power source if the power source that it is using fails.</li> <li>• <b>atsFullyRedundant (2)</b>: The Automatic Transfer Switch can switch to the alternate power source if the power source that it is using fails.</li> </ul>
<b>atsStatusOverCurrentState</b>	The state of the output current of the Automatic Transfer Switch: <ul style="list-style-type: none"> <li>• <b>atsOverCurrent (1)</b>: The Automatic Transfer Switch has exceeded the output current threshold and cannot switch to the alternate power source if the source that it is using fails.</li> <li>• <b>atsCurrentOK (2)</b>: The output current is below the output current threshold.</li> </ul>
<b>atsStatus5VPowerSupply</b>	The current state of the Automatic Transfer Switch's 5-volt power supply: <ul style="list-style-type: none"> <li>• <b>atsPowerSupplyFailure (1)</b>: The power supply has failed, and the Automatic Transfer Switch's internal <b>Configuration</b> menu, which you access through a serial port connection, is not accessible.</li> <li>• <b>atsPowerSupplyOK (2)</b>: The power supply is operating correctly (within tolerance).</li> </ul>
<b>atsStatus24VPowerSupply</b>	The current state of the Automatic Transfer Switch's 24-volt power supply: <ul style="list-style-type: none"> <li>• <b>atsPowerSupplyFailure (1)</b>: The power supply has failed and the Automatic Transfer Switch cannot switch to the alternate power source if the source that it is using fails.</li> <li>• <b>atsPowerSupplyOK (2)</b>: The power supply is operating correctly (within tolerance).</li> </ul>

OID	Information Reported
<b>atsStatusResetMaxMinValues</b>	<p>Resets the following maximum and minimum Automatic Transfer Switch values, which are the maximum and minimum Automatic Transfer Switch values recorded since the last time they were read or reset by <b>atsStatusResetMaxMinValues</b>.</p> <p><b>none (1):</b> Do not reset the values.</p> <p><b>reset (2):</b> Reset the values.</p> <p>Parameters that are unsupported by your model of the Automatic Transfer Switch return <b>-1</b>.</p> <ul style="list-style-type: none"> <li>• <b>atsInputMaxVoltage</b></li> <li>• <b>atsInputMinVoltage</b></li> <li>• <b>atsInputMaxCurrent</b></li> <li>• <b>atsInputMinCurrent</b></li> <li>• <b>atsInputMaxPower</b></li> <li>• <b>atsInputMinPower</b></li> <li>• <b>atsOutputMaxCurrent</b></li> <li>• <b>atsOutputMinCurrent</b></li> <li>• <b>atsOutputMaxLoad</b></li> <li>• <b>atsOutputMinLoad</b></li> <li>• <b>atsOutputMaxPercentLoad</b></li> <li>• <b>atsOutputMinPercentLoad</b></li> <li>• <b>atsOutputMaxPower</b></li> <li>• <b>atsOutputMinPower</b></li> <li>• <b>atsOutputMaxPercentPower</b></li> <li>• <b>atsOutputMinPercentPower</b></li> </ul> <p>You can set this OID to either of the following values:</p> <p><b>none (1):</b> Do not reset the minimum and maximum values.</p> <p><b>reset (2):</b> Reset the minimum and maximum values.</p> <p>Parameters that are unsupported by your model of the Automatic Transfer Switch return <b>-1</b>.</p>

## [atsStatusInput] Input Olds

The **[atsStatusInput]** category has an OID and two tabled set of OIDS that provide information on the Automatic Transfer Switch's input feeds and their phases. All OIDs in this category are read-only except **atsInputName**, which is read-write.

OID	Information Reported
<b>atsNumInputs</b>	The number of input feeds to this device. This number defines the number of rows in <b>atsInputTable</b> .
<b>{atsInputTable}</b> <b>{atsInputEntry}</b> <b>atsInputTableIndex</b> <b>atsNumInputPhases</b>  <b>atsInputVoltageOrientation</b>          <b>atsInputFrequency</b> <b>atsInputType</b> <b>atsInputName</b>	<p>A tabled set of OIDs providing the following information for each input feed:</p> <ul style="list-style-type: none"> <li>• The input feed identifier.</li> <li>• The number of input phases used in this device. This number defines the number of rows in <b>atsInputPhaseTable</b>.</li> <li>• The input voltage orientation:                  <b>unknown (1)</b>: Unknown for this source.                  <b>singlePhase (2)</b>: Phase 1 voltage is between Phase 1 and neutral.                  <b>splitPhase (3)</b>: Phase 1 voltage is between Phase 1 and Neutral; phase 2 voltage is between Phase 2 and Neutral; and phase 3 voltage is between Phase 1 and Phase 2.                  <b>threePhasePhaseToNeutral (4)</b>: Phase 1 voltage is between Phase 1 and Neutral; phase 2 voltage is between Phase 2 and Neutral; and phase 3 voltage is between Phase3 and Neutral.                  <b>threePhasePhaseToPhase (5)</b>: Phase 1 voltage is between Phase 1 and Phase 2; phase 2 voltage is between Phase 2 and Phase 3; and phase 3 voltage is between Phase 3 and Phase 1.</li> <li>• The input frequency in Hz, or -1 if it is unsupported by this source.</li> <li>• The input type.</li> <li>• The name given to this input. This value is read-write.</li> </ul>

