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UPSUTIL for MPE/iX
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User's Manual
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HP

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http://jazz.external.hp.com/papers/upsutil.htm

1 INTRODUCTION...... 5 1.1 Intended Users..... 5 1.2 Product Environment 6 1.3 Product Structure..... 6 2 UPSUTIL OVERVIEW 7 2.1 Functional Overview..... 7 2.2 Product Invocation and Security...... 7 2.4 Product Restrictions & Limitations... 9 2.4.1 Batch Mode Limitations 9 2.4.2 Language Localization Limitation 10 2.5 UPSUTIL User Interface..... 11 2.5.1 Type of User Interface 11 2.5.2 UPSUTIL Commands Summary 11 2.5.3 General Command Parser Errors...... 11 3 UPSUTIL Commands..... 13 3.1 HELP Command... 14 3.2 EXIT Command... 15 3.3 CONFIG Command... 16 3.4 NEWCONFIG Command... 18 3.4.1 Requirements for UPS Monitor Configuration Files.... 19 3.4.2 UPS Monitor Configuration Options 20 3.4.2.1 Powerfail Message Routing 20 3.4.2.2 Powerfail Command File 20 3.4.2.3 Powerfail Grace Period 21 3.4.2.4 Powerfail Low Battery 21 3.4.3 The Default UPS Monitor Configuration File..... 22 3.4.4 If No UPSCNFIG.PUB.SYS File Exists..... 23 3.4.5 Observing Results of NEWCONFIG Command...... 23 3.5 STATUS Command... 27 3.5.1 The Status Display.. 28 3.5.2 UPS Monitor Process Status Display.. 28 3.5.2.1 UPS Monitor Operating State... 28 3.5.2.2 UPS Monitor Version Number 28 3.5.2.3 System Power State... 29 3.5.2.4 Powerfail Recovery Messages...... 29 3.5.2.5 Configuration File Name.. 29 3.5.2.6 Powerfail Command File Name...... 30 3.5.2.8 Powerfail Grace Period 30 3.5.2.9 Powerfail Grace Timer.. 30 3.5.2.10 Powerfail Command File 31 3.5.2.11 Action on UPS Low Battery 31 3.5.2.12 Pin..... 32 3.5.2.13 UPS Devices Configured...... 32 3.5.2.14 UPS Devices Monitored...... 32 3.5.2.15 UPS Devices Allocated...... 32 3.5.3 UPS Devices Status Display.. 33 3.5.3.1 UPS #. 33 3.5.3.2 LDEV # 33 3.5.3.3 Alloc (Allocated Indicator)...... 33 3.5.3.4 Init (Initialized Indicator)...... 33 3.5.3.5 State... 34 3.5.3.6 Power. 34 3.5.3.7 Hardware Status 35 3.5.4 Additional Examples 36 3.6 RESETPFAIL Command... 43 3.7 START Command... 45

- 3.8 STOP Command... 463.9 RESTART Command... 48

1 INTRODUCTION

UPSUTIL is an easy-to-use support tool that helps to manage the UPS Monitor/iX UPS-management subsystem on MPE/iX HP3000 systems.

Working in conjunction with the system's UPS Monitor/iX UPS management subsystem, UPSUTIL provides easily accessible functions that assist authorized users to:

- check the system to see if the UPS Monitor/iX subsystem is running.
- check the system to see what, if any, UPS LDEVS (logical devices) have been configured.
- check the current operational status of all configured UPS devices on the system.
- control (start, stop, restart, set UPS Monitor configuration file) the UPS Monitor/iX subsystem while the HP3000 system is running.

These functions make it easy to determine whether the running system has been configured correctly for UPS devices, whether the UPS Monitor/iX subsystem is communicating correctly with the configured UPS devices, and allow an online user to have "stop and start" control over the UPS Monitor/iX subsystem.

The "stop and start" control is valuable in cases where a UPS device may have been removed from the system for repair and is now being reinstalled in the system, or has had its I/O interface cable accidentally or intentionally disconnected and now reconnected. In either of these cases, without UPSUTIL it is necessary to re-boot the system in order to re-start the monitoring of that UPS device by the UPS Monitor/iX subsystem. But with UPSUTIL, the UPS Monitor process may be restarted with the system up, without rebooting the system. This ability reduces system downtime and increases system availability.

1.1 Intended Users

UPSUTIL is intended to be used by authorized system users who perform system management functions for the HP3000 system, such as:

- System Managers
- System Operators
- HP Customer Engineers
- HP Response Center Engineers

UPSUTIL is not intended for use by "ordinary" system users.

(Refer to the Product Invocation and Security section of this document for information about limiting usage of UPSUTIL.)

1.2 Product Environment

UPSUTIL is intended for and supported for use in an HP3000 MPE/iX system environment, characterized as follows.

1.2.1 Hardware Environment

UPSUTIL will run correctly on any HP3000 system platform, but is intended for, and really only useful on, HP3000 systems that employ the UPS method of power failure protection, such as:

- HP3000 Series 991/995/997
- HP3000 Series 9X8
- HP3000 Series 9x9
- HP3000 N-Class and A-Class
- Future HP3000 systems with UPS devices

While it is possible to run the program harmlessly on other HP3000 models (where there are no UPS devices), there is nothing useful that UPSUTIL can do on such systems.

1.2.2 Software Environment

UPSUTIL runs under the MPE/iX Operating System, and requires system release "5.0 Push" (Core System Release C.50.00) or later in order to function correctly.

1.3 Product Structure

UPSUTIL is structured as a single executable program file, UPSUTIL.MPEXL.TELESUP. There are no message catalog files or other auxiliary files associated with UPSUTIL.

2 UPSUTIL OVERVIEW

2.1 Functional Overview

Through a very simple "command keyword" user interface, the UPSUTIL program provides the following functions pertaining to the management of UPS devices and the UPS Monitor/iX subsystem on HP3000 systems running MPE/iX Release 5.0 "Push" or later releases:

- 1) A configuration query function that obtains and displays the list of UPS Ldevs (logical devices) that are in the I/O configuration of the system that is running.
- 2) A status query function that obtains and displays the current status of the UPS Monitor/iX subsystem process (running or not running; power normal or power failed; number of UPS devices being monitored) and of each of the configured UPS devices (Ldev number, allocated/not allocated, initialized/not initialized, operational state, power condition, and UPS hardware status).
- 3) A control function that halts the UPS Monitor/iX subsystem process, if it is currently running.
- 4) A control function that starts the UPS Monitor/iX subsystem process, if it is not currently running.
- 5) A control function that restarts (stops, then immediately starts) the UPS Monitor/iX subsystem process, if it is currently running.
- 6) A configuration function that selects a new user-defined configuration file to be used by the UPS Monitor subsystem.
- 7) A control function that resets (clears) the UPS Monitor's information pertaining to the previous execution (if any) of a UPS powerfail "grace period" timeout and a UPS powerfail "user command file".

In addition, UPSUTIL has two other functions that pertain to the operation of UPSUTIL itself:

- 1) A "help" function that displays the menu of UPSUTIL's commands.
- 2) An "exit" function that ends UPSUTIL program execution.

2.2 Product Invocation and Security

Like any MPE/iX program, UPSUTIL is activated by being ":run" from the Command Interpreter in a job or in a session. However, because the user of UPSUTIL can affect the operation of the system's UPS Monitor Process, there are security restrictions on running the UPSUTIL program.

UPSUTIL should not be accessible to ordinary system users because of UPSUTIL's ability to affect execution of the system's UPS Monitor Process. Therefore UPSUTIL has been implemented as a Privileged-Mode Program, and is limited in accessibility to privileged system users, such as System Managers and HP Service Personnel.

Security to prevent unauthorized access to the UPSUTIL program is provided by two factors:

(1) UPSUTIL is a "Privileged Mode" program. This requires that, in order to run, it reside in a file group.account that has the PM capability associated with both the group and the account.

(2) UPSUTIL requires that its user have "System Manager" (SM) capability in order to be able to run the UPSUTIL program. Users without SM capability can not run UPSUTIL.

To invoke UPSUTIL from an interactive session, type "run upsutil.mpexl.telesup" at the CI prompt, as shown in the following example:

```
:run upsutil.mpexl.telesup
```

There is no run-time parameter (parm=) and no information string (info=) for UPSUTIL.

When activated, UPSUTIL presents the start-up display information (see Figure 2-1) on the Output file (terminal screen). The start-up display shows the version and copyright banner of UPSUTIL, the "help menu" of UPSUTIL's commands, and then the UPSUTIL prompt for the user's first command input.

UPS Utility Program A.02.00 (c) COPYRIGHT Hewlett-Packard Co. 1994, 2001

UPSUTIL Program: Commands available are as follows:

(There are no parameters for any of the commands. At the prompt, just type the command name.)

