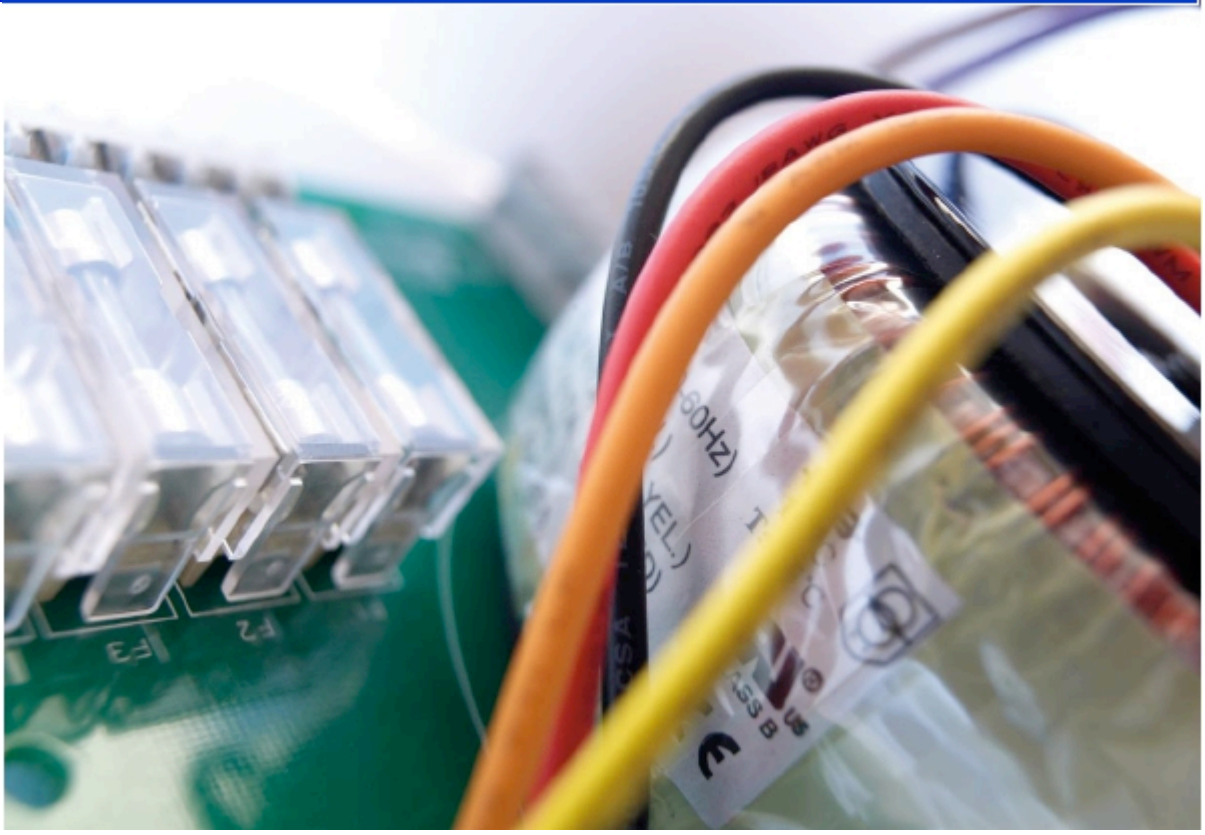
DYCON
power solutions limited

Power supplies – the heart of every security system



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Every security system – whether it's an intruder alarm, fire alarm, CCTV or access control – has a common component that, if correctly specified, ensures that the system operates reliably, day in and day out. And yet, most specifiers and installers fail to understand how this component operates and how it can improve the system's performance.
What is this component?

The Power Supply Unit (PSU) – the critical 'beating heart' of any system!
We expect security systems to be fully functioning 24/7/365 yet, although we outline a specification for a control panel, detectors or equipment, we rarely give the PSU much consideration, often treating it purely as a 'commodity' or listing it in tenders as a 'PC Sum'. People who think of PSUs in terms of a metal box that houses a battery and PCB are missing out on recent technological innovations that enable any system they fit to perform more effectively, reliably and economically.

Developments in PSU technology
Traditional PSUs deploy conventional linear technology to deliver 12/24vDC at 0.5A-5A. This technology is inefficient – typical efficiency is less than 30% because the circuitry generates considerable heat when converting the 230vAC down to 12/24vDC. Nowadays, switched-mode technology is a superior option.

Why use switched-mode PSUs?
A switched-mode PSU's circuitry is over 90% efficient; it doesn't waste electricity by generating excessive heat when it converts 230vAC down to 12/24vDC. The resultant cost savings often mean initial capital cost payback periods are as short as four months, with substantial savings ongoing. It's a far more efficient way of charging standby batteries too. Under less strain, they enjoy an improved battery life of up to 12 months. This feature alone can reduce the probability of service-call expenditure as the battery gets older.

Switched-Mode Power Supply Technical features?

A typical Dycon switched-mode power supply incorporates a switching regulator, which means:

1. Greater efficiency, as the switching transistor dissipates little power in the saturated state and the off state compared to the semiconducting state
2. Smaller size and lighter weight as the high-weight, low-frequency transformers have been eliminated
3. Stable output to limit of stated capacity – ripple less than 50mV p/p
4. Output current ranges from 0.5A to 5A mean there is a size for most applications
5. Over 90% efficiency, which means lower running costs and less energy wasted through heat – units run cool compared to linear designs

Other benefits of Dycon switched-mode technology include:

1. Very little heat to dissipate means easier installation in consoles, cupboards, ceiling voids and other places suited to cabling.
2. Totally integrated PCB “transformerless” design
3. Smaller footprint
4. Built-in AC connector
5. Easy-fit, plug-on battery connector leads
6. AC power input surge and transient protection
7. Power supply overheating protection
8. Power supply over-current protection
9. Under- and over-limit AC power protection
10. Battery-reverse connection protection
11. Battery charge over current protection

How can this improve security system operation?