OID	Information Reported
<b>{atsInputPhaseTable}</b> <b>{atsInputPhaseEntry}</b>  <b>atsInputPhaseTableIndex</b> <b>atsInputPhaseIndex</b> <b>atsInputVoltage</b> <b>atsInputMaxVoltage</b>  <b>atsInputMinVoltage</b>  <b>atsInputCurrent</b> <b>atsInputMaxCurrent</b>  <b>atsInputMinCurrent</b>  <b>atsInputPower</b> <b>atsInputMaxPower</b>  <b>atsInputMinPower</b>	<p>A tabled set of OIDs providing the following information for each input phase. Parameters that are unsupported by your model of the Automatic Transfer Switch return <b>-1</b>.</p> <ul style="list-style-type: none"> <li>• The input identifier.</li> <li>• The input phase identifier.</li> <li>• The input voltage in VAC.</li> <li>• The maximum input voltage in VAC recorded since the last time this value was read or reset by <b>atsStatusResetMaxMinValues</b>.</li> <li>• The minimum input voltage in VAC recorded since the last time this value was read or reset by <b>atsStatusResetMaxMinValues</b>.</li> <li>• The input current in Amps.</li> <li>• The maximum input current in Amps recorded since the last time this value was read or reset by <b>atsStatusResetMaxMinValues</b>.</li> <li>• The minimum input current in Amps recorded since the last time this value was read or reset by <b>atsStatusResetMaxMinValues</b>.</li> <li>• The input power in Watts.</li> <li>• The maximum input power in Watts recorded since the last time this value was read or reset by <b>atsStatusResetMaxMinValues</b>.</li> <li>• The minimum input power in Watts recorded since the last time this value was read or reset by <b>atsStatusResetMaxMinValues</b>.</li> </ul>

## [atsStatusOutput] Output Olds

The **[atsStatusOutput]** category has a read-only OID and two tabled set of read-only OIDs that provide information on the Automatic Transfer Switch's output feeds and their phases.

[illegible]

OID	Information Reported
<b>{atsOutputPhaseTable}</b> <b>{atsOutputPhaseEntry}</b>  <b>atsOutputPhaseTableIndex</b> <b>atsOutputPhaseIndex</b>  <b>atsOutputVoltage</b> <b>atsOutputCurrent</b>  <b>atsOutputMaxCurrent</b> <b>atsOutputMinCurrent</b>  <b>atsOutputLoad</b> <b>atsOutputMaxLoad</b> <b>atsOutputMinLoad</b>  <b>atsOutputPercentLoad</b> <b>atsOutputMaxPercentLoad</b>  <b>atsOutputMinPercentLoad</b>  <b>atsOutputPower</b> <b>atsOutputMaxPower</b> <b>atsOutputMinPower</b>  <b>atsOutputPercentPower</b> <b>atsOutputMaxPercentPower</b>  <b>atsOutputMinPercentPower</b>	<p>A tabled set of OIDs providing the following information for each output phase: Parameters that are unsupported by your model of the Automatic Transfer Switch return <b>-1</b>.</p> <ul style="list-style-type: none"> <li>• The output identifier.</li> <li>• Description of each output phase used in this device and one for neutral: <b>phase 1 (1)</b>, <b>phase 2 (2)</b>, <b>phase 3 (3)</b>, and <b>neutral (4)</b>.</li> <li>• The output voltage in VAC.</li> <li>• The output current, in 0.1 Amps, drawn by the load on the Automatic Transfer Switch</li> <li>• The maximum output current in 0.1 Amps recorded since the last time this value was read or reset by <b>atsStatusResetMaxMinValues</b></li> <li>• The minimum output current in 0.1 Amps recorded since the last time this value was read or reset by <b>atsStatusResetMaxMinValues</b>.</li> <li>• The output load in VA.</li> <li>• The maximum output load in VA recorded since the last time this value was read or reset by <b>atsStatusResetMaxMinValues</b>.</li> <li>• The minimum output load in VA recorded since the last time this value was read or reset by <b>atsStatusResetMaxMinValues</b>.</li> <li>• The percentage of the Automatic Transfer Switch's load capacity being used on this output phase at a redundancy of (n + x).</li> <li>• The maximum percentage of the Automatic Transfer Switch's load capacity being used on this output phase at a redundancy of (n + x) that has been recorded since the last time this value was read or reset by <b>atsStatusResetMaxMinValues</b>.</li> <li>• The minimum percentage of the Automatic Transfer Switch's load capacity being used on this output phase at a redundancy of (n + x) that has been recorded since the last time this value was read or reset by <b>atsStatusResetMaxMinValues</b>.</li> <li>• The output power in Watts.</li> <li>• The maximum output power in Watts recorded since the last time this value was read or reset by <b>atsStatusResetMaxMinValues</b>.</li> <li>• The minimum output power in Watts recorded since the last time this value was read or reset by <b>atsStatusResetMaxMinValues</b>.</li> <li>• The percentage of the Automatic Transfer Switch's power capacity being used on this output phase at a redundancy of (n + x).</li> <li>• The maximum percentage of the Automatic Transfer Switch's power capacity being used on this output phase at a redundancy of (n + x) that has been recorded since the last time this value was read or reset by <b>atsStatusResetMaxMinValues</b>.</li> <li>• The minimum percentage of the Automatic Transfer Switch's power capacity being used on this output phase at a redundancy of (n + x) that has been recorded since the last time this value was read or reset by <b>atsStatusResetMaxMinValues</b>.</li> </ul>

# Chapter 9: PowerNet MIB Traps

This chapter describes the PowerNet MIB traps that a Management Card, PowerNet Agent, MasterSwitch unit, or Automatic Transfer Switch can send to an NMS to alert the NMS that a specific event has occurred and describes how to define which NMSs can receive those traps. (See [How To Define Trap Receivers](#).)