Cmd Name:		Command Function:
~~~~~~		~~~~~~~
help	-	Show this menu of commands.
exit	-	Done, exit the program.
config	-	Show system configuration of UPS devices.
newconfig	-	Change to a new UPS Monitor config file.
start	-	Start the System UPS Monitor process.
stop	-	Stop the System UPS Monitor process.
restart	-	Restart (stop, then start) the UPS Monitor process.
resetpfail	-	Reset (clear) UPS Monitor's information about the
		most recent execution of the "powerfail command file".
status	-	Show System UPS Monitor process status.

UPSUTIL: Command >

Figure 2-1. UPSUTIL Invocation

## 2.3 Use of Files

UPSUTIL uses only two files in its operation. It reads its commands from the Pascal INPUT file (job/session \$STDIN file), and writes its output (prompts for commands, progress messages, error messages, and display information resulting from command execution) to the Pascal OUTPUT file (job/session \$STDLIST) file.

### **Revision of March 2000: Version 8:**

UPSUTIL now also uses "UPS Monitor configuration files", as described in the NEWCONFIG command. (Actually, UPSUTIL does not, per se, "use" these files -- it never opens a UPS Monitor configuration file; it simply acquires from the user the file name of a configuration file, and passes that file name to the UPS Monitor, which actually opens and uses the file.)

#### **Revision of December 2001: Version 9:**

Introduction of the "user-specified UPS powerfail command file". This is an MPE/iX CI command file that can be specified by a configuration command within the UPS Monitor configuration file. When so specified, this command file will be executed by the MPE/iX CI at a user-specified time following the detection by the UPS Monitor of a UPS device's powerfail signal. UPSUTIL itself does not access this file; it merely reports the file's specification (or lack thereof) in UPSUTIL's STATUS display.

## 2.4 Product Restrictions & Limitations

Because UPSUTIL was conceived to be a simple-to-use service tool, intended primarily for use by HP support personnel to help them to verify and troubleshoot the operation of the UPS Monitor/iX subsystem, UPSUTIL is not a "full-blown" MPE/iX software product implementation. In its initial implementation, UPSUTIL has the following restrictions and limitations. These could be alleviated by future enhancements if warranted.

## 2.4.1 Batch Mode Limitations

UPSUTIL is primarily intended to be operated interactively from an online user's terminal within an MPE/iX session, and although it can be operated within a batch job, it does not implement the file I/O functions that batch- mode applications usually possess.

In particular, UPSUTIL assumes that its Input and Output files comprise an MPE/iX "duplicative file set" (i.e. input records that are read from the Input file are automatically written to and appear on the Output file), and so it makes no checks for duplicative input/output files and no provision for echoing the input records to the output file when the file set is not duplicative, as is the case in a batch job.

So, while it is permissible to run UPSUTIL from a batch job, taking UPSUTIL's command inputs from \$STDIN (or from a file-equated INPUT file) and writing UPSUTIL's output to \$STDLIST (or to a file-equated OUTPUT file), when UPSUTIL is run in this fashion the commands read from INPUT will not be echoed to the OUTPUT file.

## 2.4.2 Language Localization Limitation

UPSUTIL has made no provisions for national language localization. Instead, to speed development, as assumption was made that since the primary users of UPSUTIL will be HP support personnel, probably in the HP Response Centers, it will be acceptable to have an English-language-only implementation.

Consequently, all UPSUTIL command input and display and error message output are hard-coded in English language in the ASCII character set.

## 2.5 UPSUTIL User Interface

## 2.5.1 Type of User Interface

The UPSUTIL user interface is a simple "line mode" command and response interface, suitable for use on direct-connected user terminals and dial-up modem-connected remote user terminals with no special hardware features required in the terminal (e.g. no graphics capability is needed).

UPSUTIL sequentially prompts the user for the next command (using the UPSUTIL command prompt shown at the bottom of Figure 2-1), reads the user's command from the Input file, executes the command, and displays the command's results (including warning or error messages, if any) on the Output file.

## 2.5.2 UPSUTIL Commands Summary

The UPSUTIL commands are syntactically very simple: each command consists only of a single command-name keyword, such as "start".

The UPSUTIL command set is summarized in the following table (Table 2-1). Subsequent sections of this document explain the commands in detail.

## 2.5.3 General Command Parser Errors

Since the UPSUTIL user interface for entering commands is very simple, there are only a few error conditions associated with entering commands.

First, if a command keyword is simply mis-typed (misspelled), then UPSUTIL outputs the error message:

** ERROR: This command is not known to the UPSUTIL program, command ignored.

Second, if a command keyword contains an invalid character, such as a numeric digit or special punctuation character, then UPSUTIL outputs the error message:

** ERROR: This command name is not legal, command ignored.

Third, if a command keyword is just too long to be valid, then UPSUTIL outputs the error message:

** ERROR: This command name is too long, command ignored.

## Table 2-1. UPSUTIL Commands Summary

+=====================================	Keyword	Command Function
Help	help	Displays the menu of UPSUTIL commands.
Exit	exit	Terminates UPSUTIL execution, returns to CI.
Show UPS   Devices   Configuration	config	Queries the running system for UPS devices configuration information, and displays the list of configured UPS Ldevs.
Set new UPS     Monitor     Configuration	newconfig	Commands the UPS Monitor to start using a new, user-specified configuration file, which establishes some operating characteristics of the UPS Monitor.
Show UPS   Monitor   Status	status	Queries the running system for UPS Monitor process status and UPS devices' statuses, and displays those statuses to the user.
Start UPS     Monitor	start	Starts execution of the system's UPS Monitor
Stop UPS     Monitor	stop	Stops execution of the system's UPS Monitor
Restart UPS     Monitor   	restart	Restarts (stops, then starts) execution of the   system's UPS Monitor process, if it is currently  running.
Reset UPS Powerfail Indicators	resetpfail	Resets (clears) the status indicators that show the completion dates and times of the previous occurances of UPS powerfail grace period timer runout and UPS powerfail user command file execution.

# **3 UPSUTIL Commands**

UPSUTIL's command set is defined and explained in this section. Each command is fully described, including:

- command name
- command purpose/function
- command syntax
- UPSUTIL's operation in response to the command
- information displayed by UPSUTIL for the command's execution
- normal (no-error) operation of the command
- possible errors in command execution, and error messages
- actual examples of the terminal screen displays produced by invoking UPSUTIL commands.

## 3.1 HELP Command

The HELP command merely displays a "menu" of UPSUTIL commands, as an online documentation aid to users of UPSUTIL.

#### Syntax

help

#### Example

_____ UPSUTIL: Command > help _____ _____ UPSUTIL Program: Commands available are as follows: (There are no parameters for any of the commands. At the prompt, just type the command name. ) Cmd Name: Command Function: ~~~~~~~~ - Show this menu of commands. help help - Show this menu of commands. exit - Done, exit the program. config - Show system configuration of UPS devices. newconfig - Change to a new UPS Monitor config file. - Start the System UPS Monitor process. start - Stop the System UPS Monitor process. stop restart - Restart (stop, then start) the UPS Monitor process. resetpfail - Reset (clear) UPS Monitor's information about the most recent execution of the "powerfail command file". - Show System UPS Monitor process status. status _____

## 3.2 EXIT Command

The EXIT command terminates a UPSUTIL session. When the EXIT command is entered, UPSUTIL finishes execution and returns to the MPE/iX Command Interpreter.

### Syntax

exit

## Example

_____

UPSUTIL: Command > exit

END OF PROGRAM :

## 3.3 CONFIG Command

The CONFIG command causes UPSUTIL to examine the I/O configuration tables of the currently running system to determine what (if any) UPS devices are configured on the system, and then to display the list of configured UPS devices (if any).

#### Syntax

config

### Example

The first example shows the results of a CONFIG command performed on a system on which there are three UPS devices currently configured.

For convenience in referring to the display, UPSUTIL consecutively numbers the UPS devices that it finds in the system configuration, starting with UPS #1. This "UPS number" has no operational significance in the system: it merely provides a convenient means for counting and referring to the system's UPS devices.

The LDEV numbers do have operational meaning within the system. These are the file system's "logical device numbers" that were assigned to the UPS devices during system configuration. These LDEV numbers can be used to check and corroborate the system's SYSGEN and NMMGR NMCONFIG I/O configurations for the UPS devices. The MPE/iX ":SHOWDEV" command will display all LDEV numbers configured on the running system, including, as a subset, these UPS LDEV numbers.

_____ UPSUTIL: Command > config _____ Begin SHOW UPS CONFIGURATION Operation There are 3 UPS devices configured on this system. UPS # LDEV # ~~~~~ ~~~~~ 1 2.2 2 23 3 24 End SHOW UPS CONFIGURATION Operation _____

UPSUTIL: Command >

The second example shows the result of performing a CONFIG command on a system on which there are no UPS devices configured. If you get this result from a CONFIG command on a system that is supposed to have UPS devices configured, then there is something wrong with the system's I/O configuration files: the UPS devices have not been configured correctly. You should revise the system I/O configuration according to the procedures given in the *Performing System Management Tasks* manual for configuring UPS devices, then reboot the system and run UPSUTIL again to verify the configuration.

UPSUTIL: Command > config Begin SHOW UPS CONFIGURATION Operation There are no UPS devices configured on this system. End SHOW UPS CONFIGURATION Operation

## 3.4 NEWCONFIG Command

The NEWCONFIG command causes UPSUTIL to instruct the UPS Monitor subsystem to begin using a new UPS Monitor configuration file, specified by the user in the NEWCONFIG command. (The NEWCONFIG command executor prompts the user to enter the file name of the desired new UPS Monitor configuration file.)

