

Príloha č. 4: Technické listy dodávaných aktívnych prvkov

Dual Band AC1300 Wave2 Outdoor Long Range Wireless Access Point

The edge 802.11ac built-in high performance Access Point with MU-MIMO technology for high-density use on multiple applications.

EnGenius Wireless Long Access Point solution is designed for deploying on the versatile indoor and outdoor application. To meet today's requirement on varied net-working environment, EnGenius would like to provide the solution as flexible, robust and effective as the organization they desire.

The state-of-the-art 802.11ac and MU-MIMO technology brings revolutionary connecting speed and bandwidth for diversity of multimedia applications. ENH1350EXT equips with two powerful RF interfaces that support up to 867 Mbps in 5GHz frequency band and 400 Mbps in 2.4GHz frequency band (with 2ss/VHT40 clients). With robust IP67 certified casing, these access points is designed to withstand harsh environment conditions including serve and prolonged exposure to sunlight, extreme cold, frost, snow, rainfall, hail and humidity.



Features

- > Dual radio 2x2 802.11 ac/a/b/g/n Access Point with multi-user MIMO (MU-MIMO)
- > Support up to 867 Mbps in 5GHz frequency band and 400 Mbps in 2.4GHz frequency band (with 2ss/VHT40 clients).
- > Support 802.11ac Wave 2.0 technology to enhance overall bandwidth and speed to wireless client devices.
- > 360° omni-directional antennas to achieve comprehensive coverage for networking client devices under a pervasive environment.
- > External antennas interface for connecting with high directional antennas to deliver signal to long-range distance.
- > Compliance with Proprietary 48V PoE Input for flexible installation over 100 meters (328 feet).
- > Robust housing with IP67 enclosure rated to deploy at extremely weather.
- > Deliver High resolution content or multiple IP surveillance over wireless transmission
- > Choose an operating mode to meet your management and deployment requirement. (AP mode/CB mode/WDS modes/Mesh mode will develop in phase 2, Nov. 2018)

Wireless Management solution is ideal for deployment in these venues:

- | | | |
|------------------------|--------------------|-----------------------|
| > Airport Terminals | > Rail Stations | > Resort Properties |
| > Warehouse Operations | > Petroleum fields | > Parks & Campgrounds |
| > College Campuses | > Seaport | > Stadiums & Arena |
| > Corporate Campuses | > Shopping Malls | > Public Lightings |

Enterprise Robust Solution

ENH1350EXT is easily to install anywhere and its internal electronics have been mounted in an **IP67-rated** enclosure, one of the better waterproof and dustproof rating available, designed to withstand harsh environment conditions including serve and prolonged exposure to sunlight, extreme cold, frost, snow, rainfall, hail and humidity .

Scalable and Flexible deployment for Outdoor Installation

With included mounting accessories, ENH1350EXT provides reliable kits to fix this device on anywhere for delivering wireless signal under outdoor environment. To save the maintenance cost and labors fee on deploying Access Points, ENH1350EXT built with power over Ethernet (PoE) functions for receiving power source from the included PoE adapter. With scalable extension over PoE mechanism, Access Points can receive power and signal source easily from **100 meters or 328 feet distance**.

Meanwhile, EnGenius ENH1350EXT also built in external SMA interfaces for users to connect with other high-gain directional antennas for delivering the wireless signal to long-range distance.

Provide Consistent Performance

Designed by EnGenius could provide the powerful RF interface to assure the reliability of signal strength and sensitivity in a pervasive environment. These optimist interfaces will provide the evenly coverage to assist users to reduce dead spots in their WLAN and boost received signal quality to deliver the best **1.2Gbps** air performance to wireless client devices.

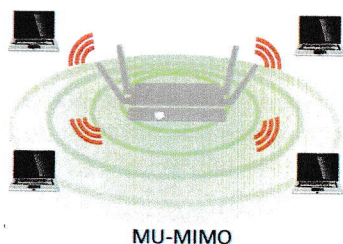
Carry multimedia content over MU-MIMO Transmit Beam-forming technology.

