Rail infrastructure solutions
Contents

Complete mobility 3
The Siemens difference 4-5
Signalling 6-7
Power 8-9
Rail communications 10
Telecommunications 11
Contact details 12
Complete mobility

Integrated mobility solutions from Siemens enable better connections between road and rail travel. Millions of commuters travel to work every day. To them, intelligently connected transport networks mean fewer traffic jams and less stress. And for the environment it means lower emissions.

As market leaders across rail, road and logistics, Siemens is pursuing the goal of networking transportation systems with each other to move people and goods efficiently.

As part of Siemens in the UK, Siemens Mobility employs around 1700 people, providing expertise and technology in rolling stock, rail automation and electrification, traffic solutions and infrastructure logistics to the transport industry.

Delivering for the rail industry

With rail traffic forecast to grow each year, combined with demands for lower costs and a more environmentally friendly railway, the rail industry has to meet some difficult challenges.

Billions of pounds are being invested in major rail projects, and Siemens is playing its part in making these a success.

More than a billion passenger journeys are made each year on the UK rail network, and half a million London commuters are carried by rail every week. Siemens expertise helps to make these journeys comfortable, punctual and safe.

Siemens combines innovation with responsibility, to deliver technologically advanced solutions for rail infrastructure. It offers a wide range of systems for signalling, control, communications and electrification for main line, metro and light rail infrastructure applications.

Excellence in technology is just the beginning. Siemens provides the right people for each project, with the experience and skills to deliver a successful outcome, on time and on budget. Its culture of respect and team-working makes working with Siemens straightforward, from small projects right up to the biggest turnkey systems.

Integrated solutions

Complete rail transportation solutions are complex, and are best handled and managed on an integrated basis.

Siemens has proven expertise in project management, engineering systems integration and financing. It can deliver innovative solutions precisely suited to individual requirements. Its experienced and knowledgeable team is capable of undertaking and delivering the most challenging of large turnkey projects.

By bringing together the combined expertise of its project teams, Siemens can offer complete infrastructure solutions. Its rail infrastructure team is fully committed to delivering an efficient, reliable, safe and green railway.
Siemens focuses on the needs of its customers. It works with them as partners, aiming for mutual benefit in all relationships.

The global scale of Siemens and its diverse portfolio means that it has the capability to deliver complete rail infrastructure solutions, right up to the largest projects. The approach is the same, whether a full turnkey project is required, or simply a technology component to fit into a bigger system.

Siemens provides an effective combination of engineering skill and project management experience. This ensures that its solutions are delivered on time, on budget and fit for purpose.
People and teamwork

Siemens knows that long term success is dependent on attracting and retaining the most talented people and helping them to realise their full potential. Siemens sees effective talent management as a business priority and considers improved diversity across the workforce as a key driver in ongoing competitiveness.

Siemens believes in achieving the highest business performance with the highest ethical conduct, and therefore its three key values are:

- Responsible - committed to ethical and responsible actions
- Excellent - achieving high performance and excellent results
- Innovative - being innovative to create sustainable value

Teams have the experience and professionalism to deliver the highest standards of project management. They achieve successful results by striking the right balance between time, cost and quality.

Standardised procedures and thorough documentation ensure that potential savings and opportunities are identified. The Siemens culture is quality-orientated and professional, with a focus on developing and respecting people.

Quality

For Siemens, excellence and quality are not just theories – they relate to everything the company does, and how it does it.

The European Foundation for Quality Management (EFQM) assessment model and ISO 9001 accreditation provide Siemens customers with confidence that its products and services are of the highest class. Siemens utilises a quality management system which is focused on excellence through continual improvement.

The EFQM model is adopted throughout the Siemens rail business and its many support functions. This means that Siemens customers receive quality products and services every time they do business with the company.

Project finance solutions

Siemens can provide financing to help with major projects. As would be expected from a major global company, Siemens is a reliable and efficient source of financing, enabling it to help meet the challenges of industry.

Siemens Financial Services advises on project finance, and provides equity and debt financing solutions for infrastructure, equipment, technology and working capital.
Signalling

Electronic signalling and control systems

Today’s rail systems place increasing demands on operators: growing traffic density, higher speeds, and ever-growing targets for punctuality and safety. To meet these demands, rail infrastructure must be as effective as possible.

Signalling and control systems must be technologically advanced, while maintaining high reliability and minimising maintenance requirements. And, of course, systems must be efficient, and costs must be kept as low as possible.

Innovation

To meet these challenges, Siemens is continually innovating to develop its signalling and control technologies. Systems from Siemens, whether for main line, metro or light rail, combine more than 100 years’ experience with continuing investment in R&D.

Siemens has a wealth of experienced project teams to deliver railway signalling systems, and can call upon its global pool of experience when developing solutions. With a signalling workforce including many specialists with direct UK experience, Siemens brings industry-leading strength and depth to the challenges of complex projects.

