

# EL-N Series PTP Wireless Mesh Backup Ring Network System



- PTP Private enclosed wireless backbone transmission system technology
- Low-loss bandwidth and low latency response for PTP Mesh Hops with 250 repeater
- With PTP Mesh Ring automatic detection circuit disconnection and automatic repair connection
- Multi PTP Mesh Ring multi-group loop disconnection detection and recovery backup connection function
- Support IGMP broadcast packet / network storm resolution technology
- Dedicated to Outdoor Wireless Surveillance Transmission Backhaul System
- Large Cities and Vast Range of Wireless Transmission Mesh Backhaul System



Model:

EL-N-1

EL-N-2

EL-N-3

- Standard with: support 4.9 ~ 6.1GHz single-frequency wireless RF module to provide 300Mbps data rate and 200Mbps bandwidth max; up to support three wireless RF module design.  
(Optional with: support 2.4 / 5.8GHz dual-band wireless RF module)
- Design PTP wired network technology into the wireless system to reach PTP transmission up to one-way or Tx & Rx two-way total 200Mbps bandwidth by TCP.
- The design of PTP Mesh Hops wireless network connection technology, after 8 hops wireless serial connection, the two-way TCP bandwidth is still up to 150Mbps; 12 hops still up to 140Mbps.
- It real transmission response to ultra-low latency, even hops 10 times after the relay platform, the system can still maintain the response delay of 15ms or less.

- Point-to-point wireless Mesh Backup Ring loop backup network, can automatically maintain the multi-path backup circuit, and automatically avoid the formation of a bad network loop status.
- Designed with high-performance Multicast / Broadcast transmission characteristics can greatly enhance the effectiveness of video stream or broadcast, increase the relevant fields of application.
- Extra Cost parameter setting, combined with the wisdom and human nature of the design, allowing users to specify the transmission path and backup path.
- EL-N unique means of communication can block other illegal attempts to wireless connection, you can enable the AES high-security wireless encryption to prevent wireless data is intercepted to monitor and steal.

## Product Highlights

### ➤ High Capacity / Low Latency

Simply design for purely PTP applications. Remove the useless features and protocol for PTMP applications and hotspot coverage to improve the throughput capacity and latency performance.

### ➤ Robust Design for Harsh Environment

For complete outdoor applications, radio can balance the internal pressure itself automatically, complies with IP-68 and built in special design for lightning strike area security level of 10KA (1 million Amp) of the Ethernet lightning & surge protector to achieve the highest protection design.

### ➤ Import point to point wired network transmission technology, with 100% completely replace physical characteristics of the cable network

EL-N series products include EL-N-1 single-radio, EL-N-2 dual-radio and EL-N-3 triple-radio, three models, with high efficiency, high stability, 100% completely replace the physical cable network the characteristics, the Mesh node and node connection by point to point wireless connection of radio frequency, you can quickly set up wireless relay jumper in series to extend the range of applications.

### ➤ Special design Mesh ring multipath network mechanisms, it can enable wireless communications link to upgrade redundancy and stability

Point to point wireless transmission network system tandem formed based on introducing unique



multipath Mesh Backup ring network technology, to achieve redundancy and automatic wireless network system to avoid the formation of bad network circuit state function, so the operating system is more stable wireless transmission

### ➤ **Designed for high-efficiency multi-packet transmission and broadcast packets**

EL-N Series multi-point packet with a broadcast packet transmission for surveillance cameras to provide higher transmission efficiency solutions & import IGMP Snooping protocol technology to improve the efficiency of IP multimedia streaming.

### ➤ **Deploying have extensions extending wireless Mesh network structure architecture**

Design Point to Point Mesh hops network series connection technology, can easily expand and extend network reach, after 8 hops wireless series, the TCP bandwidth is still up to 150Mbps; after 12 hops wireless bandwidth series is still up to 140Mbps, can be applied transmission backbone using a wide range of cities or large bandwidth wireless PTP mesh hops ring surveillance system.

### ➤ **Wireless transmission security and encryption**

EL-N-specific communication can block the other's illegal attempt to wireless connectivity; you can enable high-security AES wireless encryption to prevent the wireless data being intercepted monitor and steal.

### ➤ **Wireless Signal Interference Makes Resistance Ability Excellent**

Support full RF module frequency band from 2.3~2.7GHz & 4.9~6.1GHz and greater use of the channel width, plus a specially designed proprietary tandem technology and Mesh wireless signal transmission pure point to point, will make radio signal interference ability more excellent performance. (Default 5GHz 11a / n 2x2 MIMO mini PCI card)