Be a prior AC1300 solution, ENH1350EXT are not only built in powerful RF interfaces, but it also features advanced **Multi-Users Multiple input Multiple output (MU-MIMO)** and **Transmit beamforming (TxBF)** technologies.

The significant improvement on 802.11ac wave 2.0 is MU-MIMO technology, which enhances a dramatic break-through in the performance and flexible transmission to wireless client devices. MU-MIMO allows multiple spatial streams to be allocated to different clients simultaneously, increasing totally throughput, reduce latency, capacity of the WLAN system and increase spectral efficiency.

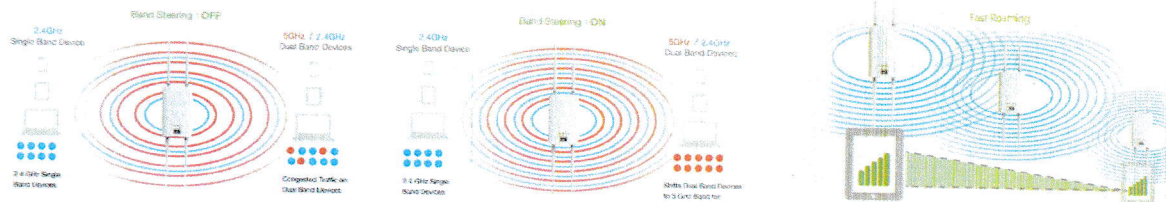
Beamforming is a standard in 802.11ac wave 2.0 which allows Access Points to focus energy of multiple antennas to transmit to a particular client device in that direction of that client. The innovative technology significantly enhances the higher signal-to-noise ratio and greater throughput of that client .

With MU-MIMO and Beamforming technology, ENH1350EXT outdoor long-range Access Point could bring more traffic to wireless client devices simultaneous over the longer distance and save time for serving other wireless client devices.



Exquisite RF Management to Achieve Optimal Wireless Performance

To assist client devices to get the optimal performance under a pervasive environment, **Band Steering** automatically steers dual-band capable client devices to the appropriate channel, while prefer 5GHz or band balancing works to maintain a balanced number of clients per Access Point. Configuring multiple Access Points to serve your own devices (BYOD) in enterprise class wireless LAN environment can enable **Fast Roaming** to reduce roaming delay time and to secure seamless connection on VOIP service when mobile devices move between Access Points.



Securable Portals for different purpose

Administrators can also use **Virtual LAN (VLAN)** with **Guest Network** to isolate each client for avoiding an unnecessary touch, leaking sensitive data, and enhancing Internet security and reliability for internal network.

With **VLAN per SSID**, the Integrate VLAN ID with a WLAN service set identifier (SSID) interface will deliver packets to the defined path. The built-in QoS mechanism could allow the specific VLAN SSID to get more bandwidth and deliver video streaming content to the destination first.

EnGenius advanced **Cross-band VLAN pass-through** provides a powerful interface to deliver VLAN-tag packets between 2.4GHz frequency band and 5GHz frequency band without removing VLAN-tag. The integrated **Management VLAN and Cross-band VLAN pass-through** function on dual-band Access Points forces a command from a 2.4GHz capable client device and then deliver this command via 5GHz frequency to the other 5GHz capable Access Point throughout WDS BR mode. The ideal combination dramatically enhances the security on operating devices from remotely-side, reduces the maintenance cost, and labor fee significantly.

Restrain Wireless Traffic under a Pervasive Environment

To effective manage the usage of each client devices at a LAN topology, **Traffic Shaping** controls the bottle of bandwidth to offer the limited bandwidth for an individual **SSID** or **each client** per Access Point. This constraint offers the constant bandwidth to perform specific applications like VOIP and video streaming fluently and smoothly without air congestion on each client devices.

Comprehensive Network Protection

With ENH Access Points, your network is protected from attacks at multiple level through advanced wireless encryption standards such as Wi-Fi Protected Access (WPA2) which uses authentication database and IEEE 802.1X with Radius server. EnGenius also offers the advanced encryption standard to encrypt traffic between Access Points and client devices. To isolate the internal client devices and guest devices, client isolation can avoid each client device to see each other under the same WLAN. Once threats or events are detected, built-in **E-mail Alerts** systems will automatically deliver an e-mail notification for administrators to trigger immediate actions on these networks threats.

