

## Case Study

The most important thing will build is trust

### Overview

To implement a VHF and digital wireless system in the Purkersdorf switch hall with Kapsch CarrierCom for the national Austrian railway operator ÖBB (Österreichische Bundesbahnen) - a deal worth €1.3M in total.

### Challenge

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### The Challenge

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Digital wireless train communications aimed at industry logistics are evolving rapidly in Europe with the EU standardisation of cross-border communications and the pan-European connection of the GSM-R networks. ÖBB needed to install a digital system in Purkersdorfer switch hall that would meet these standards and offer the latest in public safety systems as well as streamlining rail logistics, and offer customers the latest in mobile digital services.

Currently under construction and due to open in 2012, the Lainzer Tunnel will be 12km long and link the Western railway line and the Southern and Donaulände railway lines, while the Purkersdorfer switch hall will connect the Lainzer Tunnel and the new Vienna-St. Pölten line with the Western line

The digital wireless system required by ÖBB needed to meet all the communication requirements of the railway network, the emergency services (digital and analogue) and national mobile network operators. This required a system to be designed that would serve the dual purpose of providing wireless coverage for both public safety and commercial usage.

To meet security standards, the radio system needed to provide coverage for GSM-R (global system for mobile communications – railway) and TETRA (terrestrial trunked radio), a two-way radio standard used by the emergency services. The commercial layer also needed to provide coverage across the GSM spectrum at different frequencies for three operators, including 3G and DVB-H to allow mobile device users to access voice and data services.

### The Solution

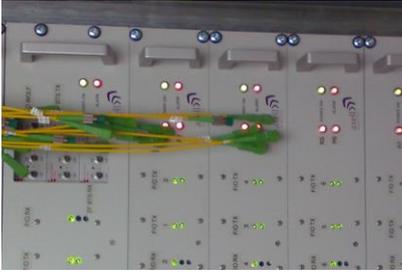
A dual-layer multiband commercial and public safety system supplied by Cobham Wireless and installed by Kapsch Carrier was the solution. This included Cobham Wireless' new tri-band optical master unit (OMU) and its management software to integrate the systems.

Cobham Wireless, together with Kapsch CarrierCom, designed the entire system to run on its 'complex combiners', and through its software manager - Active Element Manager (AEM) - to create a balanced system with one technological interface, which Kapsch CarrierCom installed. To integrate the TETRA, GSM and analogue standards, Cobham



Wireless provided its OMU to act as a central hub and bring the different radio frequencies back to the unit, which was installed with an automatic gain setting, creating a simple installation process for Kapsch CarrierCom who could then leave it running, confident that any changes required to optimise the network would be done automatically. The system was also designed with radiating cable to enable energy displacement.

The public safety layer included an AWS (automatic warning system), a siren warning system to warn maintenance workers in the tunnel of any incoming trains. GSM-R was included for ÖBB, and an analogue train radio system to ensure legacy systems remained operational, as well as integrating the new EU-defined standard TETRA BOS, and last but not least analogue services for the Vienna fire brigade.



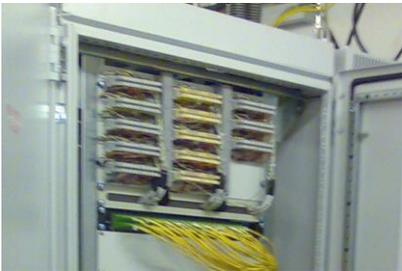
To deliver the commercial coverage for public use, Cobham Wireless delivered cabinets or industrial mount units, which contained all the necessary equipment including combiners and repeaters. The hardware was tailored to meet the requirements of each individual installation, delivering the shortest possible cable length to significantly reduce signal loss. Cobham Wireless also included two separate alarm systems in every cabinet to control the parameters in each, such as signal measurement and system calculation, and ensure ÖBB had a full view of all network events.

The standards covered included GSM-900 (6 carrier), GSM-1800 (6 carrier), UMTS (8 carrier) and a full preparation of the whole system to extend DVB-H.



### The Benefit

Cobham Wireless and Kapsch CarrierCom are the sole suppliers of all the equipment, from amplifiers to racks and combiners, which meant that ÖBB finished with a single point of contact - Kapsch Carrier Com - rather than the multiple vendors usually needed for a multiband network such as the Lainzer Tunnel. The system is a cohesive one where all the different elements or technologies run uniquely over one single system, and was designed to use the minimum amount of space and be neat in appearance.



The integration of all alarms nation-wide in the ÖBB railway network gives the operations managers complete visibility into network activity, while the automatic signal level control of each signal leaves them free to focus resources where needed. Additionally, the completely redundant system means that if anything fails, the system will overrun, so there is no risk of signal not being carried.

The system can also be easily extended for different channels and services, something which is traditionally very awkward to achieve in a multiband, multivendor environment.

