

Introduction

The H2-Rail router is a multi-service communications platform for railway environments. It provides reliable 4G/LTE broadband and Wi-Fi communications with redundancy options, bandwidth aggregation and advanced network security mechanisms.

The hardware design is compliant with railway regulations for installations on lightweight and high-speed trains or trams, is EN 50155 certified to meet vibration and emission requirements, and offers an extended operating temperature range.

The router also provides extremely reliable communications using dynamic configurations (based on location/communications quality data).

Product Highlights

- ▶ Multi-service communications platform
- ▶ Multiple WWAN (bandwidth aggregation & load balancing)
- ▶ Compliant with railway regulations
- ▶ Geo-fencing: GPS-based dynamic configuration
- ▶ Standard-based service isolation
- ▶ Built-in switch for connection to other systems
- ▶ Complete Wi-Fi solution (management, hotspot & APs)

Interfaces

H2-Rail

Up to 4 x 4G/LTE Module	Yes (depending on the model)
Up to 2 x 802.11n Wi-Fi (client and AP)	Yes (optional)
4 x 10/100/1000 Mbps Giga-Ethernet (M-12)	Yes
Asynchronous serial port (RS-232) (DB-9)	Yes
Built-in GPS (NMEA) (FME connector)	Yes (optional)
72-110 VDC power input (M-12 connector)	Yes
2 x N-Type per LTE module (MIMO)	Yes
2 x N-Type per Wi-Fi module (MIMO)	Yes

Competitive Advantage

Concurrent multiple WWAN interfaces	Up to 4 simultaneous LTE and/or Wi-Fi radio links, with bandwidth aggregation and load-balancing to ensure maximum availability and application continuity.
Ruggedized hardware	Designed to withstand vibrations and extreme temp (-25 to 70°C). Certified according to railway standards (EN 50155, EN 50121-3-2, EN 45545-2, EN 301 908-1)
Service and GPS-based automation	Communication monitoring (availability/quality) and location tracking for dynamic routing policies per-service/link/position.
Corporate networking software	Uses the latest IP networking technologies for vehicles, bringing security, quality and ease of use to large-scale, multi-service deployments.

Scenarios

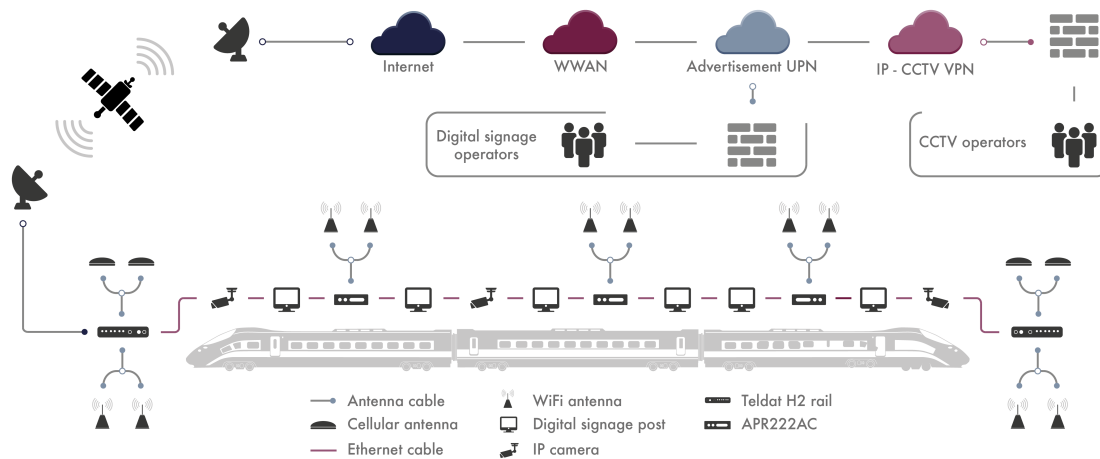


Figure: The connected train: A new rail transport paradigm

Key Features

Broadband with up to 4 concurrent LTE connections Support for up to 4 WWAN modules (4G/LTE). Each module can operate independently of the other or as backup. One of the modules also supports up to 2 x SIM for operator redundancy.

4G/LTE Quad-SIM for telecom carrier redundancy Quad SIM feature – using a single module for two telecom operators, employing one to back up the other and using only one of the modules.

