

TWMR-5002

EN50155 Multifunction VPN Router w/1 WiFi 11ac + 1 LTE 4G + 2 serial ports + 2 Gigabit X-coded Ethernet(incl.1 PD) for Load Balancing**, TWCC**, VPN, Protocol Gateway, Storage**; WV input; IP65/54

- Built-in 1x WiFi 11ac/a/b/g/n module + 1xLTE 4G module + 2xGigabit X-coded ports(incl. 1PD)
- Up to 2 concurrent modem for 3G/4G LTE Link & GPS(1L-1AC model/2 SIMs)
- Optional TWCC**(Train Wireless Carriage Coupling) for auto wireless coupling
- Built-in 2 serial ports with 2.5K isolation(RS422/485) or w/o isolation(RS232)
- LTE 4G modem with GPS positioning & 2 SIMs fail-over
- WiFi radio for 802.11ac/a/b/g/n with 5GHz or 2.4GHz; MIMO 3T3R
- Fast roaming**; 802.11r work with Lantech controller
- Supports AP/ Bridge/ Client modes
- VPN router for Multi-site VPN, OpenVPN, L2TP, IPSec, PPTP**, L2 over GRE
- Load Balancing** support 8 mechanism for WiFi client/WAN arrangement
- Optional EMMC Flash storage on-board**
- Support NAT and Firewall
- Support Modbus or gateway on serial ports
- Galvanic isolation on WV model from 16.8V~137.5V input
- Built-in environmental monitoring for router inside info with voltage, current, temperature; WiFi & LTE graphic signal strength & TX/RX rate display
- Editable login page of captive portal for hot-spot application
- USB port for backup, restore the configuration file and upgrade firmware*; Dual image firmware*
- IP 65 /54 Aluminum housing for best heat dissipation and preventing moist ingress
- EN50155/61373/45545 verification for railway application



OVERVIEW

Lantech TWMR-5002 series is a next generation EN50155 multi-function VPN router w/1x 802.3ac WiFi + 1x LTE modem + 2x Gigabit Ethernet(incl.1 PD)+ 2 serial ports that supports advanced function of VPN, Load-balancing**(Premium pack), EMMC Flash Storage**, Protocol gateway(Modbus), Storage**, WiFi roaming** and LTE dual SIM fail-over for on-board / onboard-to-ground applications. The dual core CPU with 1.6GHz + 256M flash enables the router to multi-task smoothly.

Optional TWCC (Train Wireless Carriage Coupling) for auto coupling**

TWMR-5002 series supports optional TWCC** (Train Wireless Carriage Coupling) that enables auto wireless coupling to reconnect APs.

LTE modem 4G/3G with dual SIM fail-over

Built-in one LTE modem with 2 SIM card slots, TWMR-5002 can allow failover between two operators for resilient connection. Both GPS and Russian GLONASS systems are

supported (may vary in models)

IEEE 802.11ac radio up to 1.3GMbps bandwidth

With IEEE 802.11ac capability, TWMR-5002 can operate either 5GHz or 2.4GHz bands, offering the maximum speed of 1.3GMbps bandwidth. It is also compatible with 802.11g/n that can work with 2.4GHz for longer range transmission.

The WiFi 11ac supports AP/BRIDGE/AP Client modes can be diverse for most of wireless application. Client mode supports PMK** Caching and pre-authentication. Working with load-balancing** "Priority" mode, the AP client can enable router to transmit on WiFi with first priority.

Optional EMMC Flash storage**

The optional EMMC flash storage on router can offer 8G/16G/32G capacity.

MIMO technology with 3T3R and SMA/QMA type**

connectors

Lantech TWMR-5002 series adapts MIMO technology with Smart antenna transmission and reception for 3T3R. With six external detachable antenna connectors (SMA/QMA**) and optional antennas, TWMR-5002 can have better Wi-Fi & LTE/GPS coverage.

Optional 802.11r fast roaming**

TWMR-5002 support fast roaming** (optional) in coordination with Lantech Wireless Controller to allow encryption keys to be stored on all of the APs in a network.

Client mode supports PMK** Caching and pre-authentication.

Wireless WMM QoS

TWMR-5002 supports 802.11e standard which defines a set of Quality of Service for wireless LAN applications as well as WMM (WiFi multimedia)

Advanced security & 16 SSIDs

The security support standards including 64/128bits WEP, WPA/WPA2 PSK (TKIP*, AES), 802.1x** ensures the best security and active defense against security threats. Lantech TWMR-5002 support up to 16 SSIDs, each SSID has its independent security and encryption.

