

SMART CIRCUIT



Electricity Controller – Applications

Electricians

Electricians can now install entry level Energy Management Systems (EMS) for their customers, greatly expanding their market opportunity. Previously, an EMS was so expensive and complicated that only specialized companies could be involved. Now with a starting price point of \$159, a browser based user interface, and installation as easy as installing an outlet, an EMS can be installed by any electrician. Easily installed at a breaker panel, SC's can be installed in multiples of 10 or one at a time for a specific circuit or load. Our convenient pre-wired enclosures makes adding 10 SC's a 1-3 hour install depending on site conditions.

- Immediately reduce customer's electric bill by automatic load shedding during peak usage
- Automatically turn off loads when business is not operating
- Sub-meter usage down to the circuit level
- Entry level Energy Management System
- Quickly measure line voltage
- Diagnose voltage drop or loading problems

ESCOs

Finally an EMS system that starts at \$159 for a single 20 A circuit, and is scalable to 100's of circuits! Previously, the capital outlay requirements for an EMS was \$50,000 minimum if not much higher. Installations were complicated, and the user interface required specialized training for both the installer and end user. This meant the market opportunity was limited to medium to large size commercial facilities, and industry. Now the SC makes an EMS appropriate for almost every commercial application that has a demand charge on their electric bill (which is most commercial entities). This greatly expands the sales & service opportunity for electricians, who are often too dependent on cyclical new construction. EMS is not seasonal and is part of the ever growing green movement. EMS involves high levels of customer interaction, so installs are not simply price driven bids. In addition, an EMS often involves annual expansion and service, providing an on-going revenue stream. Total system cost (including hardware, installation, and setup) can range from \$500 to \$10,000 +, offering a fit with almost any business size. See examples below for how a SC based EMS can apply to specific businesses in your service area.

- Save money by load shedding, automatically turning loads off when not needed, load shifting to off-peak times
- Provide metering data down to the circuit or load level
- Browser based interface so the end user can utilize the information and control themselves
- Simpler system design because SC's are combination units (meters and controllers) so only half the devices are needed

Farmers

Farming has become increasingly power intensive. Electronics, pumps, heating and irrigation systems are now commonplace. Although these devices sometimes cycle only a small portion of the day, the peak usage and cost can be quite high if they happen to turn on at the same time. Installing a SC on each circuit or major load can minimize when the loads are on simultaneously, thereby immediately reduce the peak usage and associated peak charge. With Demand charges typically \$5-10 per kw, each SC can save \$5-\$50 per month, or up to \$600 in savings per year*. Not bad for a \$159 device! (* savings calculated by switching load of 20A at 240v for 5kw @\$10/kw per month = \$600/yr)

- Save money by lowering the peak charge by preventing certain loads from running at the same time
- Save money by turning certain circuits completely off when not needed
- Remotely identify when loads are running in real-time, identifying problems more quickly (a pump running may indicate flooding)
- Track efficiency of pumps
- Determine run cycles

Facility Managers

Intense budget pressure to reduce utility costs, and stress from pending rolling blackouts that wreck havoc on sensitive equipment make the facility manager's job even more difficult. A SC can quickly and economically reduce a facility peak charge, without having to install a sophisticated \$50,000 system.

- Save money by lowering the peak charge by preventing certain loads from running at the same time
- Save money by turning certain circuits completely off when not needed
- With our open API, 3rd party providers offer integration with 3 phase facility meters providing overall visibility and detailed circuit level usage
- Record line quality
- Provides record of power interruptions and voltage dips that can be used to recover compensation for service level agreement (SLA) violations

Auditors / Inspectors

Field inspectors and auditors need to quickly identify electricity waste and communicate it to the client. This requires accurate initial baseline data. However on-going data is also extremely important to validate improvements and measure success. Smart Circuits provide permanent remote access to data 24/7. This provides for an on-going client relationship, enabling you to provide monthly or quarterly reports on progress well into the future. In addition, Smart Circuits capability to switch loads off gives you the ability to provide direct savings to the end client all in one package. A complicated EMS is no longer required.

- Report usage and cost on a circuit or end load level basis
- 24/7 power profiles show time-of-use
- Load switching capability provides immediate savings from load shedding and direct turn-off of loads
- Install the SC on circuits of interest for on-going remote access to data 24/7
- The duty cycle feature can also quickly determine if motors are running continuously instead of cycling on and off.