### ➤ **Provide more advanced equipment safety management and certification mechanism**

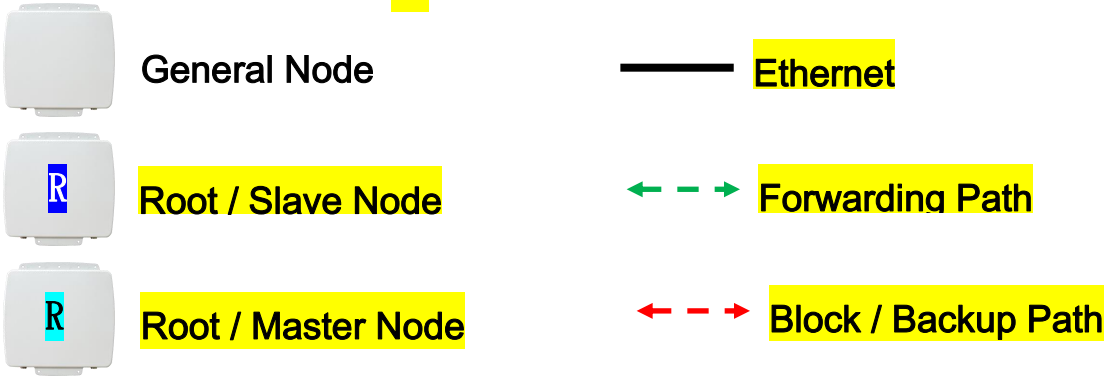
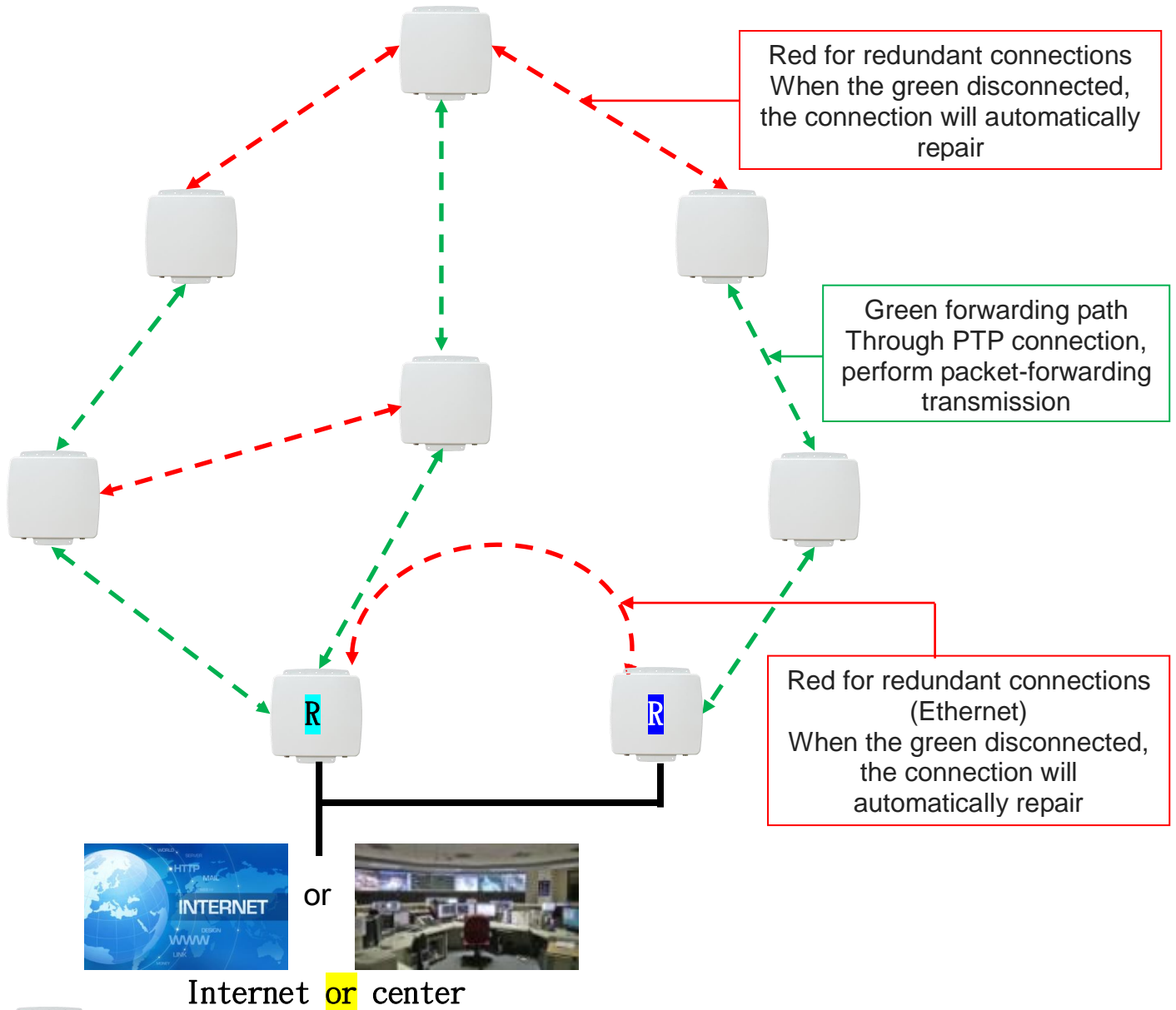
Design core software authentication encryption, the use of random matrix encryption technology, the level of upgrading to military regulations protection. The mutual authentication mechanism between the equipment end and the center end (in development), different equipment could not be used by different SI to meet the unique security requirements of the project.

