



## Worldwide GSM-R capabilities

Reliable and flexible end-to-end GSM-R solutions

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**SIEMENS**

# End-to-end GSM-R solutions

GSM-R is the future of rail communications, and it's already here. Providing a complete, secure driver to signaller link, GSM-R improves safety and information flow across the rail network.



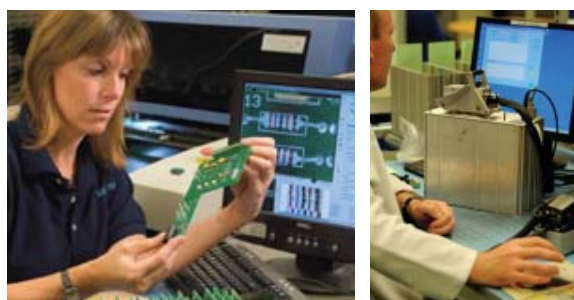
The railway industry demands high reliability and proven solutions from GSM-R, but also innovation and high performance. Naturally, total lifetime cost must be minimised.

Siemens has extensive experience in GSM-R and mobile communications for the railway industry. Its products have the highest reliability and lowest lifetime cost. Most importantly, Siemens has the expertise to provide the right solution, and the flexibility to deliver regardless of which network provider has been selected.

## Efficient project delivery from a single source supplier

On any project, each added layer of complexity increases risk. The more suppliers involved, the more there is to go wrong.

Siemens can offer a comprehensive end-to-end solution for GSM-R, it can increase control and visibility. A single point of contact that manages the interfaces in the project: limiting risk, controlling cost, and ensuring on-time project completion.



## The benefits of working with Siemens for GSM-R

- > Provider of the complete end-to-end solution
  - to reduce risk and minimise interoperability issues
  
- > Largest portfolio of terminals for GSM-R and ETCS
  - providing single sourcing
  
- > International presence combined with strong local country-by-country expertise and support
  
- > Highest reliability solution
  - to minimise downtime and maintenance costs
  
- > Lowest lifetime cost means high reliability
  - ease of installation and maintenance
  
- > Smallest cab radio Human Machine Interface (HMI) on the market
  - to ensure best use of cab space



# Global experience in radio communications

For over 20 years, Siemens has been a leading supplier of end-to-end radio communications for the railway industry. Starting with the MORANE project in 1997, Siemens team has led GSM-R development.

Today, Siemens specialists understand the complex issues surrounding a GSM-R system, and how to apply this knowledge to provide practical, reliable solutions on the ground.

Siemens has the flexibility to add extra capabilities on top of the EIRENE specification where required, providing the functionality required in each country.

## Case studies

### United Kingdom

In the UK, 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 class' 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.

### Greece

Greece ERGOSE, the Greek railway operator, are adding a GSM-R radio coverage system for the main railway axis from Patras to Promahonas, which runs via Athens and Thessalonica. For this project, the Siemens team in Poole is providing GSM-R cab radios with a graphical HMI, dispatchers and associated equipment for end use on the Greek railway.

### Saudi Arabia

In the first GSM-R/ETCS project in the Middle East, the Saudi Railway Organisation appointed a consortium to supply a GSM-R communication system for the railway line from Riyadh to Dammam. Siemens is supplying the cab radios and dispatchers for this system, as well as a voice recorder, and is also carrying out first in class installation design. Siemens has customised its standard GSM-R products to use the Arabic language. The contract includes support for five years.



## GSM-R portfolio



### On the train

Siemens EIRENE-compliant GSM-R cab radio provides all the required functions for the standard, including GSM-R voice and ETCS data.

The cab radio has the smallest Human Machine Interface (HMI) available today – with either a text or graphical display. It provides unparalleled reliability, with a proven mean time before failure (MTBF) of over 50,000 hours, dramatically reducing repair costs and down time.

The cab radio is based on a single unit plug-in concept, removing the need for on-board fault diagnostics – a new radio can be easily and quickly swapped in. Wide range power conditioning units means the same cab radio can be used on many different train types, regardless of train voltage, thus reducing spares holdings.

### In the control centre

Siemens provides a complete range of fixed and wireless GSM-R dispatcher terminal solutions.

