



802.11n a/b/g 2x2 wifi to Ethernet converter (AP/Ethernet Client/Repeater), AP83/ AR9130+AR9104

Model: RNEA-81



RNEA-81 is a carrier-class high-speed 802.11n a/b/g 2x2 wifi to Ethernet Converter that can operate as Access Point, Ethernet Client, and Repeater modes designed specifically for IPTV over Wi-Fi applications. Access Point and Ethernet Client can be paired in the factory to meet the Do-It-Yourself goal of completely plug-and-play with virtually no configuration to reduce end user support burden. GUI and firmware custom service enable Operators to quickly and easily bring competitive price/performance wifi solutions to market and ensure best end user experience possible.

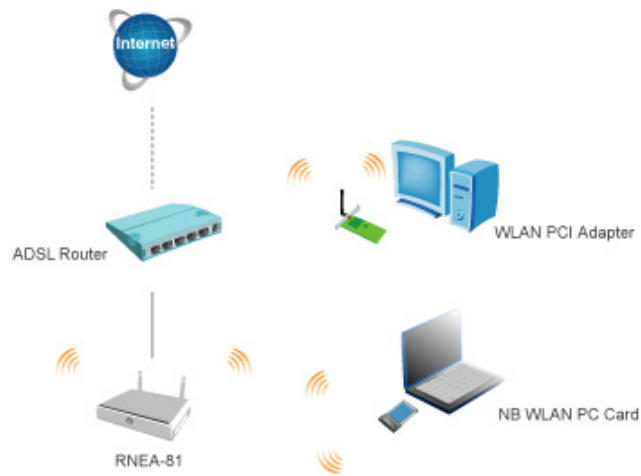
Equipped with latest 802.11n 2x2 technology that delivers up to 300Mbps wireless link rate, RNEA-81 sufficiently delivers the ultimate wireless triple play experience of video streaming, voice, and data transmission for multimedia homes, offices, and public hotspots looking to deploy co-existing 2.4 and 5GHz Wi-Fi networks.

Key Features:

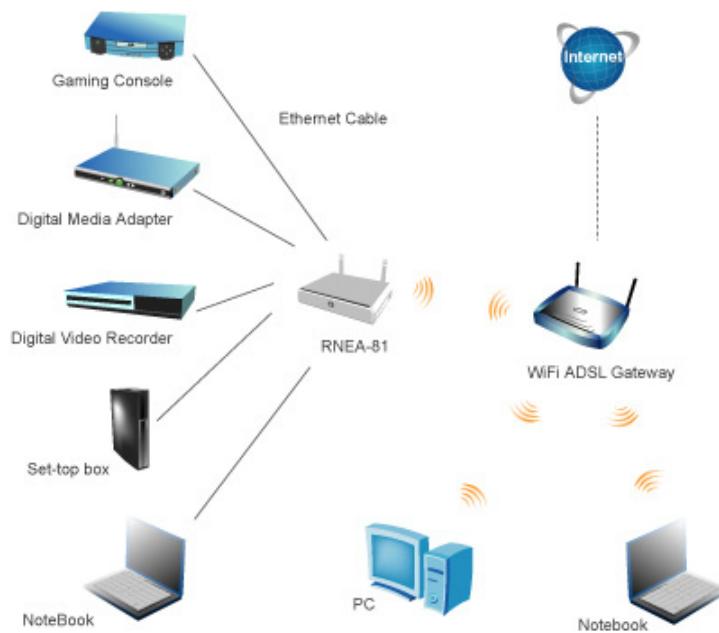
- An 802.11n a/b/g 2x2 wifi to Ethernet converter can operate in 3 working models of access point, Ethernet client, and repeater.
- Hardware switching selector of AP, Ethernet client, and repeater mode to easily select required mode without Web GUI access.
- WPS (Wi-Fi Protected Setup) hardware press button automatically configure a wifi network with a SSID as well as data encryption and authentication without troublesome Web configuration.
- Supports Multicast and Unicast conversion for video streaming applications.
- Configurations can be saved and automatically applied among access point/Ethernet client/repeater function mode switching.
- Enables bandwidth up to 300Mbps link rate, six times the throughput of 802.11a and 802.11g.
- Supports IEEE 802.11a/802.11b/802.11g backward compatibility allowing inter-operability among multiple wifi networks.
- Supports WEP 64/128/152 encryption and WPA/WPA-PSK/WPA2/WPA2-PSK/802.11x security.
- One 10/100Mbps Ethernet port supports auto-negotiation, auto MDI/MDI-X and 802.3x flow control.
- RoHS 2002/95/EC compliance meets environment-friendly requirement.
- Optional TR-069 direct management through ACS (Motive, support Soft and Netopia) support by project request.
- Optional TR-111 ACS passing management through a TR-111 compliant gateway support by project request.

