

RailBox/DDA0_V2

High performance railway router, with dual radio connectivity for Onboard and Trackside communications



- Dual radio WiFi 6, MIMO 4T4R, dual band 2.4 and 5 GHz
- 2 Ethernet ports 2.5Gbps
- Multi-functions router, AP, client, mesh
- Built-in Cybersecurity (EN 18031) with File system integrity monitor, secured access, VPN, firewall...
- Inter-Carriage Link (ICL):
 > SRCC automatic coupling
- Access Point:
 > Load balancing, band steering, Hotspot 2.0
 > Cybersecurity : Rogue AP Detection, WPA3 personal & enterprise
- Fast Roaming:
 > CBB roaming with less than 0.1% packet loss
- NMS WaveManager
- EN50155, EN45545 certified router :
 > Ultra-wide 24 to 110 VDC
 > Dual insulated redundant power supply input



Introduction

RailBox/DDA0_V2 is a rugged device designed for railway and light rail applications. It can be mounted on trains, subways, trams or in any equipment that requires robustness and high bandwidth for innovative services on the move.

RailBox/DDA0_V2 is part of the RailBox_V2 product range.

It can be implemented by system integrators and rail vehicle manufacturers who are seeking to establish reliable, efficient and agile network for:

- Uninterrupted train-to-trackside communications (CBTC, CCTV, VoIP, preventive maintenance, PIS...)
- Train and carriage coupling to establish an end-to-end Ethernet and IP backbone
- Passenger services like onboard WiFi, videostreaming, entertainment, infotainment...
- High Speed data offload at the station or depot

The device relies on the multi-streams MU-MIMO and beamforming technology that contributes to an expanded coverage, higher data throughput and increased radio link reliability.

It fulfills the most severe requirements in terms of operating environment: from -25°C to +70°C (extended : -40°C to +70°C), shock and vibration proof, protection against dust and water projections (IP66).

RailBox/DDA0_V2 is an evolution of RailBox, with exactly the same footprint (same dimensions and same connectors). This allows a smooth and cost-efficient upgrade of customers already equipped with RailBox products.

ACKSYS_RailBox/DDA0_V2_US_Rev A1_04/04/2024

Technical characteristics overview

Ethernet interface	2-port Gigabit Ethernet 100/1000/2500 auto-sensing, up to 5 Gbps link aggregation, water and vibration proof rapid connect 8-point M12 X-coded connectors (CAT-6A) plug & play mode & auto MDI/MDIX cross-over, optional Ethernet bypass that redirects the network traffic in case of device or power supply failure (for daisy chain topologies)
Radio interfaces	Radio 1: WiFi 6 Radio 2: WiFi 6
Security	Firewall, DoS, https, MAC filtering, WPA/WPA2/WPA3-Personal & Enterprise (IEEE 802.1X/RADIUS), tunnels L2 (GRE), VPN (OpenVPN, IPsec), SNMP V3, Rogue AP detector, File system integrity monitor, Strong password policy, Management of opened ports and services
WiFi Modes	AP, client, MESH (IEEE 802.11s), infrastructure, fast roaming (less than 30 ms), WMM QoS
WiFi Services	Hot Spot 2.0, Wireless Load Balancing (load balancing, band steering, client roaming control, association control per SSID)
ACKSYS enhanced features	Connect Before Break, Smart Redundant Carriage Coupling
Ethernet networking	Frames filtering, bridging, repeater, STP/RSTP, VLAN, DHCP (server & client), DNS relay, IPv6 compliant, LLDP
Ethernet routing	Multicast (PIM), IP redundancy (VRRP), static routes, NAT router, router, carriage coupling system (SRCC)
Administration	MQTT, http, https, SNMP agent (V1, V2C, V3), WaveManager administration software, save / restore configuration key (C-Key)
LEDs Signaling	Radio: quality, activity and status Ethernet: link 100/1000/2500, activity Power: on-off
Alarms & Inputs	A 3-pin Waterproof M8 connector with: <ul style="list-style-type: none"> - one solid state relay output warning (with configurable action), 1 Form A, 60VDC 80mA max - one input for external device control 24VDC max
Power supply	Dual insulated redundant input (1500V insulation, M12 connectors 4-pole A-coded) 24 to 110 VDC (EN50155 nominal), with ground lug.
Consumption	26W typical power consumption (dual radio), 30W max
Dimensions & weight	Compact shockproof rugged aluminium enclosure, (L: 80 x l: 175 x h: 57 mm), 900g Removable fixing plate: 4-point fixing plate with ground lug (L: 80 x l: 225 x h: 4 mm), 200g
Standards and certifications	CE (RED) <ul style="list-style-type: none"> Cybersecurity: EN 18031 Safety: EN 62368-1:2014+A11, EN62311 EMC: EN 301 489 [-1], [-17] Radio: EN 300 328 (2.4 GHz), EN 301 893 (5 GHz, DFS) EMC: EN 50155, EN 50121-4, EN 50121-3-2 Environmental: <ul style="list-style-type: none"> • Shocks and vibration: EN 61373 (CAT 1 CLASS B) • Climatic: EN60068-2 [-1, -2, -30] • Fire/smoke: EN45545-2 (HL3), NF F16-101 (M1F1), NFPA 130
Environment	Operating : -25°C to +70°C (HR 0-99%) Extended : -40°C to +70°C / +85°C for 10 mn, EN 50155 class TX Storage: -40°C to +80°C IP66 seal rating, GORE ® protective vent (dehumidifying membrane)

Technical characteristics overview

WiFi

WiFi radio cards 802.11ax (WiFi 6): MCS0-11 4 streams (up to 4.8 Gbps) 4 QMA connectors (per radio, 8 total)

Operating frequencies 2.4GHz: 2.412~2.472GHz
5GHz (QCN6024/9024): 5.150~5.850GHz
5GHz (QCN9074): 4.920~5.850GHz

Supports 20/40MHz at 2.4GHz
Supports 20/40/80/160MHz at 5GHz
Supports DFS and TPC

Radio max transmit power Up to 24dBm (aggregate)

Ordering references

RailBox/DDA0_V2

Dual WiFi Access Point for railway and mobile applications, shipped with a fixing plate (already mounted).

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Radio 1 (R) coding	Radio 2 (R) coding	Power supply (X) coding	Bypass (B) coding
D = WiFi 802.11ax 2.4GHz and 5GHz, -40°C to +70°C (+85°C for 10 mn, EN 50155 class TX)	D = WiFi 802.11ax 2.4GHz and 5GHz, -40°C to +70°C (+85°C for 10 mn, EN 50155 class TX)	A = +24VDC to +110VDC (EN 50155 nominal)	0 = No Bypass

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