User Manual

Model: LAP , LAQ

802.11ac Outdoor PoE Access Point

Customer Project Name:
LAP-1, LAP-2

LITE-ON Project Name:
WP9331D1-FT24 (LAP, LAP with antenna type I.)
WP9331D2-FT24 (LAQ, LAP with antenna type II.)

Version: V1.1

1 Product Descriptions

The LAP, LAQ is a 2-radio, dual band dual concurrent, 802.11ac wave 2 access point. It provides powerful WLAN supporting wireless speed up to 400Mbps on 2.4GHz and 867Mbps on 5GHz, one Ethernet port to connect to the backbone network, another one Ethernet port can be aggregated to connect to one computer through the cable. LAP, LAQ could be powered by 24VDC/48VDC PoE injector which is supplied by customer. There are two SKUs:

LAP: Type I antenna - target HPBW 170(H) x 90(V) (LAP-1)

LAQ: Type II antenna - target HPBW 120(H) x 30(V) (LAP-2)

To protect data during wireless transmission, the device supports WEP data encryption and WPA/WPA2 wireless security to ensure network safely.

The LAP, LAQ is ideal for a variety of medium density enterprise and hotspot environments.

***Note**:*

Optional features are not included in default SKU and to be quoted separately if required afterwards.

2 Product Specifications and Features

2.1 H/W Features

2.1.1 Specification

Key Components / Connectors / Performance	
Processor	QCA IPQ4029 - **IPQ-4029-1-583MSP-MT-00-0 (I-Temp)**
Wireless Chipset	Integrated with IPQ4029 – 2.4G Integrated with IPQ4029 – 5G
GE PHY	QCA8075 - **QCA-8075-1-108DRQFN-MT-00-0 (I-Temp)**
SPI Flash	**32** Mbytes
NAND Flash	-
DDR3	**512** Mbytes
Console	Internal console port
Interfaces	

Ethernet	1x 10/100/1000 Base-TX MDI/MDIX RJ-45 port with PoE PD (to engage with passive PoE injector which is provided by customer.) 1x 10/100/1000 Base-TX MDI/MDIX RJ-45 port Pin definitions : 1/2/3/6 for Data transmission 4/5 for postive power pin 7/8 for negative power pin Compliant with following standards: 1. IEEE 802.3/802.3u 2. Hardware based 10/100/1000, full/half, flow control auto negotiation 3. Full duplex IEEE 802.3x flow control and half duplex back-pressure flow control

Wireless	802.11n 2.4GHz on board 802.11ac 5GHz on board
	2 internal antennas – 2.4G 2 internal antennas – 5G
	IEEE 802.11a, IEEE 802.11b, IEEE 802.11g, IEEE 802.11n, IEEE 802.11ac compliant
	Data Rate: 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 802.11g: 54, 48, 36, 24, 18, 12, 9 & 6 Mbps 802.11b: 11, 5.5, 2 & 1 Mbps 802.11n: 20 MHz BW: 130, 117, 104, 78, 52, 39, 26, 13Mbps 40 MHz BW: 270, 243, 216, 162, 108, 81, 54, 27 Mbps 802.11ac: 20MHz BW : 173, 144, 130, 115, 86, 57, 43, 28,14 Mbps 40MHz BW : 400, 360, 300, 270, 240, 180, 120, 90, 60, 30 Mbps 80MHz BW : 867, 780, 650, 585, 520, 390, 260, 195, 130, 65 Mbps
	Modulation: 802.11b: CCK (11&5.5 Mbps), DQPSK (2Mbps), DBPSK (1Mbps) 802.11a/g/n/ac: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
	2.4GHz Operating Frequencies: USA – FCC 2412~2462MHz Canada – IC 2412~2462MHz Europe – ETSI 2412~2472MHz The available channels are subject to the country regulatory.
	5GHz Operating Frequencies: 5150MHz ~ 5350MHz for US & Canada 5150MHz ~ 5350MHz for Europe 5470MHz ~ 5725MHz for Europe 5030MHz ~ 5091MHz and 5150MHz ~ 5250MHz for Japan 5150MHz ~ 5350MHz for Australia 5470MHz ~ 5725MHz for Australia (except channel 120, 124 and 128) 5725Mhz ~ 5825Mhz for Australia 5865MHz could be supported with software enabled. The available channels are subject to the country regulatory.
	Maximum output power (per chain): 2.4GHz band (discrete PA/LNA) 802.11b: 24 +/- 2 dBm 802.11n: 24 +/- 2 dBm 802.11g: 24 +/- 2 dBm 5GHz band (discrete PA/LNA) 802.11a: 24 +/-2 dBm 802.11n: 24 +/-2 dBm 802.11ac: 24 +/-2 dBm
	Rx sensitivity: 2.4GHz band, 802.11b@11Mbps: -93 +/- 2dBm 802.11g@54Mbps: -76 +/- 2dBm 802.11n BW40 MCS7: -70 +/-2 dBm 5GHz band, 802.11a @6Mbps: -93+/- 2dBm 802.11a @54Mbps: -76+/- 2dBm 802.11n BW40 MCS7 : -68 +/- 2dBm 802.11ac BW80 MCS9: -60 +/- 2dBm

