

Say Goodbye to Lock-Ups and Failures with Computer-Grade Power

Traditional surge protection just isn't enough. It takes sophisticated filtering to protect the life and performance of today's electronics.

Ten years ago, we dreamed of building an intelligent home. “What if we could control humidity, temperature, lighting and security all from a wireless handheld controller the size of a small writing tablet?” we asked. Today’s technology enables us to do this and much more.

Systems can now store and play thousands of movies and songs, adjust lighting levels (inside and out) with the touch of one button, control temperature and humidity based on occupancy, time of day or schedule and view security cameras from thousands of miles away.

This is the electronic age, and every day we can accomplish a greater number of things faster and with greater ease. The custom homeowner wants convenience and is willing to pay for it. Custom integrators pride themselves on offering and installing the latest and greatest, giving homeowners myriad products for living the ultimate home electronics lifestyle.

Why is it, then, that what was designed to be convenient can become a complex nightmare?

Constantly reprogramming systems and replacing processors, boards and components becomes a never-ending battle. Occasional glitches in the system are as simple as lights turning on and off without user input.

Other times, though, the entire control system may shut down. And this tends not to sit well with the client. One Central Florida homeowner, Mr. Sechler, recounts his experience: “We brought technology into our home to set a standard of convenience and control, and I had no idea it would require a live-in technician to keep it all running.”

So, why do good systems go bad? How can processors misread information, and why don't these systems last their designed life?

Power quality and surge protection expert

William Goldbach — a Life Senior Member of the Institute of Electrical and Electronic Engineers (IEEE), who has spent many years as an electrical engineer, identifying the relationship between clean power and control systems performance — attempts to explain why systems falter. “There is no rocket-science to this puzzle. Dirty power degrades and destroys electronics,” he says.

The Surging Damage

Goldbach explains that microprocessors read information through current pulses as binary code (0s and 1s). As equipment is turned on and off, voltage and current pulses, known as transients, are generated. These pulses of energy are distributed throughout every piece of equipment in the system. “Depending upon the size and frequency of these pulses,” he says, “the results will vary. As microprocessors try to function, these transient pulses of energy can cause lock-ups or data can become lost or corrupted.” He adds, “Larger pulses will cause catastrophic failure while smaller pulses degrade the life of these systems and controls.”

Indeed, over 80 percent of all damaging transients are generated internally by loads cycling. Less than 20 percent are generated externally by lightning or utility grid switching.

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A quality surge protector mounted at the main electrical service entrance will lower the energy of a large, externally generated surge but, without enhanced transient filtering, it will do very little to address the hundreds of surges generated internally daily. These events happen in every home every day.

To properly guard electrical and electronic equipment, a staged approach must be imple-



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mented. Whole-house surge protection with enhanced transient filtering mounted at each breaker panel provides the highest level of protection, offering “computer-grade power” to every circuit in the home.

Plug-in suppressors just don’t have the energy-handling characteristics necessary to address the “big hits.” Rack-mounted power filters are excellent protection devices to protect A/V and control equipment, but it is impossible to install these types of protection devices on every piece of equipment in the home.

Security systems, lighting controls, flat-panel TVs, washers, dryers and refrigerators are all microprocessor-controlled. This equipment can be most cost-effectively protected at the breaker panel.

Installing panel-mounted protection with enhanced transient filtering will insure that the power fed to rack-mounted protection will never exceed the rack-mount unit’s ability to operate at peak performance.

Supply power is the most significant part of the power quality equation, but not the complete answer. Telephone, data lines, CCTV and any other copper line entering the home can be susceptible to damaging transients. A properly engineered protection scheme identifies all exposure points with protection.

Bob Levit is principal of Total Protection Solutions, a manufacturer of power protection products.