MIMO New Series

Dual Band 2x2 MIMO 802.11ac/a/b/g/n Versatile Indoor Access Point

710MHz CPU / 2x GE Port / 802.11ac Wave 2

Model: MMN428HV

KEY FEATURES

- Qualcomm Atheros IPQ4028 Quad-core ARM cortex-A7 710MHz CPU
- 2x2 On-board 5GHz radio, up to 867Mbps physical data rate
- 2x2 On-board 2.4GHz radio, up to 300Mbps physical data rate
- Supports MU-MIMO

APPLICATIONS

- 802.11n/ac Access Point
- Point-to-MultiPoint High Capacity Wireless Bridge
- Wireless Customer-Premises Equipment (CPE)

Specifications

Chipset	CPU: Qualcomm Atheros IPQ4028 710MHz
System Memory	256MB DDR3
NOR Flash	32MB
NAND Flash	128MB
Wireless	On-board 2x2 2.4GHz 802.11b/g/n, max 19dBm per chain On-board 2x2 5GHz 802.11a/n/ac, max 18dBm per chain
Antenna	Flatant-2x2-dualband-6dBi : Internal flat antenna
Frequency Range	2.412~2.472GHz, 5.180~5.825GHz, simultaneous dual band
Modulation Techniques	OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
Interface	2x Gigabit Ethernet LAN RJ45 Port with Auto MDI-X 1x Serial Port 4 Pin Connector[1] 1x JTAG 20 Pin Connector[1] 1x M.2 (NGFF) “B Key” Socket for 4G Module[1] 1x USB 3.0 Port
Reset Button	1x F/W Reset Button
LED	7x LED Indicators: Power, 2x LAN Activity, 4x Received Signal Strength
Power over Ethernet	IEEE 802.3af/at or Passive PoE 36-56V
DC Power	1x DC Jack Connector: 24-56V
Operating Voltage	3.3V, 5V
Power Consumption	19W
Supported Operating System	CompexWRT or OpenWRT/LEDE[2]
Certification	RoHS Compliance, CE and FCC pending
Environmental	Temperature: Operating: -20°C to 70°C, Storage: -40°C to 90°C Humidity (non-condensing): Operating: 5% to 95%, Storage: Max. 90%
Ceiling Mount	No
Dimensions (L x W x H)	129mm x 129mm x 51mm
Extras	2 x SIM Card Slots, 1 x Buzzer
Other Features	Surge Suppressor, Supports Dynamic Frequency Selection (DFS)

1. These features can only be accessed on the Embedded Board.

2. For more information on OpenWRT, please refer to the Software section for more information.

**Configurations are subject to change without notifications.*

RF Performance Table

	Data Rate	TX Power (per chain)	TX Power (2 chains)	Tolerance
2.4GHz 802.11b	1Mbps	19dBm	22dBm	±2dB
	2Mbps	19dBm	22dBm	±2dB
	5.5Mbps	19dBm	22dBm	±2dB
	11Mbps	19dBm	22dBm	±2dB
2.4GHz 802.11g	6Mbps	19dBm	22dBm	±2dB
	9Mbps	19dBm	22dBm	±2dB
	12Mbps	19dBm	22dBm	±2dB
	18Mbps	19dBm	22dBm	±2dB
	24Mbps	18dBm	21dBm	±2dB
	36Mbps	18dBm	21dBm	±2dB
	48Mbps	17dBm	20dBm	±2dB
	54Mbps	16dBm	19dBm	±2dB
2.4GHz 802.11n VHT20	MCS 0	19dBm	22dBm	±2dB
	MCS 1	19dBm	22dBm	±2dB
	MCS 2	19dBm	22dBm	±2dB
	MCS 3	18dBm	21dBm	±2dB
	MCS 4	18dBm	21dBm	±2dB
	MCS 5	17dBm	20dBm	±2dB
	MCS 6	16dBm	19dBm	±2dB
	MCS 7	15dBm	18dBm	±2dB
2.4GHz 802.11n VHT40	MCS 0	19dBm	22dBm	±2dB
	MCS 1	19dBm	22dBm	±2dB
	MCS 2	19dBm	22dBm	±2dB
	MCS 3	18dBm	21dBm	±2dB
	MCS 4	18dBm	21dBm	±2dB
	MCS 5	17dBm	20dBm	±2dB
	MCS 6	16dBm	19dBm	±2dB
	MCS 7	15dBm	18dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
2.4GHz 802.11b	1Mbps	-94dBm	±2dB
	2Mbps	-93dBm	±2dB
	5.5Mbps	-92dBm	±2dB
	11Mbps	-90dBm	±2dB
2.4GHz 802.11g	6Mbps	-94dBm	±2dB
	9Mbps	-93dBm	±2dB
	12Mbps	-92dBm	±2dB
	18Mbps	-90dBm	±2dB
	24Mbps	-88dBm	±2dB
	36Mbps	-86dBm	±2dB
	48Mbps	-80dBm	±2dB
	54Mbps	-76dBm	±2dB
2.4GHz 802.11n VHT20	MCS 0	-94dBm	±2dB
	MCS 1	-92dBm	±2dB
	MCS 2	-89dBm	±2dB
	MCS 3	-86dBm	±2dB
	MCS 4	-83dBm	±2dB
	MCS 5	-79dBm	±2dB
	MCS 6	-77dBm	±2dB
	MCS 7	-75dBm	±2dB
2.4GHz 802.11n VHT40	MCS 0	-92dBm	±2dB
	MCS 1	-89dBm	±2dB
	MCS 2	-85dBm	±2dB
	MCS 3	-83dBm	±2dB
	MCS 4	-80dBm	±2dB
	MCS 5	-77dBm	±2dB
	MCS 6	-74dBm	±2dB
	MCS 7	-72dBm	±2dB

