FAQs

Ordering information

Who do I call to order ESP products?
Simply call our toll free line to place an order.
1-800-645-9721

How long does shipping take?
ESP products are shipped within 24 hours of receiving your order.

ESP Product Information

What was the Digital QC designed to do?
The Digital QC is an industrial/commercial grade power filter designed to achieve or exceed the no upset ITIC/CBEMA standard. This means that that the Digital QC reduces or eliminates all real time disturbances to a level so low that what gets through a Digital QC will not upset nor disrupt the operations of your sensitive electronics 24/7.

What type of equipment can the Digital QC protect?
The Digital QC has been developed and designed to keep digital imaging systems, multi-function machines, networked print servers, printers and copiers up and running under normal to extreme power conditions without operational disruption.

Digital QC vs. Digital QC Network?
The Digital QC is designed to protect a stand-alone device. Specifying the Network feature adds protection for a modem/fax line and a 10/100 Ethernet network connection. Any system connected to a network needs to have all communication and power lines protected from disruptive or damaging spikes and noise. If you are hooked up to a network, specify the Digital QC Network.

What is the difference between the Digital QC and the MajAC?
The Digital QC gives you protection against operational disruption and protection against hardware damage; the MajAC provides protection against hardware damage (which is a lesser form of protection against operational disruption).

ESP's Digital QC is designed to meet or exceed the no upset level of the ITIC/CBEMA standard. The Digital QC keeps you up and running regardless of the severity of the disturbances on the electrical grid virtually 100% of the time! The MajAC, which incorporates many of the surge suppression components found in the Digital QC, is a true commercial grade surge protector. However, the limitations of both space and economics preclude the inclusion of the same level of noise filtering found in the Digital QC.

Which model is the right one for my equipment?
For maximum uptime and productivity, the Digital QC is the right product to protect your equipment. To identify the specific model of Digital QC for your needs, please contact our customer service/sales department at 1.800.645.9721.

How can you tell if an ESP product has been damaged or is defective?
If the circuit breaker trips or there is no power coming from the ESP product, then the ESP product has sacrificed itself as the result of an extremely rare and unusual electrical event or it is defective. Do not continually attempt to reset the breaker. Simply unplug the ESP product and call 1-800-645-9721 or go to www.realpowerprotection.com to get your "Free Warranty Replacement" product.

FAQs

I have heard that surge protectors wear out after time?
This is commonly known as “degradation” in the industry. A typical consumer grade surge protector or surge strip uses MOVs (metal oxide varistors) as the surge component. These components have a finite life expectancy that is measured in energy absorption. The more it is used the less remaining energy handling life it has left. As the MOV wears out the 24/7 conducted leakage current increases, like a light bulb on a dimmer switch. When the surge strip is new the dimmer is almost all the way off, as the surge strip wears out the light gets brighter and brighter until……one day it fails. ☹

If surge protectors wear out after time, what happens to the Digital QC?
ESP’s products incorporate multi-stage patented designs that take advantage of the strengths of all of the available surge protection technologies; at the same time our designs eliminate any component weaknesses, like increased leakage and component degradation. To enhance the performance of ESP’s surge components, ESP uses second, third and fourth order noise-filtering technologies that allow ESP to attain the NO Upset, threshold of the ITIC/CBEMA standard. After many years of hard work protecting your system, an ESP Digital QC will produce the same results as it did the day you first plugged it in.

What is a surge protector designed to do?
A consumer grade surge protector or surge strip is designed only to protect connected equipment against hardware damage, often by sacrificing itself.

What is the difference between a surge protector and a power filter?
Unlike the ESP Digital QC Power Filter, all surge protectors let through enough damaging energy to disrupt the operation of your equipment. Noise is passed completely unfiltered and often enough energy is let through to damage your sensitive equipment. If your information and your operational productivity are important to you, then a consumer surge strip is not appropriate for your application.

What is your clamping voltage?
ESP products as tested independently by UL for the UL 1449 Standard are rated 330 Volts. Clamping levels are a function of the duration, frequency and voltage of an incoming disturbance. ESP’s Digital QC filters most incoming disturbance down to levels that meet or exceed the no upset level of the ITIC/CBEMA standard. In addition, if the frequency content is such that the disturbance also needs to be clamped down, in the line to neutral and line to ground modes, ESP starts clamping at about 20% above the line voltage.

