

Product Datasheet - Technical Specifications



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Your contact

Technical and commercial sales, price information,
quotations, demo/test equipment, consulting:

Tel.: **+49 - (0)81 41 - 52 71-0**

FAX: **+49 - (0)81 41 - 52 71-129**

E-Mail: sales@meilhaus.com

Meilhaus Electronic GmbH
Am Sonnenlicht 2
82239 Alling/Germany

Tel. **+49 - (0)81 41 - 52 71-0**
Fax **+49 - (0)81 41 - 52 71-129**
E-Mail sales@meilhaus.com

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RailBox v2 series

EN50155 rugged dual 802.11ax WiFi access point, client & repeater for onboard network, 4G/5G gateway



Single or dual radio Wi-Fi and cellular

- WiFi 802.11ax MIMO 4T4R dual band 2.4GHz and 5GHz
- Cellular radio 4G/5G

2 Ethernet ports 2.5Gb/s

Multi-functions router AP, client, mesh

Advanced AP features

- Load balancing, band steering, WIDS, Passpoint/HotSpot 2.0

Advanced roaming feature with less than 0.1% packet loss

NMS WaveManager

EN50155, EN45545 certified router

- Ultra-wide 24 to 110 VDC or PoE+
- Dual insulated redundant power supply input
- Shock & vibration proof, rugged aluminum enclosure, IP66 seal rating



Introduction

RailBox v2 is a rugged device designed for railway and light rail applications. It can be mounted in trains, subways, trams or in any equipment that requires robustness and high bandwidth for innovative services on the move.

RailBox v2 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, video streaming, entertainment, infotainment...

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

It fulfils 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).

Evolution of the well-known Railbox, RailBox V2 has exactly the same format and same connectors as its predecessor, allowing an easy migration of customers already equipped with Railbox products.

Technical characteristics overview

Ethernet interface	2-port Gigabit Ethernet 10/100/1000/2500 auto-sensing, 2 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)
WiFi interface	1 or 2 radios IEEE 802.11a/b/g/n/ac/ax MIMO 4T4R, 2.4 / 5GHz ANI (Adaptive Noise Immunity) *
WiFi radio data rate	802.11a, b/g, n, ac, ax 4 streams, up to 4.8Gbps *
Operating frequencies	Supports all ISM and UNII bands, 2.4 and 5GHz Supports HT20, 40, HT80, HT160 Supports DFS and TPC
Radio max transmit power	Up to 24dBm (aggregate) *
Radio connectors	4 or 8 QMA connectors (no antenna provided)
Cellular radio data rate	Up to downlink xxxMbps / yybps uplink *
Cellular radio modes	LTE Category 6, category 12, category 20 5G GNSS: GPS/GLONASS/BeiDou/Galileo/QZSS *
Security	Fire wall, DoS, https, MAC filtering, WPA/WPA2-Personal & Enterprise (IEEE 802.1X/RADIUS), WPA3, WEP, tunnels L2 (GRE), VPN (OpenVPN), SNMP V3
WiFi Modes	AP, client, MESH (IEEE 802.11s), infrastructure, AD-HOC, fast roaming (less than 30 ms), WMM QoS
Ethernet networking	Frames filtering, bridging, repeater, STP/RSTP, automatic L2 backbone set-up (ACKSYS SRCC), VLAN, DHCP (server & client), DNS relay, IPv6 compliant
Ethernet routing	Multicast (PIM), IP redundancy (VRRP), static routes, NAT router, automatic L3 backbone set-up for TCN (Train Communication Network)
Administration	http, https, SNMP agent (V1, V2C, V3), NMSWaveManager, save / restore configuration key (C-Key)
LEDs Signaling	Radio: quality, activity and status Ethernet: link 10/100/1000/2500, activity Power: on-off
Alarms & Inputs	A 3-pin Waterproof M8 connector with: - 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. PoE+ (IEEE 802.3at Type 2 Class 4) model with ground lug also available.
Consumption	22W typical power consumption (dual radio), 25W 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) Safety: EN 62368-1:2014+A11, EN 62311 Railway EMC: EN 301 489 [-1], [-17] Radio: EN 300 328 (2.4 GHz), EN 301 893 (5 GHz, DFS) EMC: EN 50155, EN 50121-3-2 Environmental: • Shocks and vibration: EN 61373 (CAT 1 CLASS B) • Climatic: EN 60068-2 [-1, -2, -30] Fire/smoke: EN 45545-2 (HL3), NF F16-101 (M1F1), NFPA 130
Environment	IP66 seal rating - GORE® protective vent (dehumidifying membrane) Operating: -25°C to +70°C (HR0-99%) or extended -40°C to +70°C (+85°C for 10 min, EN 50155 class TX), storage: -40°C to +80°C