Devices and Agents and the Traps They Can Generate		
Management Card	PowerNet Agent	MasterSwitch Models
All UPS traps	Only UPS traps supported for an Agent by the PowerNet MIB 2.2	Traps specific to the MasterSwitch model <ul style="list-style-type: none"> <li>• Traps 41 through 48 for a MasterSwitch unit</li> <li>• Traps 85 through 97 for MasterSwitch VM unit</li> <li>• Traps 98 to 103 for a MasterSwitch Plus unit</li> </ul>
All external Environmental Monitor traps	The two traps supported for an Environmental Monitor by the PowerNet MIB 2.2	Traps related to restarting the internal SNMP agent.
All Integrated Environmental Monitor traps (AP9618 and AP9619 only)		
Traps related to restarting the SNMP agent or downloading new code		
All DC Power Plant traps (Traps 110 through 120, and Traps 136 through 162)		
All Automatic Transfer Switch traps (Traps 126 through 135)		

The PowerNet MIB 3.4.4 supports sending 175 APC enterprise-specific traps (numbered 1 through 176, with number 40 unused). The PowerNet MIB 2.2 supported only 32 traps.

No device can generate all 175 traps. For example, some traps report only events related to a MasterSwitch unit, which has its own SNMP agent. Even if a device can send a trap, no NMS can receive the trap until at least one of the four trap receiver definitions exists for the device. By default, all Management Cards, Agents, MasterSwitch units, and Automatic Transfer Switches have no trap receivers defined. (See [How To Define Trap Receivers](#).)

## Trap Severity Levels

Each trap has one of the following severity levels.

Severe	Warning	Informational
Alerts a trap receiver of an event that requires immediate corrective action.	Alerts a trap receiver of an event that can adversely affect a device's operation if the situation worsens.	Alerts a trap receiver of an event that can not adversely affect a device's operation.

## How To Define Trap Receivers

Each Management Card, PowerNet Agent, MasterSwitch unit, and Automatic Transfer Switch can send traps to as many as four trap receivers. You define an NMS as a trap receiver using that NMS's IP address. You can also define other values for each trap receiver, such as the password (community string) that traps must use when they are sent to a specific trap receiver.

To access the PowerNet MIB OIDs that you can use to define a trap receiver, perform these steps:

1. Select **[apcmgmt]** under **[apc]**.
2. Select **[mconfig]**.

OID	Task
<b>mconfigNumTrapReceivers</b>	Identify the number of NMSs to receive traps (always 4).
<b>{mconfigTrapReceiverTable}</b> <b>{mconfigTrapReceiverEntry}</b> <b>trapIndex</b>  <b>receiverAddr</b>  <b>communityString</b> <b>severity</b>    <b>acceptThisReceiver</b>    <b>receiveTrapType</b>	Use this tabled set of OIDs to define parameters for each trap receiver: <ul style="list-style-type: none"> <li>• Identify the trap receiver's number (i.e. the read-only index to the trap receiver entry).</li> <li>• Define the NMS as a trap receiver by the NMS's IP address. The default value, 0 . 0 . 0 . 0, means that no NMS can receive traps.</li> <li>• Define the password (community name) a trap must use.</li> <li>• Identify the severity of traps to send to this NMS. Only traps of a severity equal to or greater than this value are sent. See <a href="#">Trap Severity Levels</a> for definitions of the following severity levels:               <ul style="list-style-type: none"> <li>-information (1)</li> <li>-warning (2)</li> <li>-severe (3)</li> </ul> </li> <li>• Enable or disable sending traps to this NMS.               <ul style="list-style-type: none"> <li>-yes (1): Enable sending traps.</li> <li>-no (2): Disable sending traps.</li> </ul> </li> <li>• Define the type of traps this NMS will receive. You must use <a href="#">powernet (1)</a> with a Management Card.</li> </ul>

## PowerNet MIB Trap Definitions

APC devices can generate the traps defined in the following table:

Trap	Severity	Number and Description (Sheet 1 of 9)
<b>communicationLost</b>	Severe	1: The Management Card's SNMP Agent lost communication with the UPS.
<b>upsOverload</b>	Severe	2: The UPS sensed a load greater than the rated-load capacity.
<b>upsDiagnosticsFailed</b>	Severe	3: The UPS failed a self-test.
<b>upsDischarged</b>	Severe	4: A low-battery condition exists; runtime may not be sufficient if input power fails.
<b>upsOnBattery</b>	Warning	5: The UPS switched to battery power.
<b>smartBoostOn</b>	Warning	6: UPS enabled its AVR Boost feature.
<b>lowBattery</b>	Severe	7: The UPS batteries will be exhausted soon if power is not restored
<b>communicationEstablished</b>	Informational	8: The Management Card's SNMP Agent established communication with the UPS.
<b>powerRestored</b>	Informational	9: Utility power restored.
<b>upsDiagnosticsPassed</b>	Informational	10: The UPS passed a self-test.
<b>returnFromLowBattery</b>	Informational	11: The UPS returned from a low battery condition.
<b>upsTurnedOff</b>	Warning	12: The UPS was turned off.
<b>upsSleeping</b>	Warning	13: The UPS entered sleep mode.
<b>upsWokeUp</b>	Informational	14: The UPS exited sleep mode.
<b>upsRebootStarted</b>	Warning	15: The UPS started a reboot sequence.
<b>upsDipSwitchChanged</b>	Warning	16: A DIP switch setting has changed and could alter UPS performance.
<b>upsBatteryNeedsReplacement</b>	Severe	17: A UPS battery needs replacement.
<b>contactFault</b>	Severe	18: The Environmental Monitor contact x has changed from its normal position.
<b>contactFaultResolved</b>	Informational	19: The Environmental Monitor contact x has returned to its normal position.
<b>hardwareFailureBypass</b>	Severe	20: The Matrix-UPS switched to bypass due to a hardware failure.
<b>softwareBypass</b>	Warning	21: The Matrix-UPS was put on bypass by software or by the UPS front panel.
<b>switchedBypass</b>	Warning	22: The Matrix-UPS was put on bypass by the switch at the UPS.

