



What does it take for the  
railways to run on time?

Siemens' railway technology raises the efficiency of the railway network and ensures railway traffic runs smoothly.

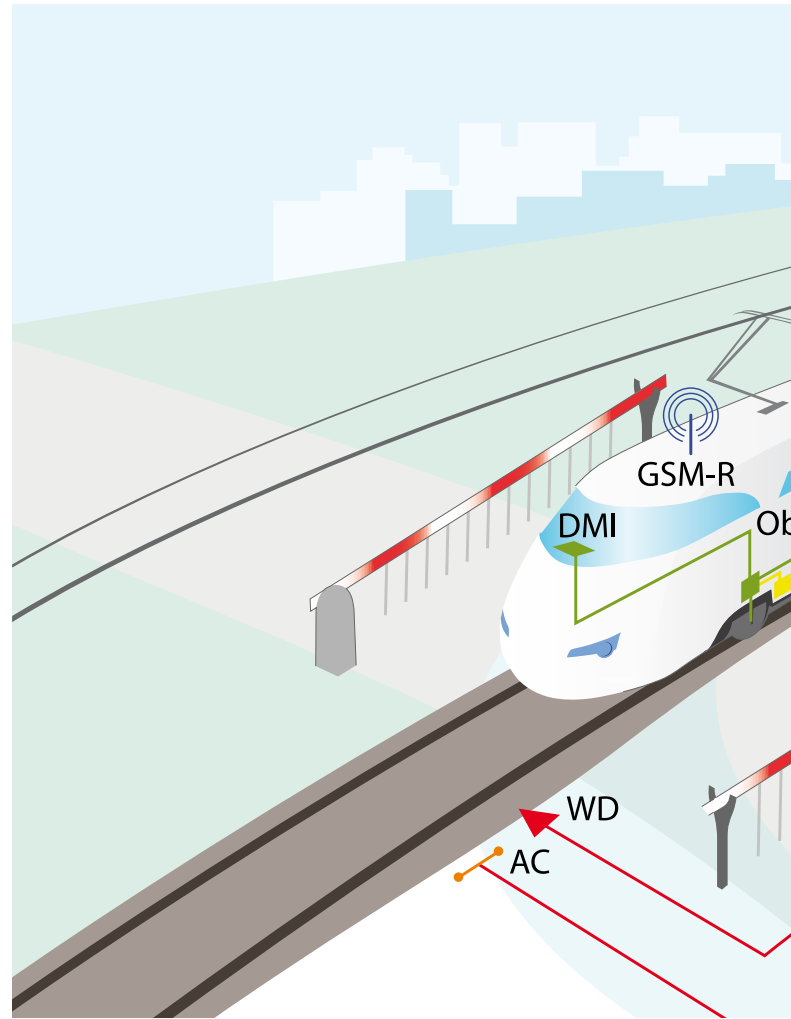
Answers for mobility.

**SIEMENS**



# Safe and Cost-effective

Rail automation products ensure smooth railway operations and make a major contribution to the safety and cost-effectiveness of rail traffic as a whole. Comprehensive functionality and a high level of reliability enhance railway network efficiency and improve train punctuality.



## Interlocking

**IL Interlocking**  
The interlocking is used to control train and shunting operations. It controls points, signals and level-crossings on the basis of commands received from the operations control system and information from track vacancy detection equipment. As a key element of rail automation, the interlocking ensures safety in rail traffic. It can be implemented either as a relay interlocking or as an electronic interlocking. For example: Trackguard Simis W, Trackguard Simis IS, Domino 67, Domino 69, Domino-C

