Safety and efficiency for mass transit railways
Rail automation from Siemens at a glance

siemens.com/mobility
“Complete mobility” is Siemens’ response to the challenges of growing global population and urbanization, climate change and the consumption of resources.

That is why Siemens is creating integrated mobility solutions – for safe, economical and environmentally friendly rail transportation.

Customers throughout the world profit from our many years of experience with customized railway signaling and safety systems and rail automation systems for trams, light rail transit and metros.

Green mobility for a clean environment
Siemens has set itself the task of creating green solutions for rail automation, using resources efficiently and making rail attractive as an environmentally friendly, safe means of transport. Our portfolio covers a wide range of products which make a demonstrable contribution to environmental protection:

- Intelligent control systems ensure reduced energy consumption, increased line capacity and improved punctuality. This stabilizes the overall timetable, reduces wear and improves convenience for passengers.
- The time-optimized initiation of grade crossings decreases the “barriers lowered” time. Thanks to a reduced road traffic waiting time, CO₂ emission levels can be considerably cut.
- Rail automation components such as LED signals and solar-powered radio-operated approach indicators reduce energy demand and save installation costs.

More passengers in less time
There is a continuous increase in the need for public transportation in cities. More and more people are using trams, light rail transit and metros on their way to work, leisure, shopping or education facilities and back home.

Efficient mass transit systems that are capable of being quickly adapted to new requirements are therefore to be seen as one of the most important factors for maximum mobility in conurbations and, thanks to efficient automation systems, contribute to energy savings and reduced emission levels and to the promotion of urban and regional economic development.

A state-of-the-art, performance-oriented rail automation system enhances network capacity, availability and safety and thus leads to greater attractiveness and more convenience for passengers, at the same time cutting down on environmental impact.
Siemens offers innovative, modular, upgradable and future-proof systems that can easily be expanded if the need for higher transportation capacity arises. After commissioning, services such as maintenance, support and long-term spare parts availability guarantee smooth operation during the entire life cycle of the system.

Siemens, world market leader in rail automation, offers the complete portfolio from single components to complex overall systems:

- railway signaling and safety systems and rail automation systems for mass transit systems and for regional and industrial railways
- operations control systems with scheduling, planning and dispatching functionality for continuous operational optimization
- rail communication solutions for mass transit

Modernization and migration without disrupting operations
For most transportation authorities, interrupting passenger services during line modernization is unacceptable. Siemens offers modular and scalable solutions that permit existing systems to be converted and upgraded step by step without service interruptions. Expertise and experience in the implementation of major modernization projects worldwide such as in New York, Paris, Helsinki, Istanbul and Budapest make Siemens the migration specialist with more than 500 km of modernized lines and over 700 refurbished trains.

Availability as the basis for more efficiency
Siemens’ products ensure maximum system availability and cost-effective operation. An integrated service and diagnostics concept makes sure that every system runs smoothly. Any deviation from standard system behavior is detected, recorded and reported. Faults are located and remedied quickly and efficiently, and system downtimes for maintenance and servicing kept to a minimum.

Cutting-edge competence for driverless operation and communications-based train control
Siemens’ competence in the field of driverless systems dates back to the early 1980’s with the suspended monorail in Dortmund, Germany, and VAL, the driverless metro system in Lille, France. In the field of communications-based train control, Line D of the Lyon Metro, France, was commissioned as early as 1992 with fully automatic operation, followed in 1998 by the Météor Project for Paris Metro’s Line 14.

Metro operators in New York, Paris, Barcelona, Budapest, Nuremberg, Helsinki, Istanbul, Guangzhou, Beijing, Nanjing, São Paulo and Algiers have opted for Trainguard MT, the worldwide leading communications-based train control system from Siemens.
Operations control systems
With operations control systems from Siemens, electronic and relay interlockings can be controlled and monitored. In addition, our operations control systems feature a large number of automation functions.

Operations control systems
- Vicos® OC 100
- Vicos OC 500
- Vicos CBTC

Remote control systems
- Vicos OC 5 / Vicos OC 15

Service and diagnostic systems
- Vicos S&D

Dispatching systems
- Falko

Rail communication systems
Real-time communications between station, train and control center
- Railcom Manager
- Airlink radio transmission system for communications-based train control, CCTV and infotainment on trains

Electronic interlockings
Electronic interlockings monitor and control safety-related facilities in line with the dependencies between signals, points and vehicles. Siemens also supplies containerized electronic interlockings that are completely preassembled and tested at our System Test Center.

