# TPWAP-5006

## EN50155 Multifunction VPN Router w/1x WiFi 11ac + 2 serial ports + 6 Gigabit X-coded Ethernet switch (incl. 4 PoE ports) w/ Load Balancing**, TWCC**, VPN, Protocol Gateway**, Storage**; WV input

With 2 serial ports

Without 2 serial ports

- *Built-in 6 Gigabit X-coded Ethernet managed switch w/4 PoE at/af Switch at 60W budget*
- *WIFI radio for 802.11ac/a/b/g/n with 5GHz or 2.4GHz*
- *Support WIFI 802.11e traffic prioritization and WMM*
- *MIMO technology 3T3R up to 6 antenna; Detachable antenna connectors with 6 SMA/QMA** type incl. 3 WIFI*
- *Fast roaming **, 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**, L2 over GRE*
- *Optional EMMC Flash storage on-board**
- *Optional Air-teaming** for WI-FI high-sustainability and aggregated bandwidth*
- *Load Balancing** support 8 mechanism*
- *Support NAT and Firewall*
- *Optional support Modbus 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*
- *Environmental monitoring for router inside info with voltage, current, temperature and total PoE load; WI-FI graphic signal strength & TX/RX rate display*
- *Editable login page of captive portal for hot-spot application*
- *USB port to backup, restore the configuration file and upgrade firmware*; Dual image firmware**
- *EN50155/EN61373/EN45545-2 verification*





## OVERVIEW

Lantech TPWAP-5006 series is a next generation EN50155 multi-function VPN router w/ 1 x 802.3ac Wi-Fi + 6 Gigabit X-coded Ethernet managed switch incl. 4 PoE ports + 2 serial ports that supports advanced function of VPN, Load-balancing**(Premium pack), EMMC Flash Storage**, TWCC**, Protocol gateway**, 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 discovery, redundant ring & auto coupling***

TPWAP-5006 supports 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, TPWAP-5006 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.

***Optional EMMC Flash storage*****

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

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

Lantech TPWAP-5006 series adapts MIMO technology with smart antenna transmission and reception for 3T3R. With six external detachable antenna SMA/QMA** connectors and optional antennas, TPWAP-5006 can have better Wi-Fi coverage.

***Optional 802.11r fast roaming *****

TPWAP-5006 support fast roaming ** 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.

***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.

***Wireless WMM QoS***

TPWAP-5006 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 treads. Lantech TPWAP-5006 support up to 16 SSIDs, each SSID has its independent security and encryption.

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

TPWAP-5006 supports Load Balancing** for WAN connections. There are eight schemes with 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.<br>The ratio = 1 - (traffic load / the capability of a WAN link).<br>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 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.

***VPN and firewall***

Besides traditional VPN peer to peer tunneling, TPWAP-5006 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.

***Optional 2 GT smart bypass protection***

The optional bypass relay is set to bypass the router to the next one when power is off in order to protect the network from crashing. Lantech bypass caters to remain in bypass mode until the router is completely booting up when power is back to avoid another network lost. Also it will be activated when detecting the router is hanged or link down.

***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 TPWAP-5006 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 input voltage from 16.8-137.5V (WV model)***
The TPWAP-5006 is able to work from dual 16.8V ~137.5V DC isolated input (WV model) for PoE at/af with PoE budget 60W that is particular good for vehicle, rail train, depot etc applications.

***Built-in Managed Switch Function***
Managed switch function is built-in and provides various L2+ functions for network access deployment. It delivers ports and PoE management, VLAN, QoS, multicast, redundant ring, and security functions.

***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 and total PoE load where can send the syslog, and email** alert when abnormal.

The graphic WI-FI signal strength and TX/RX rate display shows connection status at a glance.

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

***Editable login page of captive portal***
The TPWAP-5006 supports editable captive portal function that allows administrator to force end-users redirect to authentication page.

***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

***Ruggedized EN50155 design and FCC/CE & E-marking** certificate***
The TPWAP-5006 series is verified with EN50155, EN61373, EN45545 standard with IP65/54 housing. It passed tests under extensive Industrial EMI and environmental vibration and shocks standards. With E-marking** certificate, the TPWAP-5006 is best for outdoor community, vehicle, power substation, process control automation etc application. For more usage flexibilities, TPWAP-5006 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 1.3Gbps**
- **Built-in 6 Gigabit X-coded Ethernet managed switch incl. 4 PoE switch at/af at 60W PoE budget**
- **Dual DC input from 16.8V~137.5VDC isolated power input (WV model)**
- **Optional 2 GT smart bypass relay protection when detecting power lost as well as CPU hang-up or link down. Deferring bypass time until router is completely boot-up.**
- **EMMC-FLASH storage**8/16/32G**
- **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 ) between APs by Wireless Controller**
- **Optional TWCC** (Train Wireless Carriage Coupling) for auto wireless coupling**
- **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:**
  - ***5.180~5.825 GHz***
- **MIMO smart antenna technology with 3T3R**
- **6 STANDARD SMA / OPTIONAL QMA type connectors for Wi-Fi**
- **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 L2 over GRE, and PPTP** fro secured network connection**
- **The built-in Layer-4 firewall includes DoS**, IP address**