Load Balancing with 8 mechanism for multi-WANs (premium license)**

TWMR-5002 supports Load Balancing** for LTE / WAN connections. There are eight schemes for Load Balancing** function:

Pack	Algorithm	Description
Standard	Fixed	Manually route by traffic type through fixed WAN link.
Basic Package	Failover	Routes connections through preferred WAN link while others stand-by. Sequentially activate another link if preferred link fail occurs. Once failover will not failback until link loss.
	Priority	Routes connections through preferred WAN link as primary while others follow by. Ex. WiFi client>LTE>others
	Weighted Round-Robin	Evenly distribute the traffic over all working WAN links in circular order according to the specified weights.
	Custom Route	Routing through the selected WAN for each specific traffic, ex: TCP/UDP port number and IP address.
Full Package (incl. basic package)	Sticky Session*	Binding all connections in an application session to particular WAN link to ensure all connections in the session are routed to the same WAN link, that is suitable for security services like online payment etc.
	Smallest Load*	Routes connections through the WAN link with highest free bandwidth ratio. The ratio = 1 - (traffic load / the capability of a WAN link). The traffic load could be defined by downstream, upstream or total

	traffic
Fastest*	Routes connections through the WAN link with lowest latency time.

2 port serial connection, Modbus gateway

It builds in 2 port serial connection for RS232 or RS422, RS485 in which RS422/485 has 2.5KV isolation protection.

The built-in Modbus gateway can convert Modbus RTU/ASCII to Modbus TCP for device control.

VPN and firewall

Besides traditional VPN peer to peer tunneling, TWMR-5002 support latest Multi-Site VPN function that is an efficient way for mesh tunneling. The registration is under cloud service and encrypted by SSH makes the connection easy and safe. It supports Multi-Site VPN, Open VPN, L2TP, IPsec L2 over GRE, NAT, and PPTP** for various VPN applications.

The built-in Layer-4 firewall includes DoS**, IP address filter / Mac address filter* / TCP/UDP port number.

DIDO for alarm & email notice; Event log; Remote Web/SMS** control**

2 sets of DIDO function can support additional high/low physical contact for designate applications besides Port / Power events, for example, DIDO function can trigger alarm if the router was moved or stolen. In case of events, the TWMR-5002 will immediately send email** and trap.

When the router is at remote area with limited access, Web/SMS** control can help to get router status or remotely reboot by Web/SMS**

Wide range dual isolated input voltage from 16.8-137.5V (WV model)

The TWMR-5002 is able to work from dual 16.8V ~137.5V DC isolated input (WV model) that is particular good for vehicle, rail train, depot etc applications.

Environmental monitoring for inside router info& alerting; WiFi & LTE signal strength and TX/RX rate display

The built-in environmental monitoring can detect router overall temperature, voltage, current where can send the syslog, email** and SMS** alert when abnormal. The graphic WiFi & LTE signal strength and TX/RX rate display shows connection status at a glance.

Cloud/Host based InstaView/InstaAir** software for router/fleet management and monitoring**

Lantech InstaView** can offer fixed location router central management, configuration, and monitoring via secured Cloud or Host server. InstaAir** can offer fleet router management including the GPS tracking, signal strength, remote configure/upgrade, monitoring/alerting and report function

USB port for back up, restore configuration and upgrade firmware*; Dual image firmware*

The built-in USB port can upload/download the configuration through USB dongle for router replacement

Dual image firmware*

It supports dual-image firmware* to choose which one to start.

Editable login page of captive portal

The TWMR-5002 supports editable captive portal function that allows administrator to force end-users redirect to authentication page.

Ruggedized EN50155 design and FCC/CE, E-marking certificate**

The TWMR-5002 series is verified with EN50155, IEC61373,

EN45545 standard with IP65/54 housing. It passed serious tests under extensive Industrial EMI and environmental vibration and shocks standards. With CE & FCC radio certification for WiFi and LTE and E-marking** certificate, the TWMR-5002 is best for outdoor community, vehicle, power substation, process control automation etc. For more usage flexibilities, TWMR-5002 supports operating temperature from -20°C to 70°C or -40°C to 70°C(-E) .

FEATURES & BENEFITS

- **High Speed Air Connectivity: WLAN interface support up to 1.3GMbps link speed(1AC)**
- **Built-in two Gigabit ports X-coded incl. 1 PD; 1LAN+1WAN or 2LAN**
- **Optional TWCC** (Train Wireless Carriage Coupling) for auto wireless coupling**
- **EMMC-FLASH storage****
- **Dual band 2.4G and 5GHz with 802.11ac/a/b/g/n**
- **Support 2.4Ghz operating within the following frequency bands:**
 - **2.412~2.472 GHz**
- **Support 5Ghz operating within the following frequency bands:**
 - **5.180GHz~5.825GHz**
- **MIMO Smart antenna technology with 3T3R with 6 SMA/QMA** type connectors for WiFi & LTE, GPS**
- **Output power < 24dBm**
- **Transmit power adjustment**
- **VAP (virtual access point) support up to 16 SSIDs**
- **Operation modes : AP/ Bridge/ AP Client**
- **Traffic control for each SSID****
- **Band preference for same SSID services on dual band****
- **Rate selection to disable low data rate access****
- **Highly Security Capability: WEP64/128bits/ WPA/ WPA-PSK (TKIP*,AES)/ WPA2/ WPA2-PSK (TKIP*,AES)**
- **HTTP/HTTPS/Telnet/SSH & Administration access**
- **Support IPv6** & IPv4 protocol**
- **Radius Authentication, EAP-MD5, EAP-TLS, EAP-TTLS, PEAP; SSID broadcast disable supported****
- **Multiple channel bandwidths of 20MHz and 40MHz for 2.4G.**
- **Multiple channel bandwidths of 20MHz, 40MHz and 80MHz for 5G only.**
- **Wi-Fi Multimedia (WMM) and 802.11e traffic prioritization**
- **One LTE 4G/3G w/ 2 SIM slots design for mobile redundancy**
- **GPS/ GLONASS (built-in LTE module) connection**
- **Load Balancing** supports 8 mechanism between multiple WANs**