What is your response time? (What is response time?)
Response time is typically that time it takes for component or product to react to an incoming disturbance. Through poor design or poor manufacturing techniques, it is possible to take the response time of a typical Metal Oxide Varisitor (MOV) of 25 nano seconds and slow it down to make it less responsive. ESP has taken great care in the design and manufacturing process to ensure that the response times of any component used by ESP in its products have been maximized. For example, according to the suppliers of our components, the clamping response time in our digital QC model is less than 1 nanosecond. Because ESP’s Digital QC uses a state of the art high frequency noise filtering circuit, this circuit is an active circuit, which means that the filtering is always on, always reacting instantly to power line disturbances.

Do you have a diagnostic circuits or fault indicators?
Yes, ESP inspects and detects wiring faults: Before we give you the GREEN Light, we check the ground connection and the continuity of the hot and neutral conductors. If conditions are right, we give you the GO signal. Green means “GO”.

FAQs

Is your product UL approved?
All of our products are listed to the appropriate UL Standards. Just turn over the product and look for the cULus Logo on the manufacturing label.

What is the ITIC/CBEMA Standard?
ESP's circuitry is designed to reduce let thru energy to levels to meet or exceed the "No Upset" level that has been defined by ITIC/CBEMA (Computer and Business Equipment Manufacturers Association) as being compatible with sensitive electronics. See Fig 1, page 19 of IEEE C62.41, the IEEE C62 standard. Neither the typical surge suppressor nor the typical filter can fully comply with this curve. Nor will a typical top of the line product. The only products other than ESP products that will comply are some true on-line UPS products and top of the line Ferro resonant power conditioning products. For comparable power ratings, these solutions are typically >10 times the price of the most expensive ESP product.

Is your product transformer based?
No, a transformer is an electrical device that uses alternating magnetic fields to induce current flow from the primary winding to the secondary wining. To see if a product is "Transformer Based", simply check for continuity between the line and neutral blades of the input plug with an Ohmmeter. If you have continuity, the product contains a transformer.

ESP's major technological break through in power protection circuitry was to develop a hybrid power filter that exceed the performance of a transformer based power line conditioner at a fraction of the cost, size and weight. For example, a 120 volt, 15 amp power conditioner that had an actual transformer inside the case would weigh in excess of 65 pounds and cost many times more than our product does... about a $1000.00 for a 120 volt 15 amp transformer based product that doesn't deliver the results that you will get from the Digital QC.

Is the Digital QC a battery backup unit or UPS?
No.

Why would you recommend using the Digital QC with a battery backup unit or UPS?
If the fact that the power can be shut off has a high cost to you or your organization, then a battery back up system or UPS is recommended in conjunction with the use of ESP's Digital QC. Count on the battery back up for power when there isn't any and count on the Digital QC for clean power. Battery back up systems utilize microprocessor technology to facilitate switching from the AC power grid to the internal battery in the UPS. This circuitry needs to be protected. Testing battery back up systems has demonstrated that they provide little surge protection and usually no noise filtering, therefore you need a Digital QC all the time and a UPS in addition on those mission critical applications. We suggest that you purchase the least expensive battery back up system that will handle your load requirements. That investment plus the cost of the Digital QC will still be significantly less than the cost of a true on-line UPS system, and capable of handling bigger loads.

How much does a power filter cost?
That varies depending upon the equipment protected and the specific power filter requirements you might have. Click on the "Contact Us' section of the web site and we'll guide you to the closest Regional manager who can answer specific questions about your business needs.

FAQs

What joule rating do you have and what does that mean?
This is an area where many individuals and companies attempt to confuse you by distorting laboratory specifications rather than focus on product performance. According to the premier authority on surge protection, the Institute of Electrical & Electronics Engineers, "energy rating can be misleading . . . a lower energy rating does not necessarily mean a lower capability of survival in the transient environment." Rather than play games with "specsmanship" or trying to mislead you, we don't deal specifically with joule ratings. Instead we measure the real-world performance by measuring the actual energy let-through by the power filter to the protected product. ESP products have the lowest energy let-through values in the industry.

What exactly does the network connection do? Noise, surges, what?
The Network connection provides protection and Cat5 compatibility against voltage surges and spikes. Noise is generally not a problem since Ethernet uses a balanced line configuration, which inherently cancels noise; also Ethernet uses error correction circuitry. If noise filtering were provided in the network protection circuit, it would interfere with the data transmission.