### ➤ **Improve the flexibility of the future integration of expansion system**

With integrated remote switching power supply and remote control system with special Trunk Switch to achieve multi-frequency, multi-channel, low interference, large integrated bandwidth of the wireless transmission backbone solution.

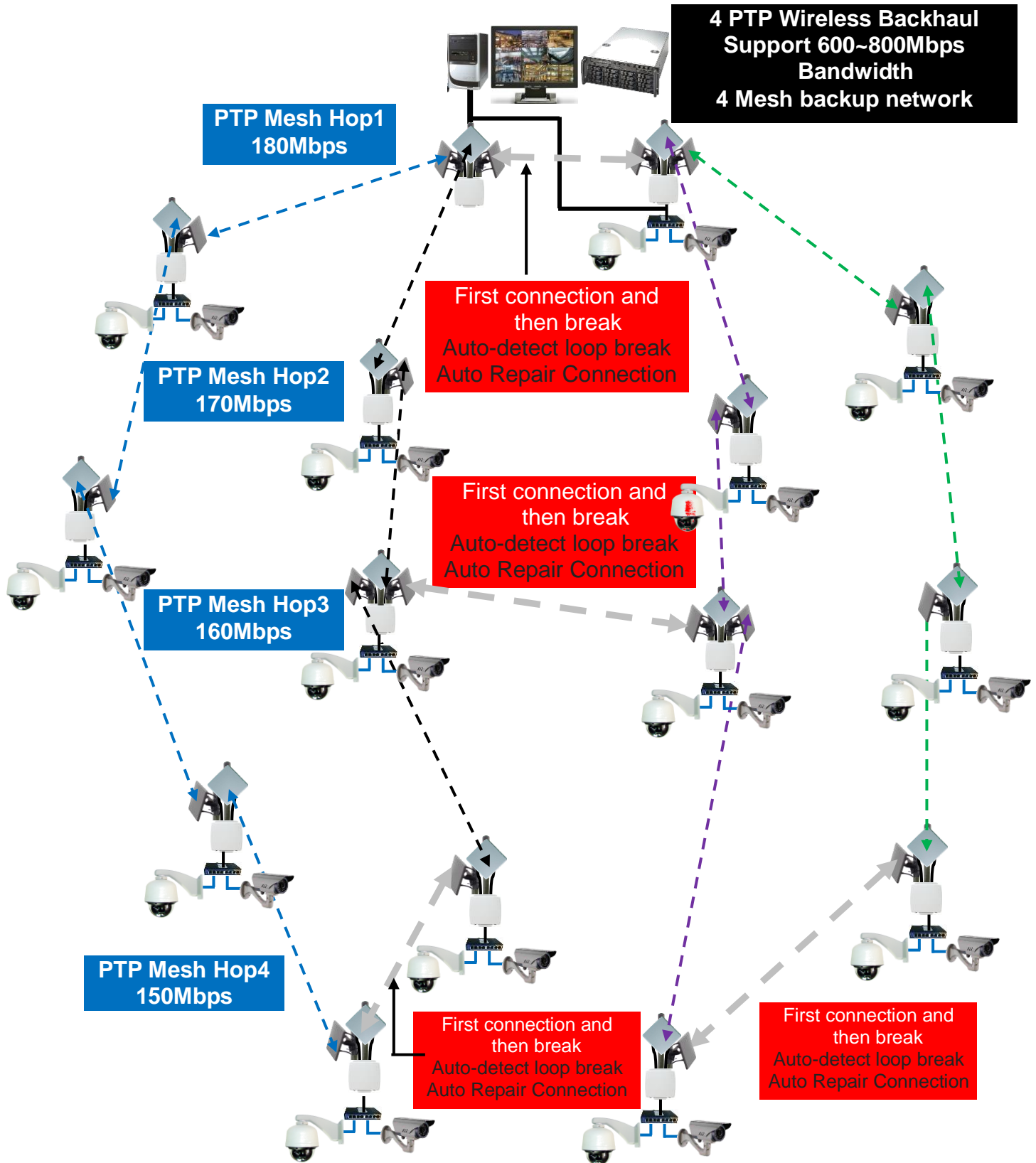
# Mesh multipath network system structure and application diagram

