

ML-N PTP Mesh Hi-mobile wireless multipath transmission system



- Point to point hi-mobile wireless transmission system dedicated
- Support vehicle mobile speed (max) > 200Km/h
- Hi-mobile transmission bandwidth > TCP 100Mbps
- Hi-mobile fastest seamless handover < 10ms
- Support multi-module、multi-frequency、multi-connection to transmit by best multipath transmission function
- IGMP broadcast packet /network storm resolve technical



Model:

ML-N-1

ML-N-2

ML-N-3

- In wireless transmission, import point to point wired network transmission technology design
- Support Frequency 2.3GHz ~ 2.7GHz / 4.9GHz ~ 6.1GHz
- Support vehicle mobile speed (maximum) > 200Km/h
- Hi-mobile transmission bandwidth > TCP 100Mbps
- Hi-mobile fastest seamless handover < 10ms
- Support multi-module、multi-frequency、multi-connection to transmit by best multi-path transmission function
- Import point to point wired network transmission technology
- IGMP broadcast packet / network storm resolve technical

- Point to Point Wireless Mesh multipath Hi-mobile networks, can automatically maintain redundant multipath connection, and automatically selects the best transmission path
- Designed with a high-performance Multicast / Broadcast transmission characteristics, can greatly enhance the video multicast or broadcast efficiency, increase related applications.
- Support easy way of illustration, instantly rendering RSU node device connection status and OBU high-speed mobile wireless transmission node handoff connection status display.
- Private network and then with the wireless security encryption: AES 128 bits, so that wireless transmission is more secure confidential.

Product Highlights

➤ Import Point to Point Mesh multipath high-speed mobile transmission technology

Based on a wired or wireless network backbone, import point to point Mesh multipath high-speed mobile transmission technology that allows high-speed mobile transmission into a mobile point to point transmission, combined Mesh automatic backup connection and the best path transmission technology, truly simple high-speed mobile applications.

➤ Support multi-modules、multi-bands、multi-links to transmit by best multi-path transmission function

For wireless high-speed moving environment faced by connecting multiple changes, while the presence of radio frequency interference possibilities, ML-N product specially designed multi-module, multi-frequency, multi-connection function, in high-speed mobile transmission can support multiple multi-frequency detection with multiple connections, and finally the best path by the mobile connection, perform the operation of high-speed mobile transmission. So avoid the connection of a single frequency signal instability or bad or disturbed interruptions.

➤ Faster speed, higher transmission bandwidth, lower seamless handover time

Point to point high-speed mobile mesh wireless transmission system, support maximum moving speed > 200Km / h; high-speed travel, the transmission bandwidth > TCP 100Mbps; high-speed travel,



the fastest seamless handover switching < 10ms, so that more high-speed mobile transmission operating value.

➤ **Special Mesh network mechanisms to enable wireless communications link adds redundancy and stability**

Based on wireless mesh network systems and multi-module mesh wireless transmission system formed, introducing unique multipath Mesh network technology, wireless network system to achieve redundancy and automatic repair wiring and automatically determine the best path feature that lets the wireless transmission system operation more stable

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

ML-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.

➤ **For a variety of entities wired network backbone and different wireless backbone technical infrastructure**

Design Point to Point Mesh Hi-mobile wired network technology can be easily adapted to entities wired network backbone and different wireless technologies to formed wireless backhaul network infrastructure. Including: fiber optic cable backbone network, wired Ethernet backbone, general wireless hops wireless backbone ... and so on, can use Point to Point Mesh Hi-mobile wired network technology to do high-speed mobile transmission operation.

➤ **Wireless transmission security and encryption**

ML-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.