The Siemens signalling product range is led by the Simis W interlocking and Vicos control systems. These provide the flexibility to handle many different and complex interfaces. Siemens can also deliver traditional signalling systems.

Proven experience

Simis W and Vicos are in operation for Network Rail in the Portsmouth and Bournemouth areas of the UK rail network, alongside Siemens axle counters. Simis W interlockings and train detection systems in these locations have achieved flagship performance and reliability for Network Rail.

Siemens is also a leading supplier of advanced Automatic Train Control for mass transit systems around the world, including projects in Paris and New York.
Solutions

• Electronic interlockings
• Operations control systems
• ETCS – onboard and trackside
• Level crossing protection systems
• Track vacancy detection

Simis W

Computer-based interlocking system

Simis W is a high performance, state-of-the-art interlocking technology. It was developed in accordance with the CENELEC standards to achieve the highest possible levels of safety, and has gained Network Rail cross acceptance.

Signalling systems based on Simis W can interface seamlessly with and control standard trackside equipment including main and shunt signals, indicators, point mechanisms and level crossings.

Simis W has been proven globally, including implementations in China, the Netherlands, Poland, Romania and Slovenia.

SIMATIC S7

SIMATIC S7-based electronic interlocking

The use of SIMATIC S7 as an established standardised hardware platform for signalling interlockings and level crossing control provides operators with the benefits of low investment and maintenance costs due to the use of standard components used across other industry sectors.

The system is simple to operate, and hence requires less training and orientation. It is flexible and simple to expand, and competent local customer support, servicing and spare parts are easily available worldwide.

Vicos

VDU-based control system

The Vicos system will interface directly with Simis W and can also be configured for controlling existing relay interlocking systems, Siemens S7 (such as Edinburgh Tram) or SSI systems. Vicos also offers automatic train-tracking, automatic route setting and SCADA.

The Vicos system, as well as being installed in Bournemouth and Portsmouth, has been tried and tested around the world, including projects in Germany, China and Hong Kong.

Standalone signalling products

Sensors, counters and controllers

Siemens provides a range of standalone signalling solutions, including multiple-section axle counter systems, electronic wheel sensors, and level crossing controllers and barrier drives. Building on a history of successful operation on mainline rail and the London Underground, the solutions combine advanced technology with high reliability and low maintenance.
Quality and reliability
Throughout system specification and design, the top priorities are safety and reliability. Siemens provides tested components that can be depended on.

Siemens is one of the few suppliers with the capability to implement complete electrification systems. Its customers get all the services they need from a single source – from consultancy and planning, to project execution and maintenance. All phases are implemented to the highest quality standards.

System expertise
With extensive know-how and wide experience, Siemens can design and build future-oriented and efficient traction power supply and contact line systems – tailor-made for the rail operator. Rigorous computer simulation is used to calculate items such as electromagnetic compatibility (EMC), and to ensure all systems meet customer requirements cost-effectively, with sufficient reserve capacity for the future.

Siemens uses the latest results of its global research and development activities to deliver the best solutions for rail power projects. IT-based engineering tools increase quality, and save money and time.

Track record
Siemens has designed and built electrically-operated rail systems all over the world, covering tens of thousands of track kilometres in more than 40 different countries. These cover the whole spectrum of railway electrification, from rail projects for suburban areas to cross-border high-speed routes.

In the UK, successful projects include major substation upgrades for Network Rail in London and the South of England, Manchester, and in Scotland.
Solutions

• Overhead line equipment
• Substations
• Switchgear
• Rectifiers
• Protection relays

Whether for high-speed overhead contact lines or traction power supplies, Siemens can provide modern, cost-effective solutions to meet the specific requirements of the project. Siemens offers Network Rail-approved products for catenary systems, and AC and DC traction power supplies.

With an emphasis on maintenance-free equipment, Siemens offers stainless steel and aluminium overhead contact line components and polymeric insulators for 25kV and GRP cantilevers for DC light rail systems.

Its range of gas insulated switchgear provides high reliability and low maintenance in a compact enclosure. The air-insulated range has been designed with recyclable components. Its intelligent AC and DC protection systems, with better diagnostics, communications and built in control logic, reduce the amount of additional equipment required, which helps reduce cost.

Case study – Shields to Gourock overhead line renewal

Siemens was contracted by First Engineering, for Network Rail, to renew the overhead line between Shields Junction (Glasgow) and Paisley, and to refurbish the overhead line equipment from Paisley to Gourock & Wemyss Bay. The project also included a new Track Sectioning Cabin (TSC) at Shields Junction.