**filter / Mac address filter* /**

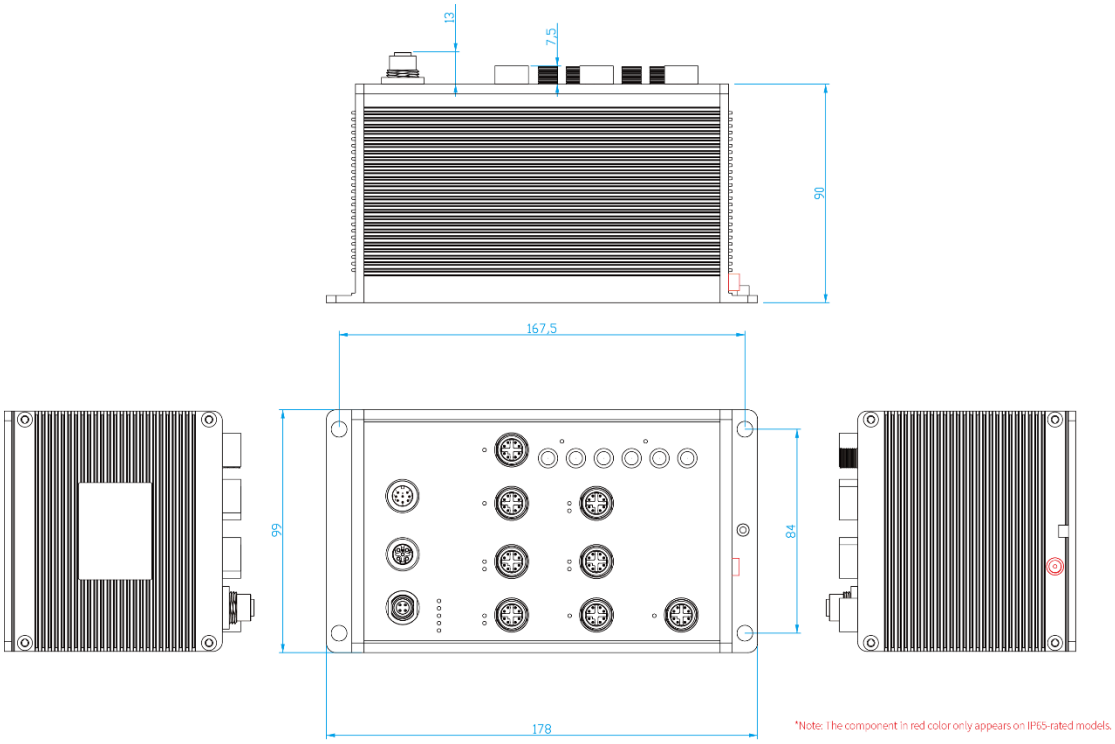
- **TCP/UDP port number.**
- **Support SNMP*v1/v2c/v3**
- **Support NAT/DMZ**
- **Load Balancing** supports 8 mechanism between multiple WANs**

| 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.<br>The ratio = 1 - (traffic load / the capability of a WAN link).<br>The traffic load could be defined by downstream, upstream or total traffic |
| | Fastest* | Routes connections through the WAN link with lowest latency time. |

