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Clearguard ACM 200 axle counting system

Smart track vacancy detection for cost-effective rail services

The launch of smart track vacancy detection

The Clearguard ACM 200 axle counting system

Smart installation: easy to mount

Safeguarding mobility is one of the big challenges in our society. To ensure our mobility in future, we need networked transportation and information systems. This is why Siemens – with its "Complete mobility" approach – is offering integrated transportation and logistics solutions for safe, cost-effective and environment-friendly passenger and freight services.

Key elements of "Complete mobility" are efficient solutions for rail-based transportation systems

From the market leader in rail signaling technology now comes the new generation of smart track vacancy detection systems. Target-oriented development, task-directed design and the use of state-of-the-art technology solutions create a new combination of trendsetting capabilities and hitherto unknown features that give the system outstanding cost-effectiveness.

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 200 axle counting system is made up of maintenance-free ACM 200 modules, which are programmed via an ID plug and combined with the Ethernet bus and counting heads of the ZP product family (Cleargard ZP D 43, ZP 43 E und ZP 43 V) into a fail-safe axle counting system.

Safe, reliable

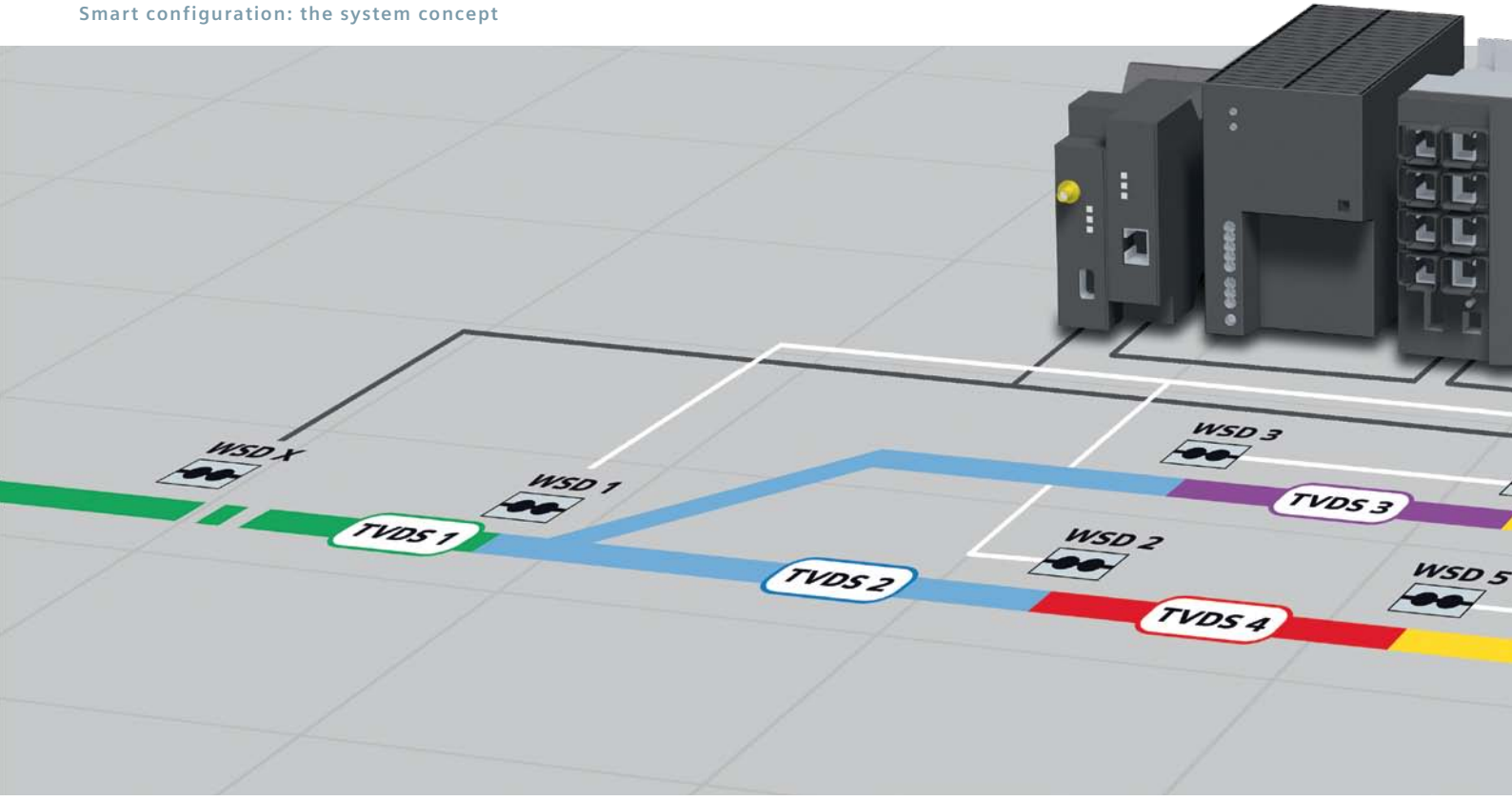
Clearguard ACM 200 was developed in accordance with the safety requirements of the European CENELEC standards EN 50126, EN 50128 and EN 50129 and conforms to the highest safety integrity level, SIL 4.