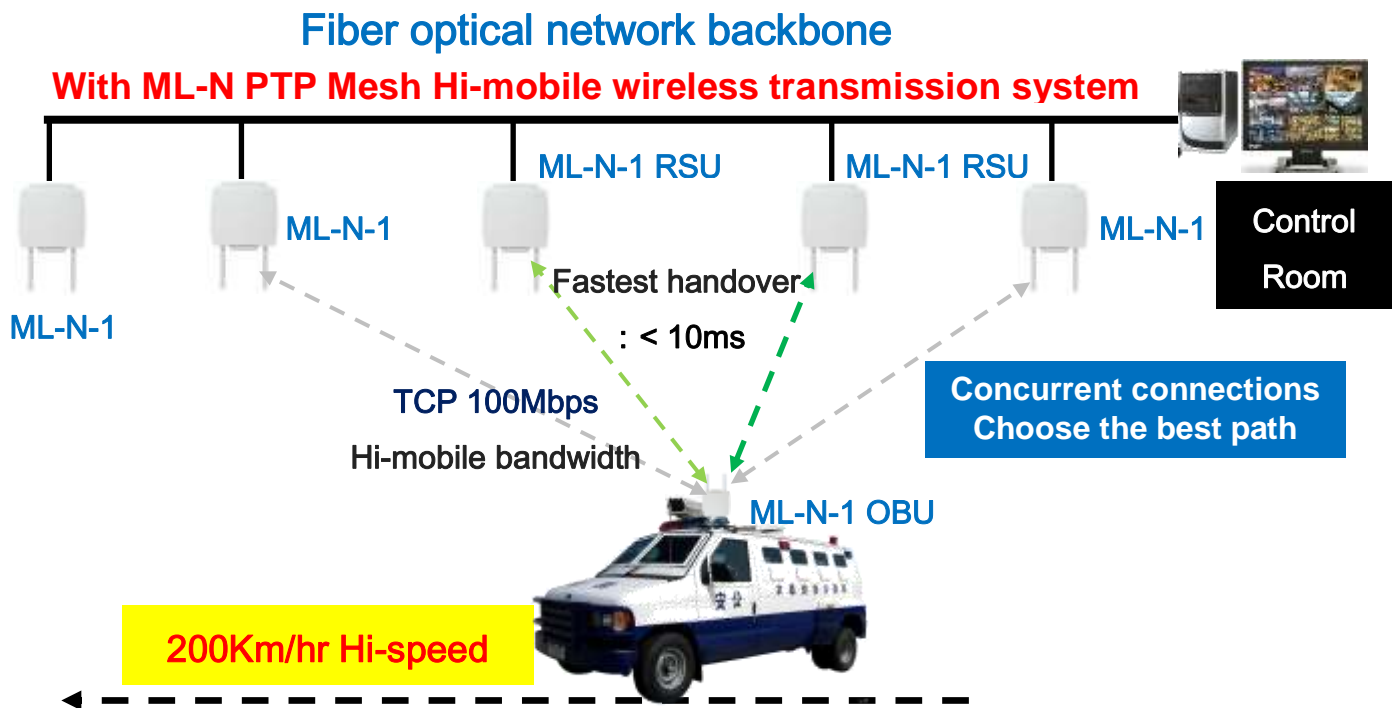
➤ **Wireless Signal Interference Makes Resistance Ability Excellent**

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)

