

# Why Buy Compaq Power Management Products?

Compaq has developed a full range of power management products that protect and manage computer systems ranging from individual workstations to distributed enterprises. Compaq offers a wide range of Uninterruptible Power Systems (UPSs) from 500 VA to 6000 VA in both tower and rack form factors. The bundled Compaq Power Management Software continuously manages and monitors Compaq UPSs.



## Competitive Advantages:

### Ultimate, Long-Term Battery Reliability with Compaq Enhanced Battery Management

Batteries that are constantly trickle-charged reach the end of their useful life in less than half the time of those charged using advanced techniques such as Compaq Enhanced Battery Management technology. Compaq understands that the battery reliability of your UPS is essential to ensuring network server protection. Compaq Enhanced Battery Management, standard with all Compaq UPSs 700 VA and above, incorporates an advanced battery three-stage charging technique that doubles battery service life, optimizes battery recharge time, and provides up to a 60-day advanced notification of the end of useful battery life. This innovative technology is comprised of three components:

#### >Double Battery Service Life with Intelligent Battery Charging

All UPS batteries need charging. Extended charging, however, significantly shortens battery life. The Compaq UPS utilizes a three-stage charging process that ultimately doubles battery service life. First, the Compaq UPS rapidly charges the battery to 90 percent. A constant voltage (float charge) continues until the battery reaches full capacity. The charger is then turned off and the Compaq UPS goes into a rest mode, enabling the battery to be preserved for future power failures. Most manufacturers use a trickle-charging method (a constant voltage feeding a low current to the battery) which dries the electrolyte and corrodes the plates, reducing potential battery life by up to 50 percent.

#### >Advance Notification of Battery Replacement with Sophisticated

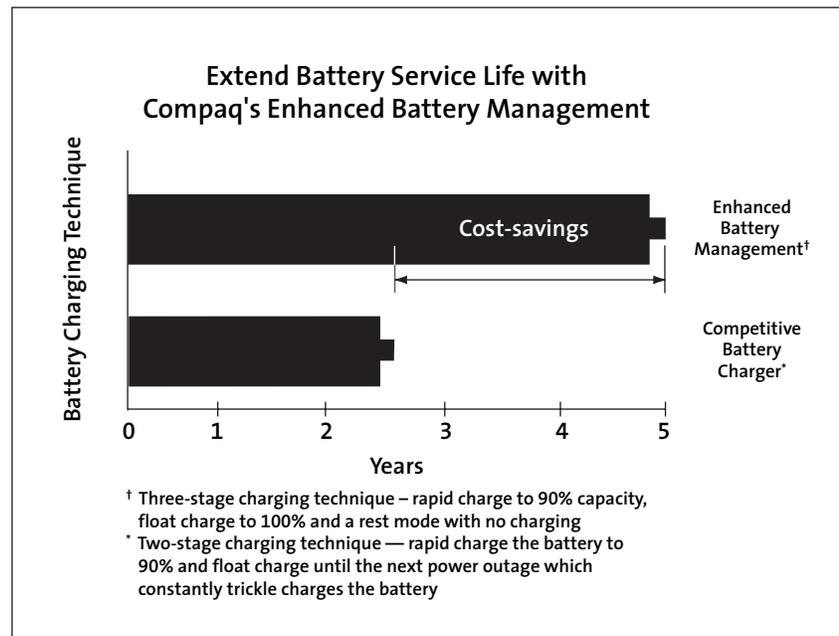
# Why Buy Compaq Power Management Products? (cont.)

## Monitoring Techniques

All batteries will eventually fail. Because UPS batteries are valve-regulated, sealed, lead-acid cells, there has not been a practical way to provide users with advance notification of battery failure. The only way to determine that batteries needed replacing was to wait until the power failed, taking the servers and computers down with it. Compaq's Enhanced Battery Management is the only technology available that reliably provides advance notification prior to battery failure. The Compaq UPS microprocessor tracks the charge and discharge characteristics of the battery. These characteristics are compared to an ideal battery state, indicating to the user, well in advance, when battery replacement is necessary.

## >Minimize Battery Use with Superior Voltage Regulation

Most manufacturers' UPSs correct input voltage variations as low as -25 percent, but transfer to battery when a surge or a sag needs to be filtered in the system. This type of voltage regulation shortens the battery service life of the UPS. Innovative Buck/Double Boost voltage regulation ensures consistent input voltage to the load by automatically "bucking" it if it is too high, or "boosting" it if it is too low. Voltage variations as low as -35 percent or as high as +20 percent of nominal voltage are corrected — without transferring to battery. This reduces the number of charge/recharge cycles, thereby prolonging the life of the Compaq UPS battery.



# Why Buy Compaq Power Management Products? (cont.)

## **Intelligent Manageability with Compaq Power Management Software**

Compaq Power Management Software allows for diagnostics, monitoring, user notification, and — when necessary during an extended blackout — unattended, prioritized shutdown of multiple servers and client workstations. For ultimate intelligent manageability, the Compaq UPS has been designed to schedule startups and shutdowns of connected equipment and control separate receptacle groups (load segments).

## **Preserve Valuable Rack Space with the Compaq Zero U/1 U Power Distribution Unit**

Designed to fit into a Compaq rack environment, the Compaq Power Distribution Unit provides managed power distribution and surge protection via up to 12 circuit-breaker and fuse-protected AC receptacles. The unique sidewall-mount design of the Compaq Power Distribution Unit preserves valuable rack space for more critical servers and systems.

