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Trackguard Westrace Urban electronic interlocking for mass transit

Compact and scalable for maximum flexibility

Economic operation thanks to industrial standards



Cities are becoming increasingly larger and more complex. This also imposes increased requirements on mass transit systems. Their operators have to cope with rapidly growing traffic flows and passengers' rising expectations. Their success is measured against factors such as safety, punctuality, convenience and environmental friendliness.

Siemens' intelligent and future-oriented mass transit concepts support operators in successfully meeting these challenges.

We regard our customers as partners who we support through our work in sustainably developing their urban environment and making their public mass transit both efficient and effective. You thus boost your passengers' quality of life and the attractiveness of your city as a business location.

Siemens has come up with a safe, innovative and customer-oriented solution for these requirements: the design of compact electronic interlockings with standard industrial automation components from the Simatic family.

The Trackguard Westrace Urban interlocking offers a wide range of applications wherever economic operating concepts are required.

Individual solutions

The Trackguard Westrace Urban electronic interlocking is based on Siemens' tried-and-tested Simatic S7 programmable logic controllers. Scalable automation solutions on this basis have established themselves as a cost-effective industrial standard.

Simatic controllers can be used to handle very different control and regulating tasks both efficiently and flexibly.

Thanks to the modular design of both hardware and software, Trackguard Westrace Urban electronic interlockings can be very easily adjusted to a wide range of different requirements and environments.

The worldwide spread of Simatic controllers ensures that railway operators are supplied with spare parts both fast and economically.

Hardware innovations such as new higher-performance CPUs can be integrated without entailing any new safety case. By using widely spread and readily available industrial standard products, hardware and life-cycle costs as well as the need for specially trained staff for purposes of installation and maintenance are reduced.

Benefits

High safety integrity level (CENELEC SIL 3)

