CyBox LTE-W

Wireless LTE Router for Mobile Rail Applications

↳ Router for train-based LTE Internet connectivity
↳ EN 50155 compliant
↳ Wall mount solution

Q ISO 9001
CERTIFIED QUALITY-SYSTEMS

ELTEC systems

III Main Features

↪ IEEE802.11a/b/g/n/ac radio module with 3x3 MIMO
↪ Maximum bandwidth up to 1300 Mbps
↪ LTE advanced modem module with 2 antennas
↪ Integrated 2-port Gigabit Ethernet switch
↪ Ultra-wide-range power supply supports all voltage ranges worldwide
↪ Maintenance free design for ruggedized mobile applications
↪ Easy-to-use web interface for management and configuration
↪ Configurable firewall to ensure communication security
↪ Optimized CPU for high-speed network communication
↪ Integrated navigation module supporting all standards
↪ Lowest power consumption supporting green IT

III Description

The CyBox LTE-W is a member of the CyBox family of robust wireless communication devices for wall mounting. It is particularly designed to meet requirements of rolling stock applications. The device hosts a Wi-Fi radio and a LTE modem providing broadband routing functionality between the local Ethernet or wireless clients and broadband communication media on board a passenger or freight train, tramway, or the subway for example. The built-in fully configurable firewall ensures communication security.

The Wi-Fi radio can operate in 2.4 GHz or 5 GHz and is fully compliant to IEEE 802.11a/b/g/n/ac, allowing a maximum wireless transmission rate of 1300 Mbps on the interface. On the fixed network side, the CyBox LTE-W features two 10/100/1000 Mbps Ethernet ports with auto-negotiation and TX-crossover. The ports are internally connected to an unmanaged switch and can be used either for redundancy to increase the availability of service, or to connect a second CyBox LTE-W for instance. The switch works independently from the CyBox LTE-W CPU, so that internal failures do not influence the packet forwarding between the two Ethernet ports.

The CyBox LTE-W provides very flexible powering options. It can be supplied by a local 24 to 110 VDC power source. As a second source it provides an IEEE802.3af compliant PoE input. Its capability to supply power to a second CyBox LTE-W, if it is connected to the downlink port, is a unique feature. This setup allows providing wireless connectivity with two access points using just one CAT-X cable; a noticeable cost saving factor especially in retrofit programs.

The CyBox LTE-W firmware provides a comfortable management interface through http service. Besides global setup parameters the open source software OpenWrt allows complete configuration of the LTE/GSM interfaces, such as provider information, login dialog editing, and firewall setup. The OpenWrt configuration can be up- and downloaded and the complete management firmware can be upgraded. Furthermore it provides remote update capability.

ELTEC systems

▥ Standards and Specifications

Interoperability of the rail system – Directive 2008/57/EC

↝ EN 50155
↝ EN 45545-2 (HL 1 to HL 3)
↝ EN 61373 (Category 1, Class B)

RED – 2014/53/EU

↝ EMC
↝ Radio spectrum
↝ Health & Safety

▥ Modules

WI-FI Interface IEEE 802.11 a/b/g/n/ac

Transmission Rates	up to 1300 Mbps
Frequency Range	2.412 GHz to 2.472 GHz, or 5.180 GHz to 5.825 GHz, selectable band
RF	3 RF signal inputs, 3T3R MIMO technology
Encryption	AES, TKIP, WEP
Security	Visible / invisible SSID 64-bit and 128-bit WEP encryption, WPA / WPA2-personal and enterprise Firewall

LTE Interface Cat-6 advanced

Peak Rates	300 Mbps download / 50 Mbps upload
4G (LTE) Bands	B1, B2, B3, B4, B5, B7, B12, B13, B20, B25, B26, B29, B30, B41
3G Bands	B1, B2, B3, B4, B5, B8
Antenna	With Diversity and MIMO

GNSS Interface

Frequency Band	GPS (L1), GLONASS (L1, FDMA), Galileo (E1) (Ready)
Protocol Standards	NMEA, RTCM 104
Accuracy	up to 1.5 m
Performance	Time-to-first-fix: cold start < 35 s Warm start/aided start: 1 s

III Technical Data

Physical Interfaces

Antenna	QLS connectors supporting QLS or QMA
LAN	10/100/1000BaseT(X), M12 X-coded
USB Port	M12 4-pin female A-coded
Power Input	M12 4 pin male A-coded
Reset Switch	available on the front panel

Mechanical Specifications

Dimensions	130 mm x 55 mm x 205.2 mm (w h d)
Weight	up to 1250 g
Housing	IP40, aluminum, prepared for wall-mounting

Electrical Specifications

Local supply voltage	24 to 110 VDC nominal, wide-range power supply
Interruptions of voltage supply	compliant to EN 50155, Class S2
Supply change over	compliant to EN 50155, Class C1
Power over Ethernet	Class-3 powered device, IEEE 802.3af
Power consumption	8 W typ., 12 W max

Environmental Conditions

Ambient temperature (operation)	Class TX, -40..+70 °C (85 °C for 10 min)
Ambient temperature (storage)	-40..+85 °C
Relative humidity (operation)	max 90 % non-condensing
Relative humidity (storage)	max 90 % non-condensing
Altitude	Class AX, up to +2000 m
PCB protection	conformal coating

MTBF

MTBF	approx. ~220.000 h

III Options

↪ Various combinations of Wi-Fi and LTE modules
↪ SMA antenna connectors

III Standard Configurations

ARTICLE NO.	WLAN | LTE	NETWORK	802.11	GPS
CYLTE-1001V0	1 | 1	2 ETH (M12X)	n	GPS
CYLTE-1005V0	1 | 1	2 ETH (M12X)	ac	GPS

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