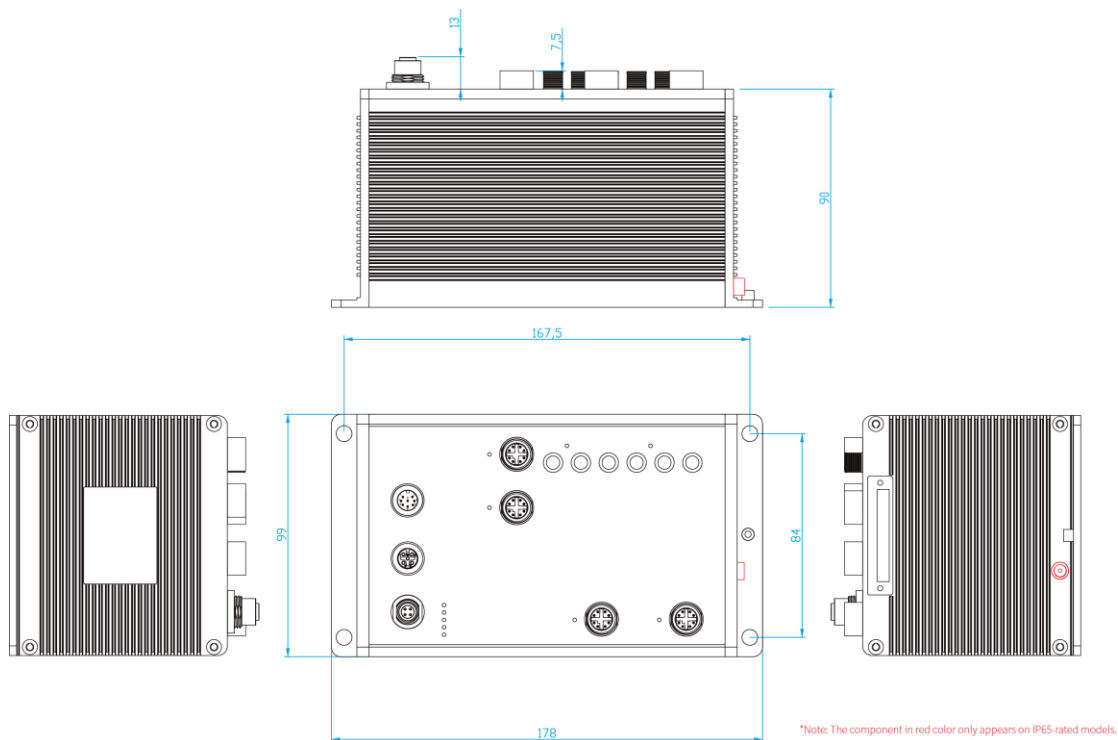
Pack	Algorithm	Description
Standard	Fixed	Manually route by traffic type through fixed WAN link.

Basic Package	Failover	Routes connections through preferred WAN link while others stand-by. Sequentially activate another link if preferred link fail occurs. Once failover will not fallback until link loss.
	Priority	Routes connections through preferred WAN link as primary while others follow by. Ex. WiFi client>LTE>others
	Weighted Round-Robin	Evenly distribute the traffic over all working WAN links in circular order according to the specified weights.
	Custom Route	Routing through the selected WAN for each specific traffic, ex: TCP/UDP port number and IP address.
Full Package (incl. basic package)	Sticky Session*	Binding all connections in an application session to particular WAN link to ensure all connections in the session are routed to the same WAN link , that is suitable for security services like online payment etc.
	Smallest Load*	Routes connections through the WAN link with highest free bandwidth ratio. The ratio = 1 - (traffic load / the capability of a WAN link). The traffic load could be defined by downstream, upstream or total traffic
	Fastest*	Routes connections through the WAN link with lowest latency time.

