# Teldat H1-Rail & bintec W2002T-n
## rugged train router and access point

The combination of the Teldat H1-Rail router and the bintec W2002T-n access points allow LTE connectivity whilst trains are in movement and at the same time permit Wi-Fi services to be offered to travelers.

Teldat
bintec-elmeg

# Teldat H1-Rail & bintec W2002T-n rugged train router and access point

| Challenge | Solution | Why Teldat |
|---|---|---|
| ▶ Amenities such as entertainment and free Wi-Fi services should increase passenger satisfaction. | ▶ H1-Rail is a rugged railway router with GPS and an embedded dual SIM module for LTE connectivity. | ▶ Teldat's solution is robust, endures harsh conditions and is well positioned in terms of price. |
| ▶ Enough bandwidth has to be available to support entertainment services and shared WLAN connections. | ▶ The W2002T-n has a dual radio module with a 2.4 and a 5 GHz module allowing to choose the frequency. | ▶ Guaranteed Internet connectivity regardless of any failures because of ring architecture and dual SIM. |
| ▶ 3G coverage had to be guaranteed at any time in order to ensure a seamless and permanent data connection. | ▶ H1-Rail and W2002T-n have EN 50155 certification and endure harsh conditions such as high temperature. | ▶ Teldat devices have preventative maintenance and thus reduce the operational costs for the client. |
| ▶ The professional railway solution had to be completely manageable and monitored from a central site. | ▶ All three coaches are connected in ring architecture which guarantees all travelers connectivity at any time. | ▶ The client had total confidence in Teldat equipment as well as in its expertise in mobile routing. |

## Client Summary

Our client is a manufacturer and supplier of high-tech rolling stock, offering in addition comprehensive global rail solutions including viability studies, civil work, signaling or maintenance and system operation. Thanks to its integrated projects, customers obtain a single global specific solution that guarantees the integration and compatibility of all the systems. Since its foundation more than 100 years ago the company has been noted for its capacity to innovate and to tailor its products to meet the needs of each and every customer. It is a multinational company with offices and production plants worldwide spread across countries in various continents.
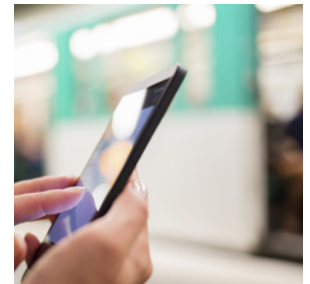
## Challenge

One of the New Zealand Transport Authorities was incorporating a fleet of trains for a new suburban railway infrastructure. Each modern train would have three coaches and they would replace the old diesel fleet. The replacement of the old fleet had also been taken as an opportunity to offer travelers a much better customer experience. All sorts of amenities such as for instance entertainment and free Wi-Fi services should increase customer satisfaction and enhance the service of the transport authority for travelers.

The three coaches in each train needed to be delivered with all the telecommunications equipment to allow a continuous and reliable connectivity at any time. Enough bandwidth had to be available to support the entertainment services and the shared wireless LAN connections for approximately 40 passengers in every coach. In order to ensure a seamless and permanent data connection for offering Wi-Fi and entertainment services to the passengers, 3G coverage had to be guaranteed at any time whilst the train is moving on the rails. A seamless 3G coverage can only be provided by using two different carriers, which means that the devices had to have the possibility of using two SIM cards at the same time.

Furthermore, the complete solution had to be manageable and monitored from a central site. Overall the client needed a modern set up of telecommunication equipment including redundancy for this demanding railway project. The advanced and customer-oriented solution had also to offer a backup solution for assuring professional routing and wireless LAN connection at any time.

Teldat H1-Train

Trains are made up of three coaches. On each coach an H1-Rail and a W2002T-n are installed. The H1-Rail is a rugged railway router with GPS and an embedded dual SIM module for LTE connectivity. The W2002T-n has a dual radio module with both 2.4 and 5 GHz frequencies allowing the travelers to choose whichever one they prefer.

Both H1-Rail and W2002T-n have EN 50155 certification and can endure harsh conditions like high temperature, vibrations and voltage spikes.

All three coaches are connected in ring architecture which guarantees all travelers connectivity at any time despite various types of possible failures such as:

- The H1-Rail router fails. The coach is connected by Wi-Fi to the other coaches and uses the H1-Rail on the other coach to have Internet access.
- There is an operator failure. The H1-Rail has a dual SIM module, with access to Internet from two different operators. If one fails the other acts as a resilience line.
- The W2002T-n access point fails but the H1-Rail is connected to the other coaches by Wi-Fi and the travelers have the service of the other coaches' W2002T-n.