Trap	Severity	Number and Description (Sheet 2 of 9)
<b>returnFromBypass</b>	Informational	23: The Matrix-UPS returned from bypass mode.
<b>bypassPowerSupplyFailure</b>	Severe	24: The Matrix-UPS base module bypass power supply needs repair.
<b>baseFanFailure</b>	Severe	25: The Matrix-UPS base module fan needs repair
<b>batteryPackCommLost</b>	Severe	26: Communication with external battery packs was lost (Matrix-UPS or Smart-UPS XL).
<b>batteryPackCommEstablished</b>	Informational	27: Communication with external battery packs was regained (Matrix-UPS or Smart-UPS XL).
<b>calibrationStart</b>	Informational	28: A runtime calibration has started.
<b>restartAgent</b>	Informational	29: The Management Card's SNMP agent is restarting as commanded by the NMS
<b>upsTurnedOn</b>	Informational	30: The UPS is turned on.
<b>smartTrimOn</b>	Warning	31: The UPS enabled its AVR Trim feature.
<b>codeAuthenticationDone</b>	Informational	32: Authentication of TFTP agent file code image is done.
<b>upsOverloadCleared</b>	Informational	33: The UPS overload condition is corrected.
<b>smartBoostOff</b>	Informational	34: The Smart-UPS returned from using its AVR Boost feature.
<b>smartAvrReducingOff</b>	Informational	35: The Matrix-UPS returned from using AVR Trim feature.
<b>upsBatteryReplaced</b>	Informational	36: Bad battery replaced.
<b>calibrationEnd</b>	Informational	37: Runtime calibration ended.
<b>dischargeCleared</b>	Informational	38: UPS discharge condition ended.
<b>gracefullShutdown</b>	Informational	39: Graceful shutdown started.
<i>Not currently used.</i>	<i>none</i>	40: <i>No value.</i>
<b>outletOn</b>	Informational	41: The MasterSwitch outlet specified by <b>SPDUOutletControlIndex</b> is turned on or, if that value is <b>0</b> , all outlets are turned on.
<b>outletOff</b>	Informational	42: The MasterSwitch outlet specified by <b>SPDUOutletControlIndex</b> is turned off or, if that value is <b>0</b> , all outlets are turned off.
<b>outletReboot</b>	Informational	43: The MasterSwitch outlet specified by <b>SPDUOutletControlIndex</b> was rebooted or, if that value is <b>0</b> , all outlets were rebooted.
<b>configChange</b>	Warning	44: The MasterSwitch SNMP configuration changed.

Trap	Severity	Number and Description (Sheet 3 of 9)
<b>configChangeOutlet</b>	Warning	45: The configuration of the MasterSwitch outlet specified by <b>sPDUOutletConfigIndex</b> changed, or if that value is <b>0</b> , the master outlet configuration changed.
<b>accessViolationConsole</b>	Warning	46: Three unsuccessful MasterSwitch console login attempts occurred.
<b>accessViolationHTTP</b>	Warning	47: An unsuccessful MasterSwitch HTTP login attempt occurred.
<b>passwordChange</b>	Warning	48: The MasterSwitch console password has changed.
<b>badVoltage</b>	Warning	49: The UPS output voltage is not within the acceptable range.
<b>badVoltageCleared</b>	Informational	50: The UPS output voltage is again within the acceptable range.
<b>chargerFailure</b>	Warning	51: The UPS battery charger has failed.
<b>chargerFailureCleared</b>	Informational	52: The UPS battery charger has returned to normal operation.
<b>batteryOverTemperature</b>	Warning	53: The UPS battery temperature exceeded the temperature threshold.
<b>batteryOverTemperatureCleared</b>	Informational	54: The UPS battery temperature no longer exceeds the temperature threshold.
<b>smartRelayFault</b>	Warning	55: The AVR Boost or AVR Trim relay failed.
<b>smartRelayFaultCleared</b>	Informational	56: The AVR Boost or AVR Trim relay failure is corrected
<b>humidityThresholdViolation1</b>	Warning	57: The Environmental Monitor probe 1 humidity threshold violated.
<b>humidityThresholdViolationCleared1</b>	Informational	58: The Environmental Monitor probe 1 humidity threshold is no longer violated.
<b>TemperatureThresholdViolation1</b>	Warning	59: The Environmental Monitor probe 1 temperature threshold violated.
<b>TemperatureThresholdViolationCleared1</b>	Informational	60: The Environmental Monitor probe 1 temperature threshold is no longer violated
<b>humidityThresholdViolation2</b>	Warning	61: The Environmental Monitor probe 2 humidity threshold violated.
<b>humidityThresholdViolationCleared2</b>	Informational	62: The Environmental Monitor probe 2 humidity threshold is no longer violated.
<b>TemperatureThresholdViolation2</b>	Warning	63: The Environmental Monitor probe 2 temperature threshold violated.
<b>TemperatureThresholdViolationCleared2</b>	Informational	64: The Environmental Monitor probe 2 temperature threshold is no longer violated