- **Built-in 2 x serial ports(RS232/RS422/485)**
- **Serial port with 2.5KV isolation on RS422/485**
- **Supports 2DI / 2DO(Digital Input / Output)**
- **Support Multi-Site VPN for mesh tunneling as well as Open VPN, L2TP, IPsec L2 over GRE, NAT, and PPTP** fro secured network connection**
- **The built-in Layer-4 firewall includes DoS**, IP address filter / Mac address filter* / TCP/UDP port number**
- **NAT/DMZ**
- **Built-in Modbus gateway converting Modbus RTU/ASCII to Modbus/TCP**
- **Event alerting by Syslog, SNMP Trap, Email**, SMS** text, Relay ; Permanent local log rotation / Maxi 1K records**
- **Remote Web/SMS** control to get status or re-boot by Web/SMS****

- Built-in RTC to keep track of time always
- Support SNTP to synchronize system clock
- Support LLDP discovery protocol
- Support DHCP Server and Client
- Built-in environmental monitoring for system input voltage, current and ambient temperature; Able to set alert when abnormal
- Graphic LTE & WiFi signal strength & TX/RX rate display
- Firmware upgradeable through TFTP/FTP/HTTP
- Configuration backup and restoration
 - Supports editable configuration file for system quick installation
 - USB port to upload/download configuration by USB dongle
 - InstaView/AIR** for centralized configuration deployment, backup & upgrade
- Dual image firmware*
- Support editable captive portal login page
- Cloud/Host based InstaAIR** for fixed/fleet router management/configuration/monitoring
- IP 65/54 housing for water proof environment
- Wall-mount installation
- Operation temperature -20~70C or -40~70C(-E)

DIMENSIONS (unit=mm)