A UPS Monitor configuration file is a simple ASCII line-oriented text file that the user can create with a text editor. The file contains a set of UPS Monitor configuration commands which establish various operating characteristics or op- tions in the UPS Monitor. In its first implementation (March 2000) the NEWCONFIG configuration file permits only one kind of UPS Monitor configuration option to be set: namely, the option to have the UPS Monitor's "** RECOVERY FROM POWERFAIL **" messages either routed to the system console and to all logged-on user terminals, or to have those messages sent only to the system console, and not to any user terminals. This configuration option is called the "powerfail message routing" option. In the future, more configuration options may be added to the UPS Monitor configuration file facility, as the need arises.

#### Revision of December 2001: Version 9: Additional Configuration Commands

The UPS Monitor has been enhanced to include more configuration options. The new configuration commands pertain to establishing the UPS Monitor's behavior in response to a UPS device's signaling of an AC power failure. The new commands allow the user (system manager) to specify his own custom MPE/iX Command File to be executed a certain time (also user configurable) following a UPS power failure signal. In addition, the UPS Monitor's behavior in response to a UPS's "low battery charge" signal is now configurable by the user. (Prior to this enhancement, the UPS Monitor always performed an intentional "system abort" to protect disc data in case of a UPS "low battery" signal.)

The new configuration commands are:

- powerfail_command_file = <filename>
- powerfail_grace_period = <number of seconds>
- powerfail_low_battery = <option>

where <option> is either "system_abort" or "keep_running".

### Syntax

#### newconfig

When you type-in the NEWCONFIG command in response to the UPSUTIL > command prompt, UPSUTIL will then prompt you to enter the name of your UPS Monitor configuration file that you want to activate.

UPS Monitor configuration files are discussed next.

## 3.4.1 Requirements for UPS Monitor Configuration Files

UPS Monitor configuration files handled by the NEWCONFIG command must adhere to the following requirements of structure and placement:

1) ASCII text files of standard file structure (MPE file type STD).

These are simple, line-by-line, flat ASCII text files, of the most basic kind, as created by any of the HP3000 text editors.

2) The file resides in the standard MPE/iX file system, and hence the file's name is of the form "file.group.account", according to standard file system naming rules.

POSIX-style HFS (hierarchical file system) files are NOT allowed.

3) Record size (line length) from 32 bytes to 128 bytes long.

Any record size within these limits is acceptable. EDITOR-style line numbered files are acceptable.

4) The first line (record) of the file must consist solely of the file's file name.

This is a simple means of verifying that a file specified in a NEWCONFIG command is, in fact, a UPS Monitor configuration file. It protects against accidentally using an incorrect file.

5) Subsequent lines (records) in the file contain UPS Monitor configuration information settings, and are of the general form:

<configuration parameter name> = <configuration parameter value>

For example, the first implemented UPS Monitor configuration command establishes the setting of how to route ** RECOVERY FROM POWERFAIL ** messages, and it appears as follows in a UPS Monitor configuration file:

powerfail_message_routing = all_terminals

-or-

powerfail_message_routing = console_only

- 6) Configuration parameter names and non-numeric configuration parameter values are alpha-numeric symbols, using the underscore character (_) to connect the parts of a multi-part name or value.
- 7) Configuration file contents are NOT case sensitive. Use upper and/or lower case text as you wish.

## 3.4.2 UPS Monitor Configuration Options

Here are the available configuration options (configuration "commands") for UPS Monitor configuration files.

## 3.4.2.1 Powerfail Message Routing

The powerfail message routing configuration option allows you to choose how the UPS Monitor will handle its issuance of the HP3000 system's ** RECOVERY FROM POWERFAIL ** message, which is issued at the end of every power failure event -- when AC power has returned to all UPSs -- to notify the system operator and (optionally) system users of the completion of a power failure cycle.

parameter name: powerfail_message_routing

#### parameter values:

(a) all_terminals

To send the notification message to the system console and to all user terminals.

(b) console_only

To send the notification message only to the system console. No notification messages are sent to any user terminals.

### 3.4.2.2 Powerfail Command File

The powerfail command file configuration option allows you to specify your own MPE/iX Command File to be executed at a certain time (established by the powerfail grace period configuration command; see below) following the UPS Monitor's detection of a UPS AC power failure signal.

This configuration command is optional, and need not be included in the UPS Configuration file. If it is not included, then no powerfail command file will be used by the UPS Monitor. In that case, the UPS Monitor will only report UPS power fail occurrances to the system console and system log file, and will take no other actions due to UPS power fail detection.

parameter name: powerfail_command_file

#### parameter values:

(a) file.group.account [; <parm1> <parm2> ... <parmN> ]

To cause UPS Monitor to utilize the named file (file.group.account) as an MPE/iX CI command file, to be executed at powerfail grace period time following any UPS's report of an incoming AC power failure.

The file name may optionally be followed by a semicolon and a list of parameters for the execution of the CI command file. If the parameters are supplied in the "powerfail_command_file = xxx" configuration command, then the parameters will be passed as-is to the MPE/iX CI at the time when the powerfail command file is executed.

(b) \$null

To specify that no powerfail command file is to be used.

## 3.4.2.3 Powerfail Grace Period

The powerfail grace period configuration option allows you to specify a "grace period" (a delay time) following the detection of a UPS power failure by the UPS Monitor during which the UPS Monitor will wait to see if AC power returns to that UPS. If power is restored to the UPS before the grace period has elapsed, then the UPS Monitor will NOT commence execution of the user's "powerfail command file" (if a powerfail command file has been configured). But if power does not return to the UPS device by the time that the grace period has elapsed, then the UPS Monitor will commence execution of the "powerfail command file", if one is configured.

If no "powerfail command file" is configured via the UPS Monitor configuration file, then the setting of the powerfail grace period is immaterial. If a powerfail grace period is configured but no powerfail command file is configured, then the setting of the powerfail grace period has no effect upon the UPS Monitor's operation in response to a UPS device power failure report.

parameter name: powerfail_grace_period

### parameter values:

(a) nnnn -- integer number of seconds in the grace period.

Minimum value: 0, Maximum value: 1800 seconds.

## 3.4.2.4 Powerfail Low Battery

The powerfail low battery configuration option allows you to specify one of two behaviors of the UPS Monitor following its detection of a "low battery charge" condition from any configured UPS device. The choices of behavior are:

(a) *System Abort* : UPS Monitor is to perform an intentional special system abort at "low battery" detection, in order to guarantee the correctness of data stored on disk devices in case AC power to one or more disk drives does fail exactly at a time when the disk device is performing a "write data" operation on the disk. (Present models of SCSI disk devices can not by themselves guarantee not to write a partial sector of data if they happen to be writing data when their power disappears.)

(b) *Keep Running*: UPS Monitor is commanded NOT to perform its intentional system abort at "low battery" detection time. Rather, it is to allow the system to keep running even after the "low UPS battery" condition has been detected. This option gives the system approximately two more minutes of operation than it would have if the "system abort" option were specified, in the hope that this will be sufficient additional time to complete an orderly system shutdown before power to the disk device(s) is actually lost.

### NOTE

The use of the "keep running" option is entirely at the discretion and responsibility of the HP3000 system manager. While making this option available for users who wish to use it, Hewlett-Packard DOES NOT RECOMMEND USE OF THIS OPTION, and CAN NOT ASSURE USERS THAT THERE WILL NOT BE CORRUPTION OF DATA STORED ON DISK DEVICES should this option be used.

parameter name: powerfail_low_battery

#### parameter values:

(a) system_abort

To cause UPS Monitor to execute a special "low UPS battery system abort" operation whenever a configured UPS device signals "low battery charge condition" to the UPS Monitor.

(b) keep_running

To cause UPS Monitor to report any "low battery charge condition" to the system console and system log file, but thereafter to keep the system running. There will be no intentional system abort from the UPS Monitor in this case.

## 3.4.3 The Default UPS Monitor Configuration File

You can still control the UPS Monitor with a configuration file even if you never use UPSUTIL's NEWCONFIG command. This is because the UPS Monitor (Version 8 of March 2000, or later version) automatically attempts to open and read a default UPS Monitor configuration file, named UPSCNFIG.PUB.SYS, at each system startup (each system boot).

Therefore, after installing Version 8 (or later) of the UPS Monitor software on your system, you need only use your favorite editor to create a UPSCNFIG.PUB.SYS text file and then re-boot the system. From this point on, the file UPSCNFIG.PUB.SYS will govern your system's UPS Monitor's configurable behavior. The file UPSCNFIG.PUB.SYS will be read by and acted upon by the UPS Monitor during every system startup, and also (should you choose to use this facility) every time the UPS Monitor is started by using the UPSUTIL START command.

#### NOTE

The UPSUTIL START command causes a fresh-from-scratch startup of the UPS Monitor (when it is not already running). Hence, a START will cause UPS Monitor to read the default configuration file UPSCNFIG.PUB.SYS.

The UPSUTIL RESTART command causes a re-initializing restart of the UPS Monitor, when it is already running. In this case, UPS Monitor will remember the file name of the most recently active configuration file, and will re-process that same file during the restart.

Here are some examples of valid UPSCNFIG.PUB.SYS configuration files for use by the UPS Monitor:

(a) to send ** RECOVERY FROM POWERFAIL ** messages to the system console and to all logged-on user terminals, which is the traditional method:

