

# LIEBERT HIROSS: LEADING THE WORLD IN CRITICAL SYSTEM SUPPORT

## EMERSON

Emerson Electric Co. occupies a leading position on the global market.

The corporation creates and manufactures a wide range of advanced electric and electronic products and systems for a variety of industrial, commercial and consumer applications.

A Fortune 100 company, it currently has annual sales of over 14 billion US dollars and employs over 112,000 people in 250 locations.

## LIEBERT

Liebert Corporation, which became part of Emerson Electric in 1987, is the world's leading supplier of computer support systems and is the largest supplier of precision air conditioning and power protection systems for telecommunication applications world-wide. With more than one million power and environmental control systems installed throughout more than 100 countries, Liebert has more ways to protect and cool sensitive electronics than anyone.

With 13 production units and a network of more than 175 sales offices across the world, supported by distributors and service centres covering 103 countries, Liebert employs 5,500 people, and has world-wide annual sales of over 1 billion US dollars.



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## HIROSS

The Hiross Group was originally founded in 1964 to provide innovative solutions for compressed air treatment. In the 1970's and 80's the Group started to apply this knowledge to the environmental protection of digital equipment in data processing and telecommunications. Applications for precision air conditioning systems now include power plants and CAT-Scan installations, as well as the core businesses of telecommunications and computer rooms. In 1990 Hiross developed a new range of electronic controls which became the benchmark for the precision air conditioning market.

Before the acquisition Hiross employed 550 people and generated 145 million US dollars in sales. The company is particularly strong in Europe with direct sales operations in most European countries and a network of distributors in the rest of Europe, Middle East and Africa.

## THE GROUP: LIEBERT HIROSS

In 1998 Emerson Electric acquired Hiross and incorporated it within their Liebert Division. In Europe, Africa and the Middle East, this has resulted in the creation of Liebert Hiross, a combination of the two leading world players in precision air conditioning, each with a comprehensive product range, widespread distribution network and great customer loyalty.

Today no other organisation can offer such a wealth of design and manufacturing skills in environmental control systems for telecommunications, data processing and similar markets. By maintaining their individual brand characteristics, Liebert Hiross will preserve each company's unique features, specialisation and resources offering both their products High Precision Air Conditioning and UPS.

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### LIEBERT POWER PROTECTION PRODUCTS

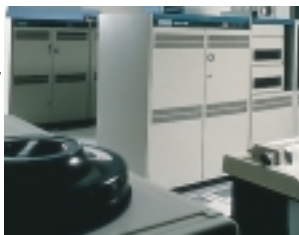
- 14/15 Micro UPS: PowerSure Personal, PowerSure Proactive, PowerSure Interactive, MicroPOD
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## POWER PROBLEMS

PROBLEMS CAN START  
ALMOST ANYWHERE

### ■ Other Equipment In The Building

According to some studies, about three-quarters of all power disturbances are caused by equipment inside your building, even within your network. Culprits include laser printers, copiers, lifts . . . even the



microwave oven in the staff kitchen. The problem becomes even more complex if the building contains industrial or process equipment: arc welders, process heat equipment and electric motors are often sources of problems.

### ■ Your Facility

If your building is more than a decade old, the chances are the wiring was not designed to support intensive use of networked equipment.

### ■ The Weather

Other than natural disasters, the major threats to power quality are lightning and wind, found together in thunderstorms. No part of Europe is immune to them.



High winds or heavy snowfalls causing power line faults or actual line breaks may be even more common.

### ■ The Power Supply

Mains power generation and distribution systems were not originally designed with computers, digital clocks and high-speed telecommunications in mind. They simply can't supply power guaranteed to meet the needs of the sensitive systems that you depend on.



### ■ Your Own System

The larger and more complex the network, the greater the risk of internally-generated power disturbances. The more outside connections, modems, hubs, routers, multiplexed data lines, the greater the risk of intrusive disturbances. Even the shape of your network can have an effect on the relative amount of damage caused by a disturbance.

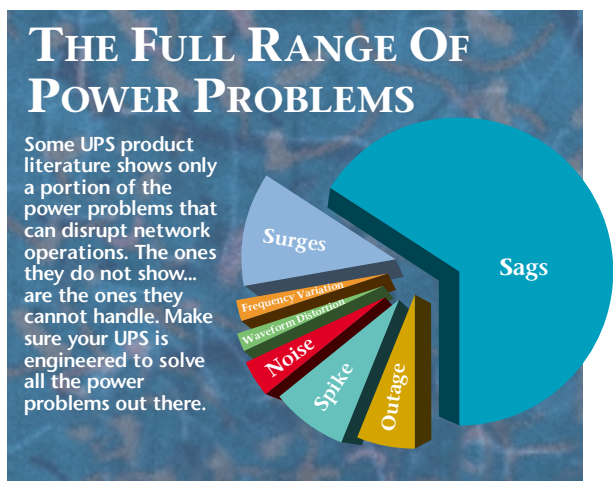




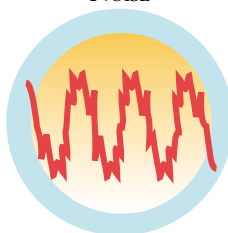
# POWER PROBLEMS

## A TECHNICAL PERSPECTIVE

Today's networks have expanded far beyond the protection offered by the traditional data centre or "glass house". Modern power protection strategies must allow for a wide variety of systems: servers, PCs, work stations, hubs, routers and other sensitive network components. And, protection must be ready to handle a dangerously wide variety of disruptions...including some that are generated by your network equipment and passed down the power or communication lines.

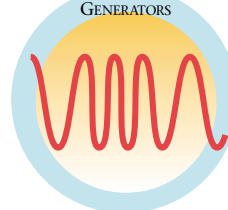


NOISE



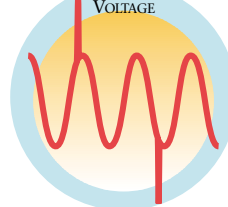
Often generated by normal computer operation, problems include incorrect data transfer, printing errors, keyboard/mouse/monitor lock-ups, program crashes, data corruption, even damage to computer power supplies.

FREQUENCY VARIATIONS  
USUALLY FROM GENERATORS



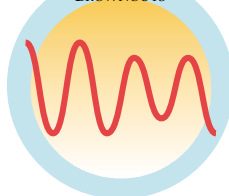
Rare in mains power, frequency variations are most common with back-up power systems such as standby generators. Off-Line and Line Interactive models, even some On-Line UPS, cannot handle frequency problems which can cause system crashes and equipment damage.

SPIKES/TRANSIENTS  
INSTANTANEOUS, VERY HIGH VOLTAGE



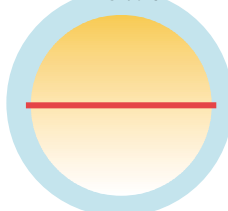
Spikes are a brief, intense surge, often lasting no more than a cycle or two, but with voltages 100% or more above normal. Transients cause data corruption, processing errors, incorrect data transfer, keyboard/mouse/monitor lock-ups and hardware damage.

SAGS  
SHORT-TERM, LOW VOLTAGE,  
BROWNOUTS



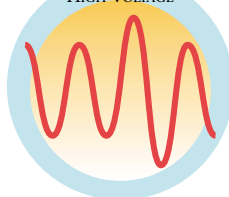
The opposite of surges, these are triggered by the startup of large loads, mains switching, mains equipment failure, lightning, mains supply that is too small for the building demand. In addition to causing system crashes, sags can damage hardware.

OUTAGES  
BLACKOUTS



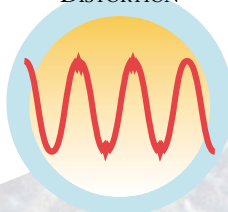
Typically described as a "zero-volt condition lasting longer than a half-cycle," outages can be caused by mains equipment failure, accidents, lightning, Mother Nature, fuses and breakers...the list is long. The result: system crashes and hardware damage.

SURGES/SWELLS  
SHORT-TERM,  
HIGH VOLTAGE



With voltages above 110% of normal, surges can be triggered by rapid reduction in power loads, heavy equipment being turned off, or by mains switching. The result: hardware damage.

WAVEFORM  
DISTORTION



A natural multiple of the standard power wave is called a harmonic. While harmonics can be triggered by equipment inside the network, mains power may contain harmonics generated hundreds of miles away. Caused by motor speed controllers, even computers themselves, distortions lead to communications errors and hardware damage.

# POWER PROBLEMS

## POWER PROBLEMS CAN REACH ALL THE WAY TO YOUR BOTTOM LINE

How much does it **really** cost your organisation when the network crashes? While an exact figure is hard to calculate, the real loss is probably much higher than you think.

Today's lean organisational structures, interactive work flow and tight deadlines means a greater reliance on the network as a productivity tool. When it goes down, productive work slows to a crawl . . . or stops altogether. Unfortunately, your costs of doing business don't change to match.

You can estimate the cost of a power problem by totalling your direct and indirect costs of losing, then regaining your network. The key is to identify **all** the costs associated with system downtime. Here's how.

### First do some basic calculations about your business:

#### Hourly Cost Calculation

To calculate an average hour's value in your organisation:  
*Annual gross revenues ÷ 2000 hours =*  
*Hourly Contribution:* \_\_\_\_\_ 1

Then calculate one employee's value:  
*Hourly contribution ÷ Number of Employees =*  
*Average hourly employee contribution:* \_\_\_\_\_ 2

#### Sales/Customer Value Calculation

To calculate the average value of a sale:  
*Annual gross revenues ÷ Number of sales =*  
*Average sale:* \_\_\_\_\_ 3

To calculate the average value of a customer:  
*Annual gross revenues ÷ Number of customers =*  
*Average customer value:* \_\_\_\_\_ 4

### Lost Data Costs

Almost everyone has had to restart a locked-up microcomputer and re-open a record to see how much was lost when the system crashed. That process is multiplied when a network crashes. The cost is usually measured in hours of extra time it takes to replace lost data.

#### DATA LOSS CALCULATION

Hours required to replace lost data \_\_\_\_\_  
 Times average hourly employee contribution (2) x \_\_\_\_\_  
**TOTAL = \_\_\_\_\_ 5**

### Employee Downtime

Many employees are paid to be at their computers. If the network is down, their productivity drops to zero. Now you have two costs to calculate:

- The actual time they spend waiting for the system to come back up.
- The incremental costs you pay to get the whole operation back on schedule. This can include overtime and externally contracted support.

