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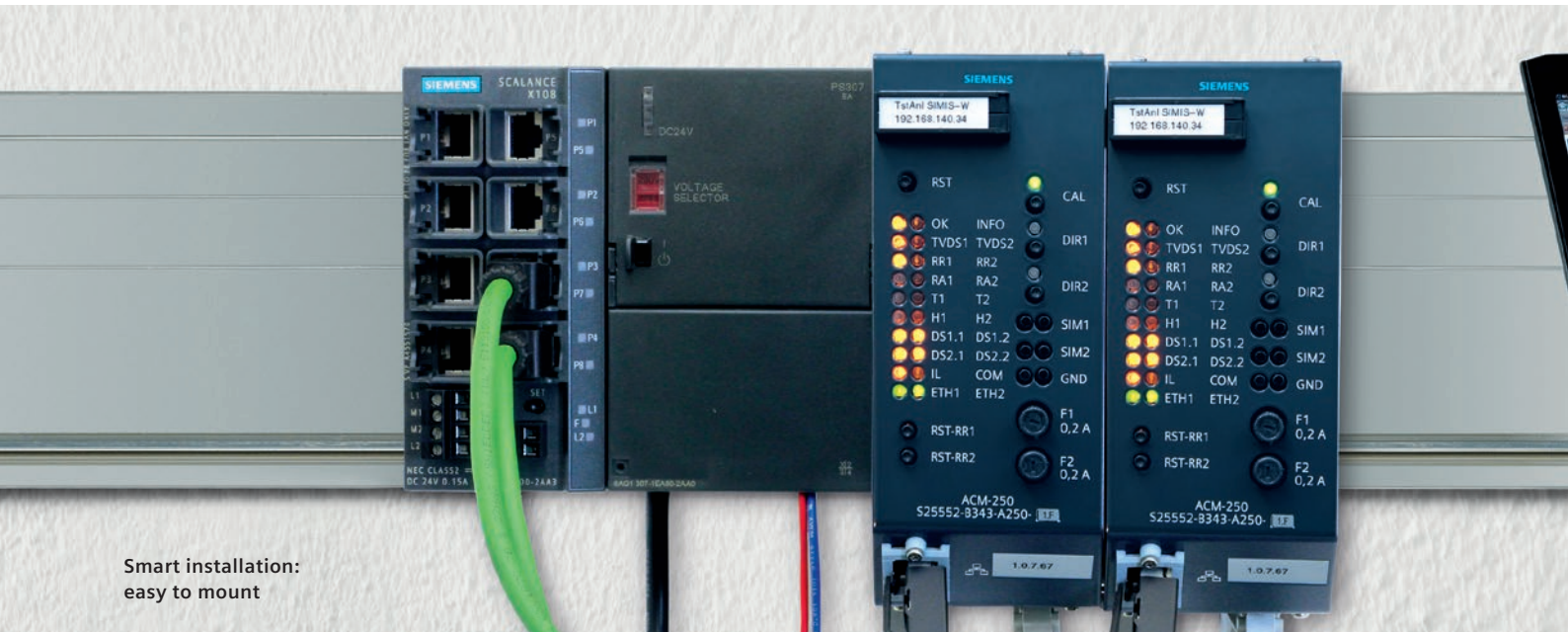
Clearguard ACM 250 axle counting system

Smart track vacancy detection for
cost-effective rail services

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Clearguard ACM 250 axle counting system

The launch of smart track vacancy detection



Smart installation:
easy to mount

The Clearguard ACM 250 electronic axle counting system is based on the tried-and-tested Trackguard Simis (fail-safe microcomputer system from Siemens) safety principle and has been issued with a system-independent approval.

This axle counting system was developed in accordance with the safety requirements of the European CENELEC standards EN 50126, EN 50128 and EN 50129 and conforms to the highest safety integrity level, SIL 4.

Clearguard ACM 250 fulfills both the CLC/TS 502617-2 standard and the technical requirements regarding interoperability (ERA/ERTMS/033281).

Track vacancy detection creates the basis for rail automation. A track vacancy detection system supplies the information about whether a track in a particular section is clear or occupied, thereby permitting safe, trouble-free and efficient operations management.

For use in local transportation links in urban and suburban areas as well as for mainline, regional and industrial railways, Siemens has developed a new generation of smart track vacancy detection systems that offer benefits hitherto unimplemented in signaling, coupled with high cost-effectiveness, by using intelligent, intercommunicating modules and a system configuration based on an Ethernet network.