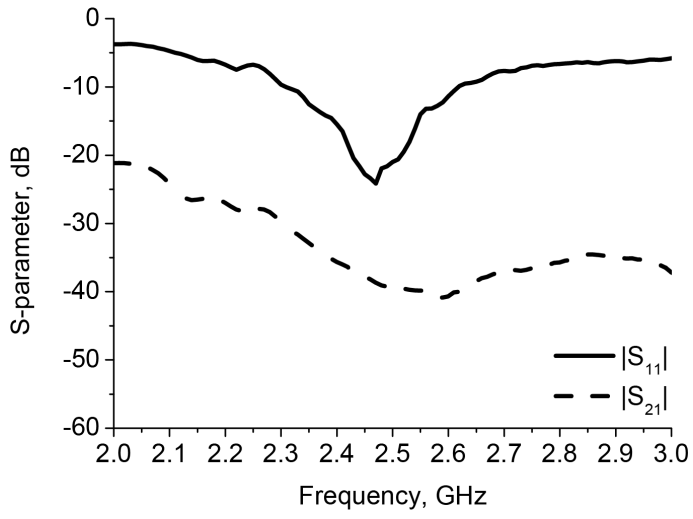
RF Performance Table

	Data Rate	TX Power (per chain)	TX Power (2 chains)	Tolerance
5GHz 802.11a	6Mbps	18dBm	21dBm	±2dB
	9Mbps	18dBm	21dBm	±2dB
	12Mbps	18dBm	21dBm	±2dB
	18Mbps	18dBm	21dBm	±2dB
	24Mbps	18dBm	21dBm	±2dB
	36Mbps	18dBm	21dBm	±2dB
	48Mbps	17dBm	20dBm	±2dB
	54Mbps	16dBm	19dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	18dBm	21dBm	±2dB
	MCS 1	18dBm	21dBm	±2dB
	MCS 2	18dBm	21dBm	±2dB
	MCS 3	18dBm	21dBm	±2dB
	MCS 4	18dBm	21dBm	±2dB
	MCS 5	17dBm	20dBm	±2dB
	MCS 6	16dBm	19dBm	±2dB
	MCS 7	15dBm	18dBm	±2dB
	MCS 8	14dBm	17dBm	±2dB
5GHz 802.11n/ac VHT40	MCS 0	18dBm	21dBm	±2dB
	MCS 1	18dBm	21dBm	±2dB
	MCS 2	18dBm	21dBm	±2dB
	MCS 3	18dBm	21dBm	±2dB
	MCS 4	18dBm	21dBm	±2dB
	MCS 5	17dBm	20dBm	±2dB
	MCS 6	16dBm	19dBm	±2dB
	MCS 7	15dBm	18dBm	±2dB
	MCS 8	14dBm	17dBm	±2dB
	MCS 9	13dBm	16dBm	±2dB
5GHz 802.11ac VHT80	MCS 0	17dBm	20dBm	±2dB
	MCS 1	17dBm	20dBm	±2dB
	MCS 2	17dBm	20dBm	±2dB
	MCS 3	17dBm	20dBm	±2dB
	MCS 4	17dBm	20dBm	±2dB
	MCS 5	16dBm	19dBm	±2dB
	MCS 6	15dBm	18dBm	±2dB
	MCS 7	14dBm	17dBm	±2dB
	MCS 8	13dBm	16dBm	±2dB
	MCS 9	12dBm	15dBm	±2dB