Operational Modes:

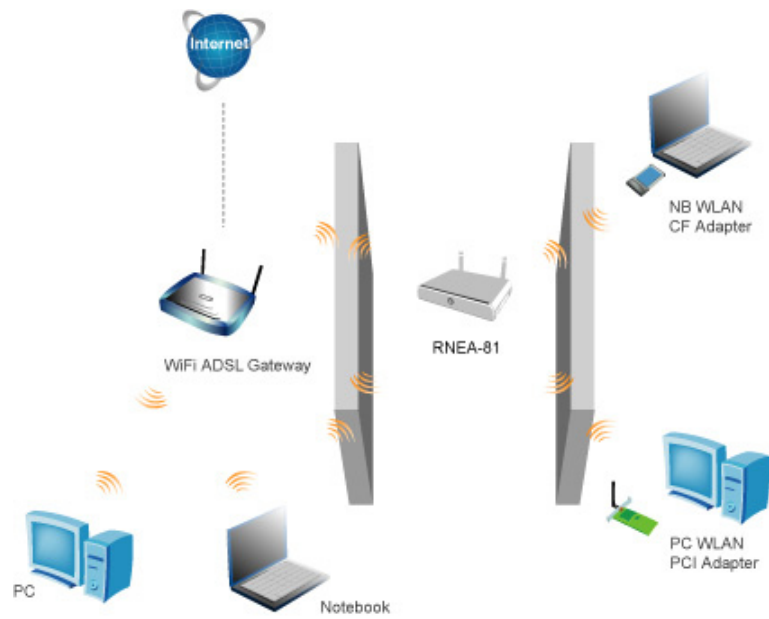
1. **Access Point (AP) mode:** connects any 2.4GHz or 5GHz wifi device to allow a group of wifi stations to communicate with each other through it.



2. **Ethernet Client mode:** connects to a computer/media device through an Ethernet cable and acts as a 2.4 or 5GHz 802.11n wifi adapter.

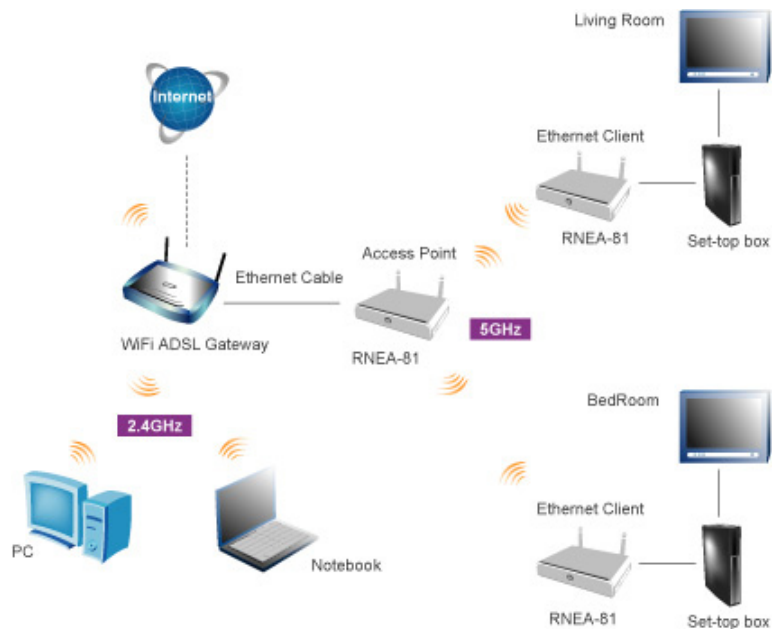


3. **Repeater mode:** extends the range of a 2.4 or 5GHz wireless network without the need to link a wired backbone.