Trap	Severity	Number and Description (Sheet 4 of 9)
<b>mupsCommunicationEstablished</b>	Informational	65: Communication with the Environmental Monitor has been established.
<b>mupsCommunicationLost</b>	Warning	66: Communication with the Environmental Monitor was lost.
<b>batteryIncrease</b>	Informational	67: The number of Symmetra UPS batteries was increased.
<b>batteryDecrease</b>	Informational	68: The number of Symmetra UPS batteries was decreased.
<b>powerModuleIncrease</b>	Informational	69: The number of Symmetra UPS power modules was increased.
<b>powerModuleDecrease</b>	Informational	70: The number of Symmetra UPS power modules was decreased.
<b>intelligenceModuleInserted</b>	Informational	71: An intelligence module was inserted into the Symmetra UPS.
<b>intelligenceModuleRemoved</b>	Informational	72: An intelligence module was removed from the Symmetra UPS.
<b>rintelligenceModuleInserted</b>	Informational	73: A redundant intelligence module was inserted into the Symmetra UPS.
<b>rintelligenceModuleRemoved</b>	Informational	74: A redundant intelligence module was removed from the Symmetra UPS.
<b>extBatteryFrameIncrease</b>	Informational	75: An external battery frame was added to the Symmetra UPS.
<b>extBatteryFrameDecrease</b>	Informational	76: An external battery frame was removed from the Symmetra UPS.
<b>abnormalCondition</b>	Severe	77: The Symmetra UPS has an abnormal condition. See <a href="#">Symmetra UPS Subtraps</a> for the subtraps that identify which abnormal condition has occurred.
<b>abnormalConditionCleared</b>	Informational	78: The Symmetra UPS abnormal condition is corrected. See <a href="#">Symmetra UPS Subtraps</a> for the subtraps that identify which abnormal condition has been corrected.
<b>deviceStatusChange</b>	Informational	79: The status of the device being monitored has changed.
<b>noBatteries</b>	Warning	80: The UPS has no batteries attached.
<b>noBatteriesCleared</b>	Informational	81: Batteries have been attached to the UPS
<b>userAdded</b>	Informational	82: A new user has been added.
<b>userDeleted</b>	Informational	83: A user has been deleted.
<b>userModified</b>	Informational	84: A user has been modified.

Trap	Severity	Number and Description (Sheet 5 of 9)
<b>msvmCommunicationEstablished</b>	Informational	85: Communication with the MasterSwitch VM unit has been established.
<b>msvmCommunicationLost</b>	Severe	86: Communication with the MasterSwitch VM unit has been lost.
<b>msvmOverload</b>	Severe	87: The MasterSwitch VM unit is near or at an overload condition.
<b>msvmOverloadCleared</b>	Informational	88: The overload condition on the MasterSwitch VM unit has been cleared.
<b>msvmOutletOn</b>	Informational	89: An outlet on the MasterSwitch VM unit has turned on.
<b>msvmOutletOff</b>	Informational	90: An outlet on the MasterSwitch VM unit has turned off.
<b>msvmDeviceConfigChange</b>	Informational	91: A device configuration change was made on the MasterSwitch VM unit.
<b>msvmOutletConfigChange</b>	Informational	92: An outlet configuration change was made on the MasterSwitch VM unit.
<b>msvmLowLoad</b>	Informational	93: The MasterSwitch VM unit has violated the low load threshold
<b>msvmLowLoadCleared</b>	Informational	94: The low load condition on the MasterSwitch VM unit has been corrected.
<b>msvmNearOverload</b>	Severe	95: The MasterSwitch VM unit is near or at an overload condition
<b>msvmNearOverloadCleared</b>	Informational	96: The overload condition on the MasterSwitch VM unit has been corrected.
<b>msvmPowerSupplyStatusChange</b>	Informational	97: The status of the power supply on the MasterSwitch VM unit has changed.
<b>mspCommunicationEstablished</b>	Informational	98: Communication with the MasterSwitch Plus unit has been established.
<b>mspCommunicationLost</b>	Informational	99: Communication with the MasterSwitch Plus unit has been lost.
<b>mspOutletOn</b>	Informational	100: An outlet on the MasterSwitch Plus unit has turned on.
<b>mspOutletOff</b>	Informational	101: An outlet on the MasterSwitch Plus unit has turned off.
<b>mspDeviceConfigChange</b>	Informational	102: A device configuration change was made on the MasterSwitch Plus unit.
<b>mspOutletConfigChange</b>	Informational	103: An outlet configuration change was made on the MasterSwitch Plus unit.