The Clearguard ACM 250 axle counting system is made up of maintenance-free ACM 250 modules, which are programmed via an ID plug and combined with the Ethernet bus and counting heads of the ZP product family (Clearguard ZP D 43, ZP 43 E and ZP 43 V) into a fail-safe axle counting system.

Safe and reliable

Clearguard ACM 250 has been developed according to the safety requirements stipulated by the European CENELEC standards EN 50126, EN 50128 and EN 50129 and conforms to the highest safety integrity level, SIL 4.

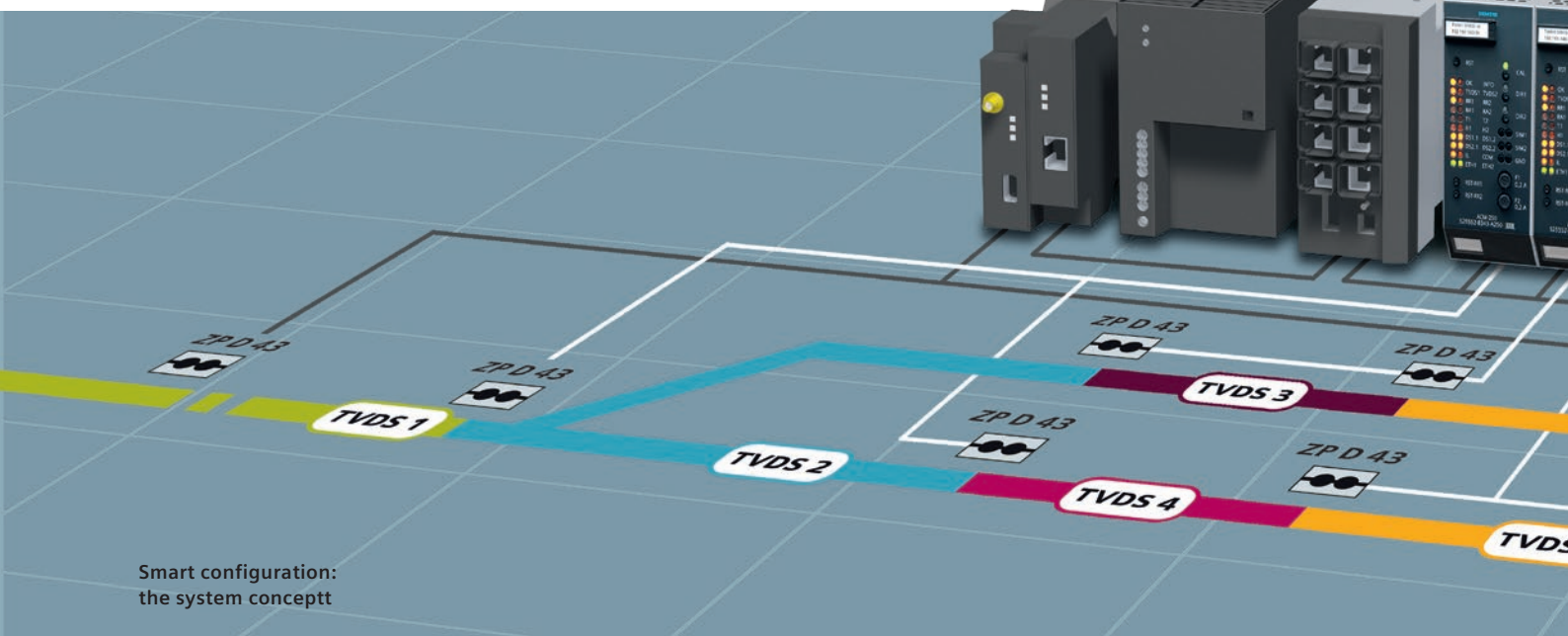
The detection equipment used meets the latest compatibility requirements for cross-border traffic in Europe in line with EN 50617 and ERA/ERTMS/033281.

The modular architecture of the Clearguard ACM 250 axle counting system can be tailored to individual customer requirements. The required number of Clearguard ACM 250 modules is functionally matched to the topology. The Clearguard ACM 250 axle counting system offers smart track vacancy detection for the cost-effective implementation of individual operating concepts.

The outdoor equipment consists of Clearguard ZP D 43 and Clearguard ZP 43 E/V counting heads; they detect the passing wheels. The pulses are transmitted via two cores of the track-side cable to the indoor equipment of the Clearguard ACM 250 axle counting system installed in the interlocking building.