Ordering references

RailBox/RRXB Rugged single or dual WiFi / cellular router for railway and mobile applications

RailBox/RRXB

Radio 1 coding	Radio 2 coding	Power supply coding	Bypass coding
1 = WiFi 4 / 802.11n commercial grade 2 = WiFi 5 / 802.11ac wave 1 industrial grade 6 = WiFi 5 / 802.11 ac wave 2 industrial grade D = WiFi 6 / 802.11ax industrial grade	0 = No radio 1 = WiFi 4 / 802.11n commercial grade 2 = WiFi 5 / 802.11ac wave 1 industrial grade 6 = WiFi 5 / 802.11 ac wave 2 industrial grade D = WiFi 6 / 802.11ax industrial grade R = LTE cat 6 S = LTE cat 12 T = LTE cat 20 U = 5G	A = +24VDC to +110VDC P = PoE+	0 = No Bypass Y 1 = Bypass The Ethernet bypass redirects the network traffic in case of device or power supply failure (useful for daisy chain network topologies) Note: Bypass is not compatible with PoE model.

Wifi Specifications	802.11n	802.11ac wave 1	802.11ac wave 2	802.11 ax
Number of streams	3	3	4	4
Radio max transmit power	24 dBm	24 dBm	26 dBm	24 dBm
WiFi radio data rate	450 Mbps	1,3 Gbps	1,73 Gbps	4,8 Gbps
Radio QMA connectors	3	3	4	4

Cellular Specifications	LTE cat 6	LTE cat 12	LTE cat 20	5G
Number of streams	4	4	4	4 ou 8
Radio max transmit power	24 dBm	24 dBm	23 dBm	26 dBm
Radio QMA connectors	4	4	4	4 en Sub-6GHz, 8 en mmWave
Cellular radio data rate	Downlink 300 Mbps Uplink 50 Mbps	Downlink 600 Mbps Uplink 150 Mbps	Downlink 2 Gbps Uplink 150 Mbps	Downlink 4,5 Gbps Uplink 2,9 Gbps
GNSS	GPS, GLONASS, BeiDou/Compass, Galileo and QZSS			

Railbox model	Radio 1	Radio 2	Type
Railbox/10	802.11n	none	wifi
Railbox/11	802.11n	802.11n	wifi
Railbox/17	802.11n	LTE cat 4	wifi + cellular
Railbox/20	802.11ac wave 1	none	wifi
Railbox/22	802.11ac wave 1	802.11ac wave 1	wifi
Railbox/27	802.11ac wave 1	LTE cat 4	wifi + cellular
Railbox/60	802.11ac wave 2	none	wifi
Railbox/66	802.11ac wave 2	802.11ac wave 2	wifi
Railbox/D0	802.11ax	none	wifi
Railbox/DD	802.11ax	802.11ax	wifi
Railbox/DR	802.11ax	LTE cat 6	wifi + cellular
Railbox/DS	802.11ax	LTE cat 12	wifi + cellular
Railbox/DT	802.11ax	LTE cat 20	wifi + cellular
Railbox/DU	802.11ax	5G	wifi + cellular

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