Trap	Severity	Number and Description (Sheet 6 of 9)
<b>rsSourceSwitched</b>	Informational	<p>104: The Redundant Switch has switched source.</p> <ul style="list-style-type: none"> <li>-The first variable represents the current source: <b>0</b> for A, <b>1</b> for B.</li> <li>-The second variable is the 32-character name of the source.</li> <li>-The third variable represents the transfer cause: <ul style="list-style-type: none"> <li>• <b>0</b>: no transfers recorded</li> <li>• <b>1</b>: user action or preferred switching</li> <li>• <b>3</b>: line notch or spike</li> <li>• <b>5</b>: low line voltage</li> <li>• <b>7</b>: high line voltage</li> <li>• <b>9</b>: frequency out of range</li> </ul> </li> <li>-The fourth variable is a character string listing the transfer cause.</li> </ul>
<b>rsLostRedundancy</b>	Severe	<p>105: The Redundant Switch has lost redundancy. The variables identify the source that is no longer available:</p> <ul style="list-style-type: none"> <li>-The first variable represents the current source: <b>0</b> for A, <b>1</b> for B.</li> <li>-The second variable is the 32-character name of the source.</li> </ul>
<b>rsRedundancyRestored</b>	Informational	<p>106: Redundancy has been restored to the source. The variables identify the source to which power has been restored:</p> <ul style="list-style-type: none"> <li>-The first variable represents the current source: <b>0</b> for A, <b>1</b> for B.</li> <li>-The second variable is the 32-character name of the source.</li> </ul>
<b>rsConfigChange</b>	Informational	107: A configuration change was made on a Redundant Switch.
<b>rsCommunicationEstablished</b>	Informational	108: Communications with the Redundant Switch is established.
<b>rsCommunicationLost</b>	Severe	109: Communications with the Redundant Switch has been lost.
<b>dcCommunicationEstablished</b>	Informational	110: Communications with the DC power plant has been established.
<b>dcCommunicationLost</b>	Severe	111: Communications with the DC power plant has been lost.
<b>dcActivePINChanged</b>	Informational	112: The active PIN on the DC controller has been changed.

<b>Trap</b>	<b>Severity</b>	<b>Number and Description (Sheet 7 of 9)</b>
<b>dcMajorAlarm</b>	Severe	113: A Major alarm is active in the DC power plant.
<b>dcMajorAlarmCleared</b>	Informational	114: A Major alarm is no longer active in the DC power plant.
<b>dcMinorAlarm</b>	Severe	115: A Minor alarm is active in the DC power plant.
<b>dcMinorAlarmCleared</b>	Informational	116: A Minor alarm is no longer active in the DC power plant.
<b>dcOutputRelayOn</b>	Warning	117: An output relay has gone on in the DC power plant.
<b>dcOutputRelayOff</b>	Informational	118: An input relay has gone off in the DC power plant.
<b>dcIntputRelayOn</b>	Warning	119: An input relay has gone on in the DC power plant.
<b>dcIntputRelayOff</b>	Informational	120: An output relay has gone off in the DC power plant.
<b>logicPowerSuppliesIncreased</b>	Informational	121: The number of logic power supplies has increased at the Symmetra 3-Phase UPS.
<b>logicPowerSuppliesDecreased</b>	Informational	122: The number of logic power supplies has decreased at the Symmetra 3-Phase UPS.
<b>externalSwitchGearClosed</b>	Informational	123: The identified external switch gear at the Symmetra 3-Phase UPS is closed.
<b>externalSwitchGearOpened</b>	Informational	124: The identified external switch gear at the Symmetra 3-Phase UPS is open
<b>generalDeviceEvent</b>	Informational	125: The identified general event occurred at the Symmetra 3-Phase UPS.
<b>atsSourceSwitched</b>	Informational	126: The Automatic Transfer Switch has switched source.
<b>atsLostRedundancy</b>	Severe	127: The Automatic Transfer Switch has lost redundancy.
<b>atsRedundancyRestored</b>	Informational	128: Redundancy has been restored to the Automatic Transfer Switch.
<b>atsConfigChange</b>	Informational	129: A configuration change has been made on a Automatic Transfer Switch.
<b>atsCommunicationEstablished</b>	Informational	130: Communications with the Automatic Transfer Switch has been established.
<b>atsCommunicationLost</b>	Severe	131: Communications with the Automatic Transfer Switch has been lost.
<b>atsOverCurrent</b>	Severe	132: Output Current of the Automatic Transfer Switch has exceeded threshold.

Trap	Severity	Number and Description (Sheet 8 of 9)
<b>atsOverCurrentCleared</b>	Informational	133: Output Current of the Automatic Transfer Switch has returned below threshold.
<b>atsPowerSupplyFailure</b>	Severe	134: The Automatic Transfer Switch Power Supply has failed.
<b>atsPowerSupplyFailureCleared</b>	Informational	135: The Automatic Transfer Switch Power Supply failure cleared.
<b>dcMainsFailAlarm</b>	Warning	136: A Mains Fail alarm is active in the DC power plant.
<b>dcMainsFailAlarmCleared</b>	Informational	137: Mains Fail alarm is no longer active in the DC power plant.
<b>dcFanFailAlarm</b>	Warning	138: A Fan Fail alarm is active in the DC power plant.
<b>dcFanFailAlarmCleared</b>	Informational	139: A Fan Fail alarm is no longer active in the DC power plant.
<b>dcRectifierOvertempAlarm</b>	Warning	140: Rectifier Overtemp alarm is active in the DC power plant.
<b>dcRectifierOvertempAlarmCleared</b>	Informational	141: Rectifier Overtemp alarm is no longer active in the DC power plant.
<b>dcCurrentLimitAlarm</b>	Warning	142: A Current Limit alarm is active in the DC power plant.
<b>dcCurrentLimitAlarmCleared</b>	Informational	143: Current Limit alarm is no longer active in the DC power plant.
<b>dcRectifierFailAlarm</b>	Warning	144: A Rectifier Fail alarm is active in the DC power plant.
<b>dcRectifierFailAlarmCleared</b>	Informational	145: Rectifier Fail alarm is no longer active in the DC power plant.
<b>dcMultRectFailAlarm</b>	Warning	146: Multiple Rectifier Fail alarm is active in the DC power plant.
<b>dcMultRectFailAlarmCleared</b>	Informational	147: Multiple Rectifier Fail alarm is no longer active in the DC power plant.
<b>dcBatteryBreakerAlarm</b>	Warning	148: Battery Breaker alarm is active in the DC power plant.
<b>dcBatteryBreakerAlarmCleared</b>	Informational	149: Battery Breaker alarm is no longer active in the DC power plant.
<b>dcRectifierOVPAAlarm</b>	Warning	150: A Rectifier OVP alarm is active in the DC power plant.
<b>dcRectifierOVPAAlarmCleared</b>	Informational	151: A Rectifier OVP alarm is no longer active in the DC power plant.
<b>dcLVDImminentAlarm</b>	Warning	152: An LVD Imminent alarm is active in the DC power plant.

