

# Simis W electronic interlocking

Safe and economical

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**SIEMENS**

Interlockings have to meet ever increasing demands

# Simis W offers you innovative solutions

The demands being placed on passenger and freight transport by rail are very high today. The railways must run quickly, safely, punctually and economically. To cope with these demands, the railways require interlocking technology

- > which ensures safe operation on open lines and in stations,
- > which is so reliable that it guarantees a high degree of punctuality
- > and which operates in an automated way and has a compact design, so that the railways can manage with fewer operating and maintenance staff.

The Simis® W (fail-safe microcomputer system made by Siemens for the world market) interlocking system is highly reliable, safe and very powerful. It is at your service as a railway operator in competition with other transport companies.

All the more reason for you to lay the foundation now for successful railway operation in the future – with state-of-the-art, high-performance interlocking technology made by Siemens. Because we know what you expect from a modern interlocking:

- > high reliability and availability
- > little maintenance requirement
- > technology adaptable to future needs
- > easy extension and conversion
- > low operating costs



## Our answer to your demands:

### Simis W

Profit from the advantages of our mature, innovative system which has proven its worth all over the world.

Simis W guarantees

- > high availability (2-out-of-3 configuration)
- > high degree of economic efficiency thanks to tailor-made solutions for every situation
- > problem-free compliance with all railway operator regulations regarding operations and safety
- > greater control distances with distributed equipment
- > easy integration of existing subsystems and elements of the outdoor equipment
- > the latest technology for all subcomponents
- > almost maintenance-free hardware
- > compact design
- > online and remote diagnostics
- > openness to innovations and therefore a secure investment for the future

## Safety is a matter of trust

### Siemens – your systems partner

Wherever the operation and whatever the operating conditions, railway operators all over the world value the combination of proven and innovative solutions and the know-how of our staff.

You, too, can profit from

- > their expertise
- > their experience
- > their innovativeness
- > and our multitude of experts working all over the world in the field of signaling, safety and control systems.

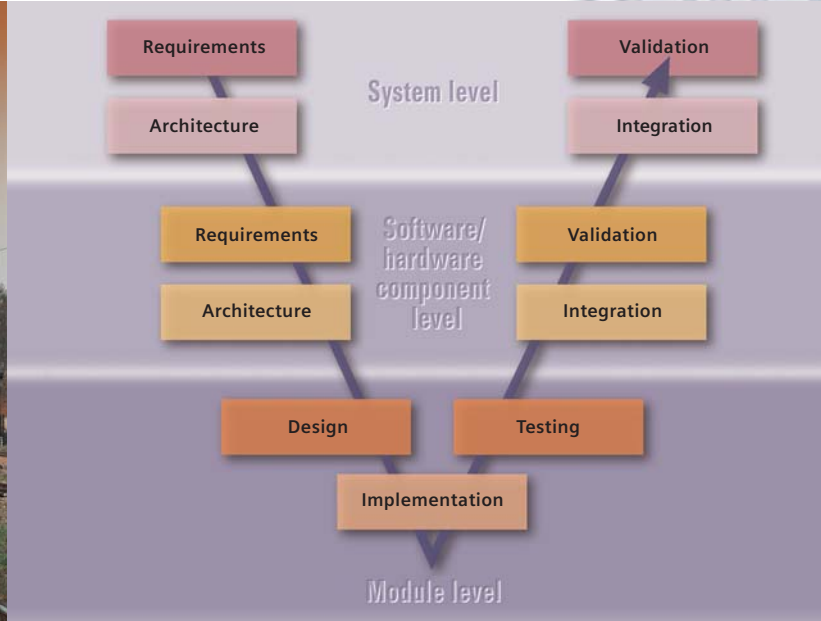
We have been putting our experience to work for your success for decades now – from first beginnings in the field of interlocking technology to our subsequent innovative and consistent developments and, ultimately, to today's pioneering systems. Among them are such modern, high-performance and economical interlocking systems as Simis W – one of the foundation stones for attractive and competitive railway operation.