Restaurants

Almost every restaurant has a walk-in refrigerator, walk-in freezer and exhaust fans that are tied into cooking equipment. For a minimal investment, even small restaurants can significantly reduce their peak charges.

- Test different control parameters during product design
- Utilize as a sales tool during sales presentations or point-of-sale displays
- Reduce peak usage by profiling lab and assembly equipment

IT

Computer and data networking equipment is vital to most organizations, so power disruptions must be avoided. Smart Circuits installed at the rack level, or Watts up? meters plugged in next to your desk conveniently records line quality with time stamped records of dips, surges, and interruptions. Watts up? can also save considerable money by sizing UPS requirements to actual needs instead of generic listings on labels.

- Inexpensive reboot device controlled remotely via the internet
- Provides time stamped record of dips, surges and power interruptions that can be used to recover compensation from service level agreement (SLA) violations.
- Save money by not over sizing UPS requirements
- Diagnose equipment problems based on increased power draw
- Optimize rack configuration to avoid extra 15A circuits, which typically run \$200 per month

Landlords

Smart Circuits provide permanent reporting of tenant usage and cost. Regardless if it is tenant or landlord paid utilities, Smart Circuits and Watts up? meters educate tenants of their usage and reduce controversy over utilities. Sub-metering or surcharges for special items (space heaters, Jacuzzi, etc) can also be accomplished fairly and objectively.

- Computer printouts of usage help mitigate disagreements.
- Report usage and cost on a circuit or end load level basis
- Record costs for high usage items.
- Establish baseline and peak usage parameters
- Calculate ROI for energy efficient appliances

Manufacturers

Companies that produce energy efficient devices utilize Smart Circuits and Watts up? meters in the design area and sales department. Smart Circuits provide permanent real-world usage data from the field. Because the data is provided over the internet, remote access without interrupting or involving the end user is possible. This enables the manufacturer to actively test different field scenarios with their product and get real-time data. Watts up? meters are a fast way for designers to get accurate power profiles under different conditions, enabling optimization of different control parameters. The one second sample rate is fast enough to capture startup and steady state usage. The sales department will embrace Watts up? as a powerful sales tool that will literally do the talking for them. Side-by-side studies are easy to implement, and the Payback Calculator provides specific ROI analysis.

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Service Repair

Field diagnostics frequently incorporate power and voltage measurements. Motors have clear power profiles and problems can be easily identified. Standard DVMs require access to internal wiring and cumbersome probes. Power readings are even more difficult, and typically depend on manual computations that inevitably do not capture phase angle shift inherent in all inductive motors. Instead, simply plugging in the Watts up? meter can often identify problems in seconds. Furthermore, the logging capability of the PRO enables profiles to be sent back to the main office for comparison and further analysis.

- Add as standard tool in case
- Record and graph power usage to identify irregularities
- Peak value displays current surge and magnitude of voltage drops
- Faster, easier, and more information compared to using probes

Utilities

With high resistance to new power plants, utilities must implement conservation programs aggressively. Utilities in virtually all 50 states are using Smart Circuits and Watts up? meters in a variety of programs to directly reduce consumption, educate their customer base on leakers, phantom loads, space heaters, and other energy hogs. Smart Circuits are similar to switches utilities put on users AC condensers, but provide load switching control to any 100-250v device.

- EPRI gave Watts up? to all it's members. Full article.
- Dominion Power distributes Watts up? to their customer base via their retail sales channel.
- Madison Gas & Electric supplies Watts up? meters to area libraries for check out. Full article.
- Xcel supplies Watts up? meters to libraries in Denver and Minneapolis
- Austin Utilities makes Watts up? meters available to residential customers. Full Article
- Utilize the .Net on water heaters, entertainment systems and other loads for automated load shedding during peak times, similar to an energy smart switch on an AC unit.

Weatherization

DOE materials specify Watts up? for refrigerator replacement programs. The cord is convenient and avoids retests that are needed when meters that plug directly into the outlet fall out. Peak readings for both current and wattage are displayed, but the duty cycle display even more definitively shows compressor run time. Recording the data with the PRO provides written documentation of the test results, and the Payback Calculator enables the homeowner to see the savings for themselves.

- Complies with DOE recommendations
- Duty cycle confirms run time of compressor
- Six foot cord provides convenience and reduces retakes
- Documented test results provided