ML-N architecture of high-speed mobile transmission system diagram

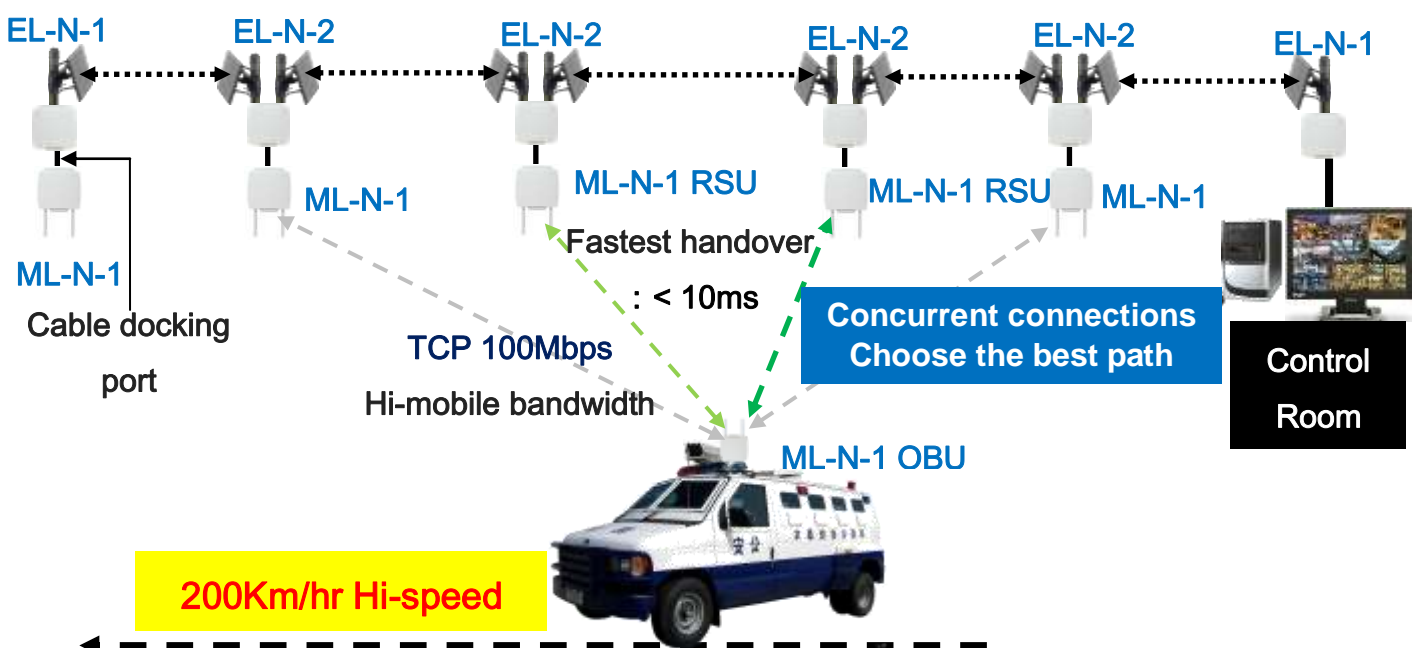
1. Fiber optical network backbone / general cable network backbone



2. EL-N PTP Mesh wireless network backbone

EL-N PTP Mesh wireless network backbone

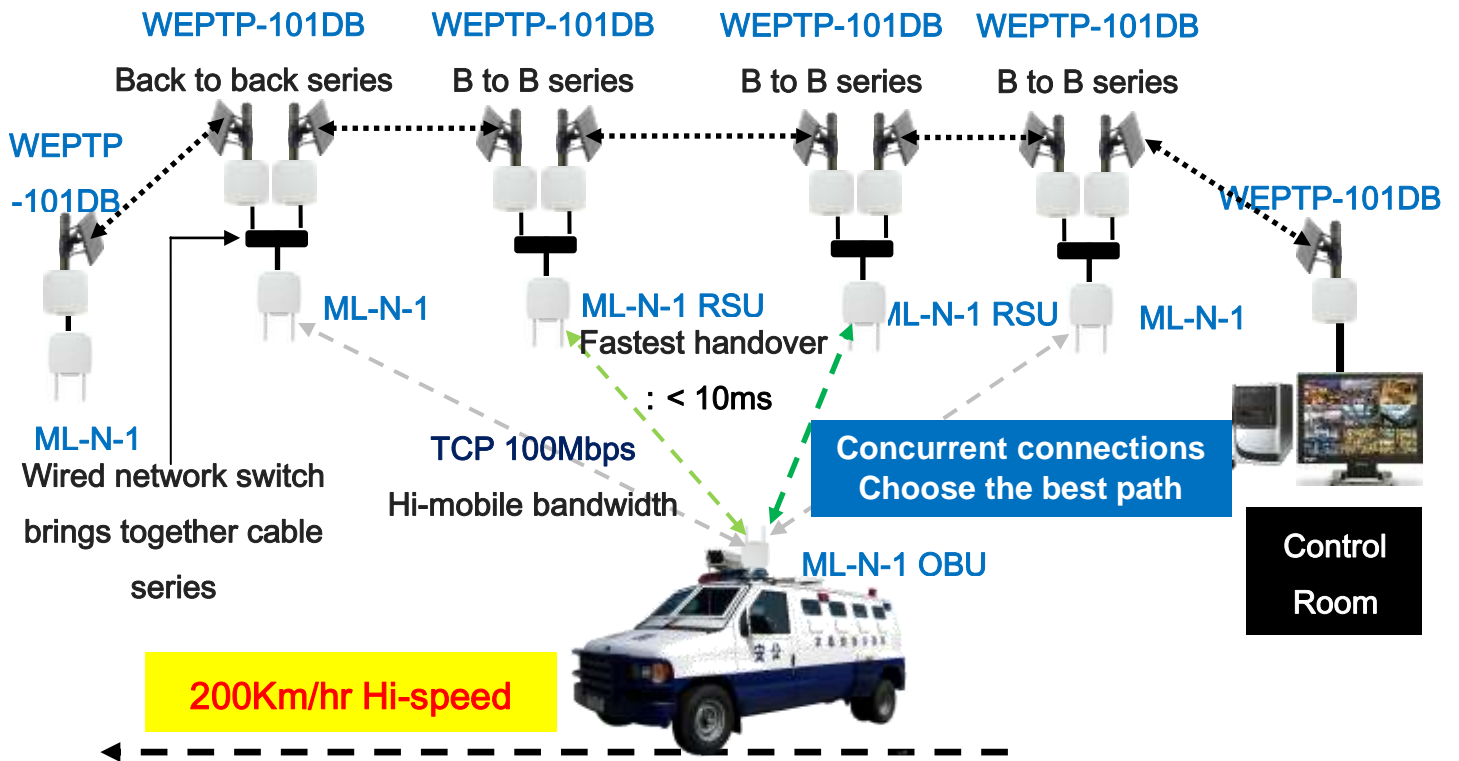
(EL-N wireless system can solve network broadcast storms and packet issues)