Electronic interlockings
- Sicas®
- Sicas S7
**Train control systems**
In driver-based train operation, the train control system supports the driver with safety-related and operational functions. In driverless operation, the train control system replaces the driver to offer maximum efficiency and flexibility.

**Communications-based train control systems**
- Trainguard® MT
- Trainguard MT CBTC

**Continuous automatic train control systems**
- LZB 700 M
- Sacem
- PA 135

**Intermittent automatic train control systems**
- Zub 200
- Imu 100

**Components and subsystems**
Siemens provides the full range of components and subsystems from axle counters and point machines to LED signals from one and the same source. In top quality, designed and built for fault-free installation, maximum availability and simple maintenance.

**Signals**
- Compact signals
- LED signal light units
- Tunnel signals

**Point operating systems**
- Point machines
- Decentralized electric points
- End position detectors

**Track vacancy detection systems**
- Axle counting systems
- Remote-fed audio-frequency track circuits
- Locating loops

**Locating equipment**
- Eurobalises
- Digiloc balises
- Zub balises

**Grade-crossing protection systems**
- Grade-crossing protection systems
- Barrier drives
- Radio-operated approach indicators

**Shorter headways**
**Cost-effective maintenance**
First-class project management – always in close cooperation with our customers

From the installation of new components to complete infrastructure solutions – our competence in project execution has been demonstrated in many projects worldwide and is the backbone of our business.

By means of excellent project management, Siemens has proved to be a reliable and competent partner from planning, configuration and implementation through to official acceptance.

The undisputed quality of our products and our internationally recognized competence in project execution provide the basis for a stable and reliable partnership with our customers.

In close cooperation with our customers, we develop continuous configuration concepts, precisely tailored to their installations and requirements. If requested, we take on the entire scope of work as general contractor for a complete turnkey project. Alternatively, we cooperate with customer teams or subcontractors.

Smooth installation thanks to thorough testing

Prior to commissioning, all products and systems run through stringent tests at our Mass Transit Test Center. Our customers can use our Test Center for their own tests and learn how to operate their installations both efficiently and correctly by means of training courses at our Rail Automation Academy.

Product quality, excellent process control and committed customer orientation determine our installation strategies. Our experience gained in many projects without interrupting passenger operations ensures that products and systems are commissioned both quickly and safely. This in turn guarantees reliable planning on the part of the customer and enhances the efficiency of railway operations.

Count on us

Worldwide recognized execution competence from Siemens
Safety first ...
This is the fundamental rule in railway signaling, and all our products follow this principle. Certified and tested signaling components and systems from Siemens meet the highest safety standards.

... with an independent safety assessment center
Regularly conducted safety and quality audits by an independent safety assessment center guarantee the high safety standard of our products. All safety assessments are performed in line with the regulations stipulated by CENELEC and the Federal German Railways Office (EBA). The Safety Assessment Center is officially accredited as an independent inspection body according to ISO 17020 / EN 45004. It is a recognized and competent partner for assessing the safety of both components and systems.

Certified in accordance with international standards
Excellently trained personnel and top-level production standards ensure the quality and reliability of our products. Siemens’ products and processes comply with all the important railway standards, including the decisive aspects of reliability, availability, maintainability and safety (RAMS). We aim at utmost quality and customer satisfaction which is why our processes are subject to continuous improvement.

Siemens is certified according to the following quality and safety standards:
• ISO 9001:2008
• EN ISO 14001:2004
• IRIS Rev. 02:2009

Servicing and maintenance throughout the entire product life cycle
Successful mass transit operations require maximum safety and availability. In order to provide undisrupted passenger services, Siemens offers tailored and innovative servicing packages.

These include inspection, on-site and remote maintenance, delivery of spare parts, corrective maintenance, testing, diagnostics and training, and ensure smooth railway operations and satisfied customers. A landmark in customer orientation is the Rail Automation Academy which offers not only vocational and further training courses for our own personnel but also individual and tailor-made courses for our customers.
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.