#### EMPLOYEE DOWNTIME CALCULATION

Hours the system is down \_\_\_\_\_  
 Times hourly contribution (1) x \_\_\_\_\_  
**TOTAL = \_\_\_\_\_ 6**

### Lost Sales

Sometimes this is easy to calculate e.g. when your sensitive equipment is part of the sales process. Just multiply the number of minutes down by your average sales per minute. Other times, an exact figure is hard to calculate. To get an idea, figure out what your organisation sells every hour of the working day, then multiply that by the number of hours the system is down.

#### SALES LOSS CALCULATION

Estimated number of lost sales \_\_\_\_\_  
 Times average sale (3) x \_\_\_\_\_  
**TOTAL = \_\_\_\_\_ 7**

### Lost Customers

This is guesswork, but it shouldn't be overlooked. Some prospective customers do not wait for you to solve your problems . . . they just buy elsewhere. And some current customers will decide that buying from you is too difficult and take their business to your competitors.

#### CUSTOMER LOSS CALCULATION

Estimated number of lost customers \_\_\_\_\_  
 Times average customer value (4) x \_\_\_\_\_  
**TOTAL = \_\_\_\_\_ 8**

### Total Loss

So go ahead and figure out the real costs of system downtime. You don't have to be exact . . . chances are good the bottom line will be a scary number anyway. Now compare the cost per hour of network downtime to the cost of quality power protection.

#### TOTAL LOSS

Data loss (5) + \_\_\_\_\_  
 Employee downtime loss (6) + \_\_\_\_\_  
 Sales loss (7) + \_\_\_\_\_  
 Customer loss (8) + \_\_\_\_\_  
**Total cost per hour of network downtime = \_\_\_\_\_**

## TECHNOLOGY COMPARISON

## MATCHING UPS CAPABILITIES WITH YOUR PROTECTION REQUIREMENTS

## UPS TECHNOLOGY

All three basic UPS technologies have their place. Each technology has its advantages, and each may be necessary for configuring cost-effective power protection, especially in complex networks.

#### ■ What To Look For In A Quality Off-Line UPS

Off-line, also called Standby, is a cost-effective choice for small, less critical, stand-alone applications such as isolated PCs and peripherals.

Off-line UPS technology is relatively simple, and mostly reliable. Almost all switch to battery fast enough to prevent glitches when the power is suddenly cut off. Off-line technology will protect against most power spikes by clamping down on excess voltage, and help you ride out more than 90% of all outages. But they offer little protection from sags and surges.

#### ■ What To Look For In A Quality Line-Interactive UPS

Line-interactive technology provides highly effective power conditioning plus UPS backup. This is particularly applicable in areas where power outages are rare, but where there are frequent power fluctuations. Network communications options are available.

Beyond battery backup, Line-interactive UPS provide far better control over power fluctuations.

The critical advantage of Line-interactive UPS is the voltage boost circuitry and the range of input voltage that the unit accepts. Look for UPS that provide boost to at least 25% below standard voltage before

switching to battery backup. Also, find out how much input over voltage the unit tolerates. The wider the range, the more total protection you will have.

The energy efficiency of Line-interactive UPS is higher than other UPS technologies. However, this is not likely to become an important cost-saving advantage unless you have hundreds of kW's of connected power use.

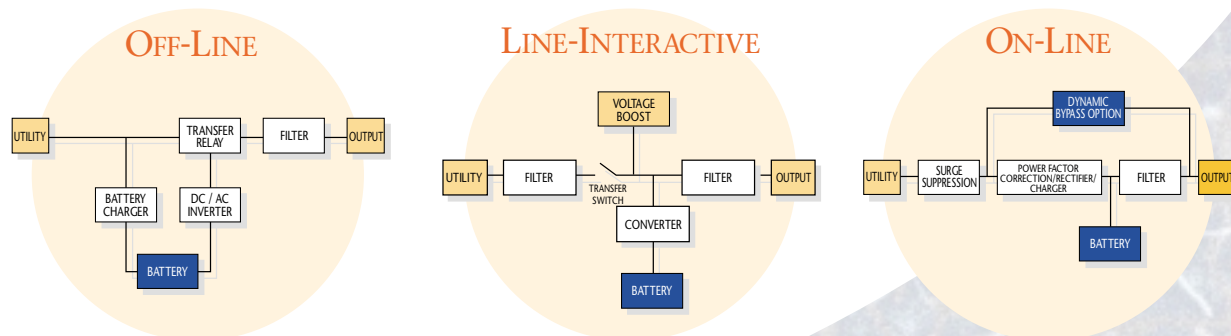
#### ■ What To Look For In A Quality On-Line UPS

The On-line alternative provides the highest levels of network power protection, conditioning and UPS backup available. But make sure it is true On-line technology . . . some manufacturers call their Line-interactive models "On-line", and one On-line hybrid has an Off-line battery. Network communications are often necessary to protect mission-critical applications.

Since there is no switching from mains to battery involved with On-line technology, switch-over time is not an issue. This On-line feature is important when the network includes high-speed data transmission and switching equipment.

The quality of power from On-line UPS is significantly better than that of other UPS technologies. Off-line and Line-interactive technologies reduce the impact of spikes, surges and sags by either "clipping" the peaks and valleys, boosting power or switching to battery backup.

On-line UPS completely regenerate the sinewave . . . not just condition the raw mains supply.





## PLANNING YOUR UPS

# COST-EFFECTIVE POWER PROTECTION . . . A MATTER OF PLANNING

With today's complex and growing networks, Network Managers cannot simply buy UPS . . . they must configure protection. For many, that means going back to square one to analyse just what their network means to the enterprise and what levels of protection it requires.

Every network has its own unique power needs. A UPS that works well for a few PCs is probably not the right choice for an industrial application. And the enterprise network with hundreds of nodes needs different protection than an inbound tele-marketing centre.

There are four basic steps in any network protection plan, and a number of factors that need to be considered within each step.

## Step One: Analysis

The simplest way to analyse network protection is to ask "What happens to the enterprise if the network goes down?" Answers will lead to specific conclusions about the levels of protection needed. Other specific issues should be reviewed in detail including:

**UPS Technology And Criticality** *For mission-critical uses, on-line is the preferred choice. But protecting servers is not the end of the job. Hubs, routers, workstations, PCs and peripherals need protection too. Even if their use is not mission-critical, an unexpected failure could trigger a domino effect that brings down the entire network. Using less expensive line-interactive UPS to protect some network nodes can be an economical alternative, providing not only outage protection, but greater resistance to brownout conditions.*

**Load Size?** *Many networks change dramatically over a single year. Calculate power protection requirements as far into the future as possible, and where possible identify how power use can be clustered onto larger, more full-featured UPS. You may be able to reduce your total cost per VA, and at the same time reduce the need for expensive reconfigurations in the future.*

**Battery Time** *If you need enough time for network hardware to be safely shut down, five minutes may be adequate. If you need to ride through almost all outages, or if you require complete continuity of operation, extended battery time – even backup generators – must be a part of the plan.*

**UPS Control, Monitoring and Communications** *UPS that is communications-ready can become an active part of the network under the direction of your network*

*management software. The capabilities range from safe shutdown of unattended work stations, to interactive SNMP communication and control that makes the UPS an intelligent part of the network.*

**Risks Other Than Power** *Some systems, especially those that are mission-critical, may also need protection from heat, humidity, dust and tampering. If these are concerns, consider a full-featured, portable enclosure.*

## Step Two: Configuration

Pencil and paper work well here. The goal is to configure cost-effective power protection onto your network as it exists today . . . then extend that design into the future. If you can develop even a rough picture of your network's future, chances are good that you can make effective use of every UPS regardless of network shape or size.

A lack of planning, however, could condemn you to a series of costly investments that are no longer useful or cost effective as your network grows.

When charting the network and configuring protection, take into account criticality, communications, growth and any special needs.

## Step Three: Installation, Training, Maintaining

Once the configuration plan is ready to implement, acquire and install the power protection hardware and software. But remember . . . there is no such thing as "set and forget" power protection. You need to train network users on the monitoring, alarm, shutdown and restart protocols of the network power protection.

To work effectively over time, UPS must be maintained properly. This is especially true in areas where the system switches to battery power frequently due to recurring outages or over voltages. Batteries can lose capacity fast under these conditions, and when the power really does go down, you may not have time for a safe network shutdown.

## Step Four: Review

Plans change. Networks grow in new directions. What was an inconvenience today may become mission-critical tomorrow.

**Make sure your power protection plan keeps up with your network computing plan. It's cheaper and safer.**

## THE SOLUTION

# FOUR CLASSES OF POWER SOLUTIONS FOR THE ENTERPRISE NETWORK

Today's network encompasses an amazing range of equipment; computers, telephone systems, servers of all types and sizes, mainframes, uplinks and downlinks, routers and hubs, gateways and firewalls. About the only thing common to all of this equipment is their vulnerability to power problems.

Whatever the size or shape of your network or the type of problems faced, power solutions come in four types. Each one is appropriate for some network configurations and wrong for others. Many larger networks may have a combination of solutions, depending on factors such as load size, criticality of applications, proximity of equipment being protected, and the nature of the power problems.

Liebert equipment cover all four types of solutions, so you get what you need. What you don't get is a single solution salesman trying to reorganise your needs into their product mix.

**The only solution is the one that fits your needs.**

## **Solution One: One-On-One**

Each network node that needs protection gets its own UPS unit. The server may have a larger or more sophisticated UPS than the workstations or peripherals, but the one-on-one principle still applies. One-on-one protection works effectively in specific situations:

- Single users who are connected to networks by modem.
- Individual, isolated network nodes where the application is sufficiently important to warrant at least minimal protection.
- Remote hubs and routers that serve isolated LANs or clusters.

## **Solution Two: Clustered Protection**

A network cluster in a single room - or a closely grouped set of nodes - can be protected with a single, larger UPS. This type of protection works well with:

- Small, but growing networks or network clusters.

- Network clusters where mission-critical applications are routinely run, or those with access to high speed communications.
- Networks where nodes or entire clusters are routinely relocated.

## **Solution Three: Integrated Protection**

Sometimes power protection alone is not enough... network managers must deal with issues such as air conditioning, security and hostile environments. Under these conditions, the best solution is one that protects without requiring the construction of a separate room or facility. Integrated protection is ideal for:

- Mission-critical servers and communications hubs that must be kept up 24 hours a day, seven days a week.
- Factory automation hardware that must be near the equipment it controls.
- Servers and other equipment that are vulnerable to physical intrusion.
- Sophisticated, sensitive equipment that must be used in ordinary office environments.

## **Solution Four: Facility-Wide Protection**

If nearly everyone in an office has their own computer, the best solution is often a large-scale UPS that provides power to the entire floor or facility. The solution can be particularly cost-effective if a facility is being built or renovated. Facility-wide or floor-by-floor protection is most effective where:

- You are moving to an as yet unbuilt facility, or one that is undergoing extensive renovation.
- The network is likely to expand dramatically over a brief period of time.
- The facility is prone to significant, instantaneous change in power demand, such as a combined office/factory facility.
- Energy conservation can pay a significant dividend in reduced costs.