Wi-Fi (802.11n) for passengers (AP) or stations(client) An 802.11n Wi-Fi module means the device can provide Wi-Fi services to passengers throughout their journeys (multiple SSIDs & integration hotspot platforms) and act in client mode to connect to external Wi-Fi networks.

Hardware design for use on trains Designed to withstand vibration and extreme temperatures (-25 to 70°C) and has full onboard train certifications (EN 50155, EN 50121-3-2, EN 301 511, EN 301 908-1, EN 45545-2).

Compatible with standards-based management platforms Seamless integration with third party standards-based management tools (SNMP). It has also been integrated into Teldat's Colibri network manager platform for remote monitoring and management.

Bandwidth aggregation/load balancing Concurrent use of multiple WAN interfaces (LTE, Wi-Fi, satellite, etc.) to distribute and/or aggregate load from multiple services on different interfaces, thus optimizing coverage areas and enhancing overall performance.

Secure, isolated multi-service communications The use of advanced networking protocols with multiple WAN links allows the services and management of the different solutions sharing the communications to be logically separated from each other.

High throughput for demanding behavior Ideal for telemarketing and fleet management. The device has a GPS (accessible via a TCP port) that provides real-time geo-location data in NMEA format.

Location-based (GPS) dynamic behavior Up to 470 Mbps of throughput to provide powerful communications for highly-demanding communication scenarios such as those requiring encryption, VRF, policy routing and QoS.

Advanced troubleshooting (fine-tuned, cloud) Advanced troubleshooting (such as sniffer and syslog) for analyzing service/position/coverage problems along the route. Cloud management and auto-provisioning allow even unskilled personnel to install the equipment.

HARDWARE TECHNICAL FEATURES

Up to 4 concurrent WWAN Interfaces (LTE/HSPA+/HSPA/EDGE)

Up to 4 built-in hardware modules with LTE/HSPA+
2 external antennas with 1 x Type-N connector per module
LTE/DC-
HSPA+/HSPA+/HSPA/UMTS/EDGE/GPRS;LTE/EVDO/1xRTT(inquire about others)

802.11a/b/g/n Wi-Fi interface

802.11abgn selectable band (2.4/5 GHz) with AP and client mode
2x2 MIMO external antennas (type-N connector) per module
WEP, WPA, WPA2 security. WMM QoS. Multi SSID.

Dimensions and Weight

Length x Width x Height: 186 x 483 x 43,6 mm (1U on a rack)
Approximate weight: 3.3 Kg
Flexible installation: rack and horizontal

Gigabit Ethernet interfaces

4 x 10/100/ 1000 BaseT Giga-Ethernet switch (X-coded M-12 connector)
LEDs on each port for installation troubleshooting
Support duplex, IEEE 802.3u link-speed auto-negotiation, VLAN and 802.1x

GPS interface

Active GPS antenna with FME and NMEA protocol
48 channels, high sensitivity and WAAS support
Provision of local and remote information

Environmental specifications

Temperature: -25 to 70 ° C
Relative humidity: 5 to 95%
Shock and vibration resistance (EN 61373)

SOFTWARE TECHNICAL FEATURES

Specific Wi-Fi functions

Hotspot Gateway function for hotspot service support
WLAN controller function for Teldat's built-in APs
Location-based dynamic function (AP or client)

IP protocol (2)

Multicast: IGMP (v1, v2, v3), PIM-SM, MSDP, MLD, MLDv2
PSLA service probes (delay, packet loss, jitter)
High availability: VRRP, TVRP (HSRP compatible)

Security (2)

Certificates: CSR, SCEP, X.509v3, PKIX, LDAP revocation
Static and dynamic access lists and session-based firewall
DoS/DDoS attack detection

Quality of Service (QoS)

Classification, marking, BW management, BW prioritisation and limitation
Up to 32 classes 16 queues per interface
Priority Queuing (PQ), Low latency (LLQ), by weight/type (WFQ, CBWFQ)

Management

CLI configuration and storage in a plain text file
Assignment of user/group licenses
RADIUS and TACACS+ compatible AAA support

IP protocol

ARP, ARP Proxy, MTU discovery, NAT, ECMP, BFD
RIP, OSPF, BGP, policy-based static and dynamic routing
Virtual Router Forwarding (Multi-VRF)

