



FRMCS

Future Railway Mobile Communication System

Public Transport

FREQUENTIS
FOR A SAFER WORLD

Maintain service continuity, minimise risk, future-proof communications

Replacing GSM-R, the Future Railway Mobile Communication System (FRMCS) provides IP-based, mission-critical communication over 5G networks, built on open 3GPP standards. It supports real-time voice, data and multimedia, improving quality, productivity and security. While target decommissioning dates vary from country to country; GSM-R support will end within twenty years. Naturally, forward-looking railways are already adopting FRMCS, recognising that it will take several years. To ensure continuity, minimise risk, and preserve safety and security, FRMCS must operate alongside GSM-R during the transition period.

Challenges in FRMCS adoption

Large scale

More than 130,000 km of GSM-R-equipped track in Europe alone (and 210,000 km worldwide).

High costs

5G increases data throughput but limits signal range and penetration, demanding more masts and antennas.

Multiple domains

FRMCS requires the transformation of on-board systems, radio networks, trackside infrastructure and control rooms.

Complexity

Adding new technologies and networks threatens to raise complexity.

Long timescales

The cost, scale and complexity imply multi-year transformation projects and a long-term perspective.

Multi-year interoperability

To avoid operational disruption, GSM-R and FRMCS will need to co-exist during the years of transition.

Fluid standards

FRMCS specifications are not yet finalised, so organisations need flexible, modular, open solutions.

Live transition

Deployment and migration will happen on live rail systems, so operational impact must be minimised.

In addition to considering the technical challenges around designing and rolling out the network fabric and service stratum for FRMCS, railway organisations will carefully consider how to provide extended control room functions. These might include: role management, record and broadcast, pick-up groups, conferencing with and without floor-control, call forwarding, and transfer rules across both voice and data. There will also be some country-specific challenges; for example, accounting for non-unique train head codes in the UK.

While FRMCS standards and specifications remain under development, waiting until everything is set in stone could be risky. The transition will be long and complex; late-starters are likely to face challenges in accessing external resources and skills as their local GSM-R cut-off date approaches.

Equally, the flexibility of the new technologies minimises any potential downside of early adoption: organisations can confidently start the transition and make simple, low-cost updates as standards and operational preferences evolve.

Combining research leadership with real-world implementation expertise, Frequentis offers a one-stop FRMCS solution across both the service stratum and the applications, including harmonised and non-harmonised ones. Our expert consultants are already helping railway organisations plan for a safe, pragmatic and low-risk adoption of FRMCS.

Your route to FRMCS starts here

Frequentis simplifies your route to FRMCS with a complete end-to-end solution spanning the service stratum, control room applications and interworking functions. Supporting mission-critical communications over public and private 5G networks, the solution enables GSM-R and FRMCS to coexist during migration, protecting existing investments while ensuring operational continuity. Compliant with 3GPP, ETSI and UIC standards, and interoperable by design, the Frequentis solution helps railways move to FRMCS at their own pace with a smooth, low-risk transition.

FRMCS Service Stratum

Building on a public or private 5G network, Frequentis provides the MCX server, including business logic for FRMCS-specific functionality, and the IP Multimedia Subsystem (IMS)/SIP core. Together, these form the resilient, standards-compliant FRMCS service stratum.

Operations Communications Manager (OCM)

Frequentis Operations Communication Manager revolutionises railway operations by facilitating the transition from decentralised local terminals to a centralised web-based application and unified dispatcher interface – supporting both GSM-R and FRMCS.