## **Compaq Quality**

Having built its reputation on providing the highest quality products, the Compaq hardware qualification process is the toughest in the industry. Extensive evaluation, testing, and product improvement guarantee the highest level of system protection, electrical performance, product construction, and compatibility.

## **Superior UPS Warranty**

To back up the wide range of features offered with our UPSs, Compaq provides a three-year limited warranty, as well as an additional \$25,000 Computer Load Protection Guarantee. The Pre-Failure Battery Warranty ensures that when Compaq Power Management Software notifies customers that the battery may fail, the battery or UPS is replaced free of charge under the warranty — reducing the total cost of ownership and system downtime.

# Why Do You Need the Protection of a Compaq UPS? - Power Facts

Here is some powerful information that makes you think twice about not having power protection.

## Did you know...?

...Demand for Internet service has helped fill these facilities (data centers), but their growth is a testament to Moore's Law, which holds that the speed of the fastest computer chips doubles every 18 months. Yet as servers such as these have become exponentially more powerful, less expensive and smaller, they have also begun to draw more electricity and give off a lot more heat. In some data centers, air conditioning consumes 40 percent of the total power. Keeping all of this equipment running smoothly is a daunting technical and logistical task. For a major Internet site, even a tiny glitch in the power is unacceptable. Source: "Austin, Texas, Energy Company Tries to Meet Demand for Tech Companies", Austin American-Statesman, December 14, 2000

...The firms feeding the high-tech boom are increasingly dependent on a fragile power grid. At the same time, these very businesses are a big part of the problem, consuming electricity in amounts no one would have predicted even a few years ago. "The current electrical system was not ever designed for the Internet economy," said Karl E. Stahlkopf, vice president for power delivery at the Electric Power Research Institute in Palo Alto. "Anything chip related is a tremendous Achilles' heel." Power failures nationally cost more than \$50 billion a year in lost productivity, Stahlkopf said, citing a study conducted for Business Week. "Those costs will only rise as our economy becomes more silicon based," he added.

Source: "Tech Companies a Drain on Power Grid Energy: Electricity demand in Silicon Valley has grown at four times overall U.S. rate, experts estimate." Los Angeles Times via DowVision, December 12, 2000

...High-tech workers are famously workaholic but the power drain in Silicon Valley is not just a matter of employees burning the midnight oil. Far more consumption comes from the machines behind the Internet and the backup systems behind those machines, which are rapidly being deployed to insure things like e-mail services and online stock brokerages do not crash.

Source: "New Economy Puts Strain on Old Power Plants", Reuters, December 13, 2000

...An unprotected microprocessor will malfunction if power is interrupted for even a single AC cycle—1/60th of a second. The average reliability of power "at the plug," however, is not nearly this reliable, so an additional combination of technologies—some applied to the grid, others on the customer premises—will be required to prevent malfunction of computers and other microprocessor-based equipment. "Unless the needs of diverse market segments are met through a combination of power delivery and end-use technologies, U.S. productivity growth and prosperity will increasingly be constrained," says Stahlkopf. (Vice-president for Power Delivery at the Electric Power Research institute in Palo Alto)

Source: Power Quality, December 14, 2000

# Why Do You Need the Protection of a Compaq UPS? - Power Facts (cont.)

...The U.S. power grid is about 99.9 percent reliable. That means the lights are out for more than eight hours a year.

Reliability Percentage	Number of Nines	Yearly Downtime in Hours*	Equal To
99%	2	87.6 hours	3 days, 15 hours, 36 minutes
> 99.9%	3	8.76 hours	8 hours, 45 minutes, 36 seconds
99.99%	4	.876 hours	52 minutes, 34 seconds
99.999%	5	.0876 hours	5 minutes, 15 seconds
99.9999%	6	.00876 hours	31.54 seconds
99.99999%	7	.000876 hours	5.26 seconds
99.999999%	8	.0000876 hours	.53 seconds

\*(Based on 8,760 hours in a calendar year).

Source: "Power and Pain: Dollars & Sense", Sm@rt Partner (magazine), September 18, 2000

... It is estimated that the overall impact of power-related problems can cost U.S. companies more than \$26 billion per year.

Source: Frost & Sullivan, Power Conditioner Market (US) February, 2000

... A split-second deviation in the voltage of the electricity serving a fabrication plant can crash a sensitive component, causing downtime, missed deliveries and lost product— interruptions that can cost the [semiconductor] industry as much as \$2 million per day.

Source: EPRI (Electric Power Research Institute), March 3, 2000

... The skyrocketing cost of Web site problems is easiest to measure during blackouts, when an entire site goes down. EBay's 22-hour crash in June cost the company more than \$5 million in returned auction fees... ESPN, which lost its fantasy baseball site for three days beginning July 11, conceded that it will have to compensate some of its 260,000 online players, who pay \$30 each to play in the league.... Recent numbers from Intel indicate that the company takes in about \$275,000 per hour over the Web. So the site wouldn't have to be down four hours to forfeit—or delay—a million dollars in sales.

Source: PlanetIT.com "The Cost Of Downtime" by Tim Wilson August 5, 1999

... ASPs, ISPs, Web hosting firms and telecoms account for about 70 percent of the UPS market.

Source: Venture Development Corp, 2000

... In just five years, the electricity consumed by the computer and networking systems that power e-commerce has risen from a tiny fraction of the overall electricity pool to close to 13 percent, according to RDI. That could rise to as much as 25 percent by 2010.

Source: Resource Data International, 2000, as quoted in the InternetWeek (June 26, 2000) "E-Comm Short On Juice – Looming electricity shortages threaten Internet economy" story.