# Process and product quality right from the beginning

## Safety has top priority

CENELEC



Having the highest safety integrity level (SIL 4) in accordance with the CENELEC standards, Simis W complies with all safety requirements. A documented safety process accompanies the whole life cycle of a product – from the very beginning.

During development of the software, the hardware and the systems, all the process events comply with the relevant CENELEC regulations and standards. A V-shaped phase model is used to illustrate the validated, verifiable and checkable stages of the safety process.

### The Simis principle

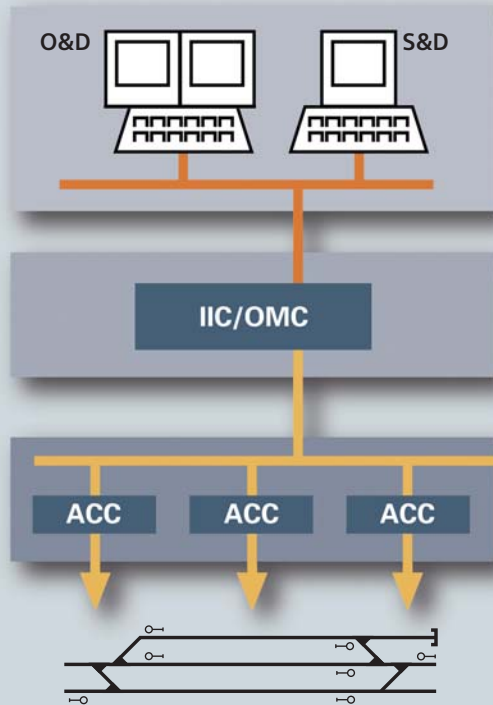
The basis of all Simis W computers which process fail-safe information (ACC and IIC/OMC functions) is the Simis principle in a 2-out-of-3 configuration. They comprise three identically programmed microcomputers, set up identically, with instruction-controlled synchronism, but independent of one another, whose processing results are compared with one another.



Big or small

# Optimum solutions for every situation

## Large-scale interlocking



## Small-scale interlocking

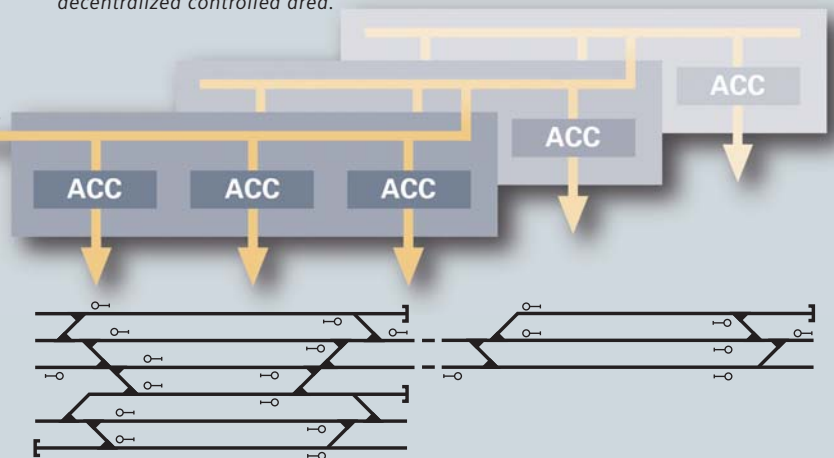
### Large-scale interlocking with decentralized controlled areas:

Extension of the IL bus by means of copper cables, fiber-optic cables or using public networks

The number of ACCs depends on the size of the interlocking.

Advantages of decentralization:

- > Centralized operation of large-scale (line and junction) interlockings
- > Greater distance possible between the centralized interlocking and decentralized controlled area.



Thanks to the modular hardware and software structure of Simis W, interlockings – from the smallest interlocking to the largest junction or line interlocking – can be implemented made-to-measure. The only thing that varies is the number of computers for connecting the existing controlled elements.

If necessary, the computers can be placed at a non-central location in order to increase the distance between the interlocking and controlled elements, for example, or to minimize the cost of laying signaling cables.

