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**Propelling POS up time through power conditioning**

6/29/2005 10:39:49 AM - New electronic power conditioners are enabling POS resellers to cost-effectively maintain system reliability, while reducing service visits

*by Dave Rizzo***SUBSCRIBER SERVICES**

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When the customers' cash register locks up, the money stops flowing. For any dealer who installs and supports POS systems for retail customers, the loss rapidly extends to the dealer's wallet, as an immediate service call is almost always warranted. Of particular frustration are those cases where the call results in "no problem found."

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To combat the instances of phantom problems and untraceable error codes, POS dealers and integrators are focusing on the most likely source: unstable line power. As a result, the use of power conditioning units that filter "dirty" line power into "clean" computer grade power is now enabling POS devices to avoid temporal damage caused by frequent spikes or over-voltages. The fact that new innovations have now brought the price of full-featured power conditioning units down to that of simple surge protectors and UPSs means that dealers and integrators can cost-effectively reduce unnecessary service

calls, while increasing customer satisfaction.

"I've become a big believer in power conditioning," says Ken Golden, president of Turn-key Business Systems, Inc. of Russellville, Arkansas-a provider of sales, service, supplies and support for Panasonic POS systems. "If I can stop service calls from coming in, then I'm making money."

Unfiltered power perils POS in particular

In few other industries do electrical malfunctions immediately translate into hard-dollars-lost than in the POS market.



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"Servicing POS requires more immediate action than servicing copiers, because that's how our customers get their money," notes Shana Ward, president and CEO of Tri-Valley Digital Imaging, Inc. (a division of BMA Digital Ventures, Inc.), a POS and document-imaging dealer in Brenham, Tex. "For example, when the cash register drawer doesn't open at a bar because they had a power surge or whatever, then I would get the call at eleven-thirty at night saying, 'Hey, get down here because we can't operate.'"

Upon arrival at a customer's site, a service tech can readily spot damage caused by a large power spike, such as a lightning strike. However, the insidious effects of power surges (less than 200 volts) are more difficult to pinpoint, yet often prove almost as devastating. According to studies, 87 per cent of power-related failures result from low-voltage surges that cause logic confusion that yields system errors and frozen screens.

"Through my years in the POS industry we have constantly battled environmental electrical problems, and erratic unexplainable lock-ups are at the top of the list," observes Stuart Smith, hardware manager for Carroll Business Systems, Inc. of Springfield, Mo., which specializes in system solutions for the hospitality and retail industries.

Oftentimes, line-voltage problems are caused by poor wiring in old buildings. Yet, even new buildings can suffer from the immediate effects of power surges and sags from line-voltage variations within the building, such as when an HVAC system cycles on and off or an elevator starts and stops. Even attempts to ensure a dedicated circuit cannot always guarantee computer grade power to POS devices.

"We always talk to the electricians before we do a job, reminding them that nothing else can be on the POS circuit, and typically, they get it right," notes Turn-key's Golden.

But two or three years down the road, a new electrician comes in to add a neon sign or something else on the same circuit. Then all of a sudden you have support issues like 'blown programming.'"

Whatever the source, the effects of dirty power can quickly erode the bottom line of POS providers. By some accounts, as much as 60 per cent of profit margin stems from selling service contracts, so the less calls the dealer has to go on, the more money he or she can keep. Since each call can cost a dealer as much as US\$100 in labour and gas, the toll can quickly mount when POS machines throw error codes for untraceable reasons.

"We span a 15 county area and have customers that are over two hours from us-to risk having to drive that far to clear an error code caused by a voltage surge is absurd," adds Ward.

Previous attempts to prevent the problem

In the past, standard surge protectors and power filters have been used to protect against catastrophic high-voltage spikes. However, they are not intelligent enough to handle the relatively small spike and over-voltages that momentarily disrupt POS devices. At the other end of the spectrum, isolation transformers (ITs), a traditional choice by many old-timers in the POS business, have been available to help avoid power surges; however, they are prohibitively expensive for use on every POS device.

The other drawback of ITs stems from their unwieldy size and weight. The tight quarters encountered in POS installations have typically cramped the ability of installers to enlist them as a means to combat poor-quality line voltage.

The new preference for POS protection

In response to the shortcomings of previous attempts to cost-effectively combat dirty power, recent technological advancements in the field of power conditioning have now yielded devices that provide computer grade power a clean, filtered power supply to the POS device at the same price as limited-function surge protectors and expensive traditional filters and ITs. Known as transformer based filtering (TBF) devices, their protective feature set is such that some VARs have already recognized the benefits and started installing these new power conditioners, known by trade names such as Smart Cord, on their POS systems.

"I had a customer's site that was having intermittent lock ups and data loss every two weeks, and when I talked to some other dealers about this problem they mentioned that SmartPower had a solution," recalls Smith.

These TBF units stop massive spikes up to 6,000 volts from passing through, but they also guard against the more common small spikes and surges. The circuitry constantly monitors the line power. If it goes too high (>160VAC) for more than five cycles (80 milliseconds), which is powerful enough blow out the power supply and motherboard, for example then it cuts the power off to the protected device.

A 2005 report prepared by PowerCETO, a power quality consulting, education and training firm based in Santa Clara, Calif., on behalf of SmartPower, discusses the testing of TBF technology vs. ITs by applying IEEE C.62.41 surges of 3000 volts. The results showed that TBF surge attenuation on common mode was less than 0.5 volts, the same as an IT.

These results placed the TBF units in the power conditioning category, yet the TBF units cost much less and take up a smaller footprint than an IT. The smart electronic circuits explain why TBF is referred to as electronic power conditioning.

In addition, the TBF products removed output power when applied voltages exceeded preset limits, and automatically reset when applied voltage returned to normal levels; whereas tested products from other manufacturers passed the over-voltage conditions through to their outputs.

These observations substantiate claims that the latest generation of TBF electronic power conditioners gives much more protection than isolation transformers in POS and networking applications.

Since all of this functionality occurs without the need for a heavy isolation transformer, TBF units manage to compress this functionality into a 17-ounce package the size of a man's fist making it particularly fitting for space-constrained POS applications.

TBF circuitry also addresses a particularly perplexing problem in many POS installations-that of ground loop current. While most electricians intentionally link earth-grounds for safety's sake, it can create a voltage differential between the two separate groundings. The resultant current can create havoc in sensitive microprocessors embedded within POS devices. For this reason, the circuitry within TBF units includes an impedance matcher that eliminates ground loop current and voltage differential.

TBF circuitry has also found its way into some UPSs, expanding their protective features, while holding at the same price point of non-TBF units.

Computer-grade power in practice

So compelling is the argument for adopting this new technology, that many resellers have improved up-time and reduced service calls by utilizing modern electronic power conditioning.

"We had 33 fast food restaurants that we had to tend to, and some of the buildings had horrible wiring, so the cash registers would throw error codes way too often," says Ward.

"What we look for is a product that is inexpensive, that works, and that will keep us from having phantom support calls," says Golden. "When we turn the system on we want the electricity to be correct without any question, and the TBF units are the only way I can guarantee that it's going to be correct."

As TBF units prove their value in reducing service calls and increasing customer satisfaction, some dealers choose to absorb the small cost of including them in every installation.

Based in Fullerton, Calif., David Rizzo writes technical articles, having published more than 100 stories in business-to-business and trade publications.