3. WEPTP-101DB or TRPTP-202DB back to back wireless network backbone

WEPTP-101DB or TRPTP-202DB back to back or wireless network backbone

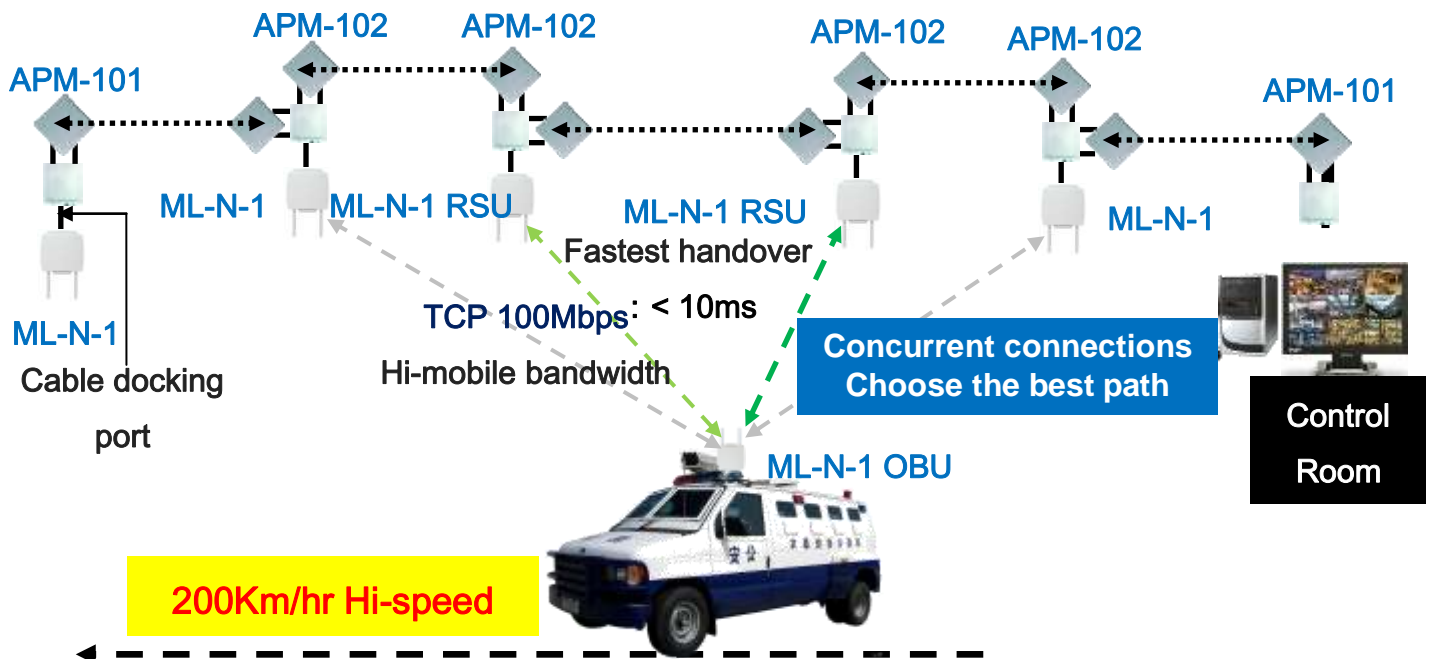
(WEPTP or TRPTP wireless system can solve network broadcast storms and packet issues)