Same question for fax/modem lines?
Essentially the same answer as above, just that the protection voltage levels are optimized for the phone lines.

Warranty Information

Does ESP offer a warranty?
Absolutely. We provide the best Lifetime Protection Guarantee in the industry, with “No Time Limit”, “No Questions Asked”. If your ESP product stops working, call us at 1-800-645-9721, and we will replace it with a brand new product at our expense. It doesn’t matter what happened, how it happed or why it happened, if it stopped working or is broken or is defective, we will replace it…No Questions Asked!

What about the equipment plugged into an ESP product? How is it protected?
ESP products are designed to withstand virtually anything that comes down the power lines and attenuate it to the no upset levels of the ITIC/CBEMA standard, that means you will be up and running when almost everyone else has crashed and burned. If an extraordinary event did manage to overwhelm ESP’s product, our patented **flash technology**™ operating with a response time in the billionths of a second range will sacrifice itself, tripping a breaker to turn off the power to protect your equipment. In the majority of cases, better than 99.95 out of 100 times, ESP provides better protection for your equipment than any other solution available.

If ESP’s product fails and as a consequence of that failure, the connected equipment is damaged, ESP will pay for the repair or the replacement of the connected equipment. Please see our Warranty Brochure for further details.

Does your product have to be registered to be under warranty?
NO. If you have an ESP product, you have the warranty.

Does the warranty have to be renewed?
NO. The ESP warranty is a “No Time Limit” Warranty.

FAQs

What about circuit board failures?
ESP's Digital QC is designed to meet or exceed the "no upset" level of the ITIC/CBEMA standard. As a result, if you are a service company, you will note a dramatic reduction in the number of circuit board failures you have historically experienced. If that's not enough, if ESP's product fails and as a consequence of that failure, the connected equipment is damaged, i.e.: "Circuit Board Failure", ESP will pay for the repair or the replacement of the connected equipment

Is it possible for a surge to damage the copier and not have the ESP product reflect any damage, thus preventing a claim? Explain.
ESP's products, like those of every other manufacturer, do not protect against all possible forms of electrical damage. Five possibilities exist: 1) Physical damage by human intervention that results in electrical damage. 2) Static discharge directly into the connected equipment. 3) Harmonic distortions (typically result in operation problems not damage). 4) Standing high frequency waves in the atmosphere that are not conducted in the power lines (typically result in operation problems not damage). & 5) Long duration (longer than 5 mili-seconds) over voltage conditions of AC voltage over 130 volts but under 240 volts. These events though extremely unusual can damage (but usually don't damage) the connected equipment. This type of event will not activate the protection device. The only device that can respond to a long duration over voltage condition is an AC Voltage Regulator. These types of events are supposed to be controlled by the utility companies and usually are which explains why it is such a rare occurrence.

Who do I contact if I have an ESP product that has not met my expectations?
Simply call our customer service department at 1.800.645.9721. We will immediately correct the situation.

What is the procedure if I have a warranty claim?
Call 1.800.645.9721

Equipment Performance

Is hardware damage preventable?
Yes, you bet! Your system is designed with lots of solid-state components in it. These don't have any moving parts and should last a lifetime. However, the moment you plug your system into the wall, you are stressing your system with raw, contaminated utility grade electricity. This always-present frequency and voltage contamination stresses your system causing excess heat and premature component failure. By installing the Digital QC, you can eliminate virtually all these disturbances, which will effectively extend the life of your system and protecting your investment.

Why do I need special protection now when I never needed it before?
Customers often ask, "If these types of conducted interference are quite common, why have I never had transient disruption or damage?" and "I have never had EMI problems in the past, so why does my latest equipment continually need EMI related service?" The first question is probably coming from a customer that is not plagued at the moment by disruptive levels of interference or the customer is not using very sophisticated electronic equipment.

The second question, on the other hand, is coming from a customer whose electrical or communication grids have recently been contaminated with disruptive/damaging interference levels or he/she has recently purchased more sophisticated office equipment that is more susceptible to the existing levels of interference.

The trend in the electronics industry since its inception has been towards the miniaturization of circuitry to achieve smaller, more efficient products. In the more recent age of data processing equipment, the trend

has also been to develop circuits that perform functions or operations in a much shorter period of time than their predecessors.

