



TETRA FOR GERMAN PUBLIC TRANSPORT

RHEINBAHN AG AND VIA VERKEHRSGESELLSCHAFT DEPLOY MOTOROLA SOLUTIONS' DIMETRA IP SCALABLE FOR RELIABLE, SECURE COMMUNICATIONS



RHEINBAHN AG AND VIA VERKEHRSGESELLSCHAFT GMBH

Rheinbahn AG is a public transport provider in the German federal state of North Rhine-Westphalia. It manages a fleet of over 700 trains, buses and trams along 110 lines in a commuting area of 570 km² and employs about 2,800 persons. Via Verkehrsgesellschaft is a public consortium including the three transport companies Duisburger Verkehrsgesellschaft AG, Essener Verkehrs-AG and Mülheimer VerkehrsGesellschaft mbH with 2,700 employees in total. It operates 99 lines with more than 700 vehicles. Between them, these four companies carry approximately 1.3 million passengers daily in the Rhine-Ruhr region.

Rheinbahn and Via Verkehrsgesellschaft joined forces in 2012 to source a full guidance and passenger information system. Part of this project involved deploying a new effective communications system for their teams to replace the previous analogue simulcast systems. Their aim was to improve efficiency, safety and resource management along their transport lines. They approached INIT, a leading worldwide supplier of integrated telematics, planning, dispatch and fare collection systems, to implement the project and provide the full turnkey solution (www.initag.com). INIT supplied hardware and software, including on-board computers, a new Intermodal Transport Control System MOBILE-ITCS and a dynamic passenger information system. Motorola Solutions directly deployed the Dimetra IP TETRA network and the TETRA two-way radios. The communication system was then integrated into the ITCS.

Rheinbahn and Via Verkehrsgesellschaft now have a secure communications platform for 2,000 enterprise users in the German Rhine-Ruhr metropolitan region, enabling them to communicate reliably with staff in buses and trams at all times. With over 2,000 users involved across 4 major public transport companies, this is one of the largest telematics projects in German history.

CUSTOMER PROFILE

Organisation:
Rheinbahn AG
Via Verkehrsgesellschaft GmbH

Industry:
Public Transport

Location:
Germany

Partner:
INIT GmbH

Motorola Solutions Products:

- 50 MTS4 TETRA base stations (for outdoor use)
- 8 MTS2 TETRA small base stations (for use in underground tunnels)
- Geographically redundant Dimetra IP scalable switching system
- 1,500 MTM800E rugged TETRA mobile radios (installed in trams and buses)
- 650 MTP850S portable radios (for mobile workforce)



CASE STUDY

DIMETRA IP SCALABLE FOR LOCAL PUBLIC TRANSPORT IN GERMANY

“We know we can rely on Motorola Solutions’ Dimetra IP TETRA system whatever the circumstances. Excellent communications help to keep all our buses and trains running on schedule.”

Reinhard Renja, Project Manager, Rheinbahn AG



CHALLENGE

Rheinbahn and Via Verkehrsgesellschaft previously had analogue simulcast systems in place. As part of their new traffic control system, they wanted a state-of-the-art communications platform to be able to efficiently contact and coordinate employees. They needed a solution that could fully integrate with INIT’s ITCS as well as providing reliable coverage in the underground sections of the transport network.

Rheinbahn and Via Verkehrsgesellschaft chose the TETRA technology from Motorola Solutions as it could deliver reliable voice and data communications along the entire transport network with near constant availability. They had also seen Motorola Solutions’ TETRA systems successfully deployed on projects for other German transportation companies, such as Hallesche Verkehrs AG (HAVAG) and VAG Verkehrs-Aktiengesellschaft Nuremberg. Motorola Solutions directly installed the radios and base stations, rolling the deployment out in conjunction with INIT’s ITCS over a two-year period and running user training courses.

SOLUTION

Rheinbahn and Via Verkehrsgesellschaft positioned the 8 MTS2 TETRA small base stations and various optical repeaters in the underground tunnels. The optical repeaters distribute the RF signal from the MTS2 TETRA base stations to the Leaky Feeder radiating cables that run through the tunnels and are designed to both receive and transmit RF signals, so ensuring a signal is always available for train drivers underground.

The 50 MTS4 TETRA base stations were installed in strategic locations above ground, to give uninterrupted radio coverage for the over ground transport network. Rheinbahn and Via Verkehrsgesellschaft have deployed a geographically redundant Dimetra IP scalable switching system, which is connected to all base stations and INIT’s ITCS server via an IP network. This delivers 99.998% network availability and ensures the system will keep working in an emergency.

A total of 1,500 MTM800E mobile radios are installed, one in every train, bus and tram, so the drivers can send and receive voice and data communications. Mobile workers – such as dispatchers and staff at depots and stations – are equipped

with MTP850S portable radios, so they can notify faults or delays in real time. Voice and data communications are generally transmitted two-way over an internet connection via APIs. Audio is transferred to the ITCS system via RTP protocol and G.711 vocoder also using IP connectivity. However, in the vehicles, the radios connect to the on-board computers via a PIE interface.

Each vehicle is equipped with a next generation on-board computer – COPILOTpc2. It manages the voice and data radio communications with the central ITCS and transmits information like the latest vehicle location. This keeps dispatchers in the control room informed about operations at any time and enables them to better react during incidents. Due to more exact forecasts with real-time departure information the passenger service can be further optimised.

Via the on-board computer the drivers can access all necessary information on routes or timetables. Even navigation support is available – this i.e. helps to maintain service levels during ad hoc detours.

BENEFIT

Motorola Solutions’ base stations offer best-in-class transmitter output power and receiver sensitivity, which has allowed Rheinbahn and Via Verkehrsgesellschaft to deploy a radio network over a huge area, with a relatively small number of base stations. The network delivers exceptional data performance and enhanced audio quality and is running at 99.998% availability. And, due to the geographically redundant infrastructure, it is completely reliable, even if public mobile or landline telephone networks fail during a serious disaster. The TETRA network was quick and easy to install and seamlessly integrated with the ITCS. Operators find the radios easy to use.

The new guidance and passenger information system has allowed Rheinbahn and Via Verkehrsgesellschaft to optimise their operations. They can effectively coordinate resources, manage their fleet, enhance efficiency and ensure safety. Most importantly, they can now provide their passengers with the best possible service, through reliable connections, real-time information on city railway, tram and bus transport as well as at the stations and on the Internet.



Applications:

- 80% data communications
- 20% voice communications

Benefits:

- Clear voice communications
- Reliable text communications
- System running at 99.998% availability
- Secure communication platform
- Ability to integrate TETRA system into the new ITCS
- Helping to keep transport on time, improve business efficiency and achieve service levels
- Increased passenger satisfaction

For more information on TETRA, please visit us on the web at www.motorolasolutions.com/en_xu/products/dimetra-tetra.html

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