Teldat

Celer Rail

Onboard router for railway communications

Introduction

The **Celer Rail**, like all **Celer-series** products, is Teldat's next generation multi-service communications platform for railways vehicles. It provides 5G cellular connectivity, with fallback to LTE, and wireless Wi-Fi 6 protected by the latest generation of Teldat firewall. It also allows artificial intelligence applications with Google's Coral, and eSIM for remote SIM provisioning.

The hardware design complies with railway regulations for installations on lightweight and high-speed trains or trams and is certified for railways requirements: EN 50155 for environmental, EMC, and shock and vibration; and EN 45545 for Fire&Smoke.

Destacar

- **5G Radio with fallback to LTE Cat. 19**
- **Wi-Fi 6 broadband connectivity**
- **Dual SIM plus eSIM provisioning (via SENDA)**
- **Artilificial Inteligence Google Coral**
- **be.OT: Next Generation FireWall IDS/IPS by Teldat**
- **GNSS Tracking Services**
- **2 x 2,5 GB Ethernet ports**

Interfaces

Cellular module	5G-NR (SA/NSA) with LTE Cat. 19 fallback
Wi-Fi module	Wi-Fi 6 802.11ax/ac/b/g/n
BT Interface	Bluetooth 5.1
Location system (GNSS)	GPS/GLONAS/BeiDu /Galileo
Digital I/O	1 PIN for I/O configurable
Ethernet interface	2 x Gigabit 2.5Gb LAN/WAN
Power supply	Multi-range from 24 to 110 VDC

Competitive Advantage

Dedicated cybersecurity embedded	IDS/IPS with +800 firms, webfiltering, NGFW and trafic analycer with multiple configurations all embedded in the router.
Best performance WWAN	5G-NR (fallback LTE Cat. 19) with Wi-Fi 6 802.11ax/ac/b/g/n in dual band (2,4GHz ans 5 GHz) AP and client modes.
Dual-SIM and eSIM	Dual SIM for active-standby, plus eSIM for dynamic operator configuration.
Artificial Intelligence applications	With the Google Coral chip the Celer has the state-of-art AI in-vehicle applications and its future updates.

Key Features

- **Broadband 5G Cellular Radio for NSA and SA.** 5GNR provides higher performance and improved efficiency to empower new user experiences and connect new industries. Where 5G is not accessible, the router falls back to LTE Cat. 19 maintaining broadband connectivity.

- **Bluetooth 5.1 low consumption.** Multi service BT 5.1 to configure the router and various functions such as connection of sensors or on-board accessories.

- **AI Applications.** Via TPU (Tensor Processing Unit) embedded Google Coral for dedicated applications such as video processing (Computer Vision), predictive maintenance and many other AI applications.

- **dual-SIM slot with eSIM.** Dual SIM slot to increase connection availability, using any telecommunications operator and back it up with a second one in case of the primary connection is lost, and eSIM availability to zero-touch provisioning.

- **Embedded GPS with Teldat's Mobility applications.** Ideal for fleet management or telemarketing applications. The equipment has GNSS accessible via TCP port that provides real-time geolocation information in NMEA standard.

- **Wi-Fi 6 (802.11a/b/g/n/ac/ax).** Multi user 2x2 MiMo for concurrent dual-band Wi-Fi access (2,4GHz and 5GHz) that seamless integrates with HotSpot and WebFilter applications, creating a full solution for on-board Internet connectivity.

- **Cybersecurity embedded.** Teldat's Security Solutions of Operational Technology to on-board systems to protect the IT system from external attacks with IPS/IDS methos.

- **Optimised hardware design for on-board environment.** Designed to withstand vibrations and extreme temperature range (-25ºC to 70ºC), it also provides a multi-range power supply from 24 to 110 VDC for rolling stock either being trains and trams.

- **Gigabit Ethernet Ports.** Provided with 2 M12-X ports of 2,5 GB to be connectes to the backbone ring a full speed.