## ■ EL-N Mesh multi-path network system architecture diagram



**EL-N multipath of Mesh network architecture application diagram:**

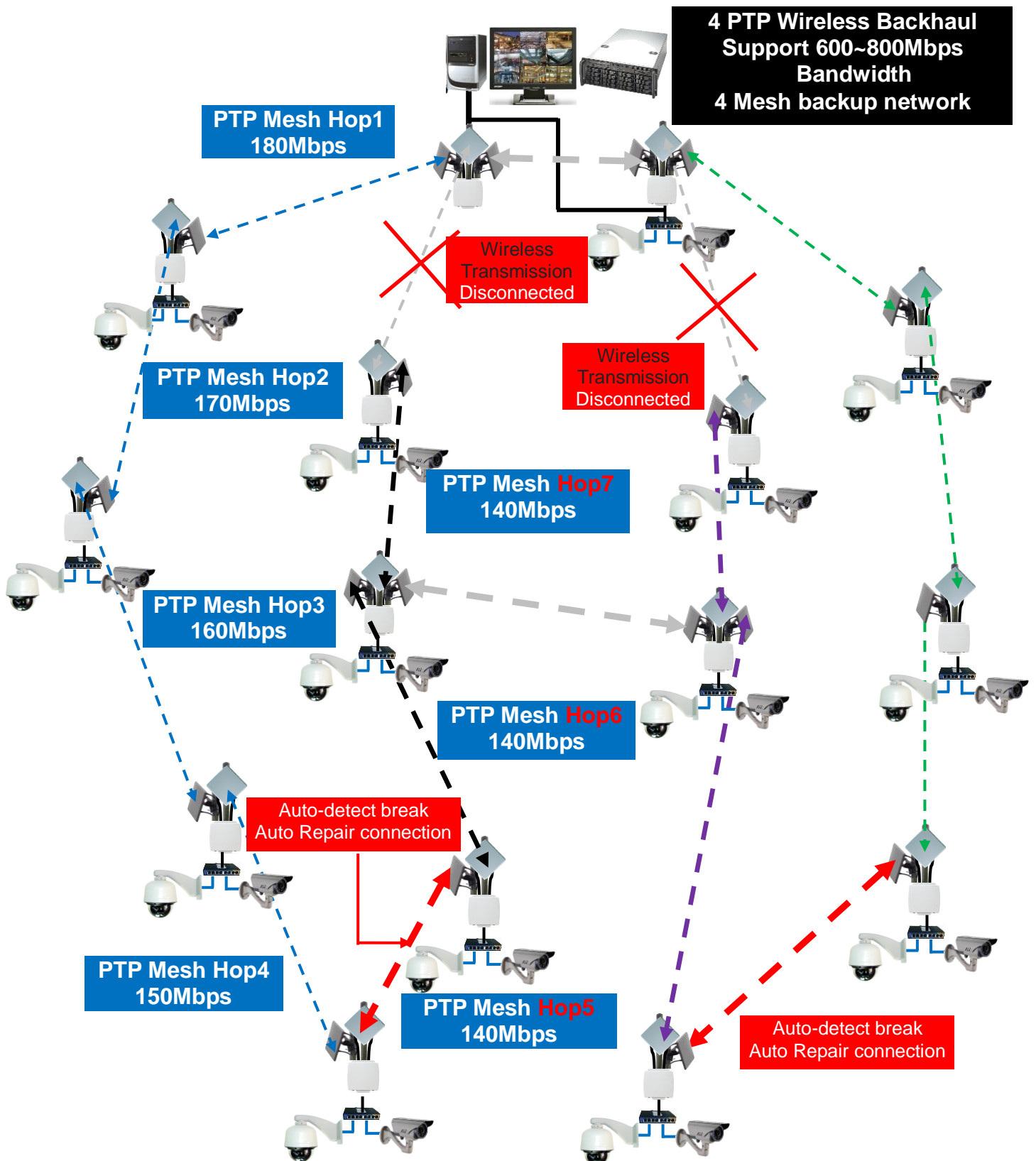
**Wireless Mesh network structure extensible structure for backup system  
 Wireless surveillance system applied to the big city transport**



**EL-N Mesh multipath network "after disconnection, automatic backup connection"**

Application Diagram:

**Wireless Mesh network structure extensible structure for backup system  
 Wireless surveillance system applied to the big city transport**