## Why Do You Need the Protection of a Compaq UPS? - Power Facts (cont.)

... One in four Local Area Networks (LANs) is completely vulnerable to disaster or disruption. And 64 % of organizations do not have an effective plan to protect their Wide Area Networks (WANs).

Source: FEMA (Federal Emergency Management Association) Disaster Statistics Fact Sheet, March, 2000

... "Now it's absolutely critical to be up 100% of the time," Dodds says. "We have some real-time traders as customers, and for some of them, just a five-second delay can amount to 15% profit or 15% loss."

Source: John Dodds, a senior systems administrator at Financialweb.com Inc. in Orlando, Florida, as quoted in the InformationWeek, August 16, 1999 "Network Pressure" article.

... Surges and spikes remain the most commonly experienced power quality problems

Source: Frost & Sullivan, UPS End-User Survey (NA) July, 1999

... According to the survey, power outages continue to be the number one disruption for businesses: 65.9 percent of respondents in 1999 and 64.1 percent in 1998 experienced a power outage in the past five years. The next closest offenders were hardware and software problems, followed by telecommunications failure.

Source: Contingency Planning and Ernst & Young 1999 Survey

# Protecting Enterprise Environments with Compaq UPSs

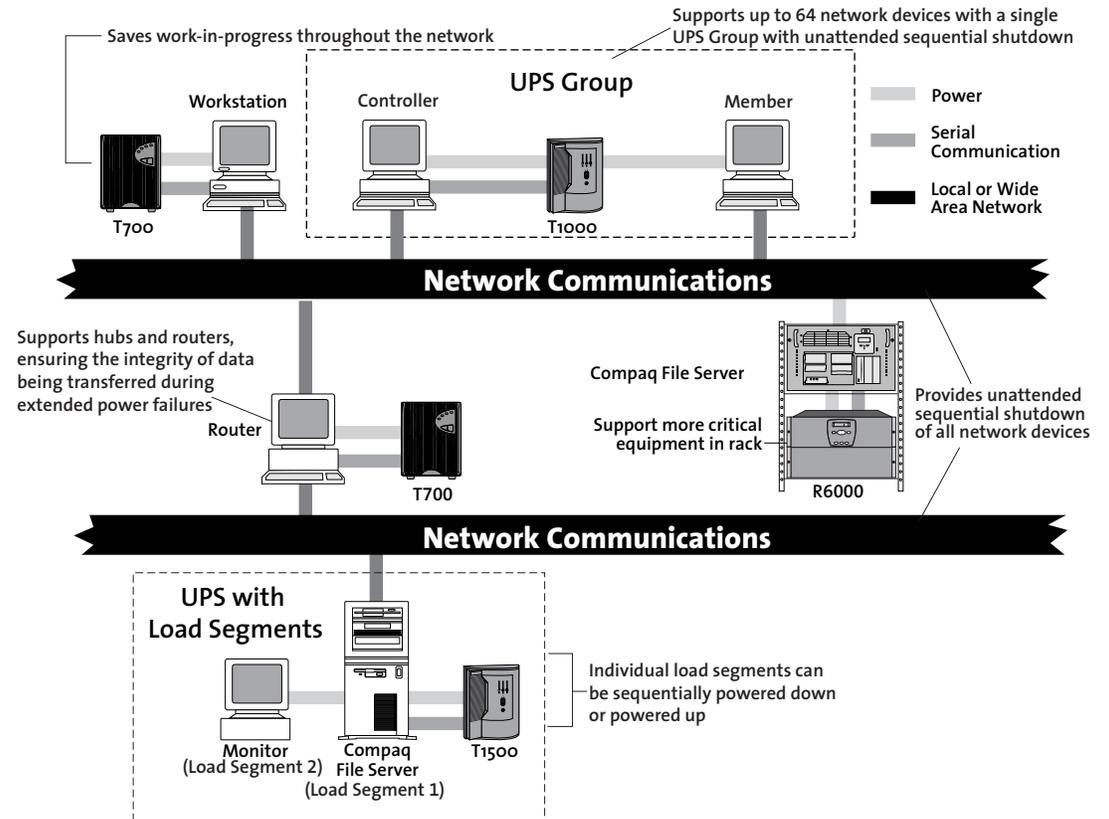
## The Costly Effects of Power Problems in an Enterprise Environment

The effects of blackouts and other power problems in an enterprise environment can be devastating and costly. Using a Compaq UPS to protect servers and other critical equipment prevents unnecessary downtime, loss of data, and damage to your hardware. Maximum data integrity and system uptime require a prioritized shutdown plan which is managed by Compaq Power Management Software. Preserving data is an increasingly complex issue in today's enterprise environments. Communication systems are required to transfer and store information within internal computer networks and must also provide critical links to the enterprise-wide networks.

## Ensure Data Integrity System-Wide with Compaq Power Management Software

A prioritized shutdown ensures that all network devices are shut down in an orderly, sequential manner, saving all work-in-progress throughout the network. Compaq Power Management Software empowers network administrators by allowing them to define their own shutdown process. Thus, a company's most critical equipment (such as a database or file server) can be shut down last, after work-in-progress has been saved from client workstations through hubs, switches, routers, and communication servers.