Technical Specifications Wireless outdoor long-range Access Point

Wireless Radio Specification

Access Point Type:

Outdoor, IP67, dual radios concurrent, 5GHz 802.11 ac 2x2 MIMO is backwards compatible with 802.11 a/n mode, 2.4GHz 802.11 n 2x2 MIMO is backwards compatible with 802.11 b/g.

SU-MIMO:

Two(2) spatial stream Single User (SU) MIMO for up to 400 Mbps wireless data rate with VHT40 bandwidth to a 2x2 wireless device under the 2.4GHz radio. Two(2) spatial stream Single User (SU) MIMO for up to 867 Mbps wireless data rate with VHT80 to a 2x2 wireless device under the 5GHz radio.

MU-MIMO

Two(2) spatial stream Multi User (MU) MIMO for up to 867 Mbps wireless data rate with VHT80 bandwidth to two(2) MU-MIMO capable client devices simultaneously under the 5GHz radio.

Frequency Radio

2.4GHz: 2400MHz ~ 2835MHz

5GHz: 5150MHz ~ 5250MHz, 5250MHz ~ 5350MHz, 5470 ~ 5725MHz, 5725MHz ~ 5850MHz

Support radios and channels will be varied on the configured regulatory domain.

Supported Radio Technology

802.11b: Direct-sequence spread-spectrum (DSSS)

802.11ac/a/g/n: Orthogonal frequency-division multiplexing (OFDM)

802.11n/ac: 2x2 MIMO with 2 streams

802.11ac supports very high throughput (VHT) — VHT 20/40/80 MHz

802.11n supports high throughput (HT) — HT 20/40 MHz

802.11n supports very high throughput under the 2.4GHz radio — VHT40 MHz (256-QAM)

802.11n/ac packet aggregation: AMPDU, ASPDU

Supported Modulation Type

802.11b: BPSK, QPSK, CCK

802.11a/g/n: BPSK, QPSK, 16-QAM, 64-QAM

802.11ac: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM

Transmit Power (Maximum Value)

2.4GHz: 23dBm

5GHz: 23dBm

Maximum power is limited by regulatory domain

Tx Beamforming (TxBF)

Increasing signal reliability and transmitting distance.

Supported data rates (Mbps)

802.11b: 1, 2, 5.5, 11

802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54

802.11n: 6.5 to 300 (MCS0 to MCS15)

802.11ac: 6.5 to 867 (MCS0 to MCS9, NSS=1 to 2)

Power

Maximum Power Consumption

Maximum 12.6W

Power Source

802.3af/at Compliance Source

Proprietary 48V-54V

Active Ethernet (Power Over Ethernet, PoE)

Antenna

SMA Type interfaces

2.4GHz: Two(2) detachable 5.0dBi SMA antennas

5GHz: Two(2) detachable 5.0dBi SMA antennas

Optional Solutions

Alternative solution to compatible with SA2216 and SA5219 sector Antennas.

Interfaces

Networking Interface

One (1) 10/100/1000 BASE-T RJ-45 Ethernet Ports

Link Aggregation achieves 2Gbps Throughput

LED Indicators

Display system and wireless transmission status

Reset Button on PoE Adapter

Convert Access Point to the Factory default or the Users Default through the reset button of the accompanied EPA5006GR

Mounting

Pole Mounting

Assemble a mounting bracket to fix this Access Point on a pole.

Wall Mounting

Mount this Access Point on a flat wall

Mechanical & Environment

Dimensions (Device only)

173.60 x 111.20 x 30.29 mm (6.83" x 4.38" x 1.19")

Weight

829.5 g

Operating

Temperature: -20°C ~ 60°C (-4°F ~ 140°F)

Humidity: 0% ~ 90% typical

Storage

Temperature: -40°C ~ 80°C (-40°F ~ 176°F)

Humidity: 0% ~ 90% typical

Environment Protection Level

IP67

Surge Protection

1KV

ESD Protection

Contact: 4KV

Air: 8KV

Compliance Regulatory

FCC

Subpart 15 B

Subpart C 15.247

Subpart E 15.407

CE

EN 300 328

EN 301 893

EN 301 489

EN 50385

EN 55032

EN 55024

EN 61000

CB

IEC 60950-1

IEC 60950-22

Technical Specifications Wireless outdoor long-range Access Point

Operating Mode

Access Point Mode (AP Mode)

Be an Access Point behaves like a central connection for station or clients that support IEEE 802.11 ac/a/b/g/n network.