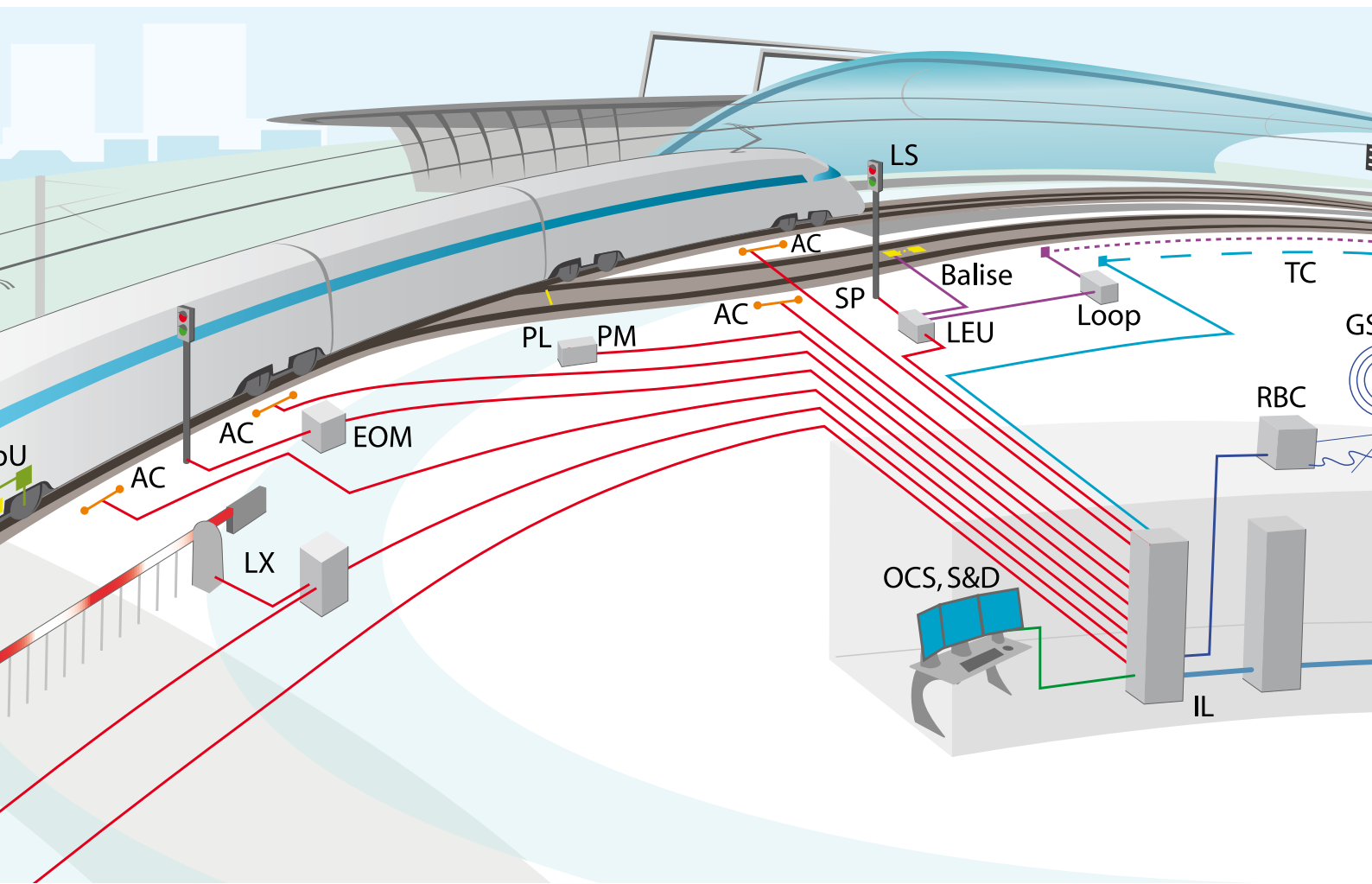
**EOM Element Operating Module**  
This decentralised module of the electronic interlocking controls signals and train control components.  
For example: Trackguard MSTT

## Operations Control System

**OCS Operations Control System**  
The operations control system is used for the control and display of railway safety system functions and for the automation of operations. All rail traffic is controlled from state-of-the-art PC workstations. For example: Controlguard Iltis N

**PIS Passenger Information System**  
The passenger information system provides passengers on station platforms with information about departure times, delays and changes in operation. It is operated by the operations control system.

**S&D Service and Diagnostic**  
The S&D system records fault indications from the subsystems of the safety system and supports maintenance personnel in troubleshooting. For example: Vicos S&D



## Train Control System

### Balise

The balise transmits track information, such as signal aspects and maximum permitted speeds, to the train.

For example: Trainguard Eurobalise S21

### DMI Driver-Machine Interface

This touchscreen terminal is located in the driver's cab and is used to enter train properties and display train protection functions, e.g. maximum permitted speeds and monitoring mode.

### GSM-R Global System for Mobile Communication – Railway

This system using the GSM mobile radio standard communicates within a special frequency band which is reserved for railway applications. It is used for ETCS Level 2 for example.

### LEU Lineside Electronic Unit

The LEU taps the signal aspect and transmits the information relevant for train control purposes to the train via balises or loops.

For example: Trainguard LEU S21

### Loop

Signal aspects are continuously transmitted to the vehicle along the loop cable. This permits the change to a less restrictive signal aspect in time between the distant signal and the main signal and activates a departure prevention when needed.