Complete network power protection with Compaq Power Management Software and Compaq UPSs



# Protecting Enterprise Environments with Compaq UPSs (cont.)

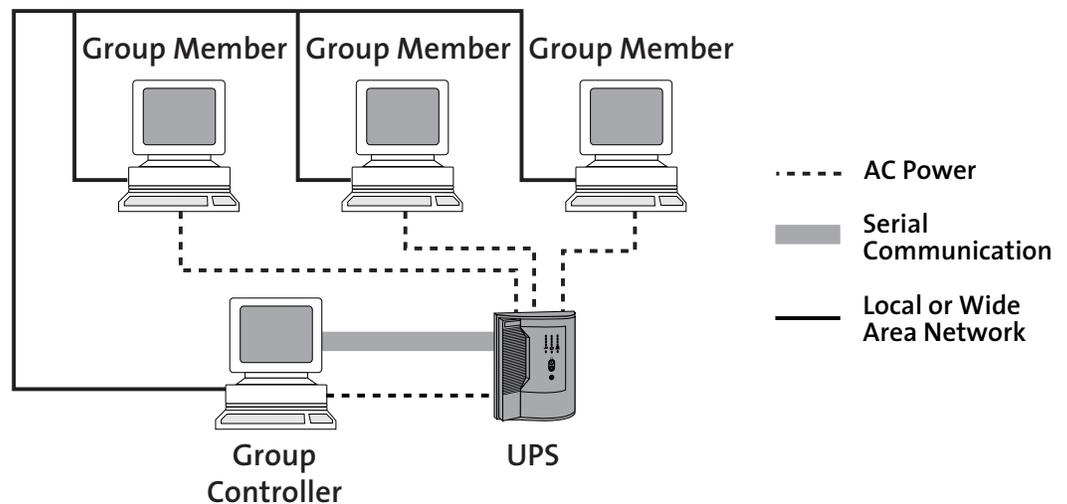
When power quality is compromised, so are a company's vital data files including data entry, orders, records, e-mail messages, and other critical business information. Compaq Power Management Software used in conjunction with Compaq UPSs plays a vital role in ensuring data integrity and the protection of your business's critical network servers and systems.

## UPS Groups

When a single UPS supports more than one server or workstation, the resultant system is called a UPS group. Compaq Power Management Software and LanSafe III support up to 64 network devices in a single UPS group, and provides unattended, sequential shutdown of every device in that group, regardless of the operating system.

Of the servers or workstations in a UPS group, only one is connected via a serial communication cable to the UPS. This workstation or server is called the UPS group controller, while the group's other workstations or servers are called UPS group members. If the UPS group controller shuts down, its group members must shut down. UPS group members may not have a longer shutdown time than the UPS group controller.

## UPS Group Configuration

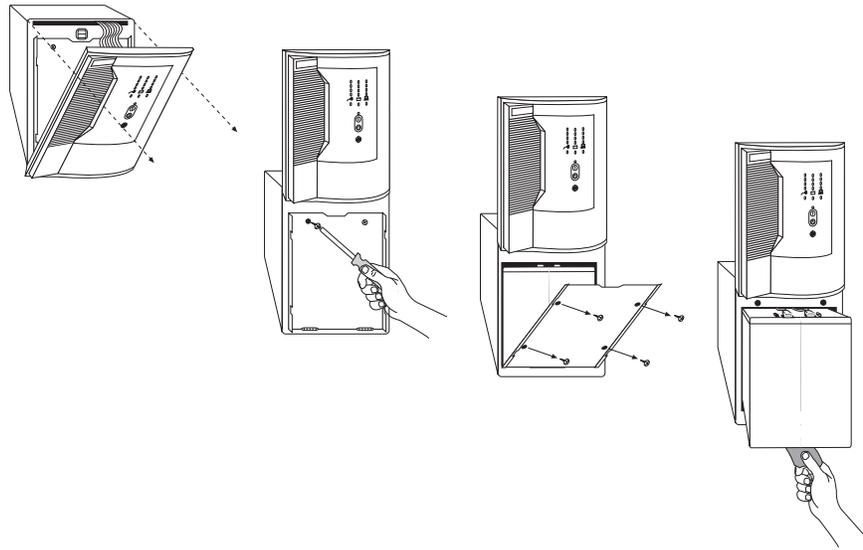


# Ease of Serviceability with Hot-Swappable Batteries

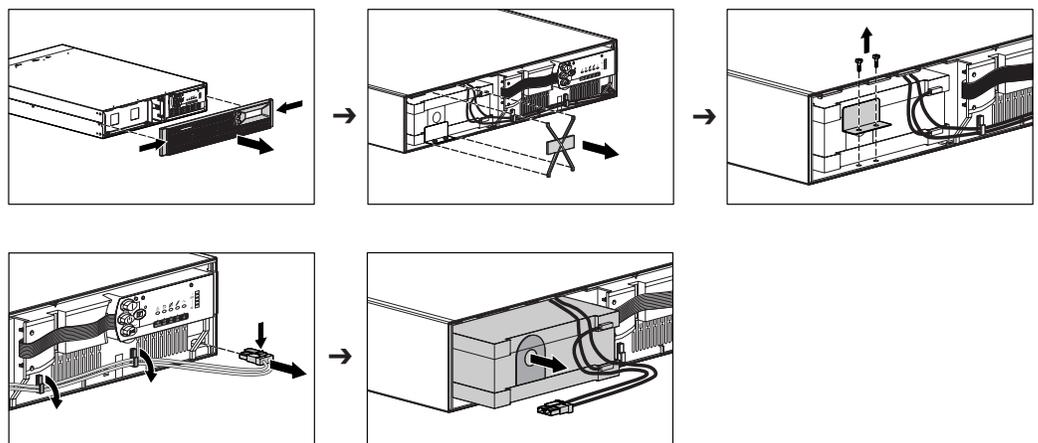
While Enhanced Battery Management has the ability to double battery service life, it cannot prevent inevitable battery failure. When your batteries reach the end of their useful life, replacement is easy with hot-swappable batteries. Simple access through the front panel allows users to safely install new batteries without ever powering down the connected equipment.

