

HP Model A3589A

PowerTrust System Guide (5.5 kVA Rack-Mounted UPS)

CONFIGURATION

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Power-On/Power-Off Procedures

This chapter contains the procedures for:

- Initial power-on
- Powering-on and powering-off during normal operation
- Switching into and out of Service Bypass mode
- Powering-off for an extended time

This chapter also discusses the Emergency Power Off (EPO) connection, and battery charging.

Warning



Only qualified service personnel should service the unit, change batteries, or power up the UPS after it is installed or serviced.

Power-On Procedures

Initial Power-On or Power-On After Shutdown

Use the following procedure to power-on the UPS for the first time after it is installed or after the UPS has been shutdown for an extended of time (see “Powering-Off the UPS for an Extended Time”). Allow time for the temperature of the equipment to stabilize before applying input AC power.

1. Set the BYPASS switch to the NORMAL position.
2. Check that AC input power is being provided to the UPS.
3. Set the MAIN and BYPASS INPUT breakers to the ON position.
4. Set the UPS/BATTERY switch to **ENABLE**.
5. Set the Output On/Output Off switch to **Output On**.
6. Confirm that the UPS powered on properly by checking the following indicators:
 - AC Output LED: on
 - Battery LED: off
 - Attention LED: off
 - Audible Alarm: none
 - Enable LED: on
 - Caution LED: off

If any of the indicators differ from the above, the UPS did not power up correctly. Refer to Chapter 6 to identify the problem.

7. Set the OUTPUT breakers appropriate for your system to the On position. Output breakers 1, 2, and 3 control Output Receptacles (IEC 320 C19) 1, 2, and 3, respectively. Output breaker 4 controls Output Receptacle 4, which is either a NEMA L6-30P receptacle or a hardwired output.

The UPS is now in Normal mode and is providing AC power and power failure protection to the equipment connected to the UPS.

Powering On the UPS After Being Powered Off for a Short Time

Use the following procedure to power-up the UPS if it has been shutdown for a short time (following a short duration power off procedure). See “Powering Off the UPS for a Short Time”.

1. Check that AC input power is being provided to the UPS.
2. Set the Output On/Output Off switch to **Output On**.
3. Confirm that the UPS powered on properly by checking the following indicators:
 - AC Output LED: on
 - Battery LED: off
 - Attention LED: off
 - Audible Alarm: none
 - Enable LED: on
 - Caution LED: off

If any of indicators differ from the above, the UPS did not power up correctly. Refer to Chapter 6 to identify the problem.

The UPS is now in Normal mode and is providing AC power and power failure protection to the equipment connected to the UPS.

Power-Off Procedures

Powering-Off the UPS for an Extended Time

You should follow the procedure for powering off the UPS for an extended time when:

- A power failure has occurred or input AC power will be off for an extended time (more than 24 hours).

Should input AC power fail, the UPS, if in Normal mode, will supply battery generated AC output to the connected equipment for up to 15 minutes. During extended power failures, the unit will warn you approximately three minutes before battery power is depleted. The three-minute warning consists of a repeating sequence of three audible beeps followed by approximately ten seconds of silence. If you hear the warning, you should immediately prepare for a loss of AC power to the connected equipment. See “Power Failure Operation” in Chapter 1.

When the input AC power is restored, the UPS will automatically recharge its batteries as long as the UPS/BATTERY switch is in the **ENABLE** position, and the MAIN INPUT breaker is in the ON position.

The recharge can take up to 14.5 hours for a 90% recharge. The recharge time may be considerably less if the batteries are not fully discharged.

- The UPS will be stored, shipped or otherwise be out of service.

Note

The UPS batteries should be recharged periodically to maintain battery life. Refer to “Shipping and Storage Requirements” in Chapter 2.

Use the following procedure to power off the UPS for an extended time:

1. Power down the equipment connected to the UPS.
2. Set the Output On/Output Off switch to **Output Off**.
3. Set the UPS/BATTERY switch to **DISABLE**.
4. Set the MAIN and BYPASS INPUT breakers to the OFF position.
5. Set the Output breakers to the OFF position.
6. If the unit is to be stored or shipped, disconnect the battery cable.