For intruder alarm systems, the Dycon EN50131 versions include the following operation features and benefits, which are rarely found in conventional linear units:

1. Powerful and flexible battery-learn feature to automatically configure the number of batteries used to suit different power supply backup requirement
2. Power supply monitoring:
    a. Battery low-voltage monitoring
    b. Power supply operational status check
    c. AC power monitoring
3. On-board status display for:
    a. Power supply OK
    b. Battery OK
    c. AC power supply OK
4. Normally-closed floating alarm outputs for:
    a. AC Power fault
    b. Battery fault
    c. PSU fault
5. All DC power outputs/inputs protected by auto resettable fuses which substantially reduces engineer on-site time and cost

Additional features and benefits for access-control systems

Access-control systems benefit from all the switched-mode features and benefits previously mentioned but specifiers and installers need to remember that, unlike typical intruder alarm

systems where power requirements are often quite modest, access systems include components that often require considerably more power to operate. Intruder systems frequently require 1A PSUs and still have power to spare, but magnetic- and electric-door releases are often more power-hungry, 3A and 5A units being quite common. The Dycon switched-mode 3A and 5A PSUs provide sufficient reliable power to ensure the system operates correctly.

High-power door releases and electric locks create a common but often unrecognised problem: an electrical interference 'spike' that can blow a PSU's fuses, resulting in a locked or unlocked door, annoyed users and a service call. The Dycon switched-mode PSU anticipates this problem with circuitry that protects against such spikes and keeps the door operational.

Additional features and benefits for CCTV/video systems

Dycon offers a full switched-mode range of 1A, 3A and 5A PSUs with multiple outputs and built-in video connectors (when used with the four-way power splitter with video connections) enabling all CCTV/video systems to benefit from the improved performance that the technology brings.

A little known, but quite common video-image problem can easily be remedied with Dycon switched-mode PSUs. Many CCTV cameras operate on 50KHz – as do virtually all commonly used PSUs – resulting in interference patterns on the received images. Installers often struggle to locate the source of the problem and resort to changing cameras or shielding the cable. All Dycon switched-mode PSUs operate on 66KHz, eliminating any chance of this problem ever occurring.

Some specialist cameras operate within a very tight voltage specification, deviation from which can cause the camera to malfunction. In these situations Dycon has a special constant-voltage PSU whose output voltage can be adjusted from between 12VDC and 15VDC with the potentiometer. The output can be measured using a suitable meter. The voltage will remain constant at the selected value, even when running on battery power only.

DIN-rail PSU solutions for major sites

Increasingly property developers demand that DIN-rail cabinets are used for power distribution within large buildings or complexes. Security installations need not be left out of this trend; Dycon's latest range of DIN-rail mounted units bring a new, easier-to-install, cheaper switched-mode alternative to the conventional boxed PSU. These offer a more efficient and economical way of providing 12vDC or 24vDC power to a vast array of applications. Utilising existing, on-site DIN-rails and cabinets, these switched-mode PSUs need no additional housings, thus reducing both equipment costs and expensive onsite time. No fixing screws are required as the units simply clip directly onto either an N32 G-section or an N35.7 Top-Hat section DIN-rail. Additional units can be added at any time by simply clipping them onto the DIN-rail and connecting the cables – no need

to find space and time for a conventional housing fitting. Dycon DIN-rail power solutions are ideal for most security and industrial applications, electromechanical devices, data communications, IT systems, power distribution boxes, building automation, control systems and much, much more. There is even a 110vAC version for the construction phase of large sites which can easily be swapped for a standard 230vAC unit when the building is commissioned.

Network Power Solutions

Many of today's security systems are linked to, or are part of, IT networks and there's an easy-to-install switched-mode solution for all such systems, Power-over-Ethernet (PoE).

Dycon's Mid-Span PoE solution provides a full 35W per channel in 4, 8, 12 or 16 channel 19" rack units, which can power any suitable device. Installation is very simple and just involves plugging a standard ethernet cable from the device into the appropriate output socket, then plugging the input socket into the network. Should the powered device require repositioning, the network cable can easily be altered to suit. Again, since the unit is a switched-mode device, very little heat is generated and no noisy cooling fans are required, so the unit can easily be fitted in quiet areas, inside consoles or even in prestigious residential properties.

Quantifying the financial benefits of switched-mode technology

Are you aware how much it costs the end user simply to have a security system switched on? A traditional 12vDC 1A linear power supply will use at least 262kWh of electricity which, at current costs of between 11p and 16p per kWh, means an annual outlay of between £29 and £42 just to have it running 24/7/365!

A Dycon 12vDC 1A switched-mode PSU uses considerably less electricity, each PSU saving the user at least 131kWh p.a., or in cash terms between £14 and £21 p.a – and those prices will rise even higher in future!

For further information on using switched-mode technology, or for a simple ready-reckoner so you can calculate the potential savings on your electricity bills by switching to Dycon switched-mode units, please contact Dycon today:

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