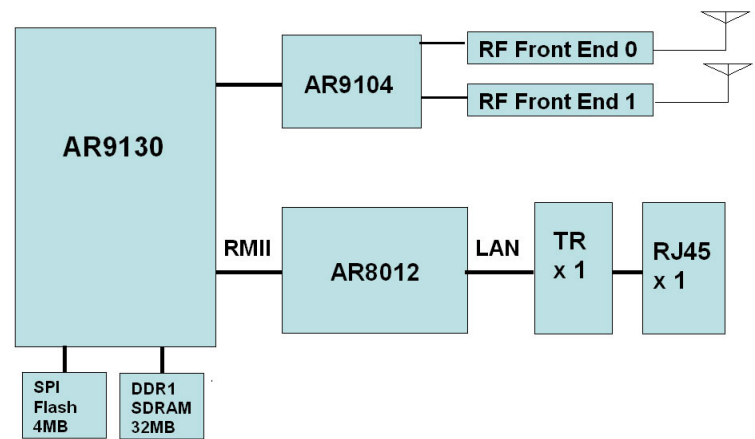


Typical Applications

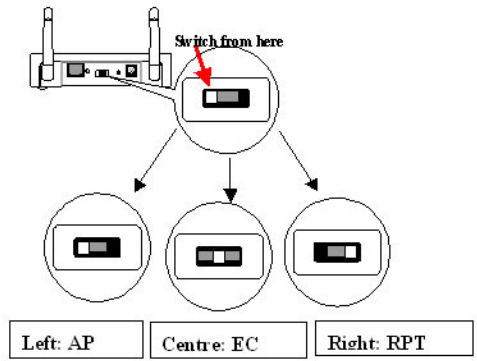
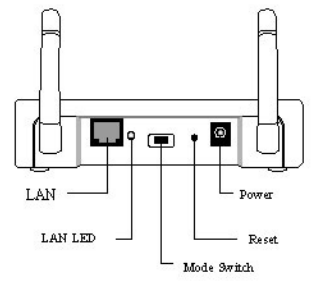
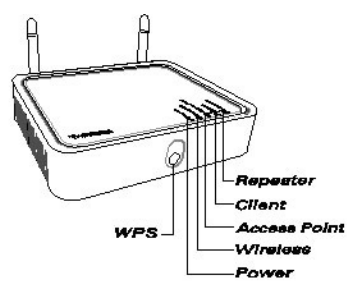
IPTV over Wi-Fi: RNEA-81 can be configured to operated in AP or Ethernet Client or Repeater; then paired to work and co-exist with Wi-Fi network.



Hardware Block Diagram



Hardware Outline




Hardware Specifications:	
Main Chipset	Atheros AR9130 (400MHz) and AR9104 and AR8012
Standard Conformance	802.11n, 802.11a/b/g, 802.11i WPA2, 802.3 10Base-T, 802.3u 100Base-TX, 802.3x Flow Control, Auto MDI/MDI-X.
Frequency Range	<ul style="list-style-type: none"> ▪ USA: 2.400 ~ 2.462GHz, 5.15 ~ 5.35GHz, 5.725 ~ 5.825GHz ▪ Europe: 2.400 ~ 2.472GHz, 5.15 ~ 5.35GHz, 5.47 ~ 5.725GHz
Interface	<ul style="list-style-type: none"> ▪ WiFi: 802.11n dual-band ▪ LAN: 1x RJ-45 10/100Mbps port
Modulation Technique	<ul style="list-style-type: none"> ▪ DSSS with CCK, DQPSK, DBPSK ▪ OFDM with BPSK, QPSK, 16QAM, 64QAM
Data Rate	<ul style="list-style-type: none"> ▪ 802.11a: 6, 9, 12, 18, 24, 36, 48, 54Mbps ▪ 802.11b: 1, 2, 5.5 and 11Mbps ▪ 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps ▪ 802.11n: <ul style="list-style-type: none"> ◦ 20MHz channel: <ul style="list-style-type: none"> ◦ 1Nss: 65Mbps(Max.) ◦ 2Nss: 130Mbps(Max.) ◦ 40MHz channel: <ul style="list-style-type: none"> ◦ 1Nss: 135Mbps(Max.) ◦ 2Nss: 270Mbps(Max.)
Operating Channels	<ul style="list-style-type: none"> ▪ 802.11n /2.4GHz: <ul style="list-style-type: none"> ◦ HT20: <ul style="list-style-type: none"> ◦ USA/Canada: 11 (1~11) ◦ Major Europe Countries: 13 (1~13) ◦ France: 4 (10~13) HT40: <ul style="list-style-type: none"> ◦ CH3~CH9 ▪ 802.11n/5GHz: <ul style="list-style-type: none"> ◦ HT20: <ul style="list-style-type: none"> ◦ US: 5.150 ~ 5.350 and 5.725 ~ 5.850 (5.180, 5.200, 5.220, 5.240, 5.260, 5.280, 5.300, 5.320, 5.745, 5.765, 5.785, 5.805, 5.825) GHz ◦ EU: 5.150 ~ 5.725 (5.180, 5.200, 5.220, 5.240, 5.260, 5.280, 5.300, 5.320, 5.500, 5.540, 5.560, 5.580, 5.600, 5.620, 5.640, 5.680, 5.700) GHz ◦ HT40: <ul style="list-style-type: none"> ◦ US: 5.190, 5.230, 5.270, 5.310, 5.755, 5.795GHz ◦ EU: 5.190, 5.230, 5.270, 5.310, 5.510, 5.550, 5.590, 5.630, 5.670GHz

