TWAP-5004

EN50155 Multifunction VPN Router w/up to 2x WiFi 11ac + 2 serial ports** + 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN w/Load Balancing**, TWCC**, VPN, Protocol Gateway**, Storage**; 24V / WV input

- *Built-in 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN ports*
- *WI-FI radio for 802.11ac/a/b/g/n with 5GHz or 2.4GHz;*
- *Support WI-FI 802.11e traffic prioritization and WMM*
- *MIMO technology 3T3R up to 6 antenna; Detachable antenna connectors with 6 SMA/QMA** type incl. 3 WI-FI*
- *Optional Air-teaming** for WI-FI high-sustainability and aggregated bandwidth*
- *Unlimited concurrent users*
- *Fast roaming < 50ms**, 802.11r work with Lantech controller*
- *Supports AP/ BRIDGE/Client modes*
- *Advanced wireless security WEP64/128bits/ WPA/ WPA-PSK (TKIP*,AES)/ WPA2/ WPA2-PSK (TKIP*,AES)*
- *Optional TWCC** (Train Wireless Carriage Coupling)for auto wireless coupling*
- *VPN router for Multi-site VPN, OpenVPN, L2TP, IPsec, PPTP**
- *Load Balancing** support 8 mechanism*
- *Support NAT and Firewall*
- *Optional support Modbus or DNP3** gateway on serial ports*
- *Support 2 RS422/485 ports with 2.5KV isolation or 2x RS232 ports*
- *Optional 2 GT smart bypass protection*
- *Galvanic isolation on WV model from 16.8V~137.5V input; 24V model input from 9V~60V*
- *Environmental monitoring for router inside info with voltage, current, temperature; WI-FI graphic signal strength & TX/RX rate display*
- *Editable login page of captive portal for hot-spot application*
- *Optional external USB to micro SD** for configuration management, storage backup or multi-media content suit with load-balancing route*
- *SB port to backup, restore the configuration file and upgrade firmware*; Dual image firmware**

With 2 serial ports

Without 2 serial ports

OVERVIEW

Lantech TWAP-5004 series is a next generation EN50155 multi-function VPN router w/ 1 x 802.3ac Wi-Fi + 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN ports + 2 serial ports that supports advanced function of VPN, Load-balancing**(Premium pack), TWCC**, Protocol gateway**, Storage**, Wi-Fi roaming**, and Air teaming** 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

TWAP-5004 series supports optional TWCC** (Train Wireless Carriage Coupling) that enables auto wireless coupling to reconnect APs.

IEEE 802.11ac one band radio up to 2.6Gbps bandwidth

With IEEE 802.11ac capability, TWAP-5004 can operate either 5GHz or 2.4GHz bands, offering the maximum speed of 2.6Gbps bandwidth (1.3Gbps per 802.11ac module) it is also compatible with 802.11b/g/n that can work with 2.4GHz for longer range transmission.

MIMO technology with 3T3R and standard SMA / optional QMA type connectors

Lantech TWAP-5004 series adapts MIMO technology with smart antenna transmission and reception for 3T3R. With six external detachable antenna SMA/QMA** connectors and optional antennas, TWAP-5004can have better Wi-Fi coverage. It can support unlimited concurrent users for WI-FI hotspot application.

Air-teaming** for wireless high-sustainability and aggregated bandwidth

The innovative Air-teaming** can combines multiple wireless links to achieve both high-sustainability and aggregated bandwidth. High sustainability can keep the network traffic alive even one link is down or severely interfered. Aggregated bandwidth can bind two link channels to provide the maximum throughput.

Optional 802.11r fast roaming < 50ms*

TWAP-5004 support fast roaming < 50ms** 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 (move to roaming section).

Wireless WMM QoS

TWAP-5004 supports 802.11e standard which defines a set of Quality of Service for wireless LAN applications as well as WMM (WI-FI 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 treads. Lantech TWAP-5004 support up to 16 SSIDs, each SSID has its independent security and encryption.