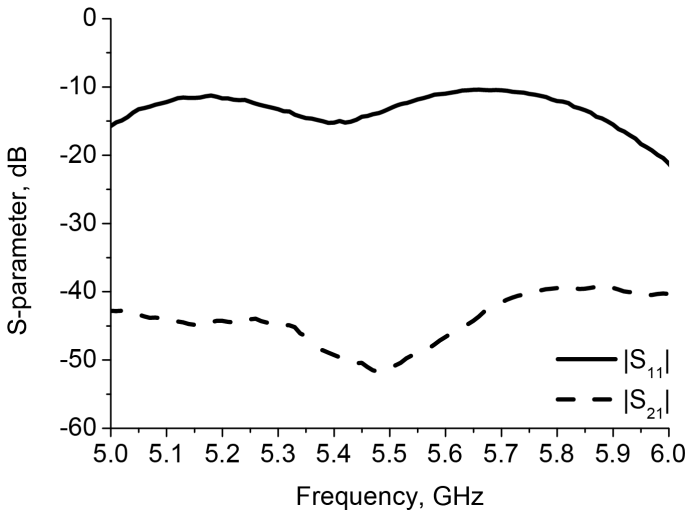
	Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11a	6Mbps	-93dBm	±2dB
	9Mbps	-92dBm	±2dB
	12Mbps	-91dBm	±2dB
	18Mbps	-89dBm	±2dB
	24Mbps	-87dBm	±2dB
	36Mbps	-84dBm	±2dB
	48Mbps	-80dBm	±2dB
	54Mbps	-79dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	-90dBm	±2dB
	MCS 1	-87dBm	±2dB
	MCS 2	-85dBm	±2dB
	MCS 3	-82dBm	±2dB
	MCS 4	-79dBm	±2dB
	MCS 5	-75dBm	±2dB
	MCS 6	-72dBm	±2dB
	MCS 7	-71dBm	±2dB
	MCS 8	-67dBm	±2dB
5GHz 802.11n/ac VHT40	MCS 0	-88dBm	±2dB
	MCS 1	-84dBm	±2dB
	MCS 2	-82dBm	±2dB
	MCS 3	-80dBm	±2dB
	MCS 4	-76dBm	±2dB
	MCS 5	-71dBm	±2dB
	MCS 6	-69dBm	±2dB
	MCS 7	-68dBm	±2dB
	MCS 8	-64dBm	±2dB
	MCS 9	-63dBm	±2dB
5GHz 802.11ac VHT80	MCS 0	-84dBm	±2dB
	MCS 1	-81dBm	±2dB
	MCS 2	-78dBm	±2dB
	MCS 3	-76dBm	±2dB
	MCS 4	-72dBm	±2dB
	MCS 5	-66dBm	±2dB
	MCS 6	-65dBm	±2dB
	MCS 7	-62dBm	±2dB
	MCS 8	-60dBm	±2dB
	MCS 9	-60dBm	±2dB