Security

IPSec support in transport and tunnel mode (including DMVPNs)
Pre-shared authentication, RSA, Certificates, MDS, SHA-1
Encryption: DES (56 bits), 3DES (168 bits), AES (128, 192 and 256 bits)

IP Services

Telnet, DHCP, DNS, FTP, SFTP, and SSH server and client
NTP, LDAP, Syslog, SCP client. TFTP server
DHCP, dynDNS relay

Specific WWAN functions

Automatic hand-over (passive and active probe-based detection)
Advanced link monitoring (packet error, latency, jitter)
Quadruple SIM and module associated with the hand-over mechanism

Management (2)

Netflow, RMON V5 and V9, SNMPv1, v2c y v3, Syslog support
Manageable via SMS
Wireshark-compatible remote traffic capture

ADDITIONAL TECHNICAL FEATURES

Console interface and asynchronous serial port

DB-9 connector with proprietary pinouts (including adapter)
Type RS232, N81
Default speed 9600 bps. Maximum speed: 115200 bps

Advanced GPS functions

GPS geo-fencing for location-based dynamic behavior
Location-based link/route activation
Location-based interface management (such as Wi-Fi as client/AP)

Load balancing and bandwidth aggregation (OLA)

Open Link Aggregation Protocol
Intelligent IPSec-based load balancing aggregation mechanism
Application continuity and per-session load balancing

Onboard environment ruggedness and power supply protection

72-110 VDC or 24 VDC power supply
Certifications: EN 50155, EN 50121-3-2, EN 301 511, EN 301 908-1, EN 45545
20 W consumption, screw-on connectors (M-12, type-N and FME)

FLEXIBLE COMMUNICATIONS SOLUTIONS THAT GROW WITH YOU.

H2-Rail: Communications Gateway for Railway

Multi-service Communication Platform for Train-to-Ground communications



Teldat is a leading provider in Enterprise Communications equipment and Services for the top corporate to mid-sized and SME markets.


About TELDAT



ROUTERS | Wi-Fi | MANAGEMENT | TRANSPORT | SMART GRID | INDUSTRIAL | VoIP | CLOUD | SECURITY | NFV |

Teldat Group is a leading technology holding that designs, manufactures and distributes advanced Internetworking platforms for corporate environments, providing new and cutting-edge communication solutions without ever losing sight of its customers real requirements. Teldat's solutions development is based on proprietary technology, which is in the Group's DNA. This allows Teldat to be a leading provider in Enterprise Communications equipment and Services for the top corporate to mid-sized markets, as well as the SME and SoHo markets.

From a geographical viewpoint, Teldat Group has a presence in all continents, with its corporate headquarters located in Spain, and operational affiliates in Europe (Germany, Austria, Portugal, Italy and France) and in LATAM (Mexico and Brazil), as well as two business development offices in USA and China.

Alcatel-Lucent 
Enterprise
al-enterprise.com

Alcatel-Lucent Enterprise
32 avenue Kléber
92700 Colombes, France

Alcatel-Lucent Enterprise USA, Inc.
26801 West Agoura Rd.
Calabasas, CA 91301, USA



Germany
bintec elmeg GmbH Suedwestpark
94. 90449 Nuremberg (Germany)
Phone: +49 911 9673 0 info@bintec-elmeg.com

France
6 Avenue Neil Armstrong Immeuble
le Lindbergh 33692 MERIGNAC
Cedex (France) Phone: +33(0)
57356300

USA
Silicon Valley Offices 718 University
Ave, Suite 210 Los Gatos, CA 95032
(USA) Phone: +1 408 892 9363

Portugal
Rua Açúcar, 86 1950-010 Lisboa,
(Portugal) Phone: +351 211 393 807

Mexico
Diagonal 27. Colonia del Valle,
Mexico D.F. 03100 (Mexico). Phone:
+52(55)55232213

Spain
Head Office: Teldat S.A. Parque
Tecnológico de Madrid 28760
Tres Cantos, Madrid (Spain)
Phone: +34 91 807 6565
D'Anna Piferrer 1-3 08023
Barcelona (Spain) Phone: +34
93 253 0222 info@teldat.com
www.teldat.com