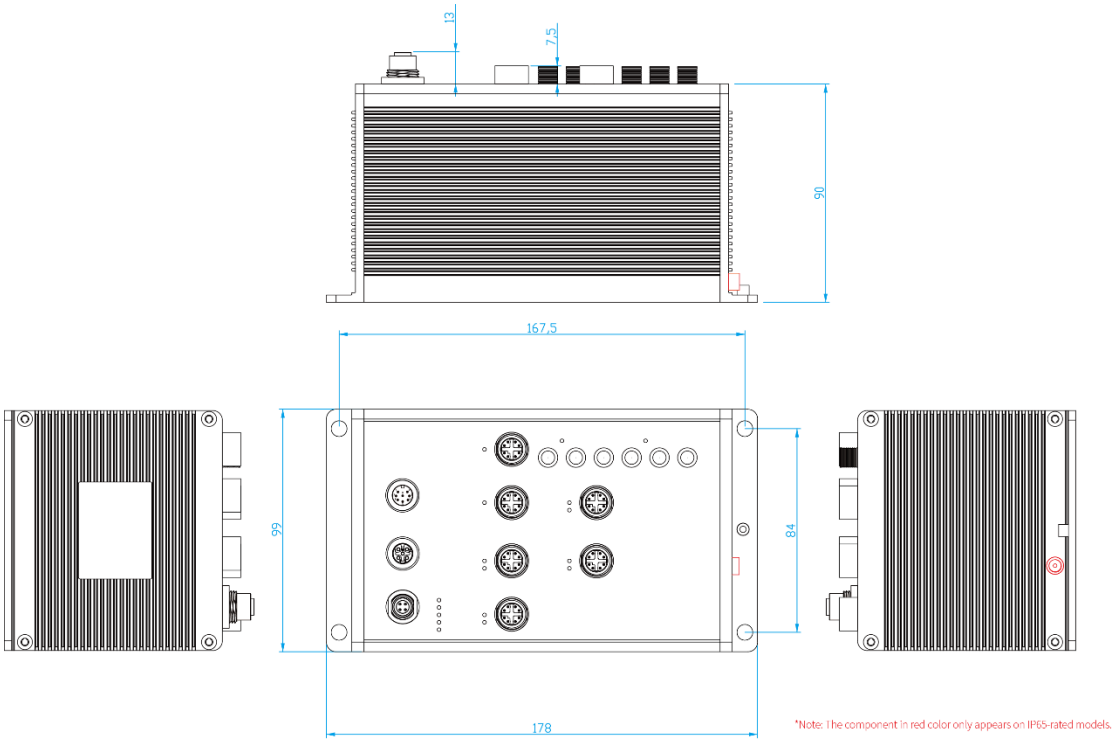
- **Optional built-in 2 x serial ports(RS232/RS422/485)**
- **Serial port with 2.5KV isolation on RS422/485**
- **Supports 2DI / 2DO(Digital Input / Output)**
- **Built-in Modbus gateway converting Modbus RTU/ASCII to Modbus/TCP for serial ports**
- **Event alerting by Syslog, Email**, Relay ; Permanent 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**
- **Support editable captive portal login page**
- **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*
- **Dual image firmware***
- **IP 65/54 housing for water proof environment**
- **Wall-mount installation**
- **Visible LED to show the power & port link and activity**
- **Operation temperature -20~70C or -40°C to 70°C(-E)**
- **EN45545-2 Fire & Smoke, EN50155 and EN61373 shock/vibration verification**

## 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<br>IEEE 802.11b/g/n 2.4GHz |
| Wireless bandwidth | 5GHz: Up to 1300Mbps<br>2.4GHz: Up to 450Mbps |
| Modulation | **802.11b: DSSS**<br>**802.11a/g:**<br>OFDM (BPSK, QPSK, 16-QAM, 64-QAM)<br>**802.11n:**<br>OFDM (BPSK, QPSK, 16-QAM, 64-QAM)<br>**802.11ac:**<br>OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM) |
| Operating Frequency | IEEE 802.11 a/b/g/n ISM Band,<br>2.412GHz~2.472GHz, 5150MHz~5850MHz |
| Transmission Rate | IEEE802.11ac: up to 1300Mbps<br>IEEE802.11b: 1 / 2 / 5.5 / 11 Mbps<br>IEEE802.11a/g: 6 / 9 / 12 / 18 / 24 / 36 / 48 / 54 Mbps<br>IEEE802.11n: up to 450Mbps |
| IEEE 802.11b/g/n(2.4Gbps) | **Output Power Tx +/- 2dB(per chain)**<br>18dBm @ 1~11Mbps<br>18dBm @ 6~54Mbps<br>20/20dBm @ MCS0~MCS7 (HT20/40)<br>**Receiver Sensitivity Rx +/- 2dB**<br>≦-95dBm @ 1~11Mbps<br>≦-92dBm @ 6~18Mbps<br>≦-88dBm @ 24Mbps<br>≦-85dBm @ 36Mbps<br>≦-81dBm @ 48Mbps<br>≦-80dBm @ 54Mbps<br>≦-94dBm @ MCS0 (HT20/40)<br>≦-76dBm @ MCS7 (HT20/40) |
| IEEE 802.11a/n/ac(5Gbps) | **Output Power Tx +/- 2dB(per chain)**<br>20dBm @ 6~24Mbps<br>16dBm @ 36~54Mbps<br>19/18dBm @ MCS0 (HT20/40)<br>16/16dBm @ MCS7 (HT20/40)<br>19/18/18dBm @ MCS0 (VHT20/40/80)<br>13/13/13dBm @ MCS8 (VHT20/40/80)<br>13/13dBm @ MCS9 (VHT40/80)<br>**Receiver Sensitivity Rx +/- 2dB**<br>≦-92dBm @ 6~18Mbps<br>≦-86dBm @ 24Mbps<br>≦-84dBm @ 36Mbps<br>≦-81dBm @ 48Mbps<br>≦-80dBm @ 54Mbps<br>≦-93dBm @ MCS0 (HT20/40)<br>≦-71dBm/≦-80dBm @ MCS7 (HT20/40)<br>≦-90dBm @ MCS0 (VHT20/40/80)<br>≦-69dBm @ MCS8 (VHT20/40/80)<br>≦-66dBm @ MCS9 (VHT40/80) |
| Encryption Security | WEP : (64-bit ,128-bit key supported)<br>WPA /WPA2 : IEEE802.11i(WEP and AES encryption)<br>WPA-PSK (256-bit key pre-shared key supported)<br>OKC** and 802.11r**<br>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 number ),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.<br>The ratio = 1 - (traffic load / the capability of a WAN link).<br>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** | 802.11r 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<br>Port link up / link down<br>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<br>USB port to upload/download firmware by USB dongle<br>Dual image firmware* |