Low life-cycle costs

High levels of reliability and flexibility

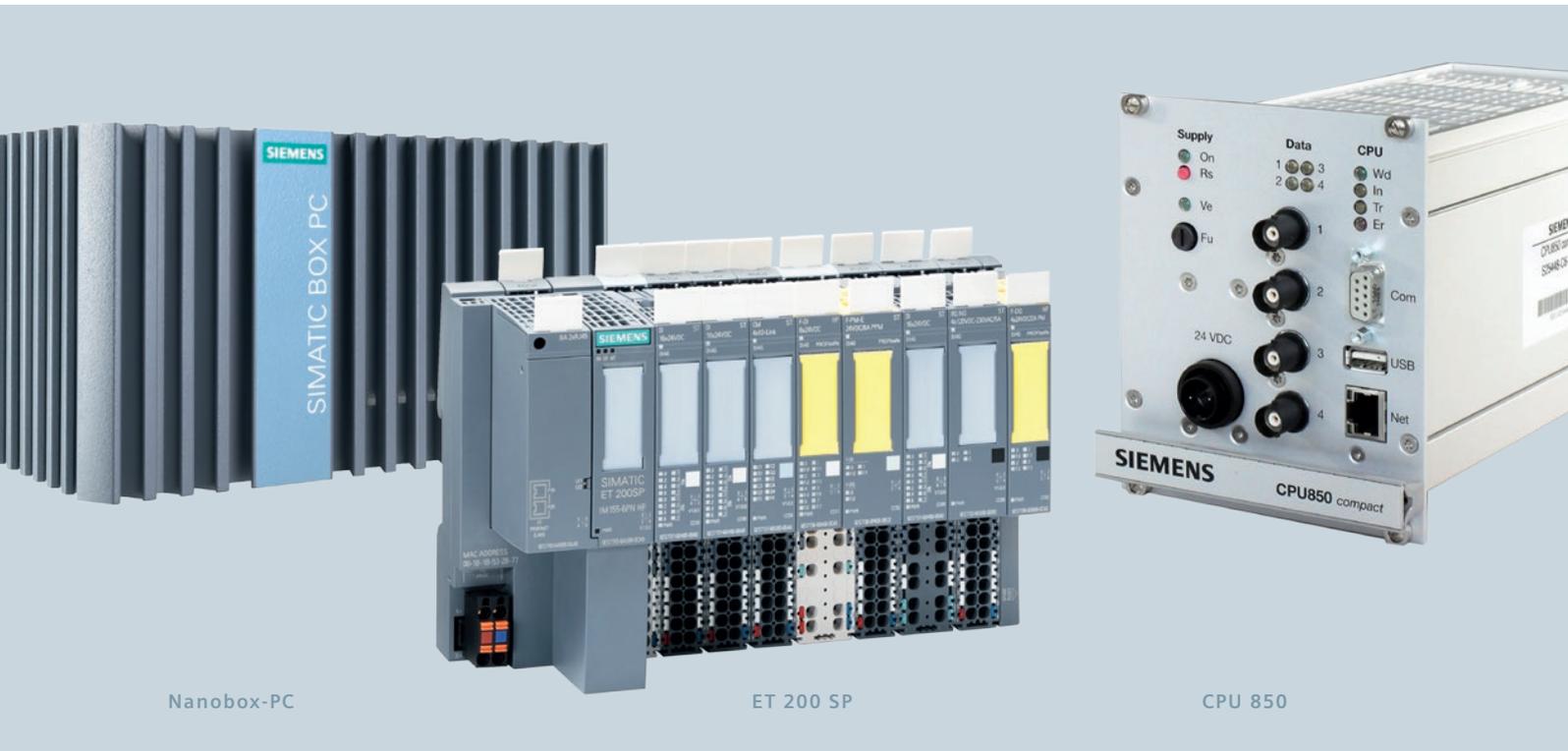
Innovative system solutions

High level of scalability

Compact design

Safe, flexible and cost-effective

Modular hardware



The basis and core of the Trackguard Westrace Urban interlocking comprise standardized, highly reliable industrial components of the well-known Simatic S7F automation system. Compact industrial PCs and fail-safe digital interface modules are in use.

The fail-safe controllers use the same hardware components and the same bus system for standard and safety applications. In this way, additional hardware is saved and availability is increased.

The signals are pre-processed both flexibly and economically within the fail-safe decentralized peripherals. The digital input and output modules are equipped with their own processors, which – in addition to the simple integration of the components into the system – provide convenient functions for diagnostics of the logical and electrical peripheral statuses. Communication between the interface modules and the CPU is fail-safe by using the PROFIsafe protocol.

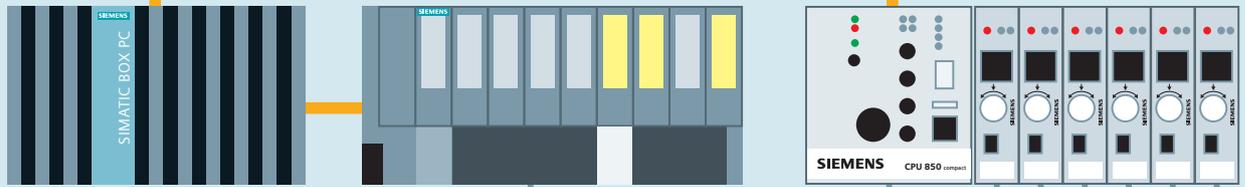
Parallel to the capturing of safe signals, non-safe information is provided by standard CPU modules for further processing.