## Tower UPSs: T1000, T1500, T2000, and T2400h

For models without internal batteries (Models T2000 and T2400h), the procedure is accomplished by replacing external battery packs.



## Rack-Mountable UPSs: UPS R1500 XR



# Extended Backup with Load Segment Control

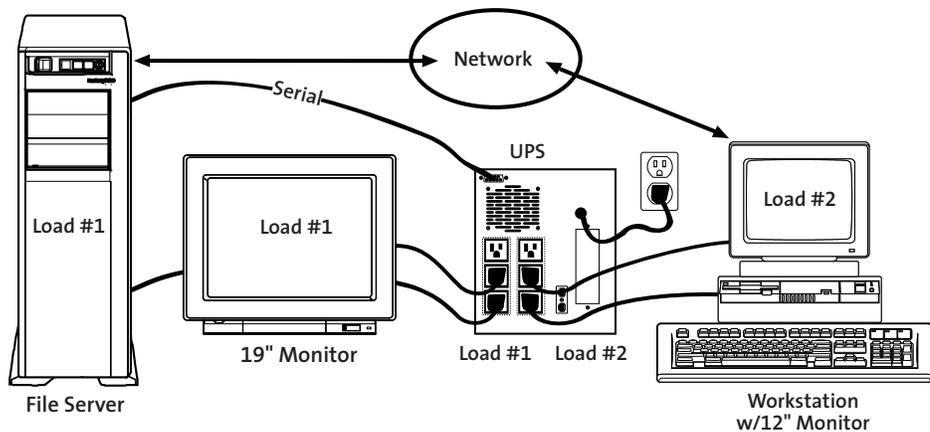
With Compaq UPS load segment control, users have the flexibility to configure scheduled startups and shutdowns of their equipment, as well as to independently control load segments.

Working in conjunction with Compaq Power Management Software, the Compaq UPS can be configured to extend runtimes for critical devices. Because the receptacles on the back of the Compaq UPS are divided into two or more groups — called load segments — each load can be controlled independently.\* By shutting down one load segment, the runtime for more critical servers and systems is extended on the other load segment, providing additional protection by shutting down less critical servers and systems first.

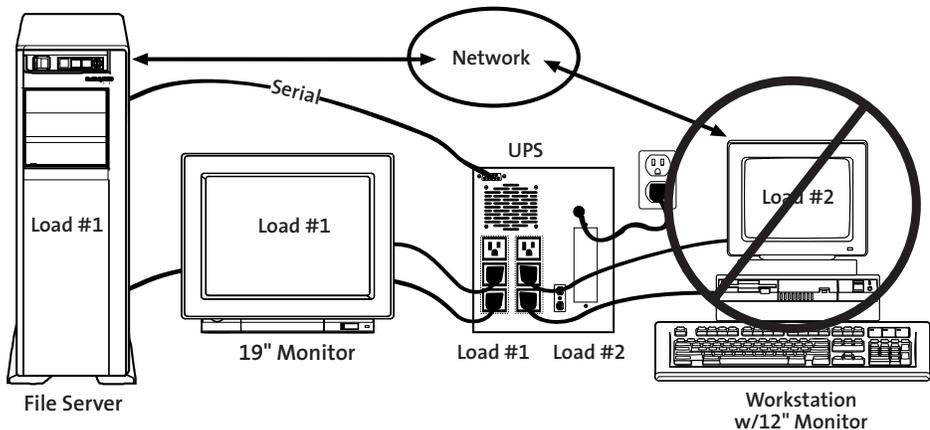
Compaq Power Management Software also facilitates a prioritized startup of connected equipment. Furthermore, the power scheduling feature allows for scheduled on-and-off times, promoting energy and power conservation.

\*T700 UPSs have only one load segment.

**BEFORE - Total Backup time = 20 minutes**



**AFTER Shutting down load #2 - Backup time = 28 minutes for File Server and Monitor**



# High-Line (208V) versus Low-Line (120V) – What’s Best for your Customer?

Choosing between voltages is mainly a North American\* issue. What might be confusing is that some individuals make references to 120V power, others mention 110V power or even 117V power. These disparate figures are essentially the same. Additionally, 120V is sometimes described as low voltage. Low voltage in correct electrical specifications is a range from 100V-120V. Most homes and office spaces in North America are wired for 120V. For marketing purposes, Compaq chooses to use low voltage to mean 120V.

The other choices for North American single-phase voltage environments are generally 208V and 240V. A typical example of this is the household washer or dryer that runs off of 240V and a computer server that runs off of 208V. These voltages are sometimes described as high voltage. High voltage in correct electrical specifications is a range from 200V-250V. For marketing purposes, Compaq chooses to use high voltage to mean 208V.

Most servers have an auto-sensing feature that allows the server to automatically adjust to voltage levels ranging from 100V-240V. Therefore, they can be powered off of any of these voltages.

## How Much Power Is Needed?

A circuit wired for 208V will power almost twice as much equipment as 120V. However, in order to get the type of power your computer equipment needs, here are a few things to keep in mind. 120V and 208V power environments require different types of wall outlets/receptacles, circuit breakers, and plugs and power line cords.