## SOLUTION ONE

## ONE-ON-ONE PROTECTION

This type of protection, common to many small networks, grew out of the early stages of distributed processing. Before the advent of simple network connectivity, individual users bought small, inexpensive UPS to protect their PC or work station. When individuals clustered into networks, they brought their protection with them. Since habits are hard to change, the process has continued up to the present day.

With the growth of networks this may not be the best, or most cost-effective, solution. One-on-one protection, however, will still work effectively in specific situations:

- Single users who are connected to networks by modem.
- Individual, isolated network nodes where the application is sufficiently important to warrant at least minimal protection.
- Peripherals such as plotters and work group printers or network output devices where unexpected shutdowns can inconvenience large groups of users.

**Advantages:**

- Small units are inexpensive and can be purchased at almost any computer store, catalogue, or through a local VAR or Dealer.



- They are easy to install, light enough to be hand-carried with virtually no configuration or special wiring.
- The controls are easy to understand and use.
- Network configuration is simple — add a UPS for each new user — so network management doesn't require extensive knowledge or experience.

**Disadvantages:**

- Lower operating efficiency becomes a cost factor with a large number of UPS systems.
- The power-conditioning and switch-over technology provides limited protection.
- Adding communications is often complex and expensive.
- Few, if any, small models are expandable.
- As the network grows, the one-on-one UPS solutions loses any cost advantage it once had.
- Most small UPS technology isn't up to the power protection demands of high-speed communications.
- Battery replacement for a large number of systems becomes inconvenient and expensive. Individual battery testing is time-consuming.
- Floorspace/Desk space required at each computer installation.
- Many systems can present an asset management nightmare.

**Liebert Products**

- Powersure® Personal, Powersure® ProActive, Powersure InterActive™, UPStation® GXT™

## SOLUTION TWO

## CLUSTERED SYSTEMS PROTECTION

The Chances are good that at least some of your network nodes are clustered closely together: co-located file servers, hubs, routers and bridges; work stations in an engineering department or PCs in the sales office. Perhaps these are small LANs that are interconnected into a larger LAN or WAN. If the units are within a metre of two of the server or hub, then a larger UPS can be used to protect the entire cluster of nodes. These UPS can provide adequate protection for a large number of nodes, and multiple UPS can be used for even larger clusters. This type of protection works well with:

- Small, but growing networks or network clusters.
- Network clusters where mission-critical applications are routinely run.
- Network clusters with access to high-speed communications.
- Networks where nodes, or entire clusters, are routinely moved from one location to another.

**Advantages:**

- Depending on the number of nodes, a single, larger UPS is often less expensive per protected node than the one-on-one approach (Solution One), because it utilises more of the UPS capacity.
- For the same or less cost, you can get a UPS with better technology and more features than the one-on-one approach (Solution One).
- On larger, full-featured UPS, the unit is 'communications ready', or has communications capability already installed.
- A combination of clustered UPS and SNMP communications allows network managers to assign priorities to protection, with the server or communications hub receiving the highest priority.
- Static bypass transfers the critical load to mains in the event of a UPS malfunction.
- Fewer battery strings, and built-in battery management software simplifies testing and service.
- Maintenance Bypass allows the UPS to be serviced without disrupting the critical load, permitting seven-day/twenty-four hour operation.

**Disadvantages:**

- Physical installation is more complex and connecting power lines can be more difficult than the one-on-one approach (Solution One).

**Liebert Products**

- UPStation® GXT™ 6/10, AP400 Series, AP4300 Series

## SOLUTION THREE

## INTEGRATED PROTECTION

Computing has increasingly left the data centre or “glass house” because of the advent of PCs, which are more tolerant of everyday office conditions. And since early PCs were not networked, computer problems were isolated. That made many network managers comfortable with minimum protection . . . sometimes only regular backups of important data.

In the real world, however, power fluctuations aren't the only thing that can affect the performance of your network. Heat, dust, people, vibration . . . all these can bring down a network even if the power is perfect. And with new computing technologies and high-speed communications becoming more and more prevalent, higher levels of sensitivity are creeping back into network hardware.

The result is a need for protection systems that go beyond power conditioning and battery backup. These multi-threat protection systems are ideal for:

- Large, mission-critical servers and communications hubs that must be kept running 24 hours a day, seven days a week.
- Servers and other equipment that are vulnerable to physical intrusion.
- Factory automation hardware that must be adjacent to the equipment it controls.
- Sophisticated, sensitive equipment that must be used in ordinary office environments.
- Businesses which are growing and/or changing and require flexible network solutions.

**Advantages:**

- Provides high levels of protection in a portable or moveable format.
- Eliminates the need for expensive facility improvements that stay behind when your organisation moves.
- Keeps networks up and operating at night and over weekends when most buildings reduce their environmental conditioning.
- Prevents unauthorised access when servers and other vital equipment are located in common areas.
- Reduces clutter and simplifies trouble-shooting with improved cable management.

**Disadvantages:**

- Higher initial cost than power protection only.
- Requires more planning.

**Liebert Products**

- Little Glass House™, Framework™





## SOLUTION FOUR

# FACILITY WIDE & FLOOR-BY-FLOOR PROTECTION

There are an increasing number of facilities where the network is a vital component of everyday productivity . . . where nearly everyone is connected to the network and depends on it for communication as well as computing. In these cases, it may prove simpler and more cost effective to wire the central network devices of an entire floor, or even the whole building, to a single, very large power protection system. These are most effective where:

- You are moving to an as-yet unbuilt facility, or one that is undergoing extensive renovation.
- The network is likely to expand dramatically over a relatively brief period of time.
- The facility is prone to significant, instantaneous changes in power demand, such as a combined office/factory facility.
- Energy conservation can pay a significant dividend in reduced electric bills, and air conditioning costs.

**Advantages:**

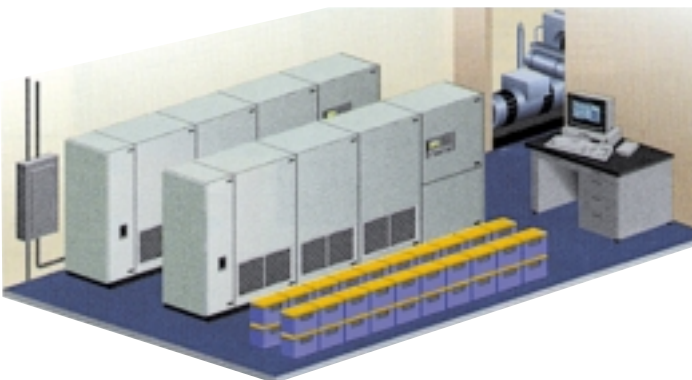
- Gives you the best possible protection from fluctuations generated by mains power, other equipment in the facility, or other equipment on the network.
- The lowest owning and operating costs per node.
- Provides the highest levels of network power control available.
- Highly effective in handling non-linear loads that change significantly over brief periods of time.
- Improves asset management; 10-20 year lifecycle.

**Disadvantages:**

- To be most cost-effective, it should be planned while the building is being designed. For retrofit applications, the space may need to be re-wired.
- Requires significant physical space within the facility, especially if there is a battery room for backup power.

**Liebert Products**

- Hipulse, Series 7200, Series 7400, Series 600T



# POWERSURE<sup>®</sup> PERSONAL

# POWERSURE<sup>®</sup> PROACTIVE

## POWER PROTECTION FOR STAND-ALONE APPLICATIONS



Designed to offer advanced UPS features in a small and lightweight desktop friendly design, the PowerSure Personal is an extremely cost effective solution.

- 300VA and 500VA ratings.
- 50/60Hz Frequency auto-sensing operation.
- Advanced Microprocessor design.
- Multiple power protected outlets.
- Communications interface and cable for use with free software.
- Continuous battery and UPS testing.
- Wall mounting facility.
- Continuous Overload sensing whilst on mains.
- EMI/RFI disturbance filtering.
- Off state charging.

**The PowerSure Personal is suitable for:**

- PC Desktop systems.
- Workstations and peripherals.
- Network Communications Nodes.

### SPECIFICATIONS

PowerSure™ Personal		
Model	PSP300	PSP500
Power/Rating	300VA/180W	500VA/300W
<b>Battery Parameters</b>		
QuantityxVoltageXRating	1 x 12V x 4.5ah	1 x 12V x 7ah
Transfer Time	4-6ms typical, includes detection time	
Backup Time: Typical <sup>1</sup>	>7 min.	
Half Load	>12 min.	
<b>Input AC Parameters</b>		
Voltage Range without Battery Operation	185 to 263 VAC	
Frequency	50 Hz or 60 Hz; (auto sensing)	
<b>Output AC Parameters</b>		
Output Voltage	230 VAC±5%	
Output Receptacles	(2) EN60320/C13 sockets	
Overload Warning (Utility & Battery Modes)	101-111%	
Overload Shutdown (Utility & Battery Modes)	Load > 200W	Load > 333W
<b>Physical</b>		
W x D x H (mm)	76 x 238 x 178	
UPS weight (Kg)	2.8Kg	3.6Kg
<b>Communications</b>		
	SiteNet MultiLink & SiteNet 1 auto shutdown software	
	SiteNet MultiPort 8	
	SiteNet Integrator	

<sup>1</sup>Typical autonomy calculated at 80% load

## POWER PROTECTION FOR NETWORK & DESKTOP EQUIPMENT



When you are concerned about power quality and backup time for your sensitive network equipment, the one-on-one protection of the PowerSure ProActive provides dual benefits: the value of an off-line UPS combined with the superior voltage regulation of the line-interactive UPS.

- More than five minutes of instantaneous battery backup at full load.
- Line Interactive design offering automatic voltage regulation ("buck & boost") without transfer to battery.
- 10Base-T/telephone surge protection.
- Lightning and surge protection for all outlets.
- Fourteen day automatic UPS and battery test.
- Automatic overload protection.
- Communications port on all models for use with free SiteNet software.
- Two year warranty.
- Power protection in 350VA, 470VA and 700VA sizes.

**PowerSure ProActive is suitable for:**

- PC and small desktop systems.
- Work stations & peripherals.
- Network nodes.
- Heavily configured Pentium systems.