4. APM-100 series multiple hops wireless backbone / general wireless devices back to back wireless backbone

APM-100 series multiple hops wireless backbone

With ML-N Mesh Hi-mobile wireless transmission system



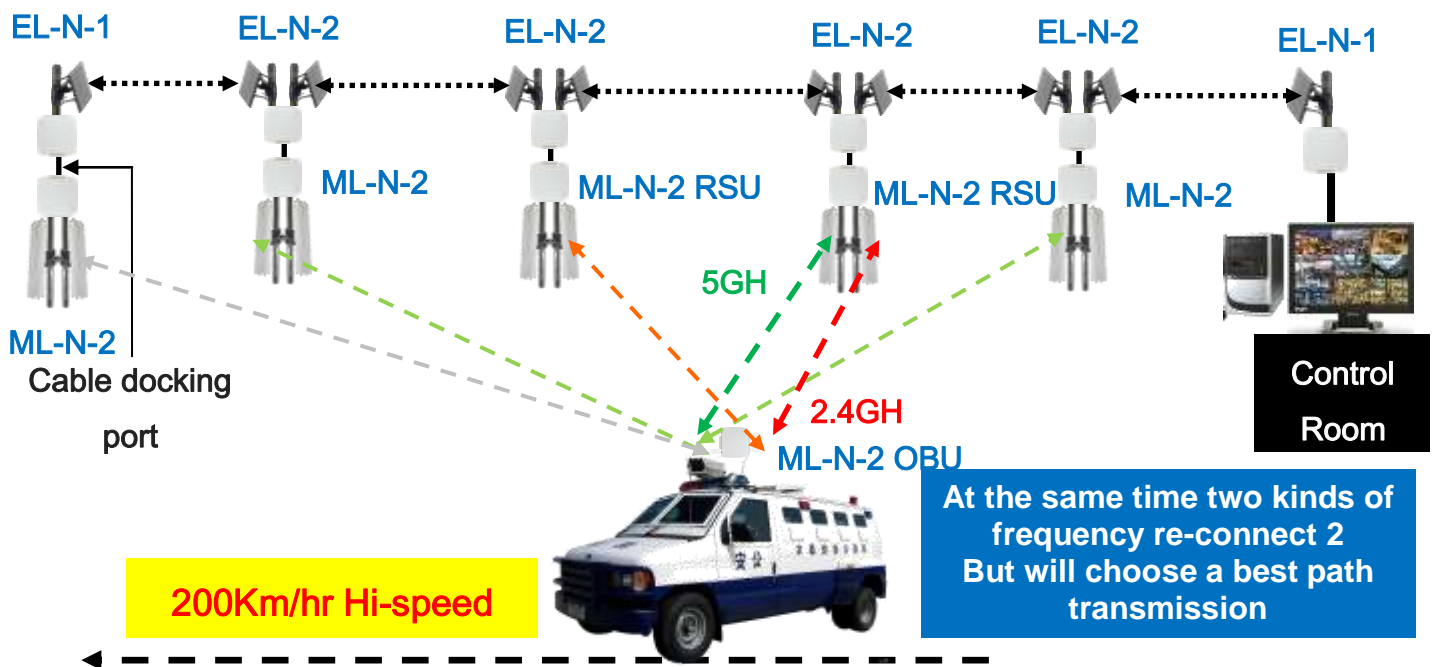
■ **ML-N architecture of Hi-mobile multi-interface module, a variety of radio frequency, multi-connection transmission system diagram:**