How much power does the equipment require, and how much power is available in the existing computer room? Assume that within the computer room there is a single power outlet rated at 120V and 15 amps. This configuration is a standard and typical wall outlet, which is also found in most residential homes. The amount of power available would be calculated by taking 120V and multiplying it by 15 amps, giving a preliminary available power figure of 1,800VA. A quick yet important safety note here: It is a safety regulation that you use only 80% of your available power in order to keep breakers from tripping and outlets from overloading. Keeping this safety regulation in mind reduces the ‘safe’ available power to 1,440VA.

Assume that there are two racks in the computer room that can hold ten servers in each of the racks for a total of 20 servers. Those servers might be rated at 100VA/100watts each. The power requirement for those servers would then be 2,000VA (20 servers \* 100VA = 2,000 VA). Given that there are only 1,440 VA currently available in the computer room, the 2,000 VA requirement is too large. This power requirement presents a quandary.

Using 208V could be the answer to the dilemma. More volts (208V is approximately 75% more than 120V) would almost double the 1,440VA to approximately 2,500—enough to power the 20 servers.

\* This issue is prevalent in other regions. This article concentrates on North America

# High-Line versus Low-Line – What’s Best for your Customer? (cont.)

## Facilities Review and Advantages of 208V

Before using 208V, a facilities review of the wiring infrastructure needs to take place to validate the feasibility of using 208V. Outcomes of this review could show that it is simple and cost effective to rewire the site for 208V. Sometimes the fix could be as easy as adding or ‘pulling’ a 208V outlet from the local panel board or breaker. 208V is an efficient solution as it allows higher volts (more power) in the same amount of computer-room space.

Circuit breakers and wall receptacles will need to be upgraded to handle the new 208 voltage. Respectively, special plugs and power line cords are also needed for the server and other computer equipment. Although servers are auto-sensing, as a standard, servers ship only with 120V power cables. Plan ahead and order 208V (high-voltage) power line cables for the servers and additional computer equipment. Also, note that Compaq UPSs and power distribution units (PDUs) are not auto-sensing but are available in high-voltage models.

A facilities review of the wiring infrastructure could prove that 208V is a cost effective and efficient way to double the available power. To keep installations problem free, remember to plan ahead and match the computer equipment power cables, plugs, UPSs and PDUs to the 208V wall outlets and receptacles.

# Which Compaq UPS is Right for You?

## Determining the Required UPS Power Rating

The table below shows which UPS models can be used with the various Compaq server and storage system models. This will vary with actual configurations, type of peripherals also protected by the UPS, and amount of backup time required. The VA/Watts values shown on the adjacent chart are maximum values.

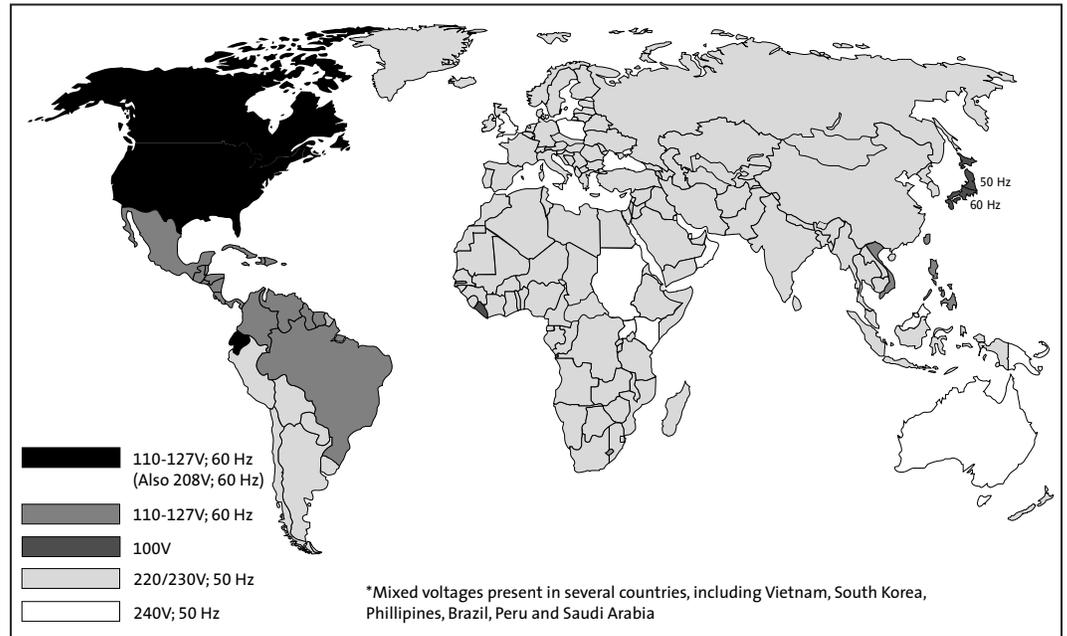
For configurations involving multiple servers and/or additional critical storage/option products, simply add up the total VA/Watts of the equipment that will be plugged into the UPS and select the UPS model with a VA/Watt rating higher than the equipment load. To allow for future system growth, a good rule of thumb is that the computer load should be about 60% - 80% of the UPS VA/Watt capacity.