Trap	Severity	Number and Description (Sheet 9 of 9)
<b>dcLVDImminentAlarmCleared</b>	Informational	153: An LVD Imminent alarm is no longer active in the DC power plant.
<b>dcFuseCBAAlarm</b>	Warning	154: A Fuse/CB alarm is active in the DC power plant.
<b>dcFuseCBAAlarmCleared</b>	Informational	155: A Fuse/CB alarm is no longer active in the DC power plant.
<b>dcBatteryTestFail</b>	Warning	156: A Battery Test failed in the DC power plant.
<b>dcTemperatureAlarm</b>	Warning	157: A Temperature alarm is active in the DC power plant.
<b>dcTemperatureAlarmCleared</b>	Informational	158: A Temperature alarm is no longer active in the DC power plant.
<b>dcHumidityAlarm</b>	Warning	159: A Humidity alarm is active in the DC power plant.
<b>dcHumidityAlarmCleared</b>	Informational	160: A Humidity alarm is no longer active in the DC power plant.
<b>dcBBCommunicationEstablished</b>	Informational	161: DC Power plant bridging board communications established.
<b>dcBBCommunicationLost</b>	Severe	162: DC Power plant bridging board communications lost.
<b>iemHighTempThresholdViolation</b>	Severe	163: High temperature threshold violation.
<b>iemHighTempThresholdViolationCleared</b>	Informational	164: High temperature threshold violation has been cleared.
<b>iemLowTempThresholdViolation</b>	Severe	165: Low temperature threshold violation.
<b>iemLowTempThresholdViolationCleared</b>	Informational	166: Low temperature threshold violation has been cleared.
<b>iemHighHumidThresholdViolation</b>	Severe	167: High humidity threshold violation.
<b>iemHighHumidThresholdViolationCleared</b>	Informational	168: High humidity threshold violation has been cleared.
<b>iemLowHumidThresholdViolation</b>	Severe	169: Low humidity threshold violation.
<b>iemLowHumidThresholdViolationCleared</b>	Informational	170: Low humidity threshold violation has been cleared.
<b>iemProbeDisconnected</b>	Warning	171: Probe has been disconnected.
<b>iemProbeConnected</b>	Informational	172: Probe has been connected.
<b>iemContactFault</b>	Severe	173: Contact fault.
<b>iemContactFaultCleared</b>	Informational	174: Contact fault cleared.
<b>iemRelayFault</b>	Warning	175: Output relay has faulted.
<b>iemRelayFaultCleared</b>	Informational	176: Output relay fault cleared.

## Symmetra UPS Subtraps

The **abnormalCondition** and **abnormalConditionCleared** traps for the Symmetra UPS have the following subtraps that identify the abnormal condition.



*Note:*

*To make the MIB forward-compatible with future UPS models, subtraps 41 through 64 are defined but unused at the time this manual is being published. If you use a new UPS model that was released after the publication of this manual, you could receive a subtrap for one of these subtrap numbers even if you have not upgraded the firmware for your Management Card. If this occurs, contact APC to obtain the latest MIB and TDF files, which will describe the newly defined bit.*

Subtrap	Description	(Sheet 1 of 3)
<b>SYMtrapstr1</b>	An installed power module has failed.	
<b>SYMtrapstr2</b>	A failed power module condition has been corrected.	
<b>SYMtrapstr3</b>	An installed intelligence module has failed.	
<b>SYMtrapstr4</b>	A failed intelligence module condition has been corrected.	
<b>SYMtrapstr5</b>	An installed redundant intelligence module has failed.	
<b>SYMtrapstr6</b>	A failed redundant intelligence module condition has been corrected.	
<b>SYMtrapstr7</b>	An installed battery has failed.	
<b>SYMtrapstr8</b>	A failed battery condition has been corrected.	
<b>SYMtrapstr9</b>	The load is above the alarm threshold.	
<b>SYMtrapstr10</b>	The violation of the load alarm threshold has been corrected.	
<b>SYMtrapstr11</b>	The UPS has lost its redundancy.	
<b>SYMtrapstr12</b>	The loss of redundancy has been corrected.	
<b>SYMtrapstr13</b>	The redundancy of the UPS is at or below the alarm threshold.	
<b>SYMtrapstr14</b>	The redundancy of the UPS is above the alarm threshold again.	
<b>SYMtrapstr15</b>	The UPS is on bypass because input voltage and frequency were out of range.	
<b>SYMtrapstr16</b>	Input voltage and frequency are back in range. so the UPS returned from bypass.	
<b>SYMtrapstr17</b>	The bypass contactor is stuck in bypass position.	
<b>SYMtrapstr18</b>	The bypass contactor is no longer stuck in bypass position.	
<b>SYMtrapstr19</b>	The bypass contactor is stuck in the on-line position.	

