

SIEMENS

THE MOST FLEXIBLE INTERLOCKING SYSTEM

Trackguard Westrace Mk II



Trackguard Westrace Mk II: the new generation of the best-selling vital logic controller

Trackguard Westrace Mk II: a safe, secure, standardized and future-proof interlocking system, the best-selling logic controller ready for the age of digitalization.

Trackguard Westrace is a highly flexible, modular vital logic processing system that has already been proven in over 2000 applications worldwide. With straightforward configuration using ladder logic to deliver any vital functionality, Trackguard Westrace offers real benefits to railway authorities in terms of cost of ownership, capability and flexibility. Its processing power makes it possible to manage any kind of installation, including multiple I/O options from the Siemens family, and to reduce operating costs whilst remaining the market leader in maintainability and availability.

Trackguard Westrace Mk II sets the benchmark for digitalization: it enhances existing flexibility in architecture and vital logic, enables implementation of interlocking in a COTS multicore rail data center with the Siemens DS3 platform and scaling of processing power according to project needs, reduces lifecycle costs as well as ensuring maximum availability with geographical redundancy.

Trackguard Westrace Mk II handles the challenges of the new IP wayside architecture by enabling up to Security Level 3 according to IEC 62443 by integrating with Siemens CoreShield family as a cyber security solution.



Versatile and dependable

Trackguard Westrace Mk II can be used as a stand-alone system or as an interface to a wide range of equipment – including existing interlockings. Typical applications include simple, medium-sized and complex interlockings, radio block systems, trackside control, and it provides vital functionality in centralized traffic control systems. The system offers unique flexibility of application, supporting both centralized and distributed architectures, as the I/O can be either located with the interlocking processor or distributed around the railway as required.

Trackguard Westrace Mk II is designed to use standard Ethernet communications systems to provide conveniently scalable versatility, whilst maintaining safety and enhancing reliability. Trackguard Westrace Mk II is aligned with the standardization of the interlocking by implementing the EULYNX standard, being able to interface with the Siemens XCMs family as well as any other interlocking subsystem that satisfies these specifications. This ensures flexibility for customers when selecting I/O models or standard

system interfaces. Trackguard Westrace Mk II enables the use of a vital processor with a COTS multicore-based hardware (by DS3) or updated processor module (PM3) with large communication capacity. Both offer the maximum security level by integrating Super Secure Long Life Linux from the Siemens CoreShield family.

Using Siemens' computer-based data and configuration management systems, the system can be quickly programmed for its specific application. The range of modules available and the flexibility allowed by our programming approach are key reasons behind the success of Trackguard Westrace to date.

SIL 4 safety certification

Trackguard Westrace Mk II fully complies with all the requirements of the CENELEC SIL 4 certification, and uses a 2-out-of-2 safety architecture for all modules. Each module continually checks its own operation, and, in case of an unexpected event occurs, it can shut itself down without affecting any other modules.





Flexible architectures

Trackguard Westrace Mk II makes use of highly flexible network-based communications and vital processor options to allow a wide variety of architectures to be implemented. Simple “end of siding” controllers can be created using two or three modules, or complex station layouts can be signaled using an array of Trackguard Westrace Mk II object controllers connected to a central interlocking processor. With the use of DS3, processing capacity can be scaled and the possibility of having all the interlockings of a city or a country in a rail data center has become reality. The decision to use centralized or distributed, directed or object controlled-based systems is not limited by the interlocking, allowing the applications engineer to use the optimum solution for each installation.

Selectable hot-standby functionality

Trackguard Westrace already has an impressive record of availability in service. Mk II takes this success yet even further by adopting an architecture that ensures that failure of one I/O module does not cause the failure of the entire interlocking, and that allows for fully selectable hot-standby functionality. Processor modules (PM) may be duplicated if necessary, with both modules in the same rack, operating in true hot standby.

If one PM fails, the system automatically switches to the control of the standby unit. With DS3, the add-on of geographical redundancy enhances availability to its maximum level.

I/O modules may also be duplicated for key railway functions as required. Most I/O modules in the system can operate as a hot-standby pair with another module. No additional external circuitry is required; inputs and outputs of duplicated modules can be wired together without the need for external relays. An installation can contain both duplicated and non-duplicated modules as determined by the designer in order to meet the specific availability needs of railway authorities. In the event that any module should fail, it can be “hot-swapped” without needing the system to be powered down or re-started.

TG Westrace Mk II diagnostics provides customers with predictive maintenance possibilities, aligned with Siemens’ state-of-the-art technology for capturing data from different assets, and enables the processing of data to change the maintenance activities from scheduled preventive to predictive.

Increased performance – increased railway capacity

Trackguard Westrace Mk II uses a range of modern techniques that allow key features of previous generations of Trackguard Westrace to be maintained, whilst adding benefits such as significantly increased performance. For example, the I/O modules make extensive use of field-programmable gate array (FPGA) technology to allow for faster processing than has previously been possible.

The Processor Module is not only a class leader in processing capacity, but also it is designed with hardware and software which adhere to the latest cyber security standards, solving the challenges of wayside signaling in the age of digitalization.

Different architectures for I/O configuration are possible, ensuring that the TG Westrace Mk II system can control a large area of railway.