### SPECIFICATIONS

PowerSure ProActive™			
Model	PSA350-230	PSA470-230	PSA700-230
Power/Rating	350VA/210W	470VA/282W	700VA/420W
<b>Input AC Parameters</b>			
Voltage Range without Battery Operation	166 to 275 VAC		
<b>Output AC Parameters</b>			
Output Receptacles	(4)EN60320/C13 sockets		
Voltage (Battery Mode)	230VAC ±5%		
Voltage (Normal)	V <sub>N</sub> X 1.0		
Voltage (Boost Mode)	V <sub>N</sub> X 1.13		
Voltage (Buck Mode)	V <sub>N</sub> X 0.85		
Overload Warning (Utility & Battery Modes)	101 -120%		
Overload Shutdown (Utility & Battery Modes)	Overload(15-30W)	Overload(20-40W)	Overload(30-60W)
<b>Physical</b>			
W x D x H (mm)	116x353x166		
Weight (Kg)	6	7	10

# POWERSURE INTERACTIVE™

# MICROPOD™

## POWER CONDITIONING AND UPS IN A COMPACT SIZE



The PowerSure Interactive provides reliable power conditioning and UPS protection for network nodes.

- Line interactive UPS.
- Choice of four models in two formats.
- Buck & boost voltage circuit that corrects brownout-level voltage and reduces battery use.
- Rackmount option.
- 50/ 60Hz operation.
- Standard network computer interface included, making PowerSure InterActive ready to work with SiteNet Multilink or SiteNet 2 communications software.
- IntelliSlot™ communications port for simple installation of the SNMP and Multiport 4 IntelliSlot Cards.
- EasySwap™ user replaceable batteries.
- Black-start facility.
- Audible noise <45 dBA.



### PowerSure InterActive power conditioning and UPS is suitable for:

- Network servers and critical nodes.
- Small Office and Home Office PCs.
- Point-of-sale terminals.
- Test equipment.
- Workstations.
- Large network peripherals.
- Network routers.
- Bridges and hubs.

## SPECIFICATIONS

PowerSure InterActive™				
Model	PSI700	PSI1000	PSI1400	PSI2200
Power/Rating	700VA/450W	1000VA/670W	1400VA/950W	2200VA/1600W
Input Voltage	166-272 VAC			
Input Receptacles	1 CEE22	1 CEE22	1 CEE22	1 CEE19
Output Voltage	186-248 VAC			
Output Receptacles	4 CEE22	4 CEE22	4 CEE22	4 CEE22
<b>Physical(MiniTower)</b>				
W x D x H (mm)	140x366x178	172x465x227	172x465x227	192x502x318
Weight (Kg)	13.6	19.7	22.5	37.1
<b>Physical(Rackmount)</b>				
W x D x H (mm)	430x483x133	430x483x133	430x483x133	430x483x178
Weight (Kg)	18.9	23.3	26.0	39.1

## THE PERFECT SOLUTION WHERE 100% UPTIME IS ESSENTIAL



When your computer system can't be without power, even for scheduled UPS maintenance, the Liebert MicroPOD ensures continuous uptime.

The MicroPOD (Power Output Distribution) allows you to manually transfer your connected equipment to utility power via a maintenance bypass switch, permitting scheduled maintenance or UPS replacement without power disruption.

- Compatible with any Liebert UPS up to 3 kVA.
- Provides utility power to your attached equipment when switched to maintenance bypass mode.
- Rotary switch and LED indicators make the unit simple to operate.
- Multiple combinations of receptacles available.

## SPECIFICATIONS

MicroPOD™ -UPS/POD Compatibility Chart		
UPS Models	Utility Voltage	Micro POD Model (No. of receptacles)
		MP210K 4 x IEC 320-10A
		MP220L 4 x IEC 320-10A 1 x IEC 320-16A
<b>PowerSure Personal</b>		
300,500VA	230V	✓
<b>PowerSure ProActive</b>		
350,450,700VA	230V	✓
<b>PowerSure Interactive</b>		
700,1000,1400VA	230V	✓
2200VA	230V	✓
<b>UPStation GXT</b>		
700,1000,1500,2000VA	230V	✓
3000VA	230V	✓
<b>Physical</b>		
W x D x H (mm)	274 x 143 x 120	274 x 143 x 120
Weight (kg)	1.6	2.3



# VERSATILE, HIGH PERFORMANCE UPS FOR NET

UPStation GXT brings you true on-line power protection, the best available technology for guarding mission-critical systems, in one of the most flexible and affordable designs available today.

Unlike other UPS designs, it provides precise sinewave power to ensure protection against all types of power disturbances, including lightning strikes and surges, voltage sags, harmonics and power outages.

#### UPStation GXT features include:

- Nine models rated from 700VA to 10,000VA.
- True on-line double conversion technology.
- User replaceable internal batteries (below 6,000VA).
- Hot swappable external battery packs (below 6,000VA).
- **Flexibility**

Three physical configurations allow the unit to be installed in any application. MiniTower units can be used on desktops, whilst Rack Towers can be installed either free-standing or rack-mounted, 6 and 10 units are tower configuration for floor-standing installations.

#### ■ Fault tolerance

A fail-safe bypass in the UPStation GXT ensures that the power supply to the critical load is maintained even during UPS overload or fault conditions.

#### ■ Upgrading

All units, except MiniTower, can be upgraded using battery packs to extend backup time.

#### ■ Software management and control

The communications interface provided as standard, allows full UPS monitoring and control, when used with Liebert's SiteNet software. All major platforms are supported including Windows, UNIX, Novell, DEC and HP. Optional Multiport 4 allows automatic shut-down of up to 5 servers and the AS/400 card provides additional UPS status relay contact.



## SPECIFICATIONS

UPStation® GXT							
	MINI TOWER MODELS			RACK TOWER MODELS			
Model	GXT700MT-230	GXT1000MT-230	GXT1000RT-230	GXT1000RTE-230	GXT1500RT-230	GXT2000RT-230	GXT3000RT-230
VA/Watts (max.)	700/490	1000/700	1000/700	1000/700	1500/1050	2000/1400	3000/2100
<b>Input Voltage Range</b>	230 VAC nominal; variable based upon output load						
100-90% Loading	160-163 VAC to 273-276 VAC					184-187 VAC to 273-276 VAC	
90-70% Loading	160-163 VAC to 273-276 VAC					160-163 VAC to 273-276 VAC	
70-30% Loading	140-143 VAC to 273-276 VAC					140-143 VAC to 273-276 VAC	
30-0% Loading	120-122 VAC to 273-276 VAC					120-122 VAC to 273-276 VAC	
Input Socket	IEC320-10A	IEC320-10A	IEC320-10A	EC320-10A	IEC320-10A	IEC320-10A	IEC320-16A
<b>Output Voltage</b>	230 VAC, +/-3%; sinewave						
Output Receptacles	(4) IEC320-10A	(4) IEC320-10A	(4) IEC320-10A	(4) IEC320-10A	(4) IEC320-10A	(4) IEC320-10A	(1) IEC320-16A
Battery Time (FL/HL)	6 min./18 min.	6 min./18 min.	6 min./18 min.	17 min./49 min.	5 min./15 min.	11 min./27 min.	6 min./15 min.
<b>Physical: WxDxH (mm)</b>	162 x 430 x 225	162 x 430 x 225	177 x 430x 522	177 x 430x 522	177 x 430x 522	177 x 430x 522	177 x 430x 522
<b>Weight (kg)</b>	13.6	16.6	26.0	33.2	29.1	39.3	41.6

# WORK & TELECOMMUNICATIONS APPLICATIONS

**■ Interactive node option**

The addition of Liebert's Intellislot User Installable SNMP card allows an UPStation GXT to be used as a fully interactive mode on a network.

**UPStation GXT provides protection for critical operations:**

- Large office telecommunications systems.
- Voicemail and E-Mail systems.
- Networks: LANs and WANs.
- Remote telecommunication units.
- Test and diagnostic equipment.
- Engineering network servers.
- Factory floor protection of micro-processor controlled equipment.
- Clustered network equipment: servers, hubs, routers, etc.



Rear view of the UPStation GXT 6/10 kVA

## SPECIFICATIONS

UPStation® GXT - 6000T - 10000T Models								
Model	GXT6000T-208X	GXT6000T-230	GXT6000T-230X	GXT6000T-240X	GXT10000T-208X	GXT10000T-230	GXT10000T-230X	GXT10000T-240X
VA/Watts (max.)	6000/4200				10000/7000			
<b>Input Voltage Range</b>	208VAC nominal*	230 VAC nominal*	230 VAC nominal*	240 VAC nominal*	208 VAC nominal*	230 VAC nominal*	230 VAC nominal*	240 VAC nominal*
100%-90% Loading	184-187 VAC to 273-276 VAC				184-187 VAC to 273-276 VAC			
90%-30% Loading	140-163 VAC to 273-276 VAC				140-163 VAC to 273-276 VAC			
30%-0% Loading	120-122 VAC to 273-276 VAC				120-122 VAC to 273-276 VAC			
Input Connector	Terminal Block (hardwired)				Terminal Block (hardwired)			
<b>Output Voltage Range</b>	208/120 VAC; ±7%	230 VAC; ±3%	230 VAC; ±7%	240/120 VAC; ±7%	208/120 VAC; ±7%	230 VAC; ±3%	230 VAC; ±7%	240/120 VAC; ±7%
Output Waveform	Sinewave				Sinewave			
Output Connector	Terminal Block (hardwired)				Terminal Block (hardwired)			
Battery Time (FL/HL)	7 min./18 min.				10 min./25 min.			
<b>Physical WxDxH (mm)</b>	260x558x800				340x640x965			
<b>Weight (kg)</b>	121	103	121	121	235	178	235	235

Note: Models with an "x" suffix contain isolation transformers. \*Variable based on output load.

## AP400 SERIES

COMPACT, VERSATILE ON-LINE  
PROTECTION & UPS

The AP400 provides comprehensive power protection for larger networks, mid-range computers and mission critical networking applications.

By using the AP400, all power related problems can be eliminated. Irrespective of incoming mains quality the AP400 will deliver the most reliable sinewave output. It converts 3-phase mains input power into 1-phase continuous conditioned power using true on-line technology. And when there is a power failure, the AP400 provides more than enough battery backup power, giving plenty of time to notify users.

