

# Saving electricity with VO

Voltage management company, **e-efficient Energy Systems**, explain that despite some scepticism within industry, there are some companies that present a clear and honest approach to voltage management initiatives and should be able to help you benefit from some of this new technology

**A** key question that has to be answered within industry, is how best to manage electricity consumption to limit cost impact as energy prices continue to rise.

During Edward Heath's tenure as prime minister back in the 1970s, we were told to simply 'use less electricity' - and the message then was simply to turn something off. Nowadays things are more complicated with a raft of 'sticks' and 'carrots' designed to encourage us to use less, but also to penalise us if we continue to use electricity, and today's government believes that everyone should pay a levy towards creating a more sustainable energy industry.

## A level of concern

Of course it would be fantastic if worthwhile reductions in electricity bills could be achieved just by encouraging people to turn things off - but we all know this doesn't work. Fortunately there are a raft of products coming onto the market, but again there is a problem as there is a growing awareness and concern that many of the so-called 'breakthrough' energy efficiency products have been over hyped and missold with LED lighting, boiler control

systems and voltage optimisation systems being key culprits.

There must be 100s of LED lighting systems on the market but the variation in performance makes it a more than challenging task to determine which one actually will deliver value for money and deliver the benefits that the supplier claims.

Voltage optimisation systems exploded onto the UK market some ten years ago and the initial experiences of many end users were so bad that many 'proper electrical engineers' refuse to countenance the idea of having a voltage optimisation system on their site. The key issues they faced were that in many cases the electricity savings that were promised just never materialised, and with the occasional system in permanent bypass due to being under specified, arguably they had a point.

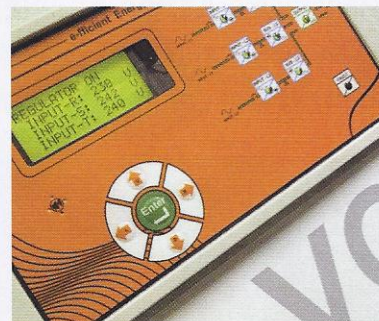
## Facing reality

The truth is, not every company can cost effectively benefit from voltage management solutions - and there is a growing realisation that the basic voltage optimisation 'step down' transformer systems on which the industry started, just do not offer the continuity of supply or the most effective way for companies to maximise their electricity savings. Advances in voltage management techniques have moved the focus away from just 'stepping down' the incoming voltage, but now enable intelligent voltage regulation, giving the customer a controlled and regulated supply whatever the fluctuations to the incoming supply.

These advances in voltage management technology come at a time when the concept of voltage management itself has just been given a strong vote of confidence by the Carbon Trust.

Late last year the Carbon Trust published its explanation of the benefits of voltage management, how it works, and outlined a methodology on how site surveys should be conducted. This has developed a minimum standard for the industry and has really helped potential customers understand what voltage management is all about and how it is, or is not, applicable to their needs. It confirms that the technology will reduce electricity usage but not on every type of electrical device.

Right: front panel of the eVO+R Voltage Optimisation plus Regulation system



Voltage management works because most incoming UK voltages are not at the 230V we expect, but in reality the average is typically nearer 242V and by reducing this incoming voltage to a level more appropriate to the optimal level required to operate on-site electrical equipment, there is the potential to save money - but only if the electrical load is what the Carbon Trust calls voltage dependent.

## Voltage dependent

These devices consume power proportional to the supply voltage - the higher the voltage the higher the power consumption - and if you reduce the voltage you'll use less electricity. A one percent decrease in supply voltage will cause a two percent reduction in power demand - saving you money. Examples of voltage dependent devices would be incandescent lamps (T8 & T12 type fluorescent lamps), many motors and air conditioning units.

All buildings will have some electrical devices which do not respond - the Carbon Trust terms these voltage independent - and these are designed to consume energy regardless of the supply voltage and with these, savings are not possible i.e. T5 and LED lighting, ICT equipment and VSDs.

Left: eVO+R Voltage Optimisation plus Regulation system



## Summary

To determine whether voltage management will work it is no longer acceptable to just pop a mini-voltage logger in the post and hope for the best. A detailed site survey needs to be conducted, identifying the proportion of the load which is voltage dependent, and this should be coupled with a week long evaluation of the voltage and load profile. This comprehensive approach needs to be followed in order to determine the correct system size requirement and an honest appraisal of the potential for savings.

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