	Target type-I antenna HPBW: 170(H) x 90 (V) (Simulated results: HPBW: 185(H) x 90(V) @2.4GHz, HPBW: 178(H) x 71(V) @5GHz) Target type-II antenna HPBW: 120(H) x 30 (V) (Simulated results: HPBW: 115(H) x 50(V) @2.4GHz, HPBW: 115(H) x 50(V) @5GHz) Peak Gain: > 5.0dBi Typical – 2.4G Peak Gain: > 5.0dBi Typical – 5G Note: The HPBW depend on the optimized EVT results.
	Impedance: 50 Ohm nominal
	Antenna efficiency - 2.4G: 50% Antenna efficiency - 5G: 60%
	V.S.W.R.: 2.0:1 Max
Reset	1 x reset button

2.1.2 LED indicators

- **from top to bottom (total 5 LEDs)**

PWR		2.4GHz	5GHz	LAN2	LAN1 (PoE)

Location	LED Indicative		Color	Status	Description
Per device	Power		Green	Solid Light	Power on
				Light off	Power off
	WLAN	5G	Green	Solid Light	Connect to WLAN port
				Blinking	WLAN activity present
				Light off	No activity or power off
			Amber		Reserved
		2.4G	Green	Solid Light	Connect to WLAN port
				Blinking	WLAN activity present
				Light off	No activity or power off
			Amber		Reserved
Per port	LAN		Amber	Solid Light	Device connected to LAN port at 10/100/1000Mbps
				Blinking	LAN Activity present
				Light off	Not Connected

2.2 Antenna

❖ Internal antenna (Type I antenna for LAP)

- 2 × 2.4GHz antennas, Target HPBW: 170 x 90 degree, peak gain > 5.0dBi

(The simulated results at 2.4GHz band are HPBW 185 x 90 degrees, peak gain is about 5.5dBi. The final results depend on the test reaults on EVT/DVT samples.)

- 2 × 5GHz antennas, Target HPBW: 170 x 90 degree, peak gain > 5.0dBi

(The simulated results at 5GHz band are HPBW 178 x 71 degrees, peak gain is about 6.5dBi. The final results depend on the test reaults on EVT/DVT samples.)

❖ Internal antenna (Type II antenna for LAQ)

- 2 × 2.4GHz antennas, Target HPBW: 120 x 30 degree, peak gain > 5.0dBi

(The simulated results at 2.4GHz band are HPBW 115 x 50 degrees, peak gain is about 8.0dBi. The final results depend on the test reaults on EVT/DVT samples.)

- 2 × 5GHz antennas, Target HPBW: 120 x 30 degree, peak gain > 5.0dBi

(The simulated results at 5GHz band are HPBW 115 x 50 degrees, peak gain is about 8.0dBi. The final results depend on the test reaults on EVT/DVT samples.)

2.3 Power Supply

❖ LAP, LAQ should be powered by 24VDC POE Injector (PoE injector is supplied by customer) or by 24VDC battery pack (external battery pack is supplied by customer) in standalone application.