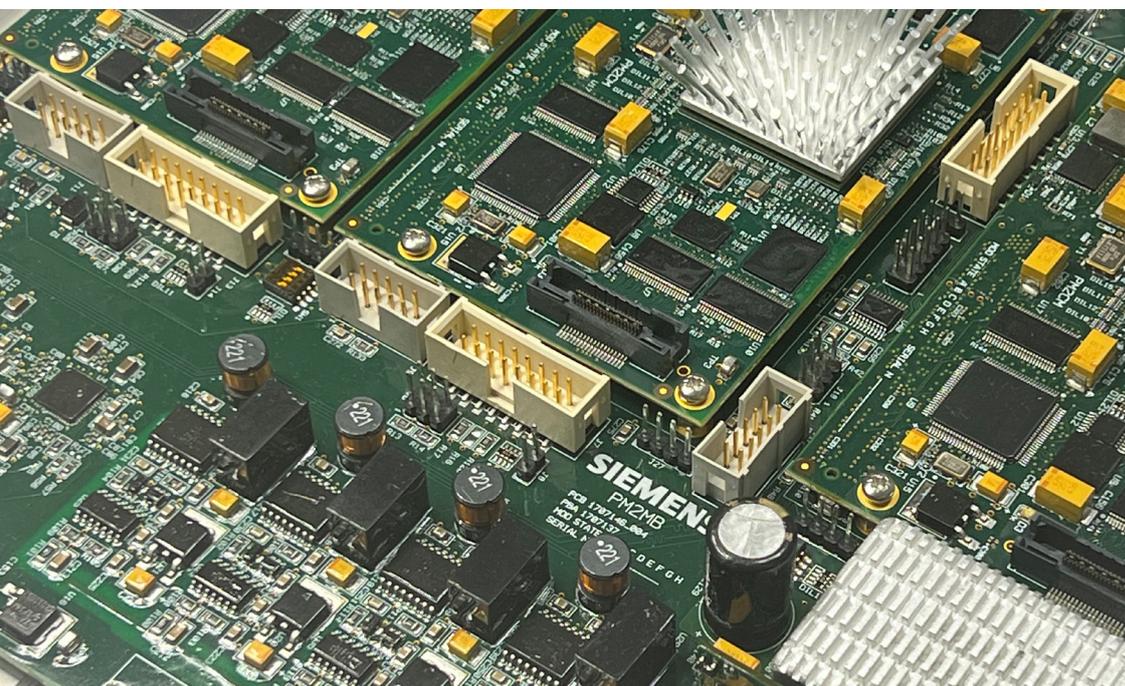
Protection and filtering functionality is provided within each I/O module; no external modules are required.



Connectivity – a key feature of Trackguard Westrace Mk II

Each PM provides duplicated network links which use the WNC protocol or EULYNX standard, operating safely over standard Ethernet technology. This allows TG Westrace MkII to interface with different systems from Main Line and Mass Transit, from legacy ATP or ETCS Level1 to CBTC Unmanned or ETCS L2 and L3, demonstrating flexibility at all levels.

As with previous generations of Trackguard Westrace, Mk II is ideally suited for connection to existing interlockings, allowing a rapid and low-risk migration path for railways.



Safe, flexible and fast system configuration

Operational service

Simple programming – ensuring safe, flexible and fast system configuration

Trackguard Westrace is programmed in ladder logic, using a PC-based graphical configuration subsystem (GCSS) and graphical simulator (GSIM) software, which allows engineers to easily configure, check and test each application in the office before installation on site.

The Trackguard Westrace template tool offers significant improvements in efficiency of data production. Application engineers can draw up “standard circuits” in ladder logic data and store them in a closely controlled template tool. Implementation of design then simply involves data production engineers “cutting and pasting” logic from the template and filling in geographical data. System configuration ensures that, once agreed by the customer’s engineers, the template cannot be changed without reapproval.

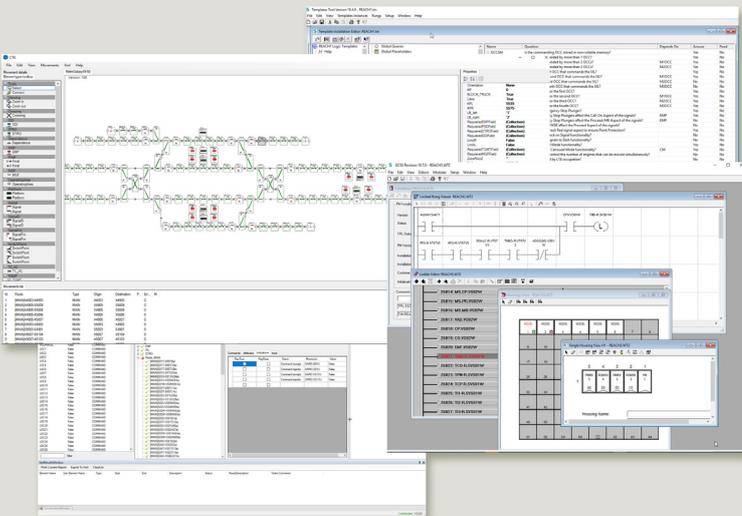
Applications

The processing power and robust, reliable performance of Trackguard Westrace has been proven in extreme conditions and demanding situations, from Australia to Norway and from high-intensity metros to long-distance, heavy-haul lines.

The system has been integrated with existing infrastructure without disruption, and designed with future expansion in mind. It has proved to be highly reliable with no downtime since its commissioning in 1998. Meanwhile, maintenance and operation costs have been reduced, and safety standards improved.

Trackguard Westrace Mk II – evolution of a bestseller

Trackguard Westrace Mk II builds heavily on the hugely successful foundation of Trackguard Westrace vital processing, using the latest techniques and technology to provide railway authorities with a highly flexible, economical and powerful solution to allow them to meet their customers' requirements.





Secure, reliable and future-proof.
Our Trackguard Westrace Mk II, sets the benchmark
for one of the most advanced interlocking systems
in the world.

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