Client Bridge Mode (CB Mode)

The Access Point essentially acts as a wireless adapter that connects to an access point to allow a system of wireless access to the network in the client bridge mode.

Mesh Modes

Mesh modes establish wireless connection to avoid interconnection on air. The architecture will be flexible for users to keep connection to Gateway side always.

WDS Modes (WDS AP, WDS BR, WDS Station)

WDS modes uses WDS technology to establish the wireless connection via filling MAC address in both Access Points to enlarge the wireless area.

Exquisite RF Management

ACK timeout (Distance Control)

Set the ACK timeout to assure the proper distance to deliver wireless signal properly

Site Survey

Scan signal level of an environment to provide parameters for performing Auto Transmit power and auto channel.

Auto Transmit Power

Automatically adjust power level

Auto Channel

Automatically assign a clearly channel to perform RF transmission under a pervasive environment.

Fast Roaming (802.11k)

Collect the parameters of neighborhood Access Points to find the optimal AP.

Fast Roaming (802.11v)

Cognize the signal strength of client devices under each to steer these client devices to one of Access Points if signal level is less than the default value of AP systems.

* This function will be available in September 2019.

Band Steering

Steer client devices to a proper frequency band for getting more bandwidth and speed under an Access Point.

RSSI Threshold

Kick client devices that the signal (RSSI) is above the set value from the AP for reducing the interference and optimize the connecting quality.

Optimize Performance

Quality of Service

Compliance with IEEE 802.11e standard
Prioritizes voice over data for both tagged and untagged traffic
Transmit video, voice and data at the same SSID

Power Save Mode

Support U-APSD

Pre-Authentication

Compliance with 802.11i & 11x

PMK Caching

Compliance with 802.11i

If wireless client devices has authenticated to an access point, it does not perform a full authentication exchange when client devices roaming between access points.

Fast Roaming (802.11r)

Use a Fast Transition key to handover between Access Points

Multicast to Unicast Conversion

Using the IGMP protocol, an access Point delivers high definition content to a large number of clients simultaneously.

Concurrent Users

100 client devices to connect to the Access Point simultaneously.

Easy to Management

Multiple SSIDs

BSSID support
Support 8 SSIDs on both 2.4GHz and 5GHz bands.

Guest Network

Isolate each client for avoiding an unnecessary touch, leaking sensitive data, and enhancing Internet security and reliability.

VLAN Tag

Independent VLAN setting can be enable or disable. Any packet that enters the Device without a VLAN tag will have a VLAN tag inserted with a PVID (Ethernet Port VID).

VLAN Pass-through

Broadcast VLAN-tag packets to find the destination and deliver packets over the defined path. The functions allows network topology scalable and flexible.

VLAN Per SSID

Integrate VLAN ID with a SSID interface to forward packets over the defined path. The functions isolate client devices to get more security.

Management VLAN

Feature is enabled with specified VLAN ID, the device will only allow management access with the same specified VLAN ID from remotely location by using protocols such as telnet, SSH, snmp, syslog etc.

Traffic Shaping

Controls the bottle of bandwidth to offer the limited bandwidth for an individual SSID or each client per Access Point.

MAC Address Filtering

Filter up to 32 sets MAC addresses per SSID

E-Mail Alert

Provides a network monitoring tool for administrators to stay informed the configuration change.

Save Configuration as Users Default

Save the customized configuration as default value for different customer demands.

Wi-Fi Scheduler

Perform a regular reboot on access point at assigned schedule
Perform it to enable or disable 2.4GHz or 5GHz interface from a period time.

SNMP & MIB&CLI

v1/v2c/v3 support
MIB I/II, Private MIB
CLI Supported

RADIUS Accounting

Help operators to offload 3G to Wi-Fi seamlessly

Wireless Clients list

Provide the list to display real status of wireless client devices on this Access Point.

