First line of defence

The UK's rail network is increasingly reliant on IT, and its communications and control infrastructure needs to be protected by robust and reliable cabinets, cabins and modular data centres, preferably from **Cannon Technologies**

24,500 trains run on the nation's railways every day, and in order for them to run as smoothly and as safely as possible a seamless communications and IT network infrastructure is vital. However, with a growing number of disparate technologies, such as customer information screens, CCTV, access control, ticket machines and signalling, all operating at the same time, the equipment needs to be protected by state-of-the-art passive and active electronic cabinets.

Work in progress
Network Rail recognises the role that IT is playing in transforming the UK's Victorian infrastructure into one that will be able to support an estimated 400 million extra passenger journeys by 2020.

Central to this objective is Offering Rail Better Information Services (ORBIS), a five-year £325 million project to improve Network Rail's approach to the acquisition, storage and usage of asset information. Network Rail hopes this strategy will transform a 'fix and fail' model into one based on 'predict and prevent'.

Work has already begun on a new traffic management strategy, which involves implementing the technology to support the phasing out of signal boxes and creating 14 regional rail operating centres across the country. 800 signal boxes nationwide will eventually be removed and the new automated system will allow large areas of the network to be controlled from fewer locations, which will cut costs by around £250 million a year, while improving efficiency and reducing delays.

In addition, controllers and monitors are currently being placed on the tracks to feed information to a system that allows maintenance workers to fix an issue before it causes a train delay. It's already estimated to have reduced delays for the travelling public and freight operators by hundreds of thousands of minutes.

Safety information
Keeping passengers safe and up-to-date with real-time information is a top priority for rail franchise operators. The use of CCTV within train stations has grown rapidly over recent years and is widely deployed on platforms, concourses and trains. As well as making passengers feel safer, particularly in smaller remote or isolated stations, CCTV has contributed to deterring criminals and providing evidence in the investigation of crimes.

Customer information screens are also being upgraded to modern systems that provide accurate up-to-the-minute information concerning arrivals,

The C-TYPE is a Network Rail PADS-approved cabinet for communications or electrical infrastructure components

departures and delays. For those who wish to access travel information and book tickets online Wi-Fi is a must. In February 2015, Prime Minister David Cameron announced that passengers will be able to access free Wi-Fi on trains throughout England and Wales from 2017, thanks to nearly £50 million of funding from the Department for Transport.

Always on
Although anything that improves the passenger experience and overall efficiency of the rail network should be welcomed, such reliance on IT means that downtime must be avoided at all costs. Put simply, with so much technology running over the network infrastructure, any interruption to its performance could throw the whole railway system into chaos.

A failsafe way of maintaining the integrity of a network is through the use of high quality active cabinets that protect the sensitive electronic equipment within them. Adopting the attitude that all cabinets are the same could create problems in the short and long terms. There are products on the market that are manufactured to both enhance functionality and offer greater flexibility, with features that can save time and money.

Active cabinets are used in a wide

Cannon's S-TYPE cabinet range provides up to IP65 sealing against water and dust ingress, along with the necessary cooling for customers' specific requirements

Cabinets can be placed on standard Network LOC roots and wooden platforms, as seen in traditional station sites or modern gantry platforms. This variant provides front and rear-door access to the equipment chamber for ease of installation and maintenance

variety of outdoor locations both station-side and platform-side and are often the first line of defence, meaning they must be as difficult as possible to move or infiltrate. It's because of this that they're usually installed using Network Rail's standard LOC (location cases) bases, or using a 'transformer root' mounting system for attachment to either a steel platform or concrete pad.

Tough call
Exposed to the elements, cabinets are designed to resist the effects of sun, rain, dust and other debris, and must be robust enough to withstand damage from vandalism.

That's why Cannon Technologies constructs cabinets from 2mm thick Z600 pre-galvanised steel sheets. Z600 denotes a total of 600gm/m² of zinc applied in an oxygen-free atmosphere to the steel substrate. The weight of the zinc equates to a thickness of 42µm per side, from which a life expectancy of 28 years can be expected without additional treatment. According to trials conducted by the Galvanisers Association, the average consumption of zinc from externally exposed galvanised products in the UK is 1.5µm per year.

Powder coating adds another layer of protection and can be adapted to meet specific colour requirements. Being made from light colours, it has the additional advantage of reflecting solar light and being UV resistant, which directs heat away from the active components contained within – minimising solar heat gain. This is vital because it ensures that the environmental conditions within the cabinet are kept within defined parameters, maintaining the correct operation of the equipment housed inside. Thermoelectric devices are used to provide active cabinets with an IP65 rating, resulting in no ventilation or change of air between outside ambient and internally circulating air.

Lock up
Protecting cabinets and preventing unauthorised access to the equipment inside them is achieved through the use of sophisticated locking and access control technology. Cabinet locking systems can be approved to The Loss Prevention Certification Board's (LPCB) LPS1175 Security Ratings, providing the necessary delay and means of detection required to protect against intrusion, including the use of a wide variety of power tools.

Train operating companies are also aware that issuing keys to every engineer or subcontractor who needs access to a cabinet is both impractical and a security threat, should it be lost or stolen. Therefore, remote keyless locking and unlocking has been enabled.

By integrating each cabinet into the network, personnel can call the relevant ROC once they are on site to unlock the unit, and then lock it again once work is completed. For those requiring even higher levels of physical security, locking systems can be used in conjunction with a personal identification number (PIN),

Cannon has developed its stainless steel level locking handle to meet stringent security requirements. It also offers the use of commercial 'double D'-type lock cylinders and the option of remote and local electronic access through RFID, biometric, keypad or the company's DCIM software

a radio frequency identification (RFID) device or even biometric fingerprint identification.

Bigger picture
Although securing individual cabinets is crucial, such is the need to keep an IT infrastructure up and running that a backup data centre facility is increasingly considered necessary as part of a disaster recovery strategy.

Transportable modular data centre (TMDC) systems offer all the functionality of a conventional data centre but are also energy efficient with low power usage effectiveness (PUE) ratings. They come with full size 19-inch or electrical control cabinets, and each unit is supplied prefabricated with power, cabling, hot/cold aisle containment and cable management. Other key features include pre-installed servers, switches, uninterruptible power supply (UPS) and fire suppression systems, LED lighting, and power distribution units (PDUs). Maximum layout flexibility facilitates a data centre solution that is easy to configure, fast to install and which minimises disruption, while making sure that downtime is avoided.

On track
As the public's reliance on the rail network increases, IT will continue to deliver a leaner, more efficient and reliable system that also provides greater value to customers. Active cabinets, cabins and modular data centres are at the forefront in providing a temperature controlled and secure environment for valuable and sensitive active equipment. They create a first line of defence in maintaining a communications, control and IT network that keeps working no matter what.

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Dri-Therm is an innovative trackside cabinet that prevents premature failure as a result of condensation within fibre and electrical connections. It does this without the need to provide cooling, heating or anti-condensation devices