SPECIFICATION

WLAN Interface		Wireless Security	SSID broadcast disable**
Operating Mode	AP/BRIDGE/Client modes	Cellular Interface	
Radio Frequency Type	DSSS, OFDM	Antenna Connector	Detachable antenna connectors x 3; SMA/QMA** type female connector (Main, Aux, GPS)
Wireless Standard	IEEE 802.11ac/n/a 5GHz IEEE 802.11b/g/n 2.4GHz	Location Solutions	GPS, Glonass (EU/Americas) GPS, Glonass, Beidou, Galileo (APAC model only)
Wireless bandwidth	5GHz: Up to 1300Mbps 2.4GHz: Up to 450Mbps	Band Options	APAC & Australia (APAC model) LTE: 2100/1800/850/2600/900/850/850/1500/700/2600/1900/2300/2500 MHz (B1/B3/B5/B7/B8/B18/B19/B21/B28/B38/B39/B40/B41) EUNA & USA model LTE: 2100/1800/2600/900/800 MHz (B1/B2/B3/B4/B5/B7/B12/B13/B20/B25/B26/B29/B30/B41) WorldWide (WW model) LTE: 2100/1900/1800/1700/850/2600/900/1800/700/700/850/850/800/850/700/2300/1500/2500/3500/3700/5200/3600/1700 (B1/B2/B3/B4/B5/B7/B8/B9/B12/B13/B18/B19/B20/B26/B28/B29/B30/B32/B41/B42/B43/B46/B48/B66)
Modulation	802.11b: DSSS 802.11a/g: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11n: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM)	Data Rates – LTE	APAC & Australia (APAC model) Downlink (Cat 6): FDD: 300 Mbps TDD: 222 Mbps Uplink (Cat 6): FDD: 50 Mbps TDD: 26 Mbps Americas (US model) / EMEA (EU model) Downlink (Category 3): 100 Mbps (20 MHz bandwidth) 50 Mbps (10 MHz bandwidth) Uplink (Category 3): 50 Mbps (20 MHz bandwidth) 25 Mbps (10 MHz bandwidth)
Operating Frequency	IEEE 802.11 a/b/g/n ISM Band, 2.412GHz~2.472GHz, 5150MHz~5850MHz	Software	
Transmission Rate	IEEE802.11ac: up to 1300Mbps IEEE802.11b: 1 / 2 / 5.5 / 11 Mbps IEEE802.11a/g: 6 / 9 / 12 / 18 / 24 / 36 / 48 / 54 Mbps IEEE802.11n: up to 450Mbps	IPv6/4	Present
IEEE 802.11b/g/n(2.4Gbps)	Output Power Tx +/- 2dB(per chain) 18dBm @ 1~11Mbps 18dBm @ 6~54Mbps 20/20dBm @ MCS0~MCS7 (HT20/40) Receiver Sensitivity Rx +/- 2dB ≤ -95dBm @ 1~11Mbps ≤ -92dBm @ 6~18Mbps ≤ -88dBm @ 24Mbps ≤ -85dBm @ 36Mbps ≤ -81dBm @ 48Mbps ≤ -80dBm @ 54Mbps ≤ -94dBm @ MCS0 (HT20/40) ≤ -76dBm @ MCS7 (HT20/40)	Login Security	Supports IEEE802.1x** Authentication/RADIUS
IEEE 802.11b/g/n(2.4Gbps)	Output Power Tx +/- 2dB(per chain) 18dBm @ 1~11Mbps 18dBm @ 6~54Mbps 20/20dBm @ MCS0~MCS7 (HT20/40) Receiver Sensitivity Rx +/- 2dB ≤ -95dBm @ 1~11Mbps ≤ -92dBm @ 6~18Mbps ≤ -88dBm @ 24Mbps ≤ -85dBm @ 36Mbps ≤ -81dBm @ 48Mbps ≤ -80dBm @ 54Mbps ≤ -94dBm @ MCS0 (HT20/40) ≤ -76dBm @ MCS7 (HT20/40)	TWCC**	Optional Train Wireless Carriage Coupling for Auto wireless Coupling
IEEE 802.11a/n/ac(5Gbps)	Output Power Tx +/- 2dB(per chain) 20dBm @ 6~24Mbps 16dBm @ 36~54Mbps 19/18dBm @ MCS0 (HT20/40) 16/16dBm @ MCS7 (HT20/40) 19/18/18dBm @ MCS0 (VHT20/40/80) 13/13/13dBm @ MCS8 (VHT20/40/80) 13/13dBm @ MCS9 (VHT40/80) Receiver Sensitivity Rx +/- 2dB ≤ -92dBm @ 6~18Mbps ≤ -86dBm @ 24Mbps ≤ -84dBm @ 36Mbps ≤ -81dBm @ 48Mbps ≤ -80dBm @ 54Mbps ≤ -93dBm @ MCS0 (HT20/40) ≤ -71dBm/≤ -80dBm @ MCS7 (HT20/40) ≤ -90dBm @ MCS0 (VHT20/40/80) ≤ -69dBm @ MCS8 (VHT20/40/80) ≤ -66dBm @ MCS9 (VHT40/80)	Access Security	HTTP/HTTPS/Telnet/SSH & Administration; SNMPv1/v2/v3 access for authentication via MD5/SHA(v3) and Encryption via DES/AES(v3)
Encryption Security	WEP : (64-bit , 128-bit key supported) WPA /WPA2 : IEEE802.11(WEP and AES encryption) WPA-PSK (256-bit key pre-shared key supported) OKC** and 802.11r** EAP,MD5,EAP,TLS,EAP,TTLS,EAP MsCHAPv3 and PEAP **	Protocol	PPPoE Client,DHCP server/client, Adjustable MTU, Port forwarding (NAPT), DMZ; NAT, SNTP, Firewall(Firewall(DoS**); IP address filter / Mac address filter* / TCP/UDP port number), VRRP**, DDNS*
		Management Load Balancing**	SNMP*v1,v2c,v3/ Web/Telnet/CLI 8 schemes for multiple WAN
		Fixed	Manually route by traffic type through fixed WAN link.
		Basic Package**	
		Failover	Routes connections through preferred WAN link while others stand-by. Sequentially activate another link if preferred link failure occurs.
		Priority	Routes connections through preferred WAN link while others stand-by. Sequentially activate other links if overflow occurs.
		Weighted Round-Robin	Evenly distribute the traffic over all working WAN links in circular order according to the specified weights
		Custom Route	Routing through the selected WAN for each specific traffic ex: TCP/UDP port number and IP address.
		Full Package incl. basic package**	
		Sticky Session*	Binding all connections in an application session to particular WAN link to ensure all connections in the session are routed to the same WAN link , that is suitable for security services like online payment etc.

