

## Modern Railways Require Advanced Connectivity Solutions

Although modern railways often have a good network backbone deployed along the tracks, many of the points requiring connectivity are positioned further away from the core network and as a result, locomotives need continuous connection with the control center. Wireless networks such as GSMR or TETRA, provide vast coverage for locomotives on-the-go but cannot provide the bandwidth required for applications such as CCTV systems and data download and upload to and from the train's remote facilities.

## Alvarion Wireless Solutions Enhance Railway Connectivity

Combining Alvarion's broadband wireless network with cable or fiber-based core networks provides an efficient solution to these challenges. Alvarion's solutions enable increased bandwidth, offering railway companies the opportunity to improve railway safety and security using advanced wireless CCTV networks and surveillance cameras; enhance customer experience with a continuously updated PIS; increase railway operation efficiency by connecting remote sites to the core IP and enabling the use of shared IT applications; and reduce costs by utilizing data downloaded from the locomotive to perform preventive maintenance and replacing costly leased lines with a private wireless network.

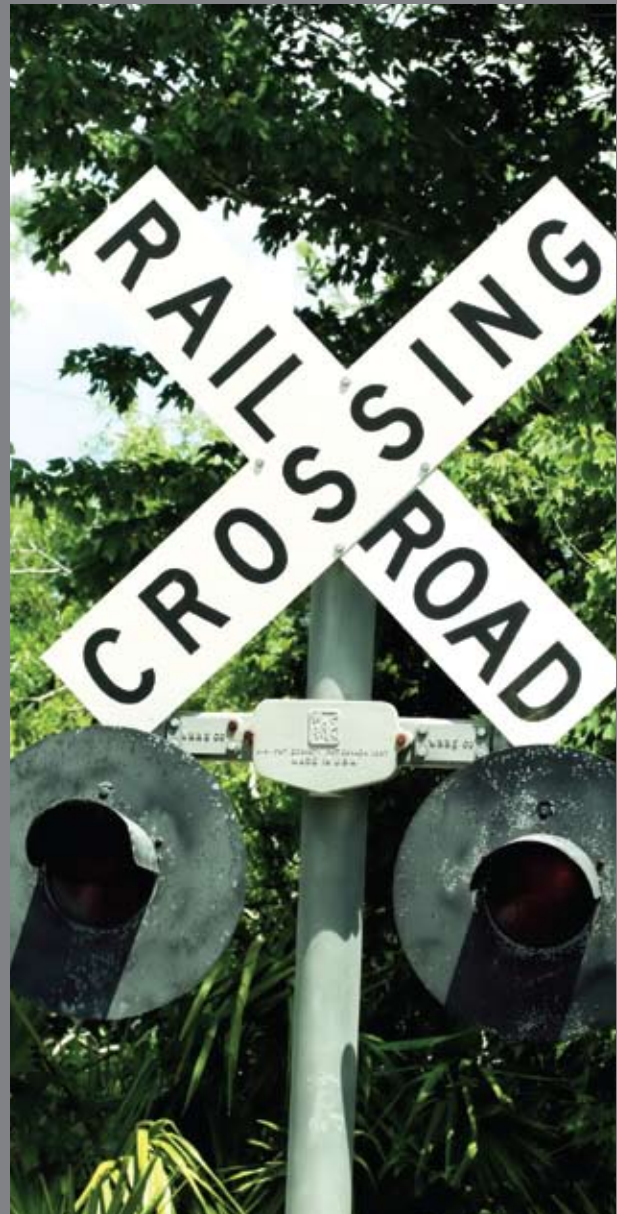
Alvarion's wireless solutions provide the reliability, security and quality-of-service essential for mission critical railway connectivity and offer a range of benefits.

### Extended Range and Coverage

- OFDM technology providing NLOS coverage
- Maximum cell radius of up to 30 km
- Maximum PTP link of up to 70 km
- Throughput of 32 Mbps per sector in PtMP and 250 Mbps per sector in PTP

### Robust Outdoor Design

- MTBF of over 11 years and over 99.999% availability
- Operational temperature range of -40°C to 60°C
- All outdoor enclosure



### Security

- Hardware-based AES encryption
- VLAN support
- Secure network management

### Ease of Deployment

- NLOS technology
- SNR LED Indicator for fast antenna alignment
- Automatic self configuration