❖ In Master-Slave daisy chain application, master LAP, LAQ should be able to be powered by 48VDC passive PoE injector and the slave LAP, LAQ -FT24 is powered by master LAP, LAQ

2.4 Reset

LAP, LAQ shall support an external reset mechanism which is not easy touched.

❖ Press and release the reset button to reboot the AP.

❖ Press and hold the reset button *"in the order of 50 seconds" (for reference only)* to reset the AP to factory defaults.

2.5 Watch dog

It shall be capable to recover IPQ4029.

2.6 S/W Features

Software specification		
Feature Item	**Feature**	**Detailed Description**
Wireless	Wireless mode	11b/g/n 11a/n/ac
	Operation mode	Access point mode (Support both normal station and WDS station)
	Bandwidth	20MHz 20/40MHz dynamic 20/40/80MHz dynamic
	Aggregation in 11n mode	A-MPDU
	SSID	Support 4 virtual AP
	QoS	EDCA WMM QoS-DSCP configurable via web UI
	Other parameter configurable via Web UI	Transmit power adjustable (four level: full, 1/2, 1/4, 1/8) DTIM Guard interval (short/long)
Security	Authentication	WPA/WPA2 Personal (PSK), 802.1x Authentication with RADIUS Client Enterprise (802.1x): PEAP, TTLS, TLS
	Encryption	AES, TKIP, WEP 64/128,
Management	Network setting	IPv4 static IP & DHCP client
	Statistics	Statistics of wired, wireless associated stations accessible
	SNMP v1/v2/v3	MIBII *(survey throughput, data statistics, location)*
	Wireless ACL in AP mode	Based on MAC address
	Firmware upgrade	via Web UI via SNMP
	System log	Syslog
	Discovery tools	LITE-ON Locator

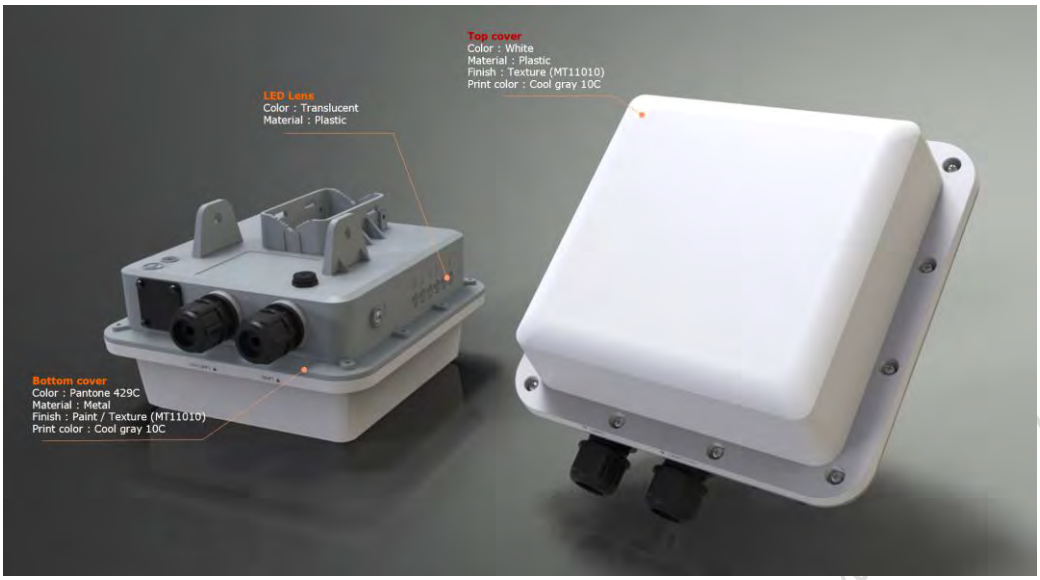
For customization, like GUI / SNMP MIBs/ configuration tool or customer internal utility, will discuss with customer once project is awarded.