Smallest Load*	Routes connections through the WAN link with highest free bandwidth ratio. The ratio = 1 - (traffic load / the capability of a WAN link). The traffic load could be defined by downstream, upstream or total traffic	RS-485 (2-wire)	Data+, Data-,GND
Fastest*	Routes connections through the WAN link with lowest latency time.	Isolation protection	RS422/485 2.5KV isolation; 8KV contact & 15KV air RS232 8KV contact and 15KV air ESD DIDO 3KV isolation Input power 1.5KVA isolation
Fast Roaming**	802.11r work with Lantech controller	DI/DO	2 Digital Input (DI) : Level 0: -30~2V / Level 1: 10~30V Max. input current:8mA 2 Digital Output(DO): Open collector to 40 VDC, 200mA
WMM	Wifi multimedia and 802.11e traffic prioritization	LED Indicators	
Security	WEP64/128bits/ WPA/ WPA-PSK (TKIP*,AES)/ WPA2/ WPA2-PSK (TKIP*,AES)/SSH/SSL/HTTPS	Power & system indicator	Per unit: Power 1 (Green), Power 2 (Green), P-Fail (Red) , Ring Master(Green), System Ready(Green), Serial1/2(Green) ,Ready(Green)
Authentication	Radius Authentication, EAP-MD5, EAP-TLS, EAP-TTLS, PEAP; SSID broadcast disable supported**	10/100/1000Base-T(X) port indicator	Link/Activity (Green), Speed (Yellow)
SSID	16 sets	SIM	Green for Link/Act
Client mode	PMK** Caching and pre-authentication.	GPS	Green for Link/Act
Timer	Built-in Real Time Clock to keep track of time always(RTC)	WLAN LEDs	WLAN 1 ,Link /ACT : Green
Discovery	IEEE 802.1ab Link Layer Discovery Protocol (LLDP)	Fault	Red: Ethernet link down or power down
SNMP trap	Device cold / warm start Port link up / link down DI / DO high / low	Fault contact	
Environmental Monitoring	System status for input voltage, current , ambient temperature to be shown in GUI and sent alerting if any abnormal status	Relay	Relay output to carry capacity of 1A at 24VDC
Graphic signal display	Graphic LTE & Wifi signal strength & TX / RX rate display	Power	
Remote Web/SMS** control	To reboot or get status of router by Web/SMS**	Input power	Dual DC input, isolated 16.8VDC~137.5VDC for (WV model)
Captive portal	Editable captive portal login page	Power consumption (Typ.)	18 Watts
Maintenance	Firmware upgradeable through TFTP/FTP/HTTP	Physical Characteristic	
Configuration backup & restore	Supports text configuration file for quick system installation USB port to upload/download configuration by USB dongle InstaView/AIR** for mass configuration/upgrade	Enclosure	IP 65/54 aluminum case
Physical Ports & System		Dimension	178 (W) x 99 (D) x 103 (H) mm
Connectors	10/100/1000T: 2x ports M12 8-pole X-coded with Auto MDI/MDI-X function (one port PD; 1LAN+1WAN or 2LAN) USB/Console connector: 1 x M12 8-pole A-coded DIDO : 1 x 5-pole terminal block Power Input connector : 1 x M12 4-pole A-coded Serial connector : 2 DB9 SIM card slots : 2 SMA/QMA** connector for LTE: 3 (female) SMA/QMA** connector for Wi-Fi: 3 (male)	Weight	1kg
Serial Baud Rate	1000Kbps high data rate,250kbps normal for RS232 ; 20Mbps high data rate,250kbps normal for RS422/485	Environmental	
Serial Data Bits	5, 6, 7, 8	Storage Temperature	-40°C ~ 85°C (-40°F ~ 185°F)
Serial Parity	odd, even, none, mark, space	Operating Temperature	-20°C ~ 70°C (-4°F ~ 158°F) -40°C ~ 70°C (-40°F ~ 158°F)
Serial Stop Bits	1, 1.5, 2	Operating Humidity	5% to 95% Non-condensing
RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND	Regulatory approvals	
RS-422	Tx+,Tx-, Rx+, Rx-,GND	EMI & EMS	FCC Part 15 Class A IEC/EN61000-6-2 CE EN55032 Class A CE EN55024: CE EN61000-4-2 (ESD) Level 3 CE EN61000-4-3 (RS) Level 3 CE EN61000-4-4 (EFT) Level 3 CE EN61000-4-5 ED3 (Surge) Level 3 CE EN61000-4-6 (CS) Level 3 CE EN61000-4-8 (Magnetic field) Level 3
		Stability Testing	EN61373 (Shock & Vibration)
		Railway	EN50155/EN50121-3-2/EN50121-4 Verification EN45545-2 R24 (EN ISO 4589-2, EN ISO 5659-2, NF X70-100-1 & 2) Fire & Smoke Certificate
		MTBF	565,049 Hrs (IEC62830 standards)
		Warranty	5 years

*Future Release

**Optional

RF Performance Table

	Data Rate	TX Power (per chain)	TX Power (3 chains)	Tolerance	RX Specifications Sensitivity	Tolerance
2.4GHz 802.11b	1Mbps	20dBm	25dBm	±2dB	-95dBm	±2dB
	2Mbps	20dBm	25dBm	±2dB	-94dBm	±2dB
	5.5Mbps	20dBm	25dBm	±2dB	-92dBm	±2dB
	11Mbps	20dBm	25dBm	±2dB	-90dBm	±2dB
2.4GHz 802.11g	6Mbps	21dBm	26dBm	±2dB	-94dBm	±2dB
	9Mbps	21dBm	26dBm	±2dB	-93dBm	±2dB
	12Mbps	21dBm	26dBm	±2dB	-92dBm	±2dB
	18Mbps	21dBm	26dBm	±2dB	-90dBm	±2dB
	24Mbps	21dBm	26dBm	±2dB	-88dBm	±2dB
	36Mbps	20dBm	25dBm	±2dB	-85dBm	±2dB
	48Mbps	19dBm	24dBm	±2dB	-81dBm	±2dB
	54Mbps	18dBm	23dBm	±2dB	-80dBm	±2dB
2.4GHz 802.11n HT20	MCS 0	21dBm	26dBm	±2dB	-94dBm	±2dB
	MCS 1	21dBm	26dBm	±2dB	-91dBm	±2dB
	MCS 2	21dBm	26dBm	±2dB	-89dBm	±2dB
	MCS 3	20dBm	25dBm	±2dB	-84dBm	±2dB
	MCS 4	20dBm	25dBm	±2dB	-83dBm	±2dB
	MCS 5	20dBm	25dBm	±2dB	-78dBm	±2dB
	MCS 6	18dBm	23dBm	±2dB	-78dBm	±2dB
	MCS 7	16dBm	21dBm	±2dB	-76dBm	±2dB
2.4GHz 802.11n HT40	MCS 0	20dBm	25dBm	±2dB	-92dBm	±2dB
	MCS 1	20dBm	25dBm	±2dB	-89dBm	±2dB
	MCS 2	20dBm	25dBm	±2dB	-87dBm	±2dB
	MCS 3	19dBm	24dBm	±2dB	-82dBm	±2dB
	MCS 4	19dBm	24dBm	±2dB	-80dBm	±2dB
	MCS 5	19dBm	24dBm	±2dB	-78dBm	±2dB
	MCS 6	18dBm	23dBm	±2dB	-77dBm	±2dB
	MCS 7	16dBm	21dBm	±2dB	-73dBm	±2dB