Powering Off the UPS for a Short Time

If input AC power will be interrupted for a short time (less than 24 hours), you can use the following procedure to power off the UPS to save the batteries from undue discharge, which would result in a reduction in battery life and longer recharge times.

1. Power down the equipment connected to the UPS.
2. Set the Output On/Output Off switch to **Output Off**.

Service Bypass

Service Bypass mode allows the Electronics Unit and Battery Box to be serviced without disrupting AC output.

Caution

Do not push the red button while the UPS is operating on battery. Damage to the connected equipment can occur.

Placing the UPS in Service Bypass Mode

The UPS should be placed in Service Bypass mode only by qualified service personnel or under their direction.

The correct procedure for placing the UPS in Service Bypass mode is as follows:

1. Determine whether the UPS is already in Automatic Bypass mode by checking that the following indicators are as shown:
 - AC Output LED: on
 - Battery LED: off
 - Attention LED: on
 - Audible Alarm: solid tone (The alarm may have been silenced by pressing the Silence Alarm/Test button. Press it again to re-enable the alarm.)

Note



If the UPS has been in Automatic Bypass mode for more than 30 minutes, it will probably be in Automatic Bypass Sleep mode. In Automatic Bypass Sleep mode the Alarm/Test button will not reactivate the alarm. See “Case 16 (Normal or Abnormal) — Bypass Sleep Mode” in Chapter 6.

2. If all of the indicators above are in the specified state, then the UPS is already in Automatic Bypass mode and you can skip to step 7, otherwise continue with step 3.
3. Make sure that the BYPASS INPUT breaker is ON, the Caution LED is out, and the unit is not running from its batteries. If any of these conditions are present, loss of AC power to the connected equipment will result when the UPS is placed in either Service or Automatic Bypass mode.

Caution



If the Caution LED is flashing, **STOP!** You may interrupt AC input to the connected equipment if you attempt to place the UPS in Service Bypass mode. Perform an orderly shutdown of the system before proceeding.

4. Press and release the red Bypass Switch Activation button.
This puts the UPS in Automatic Bypass mode.
5. Confirm that the UPS is in Automatic Bypass mode by checking the following indicators:
 - AC Output LED: on
 - Battery LED: off
 - Attention LED: on
 - Audible Alarm: solid tone (The alarm may be silenced by pressing the Silence Alarm/Test switch.)

Caution



If the Caution LED is flashing, **STOP!** You may interrupt AC input to the connected equipment if you attempt to place the UPS in Service Bypass mode. Perform an orderly shutdown of the system before proceeding.

6. Press and hold the red Bypass button while turning the Bypass switch to **BYPASS**, then release the red Bypass button.

The UPS is now in Service Bypass mode.

Taking the UPS Out of Service Bypass Mode

The UPS should be taken out of Service Bypass mode only by qualified service personnel or under their direction.

1. Check that the UPS is ready to be returned to Normal mode. If the UPS was serviced, ensure that all components are installed and properly connected.
2. Set the Output On/Output Off switch to **Output ON**.
3. Set the MAIN INPUT breaker to ON.
4. Set the UPS/BATTERY switch to **ENABLE**.
5. Confirm that the UPS has powered on properly and is ready to be returned to Normal mode by checking the following indicators:
 - AC Output LED: on
 - Battery LED: off
 - Attention LED: on
 - Enable LED: on
 - Caution LED: off
 - Audible Alarm: solid (The alarm may be silenced by pressing the Silence Alarm/Test switch.)
6. If the indicators are as specified above, continue. If any of the indicators differ from these **STOP!** The UPS should not be taken out of Service Bypass mode. You may interrupt AC output to the connected equipment if you attempt to do so. Refer to Chapter 6 to identify the problem.
7. Turn the Bypass switch to **NORMAL**. This places the UPS in Automatic Bypass mode.
8. Turn the Output On/Output Off switch to **Output Off** for about one second, then switch it back to **Output On**. This step returns the UPS to Normal mode and clears the audible alarm.

Emergency Power Off (EPO) Connections

A pair of terminals is provided for connection to an EPO system. For normal operation, the terminals must be connected by a jumper or connected to a normally closed EPO switch.