- **ML-N-2 to set up two interface modules, 2.4 & 5GHz dual band wireless frequency & two kinds Mesh connection, perform fast seamless handover transmission of high-speed mesh mobile**

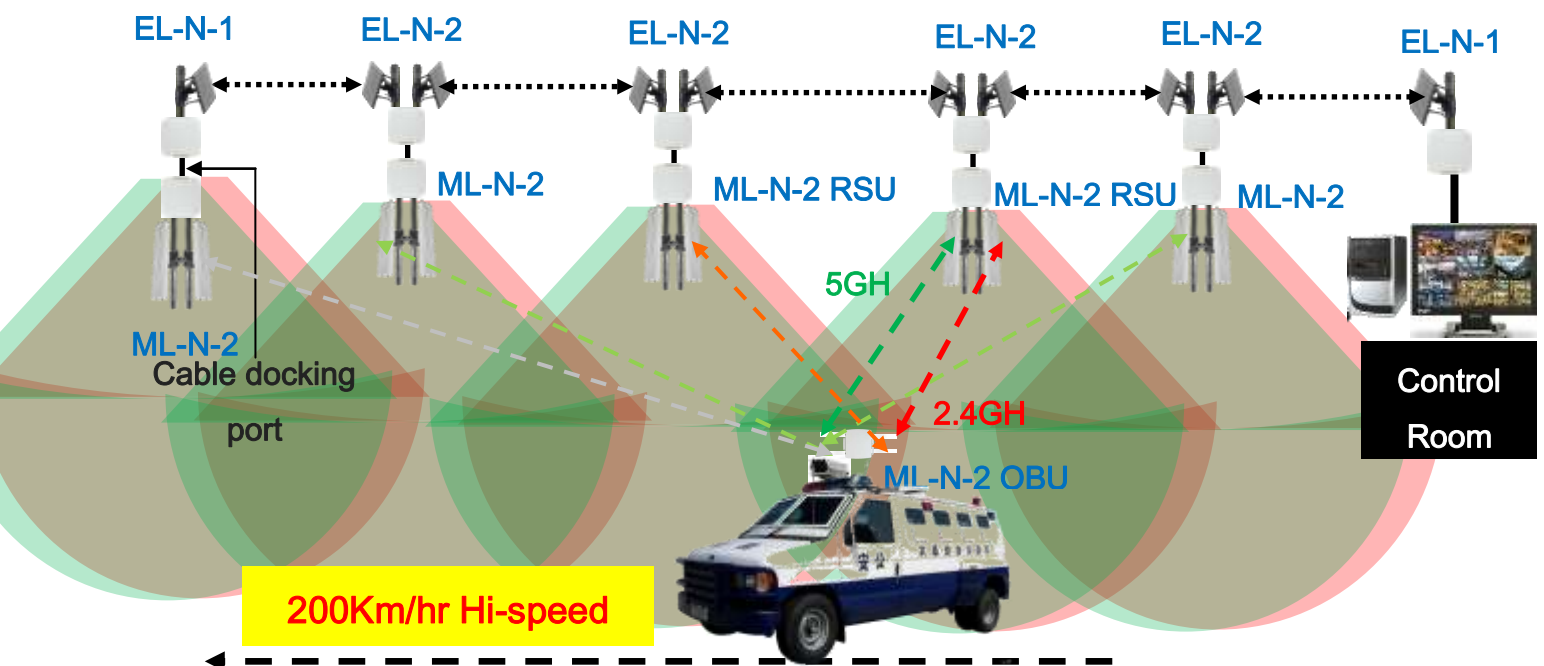
EL-N PTP Mesh wireless network backbone

With ML-N Mesh high-speed Hi-mobile wireless transmission system

2 module to work 2.4 & 5GHz dual band wireless frequency for 2 kinds Mesh Hi-mobile connection



