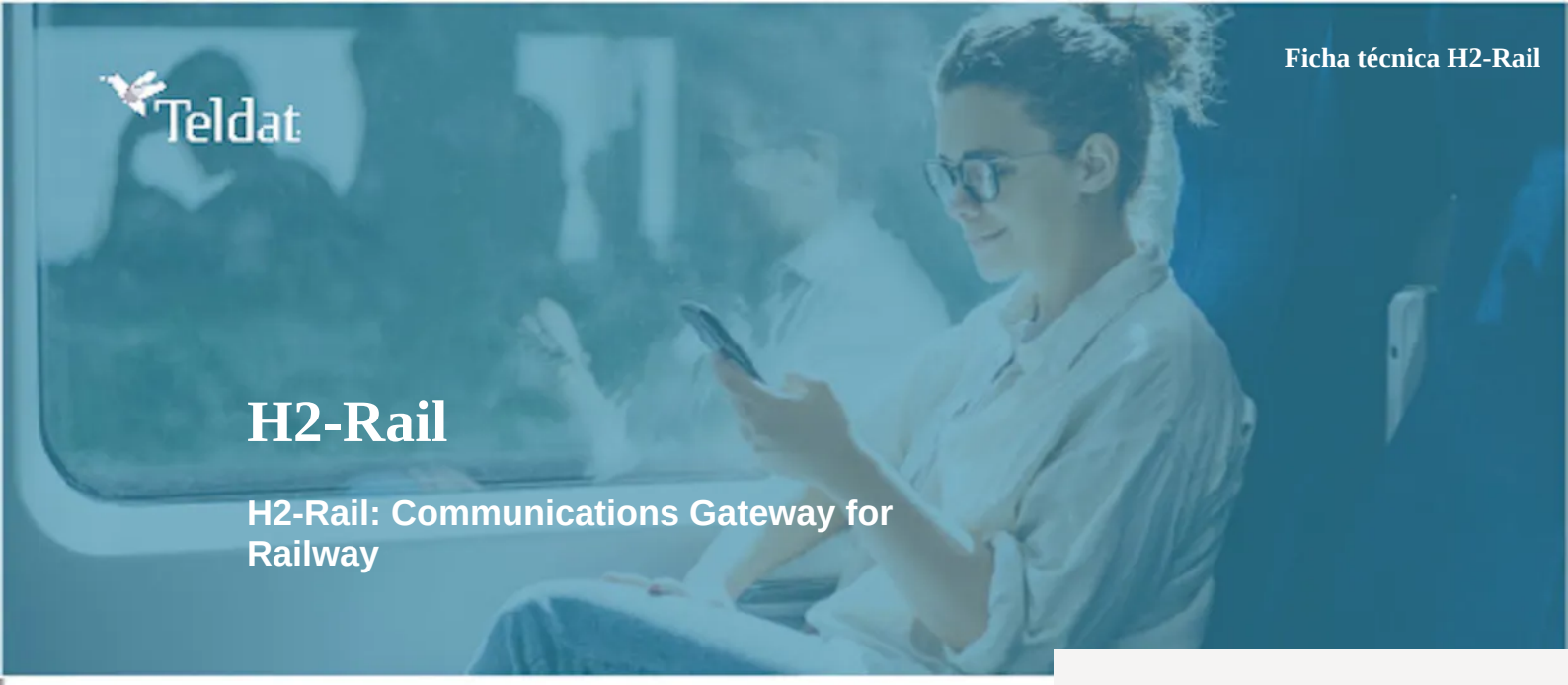

H2-Rail

H2-Rail: Communications Gateway for Railway

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 and extended operating temperature range.

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

Destacar

- **Multi-service communications platform**
- **Multiple WWAN(bandwidth aggregation&loadbalancing)**
- **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

Up to 4 x 4G/LTE Module	Yes (depending on the model)
Up to 3 x 802.11ac 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 or 24 VDC power input (M-12)	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.

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.
- **Wi-Fi 802.11ac for passengers (AP) or stations(client)** An 802.11ac 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.
- **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.
- **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** Up to 985 Mbps of throughput to provide powerful communications for highly-demanding communication scenarios such as those requiring encryption, VRF, policy routing and QoS.
- **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.
- **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).
- **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.
- **Location-based (GPS) dynamic 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.
- **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.

CARACTERíSTICA TéCNICA DEL HARDWARE

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)

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

802.11ac Wi-Fi interface

802.11ac 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.

GPS interface

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

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

Environmental specifications

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

CARACTERíSTICA TéCNICA DEL SOFTWARE

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

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

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

IPSec support in transport and tunnel mode (including DMVPNs)
Pre-shared authentication, RSA, Certificates, MDS, SHA-1, SHA-2
DES (56 bits), 3DES (168 bits), AES (128, 192 and 256 bits), IKEv1, IKEv2

Security (2)

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

IP Services

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

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)

Specific WWAN functions

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

Management

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

Management (2)

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

CARACTERíSTICA TéCNICAS ADICIONALES

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 aggreagation (OLA)

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

Advanced GPS functions

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

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, EN45545-2
20 W consumption, screw-on connectors (M-12, type-N and FME)

Scenarios

Teldat Group

Founded in 1985, Teldat is a Spanish company whose mission is to provide companies with valuable solutions for cloud access, remote office communications, cyberse-curity and voice/data connectivity both in the office and in specific environments whether they are industrial, railway, vehicles or public services.

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