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

TWAP-5004 supports Load Balancing** for 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. Wi-Fi 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.

Optional 2 port serial connection, Modbus / DNP3** gateway

It builds in optional 2 port serial connection for RS232; RS422/ 485 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.
It also can support optional DNP3** gateway over serial ports

Support various VPN applications and firewall

Besides traditional VPN peer to peer tunneling, TWAP-5004 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 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 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 TWAP-5004 will immediately send email** and trap.
The event log can be sent via syslog, emails or trigger the alarm relay.
When the router is at remote area with limited access, Web control* can help to get router status or remotely reboot by Web

Wide range dual isolated input voltage from 9V-60VDC (24V

model) or 16.8-137.5V (WV model)

The TWAP-5004 is able to work from dual 9VDC to 60VDC input voltage (24V model) or 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; Graphic WI-FI signal strength and TX/RX rate display

The built-in environmental monitoring can detect router ambient temperature, voltage, current where can send the syslog, email** alert when abnormal.

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 remote configuration/upgrade, monitoring/alerting and report function

Optional external USB to micro SD** for storage backup or multimedia resources

The optional external USB to micro SD** can have configuration management, data backup or pre-store the multimedia resources for content application. User can designate the route via load-balancing scheme to upload/download the data per request.

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

The built-in USB port can upload/download the configuration and upgrade firmware* through USB dongle for router replacement.

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

Editable login page of captive portal

The TWAP-5004 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 TWAP-5004 series is verified with EN50155*, EN61373*, EN45545 standard with IP65/54 housing. It passed serious tests under extensive Industrial EMI and environmental vibration and shocks standards. With E-marking** certificate, the TWAP-5004 is best for outdoor community, vehicle, power substation, process control automation etc. For more usage flexibilities, TWAP-5004 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 2.6Gbps link speed (2AC)**
- **Built-in 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN ports**
- **Dual DC input from 9V~60VDC (24V model) or 16.8V~137.5VDC isolated power input (WV model)**
- **Optional TWCC** (Train Wireless Carriage Coupling) for auto wireless coupling**
- **Optional Air-teaming** protection(2AC)**
  - ***High-sustainability**: if one link member is down or severely interfered, the other link will keep the network traffic alive.*
  - ***Aggregated bandwidth** : The bandwidth of two link members can be aggregated to provide maximum throughput*
- **Fast roaming** (Optional) <50ms between APs by Wireless Controller**
- **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:**
  - ***5.180~5.825GHz***
- **MIMO smart antenna technology with 3T3R**
- **6 STANDARD SMA / OPTIONAL QMA type connectors for Wi-Fi**
- **Unlimited concurrent WI-FI users**
- **Output power : <24dBM**
- **Transmit power adjustment**
- **VAP (virtual access point) support up to 16 SSIDs**
- **Operation modes : AP/ BRIDGE / 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**
- **Support Multi-Site VPN for mesh tunneling as well as Open VPN, L2TP, IPsec and PPTP** fro secured network connection**
- **The built-in Layer-4 firewall includes DoS**, IP address filter / Mac address filter* / TCP/UDP port number.**
- **Support SNMP*v1/v2c/v3**
- **Support NAT/DMZ**
- **Load Balancing** supports 8 mechanism between**

