

SECURE DIGITAL MAINTENANCE

Prevent exposure of on-board systems to cyber risk, and improve the efficiency of maintenance practices



DIGITAL MAINTENANCE DEFINED

'Digital Maintenance' describes any corrective or preventive maintenance carried out on electronic systems on board the train. It refers to the use of electronic equipment to connect to an on-board system for the purposes of viewing data, diagnosing performance issues, testing and updating configuration. This includes any on board electronic systems with an accessible interface, hardware or software and can be carried out in person or remotely.

ISSUES WITH CURRENT MAINTENANCE PRACTICES

In the rail industry, ongoing maintenance has always been a mandatory requirement to ensure reliability, availability, maintainability and safety of the operations. As rail ecosystems become increasingly digitised, new cyber risks may be introduced through the digital maintenance process itself, so there is a strong requirement to securely manage this process over the life of the asset.

PASSWORD MANAGEMENT

Passwords are generally required to access systems but the management of these passwords frequently falls short of recommendations given in many cyber security standards and guidelines. Default credentials may be in place; shared admin accounts are common, and password sharing for these accounts takes place via insecure methods and mediums; there is no enforcement of minimum password strength.

RELIANCE ON PHYSICAL ACCESS AND SECURITY

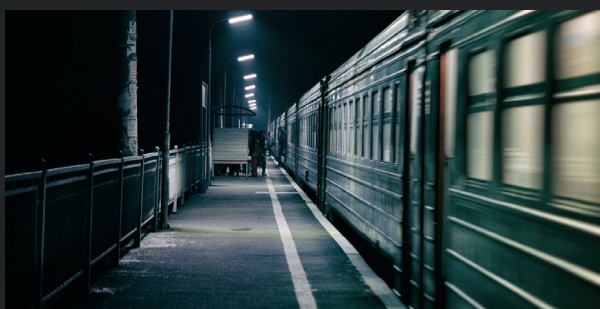
Many current maintenance practices involve service staff having to physically visit the train to connect a laptop and run software processes onboard. Operators having to send specialised staff to train units to carry out maintenance tasks is costly, time consuming and inefficient. Additionally many trains rely on physical barriers to accessing on-board networks and systems, but when that barrier, such as a panel, is removed then no further restrictions are in place to secure access.

LABOUR INTENSIVE AND ERROR PRONE MANUAL PROCESSES

Operators are currently employing inefficient and time consuming maintenance practices that could be easily automated with scheduled tasks or run in parallel across a fleet. In addition to the cost and inefficiency of operators having to send staff to train units to carry out maintenance, this also means leaving maintenance tasks susceptible to human error such as missed systems, incorrect firmware versions installed and replacement units running old firmware.

INADEQUATE CONTROL OF SERVICE LAPTOPS

The use of service laptops is an ongoing security issue in the rail industry, as these laptops are poorly controlled and are often used by maintenance staff to run external or unauthorised software. Longevity is another issue, as over time the laptops are also rendered obsolete, with unavailable security patches and hardware replacement proving to be exceptionally difficult within the near lifetime (less than 10 years) of the train delivery.

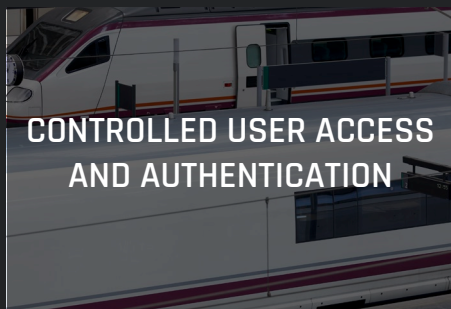
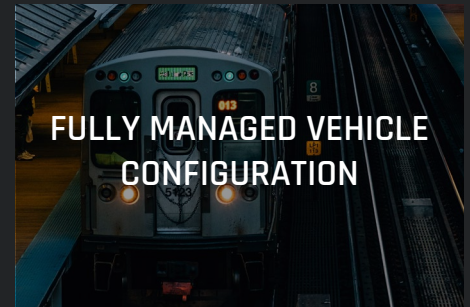
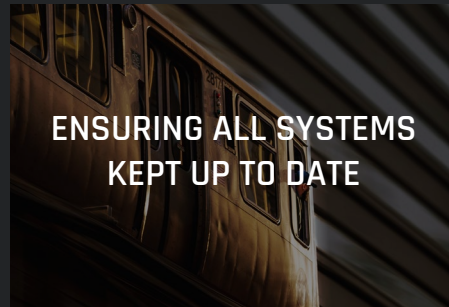


RECORDED RAIL MAINTENANCE INCIDENT

In 2021 a safety alert NIR was initiated by a train operator, due to a maintenance error scenario, when a train was released into service before the ETCS was updated. The operator stated their ongoing concern at the current maintenance process.

■ ENABLING SECURE AND RELIABLE MAINTENANCE IN RAIL

RazorSecure can provide a Secure Maintenance solution, that will support the integrity and reliability of rail services, through addressing the causes of poorly managed rail system maintenance. Capable of integration with legacy and new railway vehicles, the RazorSecure solution will ensure that future maintenance can be completed in a safe manner while taking advantage of advances in digital innovation and new technologies.



SECURED LOCAL ACCESS

While some tasks can be performed remotely, some maintenance actions still require a service person to be present at the train. We can provide a protective layer between the physical service laptop and onboard systems, to limit cyber threats accessing train systems.

TASK AUTOMATION

Repeated maintenance tasks can be automated, enabling them to take place without the need for an engineer to manually access each device individually. Updates can instead be performed on multiple devices or even several train units at the same time.

PROTECTION FOR LIFE OF THE ASSET

Where a safety risk is addressed at a single point, maintenance and cybersecurity are constantly evolving with many systems operational for long lifespans. The RazorSecure solution ensures every on-board system is maintained and protected for the full life of the asset.

CONTROLLED REMOTE ACCESS

Our remote solution operates in a secure environment which only grants specific, and controlled, access to authorised engineers and only to the onboard systems which they require for over-the-air updates and secure maintenance to take place.

AUTHENTICATED USER ACCESS

An open level of network access to conduct maintenance, means being at risk to external threats that could infiltrate the network. Our solution allows for secure authentication based access and mechanisms to ensure that no unauthorised threats can find a way into the network.

The RazorSecure Secure Maintenance solution is delivered through the deployment of the EN50155 certified RazorSecure Security Gateway that can be connected to an onboard switch, and includes a firewall as part of its core functionality.



EN50155 RAIL APPROVED HARDWARE

BUILT IN MONITORING & ANOMALY DETECTION

CYBERSECURITY EVENT RECORDER

DEPLOYABLE ON LEGACY FLEETS

WAYSIDE CONNECTIVITY WITH EMBEDDED 4G



RAZORSECURE APPROACH

We recognise that each train fleet is different and may require a tailored approach due to differences in network design and levels of IP Connectivity. By understanding your network, we can advise on security best practices and the risks within your environment. We will then work with you to design, integrate, homologate and deploy the RazorSecure software across the key systems and network points we identify.

Our flexible approach is customised to manage the unique challenges and requirements of each customer. We will work closely with you to find a solution for any challenge you may have. The first step towards improved digital is simply to begin a conversation with us, and our team will be happy to guide you through the process.

ABOUT US

RazorSecure enhances railway cyber security with products and services designed to protect rolling stock, signalling and infrastructure systems.