While this trend has produced smaller, more efficient and much more inexpensive products than their closely related predecessors, it has also resulted in products that are much more susceptible to disruption or damage from EMI. With the higher microprocessor clock speeds, this new age of equipment is much more susceptible to disruption from the fast rising short duration transients and very high frequency interference that was not a problem for the designs of the past. The more compact surface mount technology designs are also much more prone to transient damage than the bulkier less susceptible products of the past.

While the new age of equipment has become much more susceptible to EMI disruption and damage, the much lower costs of all types of electronic equipment has resulted in an exponential increase in the numbers of electronic equipment units that utilize the AC power grid and various communication networks such as the telecommunication grid. Because each one of these electronic units is a possible source for power/communication line conducted EMI, the amount of interference contamination has risen dramatically from that of the past.

While the increasingly sophisticated electronic equipment has and will continue to become more susceptible to EMI disruption and damage, the electrical grids that are used with this equipment for power and data communication are becoming more and more polluted with EMI in the form of normal and common mode RFI and transient interference. These two trends have resulted in an office equipment electromagnetic compatibility problem that will grow to epidemic proportions. The computer components of your system must be properly protected against power disturbances to ensure optimum performance and reliability. An ESP power filter is an investment in both your equipment and your business.

Can a surge harm my equipment if I am not using it or if it is turned off?
Yes, the neutral wire and the ground wire are still directly connected to your sensitive microprocessor circuits. Disturbances can still charge right into your equipment. When you turn off the power switch, this only disconnects the hot wire, and not by a significant distance. The safe bet is to unplug your equipment from all connections and move those connections at least 6 inches away from its mate. However, this is a problem for lots of office equipment as they often have internal memory, clocks and timers that remain in operation even when they are turned off; they still need to be plugged in.

Why is voltage on ground a problem with digital equipment?
High frequency voltage (noise) appearing between neutral and ground can upset the ground reference, causing errors in microprocessor-controlled circuits. This “noise” is frequently the cause of much equipment operational problems.

Why do spikes and noise negatively impact digital electronic equipment?
Electric utilities admit: “The electric utility system was designed to provide reliable bulk power that is suitable for running lights, motors, and other traditional equipment. In recent years, highly sensitive electronic devices such as computer, copiers and other microprocessor-based office systems have been developed and widely adopted by end-users. These devices are very susceptible to power line disturbances and may require special power conditioning to operate efficiently.”

It is a fundamental problem of incompatibility. Copiers, fax machines and other computer-based office systems require high quality power protection to operate with optimum reliability and a minimum of downtime.

FAQs

Profitability Improvements

How can I improve productivity and eliminate unnecessary downtime?
Surprisingly, it turns out that the majority of glitches, hang ups, lock ups, system locks and “No Problem Found” service calls are the result of operating sensitive electronics with raw utility grade power. According to many of our users, all these unproductive moments can usually be avoided by installing the Digital QC, which reduces or eliminates all real time disturbances.

Isn’t power protection already built into the office equipment?
Almost never. Unfortunately, power disturbances are environmental and are your responsibility. Equipment manufacturers rely on the servicing dealers and utility companies to inform the end user of the need for power protection.

What are some of the symptoms of excessive neutral-ground voltage?
Lockups, false error codes, misfeeds, or phantom problems that come and go without any obvious cause. Short tempers, irritability and mounting frustration at a personal level.

Why doesn’t the manufacturer build this into their products?
We are talking to all the major manufacturers about incorporating ESP technology in their equipment directly. However, the status quo in today's market is that all power filters are considered “aftermarket” products to be added by the dealer or end user.

Why is it important to protect data lines when hubs provide for protection?
Actually, most hubs don’t have protection to any significant extent. Even in cases where they do, the data terminal equipment can be located a significant distance from the hub, so if a surge is induced into the data line close to the terminal, the majority of the surge voltage will appear at the terminal. That is why we recommend protecting every "node" in the network with an ESP power filter.

Should I protect my analog products?
Absolutely, field studies that have been conducted on large populations of analog machines show a significant cost savings when ESP power filters are used.