# Product Specification

## Hardware Specification

Key Components	
Main Processor	Atheros AR7161 (680Mhz)
Wireless Chipset	<ol style="list-style-type: none"> <li>Standard with: Atheros AR9220 mini PCI,IEEE 802.11 a/n,2T2R MIMO, 300Mbps</li> <li>Optional with: Atheros AR9220 mini PCI,IEEE 802.11 a/g/n,2T2R MIMO, 300Mbps</li> </ol>
Switch Controller	Atheros AR8035
Flash Memory	16MBytes
SDRAM	128MBytes
Interfaces Specifications	
Wireless RF Module	<ol style="list-style-type: none"> <li>Standard with:RFS5-M22M Atheros AR9220 mini PCI, Output Power 25dBm Max, IEEE 802.11 a/n, 2T2R MIMO, 300Mbps.</li> <li>Optional with:DNMA-H92 Atheros AR9220 mini PCI, Output Power 23dBm Max, IEEE 802.11 a/g/n, 2T2R MIMO, 300Mbps.</li> <li>Product Model Number and built in Wireless RF module: EL-N-1: 1 Wireless RF Module EL-N-2: 2 Wireless RF Modules EL-N-3: 3 Wireless RF Modules</li> </ol>
Wireless Frequency	<ol style="list-style-type: none"> <li>Standard with:RFS5-M22M IEEE 802.11 a/n,5.8GHz (4.9~6GHz).</li> <li>Optional with:DNMA-H92 2.4GHz / 5.8GHz (2.3~2.7/4.9~6.1GHz).</li> </ol>
Frequency Bandwidth	10MHz / 20MHz / 40 MHz
Wireless Module Interface	EL-N-1: 2 x N-type Female Connectors EL-N-2: 4 x N-type Female Connectors EL-N-3: 6 x N-type Female Connectors
Ethernet Interface	<ol style="list-style-type: none"> <li>Group 1 wired network port: Support 10/100/1000Mbps RJ-45 port, Compatible with:IEEE802.3/802.3i/802.3u;and support 802.3af/3at Passive PoE PD mode</li> <li>Group 2 wired network port: Support 10/100/1000Mbps RJ-45 port, Compatible with: IEEE802.3/802.3i/802.3u (Optional)</li> <li>Ethernet Network Port:Support10/100/1000Mbps , based on 10BASE-T,100BASE-T,1000BASE-T and Half-duplex / Full-duplex / Half &amp; Full-duplex and support Auto negotiation</li> </ol>



I/O Interface	RS-232 (PCBA onboard)
Ethernet Surge Protect Interface	Interface : Ethernet RJ-45 Female Port Supports Ethernet lightning surge protection up to 10KA

**Standard with:RFS5-M22M IEEE 802.11 a/n, 2T2R MIMO, Data Rate 300Mbps**

**IEEE 802.11a**

802.11a RF Module 5150 ~ 5745MHz 5805 ~ 5825MHz	Data Rate	Output Power	Rx Sensitivity
	6Mbps	25dBm	-95dBm
	9Mbps	25dBm	-95dBm
	12Mbps	25dBm	-94dBm
	18Mbps	25dBm	-91dBm
	24Mbps	25dBm	-88dBm
	36Mbps	24dBm	-85dBm
	48Mbps	23dBm	-81dBm
	54Mbps	23dBm	-79dBm

Index MCS	IEEE 802.11an /HT20				IEEE 802.11an /HT40			
	Data Rate (Mbps)		Output Power dBm	Rx Sensitivity	Data Rate (Mbps)		Output Power dBm	Rx Sensitivity
	GI=800ns	GI=400ns			GI=800ns	GI=400ns		
MCS8	13	14.4	25	-94 dBm	27	30	25	-90 dBm
MCS9	26	28.9	25	-92 dBm	54	60	25	-89 dBm
MCS10	39	43.3	25	-90 dBm	81	90	25	-87 dBm
MCS11	52	57.8	24	-87 dBm	108	120	24	-83 dBm
MCS12	78	86.7	23	-84 dBm	162	180	23	-80 dBm
MCS13	104	115.6	23	-80 dBm	216	240	23	-77 dBm
MCS14	117	130.3	23	-78 dBm	242	270	23	-75 dBm
MCS15	130	144.4	23	-76 dBm	270	300	23	-73 dBm

Note: Output Power +- 1.5dBm





### Power Requirement

Power Supply	<ol style="list-style-type: none"> <li>Support AC100~260V 1.2~2.0A 50/60Hz adapter, output 12~28Vdc 4.0A above</li> <li>With IEEE 802.3af/3at Passive mode PoE-PSE , output 48Vdc 1.5A 72W Max</li> <li>With the product has AC 100 ~ 240V / 1.2A ~ 2.0A to DC DC 19V / 4.7A adapter</li> </ol>
Power over Ethernet PD	Support IEEE 802.3af/3at Passive mode PoE PD 48Vdc 1A max
PCBA power-receiving terminal (optional)	Support DC Jack 2.1mm receiving connector, power supply required 12Vdc 4A (inclusive) or more, through the second waterproof head access to power input connector
Power consumption of equipment (including PoE power supply)	<ol style="list-style-type: none"> <li>EL-N-1: 6W/H, 100Mbps Full Speed 8W/H max, Start on 12W max</li> <li>EL-N-2: 8W/H, 200Mbps Full Speed 10W/H max, Start on 16W max</li> <li>EL-N-3: 10W/H, 300Mbps Full Speed 12W/H max, Start on 20W max</li> </ol> <p>Use the PoE to power supply, please use the IEEE 802.3at 48Vdc 1A above Passive mode PoE PSE.</p>

### Physical Size and Weight

Size	260mm * 250mm * 80mm
Weight	EL-N-1/2/3 weight 1.8Kg / 1.9Kg / 2.0Kg Product packaging (including accessories & PoE Injector) 4.0Kg, Shipping cartons 4 box total is 16Kg

