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3rd world Conference on Rail Transport Telecoms

On-board radio evolution & operational applications

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17th of May 2017

Ensuring an interoperable transition

www.gsm-rail.com

Agenda:
Cab radio evolution & operational applications

1. Market requirements

2. Future proofing the Customer investment.

3. New range of Cab Radios

4. EDOR evolution

5. Operational applications

    1. Driver advisory system

    2. Remote condition monitoring

6. Summary

Market requirements

- ## Established GSM-R Customer base

  - Long term support of GSM-R

  - Fast remote Upgrades/updates of Radio data

  - GPS

  - Big data connectivity for train applications

  - Ethernet connectivity to train computer

  - Dual mode connectivity for the GSM-R application

- ## Green field Customers

  - VoLTE

  - 3GPP Rel.13 functionality

  - Small size also suitable for road vehicles used for maintenance

Future proofing the Customer investment

- Offer existing Customers a cost effective upgrade easily customizable to the specific requirements.

- Offer new Customer a cab radio that fulfils the requirements of the next 15 years.

- Offer Customers that require a replacement of the existing cab radio an upgrade path that utilizes as much as possible the existing installation.

- Offer green field Customers the opportunity to implement VoLTE

- Next generation Cab Radio will include:
  - GPS for broadcast to other train applications
  - Wi-Fi for data connectivity when in a depot
  - Accelerometers for the condition monitoring of the track infrastructure
  - Expandable memory 32Gb to 1Tb
  - LTE data for train applications on a dedicated module with two Sim cards
  - VoLTE on a dedicated module
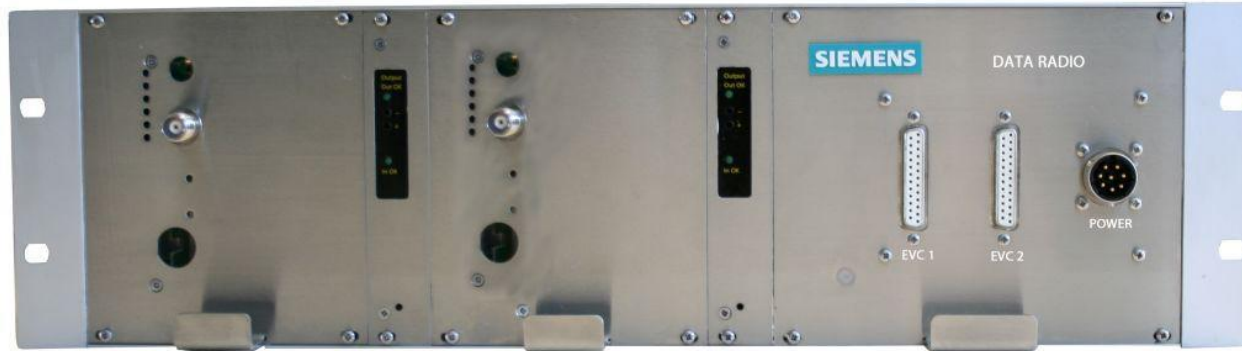
Next generation Cab Radios

Dual mode GSM-R /VoLTE Cab Radio
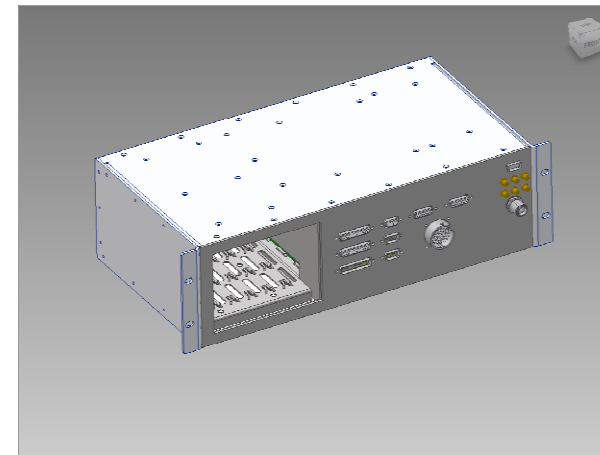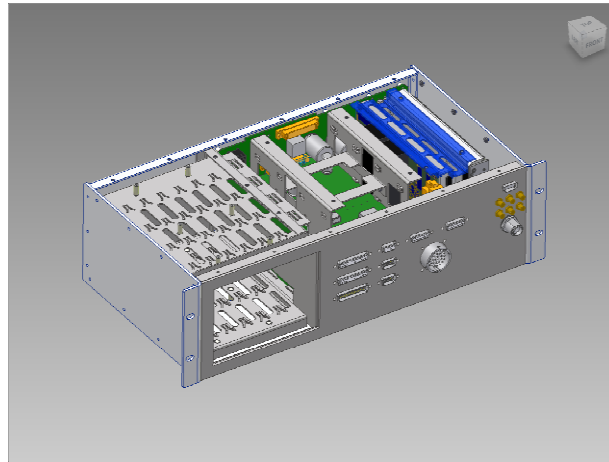
VoLTE only Cab Radio

EDOR evolution

Latest EDOR with full Eirene 8-16 compliance packet switch & circuit switch support

Latest expansion modules with LTE connectivity for Packet Switch support

Operational applications
Driver advisory system

- DAS initialised during driver Cab Radio head code sign-on (no extra driver requirement)

- External mounted GPS antenna for more accurate position information

- Remote software, schedule data and weekly TSR updates provided

- Uses Cab Radio DCP and loudspeaker when providing advice

- 4G connectivity

- Safety warning issued to driver if track speed limit exceeded

- DAS information limited to 2 lines on the Cab Radio for simplicity, and to limit driver distraction.

- Application running on a separate processor card

Operational applications
Remote condition monitoring

- Detects track defects using vibration sensors (voids, rough-ride, track dip, loose bolts, etc)
- Uses GPS functionality to provide location data of the defect
- Software application run on Nexus voice processor or within a standalone system
- On-board signal processing provides initial defect analysis to reduce the size of data transfer
- Uses the in-built LTE modules to send relevant data to Ground Systems which then uses data from multiple trains to identify defect type, growth rate and pin point location
- Highly customisable to meet operator needs
- More trains equipped with this technology will result in early identification of defects and an accurate forecast of the deterioration rate.

Summary

- More connectivity is required to satisfy the current and future requirements of a digital railway.

- Green field Customers will be the early adopters of the VoLTE technology.

- Interoperability and seamless integration are the key factors for the transition to FRMCS .

- Early definition of the required spectrum will enable the industry to complete the development of the required devices.

- Industry is ready to meet the challenge