If the terminals are not connected together, or the EPO switch has been activated (opened), the UPS will shutdown AC output power to the output receptacles in On-line mode, On-battery mode, or Automatic Bypass mode. The AC output will remain shut off until the terminals are connected together again or the EPO switch is closed and the Output On/Output Off switch is cycled OFF and then ON.

In Service Bypass mode, input AC power is routed directly to the output receptacles, bypassing the Electronics Unit, and the EPO connection will have no effect on the output power from the UPS. Output power will be present at the receptacles whenever input power is provided to the UPS.

Charging the Batteries

The 5.5 kVA PowerTrust UPS's batteries must be charged before the UPS can provide battery generated output AC power in the event of an input power failure. For the batteries to charge, input AC power must be present, the UPS/BATTERY switch must be in the **ENABLE** position, and the MAIN INPUT breaker must be ON.

Charging the batteries can take up to 14.5 hours for a 90% recharge. The recharge time may be considerably less if the batteries are not fully discharged.

Configuring the OS for the PowerTrust UPS

This appendix gives an overview of how to configure your HP-UX or MPE/iX system for the PowerTrust UPS. For specific instructions about configuring the PowerTrust UPS into your system, refer to the *System Administration Task Manual* for HP-UX servers, or to *Configuring Systems for Terminals, Printers, and Other Serial Devices* for MPE/iX systems. Instructions for how to power fail a system are in the last section of this appendix.

Introduction

Software running on the protected system can monitor the status of the PowerTrust UPS if the following conditions are met:

1. The UPS is connected to the protected system via an RS-232 connection.
2. The operating system is HP-UX version 9.04 (or higher) or MPE/iX 4.7 (or higher).
3. The operating system configuration is modified to recognize the UPS.

If the PowerTrust UPS is not added to the computer's configuration table, the UPS will still perform power conditioning and supply battery backup, but there are two limitations:

1. The error message information in Appendix A and Appendix B will not display on the system console and logfile.
2. The computer system will not be able to respond to impending power failures.

Configuring HP-UX for the PowerTrust UPS

On HP-UX 9.04 and later releases, PowerTrust UPS messages are displayed on the system console and logged to `syslog`; this functionality is not supported on HP-UX 9.0 PCO. The UPS always communicates with the operator by means of auditory alarms and indicators on its front panel.

This applies to HP-UX 9.04 and later releases only. In order for HP-UX to display UPS messages and log UPS events to the system log, you must perform several configuration tasks:

1. Connect the supplied RS-232 cable from the UPS to a serial port configured to the system for each UPS in the system. The port should be a direct connect or modem type port (except remote or maintenance type port).

If the supplied cable is not long enough, use a straight-through 25-wire RS-232-C extender cable (3062C, 25 feet long) from the MDP port to the DB-25 connector end of the cable supplied with the UPS, and then the UPS cable to the UPS's DB-9 connector.

2. Use SAM (Peripheral Devices) to configure the PowerTrust UPS when HP-UX is running. For how to log on and other detailed information, refer to the *ups_mond(1M)* and *ups_conf(4)* man pages. Specify these options and parameters:
 - a. The port used for the UPS. Configure the port at 1200 baud rate.
 - b. Activate or deactivate the automatic shutdown feature.
 - c. The *shutdown_delay_mins* parameter (default=1 minute). This parameter specifies the number of minutes the UPS Monitor program will wait before initiating a “shutdown -h” following notification that AC power to the UPS is lost. This interval allows the computer to continue operation through brief electrical fluctuations.