### Environmental Tolerable Specifications

Operation temperature	-30 ~ 70°C
Humidity	0% ~ 95% Non-condensing
Storage temperature range	-40~ 85°C
Waterproof and dustproof	Outdoor IP68 rated

### Product Certification

Certification	FCC NCC (Taiwan) BSMI (Taiwan)
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## Software Specification

Network Switching Software Function	
Network bridging functionality	<ol style="list-style-type: none"> <li>1. Mesh network data transmission with Data Link Layer interface of OSI (Open System Interconnection Reference Model) Layer 2 data Link &amp; Layer 3 to achieve fast data transfer and automatic healing links to reduce selection path delay And multi-hop relay bandwidth attenuation, to provide more than 100Mbps after 16 hops of bandwidth.</li> <li>2. PTP Mesh Private enclosed wireless backhaul transmission system technology</li> <li>3. With PTP Mesh Ring loop disconnection and recovery backup transmission function</li> <li>4. PTP Mesh Hops with 250 consecutive wireless hops relay platform of low loss bandwidth and low latency response technology.</li> <li>5. Fast Transparent Forwarding.</li> <li>6. Support IGMP Snooping for Internet Group Management Protocol. (IGMP V2 &amp; IGMP V3)</li> <li>7. Support Management VLAN and Data VLAN 15 Group QoS. (WMM)</li> </ol>
Wireless Device Operation	
System operation mode	Support AP / STA (Station) / PTP Mesh (PTP / PTP Mesh Hops / PTP Mesh Ring / Multi PTP Mesh Ring) operation modes
Wireless operation multi-mode and multi transmission interface operation	Support wireless operation multi-mode and wireless multi transmission interface, according to operational needs set to switch to AP or PTP Mesh mode of operation and cope with multi-link relay platform and pooled data transmission and surf Internet service and other system needs.
Supports wireless IGMP communication protocol	IGMP Snooping protocol to solve the transmission requirements of multiple is monitoring and management units at the same time to capture a large number of video broadcast packets, and improve the efficiency of IP multimedia streaming.
PTP Mesh Ring wireless multi-loop automatic redundancy	<ol style="list-style-type: none"> <li>1. PTP Mesh Ring with the backhaul of the hops to automatically detect the disconnect circuit or increase the set Cost to specify the function of disconnecting the loop point</li> <li>2. PTP Mesh Ring is equipped with the backbone of the hops platform to automatically detect and repair the redundant connection</li> <li>3. With Multi PTP Mesh Ring multi-group loop disconnection and automatically detect repair backup connection function</li> <li>4. Support across wireless and wired different networks to run PTP Mesh Ring auto-detecting and repairing redundant connection function</li> <li>5. Support automatic find the best transmission path</li> <li>6. Support automatic multi-outlet network shunt balance function</li> <li>7. With automatic update system node message function</li> </ol>

<p>PTP Mesh Hops multi-loop continuous relay platform function</p>	<ol style="list-style-type: none"> <li>1. PTP Mesh Hops Low-loss bandwidth technology for 250 times hops stations</li> <li>2. PTP Mesh Hops increases the delay time by 1ms for each hop, and increases by 1ms every third or four hops.</li> <li>3. PTP Mesh Hops relay platform transmission bandwidth TCP packet: Hop 8 times up to 150Mbps bandwidth Hop 12 times up to 120Mbps bandwidth Hop 16 times up to 100Mbps bandwidth UDP / Broadcast / Multicast packets: Hop 10 times up to 200Mbps bandwidth</li> </ol>
<p>Support wireless parameter adjustment function</p>	<ol style="list-style-type: none"> <li>1. Support channel / transmission power / data rate (ML-N series) / maximum distance parameter adjustment settings, in order to improve the stability of the transmission link.</li> <li>2. Support advanced wireless parameter setting, optimize the wireless transmission signal quality and transmission stability, including PTP Mesh Ring loop architecture Cost parameter settings and antenna tuning when the radio frequency optimization.</li> </ol>
<p>Support wireless environment detection and scanning function</p>	<p>Support wireless environment detection and scanning function, it can help user to set up the wireless frequency evaluation. (AP mode can scan all frequencies, PTP Mesh mode only sweep the set frequency of the upper and lower 20MHz +20 MHz range)</p>
<p><b>Transmission efficiency and PTP Mesh hops bandwidth</b></p>	
<p>From the wireless interface transmit to the wired interface (TCP / RTP)</p>	<ol style="list-style-type: none"> <li>1. One wireless RF module interface, from wireless interface transmit to wired interface the transmission bandwidth up to 180Mbps / 220Mbps max</li> <li>2. Two wireless RF module interface, from wireless interface transmit to wired interface the total transmission bandwidth up to 300Mbps / 320Mbps max</li> <li>3. Three wireless RF module interface, from wireless interface transmit to wired interface the total transmission bandwidth up to 320Mbps / 330Mbps max</li> </ol> <p>(This information can help you to determine the backhaul transmission bandwidth max)</p>
<p>PPS Number of short packet transmissions</p>	<ol style="list-style-type: none"> <li>1. One wireless RF module interface can send short packets &gt; 20,000 or more</li> <li>2. Two wireless RF module interface can send short packets &gt; 28,000 or more</li> <li>3. Three wireless RF module interface can send short packets &gt; 28,000 or more</li> </ol> <p>(In response to multiple devices connected, the Department of the transmission capacity of a number of packets to determine the basis)</p>

