

## Power quality a major concern

### Uninterruptible power supplies (UPS) protect against more than just outages

It is well known that the supply of electricity from the grid is becoming less reliable. The chance of outages (blackouts and brownouts) are increasing. Less well known but more problematic is the quality of our power. Sags, surges, under/over voltage, noise, frequency variation, switching transients and harmonics threaten many areas of business.

Power quality is compromised in 2 ways:



Incoming disturbances  
(lightning, grid disturbances)



Locally generated disturbances (motors, welding, equipment switching)

Almost all businesses are affected, but each in varying degree. Certain industries can tolerate low levels of compromised power quality. However, mission critical applications such as data and call centers, medical labs, manufacturing processes, and communications centers can experience serious consequences if power quality is compromised such as; loss of customers, loss of life, damage to equipment, monetary loss, loss of safety and overall business vulnerability to name a few.

For consultants, contractors and power-quality managers, design strategies for providing sustained power and proper power quality for both varied and specific applications within any one building can be challenging. Power quality can be likened to water being pumped into a manufacturing facility: the drinking water found in the lunch rooms must be purer than the water found in the washroom toilets, but still may not be pure enough to go in the medical products at the labs down the hall.

Many different UPS technologies exist - and the overwhelming choice of systems can be confusing. Low cost 'off line' UPS equipment can only handle power outages, short-term sags and surges. To correct sustained under/over voltage UPS units that are "line interactive" are required. Power issues that include noise, frequency variations, switching transients and harmonics require UPS units that are 'on line' or 'double conversion'.

Power Problem	UPS Categories		
	Offline	Line Interactive	On Line or Double Conversion
Outage, Sag, Surge	✓	✓	✓
Under/Over Voltage		✓	✓
Noise, Frequency Variation, Switching Transients, Harmonics			✓

Finding the exact problem, determining the best system design and sourcing solutions to meet your exact application requires sophisticated equipment and analysis supported by a full service power solutions provider like Total Power.



## UPS system design strategy

The experts at Total Power can help you analyze, design and install the UPS system that is best suited for your application. We start by asking the following questions:

How critical is your load?

What is the monetary loss of dropping your load?



Are power quality issues life threatening or creating safety issues?

How long do you need your UPS to support your load?

By understanding your budget requirements and future growth requirements, our highly trained UPS experts can design and recommend the exact UPS system with site specific features.

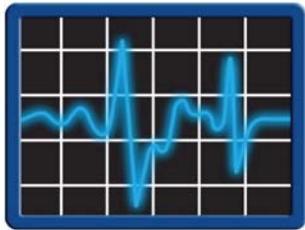
## Common UPS Configurations

Type	Description
UPS with bypass	<ul style="list-style-type: none"> <li>• Cleans up power quality and backs up the load in case of an outage.</li> <li>• Makes hydro power available (straight-through) when UPS is under maintenance.</li> </ul>
Parallel UPS (Redundant)	<ul style="list-style-type: none"> <li>• When one UPS has failed or is under maintenance the other UPS takes over the entire load automatically.</li> </ul>
Parallel UPS (Capacity)	<ul style="list-style-type: none"> <li>• System is likely to grow or you may have the occasional higher load (more than the capacity of one UPS).</li> <li>• 2 UPS systems can run in parallel to support the entire load.</li> </ul>
N+1 Parallel Redundant System	<ul style="list-style-type: none"> <li>• In addition to your regular number of UPS systems, one UPS is running in parallel and takes up the load when any of the other UPS components fail or are taken out for maintenance.</li> </ul>
2 UPS with common battery	<ul style="list-style-type: none"> <li>• Used in cases where power quality is more important than backup power.</li> </ul>
N+1 UPS and N+1 Battery	<ul style="list-style-type: none"> <li>• Used when the load is so critical that it avoids any issues when one of the UPS modules fail or is taken out of the system.</li> </ul>
UPS system with gen-set backup	<ul style="list-style-type: none"> <li>• In cases where sustained backup power is required over several hours.</li> <li>• UPS unit will support the load while the generator gets up to speed and afterwards acts to ensure clean power from the gen-set.</li> </ul>



## Utilizing UPS sophistication

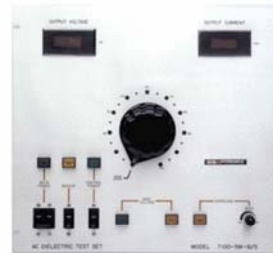
UPS systems now provide impressive levels of diagnostics, intelligent controls and communications. As a result, UPS systems can communicate critical system parameters four ways:



**Indicators** - text, bar graph, lamps & LED



**Alarms** – audio & visual with manual intervention



**Manual Controls** - options to control some settings which will control the UPS



**Remote Monitoring** - the status of the UPS is stored and sent remotely to offsite operators

UPS software is as sophisticated as the units themselves. It can assist in gracefully shutting down all the connected PCs or servers after saving data. It can monitor what you can see on the UPS panel. It can send messages or notification about UPS events / alarms to a remote source. It can browse the entire system's "health" via the web and it can even schedule start / stop commands on an daily or event driven basis. Until a few years back, batteries in backup power systems were considered the "dumbest part of the system". With advancement in technology you can now test batteries periodically without compromising the system reliability. This helps the UPS determine the amount of battery life remaining. Systems can also report on how long they will support a given connected load. There are also special battery monitors which can predict if any of the cells start showing signs of deterioration thus predicting battery failure.

### *UPS maintenance*

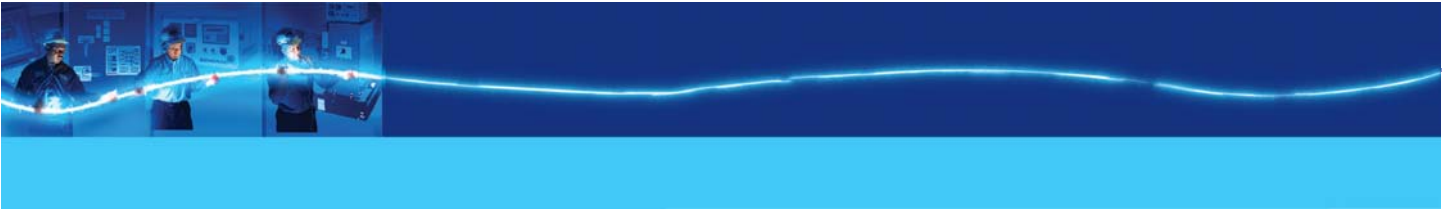
For critical applications and systems it is essential to have preventative maintenance contracts, extended warranties and remote monitoring. A professional technician can measure system parameters, ensure the UPS is "normal", check all the connections and the integrity of the system and check on battery condition. Routine maintenance will allow for corrective action, if required, to ensure system availability 24/7.

### *See a demo*

Don't become a victim of inadequate power strategies. Call now for a free demonstration to get a clear picture of how a system could be deployed in the field. Our UPS engineer can answer your case specific questions. For peace of mind call Sunil at (905) 670-1535 x 223 or email: [sunil@totalpowerltd.com](mailto:sunil@totalpowerltd.com)

Please view our website for further details. <http://www.totalpowerltd.com/UPSpage.htm>





# **TOTAL POWER**

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