## Physical Ports & System

| | |
|---|---|
| Connectors | 10/100/1000T: 6x ports M12 8-pole X-coded(incl 4 PoE ports)<br>USB/Console connector: 1 x M12 8-pole A-coded<br>DI/DO : 1 x M12 5-pole A-coded<br>Power Input connector : 1 x M12 4-pole A-coded<br>Serial connector : 2 DB9<br>SMA/QMA** connector for Wi-Fi: 3 (male) |
| 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<br>RS232 8KV contact and 15KV air ESD<br>DIDO 3KV isolation<br>Input power 1.5KVA isolation |
| DI/DO | 2 Digital Input (DI) :<br>Level 0: -30~2V / Level 1: 10~30V<br>Max. input current:8mA<br>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), Serial1/Serial2(Green) ,Ready(Green) |
| 10/100/1000Base-T(X) port indicator | Link/Activity (Green), Speed (Yellow) ), PoE (Green) |
| 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) |
| System power | 30.5W |
| PoE Budget | 60W |
| EMMC Storage** | 8/16/32 GB |

## 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)<br>-40°C ~ 70°C (-40°F ~ 158°F) |
| Operating Humidity | 5% to 95% Non-condensing |

## Regulatory approvals

| | |
|---|---|
| EMC | FCC Part 15 Class A, EN55032 , EN55024 |
| EMS | EN61000-4-2 (ESD), EN61000-4-3 (RS), EN61000-4-4 (EFT), EN61000-4-5 (Surge), EN61000-4-6 (CS), EN61000-4-8, EN61000-6-2 |
| Radio Frequency | EN301 489-1, EN301 489-17, EN301 489-19, EN301 489-52, EN300 440, EN301 893, EN300 328, EN301 908-1, EN303 413, EN62311 |
| Safety | EN60950 (LVD), AS60950 (LVD) |
| Stability Testing | EN61373 (Shock & Vibration) |
| Verifications & report | EN50155, EN50121-3-2, EN50121-4 verification<br>EN45545-2 R13/R22/R23/R24/R25 (EN ISO 4589-2, EN ISO 5659-2, NF X70-100-1 & 2) Fire & Smoke verification |
| 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 coating, optional conformal coating are with –C model name; Optional bypass models are available with –BT model name; QMA connector models are with –Q model name; -40~70C operational model are with –E model name