<p>PTP Mesh Hops</p>	<p>PTP Mesh hops times of wireless transmission bandwidth: The first hop can support transmission bandwidth is 180Mbps or more The second hop can support transmission bandwidth is 160Mbps or more The third hop can support transmission bandwidth is 155Mbps or more The fourth hop can support transmission bandwidth is 150Mbps or more The fifth hop can support transmission bandwidth is 145Mbps or more</p> <p>PTP Mesh hop10 times after the platform, the transmission bandwidth is still up to 120Mbps or more &gt; = 10 hops response delay &lt;20ms</p> <p>(Encounter buildings or hillside terrain or trees and other obstacles to the situation, can be hop several times relay turn transmission)</p>
<p style="text-align: center;"><b>Data Security Encryption and Device Security Management</b></p>	
<p>Data security encryption</p>	<ol style="list-style-type: none"> <li>1. PTP Mesh network system with a private enclosed wireless transmission system security features.</li> <li>2. Support wireless group security mechanism having a system group ID (Main Group ID) and a neighboring node connection ID (Link ID)</li> <li>3. Have the service organization code (SSID) wireless security mechanism.</li> <li>4. Have WPA / WPA2 PSK / CCMP AES key encryption.</li> </ol>
<p>Equipment safety management</p>	<ol style="list-style-type: none"> <li>1. With the operation interface of the account secret input set security function</li> <li>2. Firmware software update: dual backup design.</li> <li>3. The core software authentication encryption, the use of random matrix encryption technology.</li> <li>4. The mutual authentication mechanism between the device and the central end (in development), and the interoperable devices between different vendors.</li> </ol> <p>(PC installs on authentication software or export-side equipment to play-Root, multiple Root, the system can mutual backup).</p>
<p style="text-align: center;"><b>System management and system maintenance function</b></p>	
<p>System management functions</p>	<ol style="list-style-type: none"> <li>1. Manage the HTTP (s) WEB GUI through a web browser.</li> <li>2. Support management VLAN tag.</li> <li>3. Supports the client side by network time protocol calibration (NTP Client).</li> <li>4. Supports dual configuration files / Factory Defaults.</li> <li>5. Support multi-level management Multiple Level Management.</li> <li>6. Support L2-MAC layer system scanning and automatic detection display and software sub-automatic update of the simple network management.</li> </ol>

<p>System maintenance function</p>	<ol style="list-style-type: none"> <li>1. Software support Hardware Watchdog.</li> <li>2. To provide dedicated simple system network management software.</li> <li>3. Optional SNMPv2c / v3, standard / private MIBs are supported (optional).</li> <li>4. To provide customized ODM modification, configuration, management.</li> <li>5. Support firmware files for dual backup.</li> <li>6. Support firmware upgrade / firmware file rewrite back (downgrade).</li> </ol>
<p><b>System construction erection of auxiliary tools</b></p>	
<p>Wireless connectivity signal scanning and connectivity auxiliary tools</p>	<ol style="list-style-type: none"> <li>1. With the wireless set up the environment to detect scanning capabilities to facilitate the wireless engineering and technical personnel to determine the use of channel selection reference</li> <li>2. Support dynamic wireless signal and transmission rate and flow display icon to facilitate wireless engineering and technical personnel to determine the stability of wireless systems</li> <li>3. Support the local side and the remote side of the wireless devices, each other to detect the connection signal value and transmission rate and encryption or other information display mechanism to facilitate wireless engineering and technical personnel in the future maintenance, to determine the wireless system at both ends of the signal operation situation</li> </ol>
<p>Antenna tuning and transmission bandwidth and packet loss rate testing tools</p>	<ol style="list-style-type: none"> <li>1. With the antenna set upped, through the built-in software for wireless antenna proofing adjustment mechanism to obtain local and remote far side of the wireless RSSI signal strength information to determine the antenna alignment or not conducive to the construction staff antenna tuning operations</li> <li>2. Software testing mechanism to support the transmission of wireless links to confirm the transmission bandwidth of wireless systems can exceed 150Mbps or more, and display transmission packet loss rate, in order to determine the connection transmission stability</li> </ol>

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Note 1: The IOP-DPOE-OSW1248-4 outdoor 4-port PoE Switch can be used to expand the remote power control through switch PoE ports to control and management the four PoE devices enable or disable. The wireless operation can be performed through the web page of the wireless device operation web UI icon and setting remote power control and switch control by day time schedule.