Hardware Specifications:

Transmit Power Settings	<ul style="list-style-type: none"> ▪ 802.11a: <ul style="list-style-type: none"> ◦ +21dBm @ 6, 9, 12, 18, 24Mbps ◦ +20dBm @ 36Mbps ◦ +19dBm @ 48Mbps ◦ +18dBm @ 54Mbps ▪ 802.11b: +22dBm ▪ 802.11g: <ul style="list-style-type: none"> ◦ +21dBm @ 6, 9, 12,18,24Mbps ◦ +21dBm @ 36Mbps ◦ +20dBm @ 48Mbps ◦ +19dBm @ 54Mbps ▪ 802.11n 2.4GHz HT20: <ul style="list-style-type: none"> ◦ +22dBm @ MCS0~4/MCS8~12 ◦ +20dBm @ MCS5/MCS13 ◦ +16dBm @ MCS6/MCS14 ◦ +14dBm @ MCS7/MCS15 ▪ 802.11n 2.4GHz HT40: <ul style="list-style-type: none"> ◦ +21dBm @ MCS0~2/MCS8~10 ◦ +20dBm @ MCS3~4/MCS11~12 ◦ +19dBm @ MCS5/MCS13 ◦ +15dBm @ MCS6/MCS14 ◦ +13dBm @ MCS7/MCS15 ▪ 802.11n 5GHz HT20: <ul style="list-style-type: none"> ◦ +21dBm @ MCS0~2/MCS8~10 ◦ +20dBm @ MCS3~4/MCS11~12 ◦ +19dBm @ MCS5/MCS13 ◦ +15dBm @ MCS6/MCS14 ◦ +13dBm @ MCS7/MCS15 ▪ 802.11n 5GHz HT40: <ul style="list-style-type: none"> ◦ +20dBm @ MCS0~2/MCS8~10 ◦ +19dBm @ MCS3~4/MCS11~12 ◦ +18dBm @ MCS5/MCS13 ◦ +14dBm @ MCS6/MCS14 ◦ +12dBm @ MCS7/MCS15 															
Operation Distance	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Outdoor</th> <th style="text-align: center;">Indoor</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">802.11a</td> <td style="text-align: center;">50m @ 54Mbps 300m @ 6Mbps</td> <td style="text-align: center;">30m @ 54Mbps 100m @ 6Mbps</td> </tr> <tr> <td style="text-align: center;">802.11b</td> <td style="text-align: center;">150m @ 11Mbps 300m @ 1Mbps</td> <td style="text-align: center;">30m @ 11Mbps 100m @ 1Mbps</td> </tr> <tr> <td style="text-align: center;">802.11g</td> <td style="text-align: center;">50m @ 54Mbps 300m @ 6Mbps</td> <td style="text-align: center;">30m @ 54Mbps 100m @ 6Mbps</td> </tr> <tr> <td style="text-align: center;">802.11n</td> <td style="text-align: center;">30m @ 300Mbps 30m @ 130Mbps 250m @ 6.5Mbps</td> <td style="text-align: center;">20m @ 300Mbps 20m @ 130Mbps 100m @ 6.5Mbps</td> </tr> </tbody> </table>		Outdoor	Indoor	802.11a	50m @ 54Mbps 300m @ 6Mbps	30m @ 54Mbps 100m @ 6Mbps	802.11b	150m @ 11Mbps 300m @ 1Mbps	30m @ 11Mbps 100m @ 1Mbps	802.11g	50m @ 54Mbps 300m @ 6Mbps	30m @ 54Mbps 100m @ 6Mbps	802.11n	30m @ 300Mbps 30m @ 130Mbps 250m @ 6.5Mbps	20m @ 300Mbps 20m @ 130Mbps 100m @ 6.5Mbps
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Antenna	two dual-band reverse SMA antenna															
LAN Ports	one RJ-45 10/100Mbps															
WPS button	support WPS function															
Function Switch	function switch among access point, Ethernet client, and repeater mode															
Reset Button	software and hardware restore to factory default															
Power Supply	external power adapter with 5V/2A input															
MAC Protocol	CSMA/CA with ACK architecture 32-bit MAC															
Wi-Fi Compliance	Wi-Fi 2.4/5GHz by request															
Operation Temperature Range	0°C~+50°C															
Storage Temperature Range	-10°C~+70°C															
Operating Humidity	10% - 90%, non-condensing															
Storage Humidity	max. 90%, non-condensing															
Dimension	147 x 112 x 29 mm															
Environment-Friendly Compliance	RoHS															