Description	Watts Low	Watts High	VA Low	VA High	Description	Watts Low	Watts High	VA Low	VA High
4P Kybrd/Monitor	116	116	178	178	ProLiant ML370	500	500	510	510
8P Kybrd/Monitor	116	116	178	178	ProLiant ML530	769	769	785	785
AP250	267	267	410	410	ProLiant Storage System/U Mdl 2	828	828	845	845
AP300	353	353	544	544	RMountable SCSI Storage Expander	111	111	113	113
AP500	577	577	589	589	S700 Color Monitor 17"	111	111	148	148
SP750	654	654	667	667	Server Console Switch 2 Port	116	116	178	178
CPW 6000	500	500	510	510	StorageWorks Enclosure Model 4214R	446	731	455	746
CPW 8000	500	500	510	510	StorageWorks Enclosure Model 4254R	446	731	455	746
DLT 15 Cart Library	355	355	363	363	StorageWorks Enclosure Model 4313R	446	731	455	746
DLT 15 Tape Library	355	355	363	363	StorageWorks Enclosure Model 4354R	446	731	455	746
DLT Tape Array	568	568	579	579	StorageWorks FC SAN Switch 8-EL	100	100	102	102
DLT Tape Array - Model	3570	355	355	363	StorageWorks FC-AL Switch 11 port	115	115	117	117
ProLiant 1200	500	500	510	510	StorageWorks Fibre	216	231	220	235
ProLiant 1500R	500	500	510	510	StorageWorks Fibre Channel Storage System	291	291	297	297
ProLiant 1600R	500	500	510	510	StorageWorks Modular Data Router (HVD)	187	187	190	190
ProLiant 1850R	500	500	510	510	StorageWorksFibre Channel Storage Hub 7	113	113	116	116
ProLiant 2500	500	500	510	510	TaskSmart C series	300	300	306	306
ProLiant 3000	769	1154	785	1177	TaskSmart N series	667	1000	680	1020
ProLiant 4500R	769	769	785	785	TFT 450 Flat panel mounted upright	54	54	83	83
ProLiant 4500R	769	769	785	785	TFT 5000R	54	54	83	83
ProLiant 5000R	769	1154	785	1177	TL881 1 Drive	163	443	251	682
ProLiant 5500	769	1154	785	1177	V50 15" Color Monitor, MPR/GSA	128	128	196	196
ProLiant 6000	1538	2308	1570	2355	P50 15" Color Monitor	111	111	170	170
ProLiant 6400R	692	692	706	706	P70 17" Color Monitor	111	111	170	170
ProLiant 6500R	769	1154	785	1177	P75 Color Monitor 17"	111	111	170	170
ProLiant 7000R	1538	3538	1570	3611					
ProLiant 800†	769	769	785	785					
ProLiant 8000	1538	3538	1570	3611					
ProLiant 8000 XN500	769	1769	785	1805					
ProLiant 8500†	769	1769	785	1805					
ProLiant 850R	462	462	471	471					
ProLiant CL1850	1154	1154	1177	1177					
ProLiant CL380	1269	1269	1295	1295					
ProLiant DL320	277	277	283	283					
ProLiant DL360	292	292	298	298					
ProLiant DL380†	423	423	432	432					
ProLiant DL580†	692	692	706	706					
ProLiant ML330	385	385	392	392					
ProLiant ML350	462	462	471	471					

† Watts and VA indicated are per power supply.

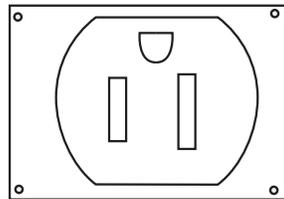
# Worldwide Power Requirements

## Worldwide Voltages\*

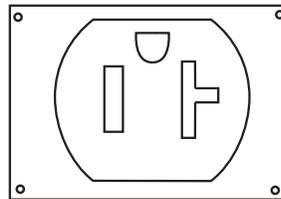


## Output Receptacles (North American, Latin American, and Japanese Models)

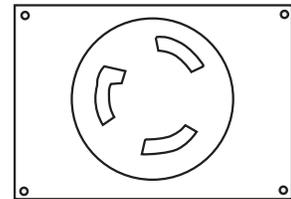
(100–127 VAC)



5-15R

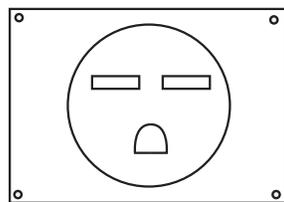


5-20R

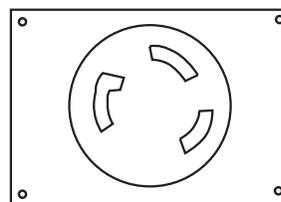


L5-30R

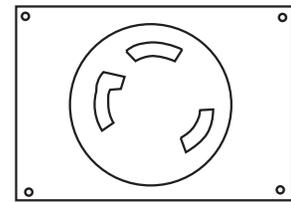
(208–240 VAC)