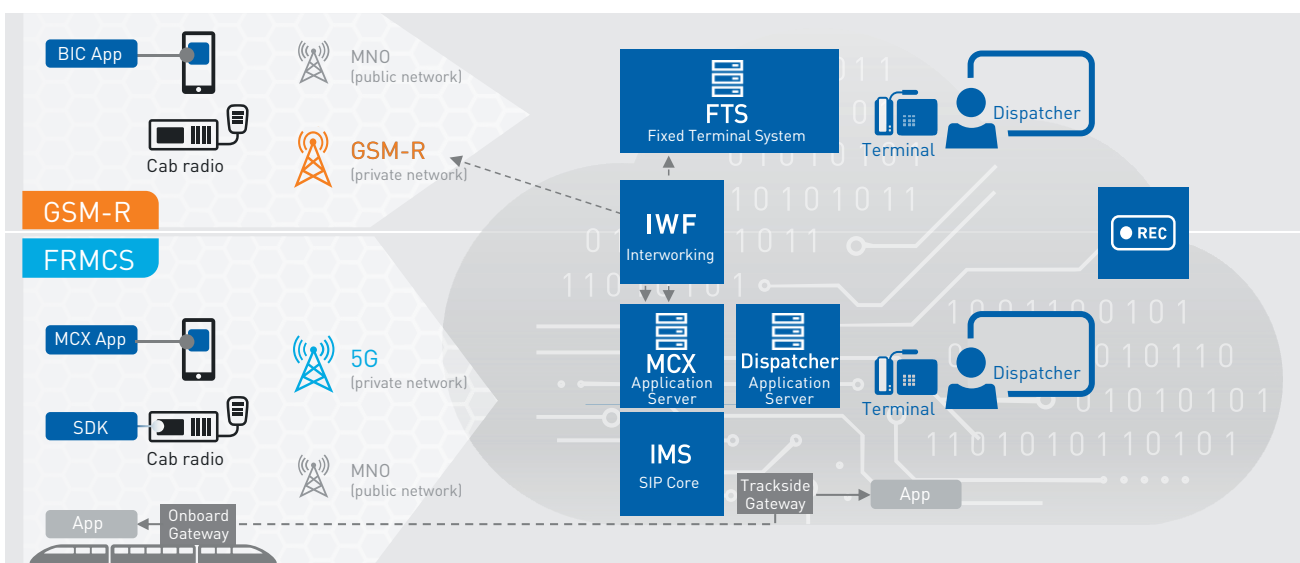
Frequentis DICORA

Re-usable from existing FTS deployments, Frequentis DICORA terminals are resilient, FRMCS-ready, all-in-one dispatcher terminals. Working with OCM and providing multiple audio devices, DICORA terminals connect control room users with drivers, onboard personnel and maintenance teams.

Interworking functions (IWF)

Supporting GSM-R, PBX, Fixed Terminal System (FTS) and other legacy technology, Frequentis IWF enables secure communication between European Integrated Radio Enhanced Network (EIRENE) and the incoming FRMCS systems, ensuring a smooth, low-risk, non-disruptive transition.

Frequentis building blocks for your route to FRMCS



Protect past investments while adopting FRMCS

Backed by decades of rail-communications expertise and hands-on FRMCS experience, Frequentis helps railways turn migration strategies into operational reality. Our phased approach minimises disruption, reduces risk and aligns with individual rollout plans,

spectrum availability and investment cycles. Built on open standards and proven technology, the Frequentis solution enables operators to move forward with confidence - adopting new capabilities when ready while maintaining reliable operations at every step.

Migration stories

Lower Austrian Transport Company (NÖVOG)

Frequentis helped the Lower Austrian Public Transport Network (NÖVOG) deploy Austria's first MCX solution for railway operations - a key building block of FRMCS. Running over public mobile networks, the 3GPP-compliant solution for the Salamander tourist railway improves audio quality, enables control-room-to-train announcements, and integrates seamlessly into existing dispatcher workflows.

Austrian Federal Railways (ÖBB)

Frequentis is supporting ÖBB (the Austrian Federal Railways) in a nationwide trial of MCX services as part of its planned transition to FRMCS. The trial includes a next-generation dispatcher, an interworking function to GSM-R and PABX, and 5G handsets equipped with new applications. Integrated with the existing GSM-R network, the Frequentis trial solution enables seamless communication across different generations of platforms, enabling ÖBB to explore and assess the integration of MCX technology into future operations.

FP2-MORANE-2

As a partner in the Horizon Europe FP2-MORANE2 research project, Frequentis is supporting the large-scale validation of FRMCS within the European Rail Traffic Management System (ERTMS) context - from laboratory testing to live field trials. In this landmark project, co-funded by Europe's Rail and the European Smart Networks and Services Joint Undertaking, Frequentis is helping to develop and test prototypes in European laboratories and under real track conditions, with a focus on interoperable control room solutions.

The Frequentis FRMCS Solution enables:

- Secure, high-availability mission-critical communication
- Seamless interworking between GSM-R and FRMCS
- Flexible, software-defined deployment models
- Structured, phased migration with built-in continuity

With real-time multimedia capabilities, FRMCS will enhance railway communications both internally and with passengers. Operationally, it will provide greater flexibility and configurability to operators, and its hardware-independent nature will simplify deployment, management and updates.



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