## SPECIFICATIONS

AP400 Series™					
Model	AP405	AP407	AP410	AP415	AP420
Power	5kVA	7.5kVA	10kVA	15kVA	20kVA
Rating	4.0kW	5.25kW	7.0kW	10.5kW	14.0kW
Typical autonomy <sup>1</sup>	16 mins	18 mins	14 mins	13 mins	10 mins
<b>Input</b>					
Voltage	380V	380V - 415V, 3-Phase. Tap selectable			
Frequency	50Hz				
<b>Output</b>					
Voltage	220V ±1%	220V / 240V. Tap selectable ±1%			
Frequency	50Hz				
<b>Physical</b>					
WxDxH (mm)	410x650x100	480x650x100	480x650x100	550x850x110	550x850x110
UPS weight (kg)	0	0	0	0	0
without batteries					
with batteries	111kg	160kg	160kg	245kg	245kg
<b>Standards &amp; approvals</b>					
without batteries	184kg	265kg	265kg	405kg	405kg
Safety	EN60950				
EMC -Emissions	EN55022 CLASS A				
-Immunity	EN50082-1 (IEC 801-2, 3, 4, 5-draft)				
European directive	CE marked compliance LVD/EMC				

<sup>1</sup> Typical autonomy is calculated at approximately 80% load

**Features of the most versatile UPS in its class include:**

- Choice of five models, from 5kVA to 20kVA capacity.
- True on-line UPS.
- Black start option.
- Low audible noise creates no constraints on equipment placement.
- Up to 18 minute typical autonomy from internal battery.
- Extended autonomy available.
- Internal static and maintenance bypass.
- Remote stop facility as standard.
- On-site power upgrade option.
- Optional LCD panel for extensive alarms and diagnostics in five languages.
- SiteNet 1 and Multilink compatible communications port as standard.

**The AP400 Series provides flexible, yet comprehensive power protection for your vital systems:**

- LAN, Metropolitan Network and WAN servers, gateways, bridges and routers.
- Process control and PLC systems.
- Mini-computers, including IBM AS/400 and RS/6000, DEC MicroVAX and virtually any UNIX/XENIX/AIX host computer.
- Parallel processor servers with RAID arrays or large-scale data warehouse systems.
- Medical or research facilities.



## AP4300 SERIES

PROTECTION FOR SYSTEMS THAT HAVE MIGRATED  
OUT OF THEIR PROTECTED ENVIRONMENT

The AP4300 Series provides high levels of protection for critical systems that are exposed to potentially fatal power problems. This includes fast-growing networks where the location of nodes changes constantly, or where process control automation has moved out to the factory floor.

The AP4300 provides true on-line 3-phase power protection even where the mains supply is complicated by high crest factor loads and 100% unbalanced loads. It is housed in a surprisingly small footprint, with easy access to system components for configuration and maintenance.

## SPECIFICATIONS

AP4300 Series™				
Model	AP4307	AP4310	AP4315	AP4320
Power	7.5kVA	10kVA	15kVA	20kVA
Rating	6.0kW	8.0kW	12.0kW	16.0kW
Typical autonomy <sup>1</sup>	17 mins	14 mins	17 mins	14 mins
<b>Input</b>				
Voltage	320V - 480V			
<b>Output</b>				
Voltage	380V - 415V, User selectable			
<b>Physical</b>				
WxDxH (mm)	427x682x1100	427x682x1100	657x682x1100	657x682x1100
UPS weight (kg)				
without batteries	122	122	176	176
with batteries	250	250	432	432
Communications options <sup>2</sup>	SiteNet 1, auto-shutdown interface			
	SiteNet 2, monitoring and control software			
	SiteNet SNMPcard SiteNet MultiLink			
	SiteNet Integrator, multi-functional SNMP monitoring			
<b>Standards and approvals</b>				
Safety	EN50091-1			
EMC - Emissions	EN55022 CLASS A			
- Immunity	EN50082-1 (IEC 801-2, 3, 4, 5-draft)			
European directive	CE marked compliance LVD/EMC			
	<sup>1</sup> Typical autonomy is calculated at approximately 80% load			
	<sup>2</sup> See software (SiteNet) section of this catalogue for further information			

**The AP4300 Series offers a long list of features designed to provide significant operating advantages:**

- Choice of four models, from 7.5kVA to 20kVA capacity.
- True on-line UPS.
- Internal static and maintenance bypass.
- Up to 17 minutes typical autonomy from internal battery.
- Extended autonomy available.
- Black start facility.
- Extensive alarms and diagnostic information from standard LCD panel.
- SiteNet 1, 2 and Multilink compatible communications port.
- User installable internal SNMP option available.

**The AP4300 Series of UPS provides comprehensive power protection for:**

- LAN, Metropolitan Network and WAN servers, gateways, bridges and routers.
- Process control and PLC systems on the factory floor or in factory control rooms.
- Enterprise-wide telecommunications systems.
- Mini-computers, including IBM 34/36, AS/400 and RS/6000, DEC MicroVAX and virtually any UNIX/XENIX/AIX host computer.
- RAID arrays and large-scale data warehouse systems.
- Parallel processor servers.
- Large-scale test equipment.

# LITTLE GLASS HOUSE & FRAMEWORK

## LITTLE GLASS HOUSE PROVIDES TOTAL PROTECTION IN A SEALED ENCLOSURE

Little Glass House is a purpose built enclosure incorporating air conditioning and UPS support that provides a totally secure environment for critical electronics.

In the Little Glass House, Liebert has integrated all the elements necessary to continually provide the optimum environment, power, monitoring and security for your critical electronic equipment. Network component uptime and reliability is assured by the secure enclosure, air conditioning, UPS and SNMP based alarm/status monitoring system.

All this is available in an enclosure which acts as a portable mini-computer room, capable of moving locations whenever the need arises.



### Features of Little Glass House

#### ■ Power protection

Power is supplied and protected with an UpStation GXT on-line UPS. The UPS conditions power and protects from overloads; battery backup allows you to ride through most outages.

#### ■ Dust prevention

Sealed enclosure keeps out dust and heat.



#### ■ Visibility and Security

See through door can be locked for security and still allow equipment readouts to be visible.

#### ■ Cable Maintenance

Organised wiring saves time when troubleshooting or servicing the system.

#### ■ SNMP Management

By adding a Liebert SiteNet Integrator, Little Glass House can become an intelligent network node, capable of monitoring conditions such as temperature, humidity and 'door open', and of initiating pre-set actions and alarms when problems arise.

#### ■ Easy Access

An external keyboard tray option provides access to secured equipment without disturbing the internal conditions.



#### ■ Durability

Robust, secure, heavy duty design.

#### ■ Rackmount or adjustable shelving

The integral rack frame accommodates 19" or 24" rackmount equipment, or adjustable shelves for free standing units.

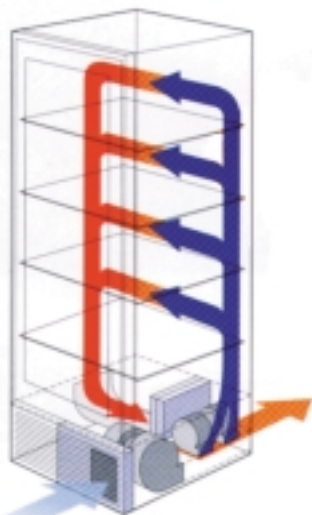
#### ■ Stability and mobility

Castor mounted for mobility and self-levelling feet for stability.



# LITTLE GLASS HOUSE & FRAMEWORK

## FRAMEWORK PROVIDES THE PROTECTION YOU REQUIRE



The integrated ECM-enclosure design promotes the best air circulation to prevent hotspots within the enclosure. Inside and outside air are isolated for maximum cleanliness.

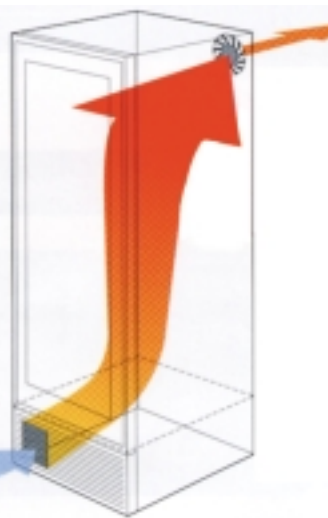
Framework is a range of rack/enclosure systems that can be individually customised to provide optional levels of network organisation and security as required.

Framework solves the problem of how to organise your equipment in a safe, efficient manner, where there already exists a dedicated computer room, with its own UPS and precision air conditioning.

In these circumstances, where the comprehensive protection of Little Glass House isn't needed, a FrameWork rack enclosure system provides the most flexible, efficient and economical solution on the market. Designed to be configured to any room or equipment combination, FrameWork organises wiring, promotes proper air flow for cooling, improves system security, and has a wide range of options to suit present or future needs.

### Features of Framework

- Robust 12-gauge steel frame with scratch/corrosion resistant coating.
- Vertical frame is rackmount hole punched.
- Cable management facility.
- Variety of heights available.
- Rack widths of 19" and 24". Shelfmount cabinet available (46").
- Top and bottom cable cut-outs for solid or raised floor mounting.
- Vented covers for unused cable outlets.
- Levelling feet for maximum stability.
- All frames fully upgradeable.



During high internal temperature or power outage conditions, the backup cooling fan (powered by Little Glass House UPS) is automatically activated, drawing filtered outside air to ensure continuous air flow to your protected equipment.

## SPECIFICATIONS

LGH Systems With Environment Control Module (ECM)								
UPS Model	ECM Model	UPS	Rated Capacity		Rated/Maximum Ambient 120V/60Hz	Min Enclosure Rack/Width/Depth	FLA/WSA/OPD 120V/60Hz	Sound Level 220V/50Hz
			ECM Total BTUH	ECM Net Watts				
GXT 1000	ECM-42	1000VA	4200	700	105F/38°C	19" rack/25"/34"	16/20/20	55dBA
GXT 1500	ECM-62	1500VA	6200	1050	105F/38°C	24" rack/30"/34"	24/30/30	55dBA
GXT 2000	ECM-80	2000VA	8000	1500	105F/38°C	24" rack/30"/38"	(1)	57dBA

Note: (1) ECM & UPS connected separately - FLA/WSA/OPD Ratings: ECM-80 16/20/20; GXT2000 16/20/20; 9 ft power cords.

### Comprehensive range of options available including

- Front and rear doors with ventilation louvres.
- Lockable see through door.
- Bolt-on side panels.
- Castors for mobility.
- Clustering kit enabling units of the same height to be connected to form a single system.



## SURGE SUPPRESSION

## PROTECTION AGAINST POWER LINE SURGES

## ACCUVAR® SURGE SUPPRESSORS

The AccuVar is a multi-phase, multi-mode transient voltage surge suppression system sinewave tracking filter, that is mounted to electric distribution panels. Any outlet that receives power from the distribution panel is continually and completely protected from damaging transient surges and electrical line noise. The AccuVar limits the peak amplitude of large surges, and attenuates or eliminates smaller noise transients. Also included is sinewave tracking circuitry that provides high-frequency noise filtering, and patented detection circuits that monitor and report - through external lights and remote dry contacts - all modes of failure.

