



Monitoring your way to higher profits



There has never been a better time to measure and monitor your energy use. Rising energy costs are having a serious impact on some businesses, and the imminent Streamlined Energy and Carbon Reporting (SECR) regulations, which take effect in 2019, will require some 12,000 UK businesses to make their energy use, carbon emissions, and energy efficiency actions, publicly available alongside some reference comparison metrics.

Monitoring power and energy usage in a facility or installation can often identify hidden issues that affect both operational and environmental quality, can pinpoint the reasons for higher than desired energy use, and can reveal the causes of more frequent equipment repair and replacement.

Measuring and recording the performance of energy-using equipment over time, and periodically monitoring critical machinery and high energy consuming building equipment to ensure proper operation, is the only way to verify whether the equipment or system performs optimally. Studies by the Carbon Trust show savings of up to **20%** can be achieved in this area through energy efficiency measures such as, but not restricted to, installing variable-speed drives for fans, pumps, and other motor driven systems.

Up to **40%** of a building's electricity use is accounted for by lighting, and installation of occupancy sensors can reduce electricity use by **30%**. Adjusting the artificial lighting according to the amount of natural light in a room using daylight sensors or photocells can reduce electricity use by up to **40%**, and of course there's simply replacing existing lighting with LED modules. Many LED replacements consume **80%** less power than an incandescent bulb with the same light output.

But, only by measuring and monitoring energy use can all of these things be identified and rectified, with before and after energy use figures available to calculate savings, and justify any necessary expenditure.

Apart from these efficiency measures, permanent monitoring of an installation also allows other parameters such as power factor to be measured and recorded, and there is an increasing trend in facilities unknowingly operating at poor power factor. The problem is that as they evolve and install new equipment over time, and as any previously installed power factor correction equipment slowly "wears out", which it does, their power factor decreases.

So, while business owners and accountants are worrying about energy prices, many are completely unaware that for the sake of some simple monitoring and correction equipment, their business may be seriously falling short of what is required to be electrically efficient. In fact, alarmingly, recent studies showed many examples where as much as **50%** of the electricity being consumed by some businesses was literally going to waste.

Other issues that can be identified and measured through the continuous monitoring of an installation include harmonic currents. These are on the rise due to increasing numbers of installed LED lighting and improved efficiency VSD's, which, while saving energy, can also introduce their own problems to the installation supply.



Thankfully, measuring energy consumption, including where and when it is being used, and monitoring other parameters such as power factor and harmonics, has never been easier thanks to portable **Power and Energy Loggers** or **PELs**.

Modern PELs are compact, lightweight, electronic monitoring instruments used for collecting electrical data. They can be temporarily placed in distribution panels or around the facility without difficulty, and without the need to interrupt the mains supply or shut down the installation or office building first.

PELs gather data and calculate electrical parameters such as 3-phase current, voltage, power and energy, and are also able to indicate phase angle $\cos \phi$, $\tan \Phi$, power factor, THD and harmonic levels.

They are capable of storing millions of readings, and data can be retrieved locally or remotely via Bluetooth, USB or Ethernet. Combine a number of PELs together for the ability to track several consumption points around the facility, or multiple facilities, without the expense of travel to retrieve the data.

PELs can be moved around a facility for local monitoring of a piece of equipment, or department, where they can be connected by an electrician, with no intrusion into the electrical wiring, and therefore no need to interrupt the power.

Once any required local monitoring is finished, with super slim designs and magnetic backs, many PELs are able to be semi-permanently stuck to the inside of a cabinet at the source of supply, where flexible current coils can be looped around the incoming phases, and magnetic voltage probes stuck to screw heads on MCB's, or wired in for added security of connection. These PELs can be self-powered from the installation they are connected to, and if plugged into the local network, a whole host of parameters can be monitored with alarms set to warn of any issues.

So even if its permanently installed metering that a business requires, with the issues and cost of retrofitting an older installation with panel mounted equipment, requiring the installation to be power down for some time and holes cut in metalwork, it could be the most cost-effective solution is to semi-permanently install a PEL.

Monitor it from a desktop, keeping an eye on energy usage over time, as well as power factor and harmonic content, with alarms set to warn of issues.

A permanent solution to monitoring your way to higher profits - until it is required to be used somewhere else.



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