To take full advantage of the UPS, this value should be large enough to account for transient power fluctuations expected at the site. Shut down is undesirable if power will return shortly. Consider the effects of frequent short power losses. Too long a delay will cause earlier battery depletion.
 - d. The *shutdown_timeout_mins* parameter (default=5 minutes). This parameter specifies the number of minutes the UPS Monitor program will monitor the “shutdown -h” operation before initiating a reboot with the halt option. In this way, a reboot is executed even if the shutdown process hangs. This value must be longer than the longest time that shutdown may take on the system, but should not exceed the battery capacity.
3. Verify that HP-UX is properly configured for the UPS by checking that UPS messages are displayed on the console. Also check for UPS messages in */usr/adm/syslog*. Messages appear whenever **ups_mond** starts, and whenever the PowerTrust detects some reportable condition.
4. Power fail the UPS to check the system and generate messages. See “Power Failing the UPS” later in this chapter.
5. Check the following if UPS messages are not displayed on the console:
 - a. Verify that the RS-232 cable is properly connected to the UPS and to an appropriate port on the HP9000 system. An UPS port may be any available DB25 or DB 9 direct connect or modem type port (except remote or maintenance port).
 - b. Verify that the RS-232 cable is the correct cable. Although the UPS Port appears to be a standard 9-pin RS-232 connector, it has a non-standard pin out. You must use one of these RS-232 cables:

5061-2575	DB9 9-pin male/DB9 9-pin female (2.5 meter)
5061-2569	DB9 9-pin male/DB25 25-pin male (2.5 meter)
 - c. Check that the port is configured at 1200 baud rate.
 - d. Verify that the configured port value corresponds to the physical port used for the UPS connection.
 - e. Reboot the system after correcting cable or connection problems before the software will attempt to resume monitoring the UPS.
 - f. Call the HP Response Center if the above checks have not resolved the problem.

Configuring MPE/iX for the PowerTrust UPS

In order for MPE/iX 5.0 and later releases to display PowerTrust UPS messages on the system console and to log UPS events to the system log, you must perform the following configuration tasks:

1. Connect the supplied RS-232 cable from the UPS to a 25-wire modem port on a DTC for each PowerTrust UPS in the system. Any DTC used for this purpose should itself be protected by a UPS; if the DTC is not protected, UPS messages will not be displayed when AC input power fails.

If the supplied cable is not long enough, use a straight-through 25-wire RS-232-C extender cable (3062C, 25 feet long) from the DTC port to the DB-25 connector end of the cable supplied with the UPS, and then the UPS cable to the UPS DB-9 connector.

2. Choose an available LDEV number if you are adding a UPS to an existing 990/992 System. The configuration groups supplied for 991/995 Systems leave LDEV 22 undefined and suitable for use for the first UPS on the system.

Any LDEV used by a UPS *should not* already be defined as being used for other devices for the system. For log on instructions and information on using SYSGEN to view and modify the configuration, see Chapter 2 of the *CS 99x/T-Class Installation Guide*.

3. Use NMMGR to configure the DTC port for each UPS. A port connected to a UPS is configured similar to a terminal. Use a profile with the following parameters:
 - a. Set the field `Allow :HELLO logon?` to N.
 - b. Set the first device class name field to HPUPSDEV.
 - c. Set the baud rate to 1200.
 - d. Set all other fields the same as those used for a terminal.

The sample configuration file `NMSAMP1.PUB.SYS` contains the profile `UP10D12` that is configured with these parameters. Enter this profile in the `Profile Name` field on the `Async Card Configuration` screen for the desired DTC port.

On a system configured for PC-based management, configure the correct baud rate using the Open View DTC Manager workstation.

4. *Make certain that the system is not performing critical work.* Shut down the system.
5. Cycle power to the DTCs, then reboot the system with the new NMMGR configuration.
6. Verify that MPE/iX is properly configured for the UPS by checking that UPS messages are displayed on the console. Use `LOGTOOL` to check for UPS messages in the system log.
7. Check the following if UPS messages are not being displayed on the console:
 - a. Verify that the RS-232 cable is properly connected to the UPS and to an appropriate modem port on a DTC. An appropriate port is a 25-pin modem-type port on a DTC configured to the computer.
 - b. Verify that the RS-232 cable is the correct cable. Although the UPS Port appears to be a standard 9-pin RS-232 connector, it has a non-standard pin out. You must use one of these RS-232 cables:

5061-2575	DB9 9-pin male/DB9 9-pin female (2.5 meter)
5061-2569	DB9 9-pin male/DB25 25-pin male (2.5 meter)
 - c. Verify that the value entered in NMMGR for the port corresponds to the physical port used on the DTC.