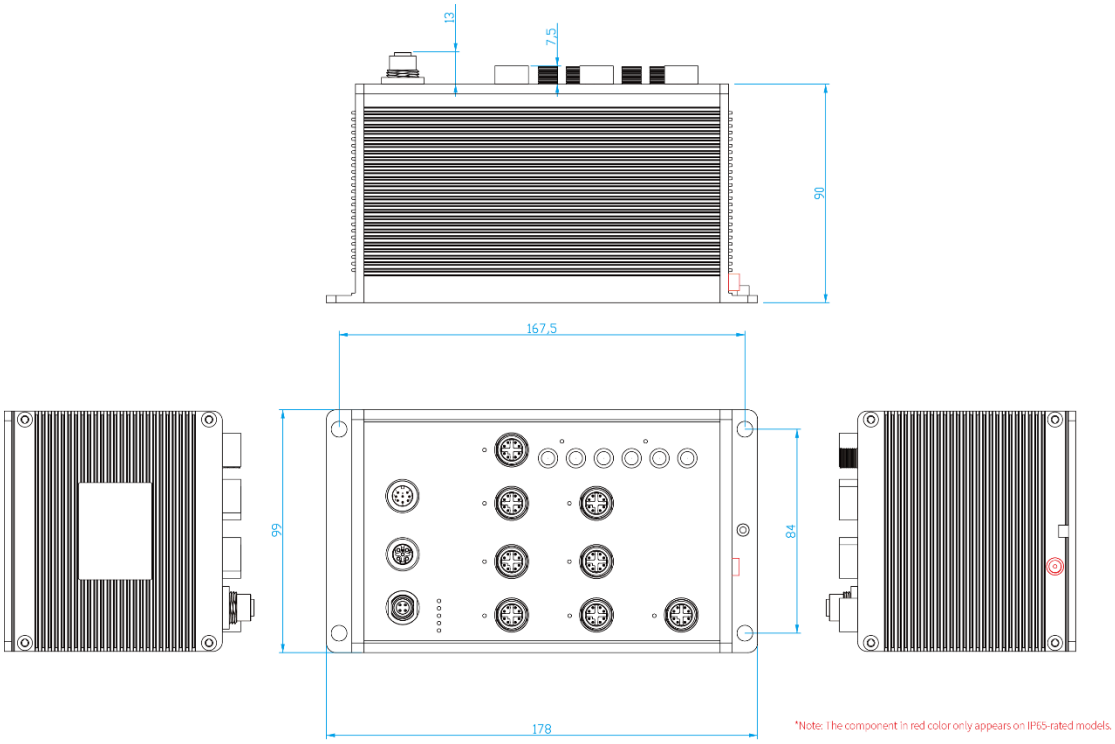
multiple WANs

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 failback until link loss.
	Priority	Routes connections through preferred WAN link as primary while others follow by. Ex. Wi-Fi 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.