What will a power protection program do for my business?
Improve productivity, protect your investments, reduces your costs and saves you money. A real power protection program protects not only your equipment from catastrophic (lightning) and disruptive (noise or surges) damage, but protects your revenue and profits from erosion due to excessive service calls, replacing damaged and undamaged electronic parts, equipment downtime and misallocated service resources. Improve your bottom line and increase customer satisfaction. For more information go to our web site or click on “Contact Us” and an ESP Regional Manager or Sales person will be happy to answer your questions on how we help your business specifically.

What makes ESP’s Digital QC different? How can I convince my customers to spend $150.00 for your units when they can get one at Office Depot for $ 15.00?
How can a $19.95 surge protector be expected to protect a $2500.00 computer system, fax machine, or home entertainment center from the ravages of the increasing frequency of power spikes, surges and line noise?

The answer is simple. *It can’t*.....because it does not have the components and technology to provide the protection demanded by the latest sophisticated microprocessor circuitry at the heart of these contemporary “electronic wonders”. *“Come on. You’re pulling my leg. But what about that amber light on the protector?”*

ESP REAL POWER PROTECTION

FAQs

If the protector's light doesn't light up, it is simply indicating that the "protector" is no longer offering even "one-event" or "low-incident" protection.

An inexpensive surge protector can't provide enough protection because today's sleekly sized, affordably priced fax machines, copiers, audio, video and home theatre equipment and appliances are driven by microprocessors. One densely constructed tiny chip replaces thousands of components that enabled previous generations of electronics. However; one of the side effects of the microprocessor's density is the product's greater vulnerability to power fluctuations. Left unprotected, today's "electronic wonders" can be easily damaged, malfunction, or simply die. The answer in the commercial and industrial sector has been to use industrial grade power filters. Until recently, they were expensive-- but as a result of recent technological advancements, industrial grade power filters have become available to the average consumer at consumer price points.

How does an industrial grade power filter protect the equipment?
Equipment may not be functioning as it should--but you don't know why. The copier may be giving you weird messages. Or, you may be experiencing excessive jams in feeders and sorters, or inconsistent copy quality. Similarly, your fax machine may complain, "Line fail" and may refuse to transmit or transmit at a slower speed. Incoming faxes may even sporadically appear garbled or incomplete. Computer problems are even more surreptitious, since the effects of "dirty power" are rarely considered when files are lost or damaged and sensitive components like hard drives and CPU's prematurely crash. Often, a service technician is called--who makes an expensive "house call"--and who is likely to tell you "there's nothing wrong". Quite simply, your electronic products are under constant stress from "dirty power".

In most cases, today's "electronic wonders" are constantly attacked by an epidemic of electrical disturbances, such as: power spikes (a short burst of high voltage lasting less than 10 milliseconds), power surges (a burst of voltage lasting longer than 10 milliseconds), and electro-magnetic (EMI) and radio frequency interference (RFI) that effect power and data lines. The airwaves are loaded with signals from radios, TV's, garage door openers, microwaves, portable and cellular phones, power tools, power supplies, and electric motors. Another severely damaging contributor is lightening storms--and the sudden return of power after the electrical outage.

The solution is to add a power filter to prevent damaging the electrical disturbances from reaching this equipment. Within the area of power protection products, there are several classes of solutions. (1) low pass power filter technology (effectiveness limited, and parts are simple inductors and capacitors); (2) suppressor technology--BUT the best solution is a (3) hybrid suppressor approach. It is called hybrid, because it contains the first two approaches and functions as a result of more sophisticated components: MOV's, TVS diodes, and gas arresters. Each of these parts is assigned different characteristics and functions. This makes them effective against an entire range of electromagnetic interference frequencies and enables them to deal effectively with high voltage disturbances, regardless of duration.

This includes: **clamping level** (the voltage at which the protector stops damaging levels of voltage from reaching into the equipment. The lower the clamping level the better the protection; **response time** (the speed with which the filter can respond to voltage irregularities); and **energy dissipation** (the amount of power a device can handle. The higher the rating, the better the protection.) Electronic Systems Protection has carefully matched the protection levels to the products to be protected.

FAQs

Why are ESP Power Filters the affordable solution?
ESP industrial grade power filters employs patented multi-stage, new technology that provides the consumer with the best possible clamping and response time, and energy dissipation. The result is: superior equipment protection. In fact, ESP is so certain about the performance of their products that all of their products are automatically backed by a **written no time limit, no questions asked, full replacement warranty!**

How can a surge protector help save me service calls?
Most surge protectors will only save you from the service calls related to equipment fatalities following a thunderstorm... an ESP power filter like the Digital QC on the other hand... saves on service calls because our filters meet the "NO UPSET" ITIC/CBEMA Standard. By meeting this standard we help avoid equipment failure, downtime and disruption that comes from noise or dirty power. Fewer misfeeds, paper jams, data or logic lockups, and reduced phantom problem service calls are what our customers experience when they connect through an ESP power filter.