The Teldat operating system allows a full stack of protocols. Special key points are the protocols TVRP and QoS which ensure the best performance of connectivity.
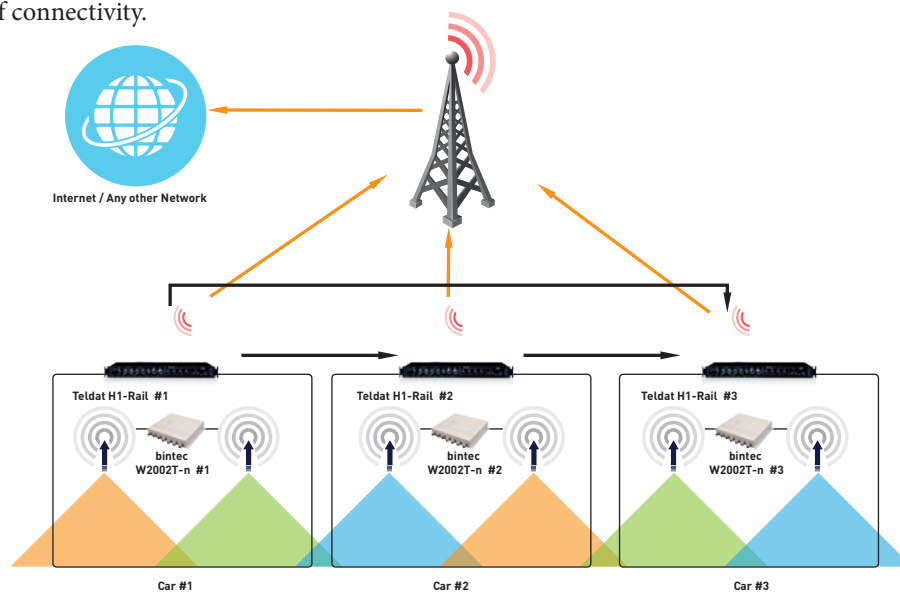


## Results

The delivery of trains to New Zealand with Teldat devices began in mid 2013. The results were quite clear:

- Internet connectivity was guaranteed.
- A very low level of failure in H1-Rail or W2002T-n, but when it does occur, the ring structure would secure contingencies.
- Operator contingencies were also avoided having a failover line using the dual SIM system.

The Transport Authority expects to establish a significant increase in traveler satisfaction, and to meet a long time demand, with high quality Wi-Fi connectivity for passengers.

## Why Teldat Got the Deal

The redundant options of Teldat's solution always guarantee Internet connectivity regardless of any failures (router, access point or operator connectivity) because of its ring architecture and dual SIM.

It was also important that Teldat routers and access points could work in the extreme temperature and humidity conditions in New Zealand. Teldat's solution is robust and well positioned in terms of price. Furthermore, the interconnection of the H1-Rail routers and W2002T-n access points was also vital.

Moreover, the Teldat devices have preventative maintenance and thus reduce the operational costs over time. The client had total confidence in Teldat equipment as well as in its expertise in mobile routing. Teldat has been working in high level routing and equipment with high standards for 30 years.

# FLEXIBLE
## COMMUNICATIONS SOLUTIONS
## THAT GROW WITH YOU.

# H1-Rail

Always-on connectivity for new services in trains

- ▶ Up to two embedded LTE interfaces for high speed connectivity to onboard applications
- ▶ Rugged mechanical and electrical design, certified for use on trains
- ▶ 19″ rackmount case, power from train's DC system
- ▶ Hardware-based data encryption for the highest performance in multi-VPN transmission
- ▶ Teldat software: complete suite of IP networking protocols + security & firewall

The **Teldat H1 Rail** brings advanced connectivity options to trains. More than simply enabling connectivity on board, it provides a wealth of advanced features such as redundancy (multiple cellular links and multiple routers), traffic prioritization, service isolation and dynamic routing options to maintain interruption-free, secure connectivity for all devices on the train.

Teldat's longstanding presence in the cellular router business has allowed us to adapt network protocols to better operate in cellular scenarios. The result is that users always have the best possible connection. SNMP support ensures that the router can be easily managed by our own management platform or by third party platforms.