As this was an existing operational railway, significant emphasis had to be put into the detailed planning for the supply chain – from site survey to commissioning. The overhead line system was designed from the Siemens portfolio of components, which have been used successfully worldwide. The switchgear design was based on proven Siemens standard equipment.

The Siemens solution provides a professional, compliant electrification system which incorporates light weight, maintenance-free overhead line systems and modular substation units.
Rail communications

Rail communications, control and asset management

The successful operation of any modern railway needs a reliable communications network, linked with effective information management, control and asset management systems.

Siemens is a specialist in control and information systems. The team combines decades of experience and innovative technologies to provide solutions for safety-critical communications, enhancing the efficiency of the rail network.

Siemens has developed many solutions for the rail industry including integrated station and network management systems, traction power SCADA, real time passenger information systems and intelligent asset management solutions.

In the arduous rail environment, where high integrity control is essential, Siemens project teams deliver effective and well-considered solutions to manage change.

Experience in the UK includes an integrated control solution for the East Coast main line rejuvenation project, a passenger information system at St Pancras International station, and an integrated station management system at King’s Cross St Pancras on the London Underground.

RailCom Manager

Siemens has responded to the challenges of communications and control with RailCom Manager, an integrated suite that enables operators to increase efficiency, control costs and improve passengers’ rail travel experience.

RailCom Manager is a proven, scalable solution that enables operators to invest in a limited system initially, and then expand it as required. It is the first system of its kind that provides access to all information, communications and asset monitoring systems via a single, integrated user interface.

Compatible with all relevant interface standards, RailCom Manager is simple to configure and modify, and provides a flexible retrofitting capability enabling it to be easily integrated into existing networks and infrastructure.

The system is made of separate modules, enabling operators to select the right components for their needs. A common, simplified user interface and centralised monitoring of all assets mean that operational efficiency is maximised and staff training is kept to a minimum.

Case study – Station management at King’s Cross St Pancras, London Underground

Siemens provided an integrated station management system for the greatly expanded station. The system covers the new Western and Northern ticket halls and includes CCTV, public address, passenger help points and station facilities monitoring. As the underground station remained fully operational, the new equipment was installed and tested in isolation, before being migrated onto the existing control architecture. The system allows London Underground to provide a central point of contact for passengers, and more consistent help and information to travellers.

Solutions

- Integrated station management
- Passenger information systems
- Power control and network management
- Intelligent asset management
Telecommunications

Fixed and mobile communications systems

Siemens brings over 30 years of experience to designing and building rail communications systems. It has the capability to deliver solutions built on innovation and state of the art technologies, while maintaining the highest levels of reliability.

Siemens recognises the need for integrated solutions, and operates as a single partner to help provide the best system for any rail communications requirements.

Fixed telecoms

The fixed telecoms product range is backed by experienced project teams. Its combined experience across all railway telecoms activities allows Siemens to offer integrated solutions for all operational and retail communications requirements, including consultancy, design, installation, testing, commissioning and maintenance.

Key capabilities provided by Siemens include systems design, test and commissioning services over a wide range of projects. It has extensive experience in voice / data transmission and switching systems based on analogue and digital technology.

The team has specialist capability and experience in mission-critical applications for harsh environments, including major regional schemes, installation or replacement of central concentrators, and local renovations.

Successful UK projects include King’s Cross and Sheffield concentrator renewals, Portsmouth and Colchester to Clacton resignalling, and Reading Operational Communications System.

Mobile communications

For over 20 years, Siemens has been a leading supplier of specialist end-to-end GSM-R terminal solutions for the railway industry throughout the world. Today, Siemens in the UK is a centre of excellence in product development and manufacturing for GSM-R communications solutions including on-train radios, network infrastructure and dispatchers.

Siemens provides a comprehensive GSM-R terminal solution. Customers include national railway infrastructure organisations as well as train operating companies.

The Siemens mobile communications team has a wealth of experience. Projects have been undertaken internationally in Australia, India, Greece, Saudi Arabia, Norway, Spain and Italy. In the UK, Siemens is providing GSM-R cab radios to meet the demands of the majority of the British main line rail fleet.

Case study – GSM-R communications

Siemens is a key participant in the development and rollout of a new national GSM-R network, due for completion in 2012. Successful trials using Siemens equipment have been completed with Network Rail, and it has won its first contract to provide GSM-R products in the UK. Siemens is developing additional functionality to meet the UK’s requirements, including providing a ‘first in type’ design for every train type in service in the UK. Siemens is providing a reliable product that is easy to repair and replace, thus minimising fleet downtime.

Solutions

**Mobile communications**

- GSM-R cab radio
- ETCS data radio
- Cab secure radio
- GSM-R dispatcher system

**Fixed telecoms**

- Fibre and copper lineside infrastructure
- Lineside telephony, including signal post telephones and level crossings
- Control centre communications
- Concentrator systems