Note 2: the Advantech Company's EKI-7720G Trunk Switch can be used with the double trunk bandwidth switch to double the EL-N-1's wireless backhaul bandwidth to achieve multi-frequency, multi-channel, low interference and large integrated bandwidth of wireless transmission backhaul solution.



## Package Contents

1. IO-Power Outdoor EL-N Series PTP Wireless Mesh Network System (IOP-EL-N-1/2/3 Series)
2. Passive mode PoE-PSE Power over Ethernet Injector (48Vdc 1.5A Max)
3. AC 100 ~ 240V / 1.2A ~ 2.0A to DC 19V / 4.7A adapter
4. AC Code 1.5 meter power cord
5. Rod-type / wall-mounted bracket and U-shaped screws and set screws

***If any of the above items are missing, please contact your reseller.***

### >>>> Select with 2.4GHz & 5.8GHz dual-band Wireless RF module recommendations:

1. Based on wireless surf Internet service need for 2.4GHz WiFi signal coverage of the project application requirements, the proposed dual-band with the choice of wireless RF module.
2. For the frequency of 5GHz is covered by other wireless strong interference or suffer serious wireless signal interference or other special interference, need to replace and use of 2.4GHz frequency of the project application requirements, it is recommended to choose the dual-band wireless RF module.
3. For special transmission application requirements (such as military or hospital area wireless transmission), if necessary, take the choice of dual-band wireless RF module.

Note 1: Choose the high-power dual-band wireless RF card module, will add double power consumption than the high-power single-frequency wireless RF card module.

Note 2: Choice the high-power dual-band wireless RF card module, will add 10°C ~ 15°C the temperature than the high-power single-frequency wireless RF card module.

Optional with: DNMA-H92 IEEE 802.11 a/g/n, 2T2R MIMO, Data Rate 300Mbps

### IEEE 802.11g

	Data Rate	Output Power	Rx Sensitivity
11g RF 2300 ~ 2700MHz  Data Rate  Output Power  Rx Sensitivity	6Mbps	25dBm	-95dBm
	9Mbps	25dBm	-95dBm
	12Mbps	24dBm	-94dBm
	18Mbps	24dBm	-93dBm
	24Mbps	23dBm	-89dBm
	36Mbps	23dBm	-86dBm
	48Mbps	22dBm	-82dBm
	54Mbps	22dBm	-81dBm

## IEEE 802.11a

11a RF 5150 ~ 5745MHz 5805 ~ 5825MHz  Data Rate  Output Power  Rx Sensitivity	Data Rate	Output Power	Rx Sensitivity
	6Mbps	24dBm	-95dBm
	9Mbps	24dBm	-93dBm
	12Mbps	23dBm	-91dBm
	18Mbps	23dBm	-89dBm
	24Mbps	22dBm	-85dBm
	36Mbps	22dBm	-82dBm
	48Mbps	21dBm	-79dBm
	54Mbps	21dBm	-75dBm

Index MCS	IEEE 802.11gn /HT20				IEEE 802.11gn /HT40			
	Data Rate (Mbps)		Output Power dBm	Rx Sensitivity	Data Rate (Mbps)		Output Power dBm	Rx Sensitivity
	GI=800ns	GI=400ns			GI=800ns	GI=400ns		
MCS8	13	14.4	25	-95 dBm	27	30	24	-90 dBm
MCS9	26	28.9	25	-94 dBm	54	60	24	-90 dBm
MCS10	39	43.3	24	-92 dBm	81	90	23	-88 dBm
MCS11	52	57.8	24	-89 dBm	108	120	23	-85 dBm
MCS12	78	86.7	23	-86 dBm	162	180	22	-83 dBm
MCS13	104	115.6	22	-81 dBm	216	240	21	-78 dBm
MCS14	117	130.3	21	-80 dBm	242	270	20	-77 dBm
MCS15	130	144.4	21	-78 dBm	270	300	20	-74 dBm
Index MCS	IEEE 802.11an /HT20				IEEE 802.11an /HT40			
	Data Rate (Mbps)		Output Power dBm	Rx Sensitivity	Data Rate (Mbps)		Output Power dBm	Rx Sensitivity
	GI=800ns	GI=400ns			GI=800ns	GI=400ns		
MCS8	13	14.4	24	-94 dBm	27	30	22	-91 dBm



MCS9	26	28.9	23	-92 dBm	54	60	22	-89 dBm
MCS10	39	43.3	23	-90 dBm	81	90	21	-87 dBm
MCS11	52	57.8	22	-86 dBm	108	120	21	-84 dBm
MCS12	78	86.7	21	-83 dBm	162	180	20	-81 dBm
MCS13	104	115.6	20	-80 dBm	216	240	20	-77 dBm
MCS14	117	130.3	19	-78 dBm	242	270	18	-76 dBm
MCS15	130	144.4	17	-76 dBm	270	300	16	-73 dBm

Note: Output Power +- 1.5dBm