General Power Information

Should I be concerned about lightning damaging my equipment?
Yes, this is a very real concern. All ESP products have been designed to protect your equipment from the damaging effects of nearby lightning and thunder storms. ESP's products utilize hardened suppression technology capable of withstanding anything that comes down normal building wiring. Your sensitive electronics will not only be protected from damage, as long as the power is on, but protected against operational disruption as well. In the highly unlikely event that ESP's product is overwhelmed by an extreme and unusually severe event, ESP utilizes surge suppression that operate with a response time in the billionths of a second range. In the very worst case, ESP will sacrifice itself, tripping a breaker to turn off the power to protect your equipment.

What is the maximum voltage at an outlet from a lighting strike?
6,000 Volts at an indoor outlet, voltages greater than this arc over before reaching the outlet. ESP's products are designed to withstand thousands and thousands of 6000-volt surges repetitively while continually providing optimal power protection.

Is it important to protect phone and data (network) lines?
Yes, any electrical connect to your equipment is a pathway for high speed transients and high frequency noise into your sensitive micro processor based equipment, whether it is a computer, a printer, a phone system, a server, a scanner, a fax machine or even a refrigerator with an internet connection. All these products and devices have electronic circuits that utilize sensitive semiconductors that can be damaged by surges, spikes and noise. ESP's network and phone options incorporate state-of-the-art protection circuitry specifically designed to coordinate with the unique requirements of communication lines.

What about brownouts or under voltage situations?
Brownouts or under voltage situations are not usually a problem for the types of power supplies found in your sophisticated electronics today. These power supplies are known as "Switch Mode" power supplies or very efficient DC voltage regulators. Digital (micro processor based) technology is powered with DC voltage that needs to be very closely regulated. As a result an entire industry was created to design and manufacture regulated DC power supplies. Therefore it is redundant to put a voltage regulator in front of a voltage regulator. For some types of power supplies, using a voltage regulator could starve the DC voltage regulator inside your equipment. Fast moving transients and high frequency noise will go right through a power supply and right through many types of voltage regulators. The appropriate solution is a industrial/commercial grade power filter.

FAQs

What causes destructive power line surges?
Transients are normally characterized by high energy, (fraction of a Joule to over 100 Joules), high amplitude, (up to 6000V), single event, (nanosecond to millisecond duration), interference signals that are often damaging in nature. There are many sources of transients including natural sources such as lightning strikes, which induce energy into all conductors of power/communication grids, producing common mode transient interference.

Another source of transients includes large inductive loads, which when switched in and out of the power grid, dump inductive energy onto the power lines in the form of normal mode transient interference which propagates in the same manner as normal mode RFI.

Transient interference in the normal and common propagation modes can be the source of equipment disruption in mild cases or equipment damage in more severe cases. Thunderstorms and lightning are the most dramatic, but there are many other causes, many of which may be right in your building... These include: electric motors, air conditioners, elevators, microwaves, refrigerators, other office equipment, etc. Even TV, cellular telephone and radio signals can cause power disturbances.

Can these surges and spikes cause damage to my equipment?
Yes, modern, computer controlled office machines can be seriously damaged by voltage surges. High voltage surges can cause catastrophic equipment damage. Lesser surges and noise will degrade electronic components and create unnecessary service disruptions and costly downtime.

Is noise always present or is it intermittent?
In many environments, it tends to be intermittent, such as would occur when an air conditioning unit turns off or on, or when an elevator operates. In a factory environment, it may always be present.

What is electrical noise?
Electrical noise is the presence of any voltage at a frequency other than the operating frequency of the equipment.

We have clean power from our utility company, why do we need ESP?
The utility companies admit that they cannot provide clean, “computer-grade” power, due to external influences on the power distribution system (storms, lightning, equipment failure, grid switching transients, etc.). Electrical distribution is over 100 years old and was built for strong, unsophisticated electro-mechanical equipment not today’s sophisticated, sensitive digital equipment. That's where ESP comes in!