```
upscnfig.pub.sys
powerfail_message_routing = all_terminals
```

(b) to send the recovery messages ONLY to the system console:

```
upscnfig.pub.sys
powerfail_message_routing = console_only
```

(c) to send the recovery messages only to the system console, and to cause the user-defined command file MYPFAIL.PUB.MYACCT to be executed starting 10 minutes (600 seconds) after a UPS signals "power failure", and to cause the UPS Monitor to perform its intentional system abort in case a UPS device signals a "low battery" condition:

```
upscnfig.pub.sys
powerfail_message_routing = console_only
powerfail_command_file = mypfail.pub.myacct
powerfail_grace_period = 600
powerfail_low_battery = system_abort
```

## 3.4.4 If No UPSCNFIG.PUB.SYS File Exists

UPSCNFIG.PUB.SYS is the default UPS Monitor configuration file, to be used unless/until you use UPSUTIL's NEWCONFIG command to choose a different configuration file.

The UPS Monitor's final default, in case there is no UPSCNFIG.PUB.SYS default configuration file on the system, is to assume case (a) above: The powerfail messages routing option will be assumed to be "to all terminals", the same as it has been in the past. Also, there will be no "powerfail command file" configured (and no "powerfail grace period time" configured), so there will be no special action taken following a UPS device power fail signal. Finally, the default UPS Monitor action for "UPS low battery charge condition" will be: system abort.

## 3.4.5 Observing Results of NEWCONFIG Command

After you have used the NEWCONFIG command to activate a new UPS Monitor configuration file through UPSUTIL, then use the STATUS command of UPSUTIL to see the results of the new configuration file activation. (Refer to the STATUS command elsewhere in this document.)

UPSUTIL's NEWCONFIG command causes your chosen configuration file to be "sent to" the UPS Monitor software; but UPSUTIL itself does not do error checking on the configuration file. (The UPS Monitor module does perform error checking on the file. Any problems with the configuration file will be reported to the system operator via console messages issued by the UPS Monitor. These error messages will also be recorded in the system diagnostic log file.)

The UPSUTIL STATUS command obtains a status report from the UPS Monitor module, which will show you whether the UPS Monitor detected any errors in your new configuration file, and what the current settings of the configurable options are after your NEWCONFIG command has executed.

Example #1 - Using UPSCNFIG.PUB.SYS

The first example shows a NEWCONFIG command being used to set the configuration using the default UPSCNFIG.PUB.SYS configuration file. A STATUS command following the NEWCONFIG command reports the results of using UPSCNFIG.PUB.SYS.

_____ UPSUTIL: Command > newconfig _____ _____ Begin SET NEW CONFIG FILE UPS Monitor operation Enter the file name of the new configuration file (file.group.account) New config file name? upscnfig.pub.sys SET NEW CONFIG FILE UPS Monitor operation successfully initiated. End SET NEW CONFIG FILE UPS Monitor operation _____ UPSUTIL: Command > status _____ Begin display of UPS Monitor status. UPS MONITOR PROCESS STATUS: UPS Monitor Operating State : Running (PIN = 78) UPS Monitor Version Number93 UPS Devices ConfiguredSystem Power State: Power is normal.3 UPS Devices MonitoredPowerfail Recovery Messages: All terminals.3 UPS Devices AllocatedConfiguretion Title: Yes Configuration File Name : UPSCNFIG.PUB.SYS ( Config File Ok ) Powerfail Command File Name : \$null ( Pfail Cmd File Ok ) Powerfail Command File Parms: none Powerfail Grace Period (secs: 0 Powerfail Grace Timer: Not Running.Powerfail Command File: Not Running. Action on UPS Low Battery : Keep Running UPS DEVICES STATUS: UPS# Ldev# Alloc Init State Power Hardware Status 22 Yes Yes Monitoring Normal AC Power Normal 1 2 101 Yes Yes Monitoring Normal AC Power Normal 3 103 Yes Yes Monitoring Normal AC Power Normal End display of UPS Monitor status. _____ UPSUTIL: Command >

#### Example #2 - Using UPSCNFGB.PUB.SYS

The next example shows the selection of a new UPS Monitor configuration file, UPSCNFGB.PUB.SYS, in which the powerfail message routing option is set to "console only". Again, the STATUS command shows the results.

UPSUTIL: Command > newconfig _____ Begin SET NEW CONFIG FILE UPS Monitor operation Enter the file name of the new configuration file (file.group.account) New config file name? upscnfgb.pub.sys SET NEW CONFIG FILE UPS Monitor operation successfully initiated. End SET NEW CONFIG FILE UPS Monitor operation _____ UPSUTIL: Command > status _____ Begin display of UPS Monitor status. UPS MONITOR PROCESS STATUS: UPS Monitor Operating State : Running (PIN = 78) UPS Monitor Version Number93 UPS Devices ConfiguredSystem Power State: Power is normal.3 UPS Devices MonitoredPowerfail Recovery Messages: Console only.3 UPS Devices AllocatedConfiguration File Name: UPSCNFGB.PUB.SYS( Config File Ok )Powerfail Command File Name: Contig File Ok ) Powerfail Command File Name : \$null ( Pfail Cmd File Ok ) Powerfail Command File Parms: none Powerfail Grace Period (secs: 0 Powerfail Grace Timer: Not Running.Powerfail Command File: Not Running. Action on UPS Low Battery : Keep Running UPS DEVICES STATUS: UPS# Ldev# Alloc Init State Power Hardware Status 22 Yes Yes Monitoring Normal AC Power Normal 1 101 Yes Yes Monitoring Normal AC Power Normal 2 103 Yes Yes Monitoring Normal AC Power Normal 3 End display of UPS Monitor status. _____

## **UPS** Utility

#### Example #3 - Error in Configuration File

The final example shows what happens when an error is detected in a UPS Monitor configuration file. In this case, the configuration file UPSCNFGC.PUB.SYS was attempting to set the powerfail message routing to "all terminals", but there was a typographic error in the "all terminals" parameter. The UPS Monitor reports the error to the system console, and the UPSUTIL STATUS command shows that the UPS Monitor has found an error in the current configuration file, UPSCNFGC.

_____ UPSUTIL: Command > newconfig _____ Begin SET NEW CONFIG FILE UPS Monitor operation Enter the file name of the new configuration file (file.group.account) New config file name? upscnfgc.pub.sys 12:09/52/Illegal configuration command parameter in UPS Monitor configuration file "UPSCNFGC.PUB.SYS" at record 2, column 29. (UPSERR 0640) SET NEW CONFIG FILE UPS Monitor operation successfully initiated. End SET NEW CONFIG FILE UPS Monitor operation _____ UPSUTIL: Command > status _____ Begin display of UPS Monitor status. UPS MONITOR PROCESS STATUS: UPS Monitor Operating State : Running (PIN = 78)UPS Monitor Version Number : 9 3 UPS Devices Configured System Power State: Power is normal.3 UPS Devices MonitoredPowerfail Recovery Messages: Console only.3 UPS Devices AllocatedConfiguration File Name: UPSCNFGC.PUB.SYS(** Config File Has Error **) Powerfail Command File Name : \$null ( Pfail Cmd File Ok ) Powerfail Command File Parms: none Powerfail Grace Period (secs: 0 Powerfail Grace Timer: Not Running.Powerfail Command File: Not Running. Action on UPS Low Battery : Keep Running UPS DEVICES STATUS: UPS# Ldev# Alloc Init State Power Hardware Status Yes Monitoring Normal AC Power Normal 22 Yes 1 101 Yes Yes Monitoring Normal AC Power Normal 2 3 103 Yes Yes Monitoring Normal AC Power Normal End display of UPS Monitor status. _____ UPSUTIL: Command >

## 3.5 STATUS Command

The STATUS command causes UPSUTIL to query the UPS Monitor Process for its status and for the status of each configured UPS device, and to display the status information reported by the UPS Monitor process.

### Syntax

status

Example #1 - Normal Status

-----

UPSUTIL: Command > status

Begin display of UPS Monitor status.

UPS MONITOR PROCESS STATUS:

UPS Monitor Version Number93 UPS Devices ConfigurerSystem Power State: Power is normal.3 UPS Devices MonitoredPowerfail Recovery Messages: All terminals.3 UPS Devices AllocatedConfiguration File Name: UPSCNFIG.PUB.SYS( Config File Ok )Powerfail Command File Name: MYPFAIL.PUB.SYS( Pfail Cmd File Ok )Powerfail Grace Period (secs: 300300Powerfail Grace Timer: Not Running.Powerfail Command File: Not Running.Powerfail Command File: Not Running.Powerfail Command File: Not Running.	UPS Monitor Operating State :	Running	(PIN = 196)
System Power State: Power is normal.3 UPS Devices MonitoredPowerfail Recovery Messages : All terminals.3 UPS Devices AllocatedConfiguration File Name: UPSCNFIG.PUB.SYS( Config File Ok )Powerfail Command File Name : MYPFAIL.PUB.SYS( Pfail Cmd File Ok )Powerfail Grace Period (secs: 300300Powerfail Grace Timer: Not Running.Powerfail Command File: Not Running.Powerfail Command File: Keep Running	UPS Monitor Version Number :	9	3 UPS Devices Configured
Powerfail Recovery Messages : All terminals.3 UPS Devices AllocatedConfiguration File Name : UPSCNFIG.PUB.SYS( Config File Ok )Powerfail Command File Name : MYPFAIL.PUB.SYS( Pfail Cmd File Ok )Powerfail Command File Parms: none000Powerfail Grace Period (secs: 300300Powerfail Grace Timer : Not Running.Not Running.Powerfail Command File : Not Running.Xeep Running	System Power State :	Power is normal.	3 UPS Devices Monitored
Configuration File Name : UPSCNFIG.PUB.SYS ( Config File Ok ) Powerfail Command File Name : MYPFAIL.PUB.SYS ( Pfail Cmd File Ok ) Powerfail Command File Parms: none Powerfail Grace Period (secs: 300 Powerfail Grace Timer : Not Running. Powerfail Command File : Not Running. Action on UPS Low Battery : Keep Running	Powerfail Recovery Messages :	All terminals.	3 UPS Devices Allocated
Powerfail Command File Name : MYPFAIL.PUB.SYS ( Pfail Cmd File Ok )Powerfail Command File Parms: nonePowerfail Grace Period (secs: 300Powerfail Grace Timer : Not Running.Powerfail Command File : Not Running.Action on UPS Low Battery : Keep Running	Configuration File Name :	UPSCNFIG.PUB.SYS	( Config File Ok )
Powerfail Command File Parms: nonePowerfail Grace Period (secs: 300Powerfail Grace Timer: Not Running.Powerfail Command File: Not Running.Action on UPS Low Battery: Keep Running	Powerfail Command File Name :	MYPFAIL.PUB.SYS	( Pfail Cmd File Ok )
Powerfail Grace Period (secs: 300Powerfail Grace Timer: Not Running.Powerfail Command File: Not Running.Action on UPS Low Battery: Keep Running	Powerfail Command File Parms:	none	
Powerfail Grace Timer: Not Running.Powerfail Command File: Not Running.Action on UPS Low Battery: Keep Running	Powerfail Grace Period (secs:	300	
Powerfail Command File: Not Running.Action on UPS Low Battery: Keep Running	Powerfail Grace Timer :	Not Running.	
Action on UPS Low Battery : Keep Running	Powerfail Command File :	Not Running.	
	Action on UPS Low Battery :	Keep Running	

UPS DEVICES STATUS:

UPS#	Ldev#	Alloc	Init	State	Power	Hardware Status
~~~~	~~~~~	~~~~	~~~~	~~~~~~~~~~~~	~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
1	22	Yes	Yes	Monitoring	Normal	AC Power Normal
2	101	Yes	Yes	Monitoring	Normal	AC Power Normal
3	103	Yes	Yes	Monitoring	Normal	AC Power Normal

End display of UPS Monitor status.