- Protection of linear and non-linear loads.
- Compact module attaches directly to breaker panel.
- 40 to 130 kA per phase surge capacity



## SURGE SUPPRESSION WITH ACTIVE TRACKING™ FILTER

For the best possible surge suppression, consider the Interceptor TVSS with active tracking sinewave correction filter. Instead of simply truncating spikes and surges at a fixed peak, active tracking filters provide power that is acceptable to even the most sensitive piece of computing or telecommunications equipment. This technology even limits ringwaves, the potentially damaging "aftershocks" caused by spikes and surges. Liebert's inherent energy storage system actually smoothes the sine wave by filling in gaps and reducing tiny ringwave spikes.

- Available in nine models ranging from 30 to 4000 amps of continuous current.
- 100 to 300 kA surge capacity.
- Tested and approved by ANSI/IEEE for Categories A, B and C surge suppression.



## TRANSIENT VOLTAGE SURGE SUPPRESSION

Liebert's line of Transient Voltage Surge Suppressors (TVSS) provides on-line protection for sensitive equipment. Available in eight sizes, these interceptor TVSS can protect anything from a single server to an entire building. While robust enough to protect against the devastating power of a lightning strike, Liebert TVSS is sensitive enough to detect and clamp down on small surges caused by heavy equipment or utility switching. Inside the unit, high energy currents are diverted by a parallel series of metal-oxide varistors (MOV's) that provide instant response to surges and spikes. These MOV's are specially designed to provide maximum continuous operating voltage to connected equipment during normal operation.

- Tested and approved by ANSI/IEEE for Categories A, B and C surge suppression as defined in BS6651.
- Available in single-phase and three-phase models from 80 to 400 kA surge capacity.



## ISLATROL® ACTIVE TRACKING FILTER

Islatrol provides the final point of usage line noise filtering by patented broad band noise filter techniques. Liebert's Active Tracking technology guards against all noise transients, from 5kHz to 500MHz, providing protection from software errors, lock-ups and annoying resets in high speed processing electronics, without potential ground-loops connected.

- Excellent common and normal node noise attenuation.
- Ring terminal connections.



# POWER CONDITIONING & DISTRIBUTION

## DATAWAVE MAGNETIC SYNTHESISER

Liebert's DataWave Magnetic Synthesiser provides total power conditioning and gives effective protection against power line disturbances. Designed to handle non-linear loads and high neutral current without oversizing, it will maintain its stable output waveform regardless of power input quality, making it the ideal choice for critical applications.

- Input voltage range exceeds  $\pm 40\%$  for deep sag protection.
- Regenerated output waveform, immune to input transients, distortion and noise.
- Provides harmonics isolation, protecting the mains from load current distortion and mains voltage distortion.



### SPECIFICATIONS

**Datawave Magnetic Synthesiser - 50 Hz**

Output kVA	3 Phase Input KW	3 Phase Input Voltage <sup>1</sup>	Input Circuit Breaker (Amps)	Panelboard Poles (std) <sup>2</sup>	Dimensions (mm)			Weight (kg)	Heat Output (kW)
					W	D	H		
15	15	380	40	42	920	870	1630	590	1.85a
		400	40						
		415	30						
20	20	380	50	42	920	870	1630	739	2.47
		400	50						
		415	40						
30	30	380	70	42	920	870	1630	775	2.97
		400	70						
		415	60						
50	50	380	110	84	1120	810	1730	1200	3.76
		400	110						
		415	100						
75	75	380	175	84	1120	810	1730	1375	5.65
		400	175						
		415	150						
100	100	380	225	120	1680	920	1930	2000	7.53
		400	200						
		415	200						
125	125	380	300	120	1680	920	1930	2230	9.41
		400	250						
		415	250						
150	150	380	350	120	2640 <sup>3</sup>	920	1930	2950	11.29
		400	300						
		415	300						
200	200	380	450	120	2640 <sup>3</sup>	920	1930	3340	15.05
		400	400						
		415	400						

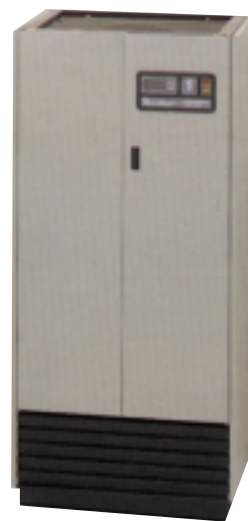
<sup>1</sup> Other input voltages available. Standard output voltages are 208/120, 380/220 and 415/240 volts. For voltages not shown, consult factory.

<sup>2</sup> Panelboards furnished on "SC" models. Main output breakers furnished on "CA" models.

<sup>3</sup> For ease in shipping and handling, unit is shipped in two modules of 52 inches (132 cm) each.

## PRECISION POWER CENTRE

Without a controlled power distribution centre, it can prove very difficult to effectively wire up a building for telecommunications, data processing or industrial systems. Using the standard building wiring system creates even more problems when changes or cable extensions are required. It can also be difficult to establish an effective computer ground. The solution is a dedicated Liebert Precision Power Centre (PPC) to handle power distribution. Its proven design has already been used in thousands of installations, where it has been chosen for its cost effectiveness, reliability and flexibility.



- The PPC is fully factory assembled and tested to ensure reliability and consistent performance.
- Comprehensive monitoring features include built-in metering and alarm annunciation.
- Single input cable connection.
- Clean, computer grade earthing.
- Easy to install.

### SPECIFICATIONS

**Precision Power Centre - 50 Hz**

Output kVA	Input Voltage*	Input Circuit Breaker (Amps)	Panelboard Poles Std	Panelboard Poles Opt.**	Dimensions (mm)			Weight (kg)	Heat Output (kW)
					W	D	H		
15	415	30	42	84	810	815	1130	275	0.84
	400	30							
	380	30							
30	415	60	42	84	810	815	1130	350	1.44
	400	60							
	380	60							
50	415	100	84	126	1120	815	1130	420	1.84
	400	100							
	380	100							
75	415	150	84	126	1120	815	1130	520	2.46
	400	150							
	380	150							
100	415	200	84	126	1120	815	1130	630	3.12
	400	200							
	380	200							
125	415	225	84	126	1120	815	1130	710	3.88
	400	250							
	380	250							
150	415	300	84	126	1120	810	1130	860	4.24
	400	300							
	380	300							

\* Consult factory for other available capacities or voltages not shown.

\*\* Standard number of panelboards as shown.

Additional panelboards are optional and increase unit width as follows: 84 pole units are 1120mm wide; 126 pole units are 1570mm wide.

## SERIES 7200™

FACILITY-WIDE PROTECTION FOR  
MISSION-CRITICAL SYSTEMS

The Liebert Series 7200 can supply clean sinewave power without the "noise" and transients common on mains. And if power fails, the Series 7200 will provide enough time to notify users and safely shut down operations.

## SPECIFICATIONS

Series 7200™			
Model	30	40	60
Power	30kVA	40kVA	60kVA
Rating	24kW	32kW	48kW
<b>Input &amp; Output</b>			
Voltage	380/400/415 V		
Frequency	50 or 60 Hz		
<b>Dimensions (mm)</b>			
Width	710		
Depth	800		
Height	1400		
Weight (kg)	480	540	620
<b>Input/Output Efficiency</b>			
Load 50%	92%	92.6%	93.1%
Load 100%	91.5%	92%	92.5%
Output overload capability	110% for 60 minutes		
	125% for 10 minutes		
	150% for 1 minute		
	200% single-phase for 30 seconds		
Maximum permissible non-linear load	100% with 3:1 crest factor		
Output voltage stability	Static ±1%		
	Dynamic ±5%		
Output voltage distortion linear load	1% typical		
Output voltage distortion non-linear load	3:1 crest factor 5% max		

**Features include:**

- Available in three models.
- Input voltage.
- Advanced engineering design, using high-power IGBT transistors in high-frequency PWM switching mode for unparalleled reliability.
- Small footprint and all round access for easy maintenance.
- Full-time filtering of electrical noise and transients, including harmonics generated by other network equipment.
- Advanced power conditioning options, including:
  - input filters that reduce input harmonic distortion
  - an input isolation transformer
  - power distribution modules.
- Supports non-linear loads with a crest factor as much as 3:1 whilst maintaining a sinusoidal output voltage waveform, with less than 5% distortion.
- Power synchronisation between UPS and generator.
- Remote monitoring and control via a standard RS232 communications port.
- Isolated Redundant Systems.
- Low operating noise, less than 56dBA.
- Programmable battery tests with automatic temperature compensated battery charging, giving protection against slow discharge and over-voltage.
- Easy system expansion to two modules with parallel operation for redundancy or extended capacity.
- May be incorporated into Liebert SiteScan site monitoring system and/or any MODBUS compliant Building Management System.
- May be monitored remotely via SNMP.

**The Series 7200 provides clean, continuous power for:**

- Metropolitan Network and WAN servers, gateways, bridges and routers.
- Mainframe, MPP and super-mini computers.
- Telecommunications networks.
- Mini-computers, including IBM 34/36, AS/400 and RS/6000, DEC MicroVAX and virtually all UNIX/XENIX/AIX host computer.
- Large-scale data storage systems, including RAID arrays and data warehouse systems.
- Test and laboratory facilities.



## FACILITY-WIDE PROTECTION FOR MISSION-CRITICAL SYSTEMS



The Liebert Series 7400 is a 3-phase UPS that uses the latest high power technology in Pulse Width Modulation (PWM) switching mode for high reliability. Installed in a compact cabinet, the microprocessor controlled unit provides a low-noise performance and a capability to match a variety of load characteristics.

The Series 7400 has been designed to support non-linear and unbalanced loads with a crest factor as high as 3:1, whilst maintaining a sinewave output with less than 5% distortion. And if mains power fails, battery backup provides sufficient autonomy, at full load, to begin and stabilise standby generator operation, or to safely switch computing operations to another data centre and shut down in an orderly fashion.