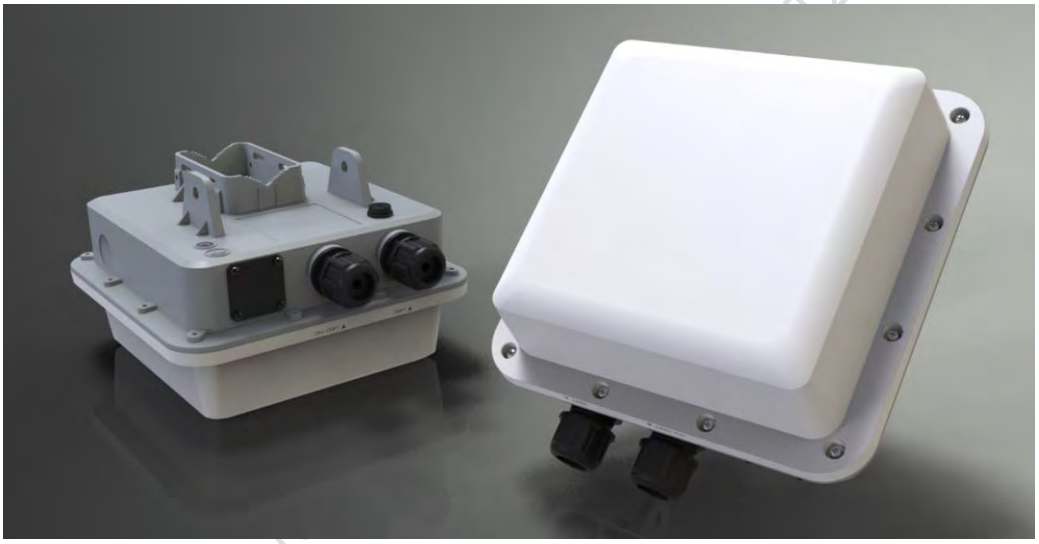
3 Mechanical and Environment Design

3.1 Case (details refer to ME drawing separately)

3.1.1 ID and Dimension

- Product dimension: 213.9mm × 213.9mm × 109.0mm
- Customer logo should be arranged on the label stick on the bottom cover. (Request by FRONTiir to remove the logo on top cover and put it on the label which is stick on bottom case.)


Top cover
Color : White
Material : Plastic
Finish : Texture (MT11010)
Print color : Cool gray 10C
LED Lens
Color : Translucent
Material : Plastic
Bottom cover
Color : Pantone 429C
Material : Metal
Finish : Paint / Texture (MT11010)
Print color : Cool gray 10C




213.9 mm
213.9 mm
109.0 mm

3.1.2 Mounting Kit

a. **(Standard Accessories)** - Pole mount (mounting kit code: OP-2-N, details refer to ME drawing separately) The proposal only supports pole mounting. Standard accessories include two metal clamps.

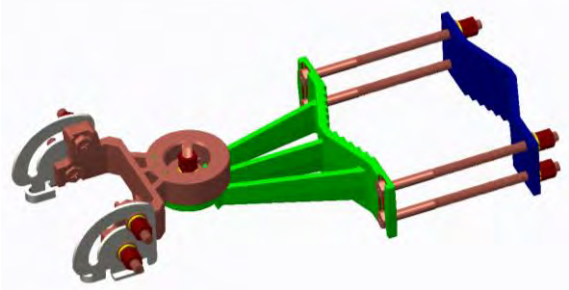
Pole mounting with two metal clamps [mounting kit code: OP-2-N]

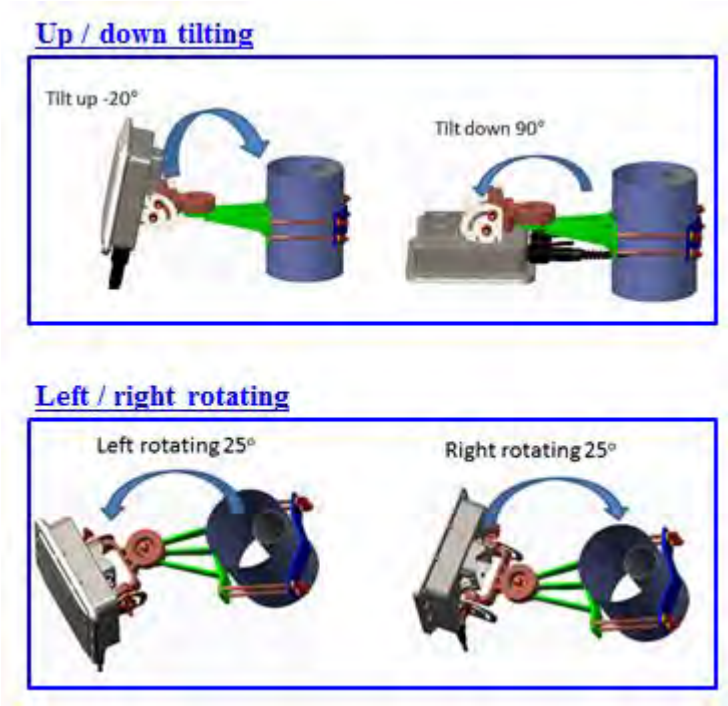
b. **(Standard Accessories) -** Wall mount (mounting kit code: OW-1-N, details refer to ME drawing separately) The proposal only supports wall mounting. Standard accessories include one bracket and its screws.