- **Railways certifications.** Certified according to railway standards (EN 50155, EN 50121-3-2, EN 45545-2, EN 301 908-1)

CARACTERíSTICA TéCNICA DEL HARDWARE

WWAN

5G-NR and LTE/HSPA+ with QMA(f) connectors
Wi-Fi: dual MiMo 2x2 radio in 2.4 and 5 GHz with QMA(f) connectors
GNSS: Support of GPS/GLONAS/BeiDo/Galileo QMA(f)

SIM - eSIM

Dual-SIM with two physical slot-trays
Additional one eSIM per modem
SENDA service (optional)

Dimensions & Consumption

249x250x44 mm (LxWxH)
Approximate weight: 2.5 Kg
Power Consumption Max. 25W

Ethernet

2 x 2.5 GbE LAN/WAN (M12-X)
Duplex support

Certifications

Regulatory: Directive 2014/53/EU (RED); FCC (roadmap)
Materials: Directive 2011/65/EU (RoHS); Directive 1907/2006:2006-12 (REACH)
Railway: Environmental EN50155; Fire&Smoke EN54545; Shock&Vibration EN61373

Envirnomental

Ingress Protection: IP52
Temperature: Operating -25 to + 70 ºC | Storage min. -40 ºC max. +75 ºC
Relative atmospheric humidity: 5% to 95%

CARACTERíSTICA TéCNICA DEL SOFTWARE

Management

Interface: User friendly GUI, CLI configuration and storage in a plain text
Cloud based Network Management with auto provision functionality.?
Certificates: RADIUS and TACACS+ compatible AAA support

IP Services and Protocols

DHCP, DNS, SFTP, and SHH server and client NTP, LDAP, Syslog
ARP, ARP Proxy, MTU discovery, NAT, ECMP, BFD RIP, OSPF, BGP
Multicast: IGMP (v1 to 3), PIM-SM, MSDP, MLDv2

Wi-Fi specific functions

HotSpot Gateway functionality to support HotSpot services
WLAN controller functionality for Teldat on-board APs

Security

IPSec in transport and tunnel mode, DMVPN, wireguard, OpenVPN and Pulsecure
Certificates: CSR, SCEP, X.509v3, PKIX, LDAP revocation ?
NGFW with additional license.?

Quality of Services

Classification, marking, BW management, BW prioritisation and limitation

CARACTERíSTICA TéCNICAS ADICIONALES

TPU Google Coral (Roadmap)

High-speed inferencing for machine learning (ML) models.
4 TOPS: capable of performing 4 trillion operations per second

Bundle CNM & CNM Mobility

Global centralized device management tool
Info in real time of the vehicles
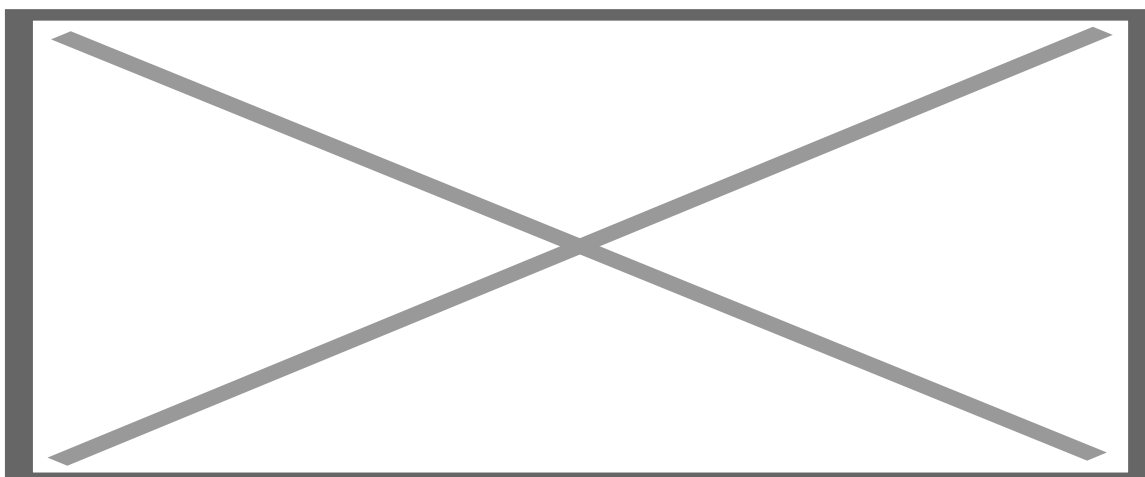Coverage, signal signal strength, bandwidth or throughput among others.

SENDA (Roadmap)

Service for ENhanced Deployment & Administration
Selected edge devices
Enhanced deployment (universal zero-touch provisioning)

WEB Cache

32GB Flash eMMC for storage of multiple HTTP sessions.

Scenarios