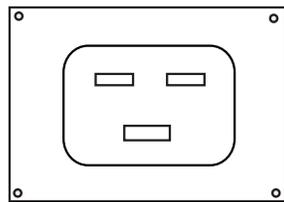
6-15R



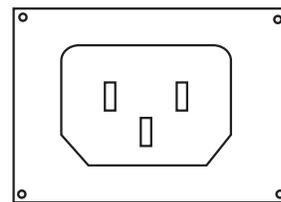
L6-20R



L6-30R



IEC-320-C19

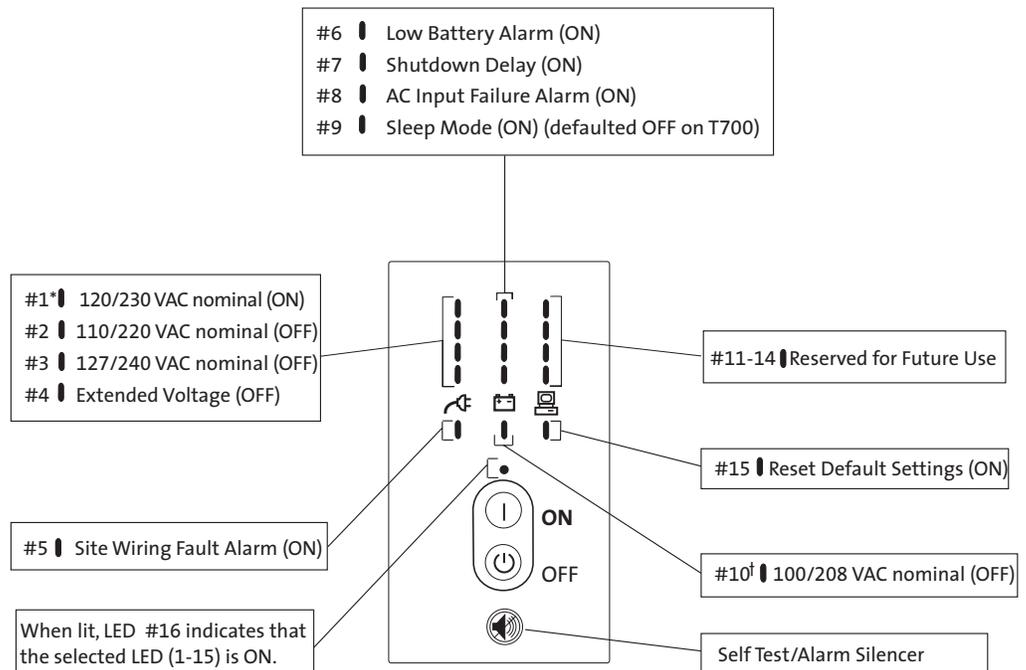


IEC-320-C13

# UPS Front Panel Configuration

## (T1000, T1500, T2200, T2400h and R1500 Models)

In the Configure Mode, the LEDs allow factory-set defaults to be changed. A user may wish to alter these functions if the AC input consistently fluctuates higher or lower than the factory-set nominal input voltage. Other changeable functions include LEDs for extended voltage, shutdown delay, sleep mode, low battery, and AC input failure. In the Configure Mode, each LED represents a changeable function, with the control buttons responsible for enabling or disabling them (see illustration below).



\*LED #1: Indicates 100 volt mode on T700j

†LED #10: Not applicable for T700 models

Q. Where can I find definitions of the setting and instructions on how to change the UPS configurations?

A. In the Compaq UPS user manual.

Q. How do I get into configure mode?

A. Press the ON and Self Test/Alarm Silencer button at the same time to switch to configure mode. Once in configure mode, use the ON button to scroll through the LEDs (LED will flash).

Then, to turn on or off a particular LED, simply press the Self Test/Alarm Silencer button (while in configure mode). The light over the ON button will be green if the LED is on and no light will appear if the LED is off.

Q. Can I configure voltage settings via the front panel?

A. Yes, the front panel is the only place you can configure voltages other than the default setting already programmed on the UPS. Refer to the above question on how to change these defaults.

# Frequently Asked Questions<sup>†</sup>

## UPS Technology

Q. What UPS technology is available with the Compaq UPS?

A. The Compaq UPS utilizes a line-interactive plus topology which features sine wave output and superior input/output voltage regulation. This technology is inherently reliable and highly efficient. The Compaq UPS corrects input voltage variations as low as -35% of nominal voltage without transferring to the battery. This will ensure that the battery is preserved and ready for the next power anomaly.

Q. Does the UPS have a transformer?

A. Yes. Its function is to provide buck and boost regulation as well as provide isolation between the battery and the output.

Q. Can I change the line cord that is provided with the UPS?

A. We strongly recommend, due to worldwide safety standards, that you do not remove or change the line cords provided with the UPS.

Q. Can I change the plug provided with the UPS?

A. Yes, as long as the new plug is rated the same voltage and amperage as the provided plug.

## T1000 through T2400, R1500 models only:

Q. What does the ground fault indicator (LED # 5, front panel) tell me?

A. This LED indicates a possible wiring error in the outlet to the UPS, which should be checked by an electrician. In high voltage applications (240V), however, this alarm is always on, even in a correctly wired installation. If this is the case, it should be disabled.

Q. When should I disable the SLEEP feature (LED # 9, front panel)?

A. In lightly loaded applications that you wish to keep running (less than 5% load) the sleep feature should be disabled. All Compaq UPSs are shipped with sleep mode disabled.

## R6000 Series

Q. Because the R6000 has two communication ports, can you hook up two servers and map them to different load segments?

A. Yes, you can map one server to COM port 1 and one server to COM port 2 with a configuration utility (available on the web as a download) and will be on CPM 1.6. The default is that all five load segments are mapped to each COM Port. We recommend that you configure load segments 1, 2 & 3 to COM port 1 and Load segments 4 & 5 to COM port 2. This configuration must be done with the configuration software as it is not a default setting.

Q. When replacing batteries in the R6000 do you replace all the batteries at the same time or just that particular ERMs two battery trays?

A. When replacing batteries for the R6000, the customer should only replace the two trays in that particular ERM. The exception is if you have the ERMs attached from the beginning and have used these for several years. It is advisable to replace all battery trays unless the service technician knows which tray needs to be replaced.

<sup>†</sup> Refer also to the Compaq UPS white papers contained in this Reference Kit for other Frequently Asked Questions.