Antenna S-Parameters

Return Loss and Mutual Coupling of the Two Elements



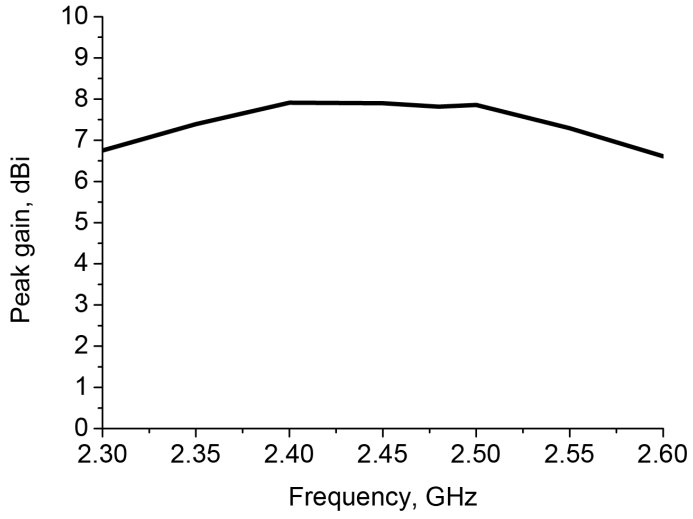
At 2.4 GHz



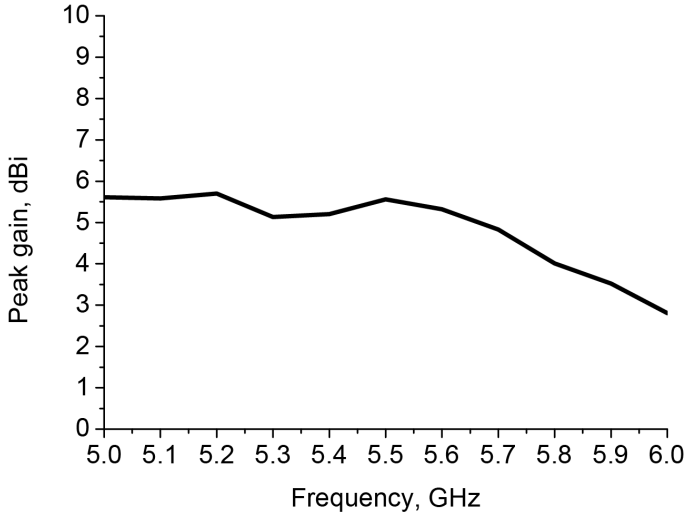
At 5 GHz

Peak Gain

Measured Peak Gain of Each Element



At 2.4 GHz

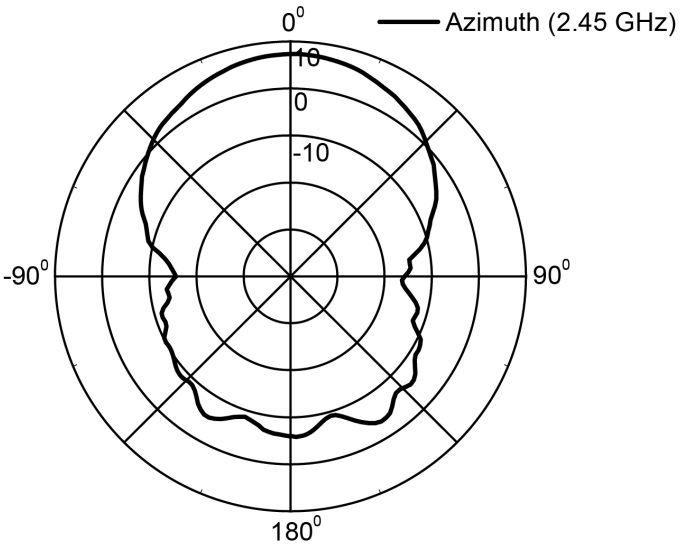


At 5 GHz

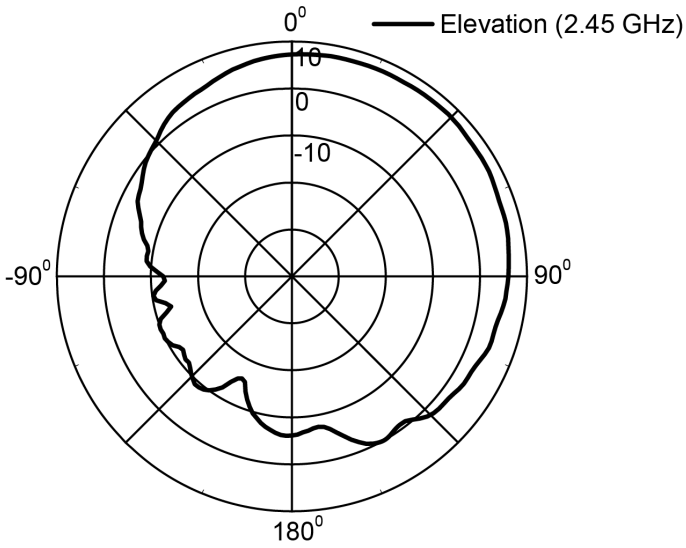
* Note: The measured peak gain (total field) includes the cable loss. The cable loss is about 0.3dB at 2.4GHz and 0.6dB at 5GHz. The actual gain is higher than shown in the graphs.