### SPECIFICATIONS

Series 7400™		
Model	300	400
Power	300kVA	400kVA
Rating	240kW	320kW
<b>Input</b>		
Voltage	380/400/415V	
Frequency	50Hz or 60Hz, ±5%	
Power walk-in	20-100% in 10 seconds	
<b>Output</b>		
Voltage	380/400/415V ±5%, User selectable	
Voltage distortion	linear load 1%	
	5% with non-linear load 3:1 crest factor	
Voltage stability	steady state ±1%, transient state ±5%	
Frequency	50Hz or 60Hz	
Overload @ 0.8pf	110% for 60 mins. 125% for 10 mins. 150% for 1 mins. 200% 1-phase for 30 secs.	
<b>Physical</b>		
6-pulse models		
UPS weight (kg)	2140kg	2340kg
WxDxH	2460x800x1900	2460x800x1900
12-pulse models		
UPS weight (kg)	2650kg	2850kg
WxDxH	2460x800x1900	2460x800x1900

#### Features include:

- Available in 2 models, 6 and 12-pulse, 300kVA and 400kVA.
- Full-time filtering of electrical noise and transients, including harmonics generated by other network equipment.
- Capabilities that meet or exceed virtually all local and international standards.
- Advanced design techniques, using high-power IGBT transistors in high-frequency PWM switching mode for unparalleled reliability.
- Parallel operation. To meet possible increased load and for provision of system redundancy, up to six units can be installed for greater power capacity.
- A wide range of battery configuration options, from short-duration support for an orderly system shutdown, interim autonomy between mains power and generator backup, to many hours of autonomous operation for telecommunications and other critical operations.
- Small footprint and front-access for easy installation and maintenance.
- A wide range of options available:
  - 12-pulse rectifier system to give lower current distortion
  - input filters to reduce harmonic distortion minimising harmonic current feed-back on both the 6-pulse and 12-pulse rectifier systems
  - power distribution module that allows field configuration of power distribution cables
  - temperature compensated battery charging to maximise battery life
  - remote alarm indicators
  - remote communications with dial-out capability

#### The Series 7400 provides clean, continuous power for:

- Mainframe, MPP and super-mini computers
- Telecommunication centres
- Metropolitan network and WAN management centres
- Data warehouses, including RAID arrays
- Test and laboratory facilities
- Large-scale process control operations

## HIPULSE UPS SYSTEM

## HIPULSE UPS SYSTEM: THE BEST PROTECTION FOR YOUR CRITICAL LOAD



No matter what equipment you are using, if continuity of use is imperative, then security of the electrical power supply should be provided by a Liebert Hipulse UPS system. It will solve all your power disturbance problems, and when complemented by other Liebert power products, e.g. transient voltage surge suppressors, static bus transfer switches, and other load bus reliability solutions, the Hipulse UPS provides the best solution to achieving fault tolerant power supplies.

Designed to support critical loads, the Hipulse space-saving design can fit in to most environments and will satisfy acceptable noise requirements. As a static UPS system, the Hipulse is an excellent choice for supplying unbalanced loads, and its performance for supplying non-linear loads is unsurpassed in the UPS industry. It is capable of providing conditioned power instantly to the continually changing, even transient levels of power demand common with most networks and industrial operations.

### Designed to protect critical systems in a variety of key applications

- Main frame and super-mini computer systems
- Telecommunication centres
- Major LAN and WAN critical systems
- Data centres, including RAID arrays
- Test and laboratory installations
- Industrial process and control operations.
- Medical equipment

### Standard features:

- High reliability IGBT inverter
- Available with 6 or 12 pulse rectifier
- Paralleling of up to six units using either modular or centralised static bypass switch
- High efficiency of over 93% while operating in normal mode, and over 97% in EcoMode when the load is supplied via the static bypass switch.
- Advanced battery management
- Intelligent battery testing to prove system availability.
- Temperature compensated charging maximising the lifetime of the battery.
- Protection against deep discharge: prevents battery damage in the event of prolonged outages at low discharge levels.
- Backfeed protection
- Battery ground fault warning
- Frequency converter 50/60Hz with or without battery
- SNMP network compatible with dynamic monitoring
- BMS connectivity through either Modbus, JBus or PROFIBUS
- Compatible with Many Types of Load and System Configuration

## SPECIFICATIONS

### Hipulse UPS System

Nominal Rating (0.8 pf)	80kVA	120kVA	160kVA	200kVA
<b>Physical characteristics</b>				
Width (mm)	900	1250	1250	1250
Depth (mm)	875	842	842	842
Height (mm)	1900	1900	1900	1900
Weight (kg)	750	1000	1200	1350
<b>Input</b>				
Voltage	380 / 400 / 415V 3Ph $\pm 15\%$			
Frequency	50 or 60 Hz $\pm 5\%$			
Power factor	0.94 with optional filter			
<b>Output</b>				
Voltage	380 / 400 / 415 V 3Ph + neutral			
Voltage stability				
- steady state			$\pm 1\%$	
- 100% load step			$\pm 5\%$	
Frequency	50 or 60 Hz			
Frequency stability	$\pm 1$ Hz synchronised with the bypass supply $\pm 0.1$ Hz auto-synchronised			
Overload capacity from inverter @ nominal voltage				
- 3 Ph	110% for 60 min. 125% for 10 min. 150% for 1 min.			
- 1 Ph	200% for 30 seconds			
Short circuit current from inverter				
- 3 Ph	1.5 In for 5 seconds (EN 50091-1-1)			
- 1 Ph	2.9 In for 5 seconds (EN 50091-1-1)			
Voltage distortion with linear load	< 1%			
Voltage distortion with 100% non-linear load	<3% Ph / Ph, < 5% Ph / N			
Max. deliverable power with non-linear load (CF = 3:1)	100%			
Max. unbalanced load	100%			
Voltage displacement with 100% unbalanced load	$120^\circ \pm 1^\circ$ el			
Output voltage dissymmetry with 100% unbalanced load	2%			
<b>Standards and approvals</b>				
Safety / EMC / Design	CEI EN 50091-1-1/ EN 50091-2 / ENV 50091-3			
European directives 73/23/EEC and 89/336/EEC	CE mark			

## SERIES 600T™

FACILITY-WIDE PROTECTION FOR  
MISSION-CRITICAL SYSTEMS

When your facility can't afford any unplanned outages, you need the Uninterruptible Power Supply system with the best reliability record in the business. The Series 600T is based on a conservative design philosophy that has produced a field-documented MTBF in excess of one million hours.

Don't let the small size mislead you. The Series 600T is a robust, feature-rich product. It is available with either the standard 6-pulse or optional 12-pulse rectifier. Internal input filters are available for either configuration.

All versions of the T-UPS make full use of the latest IGBTs and electronic packaging technology. This is especially helpful in applications where usable floor space is at a premium. The data centre manager can now upgrade to dual-UPS/dual-distribution-bus strategy in the space normally required for a single UPS.

- Critical bus MTBF in excess of one million hours, based on field experience with more than 1700 systems.
- Application-Specific Integrated Circuits (ASICs) replace the failure-prone discrete logic boards used in other brands of UPS.
- Transistorised inverters use the most advanced IGBTs for high efficiency and reliability.
- Units are compact and quiet.
- All models have been tested and certified to meet European safety requirements.
- Full-featured monitoring and alarm systems are displayed in easy-to-read text and graphics on a large LCD monitor.
- Displays and documentation available in five languages.
- Input Voltage.

**The Series 600T gives you power protection in many configurations:**

- Single Module Systems.
- Parallel Redundant Systems.
- Isolated Redundant Systems.
- Power-Tie (Dual Bus) Systems.
- Load Bus Synchronised Systems.

**Standard features:**

- LCD 80-character x 25 line monitor/control panel.
- Self-diagnostics.
- 2-stage battery charge current limit.
- 2-stage input AC current limit.
- Internal maintenance bypass.
- Programmable automatic retransfer.
- Automatic line-drop compensation.
- Battery overdischarge protection.
- Battery-time-remaining display.
- Automatic equalise charge timer.
- Emergency Power Off.

## SPECIFICATIONS

Series 600T™						
Model	500	500	600	600	800	800
Power	500kVA	500kVA	600kVA	600kVA	800kVA	800kVA
Rating	400kW	400kW	480kW	480kW	640kW	640kW
Power factor	0.8					
Rectifier	6-pulse	12-pulse	6-pulse	12-pulse	6-pulse	12-pulse
<b>Input</b>						
Voltage	380/400/415VAC, 3-phase, 3-wire plus neutral					
Voltage range	+10, -15% (no battery discharge down to -20%)					
Power factor	0.85 lagging; 0.92 lagging with optional input filter					
Frequency range	50Hz, +5%. 60Hz models also available					
Current Distortion	9% reflected THD at full load with optional input filter, 4% reflected THD at full load with optional 12-pulse rectifier and input filter					
Subcycle Magnetising Inrush	2-3 times normal full load current; 5-8 times normal for units with optional input isolation transformer or 12-pulse rectifier. Walk-in of 20% to 100% over 15 seconds					
<b>Physical</b>						
UPS weight (kg)						
- single-module	3100	4450	3910	5600	4320	6600
- Multi-module	3050	4410	3880	5560	4290	6550
WxDxH (mm)						
- single-module	1830x990x2000	2440x990x2000	2750x990x2000	3050x990x2000	2750x990x2000	3050x990x2000
- Multi-module	1830x990x2000	2440x990x2000	2750x990x2000	3050x990x2000	2750x990x2000	3050x990x2000



# SITENET® FAMILY

## EFFECTIVE NETWORK-WIDE POWER MANAGEMENT

Whether your network comprises of just a few PCs networked together, or forms a complex enterprise wide installation, effective network power communications and control is vital to your operation. Liebert's UPS communications family of SiteNet products provide protection for a basic network where only auto-shutdown of the operating system is required through to real time power monitoring, and UPS control with auto-shutdown of the operating system.

### INTELLISLOT™ MULTI PORT 4 AND AS/400 CARD

Liebert's latest extensions to the Intellislot range of network cards for the PowerSure Interactive or UPStation GXT. Multiport 4 allows up to 5 servers to be monitored "out-of-band" from the single UPS with SiteNet MultiLink and the AS/400 card provides relay contacts indicating UPS status.

### SITENET® MULTILINK™

MultiLink is the world's first UPS Software product to be written in JAVA. Operating with any Liebert UPS, whether configured as part of an SNMP network or as stand-alone power protection for a file server, MultiLink will protect the network server from unexpected crashes caused by power failures.

**■ Stand-alone or SNMP Communication Support**

MultiLink is compatible with any Liebert UPS whether configured to run as part of an enterprise-wide SNMP solution or as stand alone shutdown management for a single file-server.

**■ Multiple Server Shutdown**

Any PC or server on the network; whether connected directly to the server or being monitored from a remote workstation; can monitor the UPS or be shutdown automatically should a power failure occur.

**■ Multiple Operating System & Network Hardware**

Any PC on the network can monitor the UPS or be shutdown automatically even if the UPS is connected to a segment which is running a different network operating system or hardware protocol.

■ Timed Auto-shutdown of the operating system during a power or low battery situation.

■ User programmable event management through execution of script command files.



The Multiport 4 communications card

### OPERATING SYSTEMS SUPPORTED BY SITENET® MULTILINK™

Operating Systems	Versions
MS Windows	'95/'98
MS Windows NT	4.0
Novell NetWare	4.11 & 5.0
Sun Solaris (Sparc)	2.51 & 2.6
HP-UX	11.0
IBM AIX	4.3
SCO OpenServer (Intel)	5.0.4 & 5.0.5
IBM OS/2	Warp 4
Linux	6.2

Note: Liebert continually upgrades its software for compatibility with the latest operating system versions.