Clearguard ACM 250 axle counting system

Smart platform for easy configuration and installation



The Clearguard ACM 250 modules perform the following process steps:

- Evaluation of the signal pulses transmitted by the wheel detection components
- Comparison of the number of axles entering a track vacancy detection section with the number of axles leaving it
- Monitoring the track vacancy detection sections and transmission of clear or occupied indications to the interlocking
- Optional transmission of sensor and/or block information via ACM-ACM Ethernet communication

Modular hardware architecture

For the configuration of an axle counting system, one or more Clearguard ACM 250 modules are connected to an Ethernet network via switches. The switches and power supply modules are standard automation modules which are available worldwide.

The software of the Clearguard ACM 250 axle counting system is based on a 2-out-of-2 computer configuration according to the Simis principle, which ensures fail-safety in interlockings and railway signaling applications.

The Clearguard ACM 250 module has a robust metal housing and can be quickly installed by simply locking it into position on a mounting rail. This type of installation reduces commissioning times and cuts installation costs. The consistent use of only one module type reduces hardware costs as well as the outlay for stocking spare parts.

Module replacement without possessions

A Clearguard ACM 250 module can be replaced in the energized state; it is no longer necessary to switch off the system components and interrupt operation.

Enhanced platform base

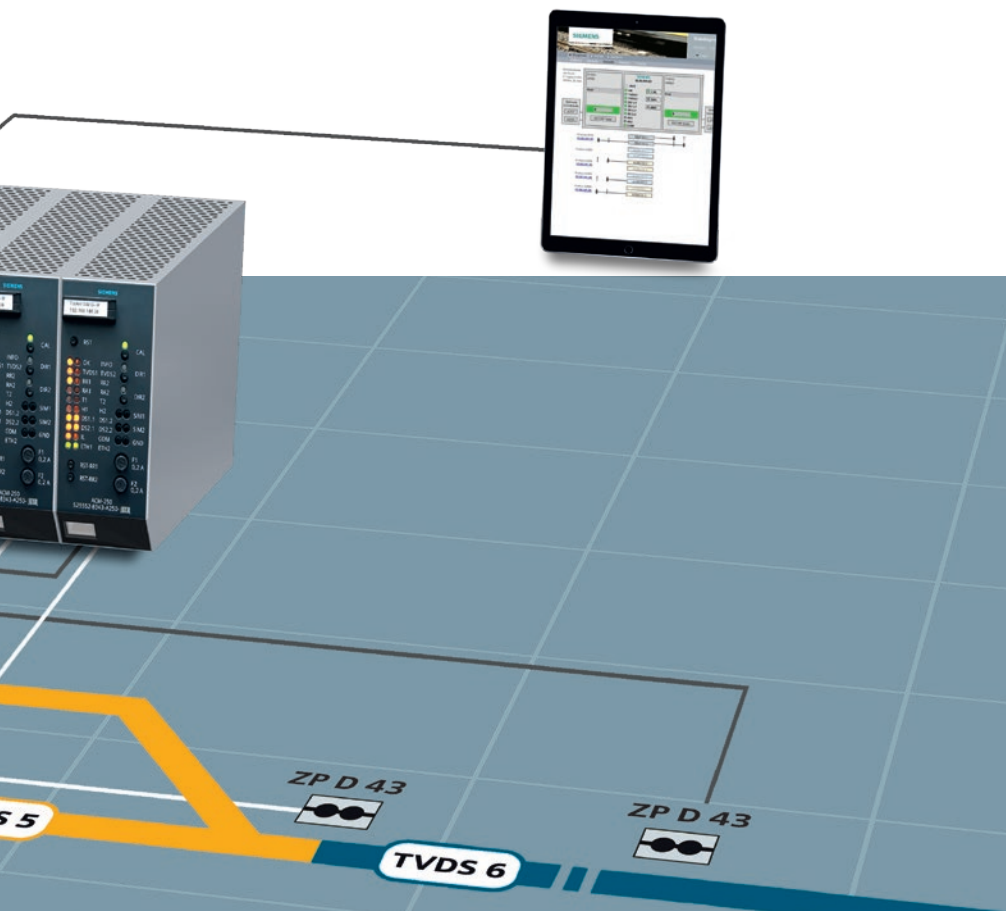
The enhanced platform base of Clearguard ACM 250 supports the following functions:

- remote diagnostics
- ability to load software updates
- preparation for IT security

HTML-based software for plug-and-play

The data configuration for the Clearguard ACM 250 modules is done via a graphical user interface on an integrated website in the module. The data is stored on a programmable ID plug that can, if necessary, be removed and plugged onto another Clearguard ACM 250 module.