Gain at 2.4 GHz

Polar Plots of the Gain of Each Element at 2.45 GHz



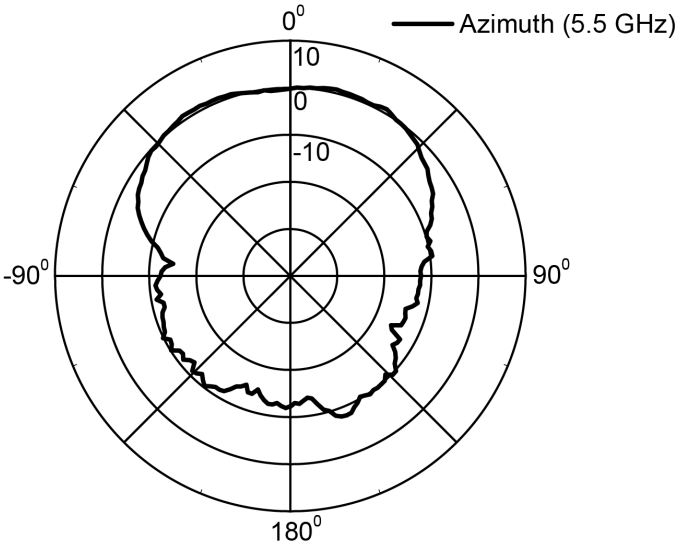
In the Horizontal Plane



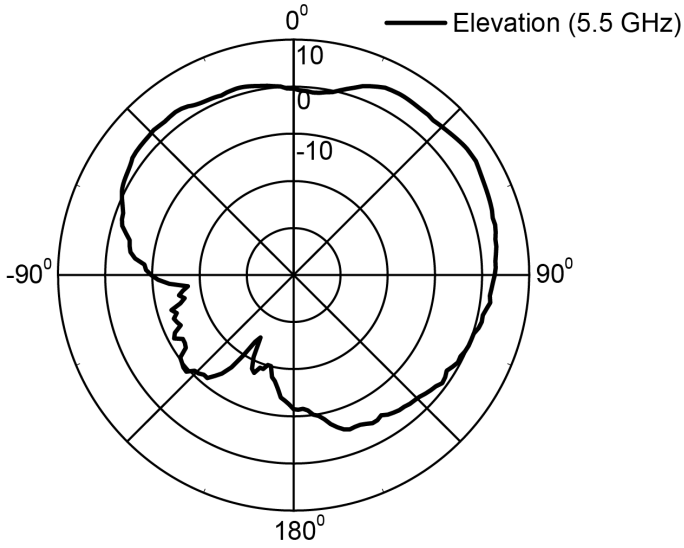
In the Vertical Plane at 0° Azimuth

Gain at 5 GHz

Polar Plots of the Gain of Each Element at 5.5 GHz



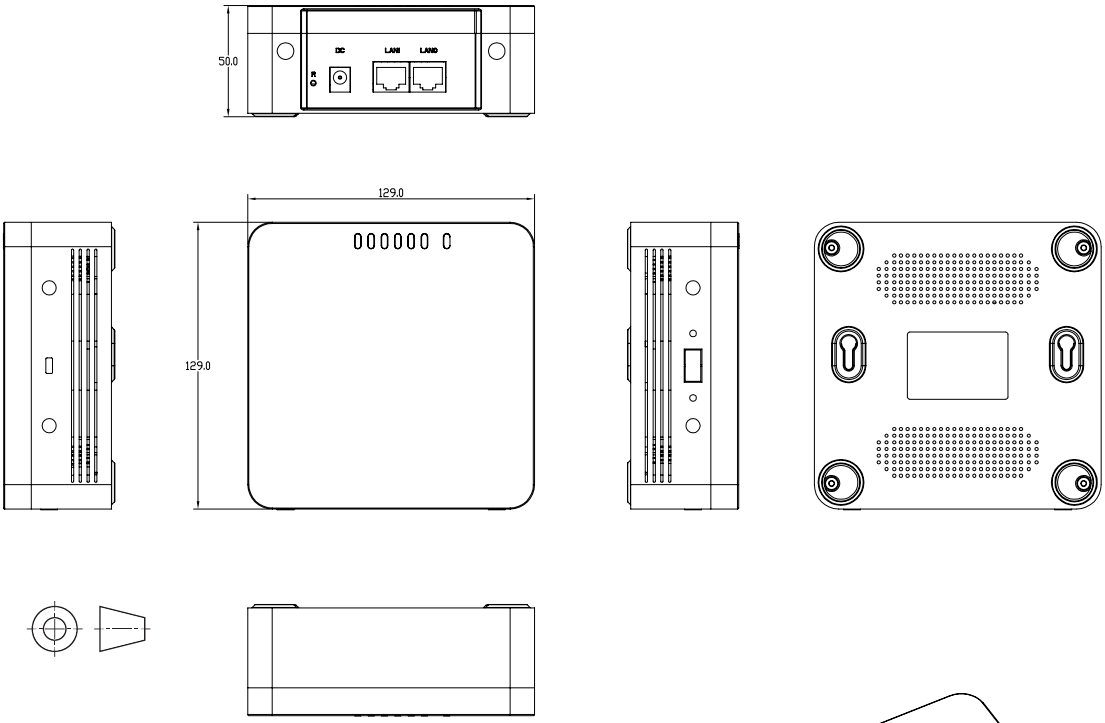
In the Horizontal Plane

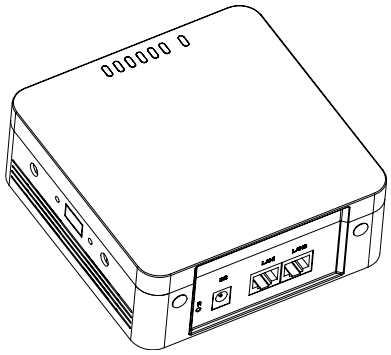


In the Vertical Plane at 0° Azimuth

* Note: The antenna plane is facing upwards. The gain of each element is expected to be highest at about 0° Azimuth and 45° Elevation.

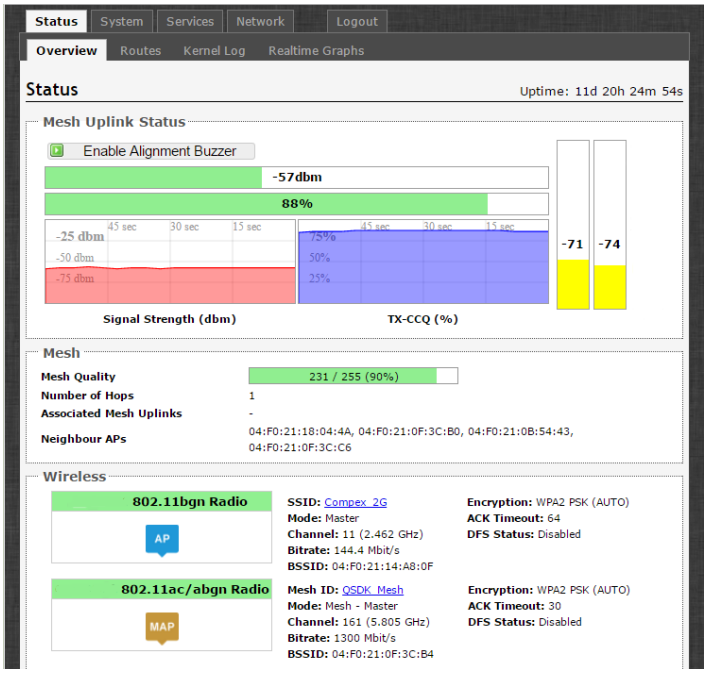
Dimensional Drawing





CompexWRT Features

It is developed based on the OpenWRT platform and features the latest Qualcomm Atheros drivers with LuCI web interface. It combines all of the best in one system. It offers many levels of customization.



Powerful Wireless Features

- Qualcomm Atheros Drivers
- Native 802.11ac Support
- Wireless Distribution System (WDS) AP and Client Mode
- Seamless Mesh Networking

Enhanced Control

- User-friendly LuCI Graphical User Interface
- Works with Compex Network Management System (CNMS)
- Powerful Network Diagnostic Utilities
- Real-time Network Load Graphs

Find out more at https://wiki.compex.com.sg/

Firmware / Software

The MMN428HV is shipped with the versatile CompexWRT firmware. OpenWRT SDK is supported for further development.

Supported Operating System	• CompexWRT Operating System • OpenWRT Operating System
Supported Mass Management Software	• CNMS AP Controller Software[1]

1. CNMS AP Controller only compatible with MMN428HV running CompexWRT.

*Configurations are subject to change without notifications.

Ordering Options

Item Code	Model	Description
MMN428HV 6A04FFO0AR	MMN428HV	24V DC Jack Power Adapter Choose between EU or US power plug

Customization Options

The MMN428HV can be customized for volume applications. Please contact our sales representatives for more information.

For more customization, contact us at sales@compex.com.sg

Packaging Contents

Item	Quantity
MMN428HV Indoor Access Point	1
Read Me First Documentation	1
24V DC Jack Power Adapter	1