

East Midlands Trains

Providing onboard coverage with Vodafone:
How East Midlands Trains made it work

COBHAM

Case Study

The most important thing will build is trust

Overview

Cobham Wireless completed a project, the first of its kind in the UK using digital repeaters, working with Vodafone to install a solution to the coverage problem on East Midlands Trains. They needed coverage on a fleet of 27 trains, known as the Meridian 222 fleet, running between London and Sheffield on a daily basis.

Challenge

To find a way to provide cellular coverage inside a large enclosed space that will be moving down a track at up to 125mph. The metallic coating designed to shield the windows from bright sunlight also prevents the signal finding its way through.



The Challenge

We have all experienced the problem – you're taking a train somewhere, you try to make a call and the signal keeps dropping, resulting in you having to dial the same number 3 or 4 times just to finish the conversation. Poor onboard coverage can be a real pain for passengers and often results in poor customer satisfaction and even complaints.

But for the rail and mobile operators alike, it means finding a way to get coverage inside a large enclosed space that will be moving down a track at up to 125mph. This is a technological challenge like no other and the prevalence of these 'not-spots' even provoked Ofcom to commission a report in 2012 on exactly this subject.

Many assume that the mobile signals from outside simply penetrate the train and get inside that way. But with modern trains, the build materials used – specifically a metallic coating designed to shield the windows from bright sunlight – mean that the signal simply can't find its way through.

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vodafone

The Solution

As a pioneer of cellular coverage products for trains, Cobham Wireless was invited by Vodafone to understand the scope of the problem and the team quickly identified that a series of digital onboard repeaters (D-OBRs) would be required in order to get coverage inside the train. Cobham Wireless' onboard units are designed and approved to withstand the physical environment inside a train, such as vibration and large temperature variations, as well as supporting all major cellular bands.



A D-OBR onboard the train

The solution also needed to work within the existing layout of the train, so a space needed to be found that would house the equipment (shown in picture, left). A retrofit inside a train wasn't going to be easy in such a confined area with limited 'free' space available.

The team specified a series of D-OBR medium-power tri-band units, with one or two repeaters per train, depending on the individual train's size. The units are fed by an antenna on the exterior of the train which picks up the coverage from outside. It then sends it, via RF cable, to two antennas inside each carriage which then distribute signal to the passengers.

Each train also houses an antenna to allow the trains to be tracked, as Vodafone and East Midlands Trains opted for remote monitoring of the system using the Active Element Manager - a network management system that can be used to manage any type of Cobham Wireless repeater, remotely and through a variety of connection methods.

The complete onboard system fully supports 2G, 3G and 4G cellular services. All the repeaters in the network can be remotely configured, using an easy-to-use user interface, to support changes in technology or bands.



The Benefit

East Midlands Trains is the first UK train operator to have digital onboard repeaters on their trains, delivering reliable wireless coverage to their passengers every day. During testing it was clear that the repeaters made a significant difference to network performance and they have seen an improvement in network quality from a user perspective too.

The investment allows passengers travelling on East Midlands Trains to stay in touch on their mobile phones whether they are working or travelling for leisure.

Both the rail and mobile operator involved were keen to find a solution to this problem, and working with the team at Cobham Wireless they now have happier customers who are experiencing improved coverage while travelling on their trains.