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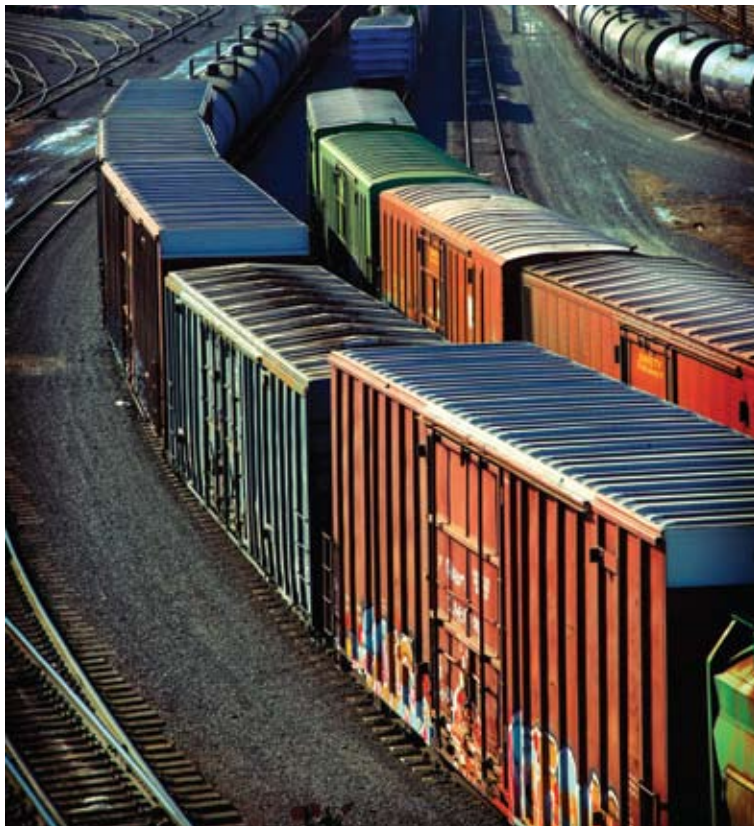
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## About Alvarion

Alvarion (NASDAQ: ALVR) is the largest WiMAX pure-player with the most extensive WiMAX customer base and over 250 commercial deployments around the globe. Committed to growing the WiMAX market, the company offers solutions for a wide range of frequency bands supporting a variety of business cases. Through its OPEN WiMAX strategy, superior IP and OFDMA know-how, and ability to deploy end-to-end turnkey WiMAX projects, Alvarion is shaping the new wireless broadband experience.

### Alvarion: The Fast Track to Improve Railway Communication

The following field proven Alvarion systems are ideal for improving communications and operational efficiency in the railway industry: BreezeACCESS®, BreezeNET®, BreezeMAX®, BreezeACCESS Wi<sup>2</sup> and BreezeMAX Wi<sup>2</sup>.

## The Fast Track to Improve Railway Communication



The railway industry has been dependant on communications since the early days of railroad history. In addition to the need for a cost-efficient operation, railroad companies also face a range of challenges such as passenger safety, station and crossroad security, and the ever growing demand for enhanced customer experience.

Alvarion's broadband wireless access solutions provide an ideal answer to these challenges and enable railway companies to increase their development and success.



### Railway Application



## Alvarion's Broadband Wireless: The Fast Track to Improve Railway Communication



### Downloading Data from the Locomotive

The wireless network enables the locomotive to download data such as video files from the DVR onboard and data from the black box or tachometer, as the train reaches the station. As a result, the data onboard is easily accessible and both maintenance time and complexity are reduced.



## Updating the Passenger Information System On-the-Go

Enhance customer experience by continually updating the Passenger Information System (PIS) with a range of information including time tables, important announcements, location-based advertising and entertainment. Deploying access points sporadically along the tracks enables updated data on-the-go.



## Connecting the Access Point to the Railway Core Network

Extend the reach of the fiber or copper core network, using a broadband wireless access network. A single entry point to the fiber network connected to a wireless sector can support various applications, avoiding the attenuation and management overhead caused by multiple routers or splitters.



## Surveillance Cameras in Railway Crossings

Crossroad safety is a key element for ensuring uninterrupted train operation. An advanced content analysis system connected to surveillance cameras is essential for sending timely alerts of non-vacant crossroads. Using a wireless link to connect the cameras provides flexibility, reliability and cost effectiveness.





## Securing Railway Yards and Stations

Train yards and stations are strategic locations which require security and monitoring around the clock. A wireless system for CCTV cameras and sensors enables a simple, fast, and cost-effective implementation of a full-scale security solution.



## Connecting Remote Premises to the Railway Core Network

Railway company premises such as warehouses, office buildings and yards are often placed away from the tracks and require connectivity to the railway communication network. The wireless network can connect even the most remote sites to the core network, eliminating the need for leased lines without compromising the benefit of shared IT applications, ERP systems, and IP telephony.