For example: Trainguard Euroloop S21

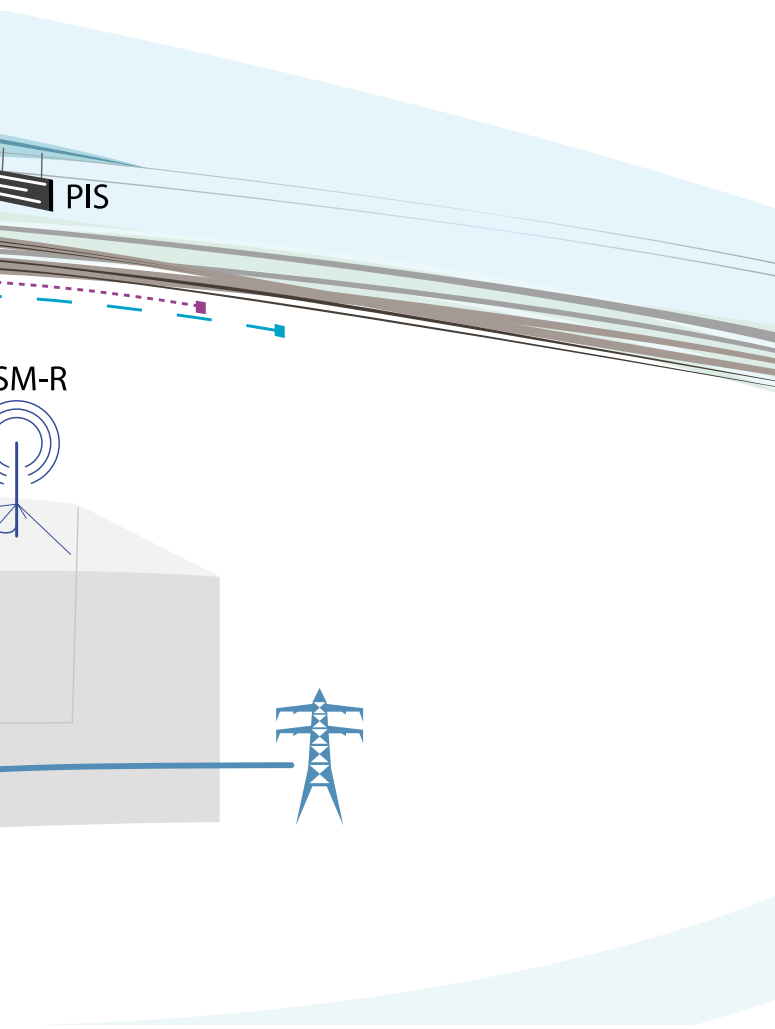
### ObU Train Control System On-board Unit

Taking into account current track information, the ObU ensures that the train is always operated safely. This includes not only signal aspect monitoring but also speed and braking curve monitoring.

For example: Trainguard ZSI 127, Trainguard ZSI-E, Trainguard 100, Trainguard 200

### RBC Radio Block Centre

The RBC processes messages sent between interlockings and trains on lines with cab signalling in connection with ETCS Level 2.



### Track Vacancy Detection

#### AC Axle Counter

The axle counter detects whether a track section is occupied by counting in and out the number of passing vehicle axles.

For example: Clearguard Az S 350 U

#### TC Track Circuit

The track circuit detects when a passing vehicle axle causes both rails to be electrically connected and indicates to the interlocking that the track section involved is occupied.

For example: Clearguard UGSK 3, Clearguard motor relay

#### WD Wheel Detector

The wheel detector is activated by a passing train and can be used to initiate succeeding events, e.g. opening of level-crossing barriers.

For example: Clearguard QL 57/2

### Point System

#### PL Point Locking

The point locking fixes points in their end position and ensures that points can be traversed safely.

For example: Switchguard CKA 12

#### PM Point Machine

The point machine sets the running direction of a set of points by moving the point blades to the required end position.

For example: Switchguard ITS 700, Switchguard S 700 K, Switchguard KCA

### Level-crossing Protection System

#### LX Level-crossing Protection System

Barriers, flashing light signals and acoustic warning signals protect both pedestrian and road traffic at level crossings.

For example: Wayguard BA 8, Wayguard LCM 200

### Signalling

#### LS Light Signal

The light signal communicates the maximum permitted speed to the locomotive driver using different combinations of colours and symbols.

For example: Signalguard LDK 1400, Signalguard LDK 70, Signalguard fibre-optic signals

#### SP Signal Post

The signal post ensures that light signals are firmly fixed.

For example: Signalguard Sigma

The products listed above are merely examples from our wide range of products. Our entire portfolio of products and services may be found on our Web site under [www.siemens.ch/mobility](http://www.siemens.ch/mobility)

# Everything for Your Railway



## **Unique**

Cooperation with one and the same partner features major benefits not only for new installations but also when existing installations are to be linked to state-of-the-art systems. Responsibilities are then defined clearly, aspects coordinated and finalised directly and interfaces handled competently.

In this respect too, Siemens Mobility enjoys an exceptional position since it is the only company in Switzerland to offer a complete portfolio for railway systems – and thus provide actual system integration.

## **Customer Satisfaction**

Thanks to our commitment, experience, innovativeness and IT competence, we can support you in transporting your passengers to their destinations fast, safely and in comfort.

## **Cost effectiveness**

Innovative, cost-effective and reliable products, systems and services enable you to optimally meet continuously increasing customer requirements. Through compatible new products and the maintenance of tried-and-tested systems over a period of many decades, Siemens guarantees optimum cost-effectiveness for the system throughout its lifetime.

## **System Integration**

Siemens is also at your service as an experienced system integrator when it comes to handling any project professionally – from the initial concept, planning and implementation through to the operation of railway safety systems.

## **Competence**

We would be delighted to discuss your present and future requirements with you and provide you with more detailed information.