3.5.1 The Status Display

The status display produced by the STATUS command's execution is shown in the above example and in several additional examples that follow this explanation of the parts of the status display.

The status display has two main sections, titled UPS MONITOR PROCESS STATUS and UPS DEVICES STATUS. The former section gives information about the UPS Monitor Subsystem Process, while the latter gives information about each UPS device configured on the system.

The next subsections describe the component parts of the status display, explaining their purposes and meanings. Refer to the examples as references while reading the following subsections, which first describe the parts of UPS MONITOR PROCESS STATUS and then the parts of UPS DEVICES STATUS.

3.5.2 UPS Monitor Process Status Display

3.5.2.1 UPS Monitor Operating State

This field of the status display shows the current operational state of the UPS Monitor Process.

Possible values of this field are:

o Starting-Up - The UPS Monitor Process has been launched, and is in the process of acquiring the system resources that it needs in order to run.

o Running - The UPS Monitor Process has started-up successfully, and is now running.

o *Shutting-Down* - The UPS Monitor Process is performing its shut-down processing in preparation for process termination. The UPS Monitor Process shuts down for any of the following reasons: (a) A system shutdown ("Control-A shutdown") is occurring. (b) A user of UPSUTIL has commanded the UPS Monitor to stop operation (via the STOP command) or to stop and then restart operation (via the RESTART command). (c) The UPS Monitor process has detected a serious problem in its operation, and is either shutting-down and restarting to try to correct the problem, or (in cases of "fatal error") is just shutting-down.

o *Undefined* - This state value is defined within the UPS Monitor Process, and it represents a "pre-startup" state in which even the most basic data structures are not yet initialized. It should not ever be possible to observe this operating state through the use of UPSUTIL's STATUS command. The reason for this is: when the UPS Monitor Process is in this early "pre-start" state, it is not possible for UPSUTIL to communicate with the UPS Monitor Process, to query it for its status.

3.5.2.2 UPS Monitor Version Number

This field of the status display presents the "version number" of the UPS Monitor Process that is executing. This is simply a software version identification number, to identify the particular revision of the UPS Monitor software present on the system.

3.5.2.3 System Power State

The System Power State status field shows the current condition of overall system power as most recently observed by the UPS Monitor Process.

The following values are possible:

o *Power is normal* - As of the most recent observation, incoming AC power was detected as "normal" at every UPS device being monitored. Overall, the system is in a "normal power" state.

o *Power has failed* - As of the most recent observation, incoming AC power was detected as "absent" or "out of tolerance" at one or more of the UPS devices being monitored. Hence, one or more of the UPS devices is/are providing "battery backup power" to the system (unless power has been absent for so long that the UPS battery has been drained completely).

3.5.2.4 Powerfail Recovery Messages

This field shows the current setting of the UPS Monitor's configuration option for handling ****** RECOVERY FROM POWERFAIL ****** messages. This setting is established when the UPS Monitor processes its configuration file, either during system startup (using UPSCNFIG.PUB.SYS) or, when the system is up, via the NEWCONFIG command of the UPSUTIL program.

Possible values of this field are:

o *All terminals* - ** RECOVERY FROM POWERFAIL ** messages will be sent to the system console and to all loggedon user terminals. (This is the traditional behavior for HP3000 systems.)

o *Console* only - Recovery messages will be sent ONLY to the system console; no powerfail messages will be sent to user terminals.

3.5.2.5 Configuration File Name

This field shows the file name of the currently active UPS Monitor configuration file, and is followed by a status indication field that reads either (Config File Ok) or (** Config File Has Error **).

Note that this field always shows the file name of the most recent UPS Monitor configuration file to have been processed by the UPS Monitor, regardless of whether that processing was successful (no errors in configuration file) or not (configuration file has some error(s)).

If a configuration file does contain some error(s), then the UPS Monitor reports the error to the system console, then ignores the configuration file record containing the error. This means that whatever configuration attribute (e.g. powerfail_message_routing) was supposedly being set in that configuration file record will not be set to a new value. Instead, UPS Monitor will simply retain the original value of the configuration attribute. Therefore, if the status display shows (** Config File Has Error **), then the actual values of configuration attributes that are shown in the status display do not "belong" to that configuration file. Instead, they are the prior values, being retained by UPS Monitor.

3.5.2.6 Powerfail Command File Name

This field shows the file name of the currently active UPS Monitor powerfail command file, if any, and is followed by a status indication field that reads either (Pfail Cmd File Ok) or (** Command File Has Error **).

Note that this field always shows the file name of the most recent UPS Monitor powerfail command file to have been set up by the UPS Monitor, regardless of whether that command file was set up correctly or not.

The UPS Monitor attempts to "set up" (or establish) a powerfail command file when it encounters a "powerfail_command_file = <filename>" configuration command while processing a UPS Monitor configuration file.

When it does so, the UPS Monitor performs only a very basic error check on the powerfail command file: it simply checks to determine if the named file exists and can be opened for reading. If so, then the UPS Monitor establishes that file to be the powerfail command file, with no errors indicated. If not, then the UPS Monitor will flag the named powerfail command file as "has errors", and will NOT attempt to execute that file in case of a UPS power failure that exceeds the "grace period" time.

3.5.2.7 Powerfail Command File Parms

This field shows the parameters, if there were any, specified for use by the powerfail command file. These parameters may be specified in the "powerfail_command_file = filename; parameters ..." configuration command in the UPS configuration file.

3.5.2.8 Powerfail Grace Period

This field shows the current "powerfail grace period", in seconds, as established by the most recent processing of the UPS configuration file.

The powerfail grace period is the amount of time, in seconds, that must elapse following the UPS Monitor's detection of a "power fail" signal from a UPS device before the UPS Monitor will commence the execution of the user's specified "powerfail command file".

Thus, the grace period gives a chance of a certain amount of time in which the incoming AC power may come back on and restore normal system operation (a recovery from the power failure), so that the UPS Monitor will not begin to execute the user's power failure command file.

3.5.2.9 Powerfail Grace Timer

This field shows the current state of the UPS Monitor's "powerfail grace period timer", which measures the amount of time (powerfail grace period) from the time of the onset of a UPS device power failure until the time when the power fail command file begins to be executed.

Possible values of this field are:

o Not Running - The grace period timer is dormant. There is no UPS power failure in progress, so no grace period time is being measured.

o Running - The grace period timer is active, measuring out the grace period time for an in-progress UPS power failure.

o *Completed* - The grace period timer has run to completion. If the UPS AC power failure is still in progress (power has not returned to the UPS device), and a user-defined "powerfail command file" has been established, then that command file will have started its execution. (It could have completed its execution by the time this status display has been observed.)

If the timer state is "Completed", then date and time of the timer completion will be shown in the status display to the right of this field. The state of "Completed" and the completion date and time will be maintained in the status display until either the UPS Monitor is re-started, or until the user invokes UPSUTIL's RESETPFAIL command to clear-out the information regarding the powerfail grace period timer completion.

When UPS Monitor is restarted, or when the RESETPFAIL command is given in UPSUTIL, then the powerfail grace timer field of the status display reverts back to "Not Running", and the date and time of the last timer completion are erased.

3.5.2.10 Powerfail Command File

This field shows the current state of the UPS Monitor's "powerfail command file" execution, which occurs only if a powerfail command file has been configured and there has been a UPS device power failure that has persisted for longer than the "powerfail grace period" time.

Possible values of this field are:

o *Not Running* - The powerfail command file is dormant. Either there is no powerfail command file configured (see the Powerfail Command File Name field of the status display to determine this), or there is no UPS power failure in progress lasting longer than the powerfail grace period time.

o *Running* - The configured power fail command file is now being executed by the MPE/iX CI, due to a UPS power failure lasting longer than the power fail grace period time.

In this case, the previous field of the status display (Powerfail Grace Timer) will show that the grace period timer has run to completion, thus allowing the powerfail command file to begin execution.

o *Completed* - The powerfail command file has run to completion. In this case, the date and time of command file execution completion will be shown in the status display to the right of this field. The state of "Completed" and the completion date and time will be maintained in the status display until either the UPS Monitor is re-started, or until the user invokes UPSUTIL's RESETPFAIL command to clear-out the information regarding the powerfail command file execution completion.

When UPS Monitor is restarted, or when the RESETPFAIL command is given in UPSUTIL, then the powerfail command file field of the status display reverts back to "Not Running", and the date and time of the last command file execution are erased.

3.5.2.11 Action on UPS Low Battery

This field shows the configured action to be taken by the UPS Monitor in case a UPS device signals "low battery charge condition."

Possible values of this field are:

o *System Abort* - The UPS monitor will invoke a particular System Abort in case of low battery charge condition, to ensure that there is no "partial write" on any disk device when the UPS output power does turn off.

o *Keep Running* - The UPS monitor will NOT invoke a System Abort in case of UPS low battery charge condition. Rather, it will allow the HP3000 system to keep running in that condition.