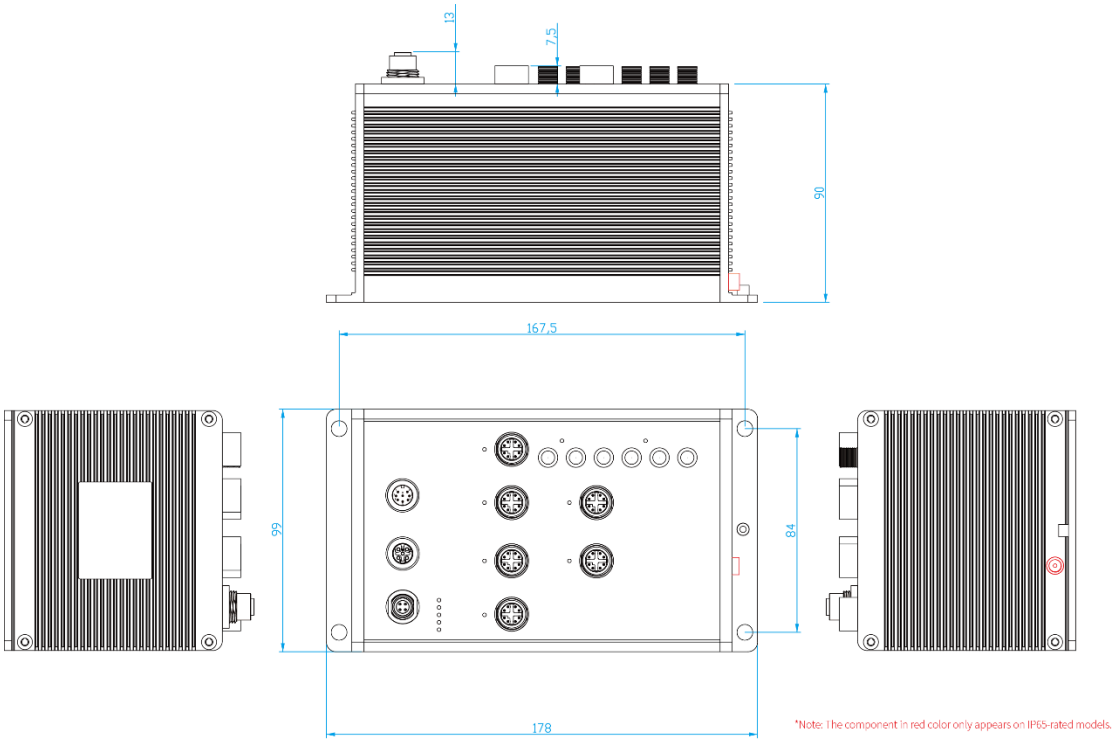
- **Optional 2 x serial ports(RS232/RS422/485)**
- **Serial port with 2.5KV isolation on RS422/485**
- **Supports 2DI / 2DO (Digital Input / Output)**
- **Built-in Modbus gateway converting Modbus RTU/ASCII to Modbus/TCP for serial ports**
- **Optional DNP3 gateway with serial ports**
- **Event alerting by Syslog, Email**, Relay ; Permanent local log rotation / Maxi 1K records**
- **Remote Web control to get status or re-boot by Web**
- **Support SNTP to synchronize system clock**
- **Support LLDP discovery protocol**
- **Support DHCP Server and Client**
- **Graphic WI-FI signal strength & TX/RX rate display**
- **Built-in environmental monitoring for system input voltage, current and ambient temperature; Able to set alert when abnormal**
- **Optional external USB to micro SD** for configuration management, storage backup or multimedia resource**
- **Firmware upgradeable through TFTP/FTP/HTTP**
- **Configuration backup and restoration**
  - *Supports text configuration file for system quick installation*
  - *USB port to upload/download firmware by USB dongle*
  - *InstaView/AIR** for centralized configuration deployment, backup & upgrade*
- **Dual image firmware***
- **IP 65/54 housing for water proof environment**
- **Support editable captive portal login page**
- **Wall-mount installation**
- **Cloud/Host based InstaView/AIR** for fixed/fleet router management/configuration/monitoring**
- **Visible LED to show the power & port link and activity**
- **Operation temperature -20~70C or -40~70C(-E)**

DIMENSIONS (unit=mm)

With serial ports



Without serial ports



SPECIFICATION

WLAN Interface

Operating Mode	AP/BRIDGE/Client modes
Radio Frequency Type	DSSS, OFDM
Wireless Standard	IEEE 802.11ac/n/a 5GHz IEEE 802.11b/g/n 2.4GHz
Wireless bandwidth	5GHz: Up to 1300Mbps 2.4GHz: Up to 450Mbps
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)
Operating Frequency	IEEE 802.11 a/b/g/n ISM Band, 2.412GHz~2.472GHz, 5150MHz~5850MHz
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
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)
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)
Encryption Security	WEP : (64-bit ,128-bit key supported) WPA /WPA2 : IEEE802.11i(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 **
Wireless Security	SSID broadcast disable

