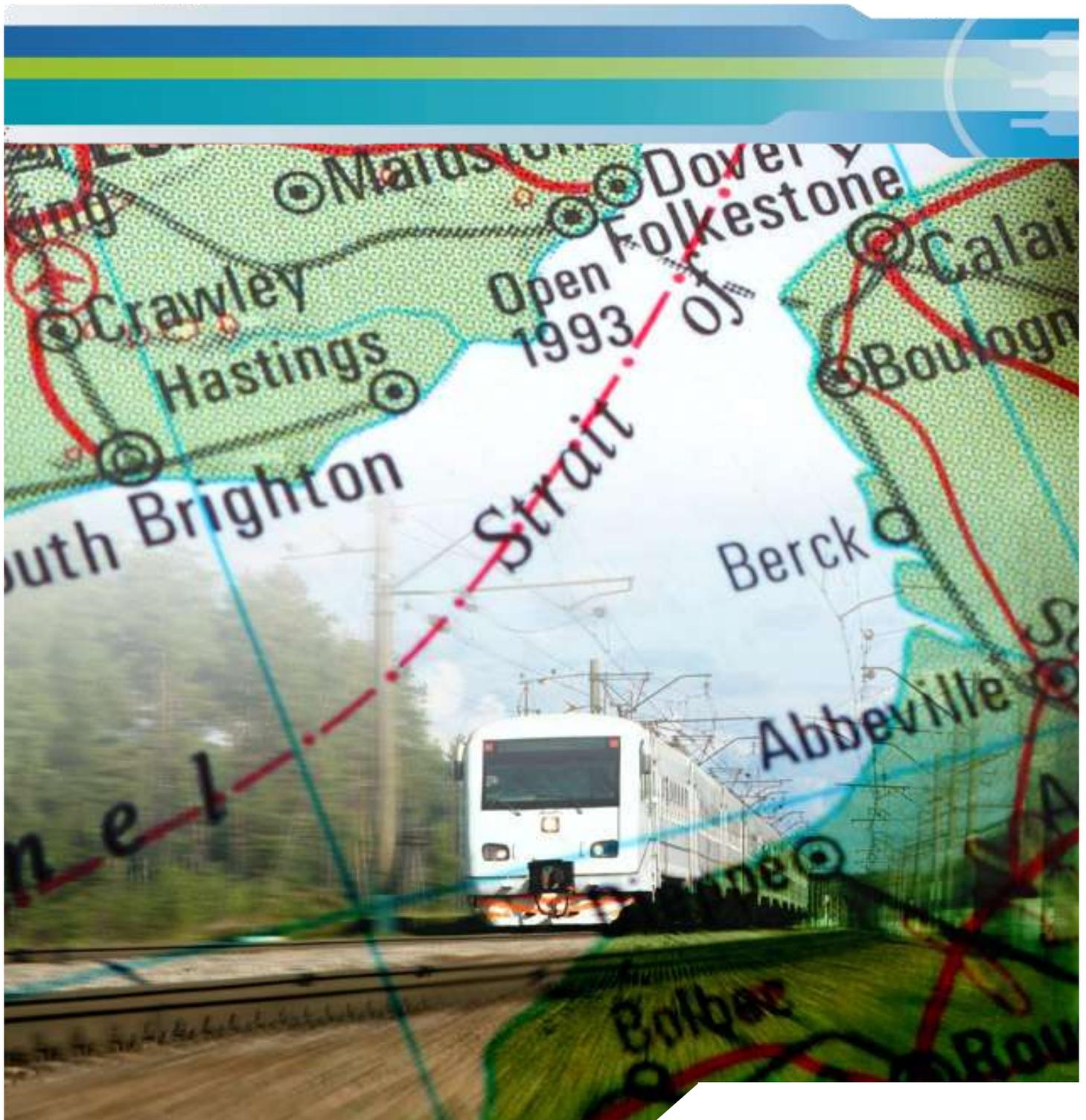


## STACKING UP FOR SUCCESSFUL MONITORING

**Eurotech's innovative** STACK 104 rugged modular system is proving itself across a range commercial and defence projects. Typical of these is an application which delivers 24-hour monitoring of electrical substations on European railway networks.