Hotspot 2.0

This function will allow client devices to discover wireless Access Point under an environment and to automatically exchange data for getting authorization on accessing Internet when roaming between Access Points.

* This function will be available in July, 2019.

Comprehensive Protection

Wireless Encryption Standard

WPA2-PSK(Personal), WPA2-EAP(Enterprise)

Hide SSID in beacons

Client Isolation

Block/Isolate the communication between the associated clients under the same WLAN.

HTTPS

A secure communication protocol can be enabled to allow secure management web access over a computer network.

SSH Tunnel

A secure communication protocol can be enabled to allow secure remote shell access or command execution.

RF Performance Specification Wireless outdoor long-range Access Point

Channel	Data Rate	Transmit Power (Aggregated, dBm)	Receive Sensitivity (Aggregated, dBm)
802.11b 2.4 GHz	1 Mbps	23.0	-92.0
	2 Mbps	23.0	-88.0
	5.5 Mbps	23.0	-87.0
	11 Mbps	23.0	-84.0
802.11g 2.4 GHz	6 Mbps	23.0	-89.0
	54 Mbps	21.0	-72.0
802.11a 5 GHz	6 Mbps	23.0	-89.0
	54 Mbps	21.0	-71.0
802.11n HT20 2.4 GHz	MCS 0 / 8	23.0	-87.0
	MCS 7 / 15	20.0	-67.0
802.11n HT40 2.4 GHz	MCS 0 / 8	23.0	-84.0
	MCS 7 / 15	20.0	-66.0
802.11n HT20 5GHz	MCS 0 / 8	23.0	-89.0
	MCS 7 / 15	20.0	-68.0
802.11n HT40 5GHz	MCS 0 / 8	23.0	-86.0
	MCS 7 / 15	20.0	-66.0
802.11ac VHT20 5GHz	MCS0	23.0	-89.0
	MCS8	19.0	-63.0
802.11ac VHT40 5GHz	MCS0	23.0	-85.0
	MCS9	18.0	-60.0
802.11ac VHT80 5GHz	MCS0	23.0	-83.0
	MCS9	18.0	-56.0

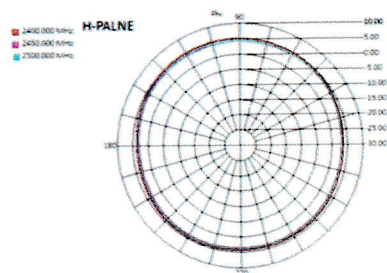
*Maximum RF performance of the hardware provided. Maximum transmit power is limited by local regulatory.

*The supported frequency bands are restricted by local regulatory requirements.

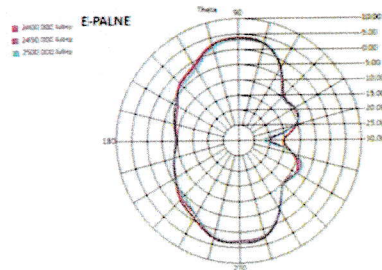
*Transmit power is configured in 1.0dBm increments.