The detection equipment used meets the latest compatibility requirements for cross-border traffic in Europe.

Smart platform for effective configuration and speedy installation

Clearguard ACM 200 axle counting system

Smart configuration: the system concept



The modular architecture of the Clearguard ACM 200 track vacancy detection system enables it to be tailored to individual customer requirements. The required number of Clearguard ACM 200 modules is functionally matched to the topology. The Clearguard ACM 200 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 a 2-core trackside cable to the indoor equipment of the Clearguard ACM 200 axle counting system installed in the interlocking building. The Clearguard ACM 200 modules perform the following process steps:

- Evaluation of the signal pulses transmitted from 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 200 modules are connected to an Ethernet network via switches. The switches and power supply modules are standard automation modules which are available worldwide.

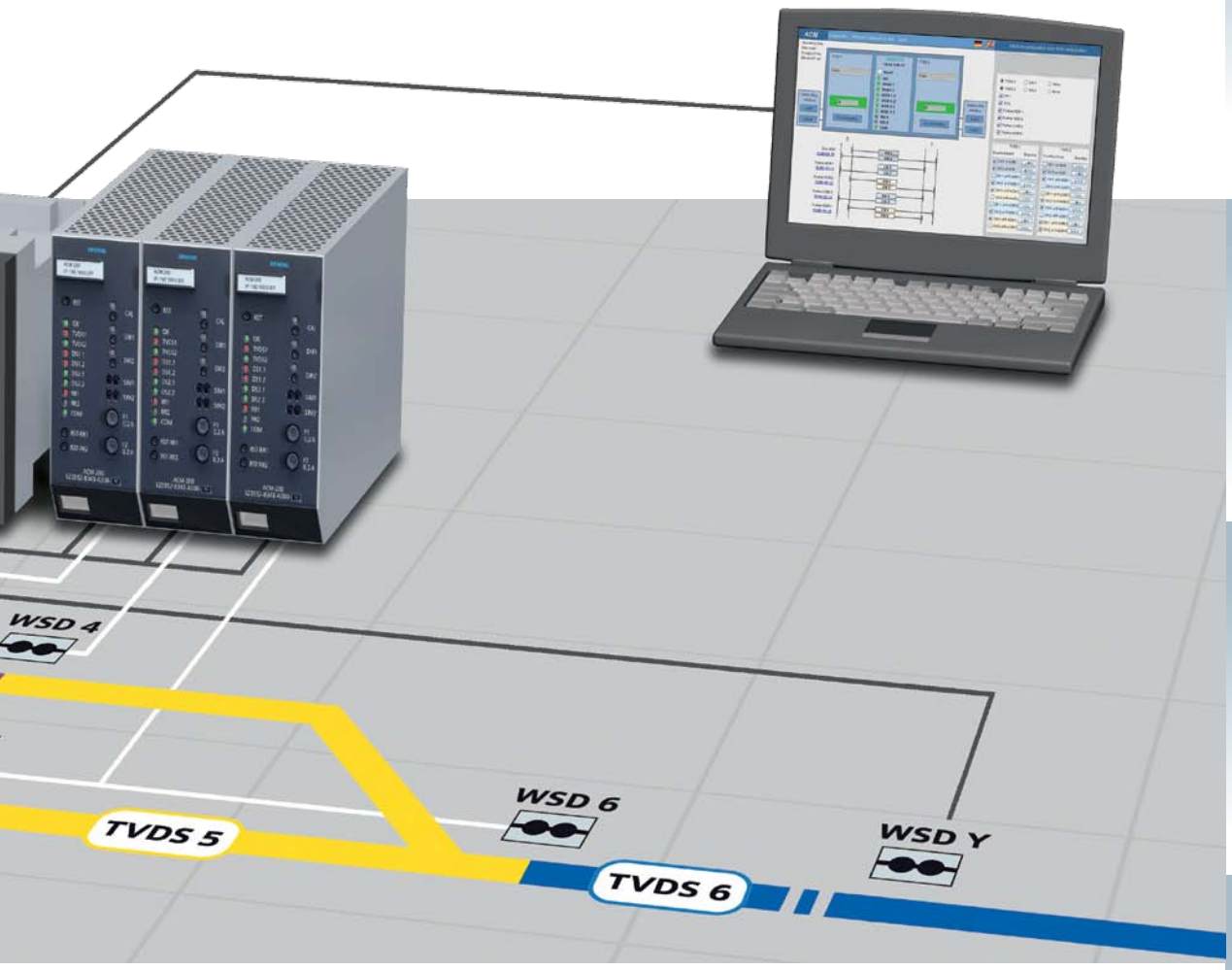
The software of the Clearguard ACM 200 axle counting system is based on a 2-out-of-2 computer configuration according to the Simis principle, which ensures fail-safety in interlockings and railway signaling applications.