3.5.2.12 Pin

The PIN field shows the PIN (Process Identification Number) of the UPS Monitor Process.

3.5.2.13 UPS Devices Configured

This field shows the number of UPS devices that have been configured into the system's I/O configuration, as detected by the UPS Montitor Process during its start-up operations.

3.5.2.14 UPS Devices Monitored

This field shows the number of UPS devices that the UPS Monitor Process is monitoring (or is attempting to monitor).

The value in this field should always be the same as the value of the UPS Devices Configured field. It can be a different number only if the system was configured with more UPS devices than the UPS Monitor Process is capable of monitoring. (At present, the limit is 128 UPS devices.) In such an unlikely case, the UPS Monitor will monitor as many UPS devices as it is capable of, and ignore the rest. In such a case, you could see "200 UPS Devices Configured" and "128 UPS Devices Monitored", for example.

3.5.2.15 UPS Devices Allocated

This field shows the number of UPS devices that the UPS Monitor Process has successfully allocated through the MPE/iX File System. (Each UPS device to be monitored must first be allocated, to give ownership of the UPS device to the UPS Monitor Process.)

This number should always be the same as the UPS Devices Configured and UPS Devices Monitored fields. In the unlikely event that some UPS device(s) can not be allocated via the File System, this number will be less than the number of UPS devices configured and to be monitored. If this happens, something is wrong with the system, and corrective action is needed. One way in which a UPS device can fail to be allocated is: a failure of the system to initialize and download a DTC (Datacommunications and Terminal Controller) to which a UPS is connected will result in a failure of the File System to "open" (allocate) that UPS device.

3.5.3 UPS Devices Status Display

3.5.3.1 UPS

The UPS number field of the UPS DEVICES STATUS portion of the status display is simply an ordinal index number assigned by UPSUTIL to the UPS devices, for convenience in referring to the UPSs. It has no functional significance.

3.5.3.2 LDEV

The LDEV number field (column) of the status display shows the logical device numbers associated with the UPSs configured on the system. These LDEV numbers are the "handles" by which I/O devices are known in the MPE/iX File System. LDEV numbers are assigned to the UPS devices during the I/O configuration process of system configuration.

3.5.3.3 Alloc (Allocated Indicator)

The allocated field (column) of the status display shows whether or not a UPS device has been successfully allocated to (i.e. is now "owned" by) the UPS Monitor Process.

In order to control and monitor a UPS device, the device must first be allocated to the UPS Monitor Process. Allocation is performed in the MPE/iX File System, via the HPFOPEN intrinsic. If allocation succeeds, then the UPS Monitor Process will attempt to monitor that UPS device, and a value of Yes will be displayed in the Alloc field. If allocation should fail, then the UPS Monitor Process can not monitor that UPS device. A value of No will appear in the Alloc column in that case.

3.5.3.4 Init (Initialized Indicator)

The initialized field (column) of the status display shows whether or not a UPS device has been successfully initialized (i.e. "brought online") by the UPS Monitor Process.

A value of Yes in this column indicates that the UPS device has been successfully initialized by the UPS Monitor Process, and is in a "ready to be monitored" condition.

A value of No in this column indicates that either initialization of the UPS device failed (in which case there will be log entries in the system log file showing what errors were encountered during initialization), or that initialization is in progress but not yet completed (in which case, a later repetition of the STATUS command will show a Yes in this column, denoting completion of initialization).

3.5.3.5 State

The State field (column) of the status display shows the operating state of the UPS device as perceived by the UPS Monitor Process.

Possible values for State are:

o *Configured* - The UPS device has been found in the system I/O configuration tables and has been recognized by the UPS Monitor Process as a valid UPS device, but initialization of the UPS device has not yet begun.

o *Initializing* - Initialization (a sequence of commands that brings the UPS device "online" and ready for monitoring) of the UPS device is in progress in the UPS Monitor Process. If it completes successfully, the UPS will be advanced to the Monitoring state. If initialization fails, the UPS device will be placed in the Down/Broken state.

o *Monitoring* - This is the normal "steady-state" of the UPS, in which the UPS Monitor Process is "watching" the UPS for its hardware events, such as power failures and other hardware conditions (e.g. high temperature, low battery charge, output power overload, etc.).

o *Down/Broken* - This state indicates that the UPS Monitor Process encountered severe errors when trying to initialize the UPS device, or while monitoring the UPS after a successful initialization.

The UPS Monitor Process will declare a UPS device to be "Down/Broken" only after a number of retries of the operations that experienced errors have also failed.

This state most likely indicates some hardware related problem with the UPS device or with the RS-232 serial I/O interface hardware (including cabling connections) used by the HP3000 system to "talk to" the UPS device.

NOTE

If a UPS device ever does enter the Down/Broken state, then that UPS device is no longer being monitored by the UPS Monitor Process and after correcting the hardware problem, the UPS Monitor Process must be restarted (by means of a RESTART command, or by a STOP followed by a START command, or by a system boot) in order to begin monitoring that UPS device again.

3.5.3.6 Power

This field (column) of the status display shows the most recent "power status" of the UPS device as observed by the UPS Monitor Process.

Possible values of this field are:

o *Normal* - AC power coming into the UPS device is normal, and the UPS device is supplying filtered AC power to the system component(s).

o *Failed* - The UPS detected a loss of, or a variation from acceptable tolerances of, incoming AC power, and reported that power status to the UPS Monitor Process. Currently, a "power fail" condition has been declared by the UPS Monitor Process. The UPS device is supplying battery reserve power to the system component(s), unless its battery has been exhausted, in which case power to the system component(s) has truly failed.

3.5.3.7 Hardware Status

The Hardware Status field (column) of the status display shows any and all of the UPS hardware status conditions that each UPS device has reported to the UPS Monitor Process, as of the most recent observation.

The "normal state" of hardware status is simply: AC Power Normal. In this normal state, AC Power Normal will be the only status item shown in the Hardware Status display. The UPS devices, however, are capable of reporting a number of status conditions to the host system, and in cases of additional UPS hardware status, there will be multiple lines in the status display showing the additional status conditions.

Possible values of Hardware Status are:

o AC Power Normal - AC power at the input of the UPS device is present and within its normal tolerance range.

o AC Power Fail - AC power at the input of the UPS device is either absent, or has drifted out of its normal tolerance range.

o *Low Battery Charge* - AC power at the input of the UPS device has failed, and the UPS has engaged its battery reserve power in order to continue to supply AC output power to the system component(s). When engaging the battery reserve power, the UPS device detected and reported that the battery in the UPS hardware was in a depleted charge condition. This means that the UPS battery will only be able to supply full output power to the system component (s) for approximately two minutes, instead of for the fifteen minute period provided by a fully charged battery.

o *Output Power Off* - The UPS device reported that its output power (to the system component(s)) has been turned off. This means that someone has (intentionally or accidentally) turned "off" the Output Power On/Off switch on the UPS device's front control panel.

o *Bypass Mode* - The UPS device reported that it had been placed into AC Power Bypass Mode. This is only possible on some models of UPS devices, such as the A2998A 3.0 KVA UPS, that have a "Bypass Switch". With this switch control, a service person can "bypass" the normal flow of power through the UPS, so that the UPS passes its AC input power directly through to its AC output plugs, without passing the power through the normal power inverters and filters.

o UPS System Failure - The UPS device reported a System Fail status, which indicates a serious hardware problem within the UPS device.

o *UPS Inverter Failure* - The UPS device reported an Inverter Fail status, which indicates a hardware failure in the UPS' DC-to-AC power inverter module.

o *Battery Disconnected* - The UPS device reported a Battery Not Present status, which indicates that the UPS internal controller perceived that a battery module was not properly connected to the UPS device.

o *UPS Charger Fault* - The UPS device reported a Charger Fault status, which indicates a hardware failure in the UPS' internal battery charger circuitry.

o *Ouput Power Overload* - The UPS device reported an Overload status, which indicates that the equipment being powered from the UPS is drawing too much power from the UPS.

o *Power Overload Shutdown* - The UPS device reported an Overload Shutdown status, which indicates that the equipment being powered from the UPS drew so much power from the UPS that the UPS performed a "shutdown" (turned its power circuits "off") to protect itself from the overload condition.

o *High Ambient Temperature* - The UPS device reported a High Ambient Temperature status, which indicates that the UPS internal hardware detected an elevated temperature condition within the UPS device.

o *High Temperature Shutdown* - The UPS device reported a High Ambient Temperature Shutdown status, which indicates that the temperature inside the UPS device rose so high that the UPS control module shut down the UPS power circuits to protect the UPS device from damage due to excessive heat.

o *Battery Test Failure* - The UPS device reported a Battery Test Fail status, which indicates that the UPS control module detected that a battery pack failed to operate within specifications.

o *High Battery Voltage* - The UPS device reported a High Battery Voltage status, which indicates that the UPS control module perceived an overvoltage at the battery terminals, indicative of a hardware problem.

o *Low Battery Voltage* - The UPS device reported a Low Battery Voltage status, which indicates that the UPS control module perceived an undervoltage at the battery terminals, indicative of a hardware problem.

o *High Output Voltage Shutdown* - The UPS device reported a High Output Voltage Shutdown status, which indicates that the UPS control module perceived a severe overvoltage at its AC power ouput terminals, and consequently shutdown its power circuits to prevent damage to itself and to the system component(s) receiving power from this UPS.

o *Low Output Voltage Shutdown* - The UPS device reported a Low Output Voltage Shutdown status, which indicates that the UPS control module perceived a severe undervoltage at its AC power ouput terminals, and consequently shut-down its power circuits to prevent damage to itself and to the system component(s) receiving power from this UPS.