Software

IPv6/4	Present
Login Security	Supports IEEE802.1x** Authentication/RADIUS
TWCC**	Optional Train Wireless Carriage Coupling for Auto wireless Coupling
Access Security	HTTP/HTTPS/Telnet/SSH & Administration; SNMP*v1/v2/v3 access for authentication via MD5/SHA(v3) and Encryption via DES/AES(v3)
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 name),VRRP**, DDNS*
Management	SNMP*v1,v2c,v3/ Web/Telnet/CLI
Load Balancing**	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
Fastest*	Routes connections through the WAN link with lowest latency time.
Fast Roaming<50ms**	802.11r <50ms work with Lantech controller
WMM	Wi-Fi multimedia and 802.11e traffic prioritization
Security	WEP64/128bits/ WPA/ WPA-PSK (TKIP*,AES)/ WPA2/ WPA2-PSK (TKIP*,AES)/SSH/SSL/HTTPS
Authentication	Radius Authentication, EAP-MD5, EAP-TLS, EAP-TTLS, PEAP; SSID broadcast disable supported**
SSID	16 sets
Client mode	PMK** Caching and pre-authentication.
Timer	Built-in Real Time Clock to keep track of time always(RTC)
Discovery	IEEE 802.1ab Link Layer Discovery Protocol (LLDP)
SNMP trap	Device cold / warm start Port link up / link down DI / DO high / low
Environmental Monitoring	System status for input voltage, current , ambient temperature to be shown in GUI and sent alerting if any abnormal status
Graphic signal display	Graphic Wi-Fi signal strength & TX / RX rate display
Remote Web control	To reboot or get status of router by Web
Captive portal	Editable captive portal login page
Maintenance	Firmware upgradeable through TFTP/FTP/HTTP
Configuration backup & restore	Supports text configuration file for quick system installation USB port to upload/download firmware by USB dongle Dual image firmware* InstaView/AIR** for mass configuration/upgrade

Physical Ports & System

Connectors	10/100/1000T: 6x ports M12 8pole X-coded incl. 2WAN/2LAN ports USB/Console connector: 1 x M12 8-pole A-coded STANDARD SMA / OPTIONAL QMA connector : 3 male WI-FI Power Input connector : 1 x M12 4-pole A-coded DI/DO : 1 x M12 5-pole A-coded
Serial Baud Rate**	1000Kbps high data rate,250kbps normal for RS232 ; 20Mbps high data rate,250kbps normal for RS422/485
Serial Data Bits**	5, 6, 7, 8
Serial Parity**	odd, even, none, mark, space
Serial Stop Bits**	1, 1.5, 2
RS-232**	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422**	Tx+,Tx-, Rx+, Rx-,GND
RS-485 (2-wire)**	Data+, Data-,GND
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
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
LED Indicators	
Power & System indicator	Per unit: Power 1 (Green), Power 2 (Green), P-Fail (Red) , Ring Master(Green), System Ready(Green), Storage(Green), Serial1/Serial2(Green)
10/100/1000Base-T (X) port indicator	Link/Activity (Green), Speed (Yellow)
Fault	Red: Ethernet link down or power down
Fault contact	
Relay	Relay output to carry capacity of 1A at 24VDC
Power	
Input power	Dual DC input, isolated 16.8VDC~137.5VDC for (WV model); Dual 9V~60VDC (24Vmodel)
Power consumption (Typ.)	20 Watts
Physical Characteristic	
Enclosure	IP 65/54 aluminum case
Dimension	178 (W) x 99 (D) x 103 (H) mm
Weight	1000g
Environmental	
Storage Temperature	-40°C ~ 85°C (-40°F ~ 185°F)
Operating Temperature	-20°C ~ 70°C (-4°F ~ 158°F) -40°C ~ 70°C (-40°F ~ 158°F)-E model
Operating Humidity	5% to 95% Non-condensing
Regulatory approvals	
EMC	FCC Part 15 Class A, EN55032
EMS	EN61000-4-2 (ESD), EN61000-4-3 (RS), EN61000-4-4 (EFT), EN61000-4-5 (Surge), EN61000-4-6 (CS), EN61000-4-8, EN61000-4-11
Stability Testing	EN61373 (Shock & Vibration)
Railway verification	EN50155*, 50121*,45545
MTBF	NA
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	-93dBm	±2dB
	18Mbps	21dBm	26dBm	±2dB	-90dBm	±2dB
	24Mbps	21dBm	26dBm	±2dB	-90dBm	±2dB
	36Mbps	20dBm	25dBm	±2dB	-85dBm	±2dB
	48Mbps	19dBm	24dBm	±2dB	-82dBm	±2dB
	54Mbps	18dBm	23dBm	±2dB	-80dBm	±2dB
2.4GHz 802.11n HT20	MCS 0	21dBm	26dBm	±2dB	-94dBm	±2dB
	MCS 1	21dBm	26dBm	±2dB	-92dBm	±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	-80dBm	±2dB
	MCS 6	18dBm	23dBm	±2dB	-79dBm	±2dB
	MCS 7	16dBm	21dBm	±2dB	-77dBm	±2dB
2.4GHz 802.11n HT40	MCS 0	20dBm	25dBm	±2dB	-93dBm	±2dB
	MCS 1	20dBm	25dBm	±2dB	-91dBm	±2dB
	MCS 2	20dBm	25dBm	±2dB	-89dBm	±2dB
	MCS 3	19dBm	24dBm	±2dB	-84dBm	±2dB
	MCS 4	19dBm	24dBm	±2dB	-82dBm	±2dB
	MCS 5	19dBm	24dBm	±2dB	-80dBm	±2dB
	MCS 6	18dBm	23dBm	±2dB	-79dBm	±2dB
	MCS 7	16dBm	21dBm	±2dB	-75dBm	±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	-91dBm	±2dB
	24Mbps	20dBm	25dBm	±2dB	-90dBm	±2dB
	36Mbps	18dBm	23dBm	±2dB	-86dBm	±2dB
	48Mbps	16dBm	21dBm	±2dB	-83dBm	±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
	MCS 8	13dBm	18dBm	±2dB	-71dBm	±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 standard models are non-conformal coated, optional conformal coated models are available with –C model name; QMA connector models are with –Q model name; -40~70C operational models are with –E model name.

