MCx Solution

The future of GSM-R train radio functionalities

kontron
The Power of IoT

Based on the future FRMCS standardization (3GPP, ETSI), the Kontron Transportation MCx solution extends obsolete analog radio communication means with modern "state of the art" train radio functionalities, without the need to develop an own infrastructure.

Kontron Transportation has developed the MCx OTT (Over The Top) solution. Here, the networks of the public providers are used as transport medium for the own MCx application with GSM-R features such as point-to-point call, group call and train emergency call.

Summary

Kontron Transportation offers the solution as a "hosted solution" in a data center or as a server solution in the railroad's own IT departments. IP-68 industrial-grade smartphones with an MCx client, IP-enabled Dispatchers with several modern user interfaces, and cab radios that follow the FRMCS standard, serve as end devices.

Since public networks do not always offer full network coverage, the MCx OTT solution has been further developed in terms of transmission security, in cooperation with the Bahnbetriebe Blumberg and the Ministry of Transport Baden Württemberg, and enhanced with the following features:

Heart-Beat Function
In addition to the use of two SIM cards from different providers in the end devices, a unique so-called heartbeat function was developed, which allows the client software to be in constant contact with the application.

This has the advantage that, for example, the user in the train cabin or on the locomotive can see at a glance whether he is connected to the MCx application on the server or whether he is in a zone without coverage. Optionally or on request, it is thus possible to switch automatically between the network providers. If no data connection is available in both networks, an emergency call via GSM is possible.

This functionality goes beyond the current FRMCS standard and offers further security in train-to-land communication.

Status display
The train driver can use the status display on the terminal to see whether the train manager at the Dispatcher or other participants are busy or reachable.
Likewise, the train manager at the Dispatcher can see whether the train driver is currently speaking or is available to accept the call.

This status display saves the controllers valuable time to concentrate on the track or other callers.

Messenger service
Another feature is the own messenger service, which extends the MCx solution with preset or freely selectable messages.

With this service, important messages can be transmitted between the dispatcher and the user on the train or in the locomotive/traction unit even with minimal available bandwidth. As standardization continues, video application, file transfer and functional train number entry will also be possible.

Dispatcher
The IP-enabled Dispatcher is another important component in the Kontron Transportation MCx solution. In addition to the existing functionalities such as individual call, group call or train emergency call, the Dispatcher also provides further intelligent innovations. For example, a geographical map is provided, which makes it possible to detect the individual trains based on their GPS coordinates and display them on the map.

In conjunction with the "user status" function, this helps the Dispatcher to detect possible radio gaps on the track at an early stage and to initiate appropriate measures. Additional call lists, mails and predefined messages help to send recurring news quickly and effectively. The Dispatcher's key display is freely programmable and assignable, ensuring an individual configuration adapted to operational requirements.

Voice Recorder
As required for a train-to-land communications solution, Kontron Transportation also provides voice recording in the MCx solution.

Kontron Transportation works here with the same manufacturer as in many GSM-R projects with major railroad companies. This enables the greatest possible security to comply with all GSM-R specifications and features.

MCx Projects

In October 2020, Kontron Transportation demonstrated the functions of MCx over the top (over the public network) in a two-week test at the Bahnbetriebe Blumberg in Baden Württemberg, locally and on the moving train. The "hosted" solution was used, as this did not require any technical effort in terms of infrastructure on the part of the Bahnbetriebe Blumberg.
The MCx application was provided in a Kontron Transportation data center. At the time, this was the first solution of its kind to be tested in an operational railroad environment. Kontron Transportation, together with the Bahnbetriebe Blumberg and the Ministry of Transportation of Baden Württemberg, successfully executed a test catalog in which all functionalities could be flawlessly demonstrated. In December 2021 Kontron Transportation won the order to realize MCx at the Bahnbetriebe Blumberg and is currently in the implementation phase.

In December 2020, Kontron Transportation received the first order for a MCx solution from Westfälische Landes-Eisenbahn. With this first important step on the way to a FRMCS-based future, the MCx solution replaces the old analog radio system without any additional investment in infrastructure. The Westfälische Landes-Eisenbahn also opted for a hosted solution in order to benefit from the reliability of a data center and to keep the costs of its own hardware andservices as low as possible. The solution with MCx application, Dispatcher and voice recorder was successfully implemented in October 2021. In Mai 2022 the operating permit of the regional railway board was given.

About Kontron Transportation

Kontron Transportation GmbH is a global leading supplier of end-to-end communication solutions for mission-critical networks. The core customer segment is railways throughout Europe and beyond.
The focus is on systems that produce, transport, and process voice, data, and video information reliably, securely, efficiently, and sustainably. This includes GSM-Railways, FRMCS (future railway mobile communication system), MCx (mission-critical over public networks) with IWF (interworking functions), enhanced radio solutions and radio access networks, transmission networks, private cloud platforms and cybersecurity concepts round off the portfolio. This portfolio also offers selected communication products to utilities and enterprises. In addition, specific mobility products such as validators and fare collection systems are provided to public transport operators.

As a driving force in the definition and specification of FRMCS standards, Kontron Transportation is significantly involved in standardization working groups and European research projects such as Morane2.
The company has more than 700 employees, 11 sites all over Europe and is headquartered in Vienna.

Kontron Transportation is part of Kontron Group.

For more information, please visit: **www.kontron.com/ktrdn**

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