Railway Gazette
INTERNATIONAL

Trains fit for the future

ASIA-PACIFIC

Civil works underway on Manila's flagship North-South Commuter Railway

Page 18

ROLLING STOCK

Wide-bodied Avril evolves from vision to reality

Page 30

IN FOCUS

Ore trains return to Whyalla as exports increase

Page 42

Getting ready for Wi-Fi 6E

> ‘Today’s passengers expect a stable and consistent connection on board’

Measures to expand the available spectrum for free-to-air wi-fi present an opportunity for railways to improve onboard connectivity, but will require the adoption of forward-compatible components.

Daniel Montagnese
Head of Product Management, Antennas
Huber+Suhner

Keeping passengers satisfied is never straightforward. And nowhere is that more true than in the growing demand for onboard connectivity. The internet is now deeply woven into many aspects of our lives, and more than ever people want to stay connected while travelling by rail. Whether it is to work during their morning commute, to watch movies, or check for live travel updates, the expectation is reliable and fast connectivity.

Today’s passengers expect a stable and consistent connection on board, which can be challenging. Railways operate through a variety of landscapes and infrastructure, which can interfere with a high-quality internet connection, while the constant change of load means data requirements can vary significantly from hour to hour. In order to guarantee seamless wi-fi, operators need a high-performance wireless infrastructure. And an essential part of that is the antennas in each vehicle which connect passenger devices to the train’s onboard network.

Trains can be very dense environments, especially on busy routes in and out of cities, when at peak times there can be hundreds of devices trying to connect. Usage trends are also leaning towards activities that consume a large amount of data, and can sometimes require a real time connection. For popular video-based social media platforms and activities such as video calling or online gaming, latency is a deal breaker.

Providing good wi-fi connectivity has become a key concern for many train operators in recent years.

The rise of 6E

To keep up with growing demand, the US Federal Communications Commission last year allocated spectrum in the 6 GHz band for unlicensed wi-fi use, augmenting the existing 2·4 GHz and 5 GHz bands. And in November, the 48 member countries of the European Conference of Postal & Telecommunications Administrations also endorsed the release of 480 MHz of spectrum in the 6 GHz band for wi-fi in Europe, subject to formal adoption by the European Commission in early 2021.

The biggest addition of spectrum since the start of public wi-fi in 1989 has been described as ‘a huge deal’, effectively quadrupling the amount of space available and potentially reducing the risk of interference for any device that can take advantage of it.

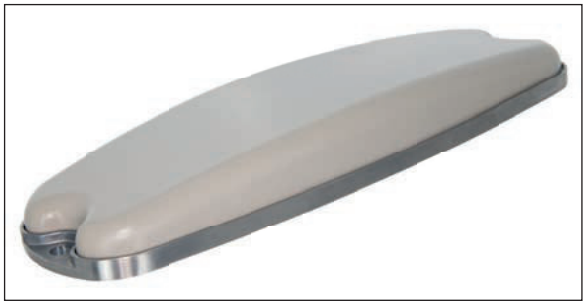
The first consumer devices designed for the 6 GHz band were rolled out towards the end of 2020, and a wider take-up can be expected in the coming years. As users become familiar with the speeds and possibilities of Wi-Fi 6E, train operators will need to evolve their own connectivity. But railways cannot afford to spend copious amounts of effort, time and money upgrading antennas on a regular basis. So they will be looking for equipment that is quick and painless to install.

Forward compatibility

Swiss electrical and optical connectivity supplier Huber+Suhner has already updated its range of onboard antennas to support Wi-Fi 6E, allowing train operators to future-proof their onboard network and meet evolving passenger demand in the coming years. The latest models have been designed for backward and forward compatibility, minimising the need for expensive or time-consuming retrofitting.

The Sencity Omni-SR Slim 6x6 MIMO is an omni-directional in-carriage antenna. The original 3x3 MIMO model has proved popular over the past decade, being fitted to thousands of trains globally. The 6x6 adds a Wi-Fi 6E capability, supporting the 2·4, 5 and 6 GHz wi-fi bands. Like the 3x3, it has a flush wall or ceiling mount; to allow easy retrofitting the later version can be slotted into place on an existing mount. The antenna is compact enough to be hidden behind wall or ceiling panels, protecting the onboard infrastructure from vandalism.

Most products are certified for use in a given region, but the Sensity range has been certified as compliant with the European EN 50155 and 45545-2 railway standards for electronics and fire safety, as well as NFPA-130 as used in the USA. This ensures that they can be on any type of train, worldwide.



The latest 6E-compatible Sencity Omni-SR aerials are designed to fit existing mountings and slim enough to fit behind ceiling panels.