- **TWAP-5004-1AC-2S-24V-65……..P/N: 8642-011**
  EN50155 Multifunction VPN Router w/1x Wi-Fi 11ac + 2 serial RS232 ports + 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN with Load Balancing**, TWCC**, VPN, Protocol Gateway**; dual 9V~60VDC; IP65; -20~70C
- **TWAP-5004-1AC-2SA-24V-65……..P/N:8642-012**
  EN50155 Multifunction VPN Router w/1x Wi-Fi 11ac + 2 isolated serial RS-422/485 ports + 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN with Load Balancing**, TWCC**, VPN, Protocol Gateway**; dual 9V~60VDC; IP65; -20~70C
- **TWAP-5004-1AC-2S-WV-65…..P/N: 8642-013**
  EN50155 Multifunction VPN Router w/1x Wi-Fi 11ac + 2 serial ports + 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN with Load Balancing**, TWCC**, VPN, Protocol Gateway**; dual isolated 16.8V~137.5VDC; IP65; -20~70C
- **TWAP-5004-1AC-2SA-WV-65…..P/N:8642-014**
  EN50155 Multifunction VPN Router w/1x Wi-Fi 11ac +2 isolated serial RS422/485 ports + 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN with Load Balancing**, TWCC**, VPN, Protocol Gateway**; dual isolated 16.8V~137.5VDC; IP65; -20~70C
- **TWAP-5004-2AC-2S-24V-65……..P/N: 8642-015**
  EN50155 Multifunction VPN Router w/2x Wi-Fi 11ac + 2 serial RS232 ports + 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN with Load Balancing**, TWCC**, VPN, Protocol Gateway**; dual 9V~60VDC; IP65; -20~70C
- **TWAP-5004-2AC-2SA-24V-65……..P/N:8642-016**
  EN50155 Multifunction VPN Router w/2x Wi-Fi 11ac + 2 isolated serial RS-422/485 ports + 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN with Load Balancing**, TWCC**, VPN, Protocol Gateway**; dual 9V~60VDC; IP65; -20~70C
- **TWAP-5004-2AC-2S-WV-65…..P/N: 8642-017**
  EN50155 Multifunction VPN Router w/2x Wi-Fi 11ac + 2 serial ports + 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN with Load Balancing**, TWCC**, VPN, Protocol Gateway**; dual isolated 16.8V~137.5VDC; IP65; -20~70C
- **TWAP-5004-2AC-2SA-WV-65…..P/N:8642-018**
  EN50155 Multifunction VPN Router w/2x Wi-Fi 11ac +2 isolated serial RS422/485 ports + 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN with Load Balancing**, TWCC**, VPN, Protocol Gateway**; dual isolated 16.8V~137.5VDC; IP65; -20~70C
- **TWAP-5004-1AC-2S-24V-54……..P/N: 8642-021**
  EN50155 Multifunction VPN Router w/1x Wi-Fi 11ac + 2 serial RS232 ports + 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN with Load Balancing**, TWCC**, VPN, Protocol Gateway**; dual 9V~60VDC; IP54; -20~70C
- **TWAP-5004-1AC-2SA-24V-54…….P/N:8642-022**