3.5.4 Additional Examples

The following examples illustrate various conditions of the UPS Monitor Process and of the UPS hardware devices that can be observed by using the STATUS command.

Example #2 - UPS Monitor Not Running

This example shows the display of the STATUS command when given at a time at which the UPS Monitor Process is not running.

If you get this result from a STATUS command, you know that the UPS Monitor Process is currently not running. You can start the UPS Monitor Process running by using the START command, if desired.

UPSUTIL: Command > status Begin display of UPS Monitor status. UPS MONITOR PROCESS STATUS:

** WARNING: System UPS Monitor Process is not running at this time.

End display of UPS Monitor status.

UPSUTIL: Command >

Example #3 - AC Power Failure In Progress

This example shows a status display typical of an incoming AC power failure condition at one of the UPS devices.

In this case, you can see in the UPS MONITOR PROCESS STATUS that the System Power State is "Power has failed," and that the configured "Powerfail Grace Period" timer is now running.

The UPS DEVICES STATUS portion of the display shows that UPS LDEV #23 has reported an "AC Power Fail" hardware status condition, and so its Power condition field has been changed to Failed.

UPSUTIL: Command > status _____ Begin display of UPS Monitor status. UPS MONITOR PROCESS STATUS: UPS Monitor Operating State : Running(PIN = 196)UPS Monitor Version Number : 93 UPS Devices Configured System Power State : Power has failed. 3 UPS Devices Monitored Powerfail Recovery Messages : All terminals. 3 UPS Devices Allocated Configuration File Name : UPSCNFIG.PUB.SYS (Config File Ok) Powerfail Command File Name : MYPFAIL.PUB.MYACCT (Pfail Cmd File Ok) Powerfail Command File Parms: [inventory_data_set orders_data_set] Powerfail Grace Period (secs: 300 Powerfail Grace Timer : Running. Powerfail Command File : Not Running. Action on UPS Low Battery : Keep Running UPS DEVICES STATUS: UPS# Ldev# Alloc Init State Power Hardware Status 1 22 Yes Yes Monitoring Normal AC Power Normal 2 23 Yes Yes Monitoring Failed AC Power Fail 3 24 Yes Yes Monitoring Normal AC Power Normal End display of UPS Monitor status. _____

Example #4 - AC Power Failure Timed-Out

This example shows a status display following an incoming AC power failure condition at one of the UPS devices, and after the configured "Powerfail Grace Period Timer" has expired. This has caused the user's "Powerfail Command File" to begin execution.

In this case, you can see in the UPS MONITOR PROCESS STATUS that the System Power State is "Power has failed," the configured "Powerfail Grace Period" timer has expired, and the "Powerfail Command File" is now in execution. ("Running")

The UPS DEVICES STATUS portion of the display shows that UPS LDEV #23 has reported an "AC Power Fail" hardware status condition, and so its Power condition field has been changed to Failed.

```
_____
UPSUTIL: Command > status
_____
Begin display of UPS Monitor status.
UPS MONITOR PROCESS STATUS:
UPS Monitor Operating State : Running (PIN = 196)
UPS Monitor Version Number : 9 3 UPS Devic
UPS Monitor Version Number:93 UPS Devices ConfiguredSystem Power State:Power has failed.3 UPS Devices MonitoredPowerfail Recovery Messages:All terminals.3 UPS Devices AllocatedConfiguration File Name:UPSCNFIG.PUB.SYS( Config File Ok )
Powerfail Command File Name : MYPFAIL.PUB.MYACCT ( Pfail Cmd File Ok )
Powerfail Command File Parms: [inventory_data_set orders_data_set]
Powerfail Grace Period (secs: 300
Powerfail Grace Timer: Completed.Powerfail Command File: Running.
                                       TUE, FEB 12, 2002, 10:22 AM
Action on UPS Low Battery : Keep Running
UPS DEVICES STATUS:
UPS# Ldev# Alloc Init State Power Hardware Status
22 Yes Yes Monitoring Normal AC Power Normal
 1
  2 23 Yes Yes Monitoring Failed AC Power Fail
  3 24 Yes Yes Monitoring Normal AC Power Normal
End display of UPS Monitor status.
_____
```

Example #5 - AC Power Failure, Command File Completed

This example shows a status display following an incoming AC power failure condition at one of the UPS devices, and after the configured "Powerfail Command File" has completed its execution.

In this case, you can see in the UPS MONITOR PROCESS STATUS that the System Power State is "Power has failed," the configured "Powerfail Grace Period" timer has expired, and the "Powerfail Command File" has run to completion.

The UPS DEVICES STATUS portion of the display shows that UPS LDEV #23 has reported an "AC Power Fail" hardware status condition, and so its Power condition field has been changed to Failed.

_____ UPSUTIL: Command > status _____ Begin display of UPS Monitor status. UPS MONITOR PROCESS STATUS: (PIN = 196) 3 UPS Devic UPS Monitor Operating State : Running UPS Monitor Version Number : 9 3 UPS Devices Configured System Power State: Power has failed.3 UPS Devices MonitoredPowerfail Recovery Messages : All terminals.3 UPS Devices AllocatedConfiguration File Name: UPSCNFIG.PUB.SYS(Config File Ok) Powerfail Command File Name : MYPFAIL.PUB.MYACCT (Pfail Cmd File Ok) Powerfail Command File Parms: [inventory_data_set orders_data_set] Powerfail Grace Period (secs: 300 Powerfail Grace Timer: Completed.TUE, FEB 12, 2002, 10:22 AMPowerfail Command File: Completed.TUE, FEB 12, 2002, 10:23 AM Action on UPS Low Battery : Keep Running UPS DEVICES STATUS: UPS# Ldev# Alloc Init State Power Hardware Status Yes Monitoring Normal AC Power Normal 1 22 Yes 2 23 Yes Yes Monitoring Failed AC Power Fail 3 24 Yes Yes Monitoring Normal AC Power Normal End display of UPS Monitor status. _____

UPS Utility

Example #6 - Monitor Startup & UPS Initializations

This example illustrates what the STATUS display shows when the STATUS command is given during the time that the UPS Monitor Process is in its "start-up and initialize UPS devices" phase of processing.

In this example, the UPS Monitor Process had originally not been running, so a START command was given to start it. Then, quickly, two STATUS commands were given, one after the other.

The first STATUS display shows that the UPS Monitor Process is now running (UPS Monitor Operating State is "Running"), and that it is part way through the process of bringing the three UPS devices "online". The display of UPS DEVICES STATUS shows that all three UPS devices have been allocated successfully (Alloc = "Yes") by the UPS Monitor Process, that the first UPS device (Ldev# = 22) has completed its initialization sequence and is now being monitored (Init = "Yes" and State = "Monitoring"), and that the other two UPS devices, Ldevs 23 and 24, are still in the process of being initialized (Init = "No" and State = "Initializing").

Notice that until the initialization process has completed, the UPS Monitor Process does not have information from the UPS device regarding its hardware status conditions. That is why the Power and Hardware Status fields for UPS Ldevs 23 and 24 are shown as "???". A few seconds later, the second STATUS display shows that the initialization processing has been completed for all of the three UPS devices. All three are now being monitored, and their Power and Hardware Status fields are normal.

```
_____
UPSUTIL: Command > start
_____
Begin START UPS Monitor operation
START UPS Monitor operation successfully executed.
End START UPS Monitor operation
 _____
UPSUTIL: Command > status
 _____
Begin display of UPS Monitor status.
UPS MONITOR PROCESS STATUS:
UPS Monitor Operating State : Running(PIN = 196)UPS Monitor Version Number : 93 UPS Devices Configured
System Power State: Power is normal.3 UPS Devices MonitoredPowerfail Recovery Messages: All terminals.3 UPS Devices AllocatedConfiguration File Name: UPSCNFIG.PUB.SYS( Config File Ok )
Powerfail Command File Name : MYPFAIL.PUB.MYACCT ( Pfail Cmd File Ok )
Powerfail Command File Parms: [inventory_data_set orders_data_set]
Powerfail Grace Period (secs: 300
Powerfail Grace Timer: Not Running.Powerfail Command File: Not Running.
Action on UPS Low Battery : Keep Running
```

UPS DEVICES STATUS:

UPS# Ldev# Alloc Init State Power Hardware Status 1 22 Yes Yes Monitoring Normal AC Power Normal 23YesNoInitializing ??????24YesNoInitializing ?????? 2 3 End display of UPS Monitor status. _____ UPSUTIL: Command > status _____ Begin display of UPS Monitor status. UPS MONITOR PROCESS STATUS: UPS Monitor Operating State : Running (PIN = 196) UPS Monitor Version Number:93 UPS Devices ConfiguredSystem Power State:Power is normal.3 UPS Devices MonitoredPowerfail Recovery Messages:All terminals.3 UPS Devices AllocatedConfiguration File Name:UPSCNFIG.PUB.SYS(Config File Ok) Powerfail Command File Name : MYPFAIL.PUB.MYACCT (Pfail Cmd File Ok) Powerfail Command File Parms: [inventory_data_set orders_data_set] Powerfail Grace Period (secs: 300 Powerfail Grace Timer: Not Running.Powerfail Command File: Not Running. Action on UPS Low Battery : Keep Running UPS DEVICES STATUS: UPS# Ldev# Alloc Init State Power Hardware Status 1 22 Yes Yes Monitoring Normal AC Power Normal 2 23 Yes Yes Monitoring Normal AC Power Normal 3 24 Yes Yes Monitoring Normal AC Power Normal End display of UPS Monitor status. _____

Example #7 - UPS Down/Broken

This example shows that a UPS device has experienced some problem, like a failed or disconnected I/O cable, or a failed piece of internal hardware, that has prevented the UPS Monitor Process from communicating with the UPS device. After retrying several times to obtain status from the UPS device, the UPS Monitor Process has marked the UPS device (Ldev #24) as "Down/Broken".