CASE STUDY



## STACKING UP FOR SUCCESSFUL MONITORING

Electrified railways need accessible and safe power at all times and Eurotech has been cooperating with a leading company specialising in the supply of DC traction power substations to rail operators throughout Europe. The customer required a rugged PLC (Programmable Logic Controller) to handle processing for a new substation monitoring system, covering aspects including protection, monitoring, control and communication functions.

Eurotech's STACK 104 system was chosen due to its high flexibility and modularity which enabled it to be easily modified to meet the customers' specific requirements. Working closely with the customer through prototype phases, the Eurotech engineering team created a bespoke version to meet both the needs of the customers vision, and the regulatory framework mandatory for deployments on the European rail networks.

The application required the PLC to analyse electrical current gradient and voltages through cyclic measurements at the supply point of the substation to the catenary (overhead line) that supplies power to the locomotive's pantograph. Measurements are made via an electronically isolated transducer.



As well as meeting these performance requirements, rigorous assessment also confirmed the STACK 104's capabilities to meet stringent regulatory standards for the railways, notably IEC60255.

The main technical standard covering electrified rail network static applications, IEC60255 deals with a range of constraints including:

- Surge requirements
- Electromagnetic interference
- Mechanical requirements
- Temperature/humidity resistance
- Galvanic isolation (namely isolating functional sections of electrical systems)

Eurotech's STACK 104 proved its ruggedised credentials and demonstrated that its modular configuration allowed for customised design to meet the demands of the application with complete accuracy. One of the key benefits is that it is fully configurable, which allowed the customer to adapt this solution into a range of products suitable for winning business in different markets throughout the world.

### SCALABLE AND FLEXIBLE

The STACK 104 is a highly effective innovation from Eurotech's engineers, consisting of modular boards installed in a purpose built frame, to which flanged end plates are added to complete an enclosure. This arrangement essentially allows the system enclosure to be built up as boards are added such that the number of boards is not constrained by the physical dimensions of the case, but rather that the physical dimensions of the case are a function of the boards selected. A variety of CPU (Central Processing Unit) and power supply systems are available for different applications. Additionally, a range of I/O (input/output) modules can be integrated to expand the stacking system.

There are three basic areas of functionality:

- CPU head
- Power supply

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- I/O boards (including Fast Ethernet, CAN BUS, Isolated Multi-Serial Ports, Isolated Digital I/O and hi-speed USB 2.0 ports)



Information on current detection (via shunt or Hall sensors) and voltage detection is channelled through measurement amplifiers from the feeder, while control and monitoring data is picked up from the high speed circuit breaker. Information is transferred to SCADA (Supervisory Control and Data Acquisition) via Field Bus industrial computer network protocols. The substation application sits on top of a Linux operating system and uses an application interface based on the STRATON PLC kernel to allow user coding via languages in compliance with IEC 61131-3 international standard.

Easily assembled and built on a modular “Lego” system architecture based on stacking standard PC/104 modules, the STACK 104 is fanless, lightweight (300g per module) and has an operating temperature range of - 25°C to + 70°C. It is resistant to harsh environments and tolerates installations experiencing high levels of vibration, while its use of high density connectors allows for high density I/O and high levels of isolation. These benefits make the system ideal for applications relating to feeder driven trains or metros.

### SERVICE QUALITY FOR A DYNAMIC INDUSTRY

Eurotech’s experience in engineering solutions for severe environmental and operating conditions has been an important factor in the success of this project and in the customer’s ability to expand its application into markets worldwide.

Eurotech’s in-house engineering and technical support teams deliver significant value add to all customers and provided a working solution designed to the exact requirements of this project from day one. This has included the ability to meet tight project deadlines. For example, in another project, Eurotech built, tested and delivered two complete sets of the STACK 104 configurations to an end user in Asia within three days of notification. The commitment from Eurotech **doesn’t stop** there, with continued support being offered to all customers beyond the finalisation of the project.

The railways are experiencing a renaissance in popularity, partly due to rising fuel costs and concerns about the environmental impact of road transport. There have been huge advances in railway technology in parallel with exciting developments in power electronics and microprocessors. This is a dynamic and expanding sector in which Eurotech is playing an important and prominent role with leading edge **cost-effective solutions designed for today’s** requirements.

For more information on Eurotech please visit our website [www.eurotech.com](http://www.eurotech.com) or contact our sales team at [sales.emea@eurotech.com](mailto:sales.emea@eurotech.com).