	Data Rate	TX Power (per chain)	TX Power (3 chains)	Tolerance	RX Specifications Sensitivity	Tolerance
5GHz 802.11a	6Mbps	20dBm	25dBm	±2dB	-94dBm	±2dB
	9Mbps	20dBm	25dBm	±2dB	-94dBm	±2dB
	12Mbps	20dBm	25dBm	±2dB	-92dBm	±2dB
	18Mbps	20dBm	25dBm	±2dB	-90dBm	±2dB
	24Mbps	20dBm	25dBm	±2dB	-86dBm	±2dB
	36Mbps	18dBm	23dBm	±2dB	-84dBm	±2dB
	48Mbps	16dBm	21dBm	±2dB	-81dBm	±2dB
	54Mbps	15dBm	20dBm	±2dB	-80dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	19dBm	24dBm	±2dB	-93dBm	±2dB
	MCS 1	19dBm	24dBm	±2dB	-90dBm	±2dB
	MCS 2	19dBm	24dBm	±2dB	-87dBm	±2dB
	MCS 3	18dBm	23dBm	±2dB	-83dBm	±2dB
	MCS 4	18dBm	23dBm	±2dB	-80dBm	±2dB
	MCS 5	17dBm	22dBm	±2dB	-77dBm	±2dB
	MCS 6	16dBm	21dBm	±2dB	-74dBm	±2dB
	MCS 7	14dBm	19dBm	±2dB	-73dBm	±2dB
5GHz 802.11n/ac VHT40	MCS 0	18dBm	23dBm	±2dB	-90dBm	±2dB
	MCS 1	18dBm	23dBm	±2dB	-88dBm	±2dB
	MCS 2	18dBm	23dBm	±2dB	-85dBm	±2dB
	MCS 3	17dBm	22dBm	±2dB	-82dBm	±2dB
	MCS 4	17dBm	22dBm	±2dB	-80dBm	±2dB
	MCS 5	16dBm	21dBm	±2dB	-75dBm	±2dB
	MCS 6	15dBm	20dBm	±2dB	-73dBm	±2dB
	MCS 7	14dBm	19dBm	±2dB	-73dBm	±2dB
	MCS 8	13dBm	18dBm	±2dB	-70dBm	±2dB
	MCS 9	13dBm	18dBm	±2dB	-68dBm	±2dB
5GHz 802.11ac VHT80	MCS 0	18dBm	23dBm	±2dB	-89dBm	±2dB
	MCS 1	18dBm	23dBm	±2dB	-87dBm	±2dB
	MCS 2	18dBm	23dBm	±2dB	-85dBm	±2dB
	MCS 3	17dBm	22dBm	±2dB	-83dBm	±2dB
	MCS 4	17dBm	22dBm	±2dB	-80dBm	±2dB
	MCS 5	16dBm	21dBm	±2dB	-78dBm	±2dB
	MCS 6	15dBm	20dBm	±2dB	-75dBm	±2dB
	MCS 7	14dBm	19dBm	±2dB	-72dBm	±2dB
	MCS 8	13dBm	18dBm	±2dB	-70dBm	±2dB
MCS 9	13dBm	18dBm	±2dB	-68dBm	±2dB	

ORDERING INFORMATION

All QMA connector models are with -Q model name; -40~70C operational models are with -E model name.

