

# Power protection for medical diagnostic imaging systems

## Application Note

Millions of dollars are invested in your diagnostic imaging equipment.

Thousands of dollars are riding on the successful completion of each scan.

Patients are expecting a smooth procedure and accurate diagnosis.

Can you afford to lose power?

Can sensitive electronics take the daily "zaps" of unclean power?

**“ If you want medical imaging systems to be reliable, you have to consider what happens if the power goes out. It is important to consider power protection as an integral part of the purchase of imaging systems.”**

Ed Stancklik  
Imaging Specialist  
Wisconsin Children's Hospital

## The symptoms

**Diagnostic imaging systems must be reliable. The power that serves those systems is not.**

Clean, uninterrupted power is critical for medical diagnostic imaging. If power fluctuates for just a few milliseconds, data can become corrupted or lost. Internal system communications can lock up and require a restart. Even a brief power outage can trigger events that make it a 45-minute job to restart a magnetic resonance imaging (MRI) system. "Invisible" power anomalies can be silent killers—the electronic equivalent of high blood pressure—causing damage to sensitive components and malfunctions in crucial equipment and procedures.

In all these cases, the outcome is the same. The in-process diagnostic scan is aborted, and the procedure must be rescheduled for another time. If the patient has been sedated, such as for a cardiac catheterization, the procedure must be rescheduled for another day. With backlogs running into weeks, patients are inconvenienced and radiology technicians are frustrated. Costly, sensitive equipment sustains mounting damages. The hospital loses a measure of image and goodwill, as well as potentially thousands of dollars in profit.

The problems intensify as diagnostic technologies evolve from X-Ray to computerized tomography (CT) to MRI and functional imaging with Positron Emission Tomography (PET). The cost of downtime goes up dramatically with this evolution. So does the likelihood of power-induced failures.

## The diagnosis

**Diagnostic imaging systems need some critical care.**

Digital imaging represents nearly one-third of capital equipment costs for a typical hospital, yet on average, fewer than 15 percent of these systems are fully protected against power problems.

A commercial customer on typical utility power can experience four to fifteen outages per year. The system could also be plagued with daily



power surges, sags, electrical noise, harmonics, load fluctuations, and other power interferences.

Most hospitals have backup generators that provide emergency power within 10-30 seconds and transient voltage surge suppressors (TVSS) that absorb potentially harmful electrical spikes, such as from lightning storms. But these technologies solve only a fraction of typical power problems. It's not enough to recover power within 10-30 seconds, when that interval is enough to lock up a scan in progress. It's not enough to shield systems from power surges, when other power disturbances can cause random software errors, system lockups, image distortion, and equipment failures.

Thousands of dollars are at risk with just a few moments of downtime.

## The prescription

### UPSs from Powerware

Uninterruptible power systems (UPSs) from Powerware protect expensive digital imaging equipment from power disturbances that damage sensitive electronics and interrupt procedures. They protect imaging modalities from the full range of potential power problems: outages, sags, surges, spikes, brownouts, line noise, frequency variation, switching transients, and harmonic distortion.



Powerware provides the largest selection of premium-quality UPSs for the healthcare industry, ranging in size from 300 VA to more than 1,000 kVA. Smaller, single phase systems, such as the Powerware 5125, protect ultrasound equipment or the computer on an imaging modality during a power disturbance, providing enough backup power to save data and preclude a "hard" shutdown. Larger systems, such as the Powerware 9315, provide a continuous flow of conditioned power to the entire imaging modality and enable normal functioning even during a total loss of power.

Powerware offers systems for distributed applications where a UPS protects a single imaging modality and centralized applications where a UPS protects multiple pieces of equipment. Forward-thinking hospitals are migrating to centralized applications as they increase their reliance on sensitive computerized systems throughout the organization.

Through our long-standing relationships with major manufacturers of digital imaging systems, such as GE Medical Systems and Siemens Medical Solutions, we have created UPS solutions that have passed rigorous manufacturer testing for performance, reliability, and compatibility. Our award-winning power management software enables you to proactively manage crucial systems, from basic monitoring and shutdown to predictive analysis and power management. This management function can be performed from your desktop, your mobile devices, or through the integration with your existing network and building management systems.

In addition, Powerware offers world-class global services around the clock through our customer service centers and factory-trained field technicians deployed across the U.S. Our preventive services and quick response capabilities give you the peace of mind that your diagnostic imaging systems are always protected.

**Want to know if your imaging equipment is protected against power disturbances? Contact Powerware for a Power Quality Audit service.**

## The cure

### Advantages for administrators, technicians, and patients

Many healthcare providers are not aware of potential power interruptions until they occur. Proactive planning can prevent the potentially devastating consequences of power disturbances. With a customized UPS solution from Powerware, your healthcare organization enjoys a host of benefits:

- ▶ **Improved customer relations.** No need to reschedule or delay appointments due to equipment downtime or damages caused by power disturbances.
- ▶ **Consistent diagnostic quality.** Clean power produces clean images, such as richer X-Ray images, reducing the risk of a missed diagnosis.
- ▶ **Extended equipment health.** By resolving power issues that erode circuit boards and intra-system communications, imaging equipment becomes more reliable and longer-lasting.
- ▶ **Enhanced productivity and revenue.** Equipment downtime undermines staff productivity and morale, as well as potential patient revenue.
- ▶ **Peace of mind.** Rest assured that your diagnostic imaging systems are protected against power disturbances.

Assure the integrity of patient care by providing the conditioned power needed by sophisticated diagnostic imaging equipment. All these benefits—including savings of thousands of dollars from one power incident alone— can be achieved with proven systems that represent only a small fraction of the cost of the imaging equipment itself.

Find out why more than 1500 hospitals have deployed Powerware UPS solutions.

To learn more about what Powerware UPSs can do for your healthcare organization, visit us on the Web at [www.powerware.com/healthcare](http://www.powerware.com/healthcare)

## Powerware

WORLDWIDE HEADQUARTERS  
8609 Six Forks Road  
Raleigh, NC 27615 U.S.A.  
Toll Free: 1.800.356.5794  
or 919.872.3020  
[www.powerware.com](http://www.powerware.com)

CANADA  
Ontario: 416.798.0112

COR01AN  
Revision 06/03  
Reprint 06/03

EUROPE/MIDDLE EAST/AFRICA  
Denmark: 45.3677.7910  
Finland: 358.9.452.661  
France: 33.1.60.12.74.00  
Germany: 49.7841.6660  
Italy: 39.02.66.04.05.40  
Norway: 47.23.03.65.50  
Sweden: 46.8.598.940.00  
United Kingdom: 44.1753.608.700

ASIA PACIFIC  
Australia/NZ: 612.9878.5000  
China: 86.21.6350.0606  
HK/Korea/Taiwan: 852.2745.6682  
India: 91.11.2649.9414 to 18  
Singapore/SEA: 65.6829.8888

LATIN AMERICA  
Argentina: 5411.4343.6323  
Brazil: 55.11.3616.8500  
México: 5255.9171.7777

**POWERWARE**