- **2.4GHz & 5GHz with two different radio frequencies overlap of the wireless signal coverage**





Product Specification

Key Components

Main Processor	Atheros AR7161 (680Mhz)
Wireless Chipset	Atheros AR9220 mini PCI, Support IEEE 802.11n a/g, 2T2R MIMO, 300Mbps
Switch Controller	Atheros AR8035
Flash Memory	16MBytes
SDRAM	128MBytes

Interfaces Specifications

Wireless RF Module	EP09-HB91 mini PCI, 802.11a/n 2 x 2 MIMO 300Mbps, Output power 26dBm. DNMA-H92 mini PCI, 802.11a/g/n dual band 2 x 2 MIMO 300Mbps, Output power 23dBm. (Optional)
Frequency	4.9~6.1GHz / (2.3~2.7GHz) (Default 5GHz 11a/n 2x2 MIMO mini PCI)
Bandwidth	10MHz / 20MHz / 40 MHz
Wireless Interface	ML-N-1 : 2 x N-type Female Connectors ML-N-2 : 4 x N-type Female Connectors ML-N-3 : 6 x N-type Female Connectors
Ethernet Interface	10/100/1000 Base-T RJ-45 port with M25 Calbe Gland

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(±1.5)	-94 dBm	27	30	22(±1.5)	-90 dBm
MCS9	26	28.9	23(±1.5)	-92 dBm	54	60	22(±1.5)	-89 dBm
MCS10	39	43.3	22(±1.5)	-90 dBm	81	90	21(±1.5)	-87 dBm
MCS11	52	57.8	21(±1.5)	-87 dBm	108	120	20(±1.5)	-83 dBm
MCS12	78	86.7	20(±1.5)	-84 dBm	162	180	19(±1.5)	-80 dBm
MCS13	104	115.6	19(±1.5)	-80 dBm	216	240	18(±1.5)	-77 dBm
MCS14	117	130.3	18(±1.5)	-78 dBm	242	270	17(±1.5)	-75 dBm
MCS15	130	144.4	18(±1.5)	-76 dBm	270	300	17(±1.5)	-73 dBm



General Specs

Point to point multi-path mesh Hi-mobile system design Mesh Link ID transmission of high-speed mobile networks, users do not need a complex system settings, you can perform point-to-point wireless high-speed mobile handoff multipath transmission.

Using RSU (Road Side Unit) radio base station's signal coverage, with OBU (On Board Unit) mobile point devices, point to point wired high-speed mobile handoff mode of operation.

Support maximum moving speed :> 200Km/hr car moving at high-speed operation of the device.

Support for the highest performance: high-speed travel> TCP 100Mbps wireless network transmission bandwidth.

Support fastest switching: high-speed moving < 10ms a very short time of handover transmission

Support multi-module, multi-frequency, multi-connection optimal path transmission function, to ensure high performance of transmission and resistance complex environment demands.

Support easy way of illustration, instantly rendering RSU node connection status and OBU high-speed mobile wireless node handoff status display.

Fast Transparent Forwarding

IGMP Snooping -- IGMP (Internet Group Management Protocol)

VLAN / QoS Mapping

Wireless Security : AES 128 bits

Antenna Alignment : WEB GUI Local / Remote Information

Firmware Upgrade : Dual Images

Power requirements: supports 802.3af/at 48VDC PoE Passive 1A, support 1Gbps Ethernet bandwidth

Size: 260mm * 250mm * 80mm

Weight: ML-N-1/2/3 weight 1.8Kg / 1.9Kg / 2.0Kg, product packaging (including accessories) 3.7Kg, shipping

Operation temperature : - 40°C ~ + 70°C

Humidity : 0% ~ 95% Non-condensing

Storage temperature range : - 40°C ~ + 85°C

Waterproof and dustproof : IP 68

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Package Contents

1. IO-Power Outdoor ML-N PTP Mesh Hi-mobile Wireless Multipath Transmission System
(IOP-ML-N-1/2/3 Series)
2. PoE Power Injector
3. Power Adapter
4. AC Power Code
5. Mounting Kit & Screw

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