Technical data

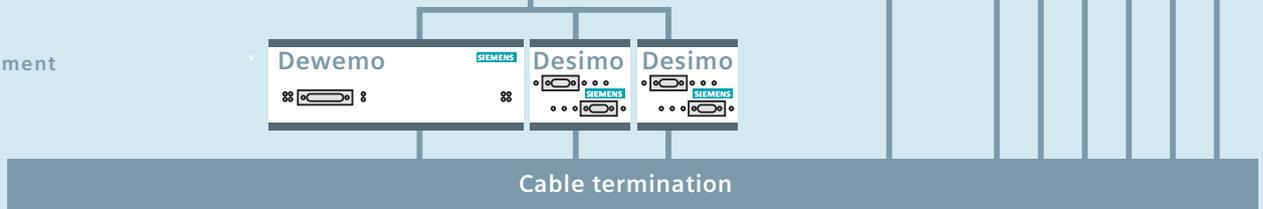
Temperature	0 °C to +55 °C
Relative humidity	5% to 95% short-term condensation permitted
IP rating	IP20 to IP65
Mechanical requirements:	
• Vibrations	as per IEC 69 T2-6
• Shocks	as per IEC 68 T2-27
Compliance with safety requirements:	
• EN 954 (EU)	
• IEC 61508	
• EN 50126, 50128 and 50129 (SIL 3)	

Sample configuration

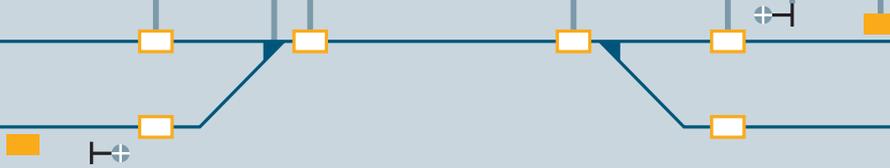
Operator level



Indoor equipment



Outdoor equipment



For reliability and availability

Integrated web diagnostics

The Trackguard Westrace Urban system features an integrated web server which provides the present system status, current alarms and a history memory in the network via a web interface.

Detailed diagnostic information contributes to simple fault localization, enabling operations to be rapidly continued after any disruption caused by a fault.

All faulty modules can be replaced during ongoing operation. Operating sequences are recorded and can be output and evaluated via the web interface at a later point in time. The system keeps an operating log which records all events in detail.

Scalable, powerful and compact

Optimum light rail customer solutions



High scalability

The Trackguard Westrace Urban electronic interlocking was specially developed on the basis of the requirements imposed by light rail transit customers. The control of points, signals and track vacancy detection has been optimized for use with tram applications for SIL 3.

The design of the interlocking is extremely compact. All components can be installed both in small-sized indoor racks and in compact outdoor cabinets.

The Trackguard Westrace Urban logic is based on easy-to-understand contact diagram logic. This architecture permits white-box tests to be performed more simply than is the case with complex solutions. The most important basic functions are provided in completed, assessed libraries.

Cost-effective implementation

Due to its simple architecture, the Trackguard Westrace Urban electronic interlocking does not take long to implement and can therefore be configured cost-effectively. Using input/output modules from the tried-and-tested Simatic portfolio, customer-specific hardware components can be easily installed. The software architecture which has been deliberately designed to be simple enables customer-specific functions to be rapidly implemented.

Flexible system architecture

The use of PROFINET-capable Simatic components enables the central or decentralized installation of Trackguard Westrace Urban. By using decentralized peripheral modules for field elements which are located far away from the element control computer, costs for the cable system can be reduced. The PROFIsafe protocol on the basis of the PROFINET bus system ensures fail-safe

communication between the interlocking components. Trackguard Westrace Urban interlockings can be easily integrated into existing signaling systems. Existing outdoor elements can also be simply connected using highly flexible decentralized element operating modules (DSTT).

High-performance computer for all applications

The fail-safe hardware core of Trackguard Westrace Urban is based on a PC-based fail-safe Simatic WinAC RTX F software controller. Robust nanobox/microbox industrial PCs are used.

This architecture permits both fail-safe functions and non-fail-safe tasks to be implemented in one and the same computer cost-effectively. The user can execute different configurations web-based using the central computer, for example in train number evaluation.

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The information in this document contains general descriptions of the technical options available. The required features should therefore be specified in each individual case at the time of closing the contract. For the secure operation of Siemens products and solutions, it is necessary to take suitable preventive action and integrate each component into a holistic, state-of-the-art security concept. Third-party products that may be in use should also be considered.