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

<table>
<thead>
<tr>
<th>H2-Rail</th>
<th>Interfaces</th>
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<tbody>
<tr>
<td>Up to 4 x 4G/LTE Module</td>
<td>Yes (depending on the model)</td>
</tr>
<tr>
<td>Up to 2 x 802.11n Wi-Fi (client and AP)</td>
<td>Yes (optional)</td>
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<tr>
<td>4 x 10/100/1000 Mbps Giga-Ethernet (M-12)</td>
<td>Yes</td>
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<tr>
<td>Asynchronous serial port (RS-232) (DB-9)</td>
<td>Yes</td>
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<tr>
<td>Built-in GPS (NMEA) (FME connector)</td>
<td>Yes (optional)</td>
</tr>
<tr>
<td>72-110 VDC power input (M-12 connector)</td>
<td>Yes</td>
</tr>
<tr>
<td>2 x N-Type per LTE module (MIMO)</td>
<td>Yes</td>
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<tr>
<td>2 x N-Type per Wi-Fi module (MIMO)</td>
<td>Yes</td>
</tr>
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Competitive Advantage

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<th>Competitive Advantage</th>
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<tr>
<td>Concurrent multiple WWAN interfaces</td>
<td>Up to 4 simultaneous LTE and/or Wi-Fi radio links, with bandwidth aggregation and load-balancing to ensure maximum availability and application continuity.</td>
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<td>Ruggedized hardware</td>
<td>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)</td>
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<tr>
<td>Service and GPS-based automation</td>
<td>Communication monitoring (availability/quality) and location tracking for dynamic routing policies per-service/link/position.</td>
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<tr>
<td>Corporate networking software</td>
<td>Uses the latest IP networking technologies for vehicles, bringing security, quality and ease of use to large-scale, multi-service deployments.</td>
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Scenarios

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+/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
WEA, 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

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
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

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

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)
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

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.