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Critical communication made easy

Interoperability: A Key Focus Point in Rail

India has one of the largest numbers of commuters in the world, putting enormous pressure on the public transport system.

It also puts pressure on the ability to allow different networks, technologies and systems to communicate seamlessly to ensure uninterrupted service and maximum safety. A key focus point in DAMM India's rail solutions is therefore interoperability.

Different Interoperability Scenarios, Same Goal

The goal in any interoperability scenario is to maintain seamless communication without any limitations, including when operating different technologies or networks.

Interoperability can be relevant when:

- Migrating from one technology to another

- Running different technologies in one or multiple networks

- Needing to communicate with other networks

Bridging: Network Migration or Extension

In the rail industry, the need for interoperability would normally arise when you either need to integrate other technologies or when you need to upgrade and expand your network.

From Analogue to Digital

Integration of or moving from analogue to digital is the simplest operation. Both scenarios can be solved using a radio bridge such as DAMM TetraFlex Group Bridge, which enables voice communication, simple messaging and basic interoperability between an analogue network and a digital network like TETRA or DMR Tier III. This way an analogue network can be integrated or gradually downscaled and moved to digital with the network running continuously.

Digital to Digital

A rail operator may also wish to only upgrade the radio communication equipment on one site. However, this can in some cases be a costly affair as a radio communication provider may require all sites to be upgraded instead of just one.

In this case, a digital to digital (TETRA) bridging solution like the DAMM TetraFlex Network Bridge would be a cost-efficient solution as

it allows you to create an extension to an existing TETRA network with both individual and group functionalities. Click here for a short illustrative video about the Network Bridge.

Benefits of Bridging

Bridging solutions are very simple to make, they reduce the complexity of your network and they are cost-efficient – in other words they address the needs of the customers. Despite the reduced complexity they have a very comprehensive feature set and provide an easy way of expanding coverage.

Users roaming between bridged networks will not notice any difference, as the interfaces and functionalities will remain the same.

Direct Connection

A similar interoperability can be achieved using an inter-system interface (ISI). Developed to the ETSI standard, the DAMM TetraFlex Inter-System Interface enables communication between two TETRA networks. This solution is ideal for cross-border communication, for instance if you are running multiple networks around the world. With a fully IP-based ISI, you can have one dispatcher communicating to all those networks while each network retains its independence.

Benefits of Direct Connections

An important benefit of an ISI is that the implicated networks retain their sovereign rights. They are

simply collaborating with other networks and only share selected data and information.

In addition, ISI is a future-proof solution that enables the customer to connect whenever and to whatever they want to. As radio communication providers we do not want to tell our customers what to do, e.g. if or when they should change to broadband. We just want to give them the ability to change whenever they want to change and provide the right technology and tool to enable them to do so.

Bridging to Broadband

To bridge from TETRA/DMR to broadband, there are two options using DAMM equipment:
One is the DAMM MultiTech platform, which enables seamless connection to broadband users to allow interaction with TETRA, DMR and analogue subscribers. DAMM's MultiTech platform is designed as one unified switching platform – with all switching done internally, eliminating the need for gateways. Thanks to this design, subscribers can collaborate with each other regardless of the standard used.

Another is the Inter-Working Function (IWF). This is the gateway/ the interconnection towards 3GPP mission-critical PTT/MCx and is a really important building block for future-proofing your system.

DAMM India – Optimising Radio Communication for Rail

Earlier this year DAMM Cellular

Systems and Consort Digital joined forces in a joint venture, DAMM India, to deliver cost-efficient infrastructure through a combination of power-efficient, low-maintenance base stations, tailored solutions and professional services ranging from design and engineering studies to installation, integration, operation and maintenance.

Apart from the interoperability solutions described above, DAMM India also supports FRMCS features.

FRMCS – Digitalising Rail Transport

FRMCS – Future Railway Mobile Communication System – is the successor of GSM-R and a key to digitalising rail transport. As the future worldwide telecommunication system for rail, it is key to sustaining interoperability in the future.

And the future is already here. Consort Digital's CONSORT MCX ONE Train Radio Solution supports key FRMCS features over existing TETRA as well as 4G/LTE networks. The solution is configured as a single, standardised hardware platform that supports multiple configurations: TETRA (voice and data), TETRA (voice) + LTE (data), or LTE (MCX for voice and broadband data services).

As such, the CONSORT MCX ONE solution extends the use of features defined in FRMCS and other features to both an existing DAMM TetraFlex solution as well as an MCX solution deployed over a 4G/LTE network. This allows for interworking and ease of migration / co-existence of a narrowband mission-critical network with a broadband network for a rail organisation.

About DAMM India

DAMM Cellular Systems and Consort Digital have collaborated on providing the radio communication infrastructure for a number of new rail networks over the years. With several big projects, including Pune and Nagpur Metro and Western Railway successfully completed, the two companies earlier this year established a joint venture to concentrate their efforts on the Indian rail market even more.

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DAMM frequency sharing functionality

With the frequency sharing functionality in the DAMM Outdoor Base Station BS422 it becomes possible to…

Improve spectrum efficiency

Frequency sharing allows adjacent BS422s to use the same frequencies. This is a significant benefit in low density networks and gives the possibility to cover for example a railway line with just two frequency pairs.

Simplify repeater systems

With frequency sharing an indoor repeater system can be built without optical fibres. The same hardware can be used as base station and repeater unit, increasing redundancy and simplifying the network architecture by having one unified network management system and reduced spare part stock.

Obtain base station geo-redundancy

With the BS422, network availability can be brought to a new level. Two BS422s located at two sites can act as one fully redundant base station, sharing the same frequencies. This will add redundancy not only to the base station, but also to the whole antenna system.

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Join us in Madrid 30 Nov. - 2 Dec. 2021 to learn more

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