Software Specifications:	
RTOS	Linux 2.6 kernel
Security	<ul style="list-style-type: none"> ▪ WEP: 64/128/152 WEP encryption ▪ 802.1x authentication ▪ WPA/WPA2 pre-shared key, TKIP, AES ▪ MAC-based access control list for wireless interface ▪ Hidden SSID
WPS Security	<ul style="list-style-type: none"> ▪ AP Mode: <ul style="list-style-type: none"> ◦ WPS Enabled: WPA-PSK, WPA2-PSK, WPA-PSK-AUTO ◦ WPS Disabled: WEP, 802.1x, WPA-PSK, WPA2-PSK, WPA, WPA2, WPA-PSK-AUTO, WPA-AUTO ▪ Repeater Mode: <ul style="list-style-type: none"> ◦ WPS Enabled: WPA-PSK, WPA2-PSK, WPA-PSK-AUTO ◦ WPS Disabled: WEP, WPA-PSK, WPA2-PSK, WPA-PSK-AUTO, WPA, WPA2 ▪ Client Mode: <ul style="list-style-type: none"> ◦ WPS Enabled: WPA-PSK, WPA2-PSK, WPA-PSK-AUTO ◦ WPS Disabled: WEP, 802.1x, WPA-PSK, WPA2-PSK, WPA, WPA2, WPA-PSK-AUTO
Management	<ul style="list-style-type: none"> ▪ web-based management tool (web GUI) ▪ upload & download text-based configuration file via HTTP browser ▪ firmware upgrade via HTTP browser ▪ software & hardware restore to factory default ▪ watch dog timer to warm bootup system ▪ web GUI survey the channel quality and available AP auto. ▪ configuration saving on each function mode.
Log Support	<ul style="list-style-type: none"> ▪ system log ▪ security log ▪ associated wireless client table
Networking Application	<ul style="list-style-type: none"> ▪ UPnP ▪ DHCP client
Network Protocol	<ul style="list-style-type: none"> ▪ TCP/IP support
Advanced Wireless	<ul style="list-style-type: none"> ▪ support adjustable output power from GUI (100%, 75%, 50%, 25%) ▪ primary and secondary Radius server support ▪ user limitation (n users) ▪ QoS (highest, high, normal, low)
Basic Wireless	<ul style="list-style-type: none"> ▪ 802.11n a/b/g ▪ 802.1d spanning tree protocol (STP) ▪ bridging between Ethernet and wireless LAN
Advanced Wireless	<ul style="list-style-type: none"> ▪ Access Point ▪ Ethernet Client ▪ Wireless Distributed System (WDS) Repeater mode ▪ Universal Repeater mode (client and AP at the same time)

Orderign Information:	
RNAE-81	802.11n a/b/g 2x2 wifi to Ethernet converter (AP/Ethernet Client/Repeater), AP83/AR9130+AR9104

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