In this case, as in Example #6 when initialization was not yet completed, the UPS Monitor Process does not know what the power status or hardware status of the UPS device is, so the STATUS display shows "???" for those fields.

NOTE

If a UPS device is put into the "Down/Broken" state by the UPS Monitor Process, then the UPS Monitor Process must be restarted (after repairing the problem that has caused the loss of communications with the UPS device) in order to resume monitoring of that UPS device.

_____ UPSUTIL: Command > status _____ Begin display of UPS Monitor status. UPS MONITOR PROCESS STATUS: UPS Monitor Operating State : Running(PIN = 196)UPS Monitor Version Number : 93 UPS Devices ConfiguredSystem Power State : Power is normal.3 UPS Devices MonitoredPowerfail Recovery Messages : All terminals.3 UPS Devices AllocatedConfiguration File Name : UPSCNFIG.PUB.SYS(Config File Ok) Powerfail Command File Name : MYPFAIL.PUB.MYACCT (Pfail Cmd File Ok) Powerfail Command File Parms: [inventory_data_set orders_data_set] Powerfail Grace Period (secs: 300 Powerfail Grace Timer: Not Running.Powerfail Command File: Not Running. Action on UPS Low Battery : Keep Running UPS DEVICES STATUS: UPS# Ldev# Alloc Init State Power Hardware Status 22YesYesMonitoringNormalACPowerNormal23YesYesMonitoringNormalACPowerNormal 1 2 3 24 Yes No Down/Broken ??? ??? End display of UPS Monitor status. _____

3.6 **RESETPFAIL Command**

The RESETPFAIL command is for the purpose of clearing-out from the UPS Monitor's status display the information pertaining to past completions of the "Powerfail Grace Period Timer" and "Powerfail Command File".

When there has been a UPS AC power failure signalled, and the user has configured the Powerfail Grace Period time, and the power failure has lasted longer than the grace period time, then the STATUS display will show that the state of the Grace Period Timer is "Completed", and will also show the date and time of completion.

Similarly, if the user has configured a Powerfail Command File, and there has been a UPS power failure exceeding the grace period time, then the powerfail command file will have been executed. The STATUS display will then show the state of the Powerfail Command File as "Completed", and will also show the completion date and time.

The "Completed" states and the completion dates and times for both the Powerfail Grace Period timer and the Powerfail Command File will be retained in UPS Monitor status until either:

(1) The UPS Monitor is re-started, or

(2) The RESETPFAIL command of UPSUTIL is used to clear this information.

The RESETPFAIL command will cause the state displays for Powerfail Grace Period timer and Powerfail Command File to revert from "Completed" to "Not Running", and will erase the completion dates and times for the Powerfail Grace Period timer and Powerfail Command File.

The example below shows an observation of UPS Monitor status following a UPS power failure that caused expiration of the Grace Period Timer and an execution of the Powerfail Command File, followed by a usage of the RESETPFAIL command, and then another status display. You can see from this example how the powerfail status information gets cleared by the RESETPFAIL command.

Syntax

resetpfail

Example

_____ UPSUTIL: Command > status _____ Begin display of UPS Monitor status. UPS MONITOR PROCESS STATUS: UPS Monitor Operating State : Running (PIN = 196)UPS Monitor Version Number : 9 3 UPS Devices Configured System Power State : Power is normal. 3 UPS Devices Monitored 3 UPS Devices Allocated Powerfail Recovery Messages : All terminals. Configuration File Name : UPSCNFIG.PUB.SYS (Config File Ok) Powerfail Command File Name : MYPFAIL.PUB.MYACCT (Pfail Cmd File Ok) Powerfail Command File Parms: [inventory data set orders data set] Powerfail Grace Period (secs: 300 Powerfail Grace Timer: Completed.Powerfail Command File: Completed. TUE, FEB 12, 2002, 2:53 PM TUE, FEB 12, 2002, 2:53 PM Action on UPS Low Battery : Keep Running

UPS DEVICES STATUS:

UPS# Ldev# Alloc Init State Power Hardware Status Yes Monitoring Normal AC Power Normal 22 Yes 1 Yes Yes Monitoring Failed AC Power Fail 2 23 3 24 Yes Yes Monitoring Normal AC Power Normal End display of UPS Monitor status. _____ UPSUTIL: Command > resetpfail _____ Begin RESET PFAIL CMD FILE UPS Monitor operation RESET PFAIL CMD FILE UPS Monitor operation successfully initiated. End RESET PFAIL CMD FILE UPS Monitor operation _____ UPSUTIL: Command > status _____ Begin display of UPS Monitor status. UPS MONITOR PROCESS STATUS: UPS Monitor Operating State : Running(PIN = 196)UPS Monitor Version Number : 93 UPS Device UPS Monitor Version Number93 UPS Devices ConfiguredSystem Power State: Power is normal.3 UPS Devices MonitoredPowerfail Recovery Messages: All terminals.3 UPS Devices Allocated Configuration File Name : UPSCNFIG.PUB.SYS (Config File Ok) Powerfail Command File Name : MYPFAIL.PUB.MYACCT (Pfail Cmd File Ok) Powerfail Command File Parms: [inventory_data_set orders_data_set] Powerfail Grace Period (secs: 5 Powerfail Grace Timer : Not Running. Powerfail Command File : Not Running. Action on UPS Low Battery : Keep Running UPS DEVICES STATUS: UPS# Ldev# Alloc Init State Power Hardware Status 1 22 Yes Yes Monitoring Normal AC Power Normal 2 23 Yes Yes Monitoring Failed AC Power Fail 24 Yes Yes Monitoring Normal AC Power Normal 3 End display of UPS Monitor status. _____ UPSUTIL: Command >

3.7 START Command

The START command instructs UPSUTIL to attempt to start-up a fresh copy of the system's UPS Monitor Process. If there is not already a copy of the UPS Monitor Process running, then UPSUTIL launches a new copy of the UPS Monitor Process. However, if the UPS Monitor Process is already running when the START command is given, then UPSUTIL displays a warning message informing the user of that, and stating that the START command has been rejected.

The first example below shows a normal, successful execution of the START command, while the second example shows the results when the START command is rejected because the UPS Monitor Process is currently running.

Before issuing the START command, you can use the STATUS command to verify that the UPS Monitor Process is not already running.

After executing the START command, you can use the STATUS command to verify that the START command worked. The STATUS command should reveal that the UPS Monitor Process is now running.

Syntax

start

Example #1 - Normal START

UPSUTIL: Command > start

Begin START UPS Monitor operation

START UPS Monitor operation successfully executed.

End START UPS Monitor operation

UPSUTIL: Command >

Example #2 - Rejected START

UPSUTIL: Command > start

Begin START UPS Monitor operation

** WARNING: UPS Monitor process is already running at this time. ** WARNING: START UPS Monitor operation not performed.

3.8 STOP Command

The STOP command instructs UPSUTIL to attempt to stop execution of the system's UPS Monitor Process. If the UPS Monitor process is running when the STOP command is given, then UPSUTIL performs the STOP operation by sending a "shutdown" message to the running UPS Monitor Process. The "shutdown" message causes the UPS Monitor Process to shut itself down (TERMINATEs the process). However, if there is no copy of the UPS Monitor Process running when the STOP command is given, then UPSUTIL rejects the STOP command, and displays a warning message to the user explaining that the STOP command could not be executed because the UPS Monitor Process is not currently running.

The first example below shows a normal, successful execution of the STOP command, while the second example shows the results when the STOP command is rejected because the UPS Monitor Process is not currently running.

Before issuing the STOP command, you can use the STATUS command to verify that the UPS Monitor Process is running.

After executing the STOP command, you can use the STATUS command to verify that the STOP command worked. The STATUS command should reveal that the UPS Monitor Process is no longer running.

Syntax

stop

Example #1 - Normal STOP

UPSUTIL: Command > stop

Begin STOP UPS Monitor operation

STOP UPS Monitor operation successfully executed.

End STOP UPS Monitor operation

Example #2 - Rejected STOP

UPSUTIL: Command > stop Begin STOP UPS Monitor operation ** WARNING: UPS Monitor process is not running at this time. ** WARNING: STOP UPS Monitor operation not performed. End STOP UPS Monitor operation

3.9 RESTART Command

The RESTART command is a shortcut method of stopping and then restarting the UPS Monitor Process. It is equivalent to issuing a STOP command immediately followed by a START command.

Like the STOP command, the RESTART command will be rejected if the UPS Monitor Process is not running at the time the RESTART command is issued.

The first example below shows a normal, successful execution of the RESTART command, while the second example shows the results when the RESTART command is rejected because the UPS Monitor Process was not running when the RESTART command was given.

Before issuing the RESTART command, you can use the STATUS command to verify that the UPS Monitor Process is running.

After executing the RESTART command, you can use the STATUS command to verify that the RESTART command worked. The STATUS command should reveal that the UPS Monitor Process is again running, after shutting itself down and then relaunching itself.

Syntax

restart

Example #1 - Normal RESTART

UPSUTIL: Command > restart

Begin RESTART UPS Monitor operation

RESTART UPS Monitor operation successfully executed.

End RESTART UPS Monitor operation

Example #2 - Rejected RESTART

UPSUTIL: Command > restart Begin RESTART UPS Monitor operation ** WARNING: UPS Monitor process is not running at this time. ** WARNING: RESTART UPS Monitor operation not performed. End RESTART UPS Monitor operation

UPSUTIL: Command >

<the end>