Wall mounting with one bracket and its screws [mounting kit code: OW-1-N]

c. **(Optional, to be quoted separately)** Pole mount & Wall mount with extra mounting brackets (mounting kit code: PW-5-N, details refer to ME drawing separately) With extra mounting brackets and the screws, LAP, LAQ can be mounted on pole with the ability of being 90D to the ground.

The mount kit can support Φ60 ~ Φ140mm pole diameter.

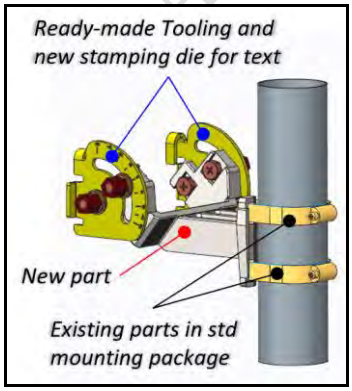


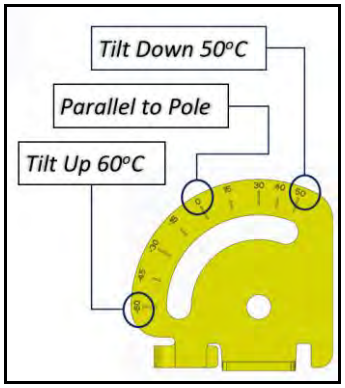


Extra brackets and screws [mounting kit code: PW-5-N]

d. **(Optional, to be quoted and packed separately)** Pole mount & Wall mount with extra mounting brackets (mounting kit code: PW-4-N, details refer to ME drawing separately): With two extra mounting brackets and the screws, LAP, LAQ can be mounted on pole with the ability of tilt up from 0 to 60 degrees and tilt down from 0 to 50 degrees. The mount kit can support Φ22 ~ Φ50mm pole diameter.

Note:
Two metal clamps packaged in standard pole mounting accessory are reused in this option.






Tilt up 60 degrees (22mm)


Tilt down 30 degrees (22mm)


Tilt down 50 degrees (22mm)

3.2 Physical & Environment

3.2.1 Operation Temperature

- Temp: -40° C to +65° C
- Humidity: 5% ~ 95%R.H non-condensing

3.2.2 Storage Temperature

- Temp: -40° C to +70° C
- Humidity: 5% ~ 95% non-condensing

3.2.3 IP Grade: IP67

3.2.4 Wind resistance

- Sustained wind: 100MPH
- Wind gust: up to 165MPH

4 Package Contents

Package Contents

- One Giftbox
- One Plup tray
- One unit of LAP, LAQ and its embedded software
- One screw kit for wall mounting & poll mounting (3.1.2 a & b)

5 Certification Requirements

STATUATORY (Standard)

- USA FCC (Non DFS)
- ESD protection: 4KV (prestest at LITEON lab by following IEC61000-4-5 standard)

Note: Primary covered the certificates of FCC for Non-DFS bands; multiple countries certificate to be quoted separately

SAFETY

- Surge protection: 4KV (Prestest at LITEON or 3rd party lab by following IEC61000-4-5 standard)

Others

- RoHS (self- announcement)
- WEEE (self- announcement)

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Professional installation is required

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 24cm between the radiator & your body.