The Clearguard ACM 200 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.

Easy module replacement
A Clearguard ACM 200 module can be replaced in the energized state; it is no longer necessary to switch off the system components and interrupt operation.

HTML-based software for plug-and-play
The data configuration for the Clearguard ACM 200 modules is done via a graphical user interface on an integral 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 200 module.



The graphical user interface, with its user-friendly display, provides optimal support for all operational, service and maintenance tasks. The following automatically and cyclically updated information as well as failure indications can be displayed, for example:

- "Clear" or "occupied" for the two track vacancy detection sections of the Clearguard ACM 200 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. LED indicators on the Clearguard ACM 200 module permit simple diagnostics – even on site.

Smart basis for extension, modification and migration
The concept of the Clearguard ACM 200 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.

Potential-free relay interface
For the connection to other interlockings or subsystems, the Clearguard ACM 200 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.

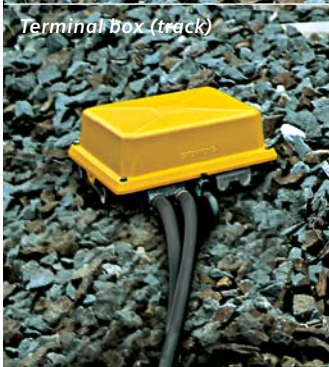
ACM 200

Power transformer

Ethernet switch

Router

Clearguard ZP 43 (track)

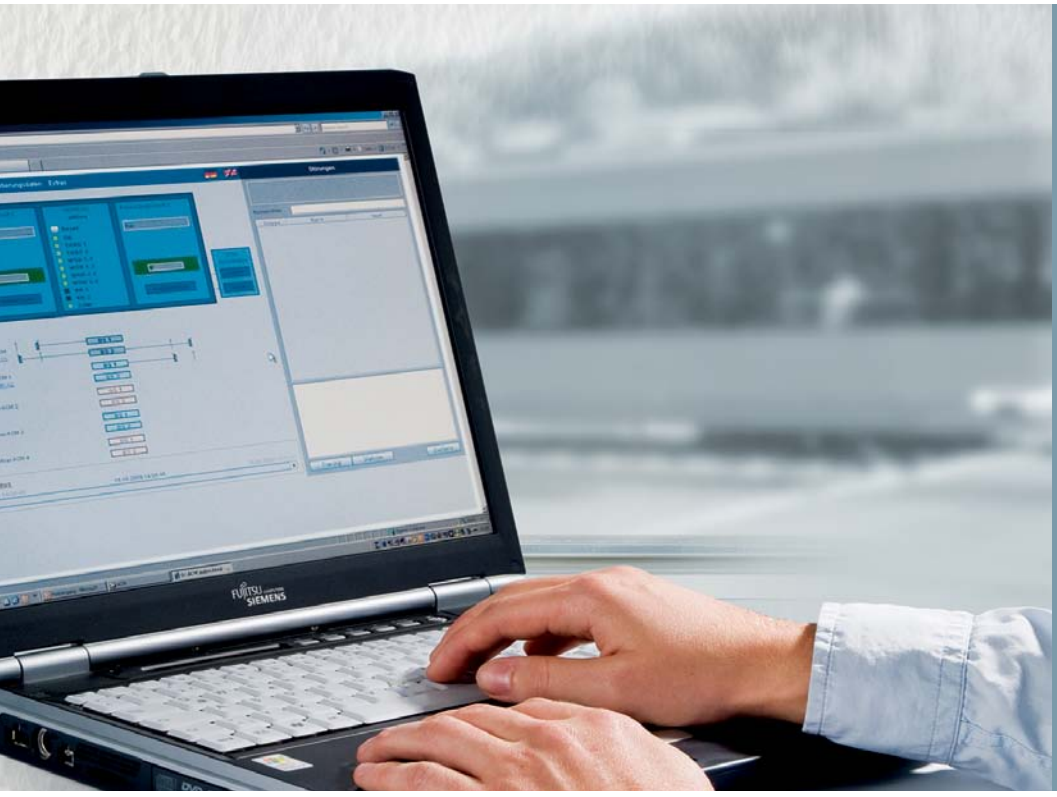


Terminal box (track)

Smart track vacancy detection for smart operators

Low investment costs coupled with high efficiency

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
- Innovative diagnostic concept
- Clearguard ZP D 43 and Clearguard ZP 43 E/V counting heads

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,
- 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 200 module is intelligent and communicative and can monitor two track sections. Each module has its own IP address and an integral website for communication and operator control and is thus addressable via Ethernet.

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

Easy extension / migration
The Clearguard ACM 200 concept permits easy extension and modification, thereby ensuring investment security for years to come. Hardware replacement and extension or configuration updates can be carried out without having to interrupt rail operations.

Cost-effective maintenance
The highly dependable and service-free Clearguard ACM 200 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
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 integral website enables the current status information to be requested.

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