The graphical user interface, with its user-friendly display, provides optimal support for all operational, service and maintenance tasks.



The following automatically cyclically updated information and failure indications can be displayed, for example:

- “clear” or “occupied” for the two track vacancy detection sections of the Clearguard ACM 250 system
- Number of counted axles
- Status of the Clearguard ZP D 43 and Clearguard ZP 43 E/V counting heads

Status information and stored log-files can be called up in the form of graphics and data lists (e.g. in telegram format). LED indicators on the Clearguard ACM 250 module permit simple diagnostics – even on site.

Smart basis for extension, modification and migration

The concept of the Clearguard ACM 250 axle counting system permits easy extension and modification, thereby ensuring investment security for years to come.

Hardware replacement and extension or configuration updates can be carried out within a very short period of time. It is not necessary to interrupt rail operation.

Interfaces to interlockings

Clearguard ACM 250 provides an Ethernet-based interface to higher-level systems using the following protocols:

- Sinet RaSTA (Rail Safe Transport Application): this interface is compatible with the standard interface to the Trackguard Simis W/D world
- WNC+: compatible with the Trackguard Westlock and Trackguard Westrace interlocking families

For the connection to other interlockings or subsystems, the Clearguard ACM 250 has a potential-free relay interface that allows flexible adaptation to a wide range of operating conditions.

Existing installations can thus be cost-effectively upgraded or extended and cost-effectively optimized.

Compatibility with Clearguard ACM 200 modules is ensured when using Ethernet.



Clearguard ACM 250



Power transformer



Ethernet switch



Router



Clearguard ZP D 43 (track)



Terminal box (track)

Low investment costs coupled with high efficiency

Smart track vacancy detection for smart operators



Smart communication:
diagnostics via internet.

Applications

- Main and branch lines, station areas, point areas
- Single- and multiple-track lines
- Lines with and without blocks
- All types of traction
- All common car types
- Track sections of any length
- Train speeds up to 400 km/h (250 mph)

System benefits

- Connection to electronic and relay interlockings
- HTML communication for effective configuration, logging and diagnostics
- Modular, compact hardware
- Support of standard interlocking communications

Low initial costs

With Clearguard ACM 200, track vacancy detection applications for individual operating concepts can be implemented quickly and economically. Whether in a centralized or decentralized configuration, the features

- modular system architecture,
- only one standard module,
- standard Ethernet bus,
- Sinet RaSTA (Rail Safe Transport Application),
- WNC+,
- floating relay interface
- optimized system configuration,
- low-cost wheel detector and
- minimized building space requirements

make for an extremely cost-effective system.

High performance and availability

The Clearguard ACM 250 module is intelligent and communicative and can monitor two track sections. Each module has two own IP addresses and can thus be integrated into redundant network systems. In the case of a connection failure, communication between the module and operations

control system is still possible, thus ensuring a maximum of operational reliability.

As an option, the integrated website can be called up via Ethernet to communicate and perform operator actions. This creates high system transparency and offers advantages for achieving the maximum possible availability of the track vacancy detection system

Programming via ID plug

The Clearguard ACM 250 modules are equipped with a programmable plug element (ID plug) with its own software. The configured data can be transferred to a replacement ACM 250 module simply by removing and then reinserting the ID plug. Thus, faults can be quickly rectified and down-times minimized.

Easy extension/migration

The Clearguard ACM 250 concept permits easy extension and modification, thereby ensuring investment security for years to come. Hardware replacement and extension or configuration updates can be performed without having to interrupt rail operations.

Cost-effective maintenance

The highly dependable and service-free Clearguard ACM 250 hardware ensures a low maintenance outlay and low life-cycle costs. Because all the track vacancy detection applications are implemented using a single module type, system configuration is easy and fewer spare parts have to be stocked.

Intelligent diagnostics

Forwarding of diagnostic data to higher-level systems is realized via a standardizable interface (OPC UA) in a single or redundant configuration. The output channel via Ethernet can be mounted to any ACM 250 module.

The ability to communicate with the integral website (IP address) allows remote diagnostics via a network (internet or intranet) from any location at any time. The integrated website enables the current status information to be requested.

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