### O&D

Operation and Display

### S&D

Service and Diagnostics

### IIC (Interlocking & Interface Component)

Central Interlocking Functions

### OMC (Overhead Management Component)

Central Interlocking Functions

### IL bus

Interlocking bus

### ACC (Area Control Component)

Signaling Logic / Control and Monitoring

Less is more

# Hardware optimization with Simis ECC boards

An especially positive feature of Simis W is its modular hardware basis (Simis ECC) with the low number of board types.

The elements of the outdoor equipment are connected to the ACC computer via peripheral boards. Peripheral boards are integrated or modular element operating modules.

The elements of the outdoor equipment are connected directly to the ACC computer via the integrated element operating modules. Modular element operating modules are connected via the Ucom-I communication board in the ACC computer. The elements of the outdoor equipment are then connected to these element operating modules.



ECC base frame  
(ACC functions)

## Well-packaged

### The Simis ECC

Simis W uses the Simis ECC in a 2-out-of-3 configuration as a fail-safe computer for both the ACC and IIC/OMC functions.

### IIC/OMC computer

The IIC/OMC computer comprises three central ECC-CU boards and two mezzanine module baseboard communication boards. These can be configured for PROFIBUS, IL bus or Ethernet.

### ACC computer

The ACC computer comprises three central ECC-CU boards and two communication boards (ECC Burep). Depending on requirements, the other slots of the base frame can be fitted with peripheral boards.

- > Inom to connect components within the signal box
- > Unom to connect components of the outdoor equipment
- > Pom for switches
- > Som for signals
- > Ucom-I to connect the MSTT Signal element operating module for signals and train control systems



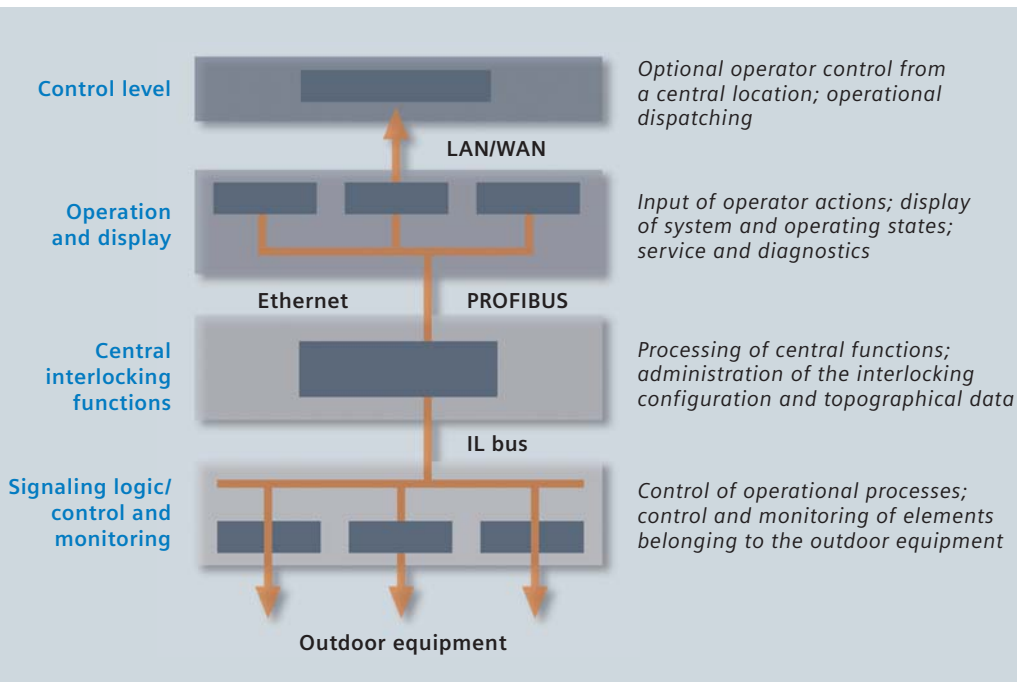
ECC extension frame  
(ACC functions)

An extension frame for peripheral boards can be attached to the base frame.