EN50155 Multifunction VPN Router w/1x Wi-Fi 11ac + 2 serial RS232 ports + 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN with Load Balancing**, TWCC**, VPN, Protocol Gateway**; EU and US band; dual 9V~60VDC; IP54; -20~70C

- **TWAP-5004-1AC-2S-WV-54…….P/N: 8642-023**
  EN50155 Multifunction VPN Router w/1x Wi-Fi 11ac + 2 serial RS232 ports + 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN with Load Balancing**, TWCC**, VPN, Protocol Gateway**; dual isolated 16.8V~137.5VDC; IP54; -20~70C
- **TWAP-5004-1AC-2SA-WV-54…….P/N:8642-024**
  EN50155 Multifunction VPN Router w/1x Wi-Fi 11ac + 2 isolated serial RS422/485 ports + 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN with Load Balancing**, TWCC**, VPN, Protocol Gateway**; dual isolated 16.8V~137.5VDC; IP54; -20~70C
- **TWAP-5004-2AC-2S-24V-54…….P/N: 8642-025**
  EN50155 Multifunction VPN Router w/2x Wi-Fi 11ac + 2 serial RS232 ports + 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN with Load Balancing**, TWCC**, VPN, Protocol Gateway**; dual 9V~60VDC; IP54; -20~70C
- **TWAP-5004-2AC-2SA-24V-54…….P/N:8642-026**
  EN50155 Multifunction VPN Router w/2x Wi-Fi 11ac + 2 serial RS232 ports + 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN with Load Balancing**, TWCC**, VPN, Protocol Gateway**; EU and US band; dual 9V~60VDC; IP54; -20~70C
- **TWAP-5004-2AC-2S-WV-54…….P/N: 8642-027**
  EN50155 Multifunction VPN Router w/2x Wi-Fi 11ac + 2 serial RS232 ports + 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN with Load Balancing**, TWCC**, VPN, Protocol Gateway**; dual isolated 16.8V~137.5VDC; IP54; -20~70C
- **TWAP-5004-2AC-2SA-WV-54…….P/N:8642-028**
  EN50155 Multifunction VPN Router w/2x Wi-Fi 11ac + 2 isolated serial RS422/485 ports + 4 Gigabit X-coded Ethernet Switch + 2WAN/2LAN with Load Balancing**, TWCC**, VPN, Protocol Gateway**; dual isolated 16.8V~137.5VDC; IP54; -20~70C

MSD Series

- **USB to Micro SD 128GB Dongle…….P/N:8850-110**
- **USB to Micro SD 256GB Dongle…….P/N:8850-113**

Software License

- **LOAD BALANCING Basic Package…….P/N: 9000-101**
- **LOAD BALANCING Full Package…….P/N: 9000-102**
- **TWCC…….P/N: 9000-103**
- **DNP3 GATEWAY…….P/N: 9000-106**
- **WIRELESS ROAMING…….P/N: 9000-107**

OPTIONAL ACCESSORIES

Wireless Connector Adapter

- **ADA11000052** RP SMA Jack Base, Length : 1M

Wireless Antenna

- **ANT11000051** 2.4G&5.8GHz SMA Omni-directional / dipole antenna, 2dBi or 5.8GHz 3dBi

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