Antennas Patterns Wireless outdoor long-range Access Point

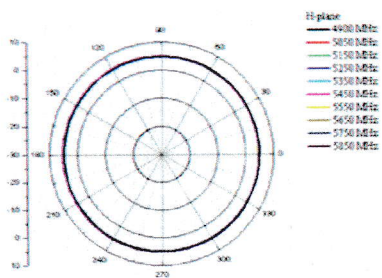
2.4GHz H-Plane



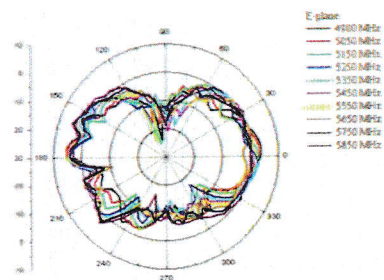
2.4GHz E-Plane



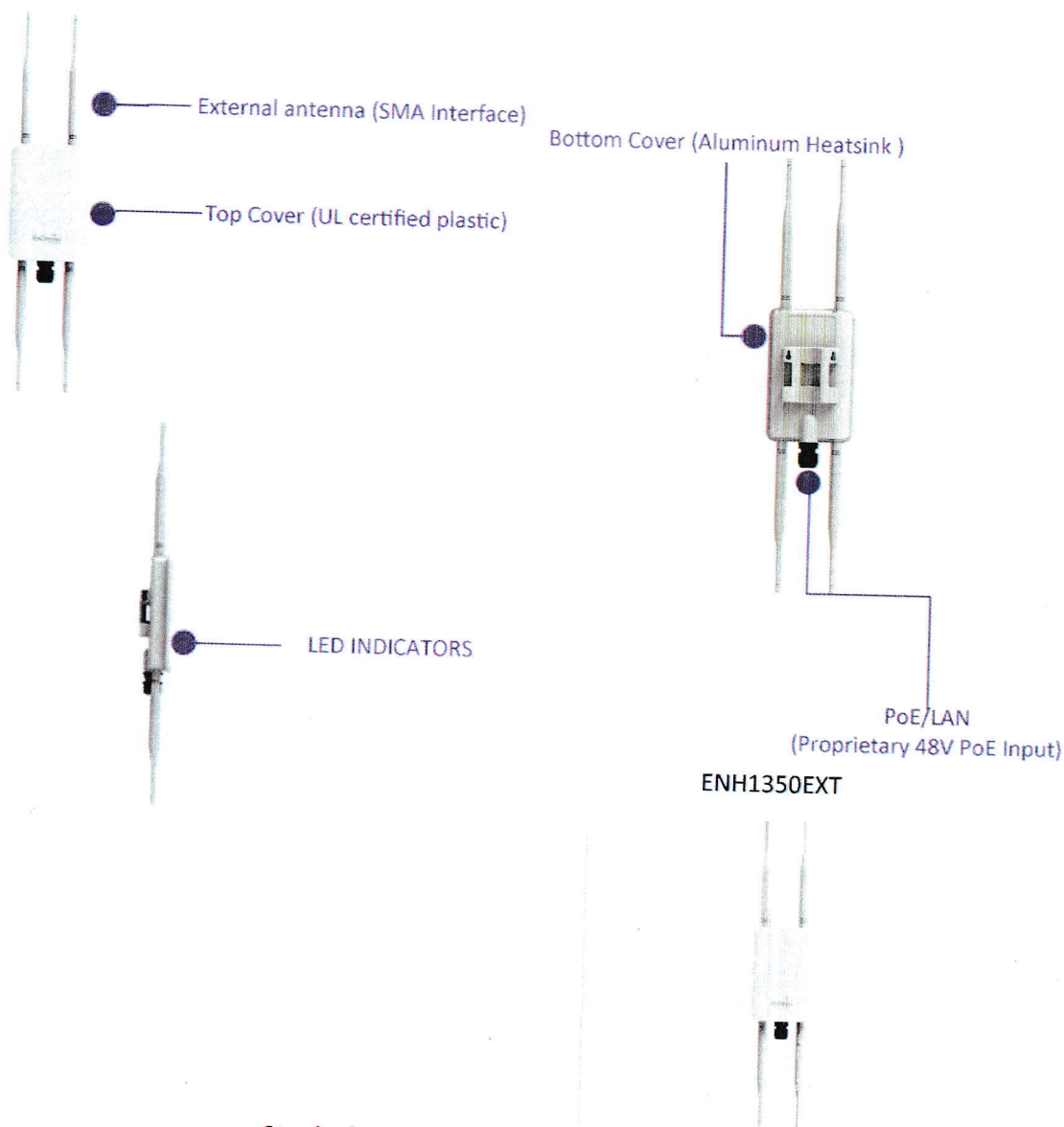
5GHz H-Plane



5GHz E-Plane



Physical Interfaces



Standards	802.11 ac/a/b/g/n
Frequency	2.4GHz+5GHz
Data Rates	400Mbps + 867Mbps
Antennas	2.4GHz: 5.0dBi; 5GHz: 5.0dBi
Physical Interface	1 x Gigabit LAN 4 x SMA Connector Interfaces
Radio Chains/Streams	2x2: 2

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