



High-Bandwidth Network for a High-Speed Passenger Train in Europe

Location: **Across Europe**

Application:

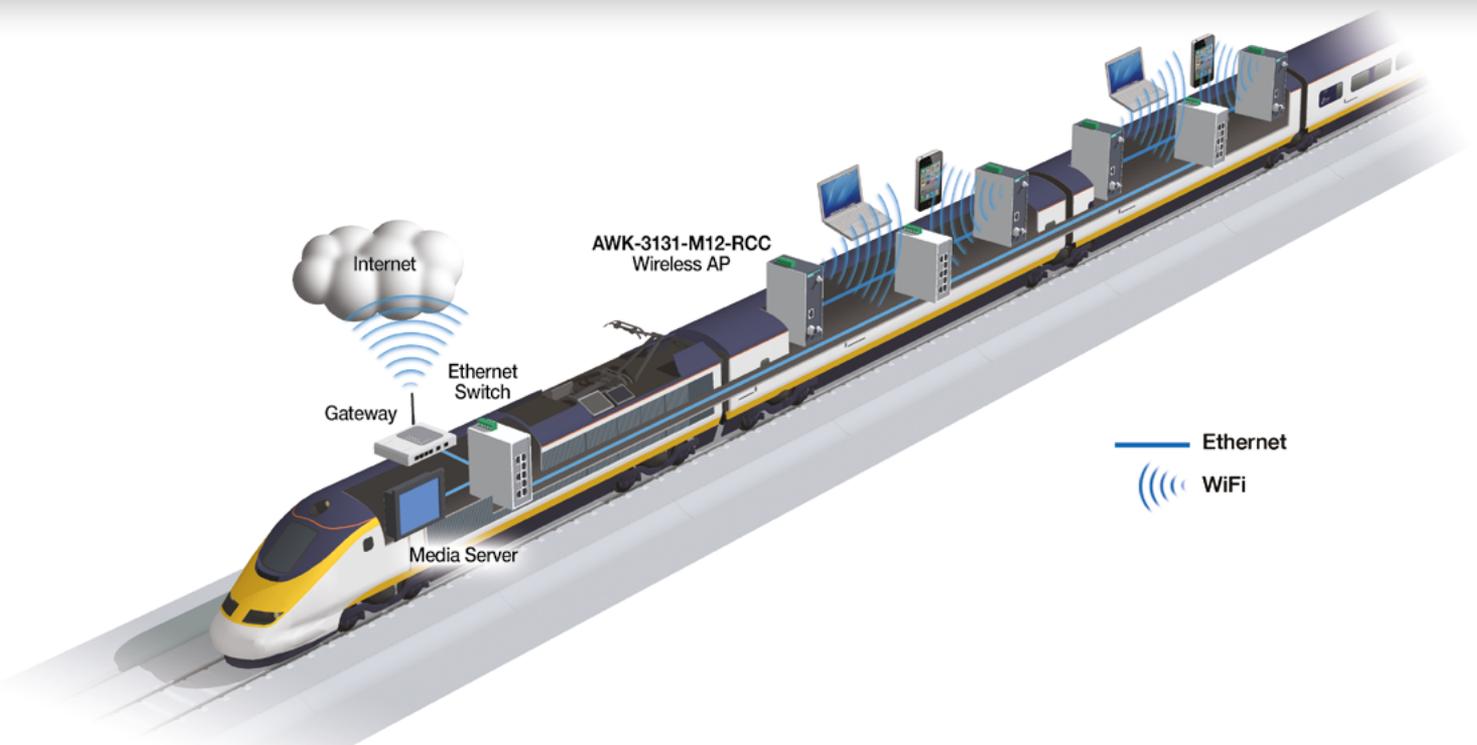
Passenger Wi-Fi Access

Customer Needs

- Sufficient bandwidth and smooth Wi-Fi access for all passengers in every carriage
- Flexible wireless backbone network for inter-carriage communications
- Network devices that can withstand harsh onboard environments

Moxa's Advantages

- Supports up to 150 Mbps throughput
- Seamless Internet access for 50 concurrent clients per AP at 2 Mbps
- Automated Carriage Connection technology for easy inter-carriage connections
- Compliant with essential sections of EN 50155 related to protection against surge, vibration, and EMI



Project Background

Uninterrupted wireless Internet access is essential for passengers who want to stream HD videos, and enjoy Video on Demand (VOD) services through their mobile devices. A high-speed passenger train company in Europe wanted to deploy a network that could provide smooth wireless access to every passenger on the train. To achieve this level of service, the operator must first perform a network bandwidth calculation to ensure that the wireless link can provide enough bandwidth to serve a large number of smart phones, tablets, and laptops, to provide every passenger on the train with the best Wi-Fi experience.

In addition, the provider must ensure that the infotainment service and Wi-Fi hotspots are available in every carriage throughout the train, which requires a reliable and flexible wireless backbone network for inter-carriage communication. Last but not least, this network must be able to withstand the harsh onboard railway environment, and the wireless devices must be rugged products that can work reliably day in and day out.

System Requirements

- A network that can provide sufficient bandwidth for around 100 passengers in each carriage
- An automated inter-carriage wireless connection to ensure network availability when train carriages are rearranged
- Network devices that can withstand harsh onboard conditions such as constant vibration and electrical disturbances

Moxa's Solution

The purpose of the new infotainment system was to provide more bandwidth to allow all passengers to access more media content, thereby creating a better onboard experience for the passengers. The design goal was that each AP would be able to simultaneously provide sufficient bandwidth for 50 Wi-Fi clients. For example, when 50 passengers in one carriage are streaming HD videos, each requires around 2 Mbps of bandwidth for continuous lag-free streaming, so each AP must be able to support a bandwidth of at least 100 Mbps. To serve almost 100 passengers in one carriage, the train required two AWK-3131-M12-RCC wireless APs per carriage that support the 802.11n standard capable of providing 150 Mbps throughput. Moreover, to avoid overloading a single AP, the wireless APs should also have load-balancing capability so that every passenger can experience uninterrupted network connectivity.



Moxa lab test using numerous smart phones and tablets.

The AWK-3131-M12-RCC is compliant with the essential parts of railway certifications relating to the ability to withstand severe vibration and electrical disturbances such as EMI and power surges, ensuring uninterrupted wireless communications throughout the journey. Moreover, to provide a reliable and flexible wireless backbone network, the AWK-3131-M12-RCC supports the Automatic Carriage Connection (ACC) feature that makes inter-carriage wireless backbone topologies easy to maintain. The ACC feature provides automatic reconnection and configuration capabilities, so that operators do not have to worry about the wireless backbone network when train carriages are interchanged. ACC also reduces the maintenance effort required and eliminates configuration errors that could occur when the train's carriages are rearranged.

Benefits

- Up to 150 Mbps of network bandwidth that ensures concurrent video streaming for 50 customers per AP
- Automatic Carriage Connection technology ensures a reliable and flexible wireless backbone network that makes maintenance easy when carriages are replaced
- Adheres to the EN 50155 railway standard for harsh trackside and onboard environments



Related Products



AWK-3131-M12-RCC-T

Industrial IEEE 802.11a/b/g/n wireless AP

<http://www.moxa.com/product/AWK-3131-RCC.htm>

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