- **TPWAP-5006-1AC-WV-65…..……..P/N: 8655-002**
  EN50155 Multifunction VPN Router w/1x Wi-Fi 11ac + 6 Gigabit X-coded Ethernet Managed Switch incl.4 PoE at/af with Load balancing**, TWCC**, VPN, Protocol Gateway; dual isolated 16.8~137.5VDC; IP65; -20~70C
- **TPWAP-5006-2AC-WV-65…..……..P/N: 8655-004**
  EN50155 Multifunction VPN Router w/1x Wi-Fi 11ac + 6 Gigabit X-coded Ethernet Managed Switch incl.4 PoE at/af with Load balancing**, TWCC**, VPN, Protocol Gateway; dual isolated 16.8~137.5VDC; IP65; -20~70C
- **TPWAP-5006-1AC-WV-54…..……..P/N: 8655-006**
  EN50155 Multifunction VPN Router w/1x Wi-Fi 11ac + 6 Gigabit X-coded Ethernet Managed Switch incl.4 PoE at/af with Load balancing**, TWCC**, VPN, Protocol Gateway; dual isolated 16.8~137.5VDC; IP65; -20~70C
- **TPWAP-5006-2AC-WV-54…..……..P/N: 8655-008**
  EN50155 Multifunction VPN Router w/1x Wi-Fi 11ac + 6 Gigabit X-coded Ethernet Managed Switch incl.4 PoE at/af with Load balancing**, TWCC**, VPN, Protocol Gateway; dual isolated 16.8~137.5VDC; IP65; -20~70C
- **TPWAP-5006-1AC-2S-WV-65…..……..P/N: 8655-013**
  EN50155 Multifunction VPN Router w/1x Wi-Fi 11ac + 2 serial ports + 6 Gigabit X-coded Ethernet Managed Switch incl.4 PoE at/af with Load balancing**, TWCC**, VPN, Protocol Gateway; dual isolated 16.8~137.5VDC; IP65; -20~70C
- **TPWAP-5006-1AC-2SA-WV-65…..……..P/N:8655-014**
  EN50155 Multifunction VPN Router w/1x Wi-Fi 11ac + 2 isolated serial RS422/485 ports + 6 Gigabit X-coded Ethernet

Managed Switch incl.4 PoE at/af with Load balancing**, TWCC**, VPN, Protocol Gateway; dual isolated 16.8~137.5VDC; IP65; -20~70C

- **TPWAP-5006-2AC-2S-WV-65…..……..…..…….P/N: 8655-017**
  EN50155 Multifunction VPN Router w/2x Wi-Fi 11ac + 2 serial ports + 6 Gigabit X-coded Ethernet Managed Switch incl.4 PoE at/af with Load balancing**, TWCC**, VPN, Protocol Gateway; dual isolated 16.8~137.5VDC; IP65; -20~70C
- **TPWAP-5006-2AC-2SA-WV-65…..……..…..…….P/N:8655-018**
  EN50155 Multifunction VPN Router w/2x Wi-Fi 11ac + 2 isolated serial RS422/485 ports + 6 Gigabit X-coded Ethernet Managed Switch incl.4 PoE at/af with Load balancing**, TWCC**, VPN, Protocol Gateway; dual isolated 16.8~137.5VDC; IP65; -20~70C
- **TPWAP-5006-1AC-2S-WV-54…..……..…..…….P/N: 8655-023**
  EN50155 Multifunction VPN Router w/1x Wi-Fi 11ac + 2 serial RS232 ports + 6 Gigabit X-coded Ethernet Managed Switch incl.4 PoE at/af with Load balancing**, TWCC**, VPN, Protocol Gateway; dual isolated 16.8~137.5VDC; IP54; -20~70C
- **TPWAP-5006-1AC-2SA-WV-54…..……..…..…….P/N:8655-024**
  EN50155 Multifunction VPN Router w/1x Wi-Fi 11ac + 2 isolated serial RS422/485 ports + 6 Gigabit X-coded Ethernet Managed Switch incl.4 PoE at/af with Load balancing**, TWCC**, VPN, Protocol Gateway; dual isolated 16.8~137.5VDC; IP54; -20~70C
- **TPWAP-5006-2AC-2S-WV-54…..……..…..…….P/N: 8655-027**
  EN50155 Multifunction VPN Router w/2x Wi-Fi 11ac + 2 serial RS232 ports + 6 Gigabit X-coded Ethernet Managed Switch incl.4 PoE at/af with Load balancing**, TWCC**, VPN, Protocol Gateway; dual isolated 16.8~137.5VDC; IP54; -20~70C
- **TPWAP-5006-2AC-2SA-WV-54…..……..…..…….P/N:8655-028**
  EN50155 Multifunction VPN Router w/2x Wi-Fi 11ac + 2 isolated serial RS422/485 ports + 6 Gigabit X-coded Ethernet Managed Switch incl.4 PoE at/af with Load balancing**, TWCC**, VPN, Protocol Gateway; dual isolated 16.8~137.5VDC; IP54; -20~70C

**Software License**

- **LOAD BALANCING Basic Package……..…….....P/N: 9000-101**
- **LOAD BALANCING Full Package……..…….....P/N: 9000-102**
- **TWCC…..……..…….....P/N: 9000-103**
- **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

**Lantech Communications Global Inc.**

www.lantechcom.tw
info@lantechcom.tw