# **DAMM** frequency sharing functionality

- a new cost-efficient way of building highly reliable networks. Ideal for optimising tunnel coverage and coverage along a railway line


To learn more please go to **dammcellular.com**

*Frequency sharing with the DAMM Base Station BS422 lets you build coverage in a completely new way: Simple, cost efficient and reliable.*

### 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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DAMM
Critical communication made easy

# DAMM Cellular Systems

## How to Reduce Costs on Voice and Data Communications Networks

All rail operators face the same challenge: the need to enhance passenger safety and improve services for the constantly increasing number of passengers, while at the same time minimising costs and resources.

It seems like an impossible task, but it isn't: cost-efficiency without compromising quality is possible – operators can achieve breakthrough TCO in both CAPEX and OPEX while keeping the high quality and 24/7 availability of their networks.

The solution is to rethink the network design and take the traditional indoor base station solution outside. Besides the outdoor base stations being small and compact and providing constant availability, an outdoor solution meets the demand for breakthrough TCO, while at the same time significantly reducing the complexity of the network.

### Traditional Network Design

The network design has been the same for generations. Operators achieve network coverage with traditional indoor base stations consisting of an antenna system, transceiver, base station controller, power supply and a battery backup system. All components are typically doubled to provide maximum availability for mission and business-critical users.

The drawback of this solution is complexity and unnecessary high costs. The complexity of different components in a base station requires a lot of space and therefore a shelter for the equipment is needed. Often an air-conditioning unit is then required to create a comfortable environment for the equipment. Further, spare part management becomes a challenge as every single component must be locally available so it can be replaced immediately in case of failure, maintaining radio network availability.

### A Network Built with Outdoor Base Stations

**Reduce Maintenance and Operating Costs**

Building a network consisting of outdoor base stations will significantly reduce the amount and size of equipment and thereby reduce the complexity and costs of the network. Equipment can be reduced to the bare minimum of components, basically to a single box and an antenna.

DAMM's outdoor base stations have been optimised for rail and metro installation. The compact design of the base station makes it ideal for installation in narrow tunnels, directly on buildings and masts alongside the railway or in stations, reducing feeder loss and installation costs considerably. The ribbed design ensures passive

cooling, eliminating the need for external air-conditioned housing or fans that risk breaking.

The special rugged design ensures a long service life, as it is built to endure metal dust and high humidity, which often characterise metro tunnels. Even for operations in extreme temperatures, DAMM base stations keep working. Due to redundancy, maintenance can be performed without shutting down operations, ensuring an efficient railway operation and avoiding costly downtime.

## Low Power Consumption

DAMM's outdoor base station offer extremely low power consumption. Mainly due to their small size and low weight they can be mounted directly on masts in close proximity to the antenna eliminating the need for long cables and subsequent loss of power. Power consumption is so low operators can even go green and choose a solar-powered solution. Besides the benefit of saving electricity costs on a daily basis, this environmentally friendly solution can also be used to meet goals in a rail operator's environmental policy.

## Higher Frequency Efficiency

DAMM base stations are extremely frequency efficient. Using the DAMM frequency sharing functionality, coverage can be built with a minimal number of frequencies in low-density networks significantly reducing the number of frequency licences needed.

Base station frequency sharing mode can also be used in areas where optical repeater systems are typically deployed. Using base stations instead of external repeaters eliminates the need for expensive leaky feeder cables and will allow a unified management system and reduced spare part stock, minimising operational costs significantly.

## Fewer Sites for Greater Coverage

The base stations are available in a wide range of frequencies in both VHF and UHF bands giving operators the possibility to optimise their solution depending on covered area and available frequencies. For example, VHF will require fewer base station towers to achieve similar coverage as UHF in open, rural environments.

## Proven solution

A variety of different outdoor systems have been developed by different vendors and they have been successfully proven under various conditions in hot, in cold, under salt spray etc. So next time you are planning a voice and data communications network, consider an outdoor approach and benefit from the advantages this brings, like a breakthrough TCO.

## Trusted by Industry Leaders

DAMM Cellular Systems has many years of experience in providing cost-effective solutions to major players within the transportation industry and have delivered systems for, e.g. Western Railway and Nagpur Metro in India, and Aurizon and FMG Railway in Australia. In other words, we have the know-how and the expertise needed to support large-scale rail and metro projects around the world.

**To learn more about our cost-efficient products and solutions and how we can help you, please contact:**

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