## Simple, clear and easy to understand

# Structuring of the functions



Principal functions of the Simis W interlocking are Central Interlocking Functions (IIC/OMC) and Signaling Logic/Control and Monitoring (ACC). The outdoor equipment elements are controlled and monitored via integrated or modular element operating modules. The interlocking can be operated locally or centrally from an operations control center.

Simis W uses standardized interfaces for communication:

- > PROFIBUS or Ethernet connects the IIC/OMC computer with the MMI PCs.
- > IIC/OMC and ACC are connected via the IL bus. Decentralized ACC computers are connected to the "extended" interlocking bus (copper cable, fiber-optic cable or public networks).

### Simple and easy to use

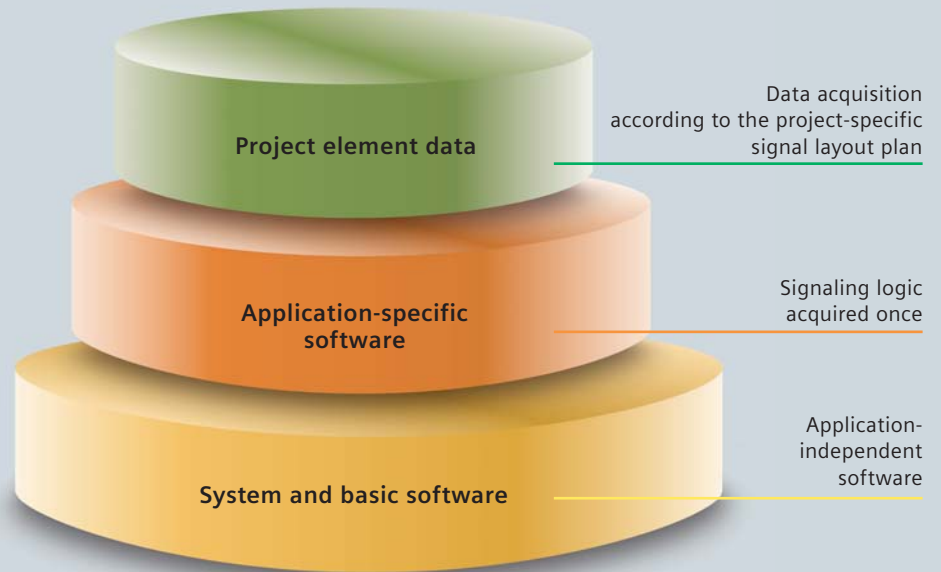
Simis W can work with all kinds of control and MMI systems which have a PROFIBUS or Ethernet connection and can handle the corresponding interface protocols, e.g. Vicos® OC 101/111 and Iltis.

MMI systems without a PROFIBUS connection can also be connected by means of a protocol converter.

Already existing control systems (also from non-Siemens manufacturers) can be easily connected via the communication interface.



# Cost savings with modern tools



The Simis W software is divided into non-application-specific software (system software and basic software) and the application-specific software to be specially programmed and project element data. This separation of modules means that processing costs for the individual systems can be kept to a minimum.

The application-specific software comprises the railway-specific signaling logic, which is acquired once. Once the signaling logic has been acquired, the individual stations are configured. This provides project element data which describes the topography of the station and the characteristics and adjacent element relationships of the individual components.

## References

- > Compania Nationala de Cai Ferate (CN CFR), Bucharest, Romania
- > HSL Zuid Projectorganisatie, Utrecht, The Netherlands
- > Ministry of Railways, Peking, China
- > Polskie Koleje Panstwowe (PKP), Warsaw, Poland
- > Network Rail, London, United Kingdom
- > Schweizerische Bundesbahnen (SBB), Bern, Switzerland
- > Slovenske Zeleznice (SZ), Ljubljana, Slovenia
- > Zeleznice Slovenskej Republiky (ZSR), Bratislava, Slovakia
- > Zeleznice Srbije (ZS), Belgrad, Serbia
- > Syrian Railways (CFS), Aleppo, Syria\*

\*Commissioning planned

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The information in this document contains general descriptions of the technical options available, which do not always have to be present in individual cases. The required features should therefore be specified in each individual case at the time of closing the contract.