- **TWMR-5002-1L-1AC-2S-WV-65-EUNA.....P/N: 8630-041**
 EN50155 Multifunction VPN Router w/1 WIFI 11ac + 1 LTE 4G SMA connectors+ 2 serial RS232 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-balancing**, TWCC**, VPN, Protocol Gateway; EU and US band; dual isolated 16.8V~137.5VDC; -20~70C; IP65 housing
- **TWMR-5002-1L-1AC-2S-WV-65-APAC.....P/N: 8630-042**
 EN50155 Multifunction VPN Router w/1 WIFI 11ac + 1 LTE 4G SMA connectors+ 2 serial RS232 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-balancing**, TWCC**, VPN, Protocol Gateway; APAC band; dual isolated 16.8V~137.5VDC; -20~70C; IP65 housing
- **TWMR-5002-1L-1AC-2S-WV-65-WW.....P/N: 8630-043**
 EN50155 Multifunction VPN Router w/1 WIFI 11ac + 1 LTE 4G SMA connectors+ 2 serial RS232 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-balancing**, TWCC**, VPN, Protocol Gateway; Worldwide band; dual isolated 16.8V~137.5VDC; -20~70C; IP65 housing
- **TWMR-5002-1L-1AC-2SA-WV-65-EUNA.....P/N: 8630-0411**
 EN50155 Multifunction VPN Router w/1 WIFI 11ac + 1 LTE 4G SMA connectors+ 2 serial RS422/485 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-balancing**, TWCC**, VPN, Protocol Gateway; EU and US band; dual isolated 16.8V~137.5VDC; -20~70C; IP65 housing
- **TWMR-5002-1L-1AC-2SA-WV-65-APAC.....P/N: 8630-0421**
 EN50155 Multifunction VPN Router w/1 WIFI 11ac + 1 LTE 4G SMA connectors+ 2 serial RS422/485 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-balancing**, TWCC**, VPN, Protocol Gateway; APAC band; dual isolated

- 16.8V~137.5VDC; -20~70C; IP65 housing
- **TWMR-5002-1L-1AC-2SA-WV-65-WW.....P/N: 8630-0431**
EN50155 Multifunction VPN Router w/1 WIFI 11ac + 1 LTE 4G SMA connectors+ 2 serial RS422/485 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-balancing**, TWCC**, VPN, Protocol Gateway; Worldwide band; dual isolated 16.8V~137.5VDC; -20~70C; IP65 housing
- **TWMR-5002-1L-1AC-2S-WV-54-EUNA.....P/N: 8630-021**
EN50155 Multifunction VPN Router w/1 WIFI 11ac + 1 LTE 4G SMA connectors+ 2 serial RS232 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-balancing**, TWCC**, VPN, Protocol Gateway; EU and US band; dual isolated 16.8V~137.5VDC; -20~70C; IP54 housing
- **TWMR-5002-1L-1AC-2S-WV-54-APAC.....P/N: 8630-023**
EN50155 Multifunction VPN Router w/1 WIFI 11ac + 1 LTE 4G SMA connectors+ 2 serial RS232 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-balancing**, TWCC**, VPN, Protocol Gateway; APAC band; dual isolated 16.8V~137.5VDC; -20~70C; IP54 housing
- **TWMR-5002-1L-1AC-2S-WV-54-WW.....P/N: 8630-022**
EN50155 Multifunction VPN Router w/1 WIFI 11ac + 1 LTE 4G SMA connectors+ 2 serial RS232 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-balancing**, TWCC**, VPN, Protocol Gateway; Worldwide band; dual isolated 16.8V~137.5VDC; -20~70C; IP54 housing
- **TWMR-5002-1L-1AC-2SA-WV-54-EUNA.....P/N: 8630-0211**
EN50155 Multifunction VPN Router w/1 WIFI 11ac + 1 LTE 4G SMA connectors+ 2 serial RS422/485 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-balancing**, TWCC**, VPN, Protocol Gateway; EU and US band; dual isolated 16.8V~137.5VDC; -20~70C; IP54 housing
- **TWMR-5002-1L-1AC-2SA-WV-54-APAC.....P/N: 8630-0221**
EN50155 Multifunction VPN Router w/1 WIFI 11ac + 1 LTE 4G SMA connectors+ 2 serial RS422/485 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-balancing**, TWCC**, VPN, Protocol Gateway; APAC band; dual isolated 16.8V~137.5VDC; -20~70C; IP54 housing
- **TWMR-5002-1L-1AC-2SA-WV-54-WW.....P/N: 8630-0231**
EN50155 Multifunction VPN Router w/1 WIFI 11ac + 1 LTE 4G SMA connectors+ 2 serial RS422/485 ports + 2 Gigabit X-coded Ethernet (incl. 1PD) for load-balancing**, TWCC**, VPN, Protocol Gateway; Worldwide band; dual isolated 16.8V~137.5VDC; -20~70C; IP54 housing

EMMC Flash Storage

- **8G.....P/N:8850-113**
- **16G.....P/N:8850-114**
- **32G.....P/N:8850-115**

Software License

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- **LOAD BALANCING Full Package.....P/N: 9000-102**
- **TWCC.....P/N: 9000-103**
- **WIRELESS ROAMINGP/N: 9000-107**

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