<b>Subtrap</b>	<b>Description</b> <span style="float: right;">(Sheet 2 of 3)</span>
<b>SYMtrapstr20</b>	The bypass contactor is no longer stuck in the on-line position condition.
<b>SYMtrapstr21</b>	The UPS is in bypass mode due to an internal fault.
<b>SYMtrapstr22</b>	The internal fault condition that put the UPS into bypass mode has been corrected.
<b>SYMtrapstr23</b>	The UPS is in bypass mode due to an overload.
<b>SYMtrapstr24</b>	The overload condition that put the UPS in bypass mode has been cleared.
<b>SYMtrapstr25</b>	The UPS is in maintenance bypass mode.
<b>SYMtrapstr26</b>	The UPS is no longer in maintenance bypass mode.
<b>SYMtrapstr27</b>	The input circuit breaker has been tripped to the open position.
<b>SYMtrapstr28</b>	The tripped input circuit breaker has been reset.
<b>SYMtrapstr29</b>	A system level fan failure has occurred.
<b>SYMtrapstr30</b>	The system level fan failure has been corrected.
<b>SYMtrapstr31</b>	The redundant intelligence module is in control.
<b>SYMtrapstr32</b>	The redundant intelligence module is no longer in control.
<b>SYMtrapstr33</b>	A I2C failure occurred. (The UPS has an internal communication problem.)
<b>SYMtrapstr34</b>	The I2C failure condition (the internal communication problem) has been corrected.
<b>SYMtrapstr35</b>	A UPS battery is overheated.
<b>SYMtrapstr36</b>	The overheated battery condition has been corrected.
<b>SYMtrapstr37</b>	Load shutdown. AC input was lost while the UPS was in bypass.
<b>SYMtrapstr38</b>	The load shutdown condition has been corrected.
<b>SYMtrapstr39</b>	Remaining runtime is below alarm threshold.
<b>SYMtrapstr40</b>	Remaining runtime is above the alarm threshold again.
<b>SYMtrapstr41</b>	Bit 20 of the Abnormal Condition register is set.
<b>SYMtrapstr42</b>	Bit 20 of the Abnormal Condition register has been reset.
<b>SYMtrapstr43</b>	Bit 21 of the Abnormal Condition register is set.
<b>SYMtrapstr44</b>	Bit 21 of the Abnormal Condition register has been reset.
<b>SYMtrapstr45</b>	Bit 22 of the Abnormal Condition register is set.
<b>SYMtrapstr46</b>	Bit 22 of the Abnormal Condition register has been reset.
<b>SYMtrapstr47</b>	Bit 23 of the Abnormal Condition register is set.
<b>SYMtrapstr48</b>	Bit 23 of the Abnormal Condition register has been reset.

<b>Subtrap</b>	<b>Description</b> <span style="float: right;">(Sheet 3 of 3)</span>
<b>SYMtrapstr49</b>	Bit 24 of the Abnormal Condition register is set.
<b>SYMtrapstr50</b>	Bit 24 of the Abnormal Condition register has been reset.
<b>SYMtrapstr51</b>	Bit 25 of the Abnormal Condition register is set.
<b>SYMtrapstr52</b>	Bit 25 of the Abnormal Condition register has been reset.
<b>SYMtrapstr53</b>	Bit 26 of the Abnormal Condition register is set.
<b>SYMtrapstr54</b>	Bit 26 of the Abnormal Condition register has been reset.
<b>SYMtrapstr55</b>	Bit 27 of the Abnormal Condition register is set.
<b>SYMtrapstr56</b>	Bit 27 of the Abnormal Condition register has been reset.
<b>SYMtrapstr57</b>	Bit 28 of the Abnormal Condition register is set.
<b>SYMtrapstr58</b>	Bit 28 of the Abnormal Condition register has been reset.
<b>SYMtrapstr59</b>	Bit 29 of the Abnormal Condition register is set.
<b>SYMtrapstr60</b>	Bit 29 of the Abnormal Condition register has been reset.
<b>SYMtrapstr61</b>	Bit 30 of the Abnormal Condition register is set.
<b>SYMtrapstr62</b>	Bit 30 of the Abnormal Condition register has been reset.
<b>SYMtrapstr63</b>	Bit 31 of the Abnormal Condition register is set.
<b>SYMtrapstr64</b>	Bit 31 of the Abnormal Condition register has been reset.



## APC Worldwide Customer Support

Customer support for this or any other APC product is available at no charge in any of the following ways:

- Visit the APC Web site to find answers to frequently asked questions (FAQs), to access documents in the APC Knowledge Base, and to submit customer support requests.
  - **www.apc.com** (Corporate Headquarters)  
Connect to localized APC Web sites for specific countries, each of which provides customer support information.
  - **www.apc.com/support/**  
Global support with FAQs, knowledge base, and e-support.
- Contact an APC Customer Support center by telephone or e-mail.
  - Regional centers:

APC headquarters U.S., Canada	(1)(800)800-4272 (toll free)
Latin America	(1)(401)789-5735 (USA)
Europe, Middle East, Africa	(353)(91)702020 (Ireland)
Japan	(03)5434-2021 Guidance 3

- Local, country-specific centers: go to **www.apc.com/support/contact** for contact information.

Contact the APC representative or other distributor from whom you purchased your APC product for information on how to obtain local customer support.

Entire contents copyright © 2002 American Power Conversion. All rights reserved.  
Reproduction in whole or in part without permission is prohibited. APC, the APC logo, Back-UPS, MasterSwitch, Matrix-UPS, PowerNet, PowerChute, Smart-UPS, and Symmetra are trademarks of American Power Conversion Corporation and may be registered in some jurisdictions. All other trademarks, product names, and corporate names are the property of their respective owners and are used for informational purposes only.