### OPERATING SYSTEMS SUPPORTED BY SITENET®1

Operating Systems	Versions	Alarms Power fail	Supported Low battery
MS Windows	'95/'98	✓	✓
MS Windows NT	3.51, 4.0	✓	✓
Novell NetWare	3.11, 3.12, 4.01, 4.02, 4.1, 5.0	✓	✓
SCO UNIX	3.2.2, 3.2.4, 3.2.5	✓	✓
SCO XENIX	2.3.4	✓	✓
SVR4	2.02, 2.03, 3.0, 4.1	✓	✓
IBM OS/2 LAN Server	2.0 and up	✓	✓
	9.01, 10.05,	✓	✓
HP-UX (700/800)	10.01, 10.10, 10.20, 11.0		
	2.1, 2.4,	✓	-
Sun Solaris (Intel)	2.5, 2.51, 2.6	✓	-
	2.2, 2.3,	✓	-
Sun Solaris (Sparc)	2.4, 2.5, 2.6		
	3.2.3, 3.2.5,	✓	✓
IBM AIX	4.1, 4.3		
Interactive	3.2	✓	✓
DG-UX	5.3	✓	✓
	4.0.5, 5.2,	✓	✓
SGI IRIX	6.2, 6.3, 6.4		
DEC OSF/1	1.3, 2.0, 3.2, 4.0D	✓	-
DEC Ultrix	4.0	✓	-
DEC Open VMS for Alpha AXP	1.3, 6.2, 7.1	✓	-
DEC Open VMS for VAX	5.4, 6.0, 6.1, 7.2	✓	-
DEC VMA for VAX	5.4	✓	-

Note: Liebert continually upgrades its software for compatibility with the latest operating system versions.



# SITENET® FAMILY

## SITENET® 1

Software solution providing basic automatic unattended shutdown of any network operating system.

- Auto-shutdown of network operating system in event of mains failure or if UPS battery runs low.
- Broadcast messages sent to all users.
- Continuous real-time monitoring of UPS activity.
- Modem and Pager control to dial out from remote sites.
- Optional multi-interface solutions available for shutdown of multiple operating systems.

## SITENET® 2

Automatic unattended shutdown of the network operating system in conjunction with extensive UPS monitoring and control.

- Event Management capability evoking key actions when any alarm conditions occur.
- User configurable UPS diagnostics & battery tests.
- User scheduled UPS On/Off times.
- User-definable graphs and interactive meters to identify potential power problems before they happen.
- User-definable operating parameters to meet your ever changing system needs.

## SITENET® SNMP MANAGER

Whatever the Liebert UPS, you can be sure it will be compatible with the very latest in network control and management through SNMP.

- SNMP agents available in either a user installable interface card or external adaptor.
- Liebert's SNMP manager software can then be used from any Network Management System to provide a full-scale power overview, plus snap-in monitoring and control applications for the UPS.

## SITENET® INTEGRATOR

Liebert's SiteNet Integrator will take the normal SNMP Management one level further and adds environmental and user programmable monitoring to the UPS management.

- Provides SNMP Management and control of the Liebert UPS.
- Enables monitoring of temperature and humidity conditions through an optional sensor.
- Multiple digital inputs and output relays allow connection to external computer room equipments.
- With the addition of the Load Control Module (LCM), you can provide remote power management for up to 6 pieces of connected equipment.

## OPERATING SYSTEMS SUPPORTED BY SITENET® 2

Operating Systems	Versions	Character	GUI
MS Windows	'95/'98	-	✓
MS Windows NT	3.51, 4.0	-	✓
Novell NetWare	3.11, 3.12, 4.01, 4.02, 4.1, 5.0	✓	✓
SCO UNIX	3.2.2, 3.2.4, 3.5	✓	✓
SCO XENIX	2.3.4	✓	-
SVR4	4.1	✓	-
IBM OS/2 WARP	3.0, 4.0	-	✓
HP-UX (700/800)	9.x, 10.0, 10.2	✓	✓
IBM OS/2 LAN Server	2.0 and up	-	✓
Sun Solaris (Intel)	2.4	✓	✓
Sun Solaris (Sparc)	2.2, 2.3, 2.4, 2.5.1, 2.6	✓	-
IBM AIX	3.2.5, 4.1.2	✓	✓
Interactive	3.2	✓	-

Notes: *Character* - Character-based User Interface  
*GUI* - Graphical-based User Interface.

Liebert continually upgrades its software for compatibility with the latest operating system versions.

## OPERATING SYSTEMS SUPPORTED BY SITENET® SNMP MANAGER

Network Management System	NMS Version	Operating System	OS Version	CPU	Media
Novell ManageWise	2.0, 2.1, 2.1	Windows Windows	3.1x 95 / NT	Intel Intel	3.5" Disk
HP Openview	7.2 7.2 7.2	Windows Windows Windows NT	3.1x 95 3.51, 4.0	Intel Intel Intel	3.5" Disk
HP Openview	3.31	SUN Solaris	2.3, 2.4	Sun SPARC	4mm DAT
	3.31	HP-UX	9.05, 9.07	HP PA-RISC	
	4.0	SUN Solaris	2.3, 2.4	Sun SPARC	
	4.0	HP-UX	9.05, 9.07, 10.01, 10.10	HP PA-RISC	
HP Openview	4.1	SUN Solaris	2.3, 2.4	Sun SPARC	4mm DAT
	4.1	HP-UX	9.05, 9.07, 10.01, 10.10	HP PA-RISC	
HP Openview	4.11	SUN Solaris	2.3, 2.4	Sun SPARC	4mm DAT
	4.11	HP-UX	9.05, 9.07, 10.01, 10.10	HP PA-RISC	
HP Openview	5.0, 6.0	Windows NT	4.0	Intel	3.5" Disk
IBM Netview AIX	3.1	AIX (UNIX)	3.2.5, 4.2	RISC 6000	4mm DAT
	4.0	AIX (UNIX)	3.2.5, 4.2	RISC 6000	
Cabletron Spectrum	4.0	Windows NT SUN Solaris	4.0 2.5.1, 2.6	Intel Sun SPARC	CD-ROM
DEC Polycenter	3.1	Windows NT	3.51	Intel	CD-ROM

Notes: *Tivole TME 10 Netview* is the same as IBM Netview AIX  
*Tivole TME 10 Netview NT* is the same as DEC Polycenter

## NETWORK POWER PROTECTION

# LIEBERT HIROSS CUSTOMER SERVICE AND SUPPORT FOR YOUR NETWORK

As networks grow from a single office to sites throughout Europe, effective monitoring of power protection and rapid response to power problems can become a nightmare for the network manager. Are all UPS operating properly? Are people at every site trained to monitor and respond appropriately? Is the right power protection being purchased?

Even with central monitoring, knowing about a problem does not automatically solve it. How can the manager of a wide-area network maintain positive control over power protection?

These are not new questions. Systems managers have been troubled by these problems for decades. And they have been relying on Liebert Hiross for effective solutions to these problems.

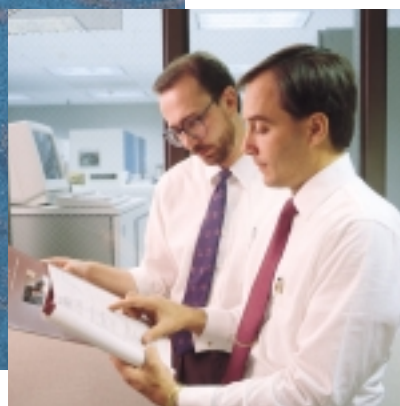
Liebert Hiross provides everything from product warranties to total management of power protection systems for large networks: UPS, batteries, generators, switchgear and power distribution. Services include planning, acquisition, integration, maintenance, repair and analysis.

## WARRANTY EXTENSION PROGRAMMES

In addition to standard product warranties, Liebert Hiross offers both one- and three-year warranty extensions which extend your warranty period up to five years. The warranty extension can be purchased for a nominal cost at any time during the original warranty period. During the covered period, Liebert Hiross will repair or replace your UPS equipment, including batteries, at no charge.

## TECHNICAL SUPPORT

Liebert Hiross has a team of experienced professionals whose sole job is to help you with technical questions. And it's not just for problems with your existing network protection . . . you can get help designing a protection plan or configuring UPS on a network.







One of Liebert Hiross many on-site support services

## LIEBERT HIROSS REPAIR SERVICE CENTRE

Liebert Hiross is the only manufacturer of computer and network power protection to provide factory repair services in order to ensure quality and reliability for UPS up to 3 kVA. You have a choice of two repair programmes:

- Factory repair of your UPS. The unit is shipped to a Liebert Hiross factory where it is fixed, updated and tested to ensure proper operation.
- Unit exchange for a replacement UPS. If you need faster turn-around, Liebert Hiross will ship an identical or better replacement unit to you. You keep the replacement unit and return the original unit to Liebert Hiross. (This feature is a standard part of the warranty programme.)

## ON-SITE SUPPORT SERVICES

Liebert Hiross has the largest service team in the power protection industry: nearly 1000 service professionals in 167 service centres throughout the world. Customers get professional support without having to hire and train staff, or retain different vendors at different sites. And they get a response time that's the industry standard. Key elements of this network support system include:

- The Customer Response Centre. The Centre is staffed by trained hardware and software experts with access to factory-trained service technicians. Many times, problems can be solved over the phone. Liebert Hiross can also monitor battery status and other factors that affect the reliability of your power protection, then conduct regular maintenance and appropriate service to ensure maximum readiness.

## UPS Systems & Networks

"Liebert is the first and only equipment we've ever used."

**Carson Porteous, IT Manager at EA Wellworth  
(Northern Ireland based supermarket chain)  
Retail Technology 01/99**

"...very impressed by the kit Liebert has supplied...the new breed of UPS can do just about anything."

**John Piernicki, Dolphin Telecommunications'  
IT/infrastructure environmental administrator  
Information Week 03/02/99**

"The network card option makes Liebert a good contender, as you can manage the UPS from across the network at a different computer."

**Network Solutions UPStation GXT review -  
review conducted by VNU labs 02/99**

"Coming from a quality European manufacturer, the UPStation GXT is a first class unit."

**Secure Computing UPStation GXT review 09/98**

"A combination of aggressive pricing and feature-rich management software makes the Liebert UPS a clear winner."

**Network Solutions PowerSure Interactive  
review, the unit won a best buy award. 02/97**



**LIEBERT COMPUTER AND NETWORK PROTECTION PRODUCTS ARE AVAILABLE FROM:**

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KEEPING BUSINESS IN BUSINESS



Uninterruptible Power Systems

# COMPLETE POWER PROTECTION