Fully compliant with the EIRENE specifications, the Siemens dispatcher terminal provides the flexibility to include railway-specific functionality beyond the EIRENE standard. For example, this could include continuously updated lists of trains within a dispatcher's area of control. Placing a call is as simple as selecting the train and the EIRENE role, and then pressing the CALL button – no need for telephone numbers.

The Siemens controller server provides the necessary support for the dispatcher terminals, including interfaces with the GSM-R network and other railway systems.



**The network**

Siemens is able to work effectively with whoever is selected to provide the GSM-R network. With experience around the world, we are able to integrate fully with the GSM-R infrastructure, regardless of the provider.

**The services**

To ensure the success of the GSM-R project, the complete solution has to cover the human factor. Siemens provides a full range of technical services, to transfer expertise and ensure that its customers have the knowledge and skills required.

The services provided include software design, installation of equipment and training of personnel, as well as full technical support over the lifetime of a project.

**Project capabilities**

Of course, a successful project is not just about selecting the best products. Siemens also provides a full range of project management capabilities, from initial planning, through installation and training, to maintenance and upgrades. It can help rationalise the supply chain, providing a single interface to the customer throughout the GSM-R project lifetime of 20 years or more.

With its expertise in maintaining trains Siemens is in a strong position to help plan the installation of the on-board train equipment and to minimise expensive down time. Siemens 'train ready' cab radios are specifically designed for fast installation and swap-out: customers can fit an install kit at a convenient time when the train is undergoing routine maintenance, and then add the radio itself when required, saving on warranty and cash flow. The actual radio fitment, or replacing a faulty radio, typically takes only 15 minutes.



Fixed dispatcher terminal



Graphical HMI



Textual HMI



ETCS data radio

# Industry-leading reliability reduces lifetime cost

Reliability is crucial in GSM-R technology. Faults affect safety and compromise service performance. Fixing the systems involves down time, which can quickly become expensive to operators and irritating to passengers.

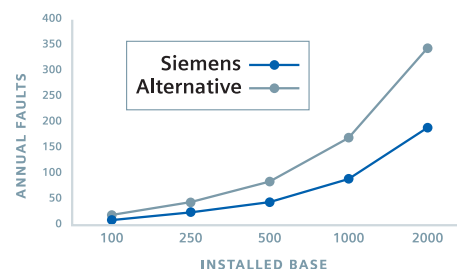
By providing a GSM-R solution that is substantially more reliable than that of any competitor, Siemens can save its customers hundreds of thousands of Euros every year. Over the lifetime of a system, the total cost savings can be dramatic.

Siemens cab radio has a proven MTBF from a European installation of 50,000 hours. The best alternative on the market only achieves a MTBF of 30,000 hours.

Over an entire fleet, the number of annual faults is nearly halved with the Siemens cab radio. For example, with 2,000 cab radios installed, the MTBF of the Siemens cab radio predicts less than 200 faults each year, which is currently the best known performance in the industry.

**Annual faults based on mean time between failures**  
Siemens GSM-R cab radios - 50,000  
Alternative suppliers GSM-R cab radios - 30,000

It's not just repair costs: Siemens radios have been specifically designed to be as fast and easy as possible to swap out when faulty. This leads to additional savings in reduced down time, meaning the overall lifetime cost for a Siemens GSM-R radio system is substantially lower than competitive solutions.





## Working in partnership

With its “Complete mobility” focus, Siemens is providing integrated transportation and logistics solutions for safe, cost-effective and environmentally-friendly travel.



As train operators across Europe and beyond turn to GSM-R, Siemens has the expertise required to deliver products that support these mobility goals, and the commitment to build long-term customer relationships over the coming decades.

Siemens UK-based centre of excellence is at the heart for GSM-R developments, and has designed market-leading products. Coupled with Siemens first-class maintenance and support, this means customers can be confident in its GSM-R solutions.

Siemens is a supplier of end-to-end GSM-R solutions, reducing risk and simplifying project implementation. It has proven experience in GSM-R around the world. It provides technically advanced products that are substantially more reliable than any competitors’, therefore reducing lifetime costs.

GSM-R is transforming communications for railway operators.

Siemens is the right partner to help you maximise the benefits from GSM-R: reliably, cost-effectively and for years to come.

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Printed in UK  
Order No.: A19100-V100-B909-X-7600

